Illuminating Change
CCR: 50 years at the forefront of climate science

FORCES AGAINST DEFORESTATION
WASTE TO ENERGY TO INNOVATION
SUSTAINABILITY PROGRAM A TRIPLE-WIN FOR MILWAUKEE
HOME SMALL HOME
**Conservation Everywhere**

I recently returned from a trip to southern India, where I conducted a long-running research project on human interactions with nature in agricultural settings such as coffee plantations. On each of my many visits to India over the last 20 years, I’ve been amazed by what is happening there, but never more so than on this latest trip.

Contrary to what you might expect, many of these managed landscapes teem with wild animals – panthers, langur monkeys, antelope, and countless species of birds and reptiles, all able to adapt and thrive in the midst of human activities. Conservation is succeeding not by design but by happenstance, often where organized conservation programs have previously failed. It is happening, more astonishingly, in one of the most densely populated places in the world, amidst meteoric economic growth.

What does this tell us about nature, and about ourselves? Perhaps that conservation is moving beyond the classic notion of wilderness, and that it can happen anywhere – in rural areas and in cities – at least under certain conditions and with the right kind of help. This means that new, imaginative approaches are essential in a rapidly changing world, one in which the climate will inevitably be warmer, more variable and more extreme; a world populated by as many as ten billion people, mostly concentrated in cities.

There is no going back, and we need to figure out how to live and prosper in this new reality. Perhaps that conservation is moving beyond the classic notion of wilderness, and that it can happen anywhere – in rural areas and in cities – at least under certain conditions and with the right kind of help. This means that new, imaginative approaches are essential in a rapidly changing world, one in which the climate will inevitably be warmer, more variable and more extreme; a world populated by as many as ten billion people, mostly concentrated in cities.

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**Earth Day conference features Jane Goodall**

Planning continues for the seventh annual Nelson Institute Earth Day Conference on Monday, April 15, at the Monona Terrace Community and Convention Center in Madison.

“Conservation Everywhere: Sustaining Natural and Cultural Diversity” will explore conservation opportunities, challenges, research and action across a range of environmental contexts: forests and oceans, farms and communities, and forward-thinking business models and sustainable urban areas.

Renowned primatologist Dr. Jane Goodall will keynote an exciting daylong program that also features marine conservationist and filmmaker Céline Cousteau; Ken Bonning, senior executive vice president of Kohl’s Corporation; Nelson Institute Director Paul Robbins; and a variety of other speakers, exhibits and activities.

We hope you can join us – for more information or to register, visit nelson.wisc.edu/earthday.

**Grasping headlines**

Gregory Nemet, UW Madison assistant professor of public affairs and environmental studies, was named in a December article in The Atlantic titled “The Kind of Energy Research I’d Like to See More Of.” Visit nelson.wisc.edu/news to view the article and more Nelson Institute news, including:

- Nelson Institute Director Paul Robbins on Wisconsin Public Radio’s Kathleen Dunn Show, discussing the political will to confront climate change.
- A five-part series spotlighting Wisconsin Ecology and a new program that also features Dr. Jane Goodall, Ken Bonning, and a variety of other speakers, exhibits and activities.
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More than 270 students are pursuing the environmental studies major and 1,380 students have already earned the designation since its debut in September 2011.

**Faculty, partnership honored**

Congratulations to these Nelson Institute faculty and students recently recognized for their achievements:

- Hydrogeologist Jean Bahr, appointed by President Barack Obama to the federal Nuclear Waste Technical Review Board.
- Tracey Holloway, associate professor of environmental studies, named deputy leader of the NASA Air Quality Applied Sciences Team and recipient of the first-ever Department of Energy Clean Energy Education and Empowerment Initiative (C3E) award for education and mentorship.
- Rob Nixon, professor of environmental studies, recipient of a 2012 American Book Award for Slow Violence and the Environmentalism of the Poor.
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Knox was a much-loved teacher to thousands of students during his 43 years as a faculty member.

His best known research was on the sometimes dramatic changes in the magnitude and frequency of floods and the behavior of streams. Knox also played an important role in encouraging the developers of climate models to compare their simulations of past climates with data from the field.

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Half a century at the cutting edge

For 50 years, the Land Tenure Center (LTC) has propelled programs on emerging environmental topics of international interest. At an anniversary celebration in April, nearly 100 affiliates gathered to review this work and explore new directions (see video of the events at nelson.wisc.edu/ilc/vprogram.php).

One of the discussions, on large-scale land concessions and acquisitions—often called land grabbing—capped a series of longer speaker series on the topic. The popular series has continued into the 2012-13 academic year.

At the Land Tenure Center, we want to be doing things at the cutting edge that are topical in the present day. This is designed to build on that,” says Ian Baird, an assistant professor of geography and environmental studies who leads the series with Peter Malin, a Wisconsin conservation leader and student in geography and student representative to the LTC board.

According to Baird, LGT and the LTC have been on the cutting edge for years in developing their research agenda, with the aim of improving the quality of life for local communities internationally. Discussions have also broached the potential impacts of land concessions in Wisconsin—for example, with regard to mining.

Baird says the series is just one example of how, 50 years running, researchers carry forward LTC’s history. “We want to continue with the important topics of the day are, both internationally and in Wisconsin,” says Baird.

The Land Tenure Center welcomes your support to help continue their research, education and outreach initiatives. For more information, visit nelson.wisc.edu/giving.

See video of fall events

Large and enthusiastic crowds joined us at our many fall events, including the first annual Jordahl Public Lecture, published in September in the journal Public Library of Science One (PLOS ONE) with UW-Madison mathematical ecologist Anthony Ives reveals increases in both fertility and mortality in a northern muriqui monkey population—a surprising combination, especially in a population that has grown from just 60 individuals to some 300, now comprising almost a third of a population under stress.

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It was the year in which the Beatles released their first single, “Love Me Do.” The idea that climate change was real — that the rise in carbon dioxide was causing the planet to warm — once seemed so far-fetched. Some scientists at the NASA Goddard Institute for Space Studies in Washington, D.C., had speculated that it was getting warmer in the 1960s, but few others were willing to say it was a problem. The thought of climate change didn’t even figure in the discussions of the Intergovernmental Panel on Climate Change, which wasn’t established until 1988.

By then, some ideas were already being tested. In 1966, at the National Center for Atmospheric Research in Colorado, a computer model had simulating the first small increases in greenhouse gases. There was a recognition that climate change could be important and that it might have impacts on the future, but it was still a nascent idea.

In 1974, the National Academy of Sciences convened a workshop to consider the potential impacts of climate change on the United States. The idea was that the future might be different from the past, and that climate change might play a role in that. This was the first time that climate change was considered as a threat to human society.

In 1988, the Intergovernmental Panel on Climate Change was established to assess the science of climate change and to develop strategies to address it. This was the first time that climate change was considered as a threat to human society on a global scale.

In 1997, the Kyoto Protocol was signed, committing industrialized nations to reduce their emissions of greenhouse gases. This was the first time that climate change was considered as a threat to human society on a global scale.

In 2015, the Paris Agreement was signed, committing all countries to reduce their emissions of greenhouse gases. This was the first time that climate change was considered as a threat to human society on a global scale.

In 2021, the Intergovernmental Panel on Climate Change released its sixth assessment report, which was the first time that climate change was considered as a threat to human society on a global scale.

