April 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

NELSON INSTITUTE
FOR ENVIRONMENTAL STUDIES
EARTH DAY
2022

Earth Day 2022: Water on the Rise

Nelson Institute Earth Day to focus on critical water issues

By Bekah McBride

"It's still important for us to celebrate Earth Day because of the vast and increasing challenges we face in relation to planetary health and well-being, especially due to the existence of our current climate crisis."

–Kelsey Leonard

Explore the inextricable link between life and water during the Nelson Institute for Environmental Studies Earth Day learning event, Water on the Rise. This day-long community learning event, featuring both in-person and virtual experiences, will examine how communities across the globe are facing, responding to, and mitigating critical water issues.

The online portion of the event will launch at 8:30 a.m. CT on April 21 and continue with a mix of virtual, hybrid, and in-person content that will culminate in the hybrid closing plenary "Reimagining our Relationship with Water" at 7 p.m. CT. The closing plenary will feature speakers Kelsey Leonard a water scientist, legal scholar, policy expert, writer, and enrolled citizen of the Shinnecock Nation, and Sandra Postel the direc-

tor of the Global Water Policy Project and 2021 Stockholm Water Prize Laureate, for a meaningful discussion of these solutions and how they will impact our relationship with water.

"Right now, we have three existential crises happening at the same time – water depletion, biodiversity loss, and climate change. These crises are interconnected. And we don't have time to solve them in a piecemeal fashion. We need holistic solutions that address them simultaneously. The good news is, such solutions exist," shared Postel.

"It's still important for us to celebrate Earth Day because of the vast and increasing challenges we face in relation to planetary health and well-being, especially due to the existence of our current climate crisis," added Leonard. "So, when we think about Earth Day celebrations at institutions of education and higher learning, it really is about inspiring a new generation of environmental leaders to be global citizens that are conscientious not only of the environmental harm and degradation in their own backyard, but in those far off and distant places that they may not be familiar with. Earth Day is an opportunity for us to break down boundaries to break down imagined borders, and to really engage in a holistic discussion of the planet."

In addition to the closing plenary, the day will feature sessions focusing on water and environmental justice, the relationship between water and electricity, climate change, biodiversity in the Okavango Delta, the impact of the Great Lakes Water Quality Agreement (GLWQA), the Colorado Compact, and more.

"Water isn't a single challenge, it's a million challenges," said Nelson Institute Dean, Paul Robbins. "That In the arid west, longer droughts are coming; in other regions, flooding is on the rise; and everywhere are the problems of nitrates, lead, PFAS, phosphorus and other water quality issues. That makes this year's Earth Day an especially important one. By gathering scientists, managers, writers, modelers, and citizens together to tackle the diversity of issues facing us, a focus on water will make this forum a crucial one."

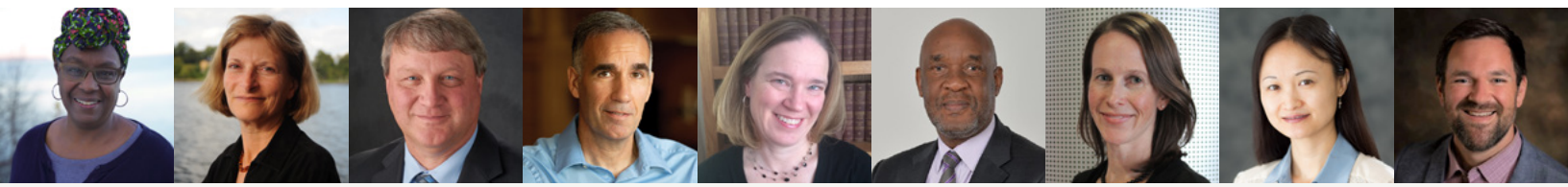
This year, Nelson Institute has partnered with Water@UW, a program that brings together water-focused faculty, staff, and students on campus to foster connection and communication among members of the UW–Madison water community. In addition to hosting a session during the Earth Day learning event, leaders from Water@UW will continue the conversation on Friday, April 22, 2022, at the annual Water@UW Symposium.

"We're so excited to team up with the Nelson Institute this year for these paired events," said Caroline Gottschalk Druschke, an associate professor in the Department of English and co-chair of Water@UW. "This year's partnership allows us to connect with a global audience about a broad suite of water issues on Thursday, and to follow that up with a somewhat more in-depth, campus-focused event on Friday. Taken together, these events will fulfill Water@UW's focus on connecting the water community at UW–Madison and beyond."

The global community is invited to join the Nelson Institute and Water@UW for these interactive learning opportunities that will explore the human relationship with water and what can be done to ensure equitable access to this life-sustaining resource.

"I'm very grateful to participate," said Postel. "The first Earth Day helped launch the environmental movement. Today we're facing bigger challenges than we could even imagine a half century ago. We need to catalyze action in a big way again. We all have a role to play in saving the beauty and abundance that remains on this blue planet. My hope is that this Earth Day programming will inspire bold, collective action." Learn more and register.

Learn more about the Nelson Institute's Signature Public Events and how you can support the Earth Day program.



NELSON INSTITUTE
FOR ENVIRONMENTAL STUDIES
EARTH DAY
2022

WATER ON THE RISE

Earth Day 2022
Schedule at a glance

Morning Concurrent Sessions

9–10 a.m. CT (virtual)

Tribal_University Partnerships for Wild Rice Revitalization in the Western Great Lakes

Hosted by the Nelson Institute Water Resources Management program

Community Partnerships for the Yahara Watershed

Hosted by the UW-Madison Office of Sustainability

The Colorado River Compact at 100

Hosted by the Nelson Institute Center for Culture, History, and Environment

10:30–11:30 a.m. CT (virtual)

Water for Food: Too Much or Not Enough?

Hosted by the Nelson Institute Center for Sustainability and the Global Environment

Water@UW: Addressing Wisconsin's Water Challenges

Hosted by Water@UW

Land-Water Connections and the Ecological Impacts of Water Pollution

Hosted by the Nelson Institute Center for Ecology and the Environment

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Plenary Sessions

12:30–1:30 p.m. CT (virtual)

Water Justice in Wisconsin

Ashley Lee, national director of alumni mobilization and engagement, Public Allies Inc.
Dylan Jennings, UW-Madison HEAL fellow, Earth Partnership, Department of Planning and Landscape Architecture, UW-Madison
Brenda Coley, co-executive director, Milwaukee Water Commons
Scott Laeser, co-owner, Plowshares & Prairie Farm; director, Clean Wisconsin

Afternoon Concurrent Sessions

2:30–3:30 p.m. CT (in person and virtual)

A Half Century of Environmental Cooperation: The U.S.-Canada Great Lakes Water Quality Agreement

Hosted by the UW-Madison Law School and Laurie Carlson Progressive Ideas Forum

Mountains and 3 or 4 Rios (Rivers)

Hosted by the UW-Madison 4W Initiative

Working Together to Improve Wisconsin's Water: How Community-University Partnerships Catalyze Water Quality Projects in Wisconsin

Hosted by UniverCity Alliance and UW-Madison Extension

4:15–5:15 p.m. CT (in person and virtual)

The Okavango Delta: Opportunities for Regional Cooperation

Hosted by the Nelson Institute's Environmental Professional Programs and the UW-Madison International Division and African Studies Program

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

Hosted by the Nelson Institute Center for Climatic Research

Climate Resilience in the Electricity-Water Nexus

Hosted by the Wisconsin Energy Institute and Nelson Institute Energy Analysis and Policy Certificate

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Confluence

6–7 p.m. CT (Wisconsin Historical Society, First Floor)

Earth Day 2022: Water on the Rise 'Confluence'

Plenary Sessions

7–8:30 p.m. CT (in person and virtual)

Reimagining Our Relationship with Water

Sandra Postel, founding director, Global Water Policy Project and 2021 winner of the Stockholm Water Prize
Kelsey Leonard, Canada Research Chair in Indigenous Waters, Climate and Sustainability, University of Waterloo

New UW–Madison research projects to benefit Great Lakes

Lake Michigan shoreline as seen from Sheboygan. Six research projects at UW-Madison will examine aspects of lakes Michigan and Superior. Photo credit: SSEC

Wisconsin Sea Grant recently announced that three Nelson Institute affiliate research projects have been selected to receive funding from the National Oceanic and Atmospheric Administration. In total, 12 projects, including six on the University of Wisconsin–Madison campus, have been selected to receive a portion of the $2.8 million in funding that is earmarked to help to build Great Lakes understanding, science-based management, and policy decisions.

Jessie Conaway, a Nelson Institute faculty associate and Indigenous Arts and Sciences research coordinator with the Earth Partnership, will receive support for her project investigating water quality and wild rice habitat in Lake Winnebago. The project will be in collaboration with tribal and non-tribal partners around the state.

"Guided by Tribal Nations and intertribal conservation organizations, together with state and federal agencies, watershed groups, and fishing and hunting clubs, we are leveraging Traditional knowledge, tribal and non-tribal expertise, to revitalize wild rice beds," Conaway said.

