June 2021

Nelson Institute for Environmental Studies
UNIVERSITY OF WISCONSIN–MADISON

THE COMMONS

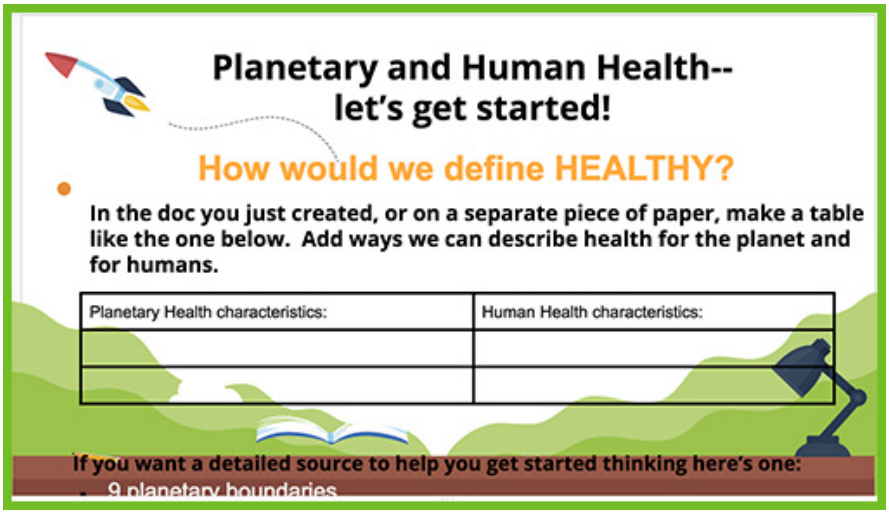
For alumni and friends of the Nelson Institute for Environmental Studies at the University of Wisconsin–Madison

Wisconsin teachers connect human and planetary health in new lessons for students

By Ann Grauvogl

A dozen Wisconsin K-12 teachers went back to school for the last year to learn more about the connections between the health of humans and the health of the planet.

The K-12 teachers from Madison, Middleton, Milwaukee and Montello were part of the Planetary Health Partnership, a new professional learning program offered by the University of Wisconsin-Madison Global Health Institute (GHI), Nelson Institute for Environmental Studies and Professional Learning and Community Education (PLACE) program in the School of Education.



Heather Messer's high school students looked at the relationships between trees and human health.

GHI Director and Nelson Institute affiliate, **Jonathan Patz** sees multiple wins in PLACE's Planetary Health program–for Wisconsin, teachers and their students, human well-being and the health of animals and ecosystems in an age of global environmental crises. "These students will be the future," he says. "If they can learn how the health of humans and the planet are connected while they are young, they are most likely to continue the vital work to preserve the health of both."

The program was designed to build a network of educators and researchers who can change how environmental health issues are taught in schools. During the year, the teachers heard from UW researchers, including GHI/Nelson Institute Planetary Health Graduate Scholars, as they developed new ways to introduce students to how humans are changing the world and inspire them to take action to solve environmental problems.

> *"Planetary health means we have to think about the planet as a bunch of systems that are dependent on each other. If we don't see that picture, that's a problem."*
>
> —Heather Messer, Clark Street Community School, Middleton

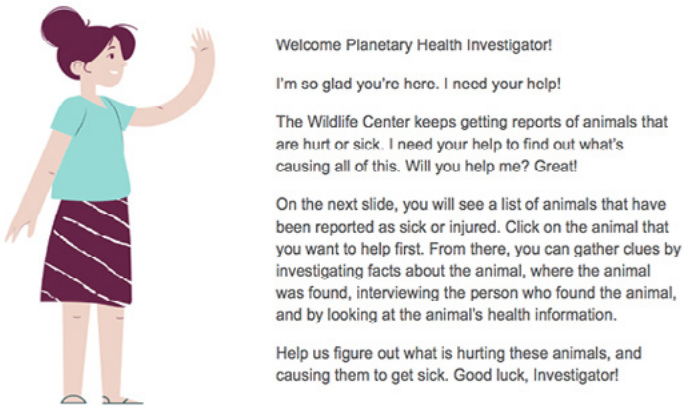
The teachers approached the topic through a variety of themes and projects.

- **Hanna Brostowitz, an advanced learning specialist in the Madison Metropolitan School District and wildlife rehabilitator used her passion for animals to inspire elementary and middle school students through "Planetary Health Investigator." The game shows students how human behavior impacts wild animals.**
- **In studying edible insects, Sandra Campos-Diaz introduced her biology students at James Madison Memorial High School to everything from eco-system interactions to the carbon cycle to benefits for human health and the environment.**
- **Messer's love of trees led her to develop Planetary Health + Human Health, a class that takes her high school students from counting trees in their neighborhoods to examining city-wide tree maps to understanding health inequities.**

Teaching planetary health is vital because human activity is the dominant driver changing our environment, Brostowitz says. "We need this generation to continue the fight for planetary health. The seeds that we plant now will impact the work that our students do when they're our age and in the workforce. That's what teaching planetary health is all about: inspiring global citizenship."

Patz and **Noah Weeth-Feinstein**, associate professor of Curriculum and Instruction in the School of Education, provided the planetary health resources suitable for K-12 students, and **Christina Stefonek**, PLACE math and science professional learning specialist, says their proposal fit PLACE's mission to further UW-Madison research by creating professional learning ex-

periences for educators. "We are excited that so many students have engaged with the planetary health framework this year," she says. "In many cases, students asked for and had opportunities to advocate for changes in their schools based on what they had studied around planetary health."



Hanna Brostowitz developed a Planetary Health Investigator game to introduce students to human impacts on wild animals.

Bringing planetary health to the classroom

The K-12 planetary health education framework is based on 12 cross-cutting principles—such as urgency and scale, inequality and inequity, and global citizenship and cultural identity—that the teachers used to plan their classes.

Sandra Campos-Diaz

As the Campos-Diaz's students near the end of the edible insect lessons, they are focusing on communication, one of the cross-cutting principles. Using visuals, data, technical information and easily understood language, they're creating infographics to promote edible insects. They're also designing a survey to see if people can be convinced to eat insects, whether to benefit the environment, for nutritional benefits or because they can be consumed in ways that taste good.

"Oftentimes, students ask, why are we learning this?" Campos-Diaz says. "They need to know it's relevant to them and useful to them in their life." The planetary health framework helps students see broad applications for science and to look ahead to careers and how, as citizens, they can contribute to solving the environmental and equity problems we are facing related to food.

Hanna Brostowitz

In "Planetary Health Investigator" game, Brostowitz invites elementary students to uncover why animals brought to the Dane County Wildlife Center are sick or injured. They get clues from people who found the animals, local maps, and wildlife rehabilitators. "Slowly they piece together these puzzle pieces until they see what causes the harm, whether it be air or water pollution, habitat destruction or climate change, all while noting the ways in which each problem is tied to humans and unintended consequences," she says. "The kids love animals, so there's a huge buy in."

Middle school students look at people who are ill or injured. They may discover that someone who recently developed asthma lives in an apartment with a moldy basement caused by flooding due to increasingly extreme weather. "Students see it impacts you, me, our loved ones and everyone in the community, not just the animals—and always find some human intervention," Brostowitz says. "There's the aha moment: We are the ones that are causing the illness or injury. It's a game changer."

Her hope is to 'bring this knowledge to my students so they can become passionate about planetary health, find their sense of advocacy and make changes locally and globally. If I can help students to recognize their membership in the global community, they will be able to define the values and practices of the next generation, and to positively affect their communities."

Messer knows trees are interconnected with the earth systems and human health. When she was introduced to the tree inventory tools, she knew she had the beginning of a planetary health class. "The visualization of where the trees are located along with county public health maps were the hook to help students enter the work like data scientists," she says.

Heather Messer

From neighborhood to city, Madison to Milwaukee, students learned about public health and understanding how resources impact health. When students see the differences in tree cover between Madison and Milwaukee, they ask why, and the conversation moves into red-lining and equity.

"At first students wonder why we're talking about trees," Messer says. "Then they look at what trees can do for us in all parts of the system." Students study trees and the public health index in four neighborhoods. They see who's at risk for heat vulnerability and see the connection to fewer trees. They make a hypothesis and defend it.

The lessons are about personal responsibility and understanding climate change and how it relates to their daily lives and choices. "Everything about planetary health is connected to me and to us. It's the immediacy," Messer says. I have to know about this. I have to make good choices because my choices impact everybody else and everything on the planet."

