



SECURE & SUSTAINABLE
AGRICULTURE



Institute for Sustainability,
Energy, and Environment



ENERGY
TRANSITIONS

Actionable
Research ...



WATER & LAND
STEWARDSHIP

Annual
Report
2014-15



CLIMATE
SOLUTIONS

University of Illinois
at Urbana-Champaign



Office of the Vice
Chancellor for Research



SUSTAINABLE
INFRASTRUCTURE

INTRODUCTION: From Director Evan H. DeLucia

From a kernel of an idea during a campus visioning exercise, the Institute for Sustainability, Energy, and Environment (iSEE) is blossoming as an influential force on the Illinois campus. Our Institute is now more than 18 months old, and this 2014-15 Annual Report shows major progress:

- We are proud to have seeded our own thematic, cross-disciplinary research projects — seven in all. Three teams are marking their first year of collaboration; four others are just getting started. Our seven projects involve 16 departments in five colleges across campus, plus one institute overseas.
- iSEE also helped put major grant proposals together for its own researchers — while building teams and finding funds for other research into sustainability, energy, and environmental themes. Grant proposals went out for campus sustainability efforts and education and outreach activities as well.
- We have coalesced the water scholars on campus, bringing them together to work on major research proposals. They are now featured on a new Water at Illinois website. In addition, iSEE is work-



ing to do the same with energy scholars at Illinois.

- As a leader in campus sustainability, iSEE has helped shepherd a process for — and creation of — the soon-to-be-adopted 2015 Illinois Climate Action Plan, a road map to carbon neutrality.
 - We launched the Certified Green Office Program to get the campus community involved in energy and resource conservation, and we are in the planning stages for a bike share program and other initiatives that will help our campus remain a nationally recognized leader in sustainability.
 - Our SEE minor is moving through the approval process — and we have already initiated courses that relate to the new minor.
 - And we continue to engage the community with our annual international scholarly Congress, Sustainability Week, Earth Week, and a new Community Conversation on Energy Conservation.
- It's been a busy year — and it's just the beginning. We look forward to big things ahead.

Sincerely,
Evan H. DeLucia, iSEE Director

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iSEE UPDATES: Funding

In 2014-15, the Institute for Sustainability, Energy, and Environment (iSEE) secured funding from private donors, foundations, and other means to support its research, campus sustainability, education, and outreach missions:

- From Alvin H. Baum Family Fund, the founding benefactor of the Institute, \$1 million. The Baum Fund, under the administrative leadership of Joel Friedman, previously gave iSEE \$1 million



when it was established in December 2013. Baum also supported the Institute's predecessors, the Center for a Sustainable Environment and the Environmental Change Institute.

- From Illinois alumnus Stuart L. Levenick and wife Nancy J. Levenick of Peoria, a \$500,000 endowment to establish the Levenick iSEE Fellows Program Fund, which will support the Institute through resident scholars, research fellows, environmental fellows, and policy fellows. Mr. Levenick recently retired as Group President of Customer & Dealer Support at Caterpillar Inc. A former Illini football player and 1976 graduate with a Bachelor of Science degree in Forestry, Mr. Levenick spent 37 years at Caterpillar. The Levenicks already have created the Stuart L. and Nancy J. Levenick Endowment Fund, which finances a scholarship for a walk-on Illini football player. Mr.



LEVENICK

Levenick also has made generous gifts to the College of Agricultural, Consumer and Environmental Sciences.

- A \$500,000 match by Caterpillar Inc. to be used toward infrastructure in support of the Levenick iSEE Fellows and the Institute.

