

CGRER@25

THE CENTER FOR GLOBAL AND REGIONAL
ENVIRONMENTAL RESEARCH



A Message from CGRER Co-Directors Gregory R. Carmichael and Jerald L. Schnoor:

The Center for Global and Regional Environmental Research was born against a backdrop of worldwide attention to global warming. CGRER was established by the State of Iowa in 1990, the same year that the Intergovernmental Panel on Climate Change (IPCC) issued its first report. The intent of these two organizations was broadly similar: the IPCC was to report on climate change at the global level, while CGRER was to perform research on this and related topics at the state and regional scales.



Record heat and drought had plagued the planet two years earlier, when the IPCC was formed. That summer James Hansen, director of the Goddard Institute for Space Studies at NASA and a UI alumnus, was the first to testify to the U.S. Congress that global warming was a real threat.

According to Ben Block of the blog *Grist*, "On June 23, 1988, in the sweltering heat, Hansen told a U.S. Senate committee he was 99 percent certain that the year's record temperatures were not the result of natural variation. It was the first time a lead scientist drew a connection between human activities, the growing concentration of atmospheric pollutants, and a warming climate."

Around that time, citizens as well as politicians were quite interested in climate change and its causation. In the spring of 1990, Iowa's Governor Terry E. Branstad, then also president of the National Governor's Association, asked the two of us to brief him on climate change and on policies governors might adopt to address this emerging problem. We saw it as our duty and a rare opportunity. Meanwhile, three state senators (Paul Johnson, Ralph Rosenberg, and David Osterberg) shepherded the Iowa Energy Efficiency Act through the legislature, thus creating CGRER.

Clearly there was a need for outstanding research to be conducted on climate change, but we understood even then

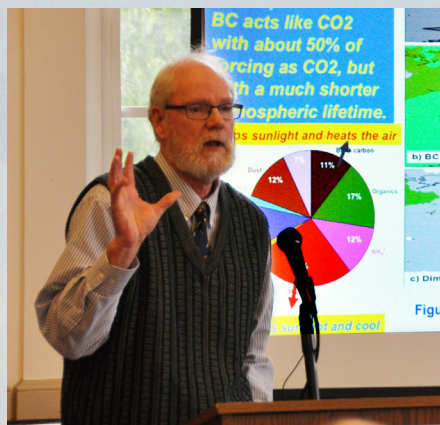
that human-induced drivers of climate change can force many divergent and interconnected environmental changes, including effects on ecosystems, human health, culture, and social systems. So CGRER's focus from the beginning encompassed both climate change and broader environmental issues.



Over the past 25 years, CGRER has grown from its initial 25 to today's 112 members who are primarily at Iowa educational institutions. Together, we have accomplished much. First and foremost, CGRER has remained a research center, seeking to add to the body of knowledge about environmental change by



bringing together investigators from broad disciplines including the natural and social sciences, humanities, and engineering. In this role, CGRER researchers have helped advance the science of climate change through improving capabilities



Gregory R. Carmichael

for modeling midwestern climate change and its impacts. Among other achievements, CGRER researchers have helped establish that air pollutants such as black carbon are powerful warming agents, a fact that offers win-win opportunities for simultaneously reducing air pollution and climate-change impacts.

But CGRER has also extended its efforts beyond research. One important contribution has been providing a forum to focus attention on how global climate change impacts are expressed at regional scales; for example, Iowa and the Midwest are vulnerable to extreme weather events, as exemplified by the floods of 1993 and 2008. In early 1994, CGRER organized the symposium *Preparing for Global Change: A Midwest Perspective*, bringing together leading scientists and policy makers to focus on the science, impacts and policy options related to global warming in the Midwest. And CGRER members have helped the state assess impacts and develop strategies for responding to global climate change by reducing greenhouse gas emissions, while simultaneously spurring economic growth through technological innovation. CGRER's contributions to the Iowa Climate Change Advisory Council and the Iowa Climate Change Impacts Committee are additional examples of our Midwestern emphasis.

In addition, CGRER has embraced the critical need for education and outreach. Through our website, podcasts, blog, and annual statements on the effects of climate change in Iowa, we are informing the public about climate and environmental change and how these changes affect us all.

What does the future hold for CGRER? We have learned that humans are contributing substantially to climate change through our ever-increasing greenhouse gas emissions. Over the past 25 years, we have observed a growing sense of urgency regarding our need to somehow facilitate a severe reduction in these emissions and transition away from the fossil fuel age. In coming years, CGRER will continue to conduct research and educate others about the causes, consequences and cures for climate change and related environmental issues. Our mission at the regional scale is more important now than ever – not only because climate change constitutes a potent threat jeopardizing our future, but also because

climate change is an incredible opportunity for creating a better environment and new economy with high-quality jobs in wind and solar power, energy efficiency, and infrastructure renewal.