Conaway connects with Tribal communities on environmental challenges

By Rebekah McBride

For Nelson Institute faculty associate, **Jessie Conaway** helping people to connect with and protect the natural world has been a lifelong goal. As a career outdoor educator, Conaway has spent both her personal and professional time working with community members of all ages on environmental initiatives and outdoor education. From her time as an American Canoe Association kayak instructor trainer and youth experiential educator to her current roles as a Nelson Institute faculty associate for Native Nations partnerships and an Indigenous Arts and Sciences research coordinator with the Earth Partnership, Conaway is committed to engaging with communities on environmental challenges.

"I am a career outdoor educator. I decided early on in high school that I wanted to be in outdoor education," Conaway said. "So, I pursued that path in environmental education and adventure education. I attended the National Outdoor Leadership School and Minnesota State University, Mankato where I earned my Master's in experiential education, which was the top tier for that career path."

After attending graduate school, Conaway spent time teaching at the University of Wisconsin- La Crosse and the La Crosse School District in outdoor education. During that time Conaway met conservation biologist, adjunct professor in the University of Wisconsin-Madison Department of Forest and Wildlife Ecology, and Nelson Institute alumnus, Curt Meine.

"He told me, we need more people in the social sciences to come into environmental studies and that was really what I needed to hear," Conaway said. "I had wanted to take the next step and earn my doctorate, but I was really hesitant about what that would entail. But after hearing from him, I started my application to the Nelson Institute."

Conaway was accepted to the Environment and Resources PhD program where she focused her research on watershed protection near the ancestral homeland of the MaskiiZiibi, Bad River Ojibwe Nation.

"I've been involved with Native Nations since I moved to Wisconsin in the mid-90s," Conaway said. "I was involved in my personal life as a young mom with the Mole Lake Band of Lake Superior Chippewa water protection work against the Exxon mine. I also started to be in places in Ojibwa country where I was learning from spiritual leaders. I was also introduced in Lac Courte Oreilles to a spiritual leader and teacher named Mary Ellen Baker and so I spent multiple summers with her in her teaching lodge and that was really a strong start to my education in Indian Country."

Conaway was interested in continuing to work with Native Nations through her research at the Nelson Institute, so she reached out to Bad River Band of Lake Superior Ojibwe member and then Nelson Institute affiliate, Patty Loew to learn more about the watershed and homeland protection the Tribe was engaging in.

"I became involved with Bad River through Patty Loew and committed to working with the Tribe on community water stewardship through my work at Nelson in 2011," Conaway said. "I did community mapping and developed a program called Bad River Youth Outdoors. Then, when Paul Robbins joined Nelson as director (now Dean), he had the priority of working with Native Nations, so that became a really helpful partnership and I was able to continue that work as a graduate student, then a post-doc, and now the position I am currently in at Nelson."

In her current role at the Nelson Institute, Conaway works directly with Native Nations on a number of projects that are most often associated with the Native Nations_UW program, Earth Partnership, and the UniverCity Year program.

Native Nations_UW is an inititative that began in May 2016, when the Provosts of the University of Wisconsin-Madison, University of Wisconsin Colleges, and University of Wisconsin Extension charged the Native Nations_UW (NN_UW) Working Group. This group partnered with the Native Nations in Wis-

> *"This work is political, it's high stakes, and we understood that and stepped up and it shows. We're at a great place and we feel we are in the right place at the right time."*
>
> –Jessie Conaway

consin on a strategic plan that will lead to more respectful and reciprocal partnerships and allow for combined efforts on health services, preserving the environment, developing local economies, strengthening families, and expand educational opportunities. Conaway served as the chair or co-chair for phase one of the Native Nations_UW program since she came on in 2016.

"This is a humongous honor to be a part of this," Conaway said. "This all began with the centennial summit. The Tribes had not been invited to campus in 100 years (1914) and we worked with campus to host a debut summit, which I helped to organize as a graduate student. We had over 50 people there from the Nations and we had focus groups. We took notes in the focus groups and built out our priority areas for this initiative based on these focus groups."

Conaway also helped to brand the initiative.

"We had called it UW/ Native Nations for that first summit, but I switched it around, for our brand we need to say the Tribes first, so it became Native Nations_UW," Conaway said.

Conaway said the initiative was supported by the individual work that had been done on campus prior to the debut summit, but that this particular initiative took it to the next level by committing to an institutional level relationship with Native Nations. Today, the Native Nations_UW initiative is going strong, having just finalized phase one. During this phase, UW-Madison faculty, staff, and students have collaborated with Native Nations throughout Wisconsin on a variety of projects in seven key areas while also increasing communication through establishing a Tribal Advisory Council with monthly meetings and two in-person events each year.

"The process was really strong," Conaway said. "It's been about elevating the macro-objectives like asserting Tribal sovereignty, educating ourselves internally about the Tribes' cultures and languages, and working with UW leadership through annual cultural responsiveness trainings. That's built a lot of momentum going from 40 people to 200 over three years of offering the trainings. My foundation of being connected to Ojibwa people and my credentials of being a career outdoors woman and an herbalist and harvester, helped me to build relationships with the Tribes when I started graduate school and later entered into this position in 2016. We share a commitment to environmental education, and environmental stewardship that includes traditional harvesting."

In addition to her leadership work with Native Nations_UW, Conaway is also involved with Earth Partnership within the Department of Planning and Landscape Architecture, which "promotes native habitat restoration as a process for community learning and land stewardship." Her research with Earth Partnership is called Connecting STEM to Native Science, which brings tribal youth and Elders together with university educators for week-long events where STEM skills are taught in a cultural way.

"We just got our fourth National Science Foundation grant," Conaway said. "We're publishing our first research article paper this month and I'm really proud of this work as well. We've learned that Native students have gained skills and confidence through these Indigenous Arts and Sciences (IAS) programs, and that they transfer those into their STEM classes in school, and also thinking forward toward environmental careers."

This also fits in with another Earth Partnership project Conaway is involved with called Native Education Pathways, which connects Tribal youth with UW-Madison and pathways to higher education early on through youth education.

Outside of Earth Partnership and Native Nations_UW, Conaway has also worked with the UniverCity Year program on Native Nation education and relationship building in both Monona and Waunakee. UniverCity Year brings faculty, students, and members of Wisconsin communities together to address local challenges through engagement, university research, and state-of-the-art problem-solving approaches. Launched with the Wisconsin Idea in mind, this program bridges university resources with community knowledge to improve sustainability, resilience, livability, and the general well-being of Wisconsin communities throughout a three-year partnership.

Ho-Chunk elders Woody White, *wanagira*, Ho-Chunk for "has walked on," (left) Marie Lewis (right), and Dawn Decorah (second from right) are pictured here with Conaway (second from left) doing a botany activity with *wamaxe*, wild ginger (*Asarum canadense*). Photo credit: Michelle Cloud

In both cases, Conaway has helped to connect the municipality with Native Nation leaders and students in her capstone course to develop programs around cultural awareness, land acknowledgement, and community education. Through the UniverCity Year program, Conaway and her students have seen great engagement on important work.

"We can get work done quickly that's tangible," Conaway said of her work with the UniverCity Year program. "A lot of work takes multiple years, but this is an example of tackling something that is needed right away."

Throughout this project, Conaway has partnered with the Ho-Chunk Nation, specifically working with Michelle Cloud, the IAS Grant Manager for the Ho-Chunk Nation Education Department, who serves as the Nation's Principal Investigator for the NSF projects. Cloud, a member of the Ho-Chunk Nation, also serves as an advisor on Conaway's spring 2021 capstone course connected with UniverCity Year, and has known Conaway for several years.

"She is so respectful in her approach to working with Native communities," said Cloud. "She is enthusiastic and clearly enjoys the work she does with Native youth and educators. I really can't say enough good things about her."

Whether Conaway is working on UniverCity Year, Earth Partnership, or Native Nations_UW, she said the one constant is the support she receives from the Nelson Institute.

"I'm so thankful for the support that Nelson and Dean Paul Robbins have given me to support these initiatives," Conaway said. "For NN_UW phase 1, Nelson emerged as a main pillar of support. Having the travel budget to visit the Tribes is key. Visiting people in their homelands has made a big difference. This work is political, it's high stakes, and we understood that and stepped up and it shows. We're at a great place and we feel we are in the right place at the right time."

Nelson Institute affiliate co-hosts virtual book launch

By Rebekah McBride

On May 18, Nelson Institute affiliate, executive director of the Human Rights Program, and director of Research Centers at the University of Wisconsin Law School, **Sumudu Anopama Atapattu** participated in the virtual launch of The Cambridge Handbook on Environmental Justice and Sustainable Development. During the event, Atapattu and her co-editors were in conversation about the book with moderator, Erin Daly.

