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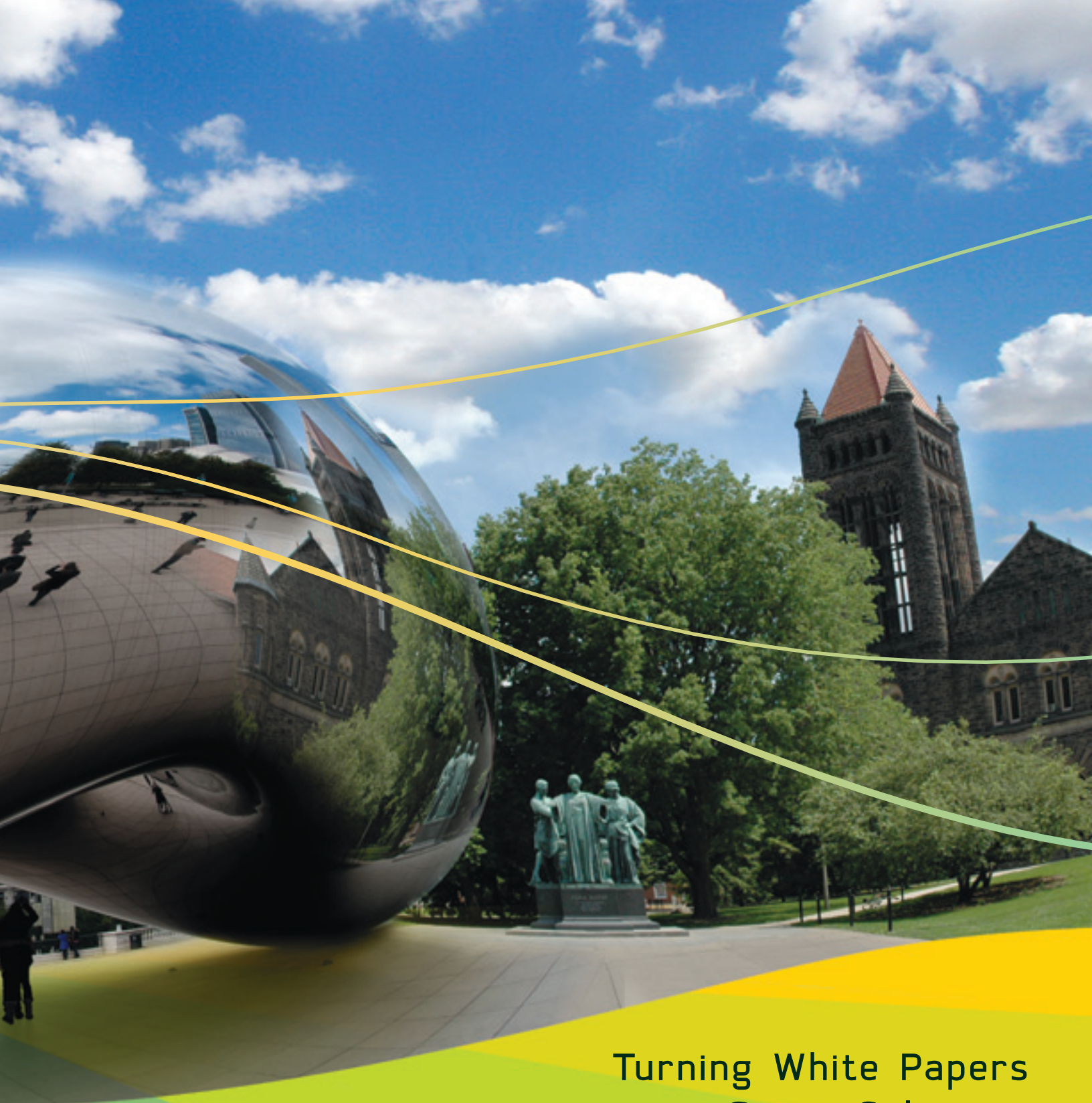
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The Environmental Change Institute

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Think.Change.



Turning White Papers into Green Solutions

2009 Annual Report of **The Environmental Change Institute**



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Message from the Founder

Joel Friedman, JD

It's been a gratifying inaugural year for the ECI. The work of the Institute - fueling the interplay of big ideas and best practices with which to negate the adverse effects of environmental change - is off to a vigorous start. We are leveraging the particular resources of The Alvin H. Baum Family Fund and The University of Illinois at Urbana-Champaign to generate momentum along every dimension of our mission.