The idea that climate change was a threat to human society has been accepted by the majority of the scientific community. This acceptance has led to a range of actions to address climate change, including the reduction of greenhouse gas emissions, the development of new technologies, and the implementation of policies to mitigate the impacts of climate change.

Climate change is a threat to human society on a global scale. It is a threat to the environment, to the economy, and to the well-being of people everywhere. It is a threat that must be addressed now.
enough factor to account for the large-scale climate changes of the last million years,” he explains. Paleoclimatology – the study of past climates – was a fast-growing field, and CCR was at the forefront, building on the interdisciplinary foundation laid by Bryson. In 1977, Kutzbach and Thompson Webb, a Byron Ph.D. student who went on to his own illustrious career at Brown University, came up with an idea that would put CCR at the center of the first “big science” project in paleoclimatology. They landed a major grant from the National Science Foundation and U.S. Department of Energy to characterize and map global climate, vegetation and hydrological changes spanning 21,000 years, since the peak of the last ice age. The Cooperative Holocene Mapping Project (CHOMAP) was an enormous undertaking, involving nearly 50 scientists at five universities. They set out to reconstruct and map the past climate using evidence such as fossil pollen, marine plankton and lake sediments, creating snapshots at 3,000-year intervals in locations around the planet.

Kutzbach’s innovation – using climate models to explain the observed changes – was the critical glue of the project. Both the sharing of data among scientists and the building of interdisciplinary teams of climate modelers, oceanographers, ecologists and geologists was revolutionary, and a precursor to the modern practice of integrated earth system science. This effort ultimately gave rise to the Paleoclimate Model Intercomparison Project, whose results are used by the Intergovernmental Panel on Climate Change to understand the natural and human drivers of climate change.

CCR continues to be a world leader in historical climate modeling, led by Zhengyu Liu. Liu, a professor of atmospheric and oceanic sciences, succeeded Kutzbach as CCR director in 2002 and has received his own accolades, elected a fellow of the American Geophysical Union and the American Meteorological Society. Liu and staff scientist Feng He were part of a team that recently completed a project decades in the making: a comprehensive and continuous simulation of the climate from the last glacial maximum to the present, showing how meltwater from receding ice sheets could trigger abrupt changes in the ocean and atmosphere.

New science, new challenges

Climate models are always evolving, riding on ever-faster computer processing capabilities and developing higher-resolution and ever-increasing realism in their representation of the earth system. At the same time, the urgency of climate change now calls for new science and a closer connection to decision-making.

For example, in the CHOMAP days, the most advanced climate models treated the world ocean essentially as an inert slab – able to exchange energy with the atmosphere, but with no ability to circulate. At CCR, Liu has pioneered the development of ocean-atmosphere and ocean-atmosphere-vegetation models that show how feedbacks between these systems are a crucial cause of climate variability, past and present.

One of CCR’s strengths has been its long-standing relationship with UW-Madison’s Department of Atmospheric and Oceanic Sciences, one of the strongest such programs in the world. And the blending of disciplines from across campus, essential to the center from its inception, has never been stronger, with more faculty members, scientists and student researchers involved than at any point in CCR’s past, with access to unprecedented capabilities from models, satellites and other tools.

“The brainpower in CCR today is incredible,” says Kutzbach, describing how CCR has expanded beyond its early roots in climatology into wide-ranging studies across the new field of Earth system science. The areas of research on which the center was founded still thrive, but a new array of interdisciplinary projects have blossomed on topics like carbon cycles in the Great Lakes, oceans and forests, long-term oscillations in the oceans; Arctic climate feedbacks, and the climatic effect of land use changes thousands of years ago. And increasingly, CCR’s mission is working with decision-makers to assess climate vulnerability and develop strategies to help society adapt.

“In the 1960s and maybe early 2000s, the goal was predicting climate change,” says current CCR director Jack Williams. “I would say we’ve passed the moment where that goal is possible. Now we’re in a conversation about slowing the rate of climate change and adapting to the changes that are happening now and are going to continue over this century.”

Again, CCR has helped lead the way, developing innovative new partnerships among climate scientists, decision-makers and stakeholders, particularly through the Wisconsin Initiative on Climate Change Impacts.

“CCR has a really important role to play, particularly on adaptation,” Williams says. “A lot of people need the best available science and information about what climate changes are expected over the next several decades, and CCR – because it’s got such a top-notch group of scientists from the atmospheric sciences, the biological sciences and the geological sciences – is in a key position to help with this effort.”

It all goes back to Bryson’s vision more than 50 years ago, when he began to stretch the boundaries of climate science. He was well ahead of his time, but others would soon follow.

“Reid’s idea had legs,” says Kutzbach.

“When he set up CCR, it was unique. There was nothing like an interdiscipinary climate research group in 1962. But the idea has proven to be so valuable that you now have a lot of centers in this country and around the world that have modeled themselves after CCR.”

### Climate archivists

RESEARCHERS MINE THE PAST FOR CLUES TO THE FUTURE

BY MEGHAN LEPISTO

T o better understand the present – and more accurately predict the future – you must understand the past.

Such is the inspiration for those in the Nelson Institute for Climatic Research (CCR) who study paleoclimatology and paleoecology. By combining powerful climate models with data from ancient clues such as fossil pollen, lake sediments and tree rings, these historical ecologists work to reconstruct past climates and ecosystems.

Their findings can help us understand the causes of 21st century climate change – which may result in new and strange climates very different from any experienced today – and the effects on plant and animal communities.

“I really think about this as a tool for aiding climate adaptation efforts,” says Jack Williams, director of the Center for Climatic Research and a professor of geography. “But there’s also the broader question of understanding how the climate system works. The geologic record has been incredibly valuable for that.”

Williams says the pre-industrial past offers a baseline for analyzing the impacts of human activities like carbon emissions and deforestation.

“You can’t understand how humans are affecting the climate system without having an understanding of the natural processes at play,” he explains. For example, that we now know how greenhouse gases drive global temperatures is, in a very significant way, “founded on our understanding of past climates and the drivers of past climate variations,” he says.

Williams is one of many CCR scientists who lead the way in this field, building on the legacy of researchers like Reid Bryson, the center’s founder and a pioneer of modern climatology, and John Kutzbach, an emeritus professor of atmospheric and oceanic sciences and environmental studies.

Palo perspective

“We live in these little slices of time and our science is funded in little slices of time, so I use the past to get perspective – not necessarily as an analog for the future, but as a wider range of perspectives for thinking about the future,” says Sara Hotchkiss, an associate professor of botany and CCR faculty affiliate.

Hotchkiss studies how rare climatic events and slow changes shape the ecological history of landscapes. “Ecological systems have legacies built into them,” she says. “I look for events beyond our experience and look at how systems respond.”

Hotchkiss conducts research in Wisconsin as well as the Hawaiian islands, which she says provide a model system for studying climate change. “The nature of the problems they have are the same as global problems; they’re just felt more intensely and sooner because it’s a little place,” she says. Throughout history, she explains, Polynesian cultures have experienced some of humanity’s greatest successes and failures of living within limits. For example, Hotchkiss is part of an interdisciplinary team studying how Hawaiian agricultural practices changed as the state developed and intensified dryland agriculture, and how vulnerability to drought may have ultimately kept society at risk.