Sumudu Anopama Atapattu

This new handbook edited by Atapattu, Carmen Gonzalez, and Sara Seck, highlights the role of human rights and environmental justice in sustainable development. Using legal frameworks and case studies, the handbook explores solutions that protect the planet while promoting environmental justice.

"We decided to do the book through case studies from around the world to highlight that environmental justice struggles are intertwined with struggles for other forms of justice and that a holistic approach is needed," Atapattu said. "One of the editors of this book, Professor Carmen Gonzalez, and I were involved in a previous edited volume (International Environmental Law and the Global South) and we realized that there is hardly any literature on the social dimension of sustainable development which overlaps with human rights. So, we started chatting and decided to do a book on it. We invited Sara Seck who had contributed a chapter to the previous edited volume to join us as an editor and she agreed."

For Atapattu, focusing the book on the social dimensions of sustainability was a good fit as her research centers on the intersection between environmental issues and human rights, especially the human rights impact of climate change. In addition to her research, she currently teaches a seminar course on climate change and human rights at the Law School while serving as the executive director for the campus-wide Human Rights Program.

"Sustainability encompasses the balancing of three dimensions – economic development, environmental protection and social development. While most existing literature focuses on balancing economic development with environmental protection, less attention has been paid to social development," Atapattu said of their decision to focus the book on the social development aspect of sustainability.

"We realized that there is hardly any literature on the social dimension of sustainable development which overlaps with human rights. So, we started chatting and decided to do a book on it."

–Sumudu Anopama Atapattu

"Social development is often expressed in human rights language which overlaps with environmental justice. In other words, human rights framework is essential for both environmental justice struggles and social development but these linkages are rarely highlighted. Through a set of case studies from around the world and utilizing different frameworks, the book highlights these linkages."

Overall, Atapattu said that the goal of the book is to address areas of sustainability that are deeply important, but often underrepresented in discussions about environmental solutions. For example, the book addresses the root causes of environmental injustices, which Atapattu says must be discussed if injustices are to be rectified. She also hopes the book will show how communities engaged in these struggles can learn strategies for success from one another and the ways the human rights framework has given a voice to marginalized communities.

"Those who are already marginalized or in a vulnerable situation are more likely to be disproportionately affected by environmental degradation and pollution," Atapattu said. "And, these vulnerabilities intersect with one another to form even greater vulnerabilities."

GLOBE Midwest ESS Collaborative hosts virtual science symposium

By Michael Notaro and Bekah McBride

On May 13, 2021, the Midwest GLOBE (Global Learning and Observations to Benefit the Environment) / ESS (Earth System Science) Collaborative hosted the GLOBE Midwest ESS virtual Science Symposium, with 25 student groups from 11 different schools across the Midwest. The program was established in 2020 with the vision of expanding and strengthening interactions among citizens, schools, and school districts in the Midwest and is an extension of GLOBE, the NASA/NSF/NOAA-supported citizen science environmental education program with a 25-year history of encouraging K-12 students to participate in nature-based, active learning to study the coupled Earth System.

Led by co-directors **Michael Notaro** and **Rose Pertzborn** from the Nelson Institute Center for Climatic Research, **Janet Struble** and **Kevin Czajkowski** from the University of Toledo, and **David Bydlowski** from Wayne RESA, the Midwest Collaborative aims to provide opportunities for team-based, student-led scientific research projects and collaborative events, provide a regional focus that fosters multi-school and locale interactions, increase the number and participation of GLOBE schools, teachers, citizens, and partnerships, and increase the input of quality GLOBE data.

The topics shared during the GLOBE Midwest ESS virtual Science Symposium were extremely diverse, with such titles as "What GLOBE means to me," "Pedosphere data and CHEESEHEAD," "What water will produce the healthiest raphanus sativus (radish) plants: bottled, tap, or snow melt?," and "Is there a difference in urban river water quality between Michigan and Ohio rivers?" The presentation, "Pedosphere data and CHEESEHEAD," was delivered by two students in Butternut School in Wisconsin, with teacher Laurie Fox collaborating with Nelson Institute's Ankur Desai, Michael Notaro, and Rose Pertzborn on both Desai's NSF-supported CHEESEHEAD grant and Notaro's Baldwin Wisconsin Idea grant.

We invite you to view the video presentations from the event.

Manantlán Biosphere Reserve supported by UW-Madison highlighted in Nature

By Rebekah McBride and Eduardo Santana Castellón

Nelson Institute adjunct professor and Department of Forest and Wildlife Ecology alumnus, **Eduardo Santana Castellón** recently co-authored a letter to the editor titled, Value of Mexican Nature Reserve is More than Monetary in the journal *Nature*. The letter addresses the United Nation´s new System of Environmental-Economic Accounting (SEEA), which will help countries establish the monetary value of ecosystem services.

The editorial describes the University of Guadalajara Sierra de Manantlán Biosphere Reserve project, which was initiated with the support of the University of Wisconsin-Madison's Department of Botany. Throughout the paper, Santana and his colleagues in Mexico including **Enrique Jardel**, **Sergio Graf**, and **Angelica Jimenez**, outline why assigning monetary value to nature is necessary but insufficient to achieve conservation goals. They propose that the urban sectors that benefit from the limitations of usufruct (the temporary right to use or benefit from someone else's property) by poor rural communities (e.g., not harvesting their forests to sustain hydrological services to cities) must be based on ethical values of justice and retribution. The authors argue that although these economic tools help certain sectors understand the value of nature, "commoditizing" ecological services can be dangerous in the long run.

"We need to acknowledge dimensions, other than monetary, of the relation between society and nature," Santana said. "For example, the cultural purpose of conserving the five colors of corn in the case of the Wixarika indigenous communities can be as important in land use, as is the dietary or commercial purposes of corn production."

The National Commission of Protected Areas, the Mexican Fund for the Conservation of Nature, and various CSOs proposed a local compensation mechanism to sustain rural communities in the forested areas of Cerro Grande that furnish the capital of the State of Colima with 90 percent of its water. By 2020, the Colima Congress had modified environmental, tariff, and water laws and almost 1 million USD (18.1 million pesos) have been transferred to mountain rural communities.

"We are redesigning with the local communities the voluntary payment component because the lack of urban awareness of the importance of mountain forests has produced low donations," Jimenez said.

Santana believes that the System of Environmental Economic Accounting recently adopted by the UN will help recognize the economic value of ecosystem services, but he says complementary agroforestry production programs also need to be implemented. The Nelson Institute, along with the Global Health Institute, the Latin American, Caribbean and Iberian Studies program, the DFWE and the School of Human Ecology, continue to work cooperatively with the University of Guadalajara, in finding solutions to socio-ecological problems with local and global effects.

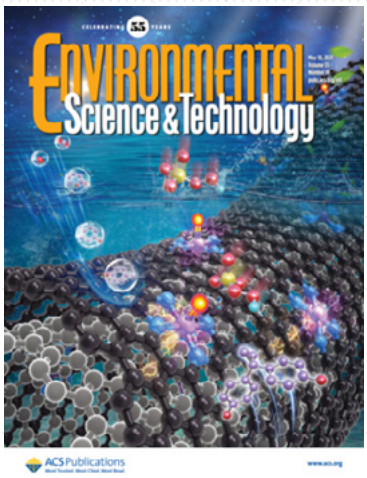
> *"We need to acknowledge dimensions, other than monetary, of the relation between society and nature."*
>
> –Eduardo Santana Castellón

New study finds high rates of repair failure in Massachusetts natural gas distribution systems

By Ann Shaffer

Repairing gas leaks is a potential strategy for near-term climate action in Massachusetts – leaky natural gas infrastructure accounts for 10 percent of the state's greenhouse gas emissions. A group of university researchers led by Nelson Institute Center for Sustainability and the Global Environment (SAGE) member, **Morgan Edwards** set out to see how effective these repairs are at reducing emissions, collaborating with the Massachusetts non-profit HEET. They recently published their results in *Environmental Science & Technology*. The researchers used utility-reported data to map almost 10,000 locations in Massachusetts where a leak was reported or repaired after a repair took place. This represents a 20 percent failure rate. For a sample of directly-measured leaks, over half of repairs did not successfully eliminate on-site emissions. Improved repairs coupled with accelerated transitions off gas can help Massachusetts meet state climate targets.

Repair failures highlight benefits of energy transitions. "Repairing gas leaks was already a near-term climate solution," notes Edwards. "Now that we have a fuller understanding of the costs of repair, including repair failures, the net benefits of transitioning off gas are greater." In Massachusetts gas utilities have already begun, with the support of state agencies and climate advocates, to invest in installations of networked geothermal, an innovative non-emitting replacement for gas infrastructure.