Three of the University's distinct divisions, the College of Agricultural, Consumer, and Environmental Sciences, the College of Business, and the College of Law, are partnering in unprecedented ways to generate insights into the causes and consequences of environmental change, and influence constructive responses more quickly than would otherwise be likely to occur. With the support of the ECI, these three Colleges now offer new 'hybrid' academic courses and matching funds for research and seed grants, all of which by design must transcend the individual fields of inquiry from which they spring. The ECI also has programs engaging university students beyond the classrooms, via student-led energy-use audits and campus-wide water and energy management efforts.

Under the auspices of the ECI, collaborative research is underway across four broad areas identified by the Institute as central to its mission:

- (1) Food security and safety
- (2) Resource and energy use
- (3) Public policy and social and economic well-being
- (4) Biodiversity and health of ecosystems

It is exciting and an honor to fund this work. In the aggregate, these courses, studies, and grants reflect our highest aspirations for achieving the ECI mission. Certainly we want to shape people's understanding of the issues, but our deepest measure of success is realized when we have helped parlay that understanding into real-world actions to mitigate the adverse effects by humankind on the environment.

When the founders conceived of the ECI, we envisioned a means whereby leading-edge environmental science would find its strongest complements in expert policy-making and business entrepreneurship. We are happy to report that this kind of cooperation between disparate academic fields is exactly what we are seeing, and the early results are quite encouraging.

Moving forward, consistent with our mission, we aim to amplify ECI's influence. We have had a terrific first year, but are nowhere close to fulfilling our potential. We are taking our first steps of collaboration with other educational institutions. Expect to hear more from us and to see participants in our work present a stronger profile in the University, the country, and the world.

There is no single-country solution to the global threats posed by environmental change. However, as a country, we ought to be prepared to lead by example. The Environmental Change Institute is committed and already hard at work. We challenge you to play your best part.

Chartered in February 2008 and operating since July 2008, the Environmental Change Institute was founded to explore the causes and consequences of global environmental change and launch an all-out assault on the forces contributing to it. A brainchild of Chicago attorney Joel Friedman, Trustee of The Alvin H. Baum Family Fund, the Institute engenders interdisciplinary thinking, strategy, and action not otherwise occurring between traditional academic structures. Our work is based on the conviction that we must at once scale up, re-direct, and accelerate our efforts if we want even a chance to vanquish the consequences of climate change. We also believe that no humans have ever confronted a challenge of this scale and complexity.

The ECI is best characterized as providing a social framework in which previously segregated academic disciplines of Business, Law, and Science co-leverage and co-operate to address climate change. For the first time, there is a formal platform for addressing questions such as:

- » What is the role of local public policy in building green?
- » How is climate change impacting Midwest agriculture and water resources?

These and other questions are what the ECI-funded research and courses seek to explore.

The Institute sees its constituencies as business leaders, policy makers, faculty, students, and, ultimately, any citizens interested in joining with us to curb the forces of climate change. We understand that for most, assimilating the deluge of information available (let alone figuring out what to do with it) is a bit like drinking from a fire hose. The ECI pledges to deliver credible, focused information resources and serve as a catalyst for appropriate action.

We conduct direct outreach efforts through research grants, courses, summits and conferences, and the web. The ECI shares insights and programs with the public through the University of Illinois Extension, which already reaches 2.5 million residents in all 107 Illinois counties.

In year one, the ECI has assembled an executive committee and professional staff. Our specific initiatives completed and in progress encompass:

- (1) Establishing a vision, mission, goals and domains into a Strategic Intent document
- (2) Launching a web site (<http://eci.illinois.edu>) with our principal messages
- (3) Assembling a network of over 260 scholars and researchers
- (4) Funding five directed research grants
- (5) Funding six competitive research grants
- (6) Funding five new interdisciplinary courses
- (7) Sponsoring the 2009 Cap and Trade Summit
- (8) Planning a summit on risk and uncertainty

The overarching challenge to realizing our mission is gleaning insight to human motivations, then shaping policy and courses of action that people will embrace and deploy for the greatest common good.

The biggest surprise since launching the Institute is also our biggest concern: the speed and magnitude at which effects of climate change are occurring is breathtaking, and it surpasses every prior estimate. All but a tiny fraction of climate scientists concur on this. Such a sobering measure assures us that the challenge is bigger and more urgent than we had imagined. The ECI is responding with heightened enthusiasm.

One positive surprise we've witnessed is the degree of economic awakening to the topic: corporations in every industry and across the globe are taking interest. They are recognizing that their future is completely dependent on the state of the environment, locally and globally. Participation in local carbon registries is rapidly increasing as businesses seek to gain intelligence, and, it is hoped, an internalized sense of what must be done. The transition toward an economy where carbon consumption is constrained and managed now seems possible, if HR2454: American Clean Energy and Security Act of 2009 and its senate counterpart move through congress to conference committee, and ultimately is signed into law by the President. For the United States to take this leadership role is critical if we want to influence decisions by other heavy carbon-consuming countries.