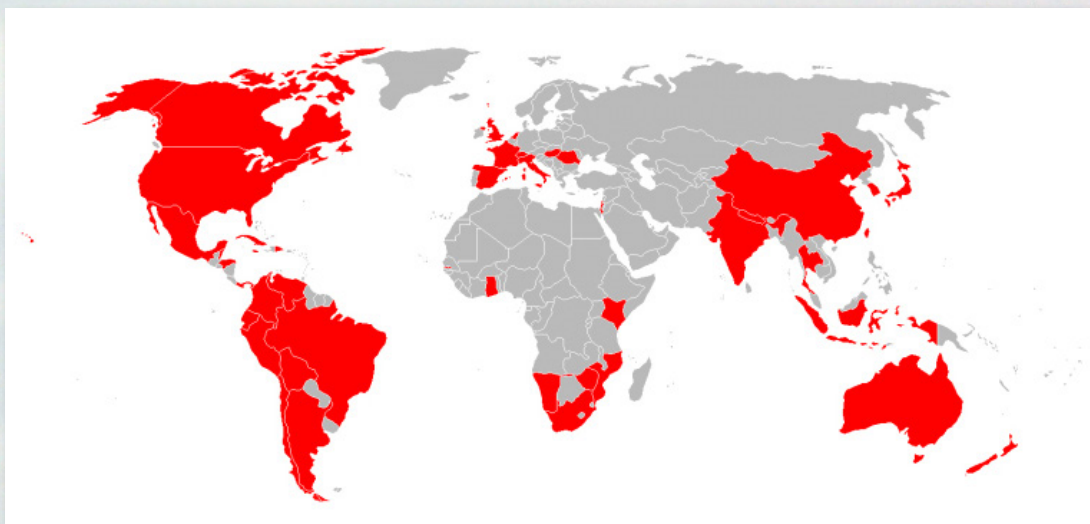
Jerald L. Schnoor

For these reasons, we remain optimistic about the future. We look forward to the coming 25 years, during which the next generation of researchers and educators will rise to the fore and CGRER will continue to develop new mechanisms for meaningfully addressing the problems of our modern world and serving the State of Iowa.

*CGRER Co-Directors
Gregory R. Carmichael and
Jerald L. Schnoor*

Claudia McGehee, who has created illustrations for many CGRER publications through the years, has designed this commemorative print for the 25th anniversary.





During the past 25 years, CGRER members and their graduate students have done research in the countries highlighted in red.

Selected CGRER members give their perspectives on the 25th anniversary:



Peter Thorne

As one of the first members of CGRER, Peter Thorne appreciates the synergies he's seen develop between CGRER and the UI College of Public Health, where he serves as the head of Occupational and Environmental Health.

Thorne says much of his department's research is divided into three categories: air and water quality issues associated with livestock production, the effect of climate change on public

health, and non-agriculture sources of air and water pollution. "The tools and expertise of CGRER members have been valuable to those of us looking at the interplay between environmental issues and public health," he says.

Thorne also admires the way CGRER engages with the public on environmental issues. "As scholars, we need to do more of this sort of engagement and education," he says. "CGRER is a model for how to do this effectively."

In looking to the future, Thorne believes it's vital that current CGRER members help train the next generation of researchers and scientists. "As we senior researchers grow older, helping with the transition to new leadership is essential," he says. "There's no shortage of talent, but we need to make sure these younger people are nurtured and supported."



Vicki Grassian

Biology may be the first scientific field that comes to mind when thinking about environmental research, but chemistry plays a vital role as well, according to UI chemistry professor Vicki Grassian.

"My research focuses on the chemistry and impacts of particles from micro- to nanoscale," she says. "In my work, we look at the chemistry and impacts these particles have on the environment and on public health. This includes particulate matter in the air, which is a major component

of air pollution but also comes from natural sources such as mineral dust and sea spray. Chemistry, a field which focuses on the molecular level, can be used to better understand the environment including the ozone hole in the stratosphere or even the health effects of air pollution."

Grassian has been at the UI since 1990 and has held the F. Wendell Miller Professorship since 2010. She is co-director of the UI Nanoscience and Nanotechnology Institute as well as the co-director of the Center for Aerosol Impacts on Climate and the Environment, a NSF Center for Chemical Innovation.