- To complete a sale of campus carbon credits, negotiated in 2014 by iSEE, Chevrolet has sent more than \$800,000 to the Illinois campus through the Bonneville Environmental Fund and will retire the carbon credits on behalf of the environment. The Chevrolet money and a 50% campus match will be used for further reductions of campus greenhouse gas emissions. (*For more, see page 24.*)

- From Warren Lavey, an Adjunct Professor of Law and an Adjunct Assistant Professor in Natural Resources and Environmental Sciences at Illinois, and Dr. Holly Rosencranz, an Assistant Professor of Clinical Medicine at the University of Illinois at Chicago College of Medicine, a scholarship grant of \$9,000 for three Illinois graduate students researching the impacts of climate change on public health. (*For more on the Lavey Rosencranz Scholars, see page 27.*)

- \$5,000 from the Champaign Urbana Public Health District to support an iSEE Graduate Intern's study of sustainable transportation options in the community. (*For more on Grace Kyung's work and the new Bike Share Pilot Program, see page 23.*)

iSEE UPDATES: Grant Applications & Awards

During 2014-15, the Institute submitted grant requests — or helped facilitate requests — totaling \$11,819,752 in support of its own research, existing Illinois campus research teams, new collaborative teams compiled by iSEE, campus sustainability initiatives, and education and outreach activities.

Two projects, totaling \$1,129,987, have been funded thus far with several more still pending. *(You can read more about the team iSEE helped build and get funded, totaling more than \$220,000 including graduate student researchers, on page 16.)*

Proposals were submitted to the following organizations in 2014-15:

- Five to the National Science Foundation (NSF).
- Four to the U.S. Department of Energy (DOE).
- Two to the U.S. Department of Agriculture (USDA).
- One to the U.S. Agency for International Development (USAID).
- One to the U.S. Army Construction Engineering Research Laboratory (CERL).
- One to the U.S. Environmental Protection Agency (EPA).

Specifically for its seed-funded research projects, iSEE has submitted or helped facilitate:

- A \$4 million request to the USDA-NIFA Food Security program for “Sustainable Food Production from Agroforestry Systems on Marginal Lands in the Midwest U.S.” with Primary Investigator Sarah Taylor Lovell, iSEE’s Woody Polyculture Project lead.



LOVELL

- A \$500,000 request to the USDA-NIFA Foundational Program (BNRE) for “Transforming the Midwest U.S. with Woody Polycultures for Food Production and Ecosystem Service Enhancement” with PI Wendy Yang, the iSEE Woody Polyculture Project co-PI. *(More on WPP, page 11.)*



YANG

- A \$3 million request to the NSF-NRT Research Traineeship program for “Revolutionizing Environmental Virology through Science, Technology, Engineering and Math (REViroSTEM)” with PI Benito Mariñas, iSEE’s Smart Water Disinfection Project lead. *(More on SWDP, page 12.)*



MARIÑAS

- A \$150,000 request to USAID’s Development Innovation Ventures program for “Solar Thermal Energy Storage: Testing Solutions for the Global Cooking Problem” with PI Bruce Elliott-Litchfield, the iSEE Stored Solar Stove Project PI. *(More on SSSP, page 13.)*



LITCHFIELD

Added to the \$11,048,520 applied for in 2013-14, iSEE has made or facilitated \$22,868,272 in external funding requests thus far.

iSEE UPDATES: Steering Committee

Director Evan DeLucia and the iSEE Steering Committee work to ensure that the Institute's research, campus sustainability, education, and outreach activities conform to the iSEE vision and mission — and are synergistic with other campus efforts.

The Committee features faculty members at the top of their respective fields, iSEE research Primary Investigators, and a student: the chair of the Student Sustainability Committee. Members come from across the Illinois campus, and their specialized areas of research are quite diverse — which fits with iSEE's vision of interdisciplinary collaboration.

2014-15 COMMITTEE MEMBERS

Name	Title	Academic Unit
German Bollero	Professor/Head	Department of Crop Sciences
Jeff Brawn	Professor/Head	Department of Natural Resources and Environmental Sciences
Carla Caceres	Professor/Director	Department of Animal Biology/School of Integrative Biology
Amab Chakraborty	Associate Professor	Department of Urban and Regional Planning
Robert Finley	Principal Geologist/Director	Illinois State Geological Survey
Don Fullerton	Professor	Department of Finance
Sharon Hammes-Schiffer	Professor	Department of Chemistry
Praveen Kumar	Professor	Department of Civil and Environmental Engineering
Bruce Elliott-Litchfield*	Professor/Assistant Dean	Department of Agricultural and Biological Engineering
Sarah Taylor Lovell*	Associate Professor	Department of Crop Sciences
Wen-Tso Liu	Professor	Department of Civil and Environmental Engineering
Stephen Long	Professor	Departments of Crop Sciences and Plant Biology
Benito Mariñas*	Professor and Head	Department of Civil and Environmental Engineering
Stephen Marshak	Professor/Director	Department of Geology/School of Earth, Society and Environment
Jesse Ribot	Professor	Department of Geography and Geographic Information Systems
Peter Sauer	Professor	Department of Electrical and Computer Engineering
Rizwan Uddin	Professor	Department of Nuclear, Plasma and Radiological Engineering
Don Wuebbles	Professor	Department of Atmospheric Sciences
Amy Liu	Undergraduate (Student Sustainability Committee Chair)	