At a personal level, it is both edifying and humbling to partake in this broad, systematic view and approach to climate change issues. It is edifying because of how closely it resonates with my own research approach for the last 30 years. More importantly, it is humbling because it underscores how challenging are the tasks before us.

This is a watershed moment. I'm grateful for the vision and hope of our founder and pleased with the cross-college support. The ECI is enthusiastic to have its feet on the ground, engaged in the work of 'turning white papers into green solutions,' and providing the wings they need to take flight.



“ The overarching challenge to realizing our mission is gleaning insight into human motivations, then shaping policy and courses of action that people will embrace and deploy for the greatest common good.”





Strategic Intent

Vision

The Environmental Change Institute will illuminate the causes and consequences of global environmental change and develop constructive responses through public policies, technologies, and lifestyles.

Mission

The ECI advances our understanding of global environmental change and offers solutions to avoid, mitigate, or adapt to its effects through support of scholarly research, innovative teaching, and public outreach.

Goals

- Enhance and promote holistic thinking about interactions among climate, food and energy systems, demographic pressures, and justice and dignity;
- Inspire real-world debates relating to global environmental change;
- Generate a cadre of highly-motivated, broadly-trained, and ethically aware leaders for the 21st century;
- Understand the impact of the changing environment on humans and assure effective and just adaptation;
- Enhance the balance of human needs and the integrity of natural systems.

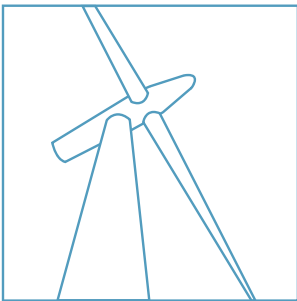
Domains of Inquiry

We advance understanding and develop solutions to global environmental change in the following domains:



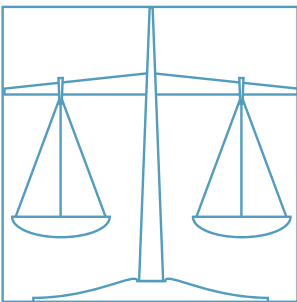
Food systems and security

Food supplies, quality, and prices, both locally and globally, will be destabilized by climatic changes and energy supply and cost-related disruptions. New plant varieties, crop management systems, and appropriate and efficient processing and distribution systems must be developed to address these risks.



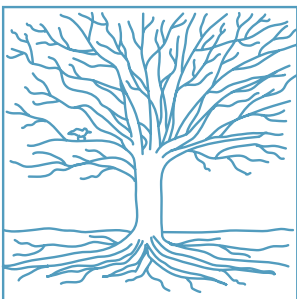
Resource and energy use

The dynamics and quantity of resource availability, including water and wind, will change. Storage of water - groundwater, reservoirs and lakes, and snow pack - will change, affecting water supplies and quality. Strong weather events can destabilize dams, levees, wastewater treatment facilities and drinking water supplies, and risk must be managed. Increased heat will increase demand for cooling, driving the need for comfortable living and working environments that use little or no external energy.



Public policy and social and economic well-being

The science underlying the threats to food systems and security, as well as resource and energy use, must be applied to inform the policies that guide public response, and private response through business decisions.