Grassian became involved with CGRER shortly after its founding in 1990. "I'm grateful for the ways in which CGRER brings together people from different backgrounds so they can tackle problems from an interdisciplinary perspective," she says.

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UI's Global Group begins to meet, hosts a climate change symposium with ISU, and proposes a formal center devoted to environmental change.

1981

A team of federal scientists finds evidence of an overall warming of the earth's atmosphere dating back to 1880.

1983

EPA releases a report on greenhouse effect and gives suggestions for mitigating rises in global temperature.

The National Academy of Scientists releases a report about the buildup of carbon dioxide in the atmosphere.

1985

Scientists from 29 nations urge leaders to develop economic and social plans to combat imminent rising temperatures and sea levels.

1988



1989

Source for timeline items in green and red:
The New York Times



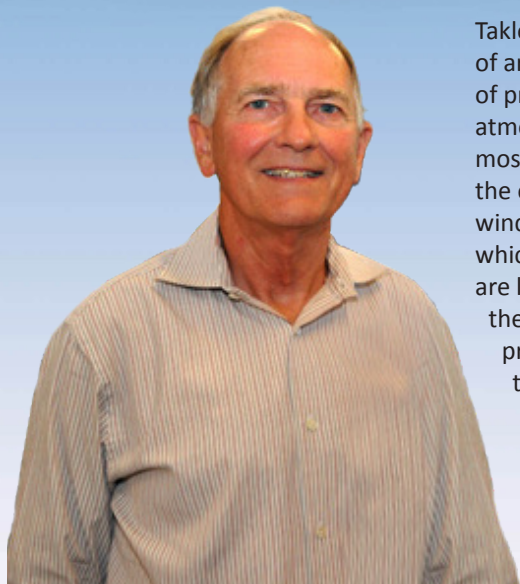
James Hansen, UI grad and NASA scientist, testifies to Congress about evidence for climate change.

Gene Takle

As a professor of atmospheric science and director of ISU's Climate Science Program, Gene Takle has been with CGRER from the beginning. To him, climate science is a foundational discipline.

"Climate science started out as a few geeks doing climate modeling, and now nearly every discipline has a place under its umbrella, including ones as far-ranging as philosophy, ethics and architecture," he says.

Takle has published dozens of articles and given scores of presentations on his atmospheric research, which most recently has focused on the effects of Iowa's growing wind industry on the fields in which most of the turbines are located. He appreciates the funding that CGRER has provided to support this research.



Kajsa Dalrymple

Joining CGRER was an obvious choice for Kajsa Dalrymple when she was hired to the UI's journalism faculty in 2011. Much of Dalrymple's research focuses on water, including the ways in which water issues are discussed in local news outlets and how such coverage may influence public opinions on water sustainability. She says CGRER serves as an important resource for its members, particularly for her as a junior faculty member trying to establish herself in her field.

"CGRER not only helps connect junior faculty with more senior members, but also provides funding opportunities for members who are trying to build a research agenda," she says.

Dalrymple appreciates the interdisciplinary nature of CGRER. "In order to conduct the best possible research, questions must be approached from a number of directions and areas of expertise," she says. "Fortunately, new media technologies now allow researchers to connect in ways that have never existed before. This means that we can approach interesting questions with teams of individuals from a variety of fields and professions. These kinds of initiatives will help members continue to produce innovative research and solutions to climate issues facing our society."



1990

The State Board of Regents establishes CGRER.

The Intergovernmental Panel on Climate Change releases a report stating that carbon dioxide and other harmful emissions must be cut by 60% to avoid sharp rise in global temperatures over the next century.



CGRER establishes office, first in Jessup Hall, then at IATL.



1991

CGRER receives its first state funding.

1992

CGRER receives its first grant.

CGRER sponsors students to go to the Rio Earth Summit in Rio de Janeiro in cooperation with the Iowa Division of the United Nations Association.

Representatives from 178 countries gather for the Earth Summit in Rio de Janeiro to confront climate change and other threats to biodiversity. The summit led to the formation of United Nations Framework Convention on Climate Change.

1993

CGRER Advisory Board established.

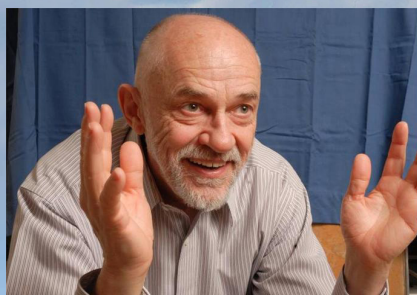
CGRER hosts first Visiting Research Scientist.

1994

First CGRER Seed Grants are awarded.