“It has real implications for the world, including how cultures respond to stressing their limits,” she says. “People are concerned about the response of ecosystems to climatic change. That’s where our resilience lies culturally, as well as in terms of natural systems.”

On the island of Maui, Hotchkiss is studying the climate sensitivity of the forest’s upper limit – a critical ecosystem boundary. In Hawaii the upper forest line is mainly con-
“I use the past to get perspective – not necessarily as an analog for the future, but as a wider range of perspectives for thinking about the future.”

-Sara Hotchkiss

In Wisconsin, Hotchkiss is studying how differences in landscape affect resilience to a changing climate – a useful perspective for the Wisconsin Department of Natural Resources, with which Hotchkiss frequently collaborates. “They want us to investigate the sensitivities of natural communities to climate change,” she explains. The range of variation and rare events in climate, such as extremes in flooding, drought, heat or cold, must be considered in modeling future climate and land management scenarios, but perspective is lacking in terms of ecosystem response – a void Hotchkiss is helping to fill. “We’re using the past to define the range of possibility and to think about the sensitivity of individual species in case we move beyond that range,” she continues. “What can you learn about a local area that can help you know which areas are likely to be more or less sensitive to climate changes, and to what kinds of changes? That’s where I mine the past.”

For instance, as climate variability increases in Wisconsin, the state is likely to see more dry periods, even as net precipitation increases. Looking to the past for context, Hotchkiss is studying how increased frequency or intensity of drought could impact fire-sensitive landscapes and the use of fire as a land management tool. She’s also looking into potential effects on the ecology of lakes and peatlands, which hold the biggest pools of stored carbon in the region.

Ice age ecologist

Much of Jack Williams’ research also has direct implications for conservation biologists and land managers. “When the world is changing to a condition that may be very different than what we’re used to and what our management process is based on, that’s a fundamental challenge for practitioners and for ecologists,” he explains.

Williams studies how natural communities have responded to past climate change by collecting lake sediment cores and extracting fossil pollen or charcoal to understand an area’s vegetation and fire histories. “The past gives us actual data about species’ responses to climate change,” he says. His work focuses on the environmental changes of the last 20,000 years. “This is the last big period of climate change, when you’ve gone from an ice age – a glacial era – to the Holocene interglacial period,” he explains.

This time period serves as a model system for understanding how ecosystems respond to large or rapid climate change, periods of drought and increases in carbon dioxide (the greenhouse gas most associated with global warming). “These are all things that happened over this time period that are similar in magnitude to what’s happening now,” Williams says.

Using networks of pollen data, Williams has helped build databases that enable him and other scientists to examine environmental changes not only at a specific location, but across the continent, mapping how a species’ range has shifted because of climate change. Through his findings, he has advanced the concept of “no-analog” communities, or communities of species remixed into combinations not seen today. “The records show very clearly that species were not all heading at the same rate, in the same direction, as climates changed in the past,” he says. “As a result, we have this reshuffling of species into new communities.”

From past to present

Williams believes no-analog communities formed in response to no-analog climates – mixtures of climatic conditions that happened in the past but don’t happen today. A similar situation could soon emerge, he says, exacerbated by rapid climate change, invasive species and changing land use patterns.

“All these things are creating a novel world,” he says. “Just as some of the late glacial climates were outside the bounds of what we see today, and as we see species reshuffling in response to these past climates, we may expect a similar response in the 21st century.”

For example, some arctic and alpine climates – those at the coldest end of the spectrum of today’s climates – are at risk of being lost in the 21st century, he says, placing species that are endemic or uniquely adapted to these climates at a heightened risk of extinction. But how do you prepare for environmental scenarios in a future climate very different from the present? Again, the past comes into play, using the geological record as a testing ground. By asking climate models to predict past species distributions during past periods of no-analog climates, Williams explains, researchers can assess a model’s robustness and predictability.

One of Williams’ colleagues, Zhengyu Liu, has undertaken a major effort to improve the predictive power of climate models. Liu, a postdoctoral researcher and a professor of atmospheric and oceanic sciences and environmental studies, is leading a team of scientists producing a state-of-the-art continuous simulation of the past 21,000 years of global climate change. Eventually, the simulation will run through the present and extend 2,000 years into the future.

This National Science Foundation-funded project explores a new paradigm of model-data comparison, coupling the detailed results of the continuous simulation with physical evidence of past climate conditions, such as from fossils and the Greenland and Antarctic ice cores. Matches between the simulated past climate and actual past data help to validate and refine the model and improve its credibility in predicting future climates.

“If the model can reproduce the past with sufficient and credible value, then the future prediction might be true,” Liu explains. “When you have the best model and the best data to verify a model, then you sync it and use the model to make predictions.”

Interdisciplinary collaborations like this are commonplace at the Center for Climatic Research. “What’s great about CCR is that everyone is working on an important different piece; it’s a nexus,” says Williams, explaining that each member of the diverse research team brings a different expertise. Hotchkiss agrees. “My lab does some of the simplest kinds of reconstructing of climate ourselves, but it’s critical for me to interact with climate modelers and the people who really understand the physics of climate to make sure I’m not diving into a complicated ecosystem response based on a spurious notion,” she says. “CCR is one of the only places in the world where you can do that, and they’ve been doing it for long enough that it’s part of the culture.”

Trolled by water availability, so it is sensitive to drought and climate-driven shifts in trade winds.

In collaboration with UW-Madison graduate Shelley Grausby and the U.S. Geological Survey, Hotchkiss has placed weather stations across the face of mountain slopes in Maui to study how climate and forest composition vary across the mountain gradient. At the same time, she collected lake sediment cores at altitudes below the forest line, analyzing fossil pollen from the cores to see how forest boundaries have shifted with past climate changes.

Early results suggest that the upper forest limit is likely to shift downward in the future, which Hotchkiss says is bad news for several endangered native bird species. “The forest-dwelling birds may be caught in a climate squeeze as mosquitos scramble across Hawaii’s high-elevation forests,” she explains. “There’s a strong light on the problem with past and present data.”
Winter/Spring 2013

Explore the carbon cycle for yourself
Galen McKinley has developed a website for the general public that explains the global carbon cycle, at carbocycle.aos.wisc.edu. Visitors can create their own future global carbon scenarios through an interactive application, by changing both human emissions and carbon uptake in the land and oceans.
Novel partnership trains students as climate scientists

When Ankur Desai measures greenhouse gases in northern Wisconsin forests, he’s not just helping to illuminate how ecosystems modify climate. He’s also igniting the spark of scientific inquiry in local students.

For two years, Desai has coordinated with the College of Menominee Nation in Keshena to bring students into the field as climate researchers. The multi-day course is supported by a five-year National Science Foundation grant that includes an outreach component.

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“CCR is a research-oriented center, but we’ve been learning that knowledge broadly and widely, and not just to experts in science,” Desai says.

While participants contribute to Desai’s field observations, his larger goal is to expose the students to scientific careers. The project targets convenience college students who might want to pursue advanced degrees in environmental science.

“CCR scientists have a good grasp on what data is needed to address local climate changes. They’ve developed a hydrodynamic model that simulates circulation in the lake’s food web. By representing quagga mussels in the model, McKinley hopes to be able to demonstrate in more detail the mussels’ influence on nutrient and carbon cycling. “Their impact is so important that you can simulate the rest of the system without them; it becomes part of the lake chemistry,” McKinley says. Once the mussels are integrated into the model, she says, “You can start asking what if questions like what if we get rid of them? or what if acidification hurts them? What might warming do?”

