Center for the Environment

Purdue University, Discovery Park
Gerald D. and Edna E. Mann Hall, Room 105
203 S. Martin Jischke Drive
West Lafayette, IN 47907

Email: environment@purdue.edu
Phone: 765.494.5146
Fax: 765.496.9322

Website link to download e-copy or view online:
http://www.purdue.edu/discoverypark/environment/2015AR
CONTENTS

2 Message from the Director

4 About Us
   What We Do

7 Research Activity
   New Grants
   Project Highlight
   Seed Grant Program
   Building Sustainable Communities Initiative

11 Meet Our Newest Faculty

12 For Our Students
   Conversation with an Environmental Leader
   Undergraduate Summer Research Internship Program

14 For Our Community
   Distinguished Lecture Series on the Future of Conservation
   Confronting Our Environmental Health Risks
   Contemplating Environmental and Social Challenges Through Art
   Workshop: Engaging Local Communities on Environmental Risk

17 Our Board and Staff
Message from the Director

2015 was a very active year for the Center for the Environment, with the more grant activity than ever, the completion of a major hiring initiative that should strengthen Purdue's environmental research community for years to come, and several new innovative learning and engagement activities. This report provides a short overview of these accomplishments by our community of faculty, students, and staff, as indicates exciting progress toward promoting activities identified as important in our 2014 strategic vision.

Center faculty had new research awards and publications in all three of our overlapping areas of strategic focus: Challenges to ecosystem functioning, environmental challenges to health and well-being, and environmental decision making and behavior. New work led by Professor Linda Lee, for example, is addressing the threats of emerging “chemicals of concern” in the form of perfluorinated compounds found on many military installations. These compounds threaten both human health and well-being as well as important amphibian species that provide many critical ecosystem functions.

Other exciting work funded this year includes the ongoing project studying threats to soil and groundwater health in the intensively managed landscapes of the Midwestern United States, led by Professors Timothy Filley and Indrajeet Chaubey. This work addresses how human decision making related to agriculture affects important ecosystem services provided by our soil and groundwater, as well as threatening human health and well being through water contamination and loss of soil fertility.

Professor Laura Bowling successfully obtained a new USGS grant studying decision making and environmental effects of the adoption of new urban stormwater best management practices, or BMPs. This new project is another interdisciplinary integration of human and ecological research focused on the critical problem of urban stormwater runoff.

Overall, center proposals for externally funded research totaled nearly $30 million in 2015, more than triple the submissions in 2014 and more than ten times the submissions in 2012. We are also excited about several new seed grant projects funded in 2015 that we expect to generate larger proposals on important challenges related to protecting estuaries and promoting sustainable development in countries such as Belize and Laos. We are grateful to several Purdue colleges and schools for their financial support for this seed grant program in 2015.

The center also completed its multi-year hiring initiative on the theme of building sustainable communities by cooperating with the departments of Anthropology, Civil Engineering, Political Science, and Psychology on three final hires. We are thrilled to welcome new professors Jennifer Johnson, David Yu, and Erin Hennes to the C4E family, and to the sustainable communities cluster which is now at full strength with seven new
faculty hired in the last 24 months. I am very optimistic about the contributions already being made by this group to the center’s goals, and the potential for greater contributions in the future as they continue to connect with each other and existing faculty at Purdue interested in a range of environmental challenges. One important early area of impact has been on how to better promote resilience in the face of environmental change, with new cluster members joining existing faculty on a number of exciting research initiatives in this area.

The center is also strongly committed to student learning and community engagement as part of our mission, and 2015 saw new programs in these areas as well. Based on student demand, we created and implemented a new “conversation with an environmental leader” program in 2015, inviting leading environmental professionals to Purdue for a meal with 12-15 undergraduates interested in environmental careers. The program has generated positive feedback from students and the invited guests as well, and we are excited to continue it in 2016. In addition, the center was able to expand our undergraduate research internship program in 2015, funding a wide range of environmental research projects on everything from nutrient recovery from urine to environmental justice conflicts in the American southwest to tracing sources of long range nitrogen deposition from air pollution. Students also continue to make a major impact at the center by serving as C4E interns working on the conversation with an environmental leader program and other special projects.