Biodiversity and ecosystem health

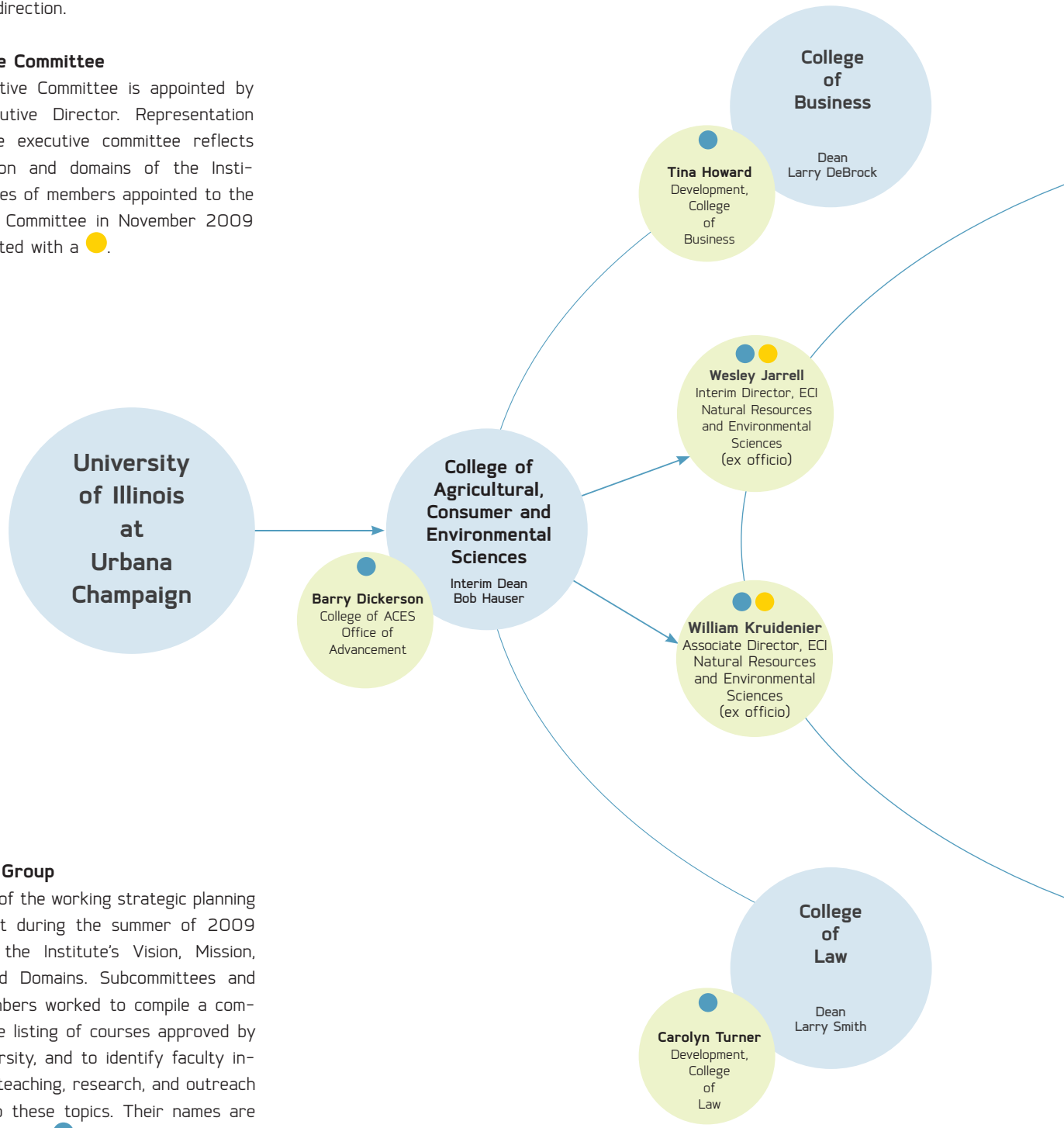
The biological elements of natural and agricultural ecosystems will respond to a generally warming climate by genetically evolving (naturally or through managed genetic change, e.g., plant breeding), attempting to migrate away from the equator and toward the poles, or moving to higher elevations. The implications of these responses, as well as the ecosystem services expected in a given geographical location, must be anticipated and addressed to avoid chronic and catastrophic failures in these systems themselves and the human systems they support.

Administrative Structure

An administrative and operational structure was developed and approved by the Colleges of ACES, Business, and Law. Deans of the three colleges serve as the governing board with budget and overall program direction.