Andrea Hicks, a Nelson Institute affiliate, director of Sustainability Education and Research, Hanson Family Fellow in Sustainability, and associate professor

"Guided by Tribal Nations and intertribal conservation organizations, together with state and federal agencies, watershed groups, and fishing and hunting clubs, we are leveraging Traditional knowledge, tribal and non-tribal expertise, to revitalize wild rice beds."

–Jessie Conaway

of Civil and Environmental Engineering, will receive funding for her efforts to diversify the aquaculture industry.

"I am delighted to work on a project that couples assisting aquaculture producers in expanding their markets and products with sustainability," shared Hicks.

Tony Goldberg, a Nelson Institute affiliate, and professor of Epidemiology with the School of Veterinary Medicine will build a database of fish viruses in Wisconsin waters in partnership with the U.S. Fish and Wildlife Services.

"We all know that viruses are important for human health, but fish get sick from viruses too," shared Goldberg. "We want to build a database of viruses in Wisconsin's sport fish. This will be important for decision-making about fish health in Wisconsin. It will let us know whether a virus identified in Wisconsin's sport fish in the future is new and problematic, or whether it has been here all along and is more likely a normal part of the ecosystem. This information will help our state's fisheries managers make evidence-based decisions about managing disease in our valuable sport fisheries." Read more

Nelson Institute faculty and programs highlighted in "Blank's Slate"

Chancellor, Becky Blank. Photo credit: UW-Madison

The Nelson Institute sustainability certificate and Nelson Institute affiliate, Andrea Hicks, were among the programs and people highlighted in the March 3 edition of "Blank's Slate". A column from University of Wisconsin–Madison Chancellor Becky Blank, "Blank's Slate" highlights important initiatives related to the university. This week, the column focused on sustainability.

As a Nelson Institute affiliate, director of Sustainability Education and Research, Hanson Family Fellow in Sustainability, and associate professor of Civil and Environmental Engineering, Andrea Hicks is a campus lead for sustainability efforts. The Chancellor noted Hicks' involvement with various campus initiatives including the Sustainability Advisory Council, the Zero Waste initiative, and the upcoming Climate Action and Adaptation Plan.

The Chancellor also highlighted the Nelson Institute sustainability certificate, which has students from more than 48 majors enrolled. The program introduces students to suitability through courses that range from social and economic topics to environmental and system. Read more

Turner and her anthrax research group in 2019 in Namibia. Photo courtesy of Wendy Turner

Nelson Institute affiliate Wendy Turner expands knowledge of wildlife disease ecology

By Bekah McBride

Understanding and improving the mitigation and management of pathogens shared among wildlife, livestock, and humans, is the inspiration for Nelson Institute affiliate Wendy Turner's research. As a research biologist at the Wisconsin Cooperative Wildlife Research Unit (WCWRU) in the Department of Forest and Wildlife Ecology at the University of Wisconsin–Madison Turner works to enhance graduate education, while facilitating research and technical assistance with cooperative partners. She is also the primary investigator and lead of a research group working to understand wildlife disease ecology.

"An overarching theme of my research is how consumer-resource interactions and environmental variation frame host-parasite dynamics and parasite life history traits," Turner shared. "My research focuses on wildlife parasites that transmit via a dormant phase or a life stage in the off-host environment."

Turner shared that her current research is focused on three main wildlife disease systems. In particular, she is focusing on anthrax in herbivorous mammals in Namibia and South Africa, white-nose syndrome in northern long-eared bats on Long Island, Martha's Vineyard, and Nantucket, and chronic wasting disease in white-tailed deer in the Midwest.

"Many pathogens are shared among wildlife, livestock, and humans, making the study of wildlife disease important to predict, manage and mitigate disease impacts on wildlife populations and on human health and livelihoods," Turner said. "Yet, there is much that remains poorly understood about how even common diseases are transmitted, and how variation in transmission affects host-pathogen interactions at ecological and evolutionary scales."

To gain a better understanding of these interactions and transmission pathways, Turner uses a disease triangle method of study. This incorporates studying three areas including how variation in hosts, pathogens, and the environment modulate host-pathogen contact, disease transmission, and ultimately disease outbreaks in host populations or communities.

By studying the hosts, pathogens, and the environment, Turner is learning more about disease transmission, which applies to diseases like those she's studying, as well as other diseases like COVID-19.

Photo courtesy of Wendy Turner

"My interdisciplinary, field-centered approach integrates novel observational data collected at field sites by my research group and collaborators, natural experiments, statistical and mathematical modeling, laboratory work in microbiology, molecular biology, and parasitology, and draws upon related disciplines such as immunology and physiology," Turner shared.

Prior to coming to UW–Madison in late 2020, Turner conducted similar research at the University of Albany, University of Oslo, Norway, and the University of California Berkeley. Turner's education also took her around the world, receiving a bachelor's in biology from Cornell University in New York, a master's degree from the University of the Witwatersrand, South Africa, and a PhD from the University of California Berkeley.

"Wendy brings extensive expertise in wildlife disease ecology to our campus community" said Sean Schoville, the current chair of Wisconsin Ecology and UW–Madison associate professor of entomology. "The scope of her international research, and research here in the Midwest and U.S. more broadly, strengthens campus efforts to understand interactions among wildlife health, environment, and human health, and to address these issues with better public policy."

Turner brings years of unique research and experiences to the Nelson Institute and will be sharing her knowledge as a part of her new role with the Nelson Institute Center for Ecology and the Environment (CEE) executive committee. The committee supports and guides CEE, which includes 23 different ecology-related academic units on campus. Executive members help organize events while also representing and advocating for ecological research on behalf of the UW–Madison community. One of the primary events for CEE is its fall and spring symposium, which Turner is looking forward to working on in the future. The symposium includes early-career researchers, undergraduates, graduates, and postdoctoral researchers sharing their work and findings.

"I'm a relatively new member of the UW–Madison community, and COVID has made it difficult to get to know people across the campus," shared Turner. "Co-organizing the fall 2022 symposium will be a great opportunity to meet more of the ecological community."

The CEE Spring Symposium will take place May 2–3 at the H.F. DeLuca Forum at the Wisconsin Institute of Discovery (see below).

Learn more about the Center for Ecology and the Environment and how you can support the program.

CEE SPRING SYMPOSIUM 2022

The Center for Ecology and the Environment (CEE) will be hosting a Spring Symposium May 2-3, 2022, at the H.F. DeLuca Forum in the Discovery Building, 330 N. Orchard St.

This annual event highlights the ecology research happening across campus, with a focus on early-career researchers, including undergraduates, graduates, and postdoctoral researchers.

In addition to presentations and poster sessions, each day will include opportunities to network and socialize. There will also be a keynote address from University of Michigan Professor Meghan Duffy, who studies the evolution of host-parasite interactions in freshwater systems.

Researchers solve mystery behind Antarctica's lopsided sea ice cycle

The U.S. icebreaker R/V Nathaniel B. Palmer travels through sea ice in the Southern Ocean as the sun rises for the first time at the end of the polar night. Photo credit: Ben Adkison

By Bekah McBride

For decades, scientists have watched as the sea ice cover around Antarctica slowly grows over several months each year, and then mysteriously disappears at a rapid rate. This has left researchers with many questions about how the ice cover, which grows to the size of Russia between March and October each year, can melt so quickly. New research from the University of Washington, in collaboration with the University of Wisconsin–Madison and the University of California San Diego, has, quite literally, shed light on this mystery, identifying solar energy as the source of the rapid melt.

"...the seasonal cycle of the Antarctic sea ice always has a longer growth period, seven months of growth, and then it shrinks quickly in five months, which is surprising."

–Till Wagner

The study, which was published March 28 in *Nature Geoscience*, was led by Lettie Roach, a scientist at NASA and Columbia University who conducted the research as a postdoc at the University of Washington, along with several co-authors including Till Wagner, an assistant professor with the University of Wisconsin–Madison Department of Atmospheric and Oceanic Sciences and Nelson Institute Center for Climatic Research (CCR). Together, they analyzed global climate models and built a physics-based system that allowed them to identify seasonal solar radiation as the source of the rapid melting. Previously, scientists had argued that intricate wind or ocean circulation patterns may have been responsible for the melting instead.

"The interesting thing is that for everything that is seasonal in the climate, we always think of it as very symmetric. For example, every six months, you have the longest and shortest day of the year," Wagner said. "But the seasonal cycle of the Antarctic sea ice always has a longer growth period, seven months of growth, and then it shrinks quickly in five months, which is surprising."

The research team noticed that in the Southern Ocean near Antarctica, the insolation energy from the sun is not exactly symmetrical. In fact, the data shows that there are longer, darker winters and then and a shorter summer with high solar energy.

"And, so we realized, hey, wait, it is not one of those really complicated circulation mechanisms causing this," Wagner said. "No, it's actually just polar night is a little longer than in a symmetric case."