Ocean exploration

Acidification – a decrease in water pH as a result of carbon uptake – is another area of study for McKinley in both the Great Lakes and the global oceans. “As we put more carbon dioxide in the atmosphere, we drive more carbon into the water and that acidifies the water,” she explains.

Ocean pH has fallen significantly since preindustrial times and continues downswings, with a range of ecological impacts. McKinley suspects the same is true in the Great Lakes, but available datasets aren’t detailed enough to know for sure. This lack of data isn’t limited to acidification, as a whole the Great Lakes are understudied, she says. With Nelson Institute Environment and Resources student Jennifer Phillips (M.S. ’12), McKinley has worked to encourage better monitoring of pH and other factors.

In her research of the Great Lakes, McKinley draws from her extensive background in ocean physics. She’s been especially focused on how ocean carbon uptake is changing in the face of increasing atmospheric carbon. Her goal is to learn how much more carbon dioxide the oceans can pull from the air, particularly in the Great Lakes.

McKinley and colleagues recently published a nearly three-decade analysis of the rate at which the ocean is absorbing human-produced carbon by comparing the surface carbon content of the North Atlantic to atmospheric carbon trends from 1981-2009. The report, funded by the National Aeronautics and Space Administration, provides some of the first evidence that the ocean is taking up less carbon because of climate change. Warm water can’t hold as much carbon dioxide, so rising temperatures weaken the ocean sink. As is true with the Great Lakes, limitations in ocean data are a major obstacle to research. As more data becomes available, McKinley can expand her analyses, using her findings to refine predictive models and future data collection.

“The area that a lot of people in CCR have worked on – trying to understand the future climate – but this brings in the carbon cycle component, which is still pretty nascent,” she says. “As we better observe the ocean carbon cycle, see changes and get more data, there’s going to be a lot of new questions brought forward,” she says. “I don’t see any limitation on the questions that can be asked. That’s one of the reasons I love oceanography – it’s a brave new world.”

Climate models, one could argue, speak in generics. These powerful computer simulations support confident assertions about future global trends, but their resolution is too coarse to allow detailed projections at the local level. To a global climate model, most of Wisconsin looks the same.

Scientists at the Nelson Institute Center for Climatic Research (CCR) have solved that problem. They’ve developed a technique that can bring out the content of global models into sharp focus.

“We’re producing climate information that is both state of the art in climate science and useful to people who are trying to understand climate impacts on various systems,” says Dan Vimont, an associate professor of atmospheric and oceanic sciences and Nelson Institute faculty affiliate. Vimont and CCR scientists Michael Notaro and David Lenz developed an innovative statistical technique to “downscale” global models, producing high-resolution climate projections on an eight-kilometer grid.

They initially produced the downscaled data for the Wisconsin initiative on Climate Change Impacts (WICCI), a statewide project co-founded by the Nelson Institute and the Department of Natural Resources.

Vimont says these localized projections allow biologists to evaluate the potential effects of climate change and variability on the state’s ecosystems, and the DNSP is incorporating them into its management plans. Other users include public health officials, educators and water managers like the Milwaukee Metropolitan Sewerage District. The CCR group has applied its downscaling technique to most of the lower 48 states, and the client list for its services has grown well beyond Wisconsin’s borders. The U.S. Department of the Interior is using the data to support resource management decisions across much of the northern tier of the country, and the National Park Service has commissioned CCR to provide high-resolution temperature and precipitation projections for all of the national parks.

The downsampling process is complex, but in simple terms, it relies on local weather on any particular day to large-scale climate projections happening at the same time – “phenomena we may not recognize in our everyday lives,” says Vimont.

A close-up view of climate change

Canary in a cold spell

During hot summer months when crops creep in, grasses turn brown and lake levels fall. Less noticeable, though equally important, is the impact on native bird populations. During extreme weather events such as droughts, cold snaps or heat waves, local bird populations often diminish.

According to Kevin Moe, a senior scientist at the Center for Climatic Research, extreme weather events can affect birds in a number of different ways, often causing death, reduced reproduction or migration. Vanus and a team of WMU-Madison scientists are studying this phenomenon to learn what death, occur and where the surviving bird populations “ride out the storm,” he says.

One likely possibility is migration to national forests or wildlife preserves. If threatened, birds use certain habitats as a buffer when things get tough at home. These areas will be an especially important conservation priority – particularly as more extreme weather events are fostered by climate change, Vanus explains.

The team is also seeking to help scientists and land managers better coordinate to protect birds and improve wildlife management strategies. The impacts of extreme weather are increasingly more visible, but these events are not always explicitly tied to climate change. Vanus hopes this research will help bridge weather impacts and climate models.

“Climate models tell us that we are going to have a very different climate in the future, but they can’t tell us what kinds of impacts that will cause,” Vanus says.

AMA NDA LUCAS

Mixed signals

New research shows that planting a tree may not help mitigate the effects of climate change after all. As it turns out, planting vegetation where none previously existed could have the opposite effect, at least in some scenarios.

Creating forest in a naturally bare region, a process known as afforestation, has been suggested as a potential method to mitigate climate change. Trees and vegetation take up excess carbon dioxide from the Earth’s atmosphere, reducing the concentration of greenhouse gases and slowing atmospheric warming. But afforestation efforts must be developed carefully, according to a model developed by the Center for Climatic Research’s Guangshan Chen, Michael Notaro and Zhengyou Liu.

Their research simulated the effects of a planned federal program to afforest nearly 1.8 million acres in the Southeast and Midwest by 2020. Through climate model simulations, the team discovered that afforestation sometimes backfires due to uncertain feedback loops between vegetation and climate.

Over the long term, according to their model, increased vegetation in the Southeast led to lower surface air temperature and increased total precipitation – the ideal outcome of climate change mitigation.

In the long-term, however, the researchers found the opposite: surface air temperatures in areas adjacent to the proposed afforestation increased, while precipitation decreased. These remote effects may have severe impacts for both ecology and the economy.

AMA NDA LUCAS

In Common
BY MEGHAN LEPISTO

Every day we damage our lungs.

Careless behavior, pollutants and fire can cause irreversible harm.

This isn’t a public service announcement about the dangers of smoking, but a warn-

ing about the health of the world’s tropical forests.

Scientists often refer to the Amazon as the lungs of the earth, says Holly Gibbs, an assistant professor of geography and environmental studies, referring to the tropi-

cal forests of South America. “It converts a significant amount of the world’s carbon dioxide into oxygen.”

In all, the tropics—spanning Africa, Asia, Australia, the Caribbean, Central America and South America—contain nearly half of the world’s forests. These ecosystems deliver fresh air, but they also help prevent climate change.

During photosynthesis, trees and other vegetation soak up atmospheric carbon dioxide—the most important global warming gas emitted by human activities.

Tropical forests store more than 340 billion tons of carbon, which equals 40 years’ worth of worldwide fossil fuel emissions,” Gibbs says, citing her work monitoring car-

bon stocks and emissions on a global scale.

But this carbon storage can be reversed.

When forests are cleared and trees decay or burn, the carbon previously stored in trunks, limbs, leaves and roots—amounting to half of a tree’s weight—is released into the atmosphere as carbon dioxide.

Plot by plot, the effects add up.