Executive Committee

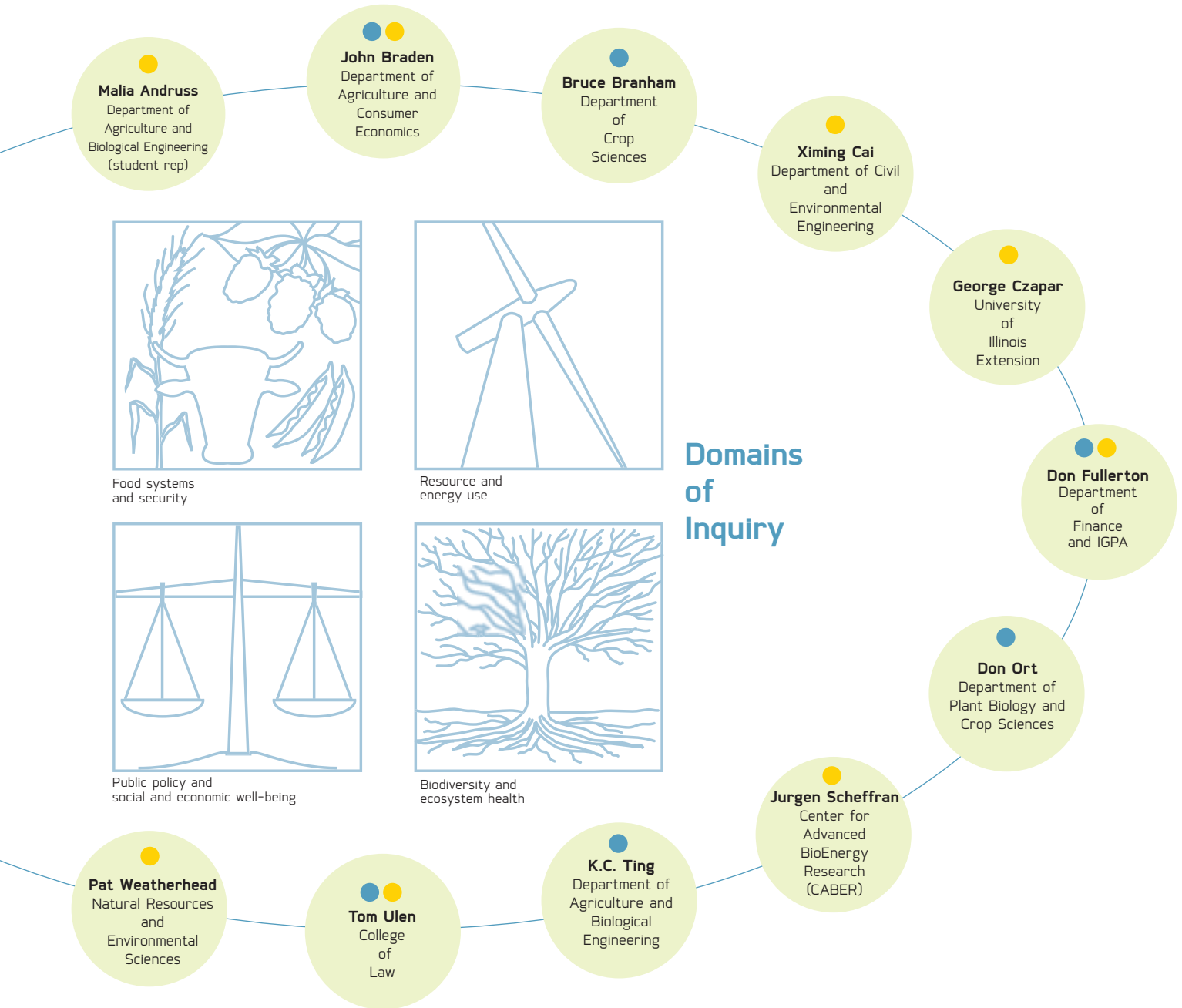
An Executive Committee is appointed by the Executive Director. Representation within the executive committee reflects the mission and domains of the Institute. Names of members appointed to the Executive Committee in November 2009 are indicated with a ●.



Working Group

Members of the working strategic planning group met during the summer of 2009 to craft the Institute's Vision, Mission, Goals, and Domains. Subcommittees and staff members worked to compile a comprehensive listing of courses approved by the University, and to identify faculty involved in teaching, research, and outreach related to these topics. Their names are indicated with a ●.

Environmental Change Institute



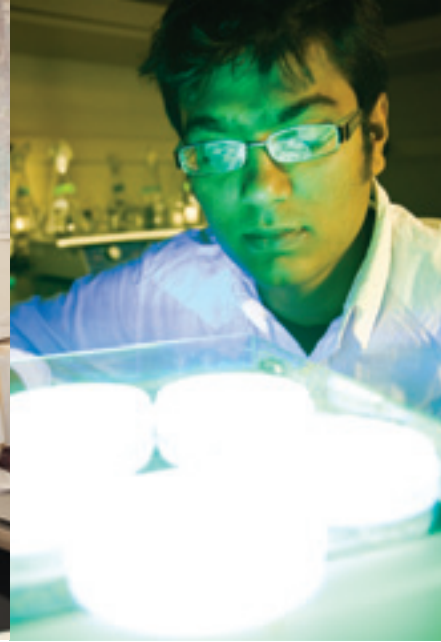
- Member, Executive Committee
- Member, Working Group



Morrow Plots



Julie Cidell, PhD



Assessing Total Soil Carbon

Our Inaugural Year:

Programs, 2008-2009

Campus Launch November 2008

When the Institute was officially launched to the campus community on November 14, 2008, the web site, eci.illinois.edu, was unveiled. It includes a comprehensive listing of courses and programs related to climate change that are currently available at the University. In addition, the Web site is undergoing dynamic upgrades in an effort to serve as an effective clearing house for research proposals, publications, and other resources on climate change.