CGRER initiates work on *Iowa Greenhouse Gas Action Plan*.

CGRER holds symposium, *Global Change II: A Midwest Perspective*.



David Osterberg

David Osterberg is a founding member of CGRER. When he served in the Iowa legislature, he played a crucial role in procuring funding in 1990 to establish the center. Money from a small fee on utility bills was designated to support the Iowa Energy Center at ISU and CGRER at the UI, funds that are on-going to this day.

Osterberg said these centers have been important both for their research and for helping bridge the gap between researchers and policy-makers. "Good public policy depends upon a foundation of good research," he says.

Osterberg believes the annual climate statements issued since 2011 are one of CGRER's most important initiatives. Each has focused on some aspect of how climate change is affecting Iowans. The 2014 statement, for example, dealt with public health issues associated with climate change, which range from increased flooding caused by heavy rains to

greater allergen content in the air due to longer growing seasons. CGRER members and more than a hundred other researchers and scientists from across the state have signed each of these statements.

Osterberg, who now serves as a clinical professor in the UI's Department of Occupational and Environmental Health, says that the need for CGRER's leadership is increasing. "Climate change is a reality," he says. "CGRER plays an important role in identifying its scope and finding possible ways to mitigate it."

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Iowa DNR gives CGRER the *Iowa Energy Leadership Award* for contributions to Iowa's energy efficiency and renewable energy.

1995

Scientists record the hottest year on record and attribute it to the burning of fossil fuels.

1996

CGRER website is launched.
Iowa Greenhouse Gas Action Plan is published.

1997

CGRER provides mapping-quality GPS equipment to Office of the State Archaeologist.
CGRER funds workshops on greenhouse gas issues for Iowa public school teachers, farmers, and citizens.

1998

CGRER performs some of first research in heterogeneous atmospheric chemistry, studying interactions of aerosolized mineral surfaces and organic molecules.

1999

CGRER Seed Grants help establish Iowa Atmospheric Measurement Station and Atmospheric Reaction Chamber at UI.



The Kyoto Protocol, which calls for industrialized nations to reduce greenhouse gas emissions, is signed at a UN meeting in Japan.

CGRER's Fulbright-Hays grant takes 12 UI faculty and students to Nepal for a month to study water issues.



Rick Cruse

Rick Cruse, an ISU agronomy professor and director of the Iowa Water Center who does research on soil erosion, tillage and other water-related issues, has been a CGRER member for six years. While the UI and ISU are sports rivals, Cruse says he's been happy to see the two entities come together for collaborations that include CGRER.

"Working together, the two institutions build on each other's strengths and have a synergistic effect," Cruse says.

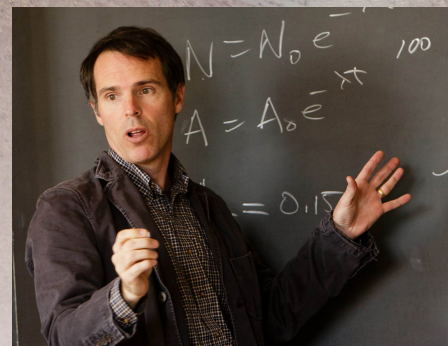
In his work, Cruse tries to bridge the gap between academia and the public through a variety of community education and outreach efforts. He works with the Soil and Water Conservation Club, a student organization at ISU, on *Getting into Soil and Water*. The annual document covers water- and soil-related issues that are relevant to Iowans. While he serves as an advisor, students are responsible for the majority of the writing, editing and design of the publication.

In addition to CGRER's research component, Cruse said CGRER has also played a key role in developing connections

between researchers and policy-makers. "In the scientific world, we often struggle to make connections with people who are in policy-making positions," he says. "CGRER encourages these connections and provides avenues for communication we wouldn't otherwise have."

Rhawn Denniston

Rhawn Denniston first got involved with CGRER as a PhD student at the UI and is now a geology professor at Cornell College. He took a class from CGRER co-founder Greg Carmichael, who also served as a member of his doctoral committee. Rhawn says that what he learned from Greg and the connections he established through CGRER have informed



his classes and provided a catalyst for his current research.

"Two of my recent NSF grants were made possible because CGRER gave me the financial support I needed to do preliminary fieldwork and obtain initial data," he says. "I published a paper two months ago in the *Proceedings of the National Academy of Science* on the nature and origins of Australian hurricane activity over the last



Scientists find sea levels to be rising faster than previously predicted based on a rapidly warming part of Antarctica.

A deadly summer heat wave, which is attributed to climate change, kills tens of thousands in Europe.