Wagner, who was hired as a part of a University of Wisconsin–Madison polar cluster hire, is thrilled to contribute to this research, which he hopes will help scientists to better understand the Antarctic ecosystem and climate change. As a part of the cluster hiring process, Wagner was selected along with a cohort of other polar scientists. Prior to joining the team at UW–Madison, Wagner studied at the University of Cambridge in the United Kingdom and carried out research at the University of North Carolina–Wilmington. His expertise lies in understanding how the polar regions interact with the climate system.

"One of the reasons why this paper is so cool is because it's really hard to show these things in climate simulations," Wagner shared. "With state-of-the-art global climate simulations there are millions of lines of code that run for months, and then it spits out some results, but it can be hard to analyze why the things you are seeing in the data are happening. And so, what we did and what was sort of innovative, is that we took the actual solar energy which we can measure accurately and put that into our simple polar climate model. And suddenly, we matched exactly those five months of ice melt. That was sort of the aha moment, right? Where we're like, oh, yeah, it's got to be the sun. And so, there's this long-standing enigma that we were able to solve with careful observations and some simple math." Read more

Learn more about the Center for Climatic Research and how you can support the program.

Top: 'Pancake' sea ice surrounds the U.S. icebreaker R/V Nathaniel B. Palmer in the Southern Ocean. Bottom: Frozen ocean near Antarctica, forming 'pancake' sea ice floes. Photo credit: Ben Adkison

Nelson Institute affiliates discuss the future of fossil fuels on WPR

Nelson Institute affiliate and La Follette School of Public Affairs Professor Greg Nemet and Nelson Institute affiliate and Professor, Jonathan Patz are featured in a Wisconsin Public Radio story discussing the future of energy. This discussion was prompted by the U.S. ban on Russian oil imports, which is leading to a larger discussion about the future of energy.

As Nemet explained, the recent ban, coupled with inflation, showcases how a reliance on fossil fuel can impact the economy and the planet. Instead of combatting the current issue by drilling or creating additional fossil fuel infrastructure at home, Nemet said that this is an opportunity to invest in energy that is better for people and the planet. For example, Nemet noted that investing in electric vehicles and battery charging stations rather than technology that relies solely on gas would be a step in the right direction.

Patz, who has previously served as a lead author for the UN panel and the director of the Global Health Institute at UW–Madison, shared why cutting emissions is so important to environmental and human health. Additionally, he joined other health professionals in a call to shift to clean energy. This call-to-action is based on a 2020 study that found clean energy could save 1,900 lives and $21 billion each year. Read more

Vavrus discusses Wisconsin's winter warming trend

The past two decades have been the warmest on record, which has led to challenges for some of Wisconsin's most popular winter recreational activities. Steve Vavrus, Nelson Institute Center for Climatic Research senior scientist and co-director of the Wisconsin Initiative on Climate Change Impacts (WICCI), shared insight into these challenges in a recent interview with Wisconsin Public Radio.

Vavrus discussed how warming trends and an increase in precipitation have had an impact on snow and ice in Wisconsin. The statistics and trends shared by Vavrus come from the recently published WICCI Assessment Report: Wisconsin's Changing Climate. Led by the Wisconsin Department of Natural Resources and the Nelson Institute, WICCI is a nationally recognized collaboration of scientists and stakeholders working together to help Wisconsin policymakers and citizens understand the impacts of climate change. This report, the first in over a decade, outlines the issues and impacts of climate change and describes scientific progress and solutions. Read more

Support WICCI

Gifts to the Wisconsin Initiatives 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.

Andrea Hicks

Ask Andrea

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

Q: I'm thinking about buying an electric vehicle, but I heard that they aren't any better environmentally than a conventional gasoline car. Is this true? Are they just as bad for the planet?

A: That is a great and oftentimes confusing question that many folks have. For automobiles in general, regardless of whether they are driven by an electric, hybrid, or conventional internal combustion engine, the portion of the automobile's life cycle with the greatest environmental impact is the use phase—that is, when you're driving it. A previous study found a potential to reduce carbon dioxide emissions by 10-24 percent using an electric vehicle when compared to diesel or gasoline; however, there was significant potential for increases in other environmental impacts due to the supply chain, such as eutrophication potential, which is a measurement of the upstream nitrogen and phosphorus emitted to waterways as a function of raw materials creation. Eutrophication is when there is an overabundance of limiting nutrients in a waterway and it results in things like algae blooms and fish kills. Just what the environmental tradeoffs may be depends on where you live and where your electricity comes from.

Depending on where someone lives, the various sources of electricity will comprise different percentages of the electricity that is available from their utility company, which will influence the environmental impact of driving and using an electric car. Coal represents 39 percent of electricity produced in Wisconsin right now. The greenhouse gas emissions of producing one kilowatt hour of electricity from coal is 1000 g of carbon dioxide equivalents (CO_2e). This is equivalent to the environmental impact of a quarter of a cheeseburger. Whereas producing one kilowatt hour of electricity from a solar panel would have an environmental impact of 44 g CO_2e or 1.1 percent of a cheeseburger. Similarly, producing one kilowatt hour of electricity from a wind turbine would have an environmental impact of 11 g CO_2e or less than one percent of a cheeseburger.

As a comparison to these figures, the environmental impact of one gallon of gasoline is 8890 g CO_2e or 2.2 cheeseburgers. It is anticipated that as the decarbonization of the electricity grid continues that the environmental impact of driving an electric vehicle and the overall environmental of electric vehicles will continue to decrease, which is good from a sustainability perspective. In short, using gasoline is more environmentally intensive outright, but how it compares with electric vehicles will depend on where the electricity to power them comes from.

To submit questions for future columns, please email us at: info@sustainability.wisc.edu with the subject line "Ask Andrea question"

Study showcases need for improved data surrounding Wisconsin wolf hunts

By Bekah McBride

Assumptions and gaps in population and reproduction data could lead to near local extinction for Wisconsin gray wolves according to a new study by University of Wisconsin–Madison researchers. The study, "Uncertainty and precaution in hunting wolves twice in a year" was published in *PLOS ONE* and was led by Nelson Institute Professor and Carnivore Co-existence Lab founder Adrian Treves and Nelson Institute doctoral candidate Naomi Louchouarn. Together, they evaluated current population data and how these data were used to inform policy decisions related to the 2021 wolf hunt in Wisconsin.

Naomi Louchouarn

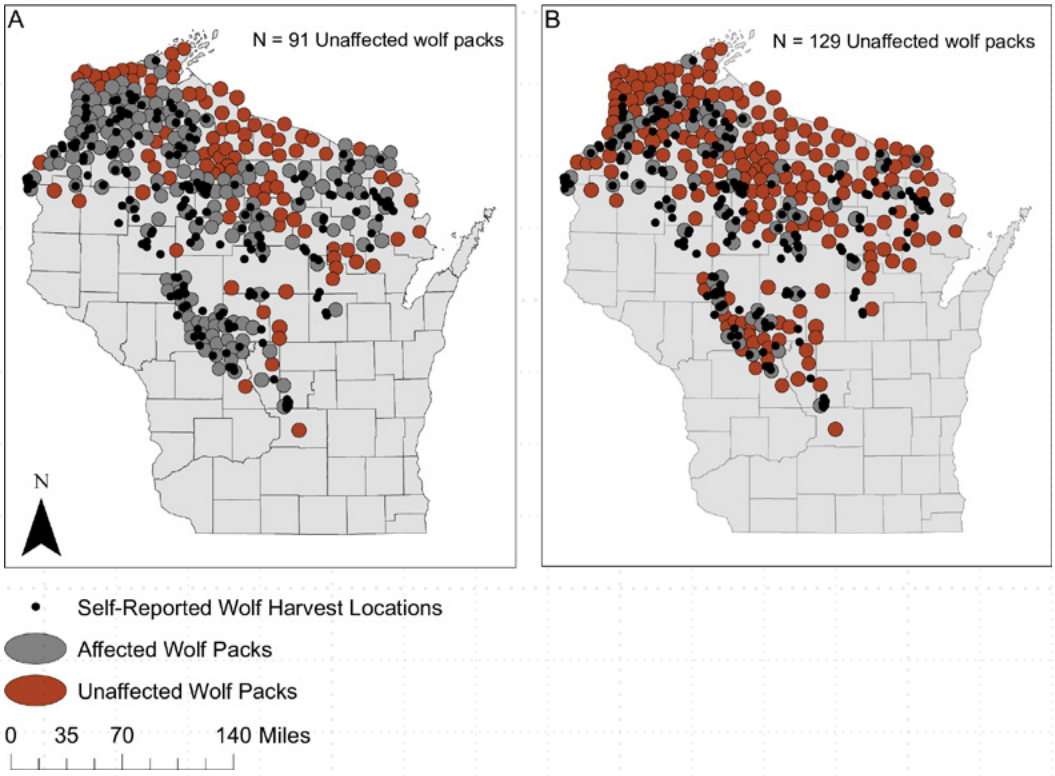
"...what we're talking about here is any mistake means wiping out the state wolf population."