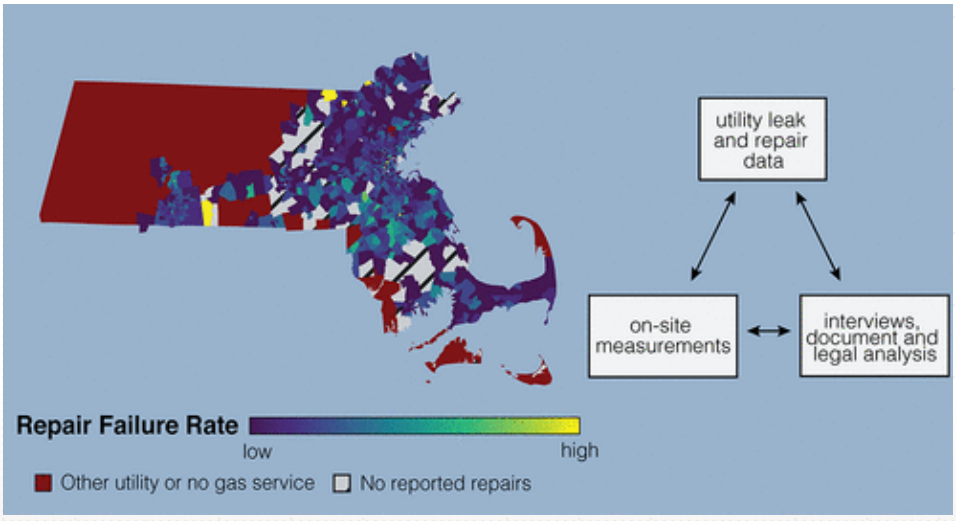
Repair is still more cost-effective than replacement. Despite the failure rates uncovered in this research, the authors found that repairing gas leaks is still more cost-effective than pipeline replacement. "New pipelines are still more expensive and lock our energy system into high-carbon infrastructure," explains Edwards.

We can improve the effectiveness of repairs. We can increase the effectiveness of pipeline repairs by prioritizing the largest leaks and by improving repair outcomes. Massachusetts has enacted a first-in-the-nation policy to prioritize the repair of large volume leaks. The results of this publication have already informed newly filed legislation incentivizing more advanced systemic repair technologies to extend the life of the existing infrastructure.

Data transparency enables smarter climate policy. These findings highlight the importance of data transparency for managing our energy systems and tracking progress on state and local climate action. "This analysis was only possible because utilities report leaks and repairs publicly in Massachusetts," remarks Edwards. "This isn't the case in many other states with similarly old and leak-prone pipelines."

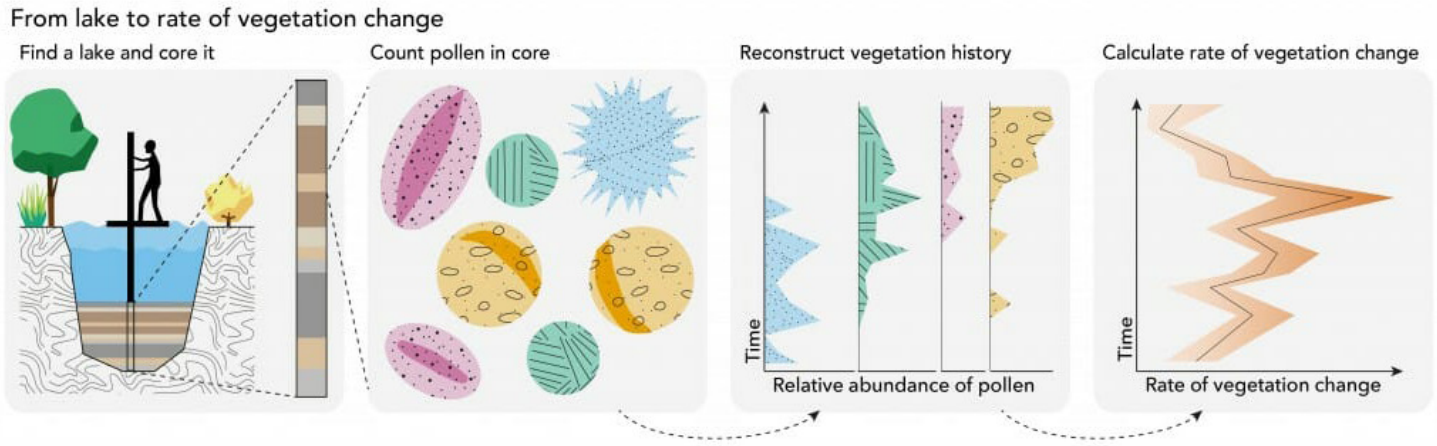
"I love when science and data drive policy," says **Zeyneb Magavi**, Co-Executive Director of HEET. "Research like this gives us the information needed to more efficiently triage older leaking infrastructure and encourages us to more rapidly modernize our energy system, building better infrastructure for a better future."

Morgan Edwards is an assistant professor at University of Wisconsin's La Follette School of Public Affairs. In addition to Edwards, the research team includes Dr. **Amanda Giang** (University of British Columbia), and **Dr. Gregg Macey** (Brooklyn Law School). They began this work with HEET while living in Cambridge, MA.



Map of 2017 repair failure rates by census tract.

Earth's vegetation is changing faster today than it has over the last 18,000 years



To study past plant ecosystems and how they changed, a lake or other suitable environment is cored to retrieve the layered sediments which usually contain pollen grains that accumulated over thousands of years. By identifying and counting the different pollen grains researchers can then reconstruct the local vegetation composition. Finally, the rate of vegetation change is estimated from the changes in pollen abundances through time. ARTWORK BY MILAN TEUNISSEN VAN MANEN

By Eric Hamilton

A global survey of fossil pollen has discovered that the planet's vegetation is changing at least as quickly today as it did when the last ice sheets retreated around 10,000 years ago.

Beginning some 3,000-to-4,000 years ago, Earth's plant communities began changing at an accelerating pace. Today, this pace rivals or exceeds the rapid turnover that took place as plants raced to colonize formerly frozen landscapes and adapt to a global climate that warmed by about 10 degrees Fahrenheit.

The research, published May 20 in Science, suggests that humanity's dominant influence on ecosystems that is so visible today has its origin in the earliest civilizations and the rise of agriculture, deforestation and other ways our species has influenced the landscape.

This work also suggests ecosystem rates of change will continue to accelerate over the coming decades, as modern climate change further adds to this long history of flux. And by showing that recent biodiversity trends are the start of a longer-term acceleration in ecosystem transformations, the new study provides context for other recent reports that global biodiversity changes have accelerated over the last century.

An international collaboration of scientists led the new analysis, which was powered by an innovative database for paleoecological data. The Neotoma Paleoecology Database is an open-access tool that gathers and curates data on past ecosystems from hundreds of scientists. Neotoma is chaired by University of Wisconsin–Madison professor of geography Jack Williams, who helped lead the new research.

The study authors analyzed more than 1,100 fossil pollen records from Neotoma, spanning all continents except Antarctica, to understand how plant ecosystems have changed since the end of the last ice age about 18,000 years ago, and how quickly this change occurred.

"At the end of the ice age, we had complete, biome-scale ecosystem conversions," says Williams, who also curates Neotoma's North American pollen database. "And over the past few thousand years, we're at that scale again. It has changed that much.

> *"That was a surprising finding, because over the last few thousand years, not a whole lot was happening climatically, but the rates of ecosystem change were as big or bigger than anything we've seen from the last ice age to the present."*
>
> –Jack Williams

Researchers collecting a core sample in St. Paul, Alaska. PHOTO BY JACK WILLIAMS

And these changes began earlier than we might have thought before."

Fossil pollen provides an extremely sensitive measure of past plant communities. As pollen from surrounding plants falls into lakes, it settles in layers from oldest at the bottom to newest at the top. Scientists can extract sediment cores and conduct the painstaking work of identifying pollen and reconstructing plant ecosystems over thousands of years.

Yet each sediment core only provides information about one place on Earth, so true global-scale analyses of past vegetation change require the amassing and curating of many such records. Neotoma has gathered thousands of such datapoints to help scientists uncover global trends. Researchers from the University of Bergen in Norway, UW–Madison, and Neotoma data stewards from around the world collaborated to perform the new analysis.

Using these pollen records, the team applied new statistical methods to better analyze how quickly plant communities have changed in the last 18,000 years.

They discovered that the rate of change initially peaked between 8,000 and 16,000 years ago, depending on the continent. These continental differences are likely caused by different timing and patterns of climate change linked to retreating glaciers, rising carbon dioxide concentrations in the atmosphere, changes in Earth's orbit, and changes in ocean and atmospheric circulation.