Finally, the center sponsored a major, state-wide workshop on collaborating with local communities on environmental risks in May 2015. Attended by more than 30 state and county officials across Indiana, as well as a number of academics and community representatives, the workshop tackled challenging issues of how to effectively communicate and collaborate with local residents facing environmental risks. Consistent with prior workshops, we also generated a short policy brief summarizing some of the key lessons from the workshop discussion for dissemination through our web site and mailing lists.

Other creative center engagement activities included panels associated with artistic events at Purdue Convocations, and working with Purdue’s Oncological Sciences Center on their Cancer, Culture, and Community colloquium featuring Dan Fagin talking about his Pulitzer Prize-winning book Tom’s River that investigates cancer clusters in a New Jersey town associated with illegal chemical waste disposal.

I hope you enjoy learning more about these and other exciting activities in this report, and that you will keep in touch with the center’s activities in the future through our web site and mailing list. I also appreciate your feedback on any of the center’s activities, or ideas for future efforts or partnerships. Connecting Purdue to other stakeholders is a vital reason for the center’s existence, so if you have any ideas about possible partnerships in that regard, please let us know!

Leigh Raymond
Professor of Political Science
Director, Discovery Park Center for the Environment
lraymond@purdue.edu
Purdue University is a vast laboratory for discovery. The university is known not only for science, technology, engineering, math and agriculture programs, but also for our imagination, ingenuity, and innovation. It’s a place where those who seek an education come to make their ideas real — especially when those transformative discoveries lead to scientific, technological, social, or humanitarian impact.

The Center for the Environment (C4E) serves to better connect faculty and students across departments and disciplines, strengthen support for innovative projects, and increase the impact of Purdue’s work on important environmental issues. Located in Discovery Park’s Mann Hall, we work closely with campus faculty to integrate interdisciplinary environmental education and training with research.
The Discovery Park Center for the Environment (C4E) is working on three interconnected aspects of today’s environmental challenges: community health and well-being, environmental decision-making and behavior, and ecosystem functioning. With our partners, we catalyze, support and promote interdisciplinary research, innovative educational opportunities, and science-based solutions and recommendations at local, regional, and global scales.

By emphasizing the deep connections between human society, our built environment, and the ecosystems that support us, the center seeks more promising solutions to environmental challenges than those that focus exclusively on technical or scientific fixes, or on social, political, or economic considerations in isolation.

**Community health and well-being**
Work in this focus area seeks to understand the causes of and identify potential solutions for threats to community health and well-being in general, paying particular attention to the uneven distribution of these threats based on race, class, gender, or ethnicity, among other factors.

**Environmental decision-making and behavior**
Work in this focus area considers the role of diverse factors such as economic incentives, political institutions, cultural and social influences, and values and ethics in shaping both individual and collective decision making processes.

**Ecosystem functioning**
Work in this focus area seeks to understand the natural and anthropogenic drivers of ecological change and how these can be reduced or managed to best maintain vital ecosystem functions.
WHAT WE DO

The mission of the C4E is to catalyze, support, and promote proactive interdisciplinary work addressing important environmental challenges. Center staff are experienced in obtaining interdisciplinary environmental research funding and launching programs and initiatives. Assistance is available at all stages of the project process from conceptualization to implementation. Support is tailored to the individual needs of project leaders and teams; examples of support available are outlined below.