* Primary Investigator on iSEE-funded project (see pages 11-15)

iSEE UPDATES: Our Staff



During the 2014-15, the Institute made significant additions to its staff by appointing former interns Nishant Makhijani (left) and Olivia Harris (right) to full-time posts. Makhijani, architect of the Certified Green Office Program (*see page 22*), was hired as a Sustainability Engagement Specialist to help iSEE increase its reach on campus sustainability, education, and outreach efforts. Harris,



a Communications Assistant, has been instrumental in sharpening the Institute's presence in publications, on the Web, and in social media.

In Summer 2015, the Institute hired Student Sustainability Committee Coordinator Micah Kenfield (right). Student Interns Noah Feingold and Catherine Kemp were hired to help lead the new Bike Share initiative on campus.



2014-15 iSEE DIRECTORS, STAFF

Name	Title
Evan H. DeLucia	Director
Madhu Khanna	Associate Director, Education & Outreach
Ben McCall	Associate Director, Campus Sustainability
Jenny Kokini	Managing Director
Stephanie Lage	Assistant Director
Morgan Johnston	Assistant Director of Sustainability, Facilities & Services
Micah Kenfield+	Student Sustainability Committee Coordinator
Tony Mancuso	Communications and Public Affairs Coordinator
Amy Rosenbery	Office Administrator
Nishant Makhijani	Sustainability Engagement Specialist
Olivia Harris	Communications Assistant
Grace Kyung*	Graduate Intern for Sustainable Transportation
Katie Pollman	Student Intern for Campus Sustainability
Andrew Walsh*	Student Intern for Education & Outreach
Noah Feingold+	Student Intern for Sustainable Transportation (Bike Share)
Catherine Kemp+	Student Intern for Sustainable Transportation (Bike Share)

* Worked for iSEE in 2014-15; + Hired Summer 2015

iSEE UPDATES: Marketing, Communications

The Institute's marketing efforts received a major boost in November 2014 with the launch of a newly branded website at sustainability.illinois.edu. The site acts as an online hub for iSEE's research projects, campus sustainability actions, educational efforts, and events.

In addition, iSEE features occasional items on good news and good work from around campus on the sustainability front.

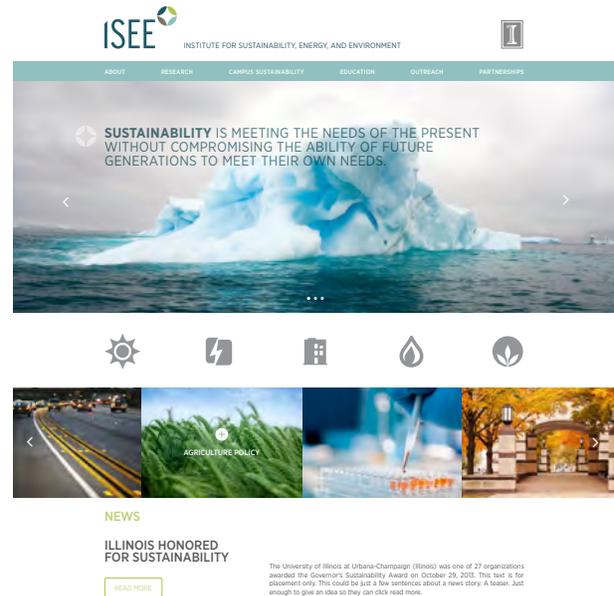
Then in Summer 2015, iSEE launched a web presence for all water scholars on campus. Part of the main iSEE site, water.illinois.edu has its own distinctive style and menus, making it easy to find areas of water research excellence on campus as well as centers, laboratories and individual researchers.