–Adrian Treves

Adrian Treves

Specifically, the study investigated how uncertainty in population data can be better incorporated into modeling and policy. To study this, Treves and Louchouarn looked at population and reproduction data that were used to determine the legal thresholds, or number of wolves that could be hunted, during the first, and proposed second, wolf hunt in 2021. One of the challenges noted in the new study is that threshold numbers are based on very specific population numbers that may, or may not, accurately reflect the true population. For example, the threshold for the early 2021 wolf hunt was based on an assumption that there are 1,034 wolves in Wisconsin, when scientific studies indicate that there is a range between 937 and 1,364 wolves. Calculations in the study show that this discrepancy in population numbers could have a significant impact on the threshold number, indicating that when there is uncertainty in the numbers, more precautions should be taken to ensure that extinction does not occur.

"There is a lot of uncertainty around these numbers. And what scientists do with uncertainty is they account for it quantitatively," Treves said. "We grapple with the uncertainty and ask our-



Two scenarios for Wisconsin wolf packs affected by wolf-hunt.
(A) 91 breeding packs scenario: Any wolf kill location self-reported by hunters was extended by the average wolf territory size (161.3 km2 according to [28]) and if it overlapped a wolf territory, those wolf packs were assumed not to have reproduced successfully. (B) 129 breeding packs scenario: Any hunter-reported wolf-kill location inside a wolf pack territory was assumed to have prevented that pack from reproducing successfully. To estimate the number of breeding wolf packs for these two scenarios, we used ArcGIS Desktop 10.7.1 to convert the map of 2020 Wisconsin wolf pack locations reported in [22] and the February 2021 self-reported wolf harvest location map from [27] into shapefiles. We then used spatial overlay and geo-rectification to find overlap in territories and self-reported kill locations. The Wisconsin county map was sourced from the WDNR Open Data Portal (https://data-wi-dnr.opendata.arcgis.com/).

selves what it means, and it makes us more cautious about our communications about our science. That's what led to the title of the paper because we discovered in the literature on science and even on decision making, that when there's high uncertainty, you also must have high precautions, because what we're talking about here is any mistake means wiping out the state wolf population."

To ensure that this does not happen moving forward, Treves and Louchouarn used their analysis to identify ways in which policy makers can more accurately represent legal thresholds and use science to guide policy decisions. One way that Treves and Louchouarn recommend addressing this challenge is through the use of predictive models such as the bell curve they generated as a part of this report. This graph shows how three different legal thresholds would impact the wolf population while accounting for a margin of error.

"When we quantify uncertainty, we can incorporate it into the policy decisions, which allows us to make decisions with greater understanding of the risks of those decisions and allows us to safeguard against value judgements dominating policy decisions," shared Louchouarn.

Treves added that by using this method policymakers, and the public, can more accurately see how a population will be impacted by a legal threshold.

"We have science that tells us what the consequences are," shared Treves. "That's what those three bell curves demonstrate there's still a chance of driving the population so that it goes below some of these thresholds. In conclusion, when one portrays uncertainty scientifically, one can see the need for precautions."

Treves and Louchouarn shared that beyond improved modeling, their study also indicates a need for a peer reviewed, published method for counting wolves in the state as well as additional information on reproductive success for wolves. Both will inform the value judgements being made around legal thresholds.

"We learned that even the more moderate quota posed an unacceptable risk of state relisting as endangered or threatened under the statute," Treves said. "We need to have predators that are important to ecosystem resilience and ecosystem health."

Vaishnavi Tripuraneni receives Teaching Assistant (TA) Award for Exceptional Service

By Bekah McBride

"CESP targets historically underrepresented and marginalized students in environmental studies, so I instituted a mentorship component into that program, where students who've been in the seminar for three semesters or longer are mentors to those who've just come in."

–Vaishnavi Tripuraneni

Vaishnavi Tripuraneni. Photo credit: Megan Spielbauer, a CESP student

Nelson Institute graduate student Vaishnavi Tripuraneni has been awarded a University of Wisconsin–Madison Teaching Assistant (TA) Award for Exceptional Service. This award recognizes Tripuraneni's service to the educational mission of UW–Madison and her efforts to go above and beyond as a mentor, volunteer, and committee member.

"It feels really good to be recognized for the work I've done," said Tripuraneni, who has been involved with a variety of Nelson Institute initiatives and programs since her acceptance into the Environment and Resources PhD program a few years ago.

Tripuraneni at the award ceremony on Tuesday, March 1 Photo credit: Eric Lynne

Among her many roles, Tripuraneni has served as a mentor, a graduate representative, and as a co-instructor for the Community Environmental Scholars Program seminar (CESP).

"The CESP program is incredible," Tripuraneni said of CESP, which is a scholarship-based program designed for students who want to link their passion for the environment with a commitment to the community. As a part of the program students engage with a cohort and participate in service-learning projects.

"CESP targets historically underrepresented and marginalized students in environmental studies, so I instituted a mentorship component into that program, where students who've been in the seminar for three semesters or longer are mentors to those who've just come in," said Tripuraneni. "It really helped with community building and ability of students to reach out and get help, especially during the pandemic."

In addition to instituting the mentorship portion of CESP, Tripuraneni organized weekly graduate student research presentations in the Nelson Institute, represented Environment and Resources students on committees, contributed to clarifying the program description necessary for international student visa processes, worked on a graduate student-advisor guidelines document, and redesigned the graduate student seminar

course. Tripuraneni has also been a strong advocate for the removal of graduate student segregated fees and international student fees and is using the money from this award to pay these fees.

In addition to her volunteer and mentorship work, Tripuraneni is also busy with her PhD research which focuses on the political ecology of agrarian debt in India. This topic is close to Tripuraneni's heart as she spent much of her life in south India. In fact, before coming to the Nelson Institute, Tripuraneni earned a Bachelor of Commerce in Hyderabad, India, which was followed by a one-year degree in Finance from St. Andrews in the United Kingdom. She then came to the U.S. to complete a Master's in Sustainable Systems at the University of Michigan.

Tripuraneni (far right, red shirt) with Gaylord A. Nelson Distinguished Chair in Integrated Environmental Studies Monica White (left front row, red jacket) and students from the Community Environmental Scholars Program (CESP). Photo credit: Kevin Berger

Once she arrived at the Nelson Institute, Tripuraneni spent some time adjusting and searching for the ideal research project. Soon, she connected with Nelson Institute Dean Paul Robbins, who agreed to be her advisor.

"He encouraged me when I went back to India to visit family, to look around the landscape and see what I find. I ended up doing a summer fellowship there for three months cataloging farmer livelihoods, especially in relation to climate change," Tripuraneni said. "I framed my research around what I heard from the farmers. So, it wasn't so much about climate change adaptation, which is what I came in thinking about, but really about people's lives and what mattered to them in the landscape."

Today, Tripuraneni is wrapping up her dissertation which focuses on this topic. But she continues to use this experience as a teaching moment for students.

"I've been in the PhD program longer than is average," Tripuraneni said. "I changed advisors, it took a while to find funding to go back to India, COVID happened, mental health crises happened, but I want to let students know that if things happen, it's okay, you can still succeed."

Tripuraneni plans to complete her PhD in 2022 and is looking for jobs. She is particularly interested in post-doctoral research positions that would also allow her to teach.

"I do really enjoy teaching, and that's something I want to do in the future," Tripuraneni said. "It makes a difference in people's lives. I think it's important to hold a space where students can feel safe exploring their ideas."

As Tripuraneni completes her time as a Nelson Institute student, she is grateful for this Exceptional Service TA Award, which is the culmination of many years of work and a variety of important connections.

"I think it's important to recognize [Nelson Institute graduate advisor] Jim Miller, [Assistant Dean for Advancement] Ann Swenson, [Academic Planner] Tara Mohan, [Financial Manager] Jill Folkerts, [Director for Community Engagement and Alumni Relations] Emily Reynolds, and [Outreach Specialist] Shelly Strom, many of whom have been like family to me, and honestly, I don't think I could do the job I do without them," Tripuraneni said. "[CESP Co-Director] Rob Beattie is one of my biggest teaching mentors. He has made such a difference in how I teach and just in how I go about being a grad student. I'm also grateful to [Gaylord A. Nelson Distinguished Chair in Integrated Environmental Studies] Monica White, [Associate Dean] Anna Gade, and [CESP Instructor] Molly Schwebach. And [Dean] Paul has been my biggest supporter."

Tripuraneni received the award on Tuesday, March 1, during a ceremony at 911 Van Vleck. Read more

Learn more about the Community Environmental Scholars Program how you can support the program.

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

Edge Effects magazine reaches one million views

By Richelle Wilson

The editorial board at *Edge Effects* is celebrating a major milestone during spring semester 2022. Less than eight years after launching in 2014, the digital magazine and podcast hit one million total page views on its website, edgeeffects.net.

"Here we are, almost eight years later, with *Edge Effects*—an entirely graduate student–run endeavor, I might add—still going strong," reflects Adam Mandelman, one of the magazine's founders and the first managing editor. "That alone is a significant achievement in a world where digital publications are launched and scrapped with a rapidity reminiscent of mayflies."