**Project conceptualization**
- Identifying and monitoring potential funding sources for projects
- Brainstorming new project ideas or topics at early stages
- Organizing campus workshops or seminars to stimulate interest in new areas
- Establishing and promoting new environmental courses, reading groups, or seminars related to the proposed research
- Providing seed funding for new efforts in emerging areas of research

**Project development**
- Identifying and recruiting research collaborators at Purdue or other universities
- Drafting or editing and commenting on a draft concept paper or project summary
- Creating effective broader impacts components for projects
- Identifying and recruiting advisory boards
- Working with Discovery Park sponsored programs staff for budget preparation

**Project implementation and promotion**
- Business office support including use of Discovery Park business office to administer grant funds
- Basic administrative support and research team meeting coordination
- Organizing campus or external workshops to promote research findings
- Writing and producing short briefs of project results for non-academic audiences
- Promotion of project internally and externally through center’s web page, social media, mailing list and other public communication
- Continued monitoring of funding landscape for additional funding opportunities in the project area
In fiscal year 2015, the center supported the submission of nearly $30 million in grant proposals to funders including federal agencies, industry, and foundations. Five new grants awarded in FY2015 spanned topics ranging from monitoring and evaluating toxins in our environment, to understanding critical zone processes in intensively managed landscapes, to making better decisions for natural resource management.

**NEW GRANTS**

**Quantification of In-Situ Chemical Reductive Defluorination of Perfluoroalkyl Compounds in Foundwater Impacted by Aqueous Film Forming Foams**
Linda Lee (PI); Funded by the US Department of Defense

**Can There Ever Be Enough? Analysis of the Adoption, Penetration, and Effectiveness of Urban Stormwater Best Management Practices**
Laura Bowling (PI); Funded by the US Geological Survey

**Critical Zone Observatory for Intensively Managed Landscapes (IML-CZO)**
Timothy Filley (PI); Funded by the National Science Foundation

**Recreational Valuation and Management Implications for the Southern Lake Michigan Fishery**
Mitchell Zischke (PI); Funded by the IL-IN Sea Grant

**Dry Deposition Monitoring at Vincennes, Indiana,**
Richard Grant (PI); Funded by MACTECH Engineering and Consulting, Inc.
Can there ever be enough? Analysis of the adoption, penetration and effectiveness of urban stormwater management practices

PI: Laura Bowling, Department of Agronomy; Co-PIs: Linda Prokopy (Department of Forestry and Natural Resources (FNR), and Sara Peel (Wabash River Enhancement Corporation); Graduate Students: Fushcia Hoover, Sanoar Rahman, and Yuling Gau (all, Department of Agricultural and Biological Engineering)

Funded by the U.S. Geological Survey 104(g) Program

Stormwater conservation practices, such as rain gardens, rain barrels, and permeable pavement, can effectively decrease stormwater run-off and improve water quality. While these urban conservation practices have great potential, unfortunately, their use is generally lower than the use of similar agricultural practices to reduce run-off and improve water quality.

Poor uptake of these urban practices is attributed to several reasons, including more numerous landowners with less property, a limited number of cost incentive programs, and fewer formal public education programs than found in the agricultural community. However, there have been few efforts to study urban stormwater conservation. As a result, there is little information regarding the adoption of stormwater best management practices (BMPs) by urban and suburban landowners, the benefits of targeting specific communities for adoption of BMPs, or the net stormwater benefit from such targeted adoption programs.

In this project, Professors Laura Bowling and Linda Prokopy, their graduate students, and collaborator Sara Peel are evaluating the watershed-scale effectiveness of BMP implementation in the Greater Lafayette area in partnership with the Wabash River Enhancement Corporation (WREC) community organization and the U.S. Geological Survey (USGS) for watershed management planning and monitoring.

The long-term goal of this project is to improve water quality and document water quality improvements in urban streams through the use of urban stormwater BMPs. In the first year of the project, Bowling and her team are focused on measuring how large a change in water quality is needed before it can be verified statistically; determining how many BMPs are needed to achieve that level of water quality improvement; and evaluating if it is possible to get that many BMPs adopted by local residents.

Map of the project site in Lafayette, Indiana, marking the location of specific conservation practices.
Assessment of current water quality indices in relation to ecological functioning in the coastal zone
Margaret Gitau, Agricultural and Biological Engineering (PI) with Venkatesh Merwade, Civil Engineering; Zhao Ma, Forestry and Natural Resources; and Bryan Pijanowski, Forestry and Natural Resources.