Ecosystems then stabilized until about 4,000 years ago. Then, the rate of change began a meteoric rise that continues today, when most plant ecosystems are changing at least as fast as they did at the peak of ice-age-induced flux.

"That was a surprising finding, because over the last few thousand years, not a whole lot was happening climatically, but the rates of ecosystem change were as big or bigger than anything we've seen from the last ice age to the present," says Williams.

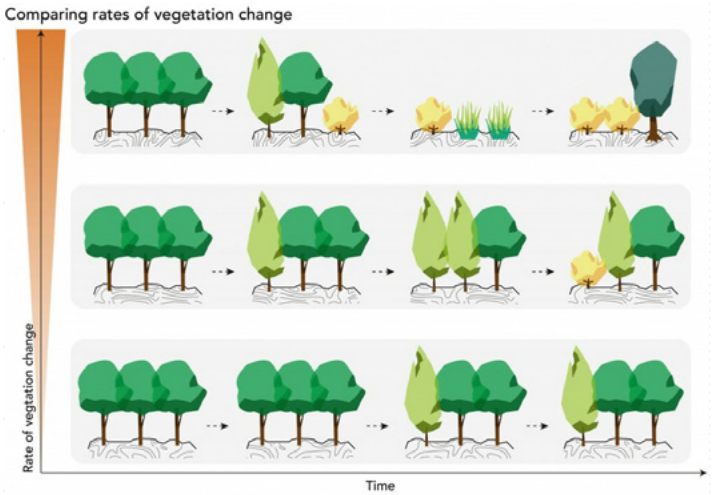
Although this analysis of pollen records was focused on detecting ecosystem changes, rather than formally determining causes, these recent ecosystem changes correlate with the beginning of intensive agriculture and the earliest cities and civilizations around the world.

Williams says that one intriguing feature of these analyses is that the early rise is so early worldwide, even though each continent had different trajectories of land use, agricultural development and urbanization.

Scientists have coined the term the Anthropocene to describe the modern geological period, when humans are the dominant influence on the world. "And one of the questions has been, when did the Anthropocene begin?" says Williams. "This work suggests that 3,000 to 4,000 years ago, humans were already having an enormous impact on the world (and) that continues today."

A sobering implication from this work, say the scientists, is that in the past, the periods of ecosystem transformations driven by climate change and those driven by land use were largely separate. But now, intensified land use continues, and the world is warming at an increasing rate due to the accumulation of greenhouse gases. As plant communities respond to the combination of direct human impacts and human-induced climate change, future rates of ecosystem transformation may break new records yet again.

This work was supported in part by the National Science Foundation (grants 1550707, 1550805, and 1948926).



In biodiversity science, a key question is understanding how quickly ecosystems change over time. Ecosystems that undergo large changes in species composition in a very short time will have high rates of change. ARTWORK BY MILAN TEUNISSEN VAN MANEN

GHI Director Jonathan Patz receives WARF Named Professorship

By Ann Grauvogl

Professor and Global Health Institute Director **Jonathan Patz**, M.D., MPH, was well along in his research linking climate change to health when he arrived at the University of Wisconsin-Madison in 2004—then everything took off.

"My research and science accelerated when I hit UW-Madison," says Patz, who has faculty appointments in the Nelson Institute for Environmental Studies and the Department of Population Health Sciences in the School of Medicine and Public Health. "I found myself coming into a university with a culture of collaboration and a breadth of faculty expertise that could come to bear in addressing climate change as a health crisis."

Patz's pioneering work has been recognized with a 2020-2021 Wisconsin Alumni Research Foundation (WARF) Named Professorship for distinguished research contributions of the UW-Madison faculty. He is among eight faculty who received the 2021-22 awards that honor those who have made major contributions to the advancement of knowledge, primarily through their research endeavors, but also as a result of their teaching and service activities. The award is supported by the UW-Madison Office of the Vice Chancellor for Reseach and Graduate Education with funding from WARF.

GHI Director Jonathan Patz will be the Tony J. McMichael Professor of Planetary Health. (Photo by Sara Rose Smiley.)

"It's a real honor and a privilege to be given this high recognition from the university," says Patz, the John P. Holton Chair of Health and the Environment who was named director of UW-Madison's Global Health Institute in 2011.

Patz's career has focused on the human health effects of climate change and ecological degradation, looking for solutions to benefit humans and the planet. He co-chaired the health report of the first U.S. National Assessment on Climate Change to Congress and, for 14 years, served as lead author for the United Nations Intergovernmental Panel on Climate Change (IPCC). The panel was a co-recipient of the Nobel Peace Prize in 2007.

Patz convened the first-ever session on climate change for the American Public Health Association in 1994 and was awarded the organization's Homer Calver Award for environmental health leadership in 2014. He also served as founding president of the International Association for Ecology and Health and was elected to the National Academy of Medicine in 2019.

In his teaching, Patz says he always told students that climate change, as a major risk to human health, is accompanied by other global environmental threats that are just as critical, including deforestation, biodiversity loss, urban sprawl and more. In recent years, the concept of planetary health has provided "an overarching framing of global environmental challenges as they relate to public health," he says. "It is exactly the right framing of it."

> *"To be put forward by my respective departments is even more gratifying, knowing that my colleagues value the work my team has been doing."*
>
> —Jonathan Patz

Planetary health was foreshadowed, Patz says, in **Tony McMichael's** 1993 book,

"Planetary Overload: Global Environmental Change and Human Health." Patz has named his professorship after McMichael, a preeminent Australian epidemiologist and global environmental health pioneer he worked with at the IPCC. "Tony McMichael's brilliance and courage inspired a generation, including me, to start focusing on the health of the planet and its systems that underpin our own health," Patz says. Beginning next academic year, Patz's title will be the Tony J. McMichael Professor of Planetary Health, which he calls well-timed as planetary health activities increase on campus.

Patz has written more than 100 peer-reviewed scientific papers and several textbooks addressing the health effects of global environmental change. He co-edited the five-volume "Encyclopedia of Environmental Health" and the 2015 textbook "Climate Change and Public Health" that he dedicated to McMichael one year after his death. Patz's recent research has focused especially on the health benefits of mitigating fossil fuel emissions. The WARF award includes $100,000 in flexible research funds that Patz plans to use for his work to encourage energy alternatives that also advance public health.

Patz received his bachelor's degree from Colorado College, and his medical degree from Case Western Reserve University and is double board-certified in Occupational/Environmental Medicine and Family Medicine. He earned his master's in public health from Johns Hopkins University in 1992. He has also received the Aldo Leopold Leadership Fellows Award, a shared Zayed International Prize for the Environment, a Fulbright Scholar Award, Alumni Special Recognition from Case Western Reserve, and the Chanchlani Global Health Research Award.

Lake Pontchartrain in New Orleans as Hurricane Zeta approached in October. There were so many named storms last year, NOAA had to use Greek letters to name some. (Edmund D. Fountain for The New York Times)

Nelson affiliate Jim Kossin's research shows that hurricanes are getting stronger

Jim Kossin

Nelson Institute Center for Climatic Research (CCR) affiliate **Jim Kossin**, recently shared his research into the connection between climate change and hurricanes with the *New York Times* and NBC Miami. Kossin's research shows that over the last four decades the likelihood a hurricane would be categorized as major intensity has increased by 25 percent. Additionally, his research shows that a category three, four, or five hurricane is now twice as likely in the Tropical Atlantic. He also shared that there has been a 41 percent increase in the local rainfall associated with these storms.

Net Impact Sustainability Competition helps Wisconsin MBA students change the planet, one project at a time

By Clare Becker

Tim Bent Jr. takes Wisconsin MBA students through Grainger Hall's attic during the office hours he and Ian Aley (second from right) hold for student teams in the weeks leading up to the competition. Photo by Paul L. Newby II

If you care about going greener, here are some interesting facts: The average person uses roughly a gallon of water with every handwashing. Grainger Hall, home to the Wisconsin School of Business on the University of Wisconsin–Madison (WSB) campus, clocks in at nearly 4,224 gallons each day. Adding low flow faucet aerators to the School's 96-bathroom faucets would reduce water use by 30-70 percent. The aerators are reasonably priced and only need to be replaced once a year. Sounds pretty good, right?

Such was the case made by Team Aqua, a four-member group of WSB students pitching their strategy to judges during the recent Net Impact Sustainability Competition, an event sponsored by the Wisconsin Chapter of Net Impact, a student organization. Now in its second year and held virtually, the competition is open to all UW–Madison students.