The magazine, which started as the dream of a group of students, has since grown to a professional publication averaging 20,000 views per month. "I remember one of the very first conversations about the 'grad student blog' that would become *Edge Effects*," says Rebecca Summer, managing editor for the 2017–2018 academic year. "This was in a meeting of [Emeritus Professor] Bill Cronon's graduate students [in 2014]. Who could have imagined it would blossom into such a robust and respected space for public scholarship?"

Since its inception, *Edge Effects* has been produced by graduate students in the Center for Culture, History, and Environment (CHE), which is housed in the Nelson Institute for Environmental Studies. Throughout the magazine's growth, its general structure has remained the same: graduate student volunteers comprise the editorial board, who shape the magazine's content and edit posts for publication. One graduate student serves as the managing editor, which involves maintaining the publication calendar, guiding the editorial process from start to finish, leading meetings, managing the social media accounts, and overseeing all facets of production.

Former *Edge Effects* editor Brian Hamilton promotes the magazine at the 2017 meeting of the American Society for Environmental History in Chicago. Photo credit: Rachel Gross

Rachel Boothby, member of the founding editorial board and managing editor from 2016–2017, says that one of the major achievements of her tenure was working with former managing editors and CHE leadership to transition the volunteer managing editor position into a paid project assistantship, thereby "helping to make the magazine more sustainable and provide an avenue of support for CHE graduate affiliates." Former managing editor (2017–2018) Rebecca Summer reports that she was the first to be compensated financially for her work. "I don't think it would be too dramatic to say that *Edge Effects* would look very different today if we hadn't made that change."

Over the years, the magazine has published hundreds of essays, creative works, and multimedia pieces about topics in the environmental humanities, with contributors ranging from graduate students and tenured professors at campuses across the world to artists and activists working in communities all over the country. Some of the all-time most-viewed posts on the site emerged in its early months, including "The Anthropocene: The Promise and Pitfalls of an Epochal Idea" by Rob Nixon, then Rachel Carson and Elizabeth Ritzmann Professor of English at the University of Wisconsin–Madison, and editor Brian Hamilton's photo essay on Davis Island. "One day I noticed Brian's piece was consistently (and significantly) topping our views and it turned out that it was being passed around a community of Civil War history enthusiasts," remembers founding editor Adam Mandelman.

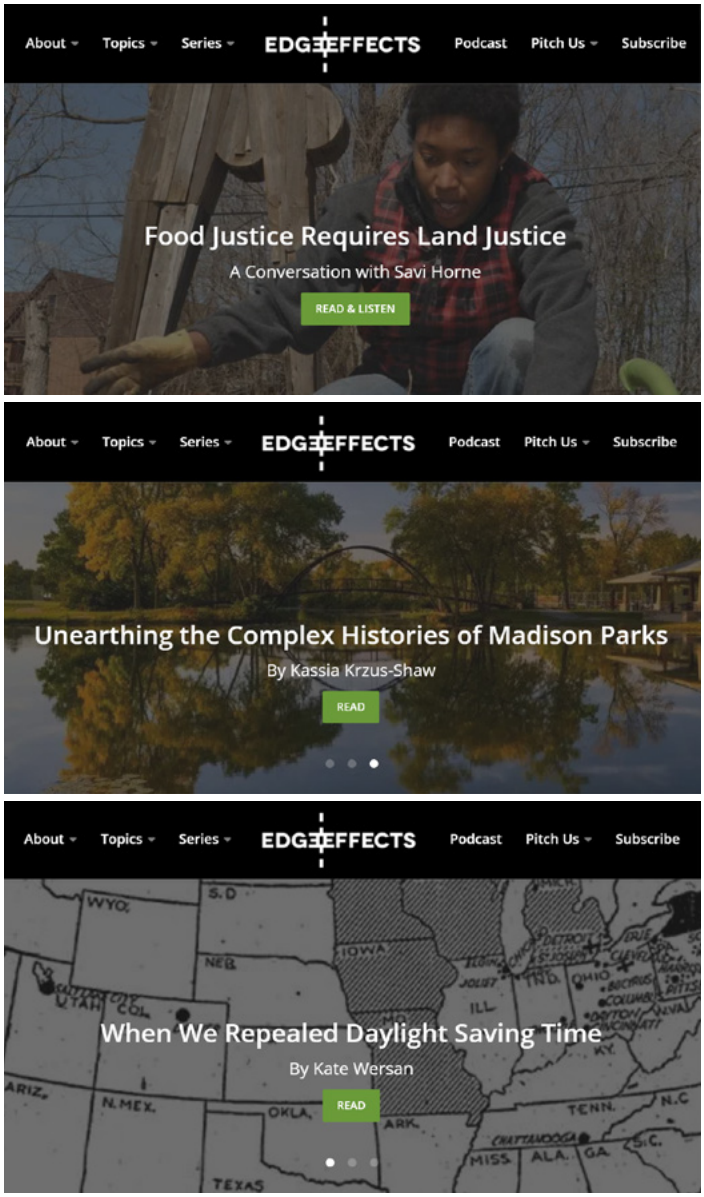
Reaching public audiences outside of academia has always been part of *Edge Effects*' mission and ethos. The editing

process that the board has carefully developed over time focuses on helping scholars write for a general audience. There is also a lot of additional behind-the-scenes work to prepare pieces for digital publication, says former managing editor (summer 2017) Brian Hamilton. "[We would ask ourselves] How could we take a post and package it with a grabby yet responsible headline, an eye-catching featured image, a well-crafted Tweet, and other promotional copy to draw in the readers it deserves? Academics are rarely if ever offered such immediate, frank feedback on our work."

One of the magazine's big successes has been the launch of several themed series, which continue to draw readers to the site. Addie Hopes, managing editor from 2018–2019 and 2020–2021 and current reviews editor, considers these series integral to *Edge Effects*' growth. "As managing editor, I took part in developing three exciting series that brought new voices and new perspectives to the magazine: the *Plantationocene, Indigenous Lands and Waters*, and *2020 Visions: Imagining (Post-)COVID Worlds*," she says. "I'm still so grateful for the monumental efforts of the many editors—and the contributors, of course—that went into making these series the successes they continue to be on the site." The magazine is launching a new series this semester called *Unpure Imagination*, which features essays and creative works that engage with and challenge ideas of purity and toxicity in environmental thought.

The podcast has also been a prominent feature of *Edge Effects*' output. In November 2021, the podcast published its 100th episode on iTunes. This semester has seen the launch of Ground Truths, a new six-episode podcast series funded by Wisconsin Humanities that "highlights environmental justice issues across the diverse communities and landscapes of Wisconsin, from Milwaukee to the Northwoods." The current editorial board has been excited about featuring more audio content on the site, including the recent launch of author narrations to accompany select essays. The first of these was Daegan Miller's essay "Badwater," an excerpt from the book series Kinship: Belonging in a World of Relations that was recently published on *Edge Effects* with original audio.

"Our goal was always to produce intellectually engaging content that was approachable and interesting to a non-specialist reader," says Nathan Jandl, former managing editor (2015–2016) and now assistant director of the UW–Madison Office of Sustainability. "That the magazine has flourished and has now passed the million-views mark is testament to that work and those values." He recalls that Danya Al-Saleh and Mohammed Rafi Arefin's 2014 essay responding to the murders of Michael Brown and Eric Gardner was a watershed moment for the magazine, along



Popular stories from the *Edge Effects* website.

with roundtable conversations about the Flint water crisis and the environmental history of Chernobyl upon the 30th anniversary of the nuclear accident.

In addition to becoming a respected digital publication in the field of environmental humanities, *Edge Effects* offers graduate students a unique opportunity for professional development. "More than any other experience in graduate school, my time at *Edge Effects* taught me how to give meaningful and constructive feedback—a skill I have not stopped using since!" says Rachel Boothby, who works for a company based in California that creates and operates responsible sourcing programs for agricultural supply chains.

"My *Edge Effects* experience helped me build skills to manage teams of student researchers and to help guide students through the writing process," says Rebecca Summer,

former managing editor and currently an assistant professor at Portland State University.

Brian Hamilton, former managing editor and now chair of the Department of History and Social Science at Deerfield Academy, echoes this sentiment. "The diverse digital and public humanities skills I developed while an editor contributed [many] lines to my resume," he says. "I was delighted to see the range of jobs I felt qualified for when I went on the market."

The magazine has also cultivated a strong community both on and off-campus and stands as a model of collaborative work in the humanities. "My favorite thing about *Edge Effects* is the team, how every piece is truly a collaborative and collective effort," says Laura Perry, former managing editor (2019–2020) and now assistant director for research and public engagement in the Center for Humanities at Washington University. "I found out that I far and away preferred this model of intellectual community to the usually solitary experience of scholarly research."