Population growth in coastal cities is stressing coastal water resources. These coastal regions, including estuaries, provide multiple benefits to communities including tourism, fisheries, and recreational activities. The areas along the coast where freshwater from rivers and streams meets and mixes with salt water from the ocean (estuaries), also deliver valuable ecosystem services including water filtration and habitat preservation. Ecologists have recognized that when ecosystems become stressed they can demonstrate warning signs where high variability occurs in the system prior to a “tipping point,” or shift to a new equilibrium state that may lack many of the desired ecosystem services. This project will assess the value of commonly used water quality indices for capturing the risk of such tipping points, by comparing them to long term ecological records of stressed coastal zones as well as through interviews with water quality managers regarding their experiences using different indices for management.

Designing just institutions for effective forest conservation governance
Kimberly R. Marion Suiseeya, Political Science (PI) and Jonathan Bauchet, Consumer Science

In recent years, scholars of global environmental governance have directed attention to questions of equity, justice, and rights in international efforts to simultaneously conserve forests and alleviate poverty. These questions have emerged, in part, as a response to a growing body of literature showing the negative social impacts that externally imposed institutions to protect forest resources have on local communities. The proposed research seeks to answer the question: How can we ensure that global efforts to protect forest resources and communities are both effective and just? The team will conduct exploratory research to understand how experimental methods can be used to examine the relationships between different provisions for social justice and targeted forest conservation intervention outcomes. The results of the project will be used to develop a proposal that can help identify better solutions for facilitating justice at the community level in conservation efforts.

Using cash transfers to promote ecosystem services and sustainable livelihoods: What is the role of conditionality?
Zhao Ma, Forestry and Natural Resources (PI) with Jonathan Bauchet, Consumer Science; Laura Zanotti, Anthropology; Ben Gramig, Agricultural Economics; Ricardo Godoy, Brandeis University; Claudia Radel, Utah State University

Payment for Ecosystem Services (PES) has become a popular conservation approach with potential social and economic co-benefits for resource-dependent communities. Most researchers and practitioners believe that conditionality is vital to PES programs—payments to local communities should be conditional on measurable ecological benefits or verifiable management actions. Enforcing these conditionality requirements is both difficult and costly. In the international development field, however, unconditional payments have been shown to be effective at producing social benefits such as schooling for children and improved youth health. This project will extend this research by investigating the circumstances under which conditionality is necessary for PES programs to succeed, using field experiments in rural communities in Bolivia.
BUILDING SUSTAINABLE COMMUNITIES INITIATIVE

Design for Resilience

The complex interdependencies of social institutions, diverse natural ecosystems, and modern technology have produced a vast network of nested, hierarchical, self-organizing and adaptive systems that are pillars of modern civilization. These interdependent systems upon which we rely for food, water, energy and other needs are poorly understood. Moreover, the world is changing on multiple scales and at unprecedented rates: anthropogenic climate change, growing populations, and globalized economies as well as more short term changes such as natural disasters, terrorist attacks, or other sudden “shocks,” pose an increasing threat to these interdependent systems and the communities that rely on them.

The Building Sustainable Communities initiative includes a focus on understanding the complex interactions among social, biophysical, and built systems to help design more resilient systems—systems that can maintain a desired level of functioning in the face of a wide range of emerging risks as well as sudden crises. A unique feature of our capabilities in resilience is the strong interdisciplinary partnerships between faculty and students from Engineering, Liberal Arts, Agriculture, and Science.

Our community of researchers and stakeholders are working on the following projects related to promoting resilience in the face of environmental change:

- Research on improved models for understanding how infrastructure design affects social decision making for resilience in water and energy systems

- Improving models of social decision making and its interaction with infrastructure design in the face of natural disaster threats such as hurricanes, in order to improve community resilience in the face of such threats.