Deforestation has historically accounted for about 20 percent of the world’s carbon emissions, equal to the transportation sector.

Among the top emitters of carbon dioxide globally earlier this decade—China and the United States, followed by Brazil and Indonesia—the latter two countries’ emis-

sions are almost entirely from deforestation.

“If we clear tropical forests, then we’re accelerating climate change, because nearly all that stored carbon is burned and emit-

ted,” Gibbs says, “just the same as burning gasoline to fuel our cars, or burning coal to

operate industry or provide electricity.”

While the rate of deforestation is slowing

accelerating climate change, because nearly

90 percent of the area of Wisconsin.

On a regional and local scale, the effects are amplified. Studies show that deforesta-
tion can also reduce precipitation, raise the
ground surface temperature and, as the

landscape becomes increasingly fragmented,
increase the potential for fires to claim even

larger swaths of land. It also lessens biodiver-
sity in the tropics, home to more than half of the world’s plant and animal species.

Gibbs says it has become increasingly clear that tropical forests must be factored into any climate change mitigation strategy as “globally important carbon storehouses.”

But what are the most effective ways to reduce tropical deforestation and forest degradation? How can we prevent natural and human-caused forest fires? And how can we hold individuals or communities responsible for the loss of these forests?

Who owns what?

For REDD to work fairly and effectively and for it to have a lasting impact, many experts say, clear and secure land tenure with atten-
tion to the rights of local forest-dependent communities is critical.

“Deforestation is about far more than how much carbon is stored or released into the atmosphere, because the forests also provide for the livelihoods of millions of people,” says Sarah Naughton, an NGO researcher and past director of the Nelson Institute Land Tenure Center (LTC) and Department of Geography, Madison. “It is about managing the connection between the environment and human well-being.”

While REDD is the most high profile of policy mechanisms being discussed in climate change conferences around the world, it is not the only approach to reducing emissions. Developing countries are also exploring REDD+, which seeks to address deforestation and forest degradation by focusing on the socioeconomic drivers of deforestation.

For REDD to work fairly and effectively, and for it to have a lasting impact, many experts say, clear and secure land tenure with attention to the rights of local forest-dependent communities is critical. When forested lands are legally recognized as such, the rights of local people to use and manage forest resources, including hunting, gathering and traditional medicines, are strengthened. When forest tenure is secure, communities have the opportunity to reduce deforestation rates, increase forest carbon stocks and enhance biodiversity.

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Naughton says REDD “place.”

deforestation in a way that power and our money to stop our economy, but use our society, according to Naughton. “The worst-case scenario is that affluent, emissions” remains the elephant in the room, according to Naughton.

hot-button issues

Though global consensus has yet to be reached on how to implement REDD, the initiative has progressed faster than other areas of climate change mitigation – namely, cuts in fossil fuel emissions by richer countries.

That the international community “is doing basically nothing about fossil fuel emissions” remains the elephant in the “They’re not always literally cutting the trees down, but they’re financing and incentivising deforestation,” Gibbs explains. “On one hand, we’re seeing much larger swaths of forest cleared and much more intensive use of that land. But on the other hand, it opens the door to a whole new type of commodity – which I call demand-side conservation.”

Making demands

While REDD uses financial incentives to prevent deforestation, demand-side tools rely on globalisation and market pressure.

For example, Brazil and Indonesia – two critical areas for forest conservation – are now deeply connected to global markets for soy, oil palm and beef and thus responsive to market signals. What this means for conservation, Gibbs explains, is that industry oversight and purchasing power can be leveraged to make operations more sustainable. One of Gibbs’ emerging research projects, supported by the Gordon and Betty Moore Foundation, is examining two specific demand-side conservation tools in which multinational grain traders, large beef processors and other businesses alter their practices to avoid forest clearing.

That these demand-side initiatives address the drivers of deforestation gives them an advantage over REDD, according to Gibbs. “That’s been one of the major criticisms of REDD – that it provides funding that goes through government, which may or may not reach the people that are actually doing the clearing,” she explains. “These demand-side efforts are directly going after the companies that control the deforestation dynamics.”


Direct effect

That these demand-side initiatives address the drivers of deforestation gives them an advantage over REDD, according to Gibbs.

Gibbs interviews oil palm plantation owners in Malaysian Borneo.

But as profits from Brazilian soy and cattle rose to extremely high levels during the recent U.S. drought, the trend remained positive for forest conservation.

“Brazil’s cattle ranchers and soy farmers can make more money now than they could in a long time, and they still haven’t increased the rates of deforestation,” Gibbs says, “indicating that this combination of domestic pressure, outside organization pressure and changing macroeconomics have significantly altered business practices for these two sectors.”

Environmentalists, Gibbs says, the best-case scenario would be to have much more efficient, optimized use of land to meet global demands while reducing supply chain waste and deforestation. But producers need to be able to sustainably increase production.
In Common

WASTE TO ENERGY TO INNOVATION

In Uganda, students see opportunity to fuel sustainability and public health

BY AMANDA LUCAS

Could the solution to some of the developing world’s energy, health and conservation challenges lie in a landfill? Nelson Institute graduate students Aleia McCord and Sarah Stefanos think so. They’ve teamed up with partners in Uganda to develop a business model that converts human waste, animal manure and food scraps into fertilizer and biogas through an anaerobic digester.

“An anaerobic digester is essentially a giant concrete stomach,” explains McCord. “Millions of microbes, like the ones that live in our stomach, eat organic matter and burp methane. The organic matter becomes a high-quality organic fertilizer, and the gas – the methane microbes produce – becomes an opportunity for energy use.”

McCord and Stefanos, both pursuing master’s degrees in Environmental and Resources and participants in the Certificate on Humans and the Global Environment (CHANGE) program, studied anaerobic digesters as part of a CHANGE course. Traveling to Germany, they learned how biogas is widely produced and used. They brought their findings to Uganda, where the students then began imagining the potential of smaller-scale systems in a country where unmanaged waste degrades urban conditions and quality of life. Makeshift landfills and a lack of public restrooms have created haphazard and unhealthy conditions in many of Uganda’s crowded urban areas.

All that waste represented an opportunity to McCord, a micro-
al ecologist, and Stefanos, a rural sociologist. They joined forces with two graduate students at Makerere University’s Centre for Environment and Resources and participants in the Certificate on Public Health and Conservation challenges lie in a landfill?

Uganda faces three struggles common in developing countries: widespread deforestation. Many of the country’s most precious natural resources are being depleted – and in some cases, destroyed completely. Uganda’s forests are home to several critically endangered species, including some of the last remaining populations of mountain gorillas.

As a result, according to McCord, many Ugandan farmers turn to the forest for new cropland, an ongoing process that drives farming techniques, high rates of soil loss and a lack of fertilizer leave only one option: move to new cropland.

Farming techniques, high rates of soil loss and a lack of fertilizer leave only one option: move to new cropland.

The diverse and imaginative team created a unique business model and launched a new company called W2E, an acronym for their waste to energy concept.

Cutting health risks

Uganda faces three struggles common in developing countries: insufficient public hygiene, severe energy inequities and limited options for agricultural expansion. W2E works to transform each of these obstacles into a socially responsible business initiative. For starters, McCord says, turning waste into energy helps divert it from streets, where careless dumping is common, attracting vermin and polluting water. W2E gives Ugandans a purpose for their waste and a place to put it (the program will provide neighborhood dumpsters, minimizing human- and animal-disease transmission and water-borne illnesses.