"I am proud of this accomplishment and indebted to the work of the amazing graduate student editors who came before me and built this foundation," says Richelle Wilson, current managing editor. She serves on the board alongside ten other students from a wide range of disciplines: Kuhelika Ghosh (English), Carly Griffith (Geography), Addie Hopes (English), Justyn Huckleberry (Nelson Institute), Ben Iuliano (Integrative Biology), Marisa Lanker (Nelson Institute), Juniper Lewis (Anthropology), Weishun Lu (English), Rudy Molinek (Geoscience), and Clare Sullivan (Geography). The editorial board's generosity of time, labor, and talent is what keeps the magazine going.

The support of CHE has also been critical to the magazine's ongoing success, with thanks to faculty advising editors past and present: William Cronon (Frederick Jackson Turner and Vilas Research Professor of History, Geography, and Environmental Studies from 2003 to 2020), Elizabeth Hennessy (Associate Professor of History and Environmental Studies), Mario Ortiz-Robles (Nancy C. Hoefs Professor of English), and Noreen McAuliffe (Lecturer in English and Academic Program Specialist in the Nelson Institute for Environmental Studies).

What started as a seed in 2014 has blossomed into a sprawling ecosystem of ideas. Cheers to the ever-expanding community of *Edge Effects* editors, contributors, and readers! Here's to one million more views in the years to come.

Learn more about the Center for Culture, History, and Environment and how you can support the program.

Nelson PhD student named Planetary Health Campus Ambassador & IIASA Scholar

By Bekah McBride

Nelson Institute Environment and Resources (E&R) PhD student Thomas Leffler has been selected as a Planetary Health Campus Ambassador with the Planetary Health Alliance. As an ambassador, Leffler, who has a master's degree in public health and is a graduate research assistant with the Center for Sustainability and the Global Environment, will be a "next generation leader" who will facilitate community collaboration around human health and environmental changes.

In this new role, Leffler will spend a year developing environmental activities and events that will educate or empower the campus community. He will also attend at least two Public Health Alliance workshops where he will have the opportunity to network and gain new leadership skills.

"There are a lot of people involved in global health or environmental issues that maybe deal with climate health things or environmental things, but aren't necessarily linking those concepts, so this program helps to do that," Leffler shared. "Hosting events and sharing programming can help us to connect."

Leffler is particularly passionate about connecting planetary health and public health as those are his

two academic areas of interest. Before joining the Nelson Institute, Leffler earned a bachelor's degree in global studies at the University of Illinois Urbana–Champaign. He later went on for his Master of Public Health focusing on international development at the University of Sheffield in England. Following graduation, he began a job in the urology department at the UW Carbone Cancer Center where he conducted clinical research for five years before entering a PhD program at UW–Madison.

Thomas Leffler

"I was inspired by the pandemic, well the origin stories of the pandemic, as there was an environmental component related to the Coronavirus emergence," said Leffler. "I had been working in public health and wanted to add an environmental component to that."

As a PhD student with the Nelson Institute, Leffler is working with Jonathan Patz a Nelson Institute professor, the Tony McMichael Professor, and the John P. Holton Chair of Health and the Environment. Patz is well-known for his leadership on the United Nations Intergovernmental Panel on Climate Change (IPCC), which shared the 2007 Nobel Peace Prize with Al Gore.

While Leffler hasn't fully decided on his research focus, he plans to consider West African deforestation and its impact on epidemiological data.

"I was inspired by the pandemic, well the origin stories of the pandemic, as there was an environmental component related to the Coronavirus emergence."

–Thomas Leffler

"I want to see what associations there are between land deforestation data and public health trends that we can measure on the ground," Leffler said.

He invites anyone with a shared interest in connecting the environment and human health to reach out to learn more about the Planetary Health Alliance events and programming. Leffler can be contacted at tleffler@wisc.edu

In addition to the Planetary Health Campus ambassador position, Leffler was also recently selected for the prestigious International Institute for Applied Systems Analysis (IIASA) Young Scientists Summer Program in Austria. Since the inception of IIASA in 1972, UW–Madison students and faculty have been participating in its programing and collaborating with the politically independent Institute, which was originally established to promote scientific cooperation between the East and the West during the Cold War. Leffler, who received a Graduate Student Research Award to fund his participation, will join the ranks of several UW–Madison alumni and faculty who have been invited to IIASA as either a visiting scientist or a Young Scientists Summer Program member, including Nelson Institute Professor, Tracey Holloway.

During the program, Leffler will conduct research on the geospatial dimensions of deforestation and associated infectious disease risk in West Africa with the Population and Just Societies working group at IIASA, that includes demographer Roman Hoffmann.

"I'm very excited and so grateful to be able to participate in the Young Scientist program – I think it's a great opportunity for me to conduct my research, and also make new connections with international scholars in a whole host of relevant and interesting fields," Leffler said. "I look forward to bringing those experiences back to UW in the fall and being that much more involved with promoting planetary health on campus."

First of its kind Nelson Institute summer course addresses eco-anxiety

Juanita Cabrera Lopez, Maya Mam knowledge holder and director of the International Mayan League. Photo courtesy of the Loka Initiative

By Bekah McBride

A new course through the University of Wisconsin–Madison Nelson Institute for Environmental Studies is teaching students to build a path towards resiliency and wellbeing in the face of climate change and eco-anxiety. The three-credit course, Resilience in the Anthropocene: Learning to Cope with Eco-Anxiety, Climate Grief and Solastalgia will introduce undergraduate and graduate students to contemplative practices and science-based interventions that will help students to identify, and manage, the stress and anxiety related to environmental challenges.

The limited-capacity eight-week course will be held June 20 through August 14, 2022 and will be led by Dekila Chungyalpa, director of the Loka Initiative with the Center for Healthy Minds, Richard Davidson, the William James and Vilas Professor of Psychology and Psychiatry and founder and director of the Center for Healthy Minds, and Jonathan Patz, the John P. Holton Chair in Health and the Environment and director of the Global Health Institute.

"I first began experiencing eco-anxiety and climate distress in the mid-2000s when I worked as the World Wildlife Foundation U.S. Director for the Greater Mekong Field Program," said course instructor Dekila Chungyalpa. "Field conservation can be extremely rewarding and equally challenging as well. Positive outcomes are sometimes few and far between and meanwhile you and your colleagues spend every free moment of every day thinking about the threats to biodiversity and local community and projecting different future scenarios with increasing concern."

After a few years in the field, Chungyalpa noticed an onset of grief and anxiety symptoms.

"I slowly started to realize that I was not alone," Chungyalpa said. "However, there was no general comprehension at that time about what conservation and climate professionals could be struggling with, in terms of the emotional and mental impacts of the environmental and climate crises. Most often, these emotions were chalked up to burnout. However, in 2009, I came across and read Glenn Albrecht's paper on solastalgia and it was as if a lightbulb went off in my head. There was a term that described what I and so many of my peers were experiencing and ever since then, I have advocated for programs that address mental and emotional wellbeing for environmental and climate leaders."

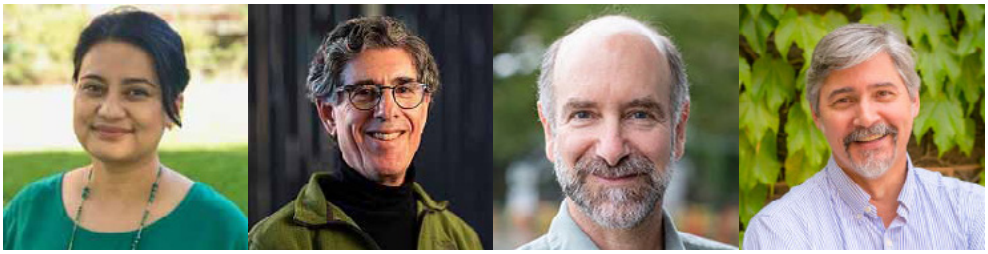
Chungyalpa hopes that this course will further this goal by starting a conversation around eco-anxiety and teaching future environmental leaders how to manage these emotions.

Co-instructor Richard Davidson shared Chaungyalpa's eagerness to be a part of a course aimed at helping students to identify and manage emotions in a changing world. He is looking forward to introducing students to a variety of contemplative practices such as mindfulness, group therapy, and nature immersion which can assist them with managing the stress associated with climate change and environmental issues. Davidson is also pleased to work with students as they evaluate interdisciplinary science and

scholarship around eco-anxiety, climate grief, solastalgia, and other conditions.

"The data on climate change has the effect on many people that is akin to what we as psychologists would call a helplessness induction. People just throw up their arms and it just seems so dire that they feel helpless," Davidson said. "So, one of our motivations is to help those who are engaged with this issue of climate change to have sufficient personal resilience and vitality so that they will be as effective as they possibly can be as change agents in the world."

As a part of the course, students will have both in-person and online instruction. This will include presentations from Indigenous leaders, psychologists, filmmakers, and state representatives as well as in-person outdoor experiences. More specifically, speakers will include Paul Robbins, the Nelson Institute dean, Aaron Bird Bear, the director of Tribal Relations at UW–Madison, Representative Francesca Hong, and Susan Clayton, a professor of psychology at the College of Wooster and the leading author for the *American Psychology Association* report that first coined the term ecoanxiety, among others.