- Understanding social and other factors that improve community recovery in the face of natural disasters through a case study of towns hit by a deadly tornado outbreak in Indiana over March 2-3, 2012.

- Generating multi-criteria decision tools to guide investment in reconstruction of the Louisiana gulf coast in the wake of Hurricanes Katrina and Rita.

Damage from the March 2-3, 2012 tornado outbreak in Henryville, Indiana.
MEET OUR NEWEST FACULTY

With a strong emphasis on interdisciplinary and mixed-methods approaches, positions within the Building Sustainable Communities cluster hiring range from engineering and forestry to anthropology and psychology, with several of the new hires holding joint appointments across multiple departments. Three of our newest faculty hires are featured here.

**Erin Hennes** is Assistant Professor of Social Psychology. Her work focuses on cognitive and motivational biases in information processing, particularly in the context of contemporary social issues such as environmental sustainability and racial and gender inequality. Specifically, she examines the consequences of the motivation to resist changes to existing sociostructural arrangements on basic psychological processes such as perceptual judgment, recall, and evaluation of scientific and media information. She takes a multi-method, interdisciplinary approach that integrates data from laboratory experiments, public opinion surveys, focus group interviews, and longitudinal field research to investigate how information and misinformation is encoded, elaborated, and disseminated. Dr. Hennes holds a B.A. in Music, Psychology, and Liberal Arts and Management from Indiana University. She completed her PhD in Social Psychology with a minor in Quantitative Methods at New York University, where she was funded by the National Science Foundation. Following graduation, she was a Postdoctoral Fellow in the Department of Psychology at the University of California, Los Angeles and a Fellow at the John F. Kennedy School of Government at Harvard University.

**Jennifer Lee Johnson** is Assistant Professor of Anthropology. Her research is historically rooted, ethnographically engaged, and focused on how stories about the past inform contemporary sustainability debates, policy-making, and regulatory enforcement efforts. Building on case-based pilot research conducted in 2011 and 2012 in U.S. fisheries, Dr. Johnson plans to develop an interdisciplinary research program at Purdue across the continents of Africa and North America to analyze historical roots and future possibilities for sustainable economies across national borders in lacustrine environments. Prior to joining Purdue University’s Department of Anthropology, Dr. Johnson earned her M.S. in Environmental Policy and Planning and Ph.D. in Resource Policy and Behavior from the University of Michigan and a BA in International Political Economy from the Colorado College. She has also worked professionally on fisheries sustainability issues for the Marine Fish Conservation Network, the National Oceanic and Atmospheric Administration’s Great Lakes Environmental Research Laboratory, and the Blue Ocean Institute.

**David Yu** is Assistant Professor of Civil Engineering and Political Science. His research centers on the resilience of highly-engineered social-ecological systems (SES) to unexpected, emergent shocks, and how biophysical and social contextual variables and institutional arrangements interact to shape the dynamics of SES. He examines these interactions to understand the conditions for building sustainable communities from local to global scales in the face of global change. His research methods include mathematical and computational modeling, case study analysis, and behavioral experiments. His recent and ongoing research projects include exploring the effects of infrastructure design on commons dilemmas and the dynamics of irrigated agriculture SES, investigating the design of learning process that leads to successful resilience-based management of irrigation SES, and tracing how social connectedness influences transformative capacity of community forestry SES under global change. Dr. Yu received his B.ASc. in Engineering Science at the Simon Fraser University and his M.P.P at the Lee Kuan Yew School of Public Policy, National University of Singapore. He obtained his Ph.D. in Sustainability at the School of Sustainability, Arizona State University.
FOR OUR STUDENTS

CONVERSATION WITH AN ENVIRONMENTAL LEADER PROGRAM

The Conversation with an Environmental Leader series provides opportunities for undergraduate students to meet and engage in meaningful dialog with a diverse range of civic, corporate, and non-profit environmental leaders. The series was instituted in the spring of 2015 with the goal of encouraging students to explore how a wide range of professions focus on solving important environmental challenges locally, nationally, and internationally, in the public and private sectors. Invited leaders share their personal career journeys and perspectives on environmental leadership and reflect on the kinds of skills and interests careers in environmental-related fields require.