It also provides an alternative to the charcoal and firewood Ugandans use as cooking fuel in their homes, both of which harm local forests and human health. According to McCord, an estimated 1.5 million Ugandans die each year from indoor air pollution. Women and children, who spend most of their days indoors, are disproportionately affected by chronic lung problems.

The long-term goal of W2E is to produce electricity for the national grid, a significantly cleaner and safer source of energy that produces emissions with less particular matter. Shifting from indoor use of charcoal and firewood also dramatically lowers the rate of lung disease, says McCord.

In addition to cleaner energy, the project also turns the waste into fertilizer, which has the potential to help feed Uganda’s growing population and even help preserve its forests. Uganda is under constant pressure to increase food production, but poor farming techniques, high rates of soil loss and a lack of fertilizer leave only one option: move to new cropland.

As a result, according to McCord, many Ugandan farmers turn to the forest for new cropland, an ongoing process that drives widespread deforestation. Many of the country’s most precious natural resources are being depleted – and in some cases, destroyed completely. Uganda’s forests are home to several critically endangered species, including some of the last remaining populations of mountain gorillas.

“We want to provide a product that helps farmers improve yields and protect their soils, so they can increase yields on the soil they have, and they don’t have to cut down more forests to make more food,” McCord says.

Boosting Uganda’s economy

W2E is currently in a pilot stage, with an anaerobic digestion system in place at a rural Ugandan school. The team is collecting data and assessing the project’s impact on waste management and public health. They plan to eventually introduce their process in urban centers across Africa.

The digesters at the heart of W2E can be implemented for $10,000 each, which, though costly, is much more affordable than many of the digesters deployed in the United States.

To date, W2E has been funded primarily through grants and prizes. The team won two student innovation competitions, the Wisconsin School of Business Burrell Business Plan Competition and the Nelson Institute-hosted Global Stewards Sustainability Prize. It also received grants from the Swedish International Development Agency for its innovations in fighting poverty, and from the Grand Challenges Rising Stars in Global Public Health, a Bill and Melinda Gates Foundation program.

Now registered as a for-profit company, W2E could also provide desperately needed jobs in Uganda. Waste must be collected and transported to the digester facility, where it will be sorted by local waste pickers who receive benefits and fair wages. The locally produced biogas will serve as a more affordable, renewable source of energy, sold for 20 to 30 percent less than competing fuel products.

“Poverty is one of the strongest motivators for innovation – innovation by necessity,” McCord says. “Our vision is to take what is currently a grant-dependent project and turn it into something that is truly financially sustainable, and to demonstrate that you can have a profitable, commercial venture that at its core is a sustainable vision for the future.”

The forces that are driving our global economy are corporate forces,” she continues. “It’s important to envision alternatives that engage with for-profit models in a way that has positive environmental and societal outcomes.

Next, W2E envisions flipping the traditional perception of innovation on its head, transferring a technology originating in a developing country to the developed world. According to McCord, the W2E model has the potential to be implemented in places like Wisconsin. Anaerobic digesters are now used on some Wisconsin farms, but the multi-million dollar systems are only feasible for very large agricultural operations. However, most dairy farms in the state have fewer than 100 cows. Scaling down the technology to something similar to that being implemented in Uganda may create new opportunities for biogas production.

“Ideally, some of our Wisconsin farmers would see the work we do in Uganda and be inspired to meet the needs here,” McCord continues.

Amanda Lucas is a senior majoring in journalism and environmental studies.
For some residents of Milwaukee, winters will not be as cold and drafty as those in recent memory. While the lakefront city is accustomed to harsh temperatures and gusty winds, hundreds of homes and businesses are better insulated and tightened up, thanks to an effort led by a Nelson Institute alumnus.

Erick Shambarger, deputy director of environmental sustainability for the city, oversees the Milwaukee Energy Efficiency program, or Me2. He says the program, which retrofits houses and buildings to save energy, boosts the economy, the environment and urban jobseekers.

“It’s kind of a threefold impact,” Shambarger says. “We want to cut energy use as an economic development tool, try to do something to reduce our greenhouse gas profile, and attract local jobs.”

Launched in 2011 to help homeowners and businesses overcome the front-end costs of energy efficiency improvements to their homes, Me2 has since expanded to include up to 445 homes, Me2 has since expanded to include business owners interested in lowering energy costs and “greening” their buildings. To date, Me2 has upgraded more than 445 homes and has approved nearly 100 business projects in Milwaukee valued at more than $8.8 million dollars. Retrofitting a building for energy efficiency is an important tool for businesses to remain financially competitive and grow, according to Shambarger.

“Energy costs are a constant challenge, and probably one of the biggest costs for any business owner,” he says. “We’d like to be able to reduce that for the long term as an economic development tool, and help all these older buildings remain competitive.”

The city of Milwaukee recently joined the national Better Buildings Challenge, a U.S. Department of Energy initiative to encourage building owners to cut their energy use 20 percent by 2020. The city urges business owners to participate by taking advantage of Me2’s financing options.

Milwaukee committed its portfolio of government buildings to the challenge, Shambarger reports, along with many other downtown buildings—including the U.S. Bank skyscraper, which, at 42 stories, is Wisconsin’s tallest. Me2 also works to lower the average carbon footprint of the city through residences. Prior to Me2, however, homeowners received little financial incentive from city government to make their dwellings environmentally friendly.

“For energy, you have to find creative solutions to finance efficiency efforts—they have high upfront costs, but they pay off over the long term,” Shambarger says.

To help homeowners overcome the front-end costs, Me2 partnered with Summit Credit Union to provide loan programs specifically for Milwaukee residents interested in energy efficiency updates. If homeowners can gain at least 15 percent energy savings through the Me2 program, they qualify for loans through Summit. The energy savings realized through retrofits are intended to cover the cost of the loan.

Homeworkers also receive a subsidized home energy assessment and a grant for eligible health and safety upgrades, often making the upfront costs negligible. And, Me2 goes one step further, offering homeowners federally-funded rebates based on projected residential energy savings. Rebates as high as $2,000 can be earned by cutting energy use at least 35 percent.

Me2 has been funded primarily by the American Recovery and Reinvestment Act, the “stimulus bill” signed into law in 2009 by President Obama. The act was meant to kick-start economic activity and growth by creating new jobs and saving existing jobs. In the case of Me2, Shambarger says, it provided a way to create a long-term, sustainable market for energy efficiency.

As part of Me2, the city implemented a community workforce agreement that requires contractors who work with the program to delegate at least 40 percent of work hours to city residents formerly unemployed or underemployed.

“We’re trying to put people back to work doing energy efficiency retrofits,” Shambarger says.

According to Shambarger, many other organizations contribute to the success of Me2. The Wisconsin Energy Conservation Corporation helps to administer the program, in addition to similar initiatives in Madison and Racine, and private contractors develop and implement specific efficiency projects. The Center on Wisconsin Strategy at UW originally presented the Me2 concept to the city of Milwaukee in 2008, with it ultimately approved by Mayor Tom Barrett and the Milwaukee Common Council.

Shambarger, who graduated from UW-Madison in 2002 with a master’s degree in public affairs from the La Follette School and a certificate in energy analysis and policy from the Nelson Institute, says his wide-ranging education taught him to think holistically in ways that have helped him create successful programs like Me2.