ECI Directed Research \$69,000

The Role of Local Public Policy in Building Green

Principal Investigator: Julie Cidell, PhD
Department of Geography

This project analyzes the role of public policy at the local level in the diffusion of 'green' buildings across the U.S. This research will help answer where, how, and why local green building policies have been implemented and what difference they are making to the built environment. The project combines multiple types of data collection, including

e-mail surveys, virtual focus groups, and interviews with local governments; printed and virtual documents; and GIS analysis. This study asks, first, what is the landscape of green building regulation across the U.S.? Second, what are the motivations and reasons for enacting these policies? Finally, what difference are these policies making to the built environment?

Dr. Julie Cidell (pictured above, center) was recommended for funding by the National Science Foundation's Geography and Spatial Sciences program for a larger project to which the ECI played a supporting role. The proposal reviewers indicated that demonstration of support from the University of Illinois at Urbana-Champaign was one of their reasons to recommend funding.

Assessment of Total Soil Carbon Using Advanced Technologies

Investigators: Willie K. Dong, PhD, Visitor, Beckman Institute, Nick G. Glumac, PhD, Department of Mechanical Science and Engineering

Due to a lack of one reliable, consistent method for soil organic carbon (SOC) measurement, large-scale assessment of SOC requires validation from additional data. This study proposes to

develop new methods and instrumentation, using advanced technology for large-scale SOC analysis, which the researchers believe will play a critical role in providing the data necessary to validate current and future SOC models. SOC analysis is necessary to evaluate the efficacy of land use and management practices that sequester soil carbon and to verify the total SOC available as a tradable commodity in carbon exchange markets.

Predicting Human Behavior in Mitigating and Adapting to Climate Change: A Basis for Policy Design

Investigators: Steven Seitz, Political Science and Computer Science, Don Wuebbles, Atmospheric Sciences, Praveen Kumar, Civil and Environmental Engineering

The study showcases the use of both computational and behavioral models in social science approaches to global warming policy. These models are used to examine global warming as a collective action policy problem.



The Tambora Project

The Role of Phosphorus in the TDML–Total Maximum Daily Loads–Process Initiated for the Tualatin River

Investigator: Jennifer Nelson, Department of Natural Resources and Environmental Sciences

This research examines the role of phosphorus in the TMDL–Total Maximum Daily Loads–process initiated for the Tualatin River (Oregon) over the last twenty years. In response to algae problems within the river basin, a TMDL was written in respect of its designated uses–consumption, recreation, fishing, swimming, and aesthetics. However, the writers of the TMDL did not account for ongoing land uses in the area or future demands on the river. Although the enforcement of the TMDL in the area has expanded since, this study aims to determine whether the TMDL is on course for failure and what role its original designation has played in phosphorus reduction.

The Tambora Project: An Historical Case Study in Abrupt Climate Change

Investigator: Gillen Wood, Department of English

Approaching the two hundredth anniversary of the massive 1815 eruption

of Mt. Tambora, the Tambora Project reconstructs on a global scale the most destructive multi-year episode of worldwide climate change in modern history, 1815–1817. Components of the project include a highly sophisticated computer simulation of the eruption, an economic assessment of the damages incurred by the disaster on a current scale, an online digital visualization and interactive website, a video documentary, and a book.

Change in the Heartland - Climate, Environment, Energy, and Food

Lead: Michelle Wander, Department of Natural Resources and Environmental Sciences

Project Assistant: John Marlin, Jr.

This publication explores key terms and concepts utilized in describing environmental change. ECI and partner organizations will develop a primer by pairing key terms, such as ‘Carbon Credits’ or ‘Sequestration,’ with a representative collection of stories written by UIUC faculty and experts.

The Integrated Sustainable Homestead

Leads: Wesley Jarrell and Matt Luedtke

The Integrated Sustainable Homestead (ISH) is being developed on University

of Illinois South Farms to demonstrate how we can create well-balanced, integrated local organic food, energy, and water systems in Illinois. The ISH informs students where their food comes from, how energy can be conserved and produced at the home scale, and how water can be used efficiently and sustainably, by providing educational resources that offer hands-on experience in food, energy, and water management. It will provide a test bed for small-scale green projects that can be incorporated into small home or farmstead systems.

ECI Communications

Environmental Almanac

This weekly production by Rob Kanter, senior writer with ECI, promotes understanding of the natural world and highlights research on environmental change by faculty and affiliates of the University of Illinois. It reaches audiences via broadcast on WILL-AM 580, Urbana, publication in the Sunday edition of the “Champaign News-Gazette,” and distribution through a website, e-mail subscription, and podcast.