Left-right: Dekila Chanugyalpa, Richard Davidson, Jonathan Patz, Paul Robbins.

Chanugyalpa shared that bringing a variety of course instructors and guest lecturers together for this course is not only unique, but an important part of approaching this course through the lens of intersectionality and justice.

"This course signifies a new way of approaching environmental education; teaching students how to build inner resilience as well as community and ecological resilience. We want to equip students with everything they need to become adaptive, compassionate, and resilient environmental and climate leaders and solution architects," Chanugyalpa said. "This requires that they not only learn to identify their own emotions but that they also understand the psychological and emotional impacts of the environmental and climate crises on others, particularly people from vulnerable communities. Centering the course on intersectionality and justice is crucially important for that reason as is centering the local context and grounding students in the reality of our local community in Madison."

Chaungyalpa also noted that the course curriculum was developed based on the existing research, which suggests that young people, Indigenous peoples, and poor communities of color bear the worst consequences of environmental degradation and climate change, and that environmental and climate professionals are more likely to experience psychological and emotional distress due to environmental degradation and climate change.

"Instead of ignoring what is a rapidly growing phenomenon, the Loka Initiative in partnership with Nelson, the Center for Healthy Minds, and the Global Health Institute, decided to bring the best of our expertise together and provide resources from the environmental education, global health, and mental health fields so that we could prioritize strengthening the inner resilience of our students," Chaungyalpa said. "As far as we can tell, nothing like this exists yet! We go beyond an academic examination of the different mental and emotional effects of the environmental and climate crises and provide a range of wellbeing tools for students to explore and apply as it suits them best."

Davidson echoed that sentiment, "I don't think that a course like this exists that is co-taught by this kind of radically interdisciplinary team. And so, to have climate scientists, physicians, psychologists, and neuroscientists come together in this way is truly unique."

Patz, who will not only serve as co-instructor, but will also bring his expertise as leader for the United Nations Intergovernmental Panel on Climate Change (IPCC), added that this course is not only unique, but essential given today's current human and planetary health concerns.

"Today's looming global environmental crises, such as climate change and rapid deforestation, demand full and urgent attention. This course endeavors to convene leading figures from across society to engage in bidirectional learning and empowerment to more effectively grapple with human-cause environmental destruction that surrounds us in this new age of the Anthropocene."

Learn more about this course and other summer 2022 courses offered by the Nelson Institute here or reach out to your advisor for additional information.

Audrey Stanton

Nelson Institute PhD student pens guest column highlighting Earth Day

By Audrey Stanton

Nelson Institute Environment and Resources (E&R) PhD student Audrey Stanton has written a guest column for *GradConnections Weekly*, the graduate student newsletter.

Tips for Grads: Making every day Earth Day

April is full of important days, from National Library Week (April 3 through 9) and Tax Day (April 18) to National Garlic Day (April 19) and my personal favorite – Earth Day, April 22! Earth Day was inaugurated in 1970 by the late Wisconsin senator, Gaylord Nelson, as an environmental teach-in. Today, climate change represents one of the most challenging environmental issues we face. The impacts of climate change are disproportionate for different populations and extend into social and economic realms. Though individual action alone will not solve climate change, we can each encourage collective action and systemic change. Taking individual action may also be helpful for addressing eco-anxiety.

For folks with the capacity to address their personal climate change impact, professor Mike Berners-Lee of Lancaster University's Lancaster Environment Centre recommends "picking your battles" to get the best return for your effort (*How Bad Are Bananas*, 2020). Here are some high-impact ideas, adapted from Berners-Lee's work:

Travel

1. Consider taking public transportation, biking, or walking instead of driving a car.
2. Limit air travel when possible, opting for traveling by train or taking advantage of virtual options.

Food

1. "Eat food. Not too much. Mostly plants" (Michael Pollan, *Food Rules*, 2009). The lower on the food chain, the better.
2. Aim for local and seasonal food when possible and affordable. Skip air-freighted, greenhouse grown, and/or packaged foods.
3. Avoid wasting food and repurpose your food scraps.

Home

1. Opt-in to local, renewable energy from your utility, if finances allow.
2. Upgrade to LEDs from Focus on Energy's no-cost energy efficiency packs.

Big Picture

1. Speak with loved ones about climate change and connect it to their lives. Sometimes the most effective approach is to illuminate local, relatable effects.
2. Contact your representatives and elected officials to advocate for climate action.
3. Support campus sustainability: higher education institutions are uniquely positioned to further climate research and promote climate action.

Read a previous Tips for Grads from Olivia Gacka.
Learn more about the UW–Madison Office of Sustainability.

Looking for more information specific to UW–Madison? Check out the Campus Sustainability Map. Want to connect with the Office of Sustainability? Join us for Earth Week events, follow us on social media at @SustainUW, and sign up for our monthly e-newsletter.

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

Tips for Grads is a professional and academic advice column written by graduate students for graduate students at UW–Madison. It is published in the student newsletter, GradConnections Weekly.

A quarter century of leadership in the private sector reinforces the value of Nelson degrees for alumni duo

By Bekah McBride

Binks: MS in Water Resources Management (1991)
Judy: undergraduate certificate in Environmental Studies (1989) and MS in Land Resources (1996)

For alumni Binks and Judy Colby-George, the Nelson Institute is where it all began. From their chance meeting during graduate school that resulted in love and marriage, to an academic journey that led to 25-plus years as successful private-sector environmental leaders, Binks and Judy are thankful for their Nelson Institute experience.

Binks and Judy in Maine (1993). Photo credit: Tim Asplund (WRM class of 1991))

For Judy, her Nelson Institute experience began as an undergraduate student at the University of Wisconsin–Madison. While working toward a degree in geography, Judy learned about the Nelson Institute certificate in Environmental Studies. She was intrigued by the interdisciplinary nature of the program and decided to pursue the certificate before graduating with her bachelor's degree in 1989. The program was exactly what Judy was looking for, so she decided to apply to the Nelson Institute master's in Land Resources (now Environment and Resources) program.

The Environment and Resources (ER) program offers opportunities for interdisciplinary graduate education and research, allowing each student to design a course of study that encourages self-direction and individual creativity.

"That's what drew me to it," Judy said. "At the end of my senior year, it never occurred to me that I should apply anywhere else for grad school."

Binks had a slightly different journey, having attended Carleton College in Northfield, Minnesota for his undergraduate degree in geology. Following graduation, Binks spent a year traveling the world. During this time, he experienced a range of cultures and environments, but in every location, he was reminded of the importance of water.

"It's a finite resource, and you really need to manage it," Binks said. "And so, I decided that was what I wanted to go into. And, having grown up in Madison, I had done my time away and wanted to be home with my family. So, I applied to the Water Resources Management program and got in."

The Water Resources Management (WRM) program prepares students to understand community water challenges and interact with stakeholders. The program includes a practicum where graduate students take on a water resources management issue facing a local community.

As newly admitted graduate students at the Nelson Institute, both Binks and Judy had the opportunity to attend a special welcome session that included a bus tour of Wisconsin. The trip was life changing.

"They took everybody on a trip around Wisconsin to learn about important Wisconsin environmental issues and that's where we met," said Binks. "We met the first week of grad school."

That chance meeting blossomed into a friendship and eventually a marriage, but the couple also became close with other Nelson Institute graduate students.

"We were super close," Judy said of the cohort. "We would meet at the Union, watch movies together, we took classes together and everything. So that was a nice core group."

Judy and Binks also connected with several of their professors, who helped them to hone their skills and identify a career path.

Nelson Institute emeritus professors Cal DeWitt and Steve Ventura were both close mentors for Judy who focused much of her work on Geographic Information Systems (GIS).

"Cal DeWitt was my advisor as an undergrad and I worked in his lab for three years," Judy shared. "And so of course, that was amazing. He's wonderful in every way. And then, when I was first discovering GIS, I did a project with Steve Ventura who became my advisor in grad school. And we did a project about creating agro-ecozones across Wisconsin using GIS data. It was just super exciting to me."

Ventura also has great memories of the projects he worked on with Judy and recalls Judy having a unique approach to GIS.

"Judy was unique in two respects," Ventura shared. "She was comfortable with, maybe even interested in, digging into the wonky details of local land records. And she recognized with GIS that you could do well by doing good, a real entrepreneur motivated by the right things."

"Whether it's how to help people think about big, sticky problems that are hard to solve or GIS, there's never a day that goes by that I'm not using that."

–Judy Colby-George

For Binks, the practicum portion of the WRM program was the most meaningful.

"Our summer research was on the Lac Courte Oreilles land, putting together a water resources inventory," said Binks. "Judy, actually helped out quite a bit with the GIS."

Binks also extended his thanks to Jean Bahr, a UW–Madison professor emerita of hydrology and former program chair of the Nelson Institute's Water Resources Management Program, who served as his advisor and was helpful in his study of hydrogeology, especially modeling.

"Binks was one of the WRM students I got to know early in my career as a faculty member at Madison," shared Bahr.