“It’s really thrilling to be able to have an impact on the community and see the city do something that it wasn’t doing before,” he says. “It’s great to be a part of something new to move the city forward.”

TOP: Insulation is blown into the wall cavity of a home as part of the Milwaukee Energy Efficiency program, or Me2, which helps homeowners and businesses finance energy efficiency upgrades. CENTER: Milwaukee recently joined the national Better Buildings Challenge, a U.S. Department of Energy initiative to cut energy use 20 percent by 2020. The city urges business owners to participate by taking advantage of Me2’s financing options. BOTTOM: Milwaukee Mayor Tom Barrett highlights Me2’s successes at an event at Wisconsin Knitwear, one of the nearly 100 participating Milwaukee businesses. Owner Steve Arenzon is pictured at right.
JONI KABANA

On campus, Madison Environmental Group recently served as green building consulting services to a range of clients. Group, which provides engineering, building design, transportation, research and market- ing services, won the Community Design Award 2010 for its innovative and sustainable design, and Union South – both Madison’s new buildings – were open to visitors.

But Newenhouse’s toolkit extends beyond green living – she is also the president of the Sonya Newenhouse prototype. Many Nelson Institute students are interested in careers that involve consulting on sustainability and environmental issues. What advice would you share with them?

My advice is to get engaged in the professional community while you’re in school. For example, maybe you pick a nonprofit that you’re excited about, local, national and try to get involved – not just to gain professional experience, but to keep having experiences to hone in what it really is for construction.

Everyone needs volunteers. So you go to a conference on topic that you’re really interested in and you volunteer. And through that volunteering you’re gaining both professional and you’re learning what your passions are.

As a student at the Nelson Institute I became a board member of a statewide nonprofit. Sometimes younger people think nonprofits might not think they’re experienced enough, that they need more experience to be a board member, but many boards are intentionally trying to diversify by having younger members on their boards.

And environmental organizations need more women and diversity on their boards. If you’re a go-getter, don’t be shy to seek a leadership role in the area you’re interested in through volunteering. If you’re too introverted to be on a board, start on a committee level. I have learned so many leadership skills from sitting on boards. You’re just absorbing, like a sponge, and continually learning. And at the same time that you’re gaining experience, you’re giving back. Don’t wait for a job announcement, don’t wait for a volunteer opportunity announcement, just seek out organizations – for profit or nonprofit – that you’re interested in and go for it. For volunteer for your local politician you meet so many people.

There is anything else you’d like to add?

Follow your passion and do your homework. I take risks, but they’re calculated, thoughtful and deliberate. You can’t just follow your passion and not be smart about it, you need to do your homework. So if you can knit your passion and your skills, but you can hone your skills, you can keep learning.

And stay connected with the Nelson Institute. I feel so fortunate; my closest friends are the graduate school friends I made at the Nelson Institute. Today they’re still my dearest friends and people I seek advice from.

Open-door policy

Sonya Newenhouse hosts open houses at her Newenhouse prototype in Viroqua, Wis., usually on the fourth Friday of every month. You can find more information and a link to Sonya’s blog about the house at madisonenvironmental.com. Or contact her for a private tour: 608-220-8029. sonya@madisonenvironmental.com

If you’re interested in the small house movement, or in living more mindfully in whatever space have, Newenhouse recommends the book Little House on a Small Planet: Simple Homes, Cozy Retreats and Energy Efficient Possibilities by Shay Salomon.
As a non-traditional student balancing the responsibilities of two jobs, two children and my studies, this financial support has made the difference. In asking ‘Can I do this?’ to saying ‘Of course I can!’ It also represents a vote of confidence in abilities that is potent and motivating. I was not considering graduate school before this; this has inspired me to continue on and expand my career possibilities.”

Janet Moore, supported by the Community Environmental Scholars Program

“The Zieve fellowship allowed me to solve a community problem while doing my dissertation research. My community needed youth programs and the urban park that I am doing an environmental history on needed revitalizing. I was not considering graduate school before this; this has inspired me to continue on and expand my career possibilities.”

Triah O’Kane, recipient of a Charlotte Zieve teaching assistantship

“As a funded graduate student in the Center for Climatic Research I’ve been able to travel regionally and internationally, increasing my scientific exposure and dissemination of current research. Becoming a scientist requires not only technical skills but the funding opportunities through CDR have provided support for the overall enhancement of my abilities.”

Kate Holman

Your support prepares students to build a better future

A defining difference in a great education may be measured through student experiences. With your support of the Nelson Institute, we provide an extraordinary range of opportunities for immersive, hands-on experiences. Thanks to the generous contributions of our donors, the Nelson Institute has for 42 years prepared students to become thought leaders in industry, government and non-profit enterprises across the planet.

Katie Holman

Thank you to all who support the Nelson Institute

We extend deep thanks to the hundreds of individuals, families and organizations that have made financial contributions to the Nelson Institute. These gracious alumni, friends and program sponsors contributed between January 2012 and January 2013.

Nelson Institute Student Experience Fund

The Nelson Institute Student Experience Fund was launched in advance of this winter 2012-2013 commencement as a special opportunity for currently enrolled students to invest in the experience of future generations. High School Student Donors to the inaugural campaign.

Joy An
Erika Cantin
Mel Dowd
Pablo Dornelles
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Sara Fine-Girard
Nick Ketchum
Jon Mancuso
Brandy Laerde
Iveta Zafarova

This fund helps prepare our students to tackle environmental challenges in the rapidly changing world that awaits their graduation. A majority of Nelson undergraduate students participate in service learning classes and internships that place them in meaningful roles within a variety of networks, companies and communities, where their emerging skills and energies can truly make a difference.

In addition, Community Environmental Scholars Program provides need-based scholarships support for students while training them to work with community-based environmental organizations. Nelson students are exceptionally well prepared to work on local projects and cultures. More than 70 percent of our undergraduates participate in study abroad programs, among the highest percentage of any unit on campus.

Your contribution to the Nelson Institute is an investment in education with purpose, in creative, collaborative solutions, and in students eager to make this a better world.

We thank you for your support.

Giftings of $1,000 - $24,999

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In Common Winter/Spring 2013

In Common

To make a gift, please visit nelson.wisc.edu/giving or mail a gift to the Nelson Institute Development Office, 550 N. Park St., Suite 122, Madison, WI 53706. A remittance envelope is available in this issue of In Common.

All gifts are tax-deductible. If you prefer, gifts can be mailed in quarterly or monthly installments. Questions? Please contact the Nelson Institute Development Office at development@nelson.wisc.edu or (608)262-4530.
The legacy of Charlotte Zieve can be seen in the beam- ing, bicolored-clawed faces of middle schoolers and their men- tors, in the student volunteers going door to door to survey residents about sustainability, and in the grateful, enthusiastic comments from community leaders. Zieve (Ph.D. Land Resources ’86), who passed away in July, was a generous supporter of Nelson Institute stu- dent programming. She helped fund a new series of undergraduate capstone courses that address envi- ronmental challenges in coordination with community organizations. A matching grant from the Morgridge Center for Public Service doubled the impact of Zieve’s gift, with the combined resources used to support graduate student teaching assistants. “Charlotte’s contributions represent a triple-win scenario,” says Rob Beattie, academic coordinator for the Community Environmental Scholars Program. “They provide real-world research and outreach training to undergraduates, support grad students who help teach the courses, and enable us to seek matching funds that double the impact of her gift. Without her support, these innovative capstones would not be possible.”