"The intent of this competition is to give students the opportunity to create a strategy for the Wisconsin School of Business that will decrease its environmental footprint, improve its social impact, and reduce its operating costs," says Ashwin Maheshwari (MBA '22), a student in WSB's Center for Brand and Product Management who is on Net Impact's executive committee. "It's a chance for students to take what they are learning in the classroom and apply it to the real-life challenge confronting today's businesses: How can they become more socially and environmentally responsible?"

The event is designed as a cross-campus collaboration with the UW–Madison's Office of Sustainability. The office manages the Green Fund, an initiative that supports student sustainability projects for the betterment of campus.

"If a student has an idea for how to make campus more sustainable, we can help them connect with the people to make that happen, and we have money available to buy the nuts and bolts to actually implement those ideas," says **Ian Aley**, Green Fund program manager. "We've done everything from rooftop solar panels to low flow toilets to pretty much everything in between."

Wisconsin MBA students Roman Orizov (MBA '22), Xu Hong (MBA '22), and Meiying Jin (MBA '22) examine an HVAC filter while in the Grainger Hall attic. Photo by Paul L. Newby II

Net Impact competition participation has more than doubled since last year to 75 students, Aley says, something that WSB's **Ann Terlaak**, an associate professor of management and human resources and the faculty advisor for Net Impact, is pleased to see. Terlaak is the director of the School's graduate-level Certificate in Business, Environment, and Social Responsibility Program, in which many of the competition's students are enrolled. In addition, Terlaak is faculty director of the Nelson Institute's Undergraduate Sustainability Certificate. Terlaak was also one of four judges for this year's competition.

"This competition is a great reflection of the growing interest in sustainability among Wisconsin MBA students," Terlaak says. "They not only want to learn about business and sustainability in the classroom, but also practice it outside of the classroom. Making it better yet, this competition is special because it actually improves the sustainability of Grainger Hall's operations. It's so much more than a mere theoretical exercise."

Culling ideas, building strategy

Once the competition launches, Net Impact entrants have 12 days to assemble their teams, come up with an idea, and research their strategy. All teams must submit a written proposal,

budget, and impact estimate. The final five teams give a presentation in front of the judges, with each team rated on a valuation matrix for categories such as innovation, operational savings, and significant impact. Even if a team doesn't win, its members are welcome to apply to the Green Fund post-competition.

Thanks to a generous donation from WSB alum and competition judge Ron Meissen (PhD '07), the top three contestants receive a monetary prize that can be used at their discretion.

Grainger Hall's Facilities and Event Services team plays a vital role in the Net Impact competition, and the event is only one of the activities and initiatives that the department has been actively involved with in the sustainability realm. The unit has

Wisconsin MBA student Andrew Shaw (MBA '22) talks with his teammates about their project prior to the competition. Photo by Paul L. Newby II

worked closely with UW–Madison's Office of Sustainability in the past and received its Office of Sustainability Green Office Platinum Certification in April 2020, says Tim Bent Jr., director of facilities and event services.

During the days leading up to the event, Bent Jr. and Aley held joint office hours for students to talk through their ideas and visit the systems and spaces relevant to their proposals. Bent Jr. offers insights on the building and ideas for brainstorming on areas of improvement. And if students are funded post-competition, he holds the funds and initiates the upgrade completion process and oversight. "We make sure students aren't just left to their own devices," Aley says. "It's absolutely about student ideas, but then we want to help them connect with people to actually gather the data they need."

Team leader Jorge Tefel (MBA '22) and fellow team members Joe Dalle Molle (MBA '22), Karan Modi (MBA '22), and Folarin Omotoriogun (MBA '22) took their idea all the way to a first prize finish. Their innovation is a safe and environmentally friendly Stabilized Aqueous Ozone (SAO™) based cleaning solution that can tackle multiple surfaces at Grainger Hall using an electric current. Aley and Bent Jr. met with Tefel and his team during office hours and connected the students with Jodi Krause, custodial services program supervisor for UW–Madison's University Housing, who shared her expertise with the team. The group is working with the Green Fund to advance its project through the next stages.

"We settled on the cleaning solution idea because it allowed us to make a difficult positive impact on the environment by instituting small change," says Tefel. "This was a unique and exciting competition to be a part of. Sustainability, to me, is about maintaining balance for the good of all humanity and our planet. The funds will help make our vision a reality by implementing our idea at WSB."

Moving into development

Catering cart: This mobile waste-sorting station took first place last year. During and after a catered event, the cart will offer customers and staff spaces to sort their dishes, liquids, food scraps, recycling, and trash. Aley worked with one of the students who proposed the idea, Nick Schaefer (BBA '20, MIPA '21), to draw up designs for the system. A team of engineers from the student organization Insight is currently building a prototype. "Rather than rolling out a big landfill-bound waste receptacle and just putting everything into it," Aley says, "this would allow for resource recovery that is a lot more nuanced."

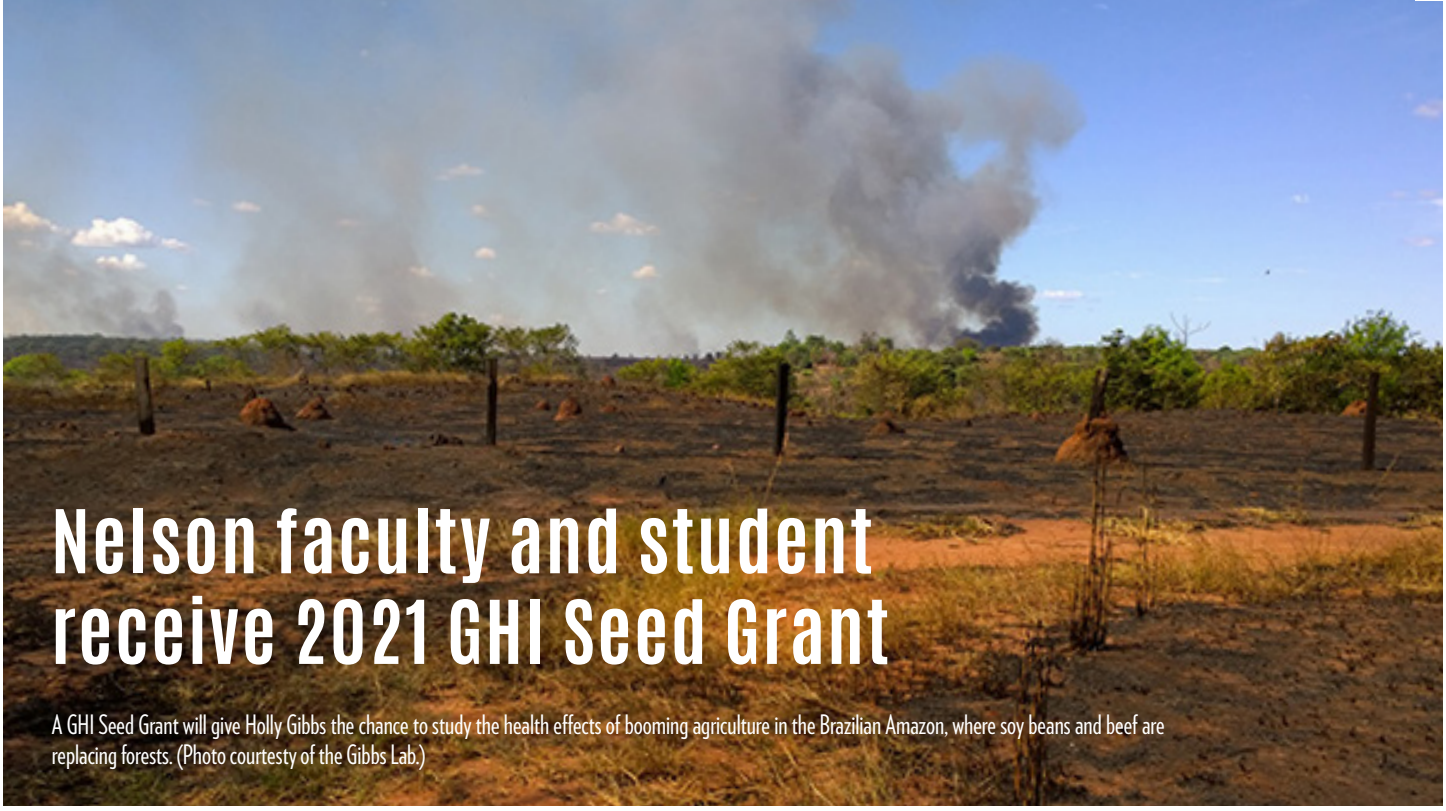
Heating and ventilation efficiency: A plan to convert Grainger Hall's heating and ventilation system from a pneumatic system to a digital one took second place last year. Aley, Bent Jr., and students are meeting with organizations like Focus on Energy to work through next steps. The innovation will make the system "more responsive to the occupancy of the space," Aley says. "If there's no one in the room, it doesn't need to have air blowing perpetually."