<http://environmentalalmanac.blogspot.com/>

Programs, 2008-2009, continued

Competitive Grants

During the first year, ECI awarded \$126,000 in seed grants for research that met the interdisciplinary criteria as defined within the Request for Proposals, and awarded \$24,000 for the development of new courses related to at least one of the four domains within ECI. The following courses were funded:

Course Development \$23,434

Development of a Renewable Energy Law

Course Instructor: Dr. Jay Kesan, Departments of Agriculture and Consumer Economics, and Business Administration

Global Warming, Biofuels and Food and Plants and Global Change

Course Instructor: Dr. Andrew Leakey, Institute for Genomic Biology

Climate and Social Vulnerability: Concepts and Policy Approaches

Course Instructor: Dr. Jesse Ribot, Beckman Institute and Department of Geography

Environmental Sustainability - A Global Perspective

Course Instructor: Dr. William Sullivan, Department of Landscape Architecture

Design and Evaluation of Green Roof Systems at the University of Illinois

Course Instructor: Dr. Kovacic, Department of Landscape Architecture

Illini Carbon Registry

Faculty leads: Anton Endress and Wesley Jarrell, Department of Natural Resources and Environmental Sciences

IlliniCarbon, a UIUC student-run carbon registry, was born out of a new university class, NRES 199. The program promotes a culture of sustainability on campus and in the community by encouraging local investment in carbon-offsetting projects to reduce the university's carbon footprint. This year's projects include a sensor-based lighting system for public classrooms, a miniature, energy efficient computer (Thin Client PC), and a student-run farm to produce food for dining halls.



Students in Illini Carbon Registry (NRES 199) meet to lower the campus carbon footprint.

Research Projects \$126,570

ECI Student Ambassadors for Global Change Research

Principal Investigator: Dr. Lisa Ainsworth, Department of Crop Sciences and Institute for Genomic Biology

Farm-Level Carbon Footprint Assessment of Agricultural Production Practices

Principal Investigator: Dr. Bryan Endres, Department of Agriculture and Consumer Economics, Affiliate professor of Institute for Genomic Biology

Role of Microbial Community Dynamics in Sequestration of Carbon in Soil Columns

Principal Investigators: Dr. Luis Rodriguez, Agriculture and Biological Engineering, and Dr. Angela Kent, Department of Natural Resources and Environmental Sciences

Impacts of Climate Change on Coastal Marine Ecosystems

Principal Investigator: Dr. Cory Suski, Department of Natural Resources and Environmental Sciences

Climate Change Impacts on Midwest Agriculture and Water Resources

Principal Investigator: Dr. Don Wuebbles, Department of Atmospheric Sciences

Sponsored Events \$55,000

Campus Launch

November 14, 2008

Planet U, The Human Story of Climate Change

April 9, 2009

Energy and Resource Sustainability in the Twenty-First Century

April 16, 2009

Amory Lovins, chairman and chief scientist of the Rocky Mountain Institute, invited speaker, Illinois Sustainability Technology Center, UIUC

Cap and Trade Summit

May 28, 2009, Chicago

The Institute's first annual summit assembled a coterie of experts from business, policy, and science to share perspectives across ECI's three founding disciplines. Educator and foremost polar explorer Will Steger presented compelling visual evidence of global climate change. The details were reinforced



Students attending The Cap and Trade Summit

through data presented by preeminent climate scientist Don Wuebbles. Ron Burke elucidated the link between science and policy recommendations.

Michael Gerard outlined the challenges to designing a cap and trade system, and Gilbert Metcalf explained in economic terms how different program designs might play out in the market.

Representing the Alvin H. Baum Family Fund, Joel Friedman provided a personal story and impassioned plea to make change happen now. Ann McCabe described the benefits for companies to measure and manage their carbon footprint with tools of The Climate Registry. Michael Walsh described how the Chicago Climate Exchange works worldwide to provide a functional and pragmatic trading platform for carbon financial instruments and futures and options.

Lois New described the first and only governmentally regulated carbon market in the USA, the Regional Greenhouse Gas Initiative. She presented the rationale and history of the Initiative, which has already gone through three auction periods without any known market manipulations.

Steve Frenkel reviewed the programs underway in Illinois to mitigate environ-

mental damage and increase the use of renewable energy and energy efficiency technologies. He asserted that through collaboration with other Midwestern states, Illinois is already a leader in climate change mitigation strategies.

Chicago Commissioner of Environment Suzanne Malec-McKenna delivered the day's closing keynote by presenting the Chicago Climate Action Plan. She detailed the considerable local efforts to be a model 'global' city in the fight against climate change, as well as some of the economic benefits predicted to ensue from implementing the Climate Action Plan.

Attendees were encouraged to follow ECI and work with Summit contacts to create effective climate policy, based on sound science, and implemented in an economically effective manner.