Binks and Judy in Maine (2021). Photo credit: Katie Casper

"I remember him as one of several bright graduates from Carleton College whose commitment to the environment and water resources made me happy to have chosen a career at UW–Madison."

In 1991, Binks completed his WRM degree and made plans to move to Maine, where he had secured a job as a hydrogeologist with Wood Environment and Infrastructure, which was ABB Environmental Services at the time. While Judy was still completing her thesis, she and Binks were married. She had finished her course work and was working towards the completion of her thesis, which she could do from Maine.

"We moved, got married, had our honeymoon, and started careers all within the space of two weeks," Judy said with a smile.

Binks' new job as a hydrologist meant a great deal of travel, and as luck would have it, he was assigned early on to a project in Wisconsin at the Badger Ammunition Plant.

"We were doing an investigation into the groundwater, both on and off of the plant," Binks said. "We did a lot of drilling, trying to figure out where the contamination was and where it might be flowing to."

During this time, Judy was in Maine finishing her thesis while also working as a receptionist at the company where Binks worked. After a short time with the company, she joined their data management committee, but eventually left and began working for a small land surveyor who had just gotten into GIS. She worked with that company for about ten years before starting her own GIS Consulting firm, Spatial Alter-

natives. Today she has added a Landscape Architecture and Planning firm and merged the two companies to create Viewshed. Judy has been involved with the Urban and Regional Information Systems Association since graduate school and has recently joined the board of that organization.

Meanwhile, Binks continued his work in locations around the world including Massachusetts, New York, and Afghanistan for several years, but when he and Judy started a family, he wanted to be closer to home, so he began working in data analytics, a role he has grown in over the past few decades.

"You know, it is possible to be an Environmental Studies student and work in the environmental field in a commercial capacity and love it. I don't feel like I've surrendered who I was 30 years ago to continue being who I am today."

–Binks George

Regardless of their role, or location, Binks and Judy said that the lessons learned during their time at the Nelson Institute remain at the heart of their work.

"There's not a single day that goes by that I don't use part of what I learned there," Judy shared. "Whether it's how to help people think about big, sticky problems that are hard to solve or GIS, there's never a day that goes by that I'm not using that."

Binks also emphasized the ways in which his Nelson Institute degree helped him to prepare for the private sector.

"You know, it is possible to be an Environmental Studies student and work in the environmental field in a commercial capacity and love it. I don't feel like I've surrendered who I was 30 years ago to continue being who I am today," Binks said. "I would say that coming out of Nelson, we have the advantage of being able to take all of the classes for being a hydrogeologist, for example, as well as law classes, and civil engineering classes, and things like that. I think it made us better candidates for getting into the commercial sector just because you do have that interdisciplinary background. You have been exposed to so many things."

Judy echoed Binks' message, adding, "Being in the private sector doesn't mean that you have given up or that you've sold out or anything like that. I've always considered myself to be a person who is good at bridging things. And that's what Nelson taught me. It really prepared me for the role of being a consultant and working between groups and among different people and bringing together teams of people to solve problems. It's important to help people to be able to understand the complicated issues that exist in the world and bringing lots of different people together can make things better."

Learn more about the WRM and E&R programs and how you can support them.

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!

THANK YOU! We are grateful for 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 appreciate your generous support of the Nelson Institute and all you do to ensure our continued success!

Community Environmental Scholars Program celebrates 10th anniversary

The Community Environmental Scholars Program (CESP) recently celebrated its 10th anniversary. The program is designed for students who want to link their passion for the environment with a commitment to the community. Undergraduates are provided with the opportunity to work with community-based environmental organizations, professional training, and a place to explore and discuss the links between environmental studies and community service.

This cohort-based program provides a supportive and welcoming community for traditionally underrepresented students, such as first-generation, Black, Indigenous, Latinx, veterans, etc. Nearly 450 scholarships have been distributed since the program's inception.

Please consider making a gift today in support of this outstanding program!

2011 Environmental Studies major celebration. Photo credit: Nelson Institute archive

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!***

Spring Virtual Alumni Networking Event

Over fifty alums joined the Nelson Institute's spring virtual alumni networking event in early March to connect and learn more about work happening in the water sector. Phil Grupe (E&R '13) moderated the 3x5 presentations from Jeff Green (WRM '83), Tony Fuller (ESC '92), Carol Warden (WRM '10), Tom Beneke (WRM '13), Karen Anderson (WRM '14), Stephanie Kluz, (ES BA '16), Jackson Parr (WRM '20), Alli Wenman (EC '21), and Ashley Gries (EC '21). Hannah Scheisl (ES Cert '20) closed out the evening by moderating several rounds of speed networking. Thank you to all the alums that participated! We hope to see some of you at Rendezvous on the Terrace this fall!

Save the Dates:

Graduation Celebration:
Friday, May 6, 2022
Tripp Commons, Memorial Union,
Madison, WI

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

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

CHE Environmental Colloquia Series

The Center for Culture, History, and Environment (CHE) invites you to attend the spring 2022 colloquia series. Mark your calendar for these upcoming events:

Many interpretations of January 6, 2021, have portrayed it as a scheme to disrupt the presidential election by far-right agitators fueled by misinformation. This talk looks for deeper historical origins, such as conflicts between white settlers, Native people, and federal agencies over land management in the west, which led to a series of occupations in 2016 that foreshadowed how an armed seizure of federal buildings could be represented as a justified form of protest among aggrieved settlers.

Wednesday, April 20
The Headwaters of Insurrection: Origins of January 6 through Environmental History
Matt Villeneuve
Noon–1 p.m. CT
Register today

Tales from Planet Earth Film Screening and Discussion: **Into the Okavango**

Wednesday, April 20, 2022

tales from planet earth

Into the Okavango Film Screening and Discussion
Film: 7–8:30 p.m. CT
Q&A: 8:30–9 p.m. CT
Marquee Theater, Union South
1308 W. Dayton St.

We invite you to join the Nelson Institute for a 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.

This Tales from Planet Earth Film Series event will feature a special discussion with Steve Boyes, a National Geographic explorer and founder of Wild Bird Trust, and Nyambe, the executive director of Kavango-Zambezi Transfrontier Conservation Area (KAZA TFCA) Secretariat. Boyes and Nyambe will lead a conversation about the efforts being made to protect the Okavango River Basin. They will also share more about the film and 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.

No registration required. Tickets will be given on a first-come, first-served basis. Seating will begin at 6:30 p.m. CT

Speakers:
Steve Boyes, Founder of Wild Bird Trust; National Geographic Explorer
Koketso Mookodi, Managing Director and Trustee for the Botswana Wild Bird Trust
Nyambe Nyambe, Executive Director, Kavango-Zambezi Transfrontier Conservation Area (KAZA TFCA) Secretariat

Weston Series

The Weston Roundtable Series is designed to promote a robust understanding of sustainability science, engineering, and policy through weekly lectures are co-sponsored by the Center for Sustainability and the Global Environment (SAGE), the Department of Civil and Environmental Engineering, and the Office of Sustainability. Lectures are held Thursdays from 4:15–5:15 p.m. CT in Room 1153 Mechanical Engineering, 1415 Engineering Dr. Some lectures will be presented online, which will require registration. Mark your calendar for these upcoming lectures:

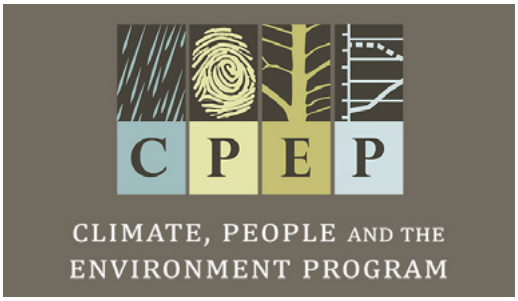
April 28
Excessive Heat and Human Health: Defining the Problem and Implementing Solutions

Larry Kalkstein, President, Applied Climatologists, Inc.

May 5
Can We Agree on the Truth of Climate, Health, and Elections? The Decline and Rise of Democratic Learning

Archon Fung, Winthrop Laflin McCormack Professor of Citizenship and Democracy, Harvard Kennedy School

Past lecture recordings are available for viewing here.



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. Lectures are held Tuesdays from 4–5 p.m. CT in Room 811, AOS, 1225 W. Dayton St. Mark your calendar for these upcoming lectures:

April 26
A Nonlinear Dynamics Approach to Understanding and Measuring Sustainability

Dylan McNamara, Professor and Chair, Department of Physics and Physical Oceanography, University of North Carolina-Wilmington

May 3
Extratropical Impacts of the Madden-Julian Oscillation

Stephanie Henderson, Assistant Professor, Atmospheric and Oceanic Sciences, UW-Madison

Past lecture recordings are available for viewing here.

Nelson offers video library of past lectures

Did you miss the Center for Culture, History, and Environment's Colloquium on Green Burials? On March 9, 125 people tuned in to learn more about modern green burial practices and the environmental impact of different burial practices. You can watch the recording here.

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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Feedback or questions about *The Commons*, please email: communications@nelson.wisc.edu