Loading dock lighting: A simple yet uber impactful idea, one of last year's teams focused on switching out Grainger Hall's loading dock lights and adjusting the motion sensors to make them more energy efficient and reduce the number of hours in use.

Taking up the challenge

Like many of the students involved with Net Impact, prioritizing sustainability doesn't stop when the competition is over. Maheshwari's future plans include an internship this summer with the global beverage company Diageo, the makers of top brands like Johnny Walker and Guinness. He applied and accepted the offer in large part because he was impressed with their long-term sustainability strategy. For his generation and those coming behind him, he says, the carbon footprint issue is a critical one.

"We're the ones who are growing up, we're going to change the world—we can change the world—but you really have to start where you live and with your community," he says. "That's what really excites me about this challenge: I can directly impact my daily life with an idea versus this huge, idealistic, 'I should be watching my carbon footprint.' Now I can actually put my ideas into something real."



Nelson faculty and student receive 2021 GHI Seed Grant

A GHI Seed Grant will give Holly Gibbs the chance to study the health effects of booming agriculture in the Brazilian Amazon, where soy beans and beef are replacing forests. (Photo courtesty of the Gibbs Lab.)

Nelson Institute for Environmental Studies and Department of Geography associate professor, **Holly Gibbs** will receive support for her research from two 2021 University of Wisconsin-Madison Global Health Institute (GHI) Seed Grants. Her research titled, "Health, climate, and agriculture: A case study of Brazil's Amazon and Cerrado biomes," has been awarded a seed grant and **Kaitlyn Sims**, a doctoral student in the Department of Agricultural and Applied Economics will receive support through the Henry Anderson III Graduate Student Award in Environmental and Occupational Public Health in support of her work on this research.

Gibb's research will focus on the health impacts associated with agriculture, deforestation, and climate shocks throughout Brazil. The project is result of an observation that **Marin Skidmore**, PhD, a co-principal investigator also from the Nelson Institute and the Department of Agriculture and Applied Economics in the College of Agricultural and Life Sciences, heard while conducting research in the Amazon- "...When soy arrives in a region, cancer follows." Upon hearing this, Gibbs became interested in utilizing data to confirm if this local observation was true.

Gibbs shared with GHI that the Seed Grant will open new doors to research innovations. Gibbs said, "Without it, we would not have a chance to study the health effects of agricultural intensification and deforestation in Brazil."

Learn more about all the 2021 global health grants and awards.

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!

Nelson Institute announces endowment for Professor Clarence "Clay" Schoenfeld Scholarship Environmental Education Fund

By Rebekah McBride

The Nelson Institute for Environmental Studies is honored to announce a new $30,000 endowment from donor **George R. Affeldt** in support of the Professor Clarence "Clay" Schoenfeld Scholarship Environmental Education Fund. The gift will support students in the Nelson Institute Community Environmental Scholars Program (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.

Affeldt, who has long been an advocate for community-based environmental work, was inspired to donate to CESP as it affords students the opportunity to gain professional experience, explore environmental science through a cohort, and work with environmental organizations on community projects.

"I hope the beneficiaries will help transform our world by working in their local communities," Affeldt said. "May they share their love of ecology- both natural and human- with their fellow citizens."

Affeldt, who graduated from the University of Wisconsin-Madison in 1986 with a degree in elementary education, is deeply invested in furthering community education and environmental education. A supporter of The Urban Ecology Center, The Riveredge Nature Center, and other environmental education centers near his home in Milwaukee, Wis., Affeldt believes in the power that environmental education can have on an individual and a community.

"My last semester on campus, I took the first inter-college conservation class. The views I learned of Earth and its natural, scientific, and societal processes have influenced my life for over a half-century," Affeldt said.

This course, which so deeply impacted Affeldt was taught by Dr. Clarence "Clay" Schoenfeld, for whom the scholarship is named.

CESP students participate in a service day at the Lakeshore Nature Preserve. Photo: Rob Beattie

"He was delightful and I admired him because he had a duel appointment with Department of Forest and Wildlife Ecology and the School of Journalism. He had the skills of introducing me to a wide variety of professors, scientists, writers, lawyers, etc. The great ones for me were the botany and zoology professors. It was three-credits and I loved going to class." Affeldt shared. "He made a wide range of students feel welcome."

George Affeldt

After graduating, Affeldt joined the United States Navy, but he says he can recall hearing about the first Earth Day in 1970 and how the things he learned in his inter-college conservation class impacted his thoughts that day. He also decided around that time to add The Nature Conservancy and the Environmental Defense Fund to his will.

"What George Affeldt powerfully feels is that if we can't make the urgent conservation and climate messages relevant to a broader range of communities, and if we can't diversify the environmental leadership of the future, we've had it. At Nelson, we get that too," said Nelson Institute Dean, Paul Robbins. "That's why a thoughtful person like George, who received his degree from a different unit on campus, chose to support CESP and the Nelson Institute."

In addition to Affeldt's donation to the Nelson Institute, Affeldt has donated to the School of Education Cooperative Children's Book Center (CCBC). His family also has a long history of supporting UW-Madison initiatives. His father George A. Affeldt was a prominent lawyer, alumnus of the University of Wisconsin Law School, a past President of the Wisconsin Alumni Association, a board member of the UW Foundation, and a member of the UW Athletic Board. Together, Affeldt and his six siblings have made donations in honor of their father and their own experiences at UW-Madison.

"I've been able to endow several things and am happy to do so," Affeldt said. "The donations are part of a connection to the university and a thank you to the university for a great education."

Environmental Conservation alumnus brings natural climate solutions to the forefront of the climate change discussion

By Rebekah McBride

Sharing the benefits of natural climate solutions is at the heart of Nelson Institute alumnus **Nathan Henry**'s work, but it wasn't long ago that he had an entirely different career. For most of his career, Henry worked as a political consultant, but in 2018 he decided to make a mid-career change and delve into environmental conservation. Before making the transition, however, Henry wanted to continue his education and gain skills in environmental studies, so he applied for and was accepted to the Nelson Institute Environmental Conservation MS program.

Nathan Henry

"I wanted to get some applied knowledge to support this career change," Henry said. "One of the things that is really great about the Nelson program is that it gets you in and out. It's intense, but you're able to get the coursework done in a reasonable time period along with having some applied project experience. I have two kids and I'm not in a situation where I can go to graduate school for years and be without an income, so this was a good fit."

The Environmental Conservation MS program includes a 15-month, 32-credit blended learning curriculum designed to train conservation leaders in practical interdisciplinary skills. The program features in-person and online courses as well as a three-month professional leadership experience where student engage directly with conservation organizations and practitioners, helping to solve some of the most urgent challenges in biodiversity conservation and environmental protection.

For his professional leadership experience, Henry worked with The Nature Conservancy in Portland, Oregon.

"There's a lot of flexibility on deciding which organization you work with. So, I ended up doing placement with the Nature Conservancy in Oregon, focusing on natural climate solutions that sequester carbon on natural and working lands," Henry said. "The work was mostly policy-focused and included an analysis of polices in Oregon. To me, this project was very helpful because it gave me an introduction into the non-profit space. One of the things I like about The Nature Conservancy is they're a big organization and they have a science team, they do communication, they do advocacy, and they have a broad-based mission. So, the fact that the Nelson Institute was able to facilitate a placement with them, which ultimately led to the position I have now, was extraordinarily helpful."

Henry currently works as the U.S. Project Manager at U.S. Nature4Climate, and is based in Portland, Oregon. U.S. Nature4Climate is a coalition of nine organizations, including The Nature Conservancy, who are "dedicated to ensuring our forests, farms, ranches, grasslands and wetlands are an important part of the overall strategy to combat climate change."

"Our job is to increase the attention paid to natural climate solutions as a climate mitigation strategy," Henry said. "There's

> *One of the things that is really great about the Nelson program is that it gets you in and out. It's intense, but you're able to get the coursework done in a reasonable time period along with having some applied project experience. I have two kids and I'm not in a situation where I can go to graduate school for years and be without an income, so this was a good fit.*
>
> — Nathan Henry

more and more momentum behind climate action, but a lot of the focus is on decarbonizing the transportation and energy sectors. Our perspective is that you absolutely need to do those things, but we probably aren't going to meet our overall climate goals unless we also figure out how to sequester more carbon in forests and farmlands as well. My job is to manage the many organizations who are all on the same page about the overall goal, but each have their own perspective. For example, some are focused on agriculture, other wetlands, some are businesses. So, I work on messaging that helps us all to effectively communicate on the issue."