Each event is structured as an informal conversation between an environmental leader and a small group of students, including dinner. The focus is on an interactive discussion about the invited leader’s professional experiences and insights.

SPRING 2015
Jesse Kharbanda, Executive Director, Hoosier Environmental Council
Melody Park, Director of Sustainability and Chief Engineer for the City of Indianapolis
Perre Burns, President and Principal Engineer for Burns Environmental Engineering, Inc.

FALL 2015
Kevin Leahy, Managing Director, Energy and Environmental Policy at Duke Energy
Sara Peel, Director of Watershed Projects, Wabash River Enhancement Corporation
Jessica Huxhold Fliss, Senior Environmental Manager at the Indiana Department of Environmental Management

The conversations program emerged from student questions about future environmental careers.
UNDERGRADUATE SUMMER RESEARCH INTERNSHIPS

The C4E Summer Undergraduate Student Research Internship offers students an opportunity to work with a Purdue faculty mentor on an environmental research project. For eight weeks during the summer, C4E interns immerse themselves in a research experience that is not possible during the academic year.

In these two months students gain technical and conceptual expertise and present their results at the C4E fall research poster session to faculty and students of all disciplines.

This year, the center awarded internships to six talented students. The research projects spanned across science, engineering, and the social sciences, involving students from six different departments across four colleges.

2015 C4E Research Interns

Michael Burnett
Environmental and Ecological Engineering; Prof. Marion-Suiseeya, mentor
Navajo environmental justice case study

Kaitlin Harris
Anthropology and Environmental and Ecological Engineering; Prof. Blatchley, mentor
Resource recovery and reuse from human urine

Kexin Nie
Actuarial Science; Prof. Viens, mentor
Determining the relative importance of various factors influencing environmental change in the Lake Chad Basin, using statistical analysis

Damian Simonini
Chemistry; Prof. Michalski, mentor
The nitrogen stable isotope analysis of atmospheric NO, NO2, NO3-

Dominique Turney
Forestry and Natural Resources; Prof. Sepulveda, mentor
Oil Pollution and Its Effects on Early Life Stages of Marine Fish

Jacob Winters
Environmental Geosciences; Prof. Filley, mentor
Stable carbon isotope proxies for source and dynamics of carbon in streams from intensively managed landscapes

C4E summer intern Kaitlin Harris describes the initial construction and startup experiments of the aerated, fluidized bed reactors used in her resource recovery project.
In Spring 2015, The Center for the Environment partnered with the Department of Forestry and Natural Resources to host Dr. Michael Soulé and Dr. Peter Kareiva for a two-part series on the future of conservation in a rapidly changing global environment. Leading conservation scientists who are thinking about environmental values and the role of people in conserving wildlife, each speaker offered very different perspectives on the issues.

Soulé, Professor Emeritus of Environmental Studies, University of California, Santa Cruz, kicked off the series on February 26, 2015 with a lecture entitled, “Can we protect inconvenient predators like sharks and wolves?” On March 11, 2015, Kareiva, Chief Scientist and Vice President of The Nature Conservancy, presented, “Why We Need and How We Can Have Vibrant Nature in a World of 10 Billion People.” The public lectures were followed by a lively Q&A and a reception with the speakers.

In partnership with the Oncological Sciences Center, the C4E co-sponsored the 2014 Cancer, Culture, and Community Colloquium. This annual series of events explores the human response to cancer as expressed through the arts and literature. In November 2014, Pulitzer Prize-winning author Dan Fagin, a nationally prominent journalist on environmental health topics, headlined the colloquium with a public lecture. Fagin, a science journalism professor at New York University, is the author of *Toms River: A Story of Science and Salvation*, a book awarded the 2014 Pulitzer Prize that combines investigative reporting and historical research to probe a New Jersey seashore town’s cluster of childhood cancers linked to water and air pollution.