Climate Policy Forum

November 3, 2009

Dr. Charles Kolstad, an internationally known economist and one of the authors of the report for the Intergovernmental Panel on Climate Change that shared the 2007 Nobel Peace Prize and Nathaniel Keohane, director of economic policy and analysis at the Environmental Defense Fund.



Chicago Commissioner of Environment
Suzanne Malec-McKenna

Chicago Climate Action Plan, available at
www.chicagoclimateaction.org.



Soils and Carbon Communities of Scholars

November 11, 2009

and

Workshop on Coment-VR-Carbon Management Evaluation Tool Voluntary Reporting

November 12, 2009

Steve Del Grosso, USDA-ARS

Water as a Resources: Impact on Real Estate Ownership, Development, and Land Use Policy

November 20, 2009

Co-sponsored conference at John Marshall Law School, Chicago



Left to right above:
 Wes Jarrell, Rob Kanter, Jen Nelson,
 John Marlin, Lori Spencer, Matt Luedtke,
 Willie Dong, Bill Kruidenier,
 Eric Jackson, Crystal Bartanen

Financial Summary, 2008-2009

Revenue

Alvin H. Baum Family Fund	300,000
University of Illinois at Urbana-Champaign	144,000
College of Agricultural, Consumer and Environmental Sciences	
College of Business	
College of Law	
Office of the Provost	

Total Revenue

\$444,000

Expenses

Staffing	68,000
Research grants	192,000
Education (courses, symposia)	110,000
Operations	72,000

Total Expenses

\$442,000

Programs and Initiatives 2009-2010

Speaker Series:

Illinois Research for the Humanities and Climate Change

November 10, 2009

Humanities and Climate Change

Julie Cruikshank

Professor Emeritus, Anthropology, University of British Columbia, Vancouver

February 10, 2010

Ethics and Climate Change

Andrew Light

Center for American Progress and George Mason University

February 22, 2010

Melting Glaciers and Emerging Histories in America's Far Northwest

Carolyn Merchant

Professor of Environmental History, University of California, Berkeley

March 9, 2010

Melting Ice: Climate Change and the Humanities

Robert Nixon

Rachel Carson Professor of English, University of Wisconsin, Madison

March 9, 2010

Slow Violence and the Drama Deficit of Climate Change

Jake Kosek

Associate Professor of Geography, University of California, Berkeley

Competitive Grants

The Student Sustainability Committee (SSC) has committed up to \$30,000 in academic year 2009-2010 for course development or enhancement that engages students on projects that use the campus as a living laboratory and especially those that have an impact on the sustainability of the campus. The grants will be supported by funds from the Sustainable Campus Environment Fee managed by the Student Sustainability Committee.

Illinois in Washington

Annual Conference and Volume on Energy Policy, 2010 Focus: Distributional Effects of Energy Policy

At this annual event, sponsored by University of Illinois, University of Chicago Energy Institute in conjunction with Argonne National Laboratory, and Resources for the Future (RFF), energy policy researchers present to an audience of policy advisors and policymakers at various agencies including the Departments of Energy, Transportation, and Interior. Participants from agencies include the Office of Management and Budget, Congressional Budget Office, Congressional Research Service, Economic Research Service, and General Accounting Office.

Affiliates, Scholars, and Fellows

Initiated and implemented in the Fall of 2009 this program enables any faculty desiring to be affiliated with the Environmental Change Institute to do so, by adding their research interests and contact information to the Institute's database. Scholars are faculty who have received ECI funding for course development/course enhancement or com-

petitive research. The Fellows program, designed to engage faculty to submit a substantive research proposal that relates to one of the four program domains, will fund the lesser of one month's summer salary or \$10,000.

Students for Environmental Concerns

The oldest and largest student environmental organization on campus, Students for Environmental Concerns educates and informs students and the community about environmental issues, and works towards positive environmental change on a national, statewide, and local level. With support from ECI, the group campaigns on important environmental issues, with several projects managed through student-run committees.

Walking the Walk

Ten faculty, staff and students comprise the ECI. Following are steps we take to lighten our own individual carbon footprints every day. Many of us bike or take the bus to work, others walk. Several team members make this a year-round practice. A few of us drive hybrid cars. We are avid gardeners, composters, mulchers, and recyclers of plastic, paper, and cans. Many of us raise enough vegetables to feed our family or roommates, all growing season long. Wherever possible we buy at local farmers' markets. Everyone at ECI is sensitized to avoid excess heating, cooling and lighting. We keep our thermostats between 60° and 65° except in summer, and some members heat their homes with ultra-efficient woodburning stoves. We've switched light bulbs to compact fluorescents and think of water from the tap as if it were priceless. Individually, these are all small steps, but we think they're worth it.