One aspect of Henry's job is writing for the U.S. Nature4Climate's blog. The stories include a variety of topics, but a recent example of these stories includes the blog "Addressing Climate Change One Beer at a Time," which highlights a partnership between Patagonia Provisions, Hopworks, and The Land Institute. Together, they utilized a long-rooted perennial grain called Kernza, which requires less water, tilling, and stores more carbon in the ground (carbon sequestration) than other grains, to create a new, more ecofriendly beer. Henry says it's stories like these that are going to make a big difference in moving climate solutions forward.

"If the science alone were enough, we would have addressed this climate change issue a long time ago. Instead, we really need to show people how this works. For example, what could a landowner or a company do that would have climate benefits?" said Henry. "So, the beer story shows that there is innovation going on that can help us sequester carbon. It also highlights a real-world situation where people are using these innovative techniques. We wanted to highlight that researchers and businesses are working together to bring this to market."

In addition to his work on the website and blog, Henry also speaks with business leaders, policymakers, and communities about the importance of natural climate solutions. In fact, everything came full circle recently when Henry spoke at the Nelson Institute Earth Day learning event, sharing a bit about carbon sequestration and how these natural climate solutions can help us to meet carbon goals.

For Henry, this mid-career transition has been a success and he is thankful for the role that the Nelson Institute programs played in that. Henry is enjoying his job with U.S. Nature4Climate, mixing his skills as a political consultant with the skills he learned at the Nelson Institute. Henry said, "This job is a really good fit for me because it has a focus on climate change, but also it really taps into the strategic communication skills I learned as a political consultant."

Learn more about the Environmental Conservation MS and how you can support the program.

Alumni and friends gather for LinkedIn Happy Hour

On May 13, Nelson Institute recent graduates, alumni, and staff connected virtually during the New Alumni Welcome Happy Hour on LinkedIn. Connections were made throughout the hour as participants shared updates on their current work, answered campus trivia, and offered advice to our new alumni. If you missed it, you can still respond to the questions! Visit the event page.

We invite you to join the Nelson Institute LinkedIn alumni and friends group

Join Nelson Institute alumni and friends on LinkedIn for job postings, poll questions, and other virtual networking opportunities! If you are not already a member of the Nelson Institute Alumni and Friends LinkedIn group, you can request to join. Anyone with a LinkedIn account is welcome to join. If you don't have an account, you can join for free.

Alumna at the forefront of wildlife-transmitted disease research

By Rebekah McBride

Sarah Olson

From understanding the viral spillover risk of diseases like coronavirus to research on the health of great apes, Nelson Institute alumna **Sarah H. Olson** is at the forefront of some of today's most pressing environmental health concerns. A graduate of the Nelson Institute Environment and Resources and the Population Health PhD program, Olson currently works as the associate director of epidemiology for the Wildlife Conservation Society (WCS) Health Program, but her path into One Health was not always clear.

"Before coming to the Nelson Institute I was looking at different programs. I came from an undergraduate program with strong microbiology and I had spent a bit of time in the lab, but I came out unfulfilled and took off a couple of years to be in the Peace Corps in Ghana," Olson said. "I used that time to think about whether I wanted to take an individual medicine route, like going to medical school, or did I want to think along the lines of One Health? I happened to come across some of Jonathan Patz's work and was thrilled to have the opportunity to connect with him. He was with John Hopkins at the time, but told me that he was taking a position in Madison and thought I should apply so I could work with him in Madison."

Olson followed Patz's advice and decided to apply to the Nelson Institute. She said one of the main reasons she decided to come to Madison was the opportunity to work with Patz and the chance to complete a dual degree in environment and resources and population health.

"I just thought this was a unique space to get the best of both worlds and to get two really firm foundations while also getting to chart my own territory," Olson said. "You go down different paths and I didn't know what was going to be the right path, but when everything lined up at the Nelson Institute, it became clear it was the right place at the right time."

During her time at the Nelson Institute, Olson studied the connection between deforestation and malaria, which she said helped her understand different models and different tools and ultimately prepared her for her current job with WCS.

In her role at WCS, Olson supports the organization's mission to move One Health forward and promote the benefits of valuing nature.

"I just thought this was a unique space to get the best of both worlds and to get two really firm foundations while also getting to chart my own territory," Olson said. "You go down different paths and I didn't know what was going to be the right path, but when everything lined up at the Nelson Institute, it became clear it was the right place at the right time."

—Sarah Olson

"We're really pedal-down on moving One Health forward and trying to accelerate this approach that brings together public health, environment, wildlife trade, and the livestock sectors together and thinking about how we can live together sustainably on the planet," Olson said. "We know there is a connection between land use degradation, wildlife trade, and viral spillover risk right now and that's where much attention has been focused."

In particular, Olson was a co-author on the paper, "Coronavirus testing indicates transmission risk increases along wildlife supply chains for human consumption in Vietnam," which showed the ways that the wildlife trade can help to spread coronaviruses.

"We noticed that in the wild about two percent of rats will have coronavirus, but we tracked the detection at different points in the trade and it increased until the time it reached a restaurant when over 50 percent of rodents were positive for a coronavirus," Olson said. "It shows that bringing diverse populations into confined spaces where they spread feces and urine does what you would expect it to do. You're going to see a lot of viral transmission and we can use that information to inform policy."

In addition to this work, Olson also studies hammerhead bat health and spillover risks as well as great ape health.

"In general, WCS is doing a lot of exciting work in terms of helping countries understand their risk and how to mitigate it," Olson said. "We work in 60 countries and this provides opportunities to engage and build proposals with local communities. We are also working to understand how Indigenous People can be empowered to help with sustainable development." With so many timely topics being studied by Olson and WCS, Nelson Institute affiliate and a professor in the Geography Department, Lisa Naughton and associate scientist and director of the Nelson Institute Center for Sustainability and the Global Environment (SAGE), **Carol Barford** reached out to Olson to invite her to be a part of the Weston Roundtable Series.

"Sarah Olson was at the top of our wish list for guest speakers in 2020 given her extensive field research on wildlife-transmitted diseases," said Naughton. "She's not only a cutting-edge scientist, she's a skilled science communicator, as evidenced in work with students in my classes who were full of questions about the implications of COVID for wildlife conservation in the tropics."

Barford added, "Sarah's research spans the thorny human, animal and ecological dimensions of zoonoses, with empathy and commitment. In her Weston lecture we saw brief video of Sarah in the field taking a blood sample from a bat, which appeared to be breathing calmly. It was a powerful suggestion of the positive connections in Sarah's work that may combat the harms of habitat destruction."

For Olson, her presentation on November 19, 2020 "Taking Action to Protect the Health of All: Science and Conservation at Zoonotic Spillover Interfaces," was a full-circle moment that made her proud of her Nelson connection.

"It was a bit surreal to be a Weston lecturer," Olson said. "I remember my first Weston lecture at Madison and how impressed I was with the caliber of speakers and now this was my chance to be a speaker. It was a pleasure to be back."

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

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

Release of Earth Day videos

Thank you to everyone who helped to make the 2021 Nelson Institute's virtual Earth Day learning event a success. While the virtual sessions were only available to participants during the learning event, the Nelson Institute is pleased to share three of the videos publicly:

- ***Just Responses***
- ***Inspired by Nature: How Nature Based Solutions Promote Resiliency***
- ***Indigenous Knowledge, 'Hope' and Climate Change***

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

Fall 2021 CHE Environmental Colloquia

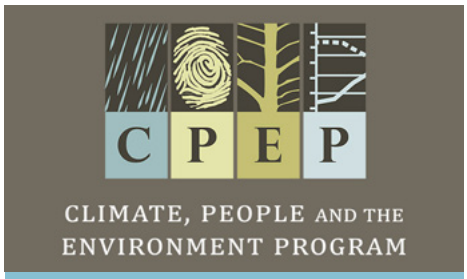
The Center for Culture, History, and Environment (CHE) invites you to attend the Fall 2021 CHE Environmental Colloquia series on Wednesdays from noon-1 p.m. (CDT). Mark your calendar for these events:

Place Writing - Narrative as Meaning, Relations, and Ecology
James T. Spartz
Wednesday, October 27, 2021
Register Today

Icy Matters: Race, Indigeneity, and Coloniality in Ice-Geographies
Jen Rose Smith
Wednesday, November 3, 2021
Register Today

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 seminars

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.

Join us

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

Facebook
Twitter
Instagram
Linkedin

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