CGRER co-sponsors *Teacher at Sea* internship, training high-school teachers about atmospheric research.

2000

CGRER establishes *Graduate Student Travel Award* grant program.

2001

CGRER initiates research-oriented Iowa Weather Forecasting System website.

2002

CGRER members attend UN's World Summit for Sustainable Development in Johannesburg, South Africa.

CGRER helps to facilitate trial burns of waste oat hulls by UI power plant.

2003

CGRER co-sponsors *The Green Awakening—Redefining Prosperity* symposium at UI.

UI Power Plant implements burning of waste oat hulls.

2004

CGRER joins Iowa DNR in organizing new UI engineering course, *Sustainable Systems*.

CGRER develops air pollution models for assessing regional air quality in Brazil.



CGRER helps World Bank create online course, *Urban Air Quality Management*, for worldwide use.

CGRER co-sponsors Alliant Energy's *Energy Policy and Global Climate Change: A Path Forward* conference.

The UI is only the second public university to join the Chicago Climate Exchange, pledging to reduce greenhouse gas emissions each year for 3 years.

two millennia, and CGRER support also jump-started a project with colleagues from ISU on the North Atlantic Oscillation, a major driver of European rainfall variability."

While the majority of CGRER members are at large research-based universities, Denniston teaches at a liberal arts college with approximately 1,200 undergraduate students. He says the collaborations between a variety of educational institutions help CGRER serve as a resource for the entire state of Iowa.

"The connections facilitated by CGRER stimulate a wonderful cross-pollination of ideas," Denniston says. "By linking and supporting people with a wide array of interests, CGRER acts as an amplifier for environmental research."



Laura Jackson

Laura Jackson, a UNI biology professor, has been a CGRER member since its founding. Her research focuses on the ecological restoration of agricultural landscapes and the dynamics of forb establishment in tallgrass prairie reconstructions. Jackson also

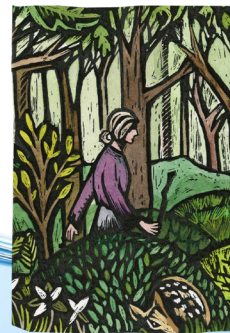
educates the public about the ecology of Iowa plant systems through a variety of initiatives at UNI's Tallgrass Prairie Center, which she directs.

"We're trying to encourage conversations about what it means to have a diverse perennial root system in the ground as opposed to an annual row crop system," she says. To illustrate the differences, Jackson and her team create displays of the intricate roots of prairie species, using plants grown in 10-foot deep pots. The exhibits show how these plants capture nutrients, slow run-off, prevent erosion, store carbon and

re-build topsoil. To date her team has created displays in 20 Iowa counties. Jackson hopes to add an additional 10 counties each year.

Part of her goal is to dispel the notion that scientific research is tied to a political or ideological agenda. "There are a lot of people who think that science works like politics, in that your research is done to prove a point," she says. "Instead, the scientific process tries to eliminate as many biases and inaccuracies as possible. It doesn't set out with any agenda other than to understand better what's going on in the world."

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2005

CGRER helps fund greenhouse-gas-monitoring tower.

Hurricane Katrina slams the Gulf Coast of the United States, killing nearly 2,000 and spurring debate about the effects of climate change.



2006

CGRER members meet in Mexico City with 300+ international researchers to discuss air quality modeling.

CGRER helps organize weeklong course on air quality forecasting for 50 scientists from Latin American megacities.

Environmental Science and Technology, *American Chemical Society* (a journal edited by Jerry Schnoor) opens Beijing office.

Former U.S. Vice President Al Gore releases *An Inconvenient Truth*, a documentary examining the effects of climate change.

The National Academy of Sciences reports that the earth has seen its highest temperatures in 12,000 years and that the earth has been warming at a rate of 0.36 degrees Fahrenheit per decade for the past 30 years.

2007

Jerry Schnoor appointed by Governor Culver to chair the Iowa Climate Change Advisory Council.



2008

CGRER editor Connie Mutel publishes *The Emerald Horizon: The History of Nature in Iowa*.

CGRER members awarded eight NSF grants to study the aftermath of the 2008 floods.



Keri Hornbuckle



When Keri Hornbuckle was applying for a job at the UI in 1998, one of the first things she noticed on its website was CGRER. Hornbuckle appreciated how CGRER focuses on environmental issues from both regional and global perspectives. "Right away I was intrigued, because I could see that my goals were similar to what CGRER was trying to do," she says.

Hornbuckle, a professor of civil & environmental engineering at the UI, does research on the fate and transport of organic pollutants in the environment. She and her team do fieldwork in locations that include the Great Lakes and Chicago and then extrapolate their data to larger regions.