In conjunction with the Colloquium, a series of TEDx talks focused on the theme, Confronting Our Environmental Health Risks, featured the work of several C4E faculty. Speakers and their topics included Jennifer Freeman, Associate Professor of Toxicology: “A new paradigm in environmental health”; Jason Cannon, Assistant Professor of Health Sciences and Toxicology: “Dietary factors in the development of Parkinson’s Disease”; Daniel Aldrich, Associate Professor of Political Science: “What can renewables learn from nuclear power”; and Leigh Raymond, Professor of Political Science: “The regulator’s dilemma”.

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FOR OUR COMMUNITY

DISTINGUISHED LECTURE SERIES ON THE FUTURE OF CONSERVATION

CONFRONTING OUR ENVIRONMENTAL HEALTH RISKS
CONTEMPLATING ENVIRONMENTAL AND SOCIAL CHALLENGES THROUGH ART

A LOOK AT SUSTAINABILITY CHALLENGES PAST, PRESENT, AND FUTURE

In January 1972 the newly created Environmental Protection Agency launched a photo documentary project, Documerica, to record the state of the environment across America. The project was modeled after the Department of Agriculture’s effort in the 1930s to document rural America during the Dust Bowl and the Great Depression. Called “The Photography Project,” this earlier effort was led by Roy Stryker through the Farm Security Administration (FSA). From 1935 to 1944 photographers and writers were hired to “relate people to the land and visa-versa.” Stryker’s vision for the project was to “introduce America to America,” in particular, to “show the city people what it’s like to live on the farm.” These FSA photographs became the face of the Great Depression for many in America and were instrumental in galvanizing public support for conservation and assistance programs for rural America.

The EPA had similar hope for Project Documerica—that the images would further energize the fledgling environmental movement, “documenting change so future generations will understand our successes and our failures,” while also recording, “what we do as individuals and as institutions.” The photos documented both overtly environmental problems of water, air, and noise pollution, as well as issues related to crumbling cities, suburban sprawl, poverty, energy crises, youth culture, and other challenges of modern life across America.

In partnership with the university’s performing arts organization, Purdue Convocations, faculty from Purdue’s Global Sustainability Institute (GSI) participated in a program in which each selected two photographs from the Documerica archive and used them to consider how environmental, economic, and social challenges have changed from when these photos were taken to the present.

The Center for the Environment captured those comparisons in a report that also highlights some ideas about how Purdue faculty are working to sustainably manage our global environment for a healthy future in the next 40 years. It is important to celebrate the many environmental improvements over the last forty years. Many of the problems captured by Documerica project have improved, and new technologies and policies along with changing behaviors are responsible. At the same time, the world faces continued sustainability challenges looking forward. Purdue researchers are striving to help make the improvements over the next few decades even more impressive and integrated than those we have witnessed from 1970 to the present.

The imagery of EPA’s Project Documerica is the inspiration for ETHEL’s Documerica—a string quartet’s modern, multimedia interpretation of the 1970s photo archive—performed on January 24, 2015 in Purdue’s Loeb Playhouse.

Faculty from Purdue’s Global Sustainability Institute participated in a pre-show discussion on how environmental, economic, and social challenges have changed from when these photos were taken to the present; and, post-show, they joined ETHEL onstage for a Q&A session with the audience.
Communities in all regions of the world face environmental risks that threaten ecosystems, economies, and public health. Many of today’s environmental risks are complex, affected by interacting factors, and span multiple scales in space and time. These challenges include understanding exposure concentrations of persistent and emerging contaminants, the pathways through which people are being exposed, and how various chemicals and environmental stressors interact to create new health risks.

A fundamental challenge in dealing with environmental risks is building effective working relationships between environmental professionals and local communities. The growing complexity and severity of environmental risks increases the challenge not only of understanding these risks in traditional terms of hazard, toxicity, and exposure, but also in terms of effectively communicating and working with at-risk communities. Many would argue that the second challenge of working with local communities to manage risk is as or more difficult than the first.