Now in their sixth semester, the classes have pro- vided real-world experiences to hundreds of students, who in turn give back to local communities. “It has been a privilege to be a part of a community- university partnership and embrace the Wisconsin Idea,” says Radit Hidayat, a Nelson Institute doctoral candidate and capstone teaching assistant. Trish O’Kane, also a Ph.D. candidate and recipient of a Zieve teaching assistantship, helps lead a class in which UW-Madison students are paired with Sherman Middle School counterparts, serving as mentors during weekly visits to the school and nearby Warner Park (see “Natural mentors, Fall 2011”). “We serve some of Madison’s most vulnerable chil- dren,” says O’Kane. The Sherman students come from one of Madison’s poorest neighborhoods, plagued by youth gang violence and a lack of safe areas for outdoor exploration. “Warner Park is the closest large, open wild space where these children can learn and play,” she says. “As mentors to these children, our students learn about intersections of racism, poverty and place. They become part of a community solution.”

Keep calm and row on

BY GRACE LATZ (ESC ’13)

I spent most of my childhood outside. I was attuned to the condition of the streams and lakes as a child, boating on the Great Lakes by summer and walking the marsh that flooded each fall. I didn’t want to lose those types of interac- tions when I transitioned to college. I chose to row so I could be out on the lakes every day despite living in an urban area.

I was a walk-on athlete to the rowing team, as most are at Wisconsin, and I luckily found other athletes who felt the same way about the environment.

I learned how our sport of rowing is affected by water quality, wind and weather conditions around University Bay, Picnic Point and Maple Bluff. I became aware of how coaches’ motor boats could disturb waterways with their wakes during training trips in Florida.

I thought of how we avoid transporting inva- sive species between the lakes and channels we compete on. I was always looking for the recycling or compost bin at our competitive events.

The more semesters that passed, the more I realized how the world of sports and athletes – recreational or competitive – are intricately tied to the environment in which they train, practice and perform.

Teammates Maggie Galloway and Annie D’Amato were two of the most avid eco-athletes, encouraging me in my sophomore year to join their group of students that would later become Rethink Wisconsin. Comprised of a handful of student athletes, members of the Greek community and green-minded students, all from Professor Jack Kloppingen’s introductory environmental studies classes, we implemented the changes that students talked about during the course discussion sessions.

By the end of my senior year, we’d established the athletic depart- ment’s first game-day recycling program, assessed our university’s waste stream, started collection sites for recyclables for UW Housing, moved-out, promoted the use of reusable beverage containers among the campus community, and sent donated bicycles around the world.

I also assisted in fostering the relationships and planning necessary to create the GreenHouse Learning Community that now stands along Lakeshore Path. My first two years of college I lived in a residential learning commu- nity and loved the experience, but thought there should be a similar community around environmental issues. The University of Wisconsin is such a historical leader in environmental stewardship, why didn’t we yet have an avenue for incoming stu- dents to live out those ethics?

I started by researching any similar programs at peer institutions and then helped to recruit interested faculty, staff and students for a planning and development committee.

It was an amazing experience contribut- ing to such a project, and when students moved in during the fall of 2010 I was so proud to serve as a GreenHouse intern and be part of what I hope is a rewarding live-in experience at UW-Madison.

From all of this, I’ve learned that through whatever roles or experiences you make of your life, you provide a unique perspective on how to change the world.

Most would never think that a hodge- podge group of athletes, fraternities, sororities and activist students would come together and implement so much change, but we did.

Our programs are here to stay, and I hope that other students see that they can make lasting change to something as grand as the University of Wisconsin-Madison.

Keep calm and row on

In Common welcomes engaging first-person essays from Nelson Institute alumni on topics related to your lives, professions or perspectives. The tone can range from serious to humorous, from sad to uplifting. Any alumni or alumnus may send us an idea for an essay or a draft of 800 words or less to be considered for publication. Submit ideas or drafts to incommon@nelson.wisc.edu.
Kishor also continues work on his dissertation in Environment and Resources, attempting to develop a methodology for measuring openness of data. A scientific, repeatable way to gauge openness would help set measurable standards and determine compliance.

Thomas Mace (M.S. EM ’76, Ph.D. EM ’80) has retired from the National Aeronautics and Space Administration (NASA), where he served as senior science advisor with the Science Mission Directorate at the NASA Dryden Flight Research Center in Palmdale, Calif. The Science Mission Directorate is dedicated to advancing new technologies and expanding the ability of existing systems to support suborbital scientific data collection. Mace now lives in Menasha, Wis.

Jennifer Phillips (M.S. ER ’12) was selected as a 2013 John A. Knauss Marine Policy Fellow. The one-year paid fellowship, established by the National Sea Grant College Program, provides a unique educational experience for students with an interest in sustainability consulting, guiding multi-day raft trips on Oregon’s Willamette river, and advocating for sustainability initiatives surrounding urban agriculture,” says Skiba. “I would love the chance to connect further with alumni and current UW staff and students.”

Letters

Hello! I graduated in summer 2010 from the Conservation Biology and Sustainable Development program and I just learned about this great alumni magazine, In Common. It is so motivating to hear what my Nelson Institute cohort is up to, so I thought I’d send another note from the field. Or rather, fields.

I am co-manager of The Farm at House in Brookville, Md. The Farm is a private business that licenses land at Our House, a residential job training program for at-risk youth from Washington, D.C., and Maryland. We hired Our House’s young men to work on the farm, where they get first-time job experience, as well as some on-the-job environmental learning. Four of WWA’s six staff members are alumni of the Nelson Institute – Beilfuss, Kyle Magyera (M.S. WRM ’10), Erin O’Brien (M.S. LR ’03) and Alexia Sailer (M.S. CBSD ’98).

Anne Braden (M.S. WRM ’12) is an environmental compliance officer with the U.S. Marine Corps in Washington, D.C.

Josh Brown (M.S. WRM ’08) and Ruth Persson (M.S. WRM ’09) have joined the Wisconsin Department of Natural Resources as a water regulations and zoning specialist and water resources management specialist, respectively. They join fellow alumnus Ron Dolens (M.S. WRM ’99), Amanda (Boyle) Minks (M.S. WRM ’10), Katie Songer (M.S. ’09 LR) and Scott Van Egern (ESC ’00, M.S. LR ’05), all water resources management specialists and Molli MacDonald (M.S. WRM ’07), IS Data Services.

Matt Dannenberg (ESC ’10), central Wisconsin organizer for the Wisconsin League of Conservation Voters, has been honored with the Liesl Blackstone Community Leadership Award from Community Shares of Wisconsin. Dannenberg educates, mobilizes and motivates citizens about conservation and activism, and leads the League of Conservation Voters’ Madison-based volunteer and intern program.

Kishor’s focus is science data management to develop a methodology for measuring openness of data. A scientific, repeatable way to gauge openness would help set measurable standards and determine compliance.

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Steph Jones, M.S. CBSD ’10

Steph Jones, M.S. CBSD ’10

Networking online

Nelson Institute alumni can find opportunities for networking and keep up with the institute news and events on Facebook and Twitter. We also encourage our alumni, students, faculty and friends to connect in our LinkedIn group. Visit nelson.wisc.edu/alumni for more information.

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