Hornbuckle has been particularly inspired by the work CGRER co-directors Jerry Schnoor and Greg Carmichael

have done in extrapolation and computer modeling. "When I joined CGRER, it was just becoming clear that chemical behavior could be described on both a regional and global basis," she recalls. "Being with like-minded people was so encouraging. It made a huge difference to me when Jerry and Greg said 'Yes, you can do that,' during a period when there was a lot of skepticism about extrapolating from a specific region."

Iowa Flood Center established at the University of Iowa's IIHR—Hydroscience & Engineering.



CGRER members contribute to *Climate Change Impacts on Iowa 2010*, a report requested by the Iowa Legislature.

Human population reaches seven billion.



2009

Iowa Climate Change Advisory Council report and emissions database for Iowa is published.

CGRER hosts first annual legislative breakfast reception at the State Capitol.

2010

CGRER launches the blog *Iowa Environmental Focus* and a weekly radio segment on Iowa environmental research and news.

CGRER organizes *Anatomy of Iowa Floods: Preparing for the Future*, which is attended by 700+ people from throughout Iowa.

2011

21 Iowa middle school science teachers attend a five-day workshop on climate, weather and energy supported by NSF and CGRER.



Representatives from 192 nations meet during the United Nations Climate Change Conference in Copenhagen to discuss an international strategy for addressing the threats of climate change.

In collaboration with the Iowa United Nations Association, CGRER sponsors students to attend the Copenhagen Climate Conference and COP15.

CGRER members establish a remote sensor network on Iowa waterways for real-time instream measurements of turbidity, phosphorus, and nitrates.

Developed countries begin contributing to the \$30 billion, three-year "Fast Start Finance" module, which helps developing countries make environmentally-conscious investments and adapt to climate change impacts.

A Watershed Year: Anatomy of the Iowa Floods of 2008 published; several chapters are by CGRER members.

CGRER helps sponsor Green Bike Tour in Slovenia.

The first cohort of graduate students enroll in the UI's new Geoinformatics for Environmental and Energy Modeling and Prediction. The program is funded by one of the highly competitive NSF Integrative Graduate Education and Research Traineeship (IGERT) grants.

Witold Krajewski

Witold Krajewski, who joined CGRER in 1990, is a faculty research engineer for IIHR - Hydroscience & Engineering and is also director of the Iowa Flood Center (IFC) at the UI.

Krajewski looks at water movement in the environment at a large scale. That research is directly related to climate change, which has played a significant role in Iowa's changing rainfall patterns.

"For a long time few people in Iowa worried about water," he

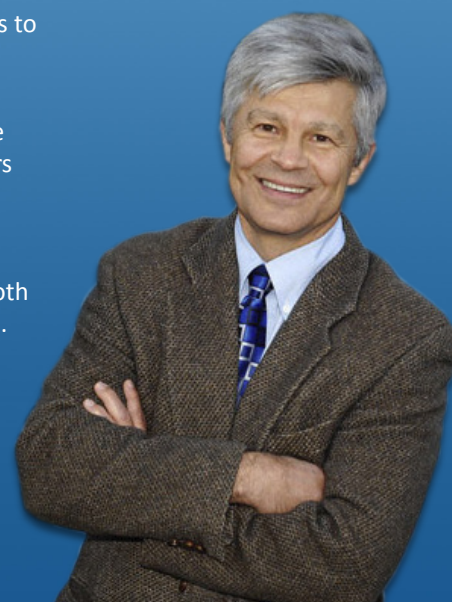
says. "Most Iowans thought that the drought of 1988 and the flood of 1993 were once-in-a-lifetime events."

That changed during the summer of 2008, when the state experienced some of the worst flooding in its recorded history. Those floods led to the establishment of the Iowa Flood Center, the nation's first academic research facility devoted to understanding floods and mitigating their damage. The IFC provides

Iowans with an array of tools to deal with major storms.

Krajewski is grateful for how CGRER has helped him make connections with researchers whose expertise is relevant to his interests. He also appreciates the fact that its members have a focus on both regional and global research.

"CGRER's approach to environmental issues and problems is unique," he says.



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2012

Iowa Climate Statement: The Drought of 2012 released.

CGRER helps sponsor a three-day environmental institute for 35 middle and high school teachers from communities affected by the floods of 2008 and 2011.

2013

Iowa Climate Statement 2013: A Rising Challenge to Iowa Agriculture released.

CGRER helps organize *Living with Floods*, a statewide project to commemorate the five-year anniversary of the historic floods of 2008.