On May 28, 2015, the C4E brought together stakeholders from academia, government, environmental groups, and public health and environment agencies in a day-long workshop on the many issues related to this “second challenge” of engaging local communities on environmental risks. Workshop speakers are featured to the right. Three core recommendations for improved risk communication and community engagement emerged from the workshop: (1) an inclusive approach to engaging a broad range of stakeholder communities, (2) recognition of the complexity and uncertainty of these issues and the diversity of local communities, and (3) a risk communication strategy that is transparent, constructive, and solutions-oriented without being unrealistic. These recommendations are described in a C4E Issue Brief, available on the center’s website.

Robin Dodson, ScD, is a research scientist at Silent Spring Institute, a nonprofit scientific research organization that focuses on the environment and health. Her research centers on developing novel residential exposure measurement methods for epidemiological studies and analyzing household chemical exposure data.

Kim Ferraro is the Hoosier Environmental Council’s Senior Staff Attorney. Kim comes to HEC from the Legal Environmental Aid Foundation (LEAF), the state’s only not-for-profit legal aid services organization focused on the environment.

Indra Frank, MD and MPH, serves as the Environmental Health project director for the Hoosier Environmental Council, Indiana’s largest environmental education and advocacy organization.

Anna Goodman Hoover, PhD, is a research assistant professor in the Department of Preventive Medicine and Environmental Health at the University of Kentucky. She studies participatory communication processes to support evidence-based decisions for public health, preparedness, and public planning.

William Kinsella, PhD, is Professor of Communication at North Carolina State University. His research and teaching address the overlapping areas of organizational communication, environmental and energy communication, rhetoric of science and technology, and rhetoric of public policy.

Kelly G. Pennell, PhD and PE, is an assistant professor in the Department of Civil Engineering at the University of Kentucky. Her research interests include the fate and transport of environmental contaminants, water treatment processes, and environmental systems modeling.

Laura Senier, PhD, is an assistant professor in Sociology and Anthropology and Health Sciences at Northeastern University. Her research interests include the sociology of medicine and public health, community environmental health, and environmental justice.

Wayne and Barbara Stutsman are representatives of the Baugo North Neighborhood Group which officially organized as a result of the community’s environmental, health, and legal issues involving VIM Recycling, Inc., Elkhart, IN.
OUR BOARD & STAFF

FACULTY ADVISORY COMMITTEE

The following individuals serve as members of the C4E Faculty Advisory Committee, helping to shape the strategic goals and initiatives of the center.

- **Chip Blatchley**
  Professor, Civil Engineering and Environmental and Ecological Engineering

- **Tim Cason**
  Professor, Economics

- **Indrajeet Chaubey**
  Professor, Agricultural & Biological Engineering and Earth, Atmospheric & Planetary Sciences

- **Jonathon Day**
  Associate Professor, Hospitality and Tourism Management

- **Jeff Dukes**
  Professor, Forestry and Natural Resources and Biological Sciences

- **Tim Filley**
  Professor, Earth, Atmospheric & Planetary Sciences

- **Jennifer Freeman**
  Associate Professor, Health and Human Sciences

- **Ben Gramig**
  Associate Professor, Agricultural Economics

- **Carol Handwerker**
  Professor, Materials Engineering

- **Linda Lee**
  Professor, Agronomy

- **Bryan Pijanowski**
  Professor, Forestry and Natural Resources

- **Linda Prokopy**
  Professor, Forestry and Natural Resources

- **Paul Shepson**
  Professor, Chemistry and Earth Atmospheric and Planetary Sciences

- **Ron Turco**
  Professor, Agronomy

- **Laura Zanotti**
  Associate Professor, Anthropology

CENTER STAFF

- **Cindy Fate**
  Administrative Assistant

- **Rose Filley**
  Managing Director

- **Leigh Raymond**
  Professor, Political Science and Director

- **Kaitlin Harris**
  Undergraduate Intern

- **Kristen Hendricks**
  Undergraduate Intern