2014

Iowa Climate Statement 2014: Impacts on the Health of Iowans released.

CGRER is a co-sponsor of a symposium on *Meeting the Renewable Energy Challenge*.

2015

Iowa Climate Statement 2015: Time for Action released.

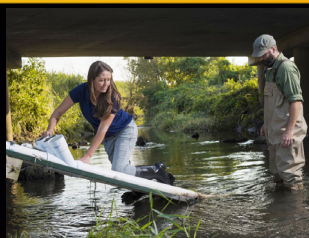
CGRER members help monitor a major fire at the Iowa City Landfill, forecasting the plume using mobile air quality sampling units.



CGRER co-sponsors the first *Iowa Climate Science Educators Forum*, which helps science faculty from around the state learn about the latest Iowa climate science information.

The Iowa Flood Center (IFC) collaborates with NASA to help develop a system that will predict precipitation and potential flooding using satellites.

The Mauna Loa Observatory in Hawaii reports daily mean concentration of carbon dioxide exceeds 400 parts per million, the highest level since record keeping began.



The Iowa Flood Center's network of flood sensors on Iowa bridges reaches 200.

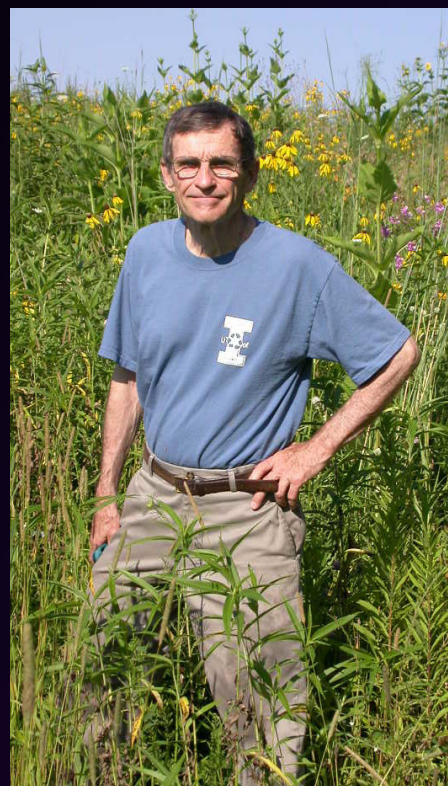
Dick Baker

Dick Baker, a professor emeritus of Earth & Environmental Sciences at the UI, researches fossil plants to understand how current plant communities and climate have changed as glaciers have advanced and retreated over thousands of years. He also documents how human activities have altered the environment.

Baker thanks CGRER for giving him many chances to collaborate with other researchers. When CGRER was formed, Baker was already working with a variety of scientists from the disciplines of geology, ecology and paleoecology, but there was little institutional support for

such interdisciplinary efforts. Baker's CGRER involvement allowed him to make contacts he could use in further research. He especially appreciated his collaborations with UI biologist Diana Horton, who ran the herbarium at the UI. "If I had a plant I couldn't recognize, I'd look in that collection and consult with her," he remembers.

Says Baker: "Too often people work in their own specialized fields, and there isn't much communication or interaction. So when CGRER formed I was eager to join. I know of no other scientific group as wide-ranging as CGRER."



CGRER Membership

UNIVERSITY OF IOWA

Anthropology

Margaret E. Beck
Michael S. Chibnik
Russell L. Ciochon
James G. Enloe
Matthew E. Hill, Jr.
Meena Khandelwal

Biology

Andrew A. Forbes
Stephen D. Hendrix
Diana G. Horton

Chemical and Biochemical Engineering

Gregory R. Carmichael
A. Umrhan Dogan
Charles O. Stanier

Chemistry

Tori Z. Forbes
Vicki H. Grassian
Sarah C. Larsen
Sara E. Mason
Scott K. Shaw
Elizabeth Stone
Mark Young

Civil and Environmental Engineering

Allen Bradley
David M. Cwierny
William E. Eichinger
Keri C. Hornbuckle
Craig L. Just
Witold F. Krajewski
Lou Licht
Timothy E. Mattes
Marian V. Muste
Wilfrid A. Nixon
A. Jacob Odgaard
A.N. Thanos Papanicolaou
Gene F. Parkin
Michelle Scherer
Jerald L. Schnoor
Richard L. Valentine
Gabriele Villarini
Larry Weber

Earth and Environmental Sciences

Richard G. Baker, Emeritus
E. Arthur Bettis
Ann F. Budd
Robert S. Carmichael
Jeffrey Dorale
Lon D. Drake, Emeritus
David W. Peate
Mark K. Reagan
Holmes A. Semken, Jr., Emeritus
Frank H. Weirich
You-Kuan Zhang

Economics

Thomas F. Pogue
John L. Solow

Electron Spin Resonance Facility

Garry R. Buettner

English

Barbara Eckstein
Laura Rigal

Geographical and Sustainability Sciences

Marc P. Armstrong
David Bennett
Margaret Carrel
Marc Linderman
George P. Malanson
Michael L. McNulty, Emeritus
R. Rajagopal
Gerard Rushton
Heather A. Sander
Kathleen E. Stewart
Ramanathan Sugumaran
James D. Tamerius
Eric Tate

History

Paul R. Greenough
Tyler Priest

IIHR-Hydrosience & Engineering

Ibrahim Demir
Connie Mutel
Douglas Schnoebelen

Journalism and

Mass Communication
Kajsa E. Dalrymple

Law

Jonathan Carlson
Burns H. Weston

Mechanical and Industrial Engineering

Geb Thomas
H.S. Udaykumar

Molecular Physiology and Biophysics

G. Edgar Folk, Emeritus

Occupational and Environmental Health

R. William Field
Joel N. Kline
Peter S. Thorne

Office of Sustainability

Liz Christiansen

Physics and Astronomy

Donald A. Gurnett
Paul D. Kleiber
Steven R. Spangler

Science Education

Cory T. Forbes

Sociology

Ion Bogdan Vasi

Statistics and Actuarial Science

Kate Cowles
Dale L. Zimmerman

Urban and Regional Planning

Charles Connerly
Scott Spak
Aaron Strong

IOWA STATE UNIVERSITY

Agronomy

Christopher J. Anderson
Raymond W. Arritt
Richard M. Cruse
Brian K. Hornbuckle

Ecology, Evolution, and Organismal Biology

Diane M. Debinski
John Nason
James W. Raich
Amy Toth
Brian J. Wilsey

Economics

David A. Swenson

Geological and Atmospheric Sciences

William J. Gutowski
Eugene S. Takle

Natural Resource Ecology and Management

Jan Thompson

UNIVERSITY OF NORTHERN IOWA

Biology

Laura Jackson

Center for Energy and Environmental Education

Kamyar Enshayan

Physical Geography

Dennis E. Dahms

CORNELL COLLEGE

Geology

Rhawn Denniston

HYDROLOGIC RESEARCH CENTER, SAN DIEGO, CA

Konstantine P. Georgakakos

RICE UNIVERSITY

Civil and Environmental Engineering

Pedro Alvarez

UNIVERSITY OF WYOMING

College of Engineering

Robert Ettema

HACETTEPE UNIVERSITY, TURKEY

Geological Engineering Department

Meral Dogan

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Elizabeth Stone

Elizabeth Stone became a CGRER member in 2010 when she joined the faculty in the Department of Chemistry at the UI. "I was eager to join to build collaborations with other environmental researchers on campus," she says.

Stone conducts research on air quality, with an emphasis on tiny particles in the air called aerosols. Through detailed chemical measurements, she gains insight into the sources of aerosols and how they transform in the atmosphere. Some aerosols occur naturally, including emissions of pollens,

while others are the result of human activity. Her current projects range from research on emissions of particles from sources such as cook stoves and diesel generators in Nepal and South Asia to examining how anthropogenic emissions contribute to secondary organic aerosol formation in the U.S.

CGRER has been particularly important to her in developing multi-disciplinary collaborations for regional environmental research. In collaboration with CGRER members Scott Spak and Charles Stanier, for example, Stone has been working to assess how the UI power plant affects local air quality, including measuring the first in-field emissions from the combustion of scrap tires. She also examines how the co-firing of regional biomasses (e.g. oat hulls, wood chips, and miscanthus grass) with different types of coal alters the chemical composition of emitted particles.

About CGRER:

The Center for Global and Regional Environmental Research (CGRER) was established in 1990 with the intent of promoting interdisciplinary efforts that focus on global environmental change. Housed on the University of Iowa (UI) campus in the Iowa Advanced Technology Laboratories (IATL), CGRER is supported by revenues generated from investor-owned utilities, as mandated by the State of Iowa's Energy Efficiency Act.

Funds are used to support research and provide services to faculty members and students across the state who are interested in environmental change. CGRER currently is composed of 112 members from 36 departments at eight institutions.

CGRER's mission is to foster collaborative interdisciplinary actions in three ways: by promoting dialogue among specialists and agencies, by educating students and the general public, and by fostering and supporting relevant research projects.



The Center for Global & Regional Environmental Research

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