The Water at Illinois website was launched based on a small brochure iSEE created to help coalesce the efforts of researchers on campus (*see page 17*) — and the same type of brochure was created for campus energy scholars (*see page 18*) as the Institute began to bring that group together.

In 2015, iSEE also began publishing iQ, a quarterly update on our activities — including features on graduate and postdoctoral researchers.

More regularly, the iSEE Newsletter is emailed to subscribers weekly during the school year. It reaches more than 1,400 subscribers.

On the social media front:



- The iSEE Facebook page — [facebook.com/iSEEatUofI](https://www.facebook.com/iSEEatUofI) — has more than 400 “likes,” up 25 percent in the past year.

- iSEE's Twitter account — @sustainILLINOIS — has more than 1,700 followers, up more than 21 percent.

- The Institute has added a Google+ account and a YouTube (bit.ly/iSEEyT) channel. Videos of iSEE Congress 2014 sessions are up on YouTube, and the 2015 event will be placed there once videos are available. Also featured is a short video describing our Stored Solar Stove project (*see page 13*).

RESEARCH UPDATES: New Thematic Projects

In July 2015, iSEE announced its second round of seed funding — totaling more than \$1.2 million — for four major interdisciplinary research projects at the University of Illinois at Urbana-Champaign.

The process started in November 2014 with a Request for Proposals. Dozens of pre-proposals were narrowed to finalists in Spring 2015, from which the four were selected.

Three projects — stormwater control to manage disease-bearing mosquitos, a new modeling system to predict plants' responses to climate change, and a framework to coalesce multiple sources of low-carbon energy for transportation — will each receive more than \$350,000 from iSEE over the next three years. The fourth project, a unique method for cleaning up oil spills, will receive \$170,000.

With a total of seven funded projects, iSEE now has at least one in all five of its research themes: Climate Solutions; Energy Transitions; Secure & Sustainable Agriculture; Sustainable Infrastructure; and Water & Land Stewardship.

A look at the four new projects:

Stormwater and Mosquito Control

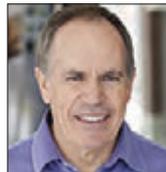
Entomology Assistant Professor Brian Allan's project, "Engineering the Microbial and Stormwater Environment for Mosquito Control," addresses the sustainable infrastructure theme. Its purpose

is to offer solutions, technology, and modeling for stormwater management in hopes of controlling mosquito populations and resulting diseases.

Allan has expertise in the ecology of infectious diseases. He will work with Animal Biology Professor Carla Cáceres, an expert in evolutionary ecology; Entomology Assistant Professor Allison Hansen, who specializes in insect-microbe interactions; Illinois Natural History Survey Director of Medical Entomology Juma Muturi, an expert in vector biology; Pathobiology Clinical Associate Professor Marilyn O'Hara Ruiz, who specializes in spatial epidemiology; Civil and Environmental Engineering Research Assistant Professor Arthur Schmidt, who has expertise in surface-water hydraulics and hydrology; and Geography and Geographic Information Science Professor Shaowen Wang, an expert in cyberinfrastructure and geospatial information.



ALLAN



LONG

Crop Response to Climate Change

Crop Sciences and Plant Biology Professor Stephen Long's project, "Plants *in silico*: A Multiscale Modeling Platform to Predict Crop Response to Climate Change," falls within the climate solutions and sustainable agriculture themes.

Continued next page

RESEARCH UPDATES: New Thematic Projects, Cont.

The team will research how to accurately predict and model plant response to climate change — from the molecular to the ecosystem level.

Long, a renowned expert in the impacts of global atmospheric change on plants, is joined by Plant Biology Assistant Professor Amy Marshall-Colon, who researches genomics and plant metabolism; National Center for Supercomputing Applications Director H. Edward Seidel, an expert in high-performance computing; Chemical and Biomolecular Engineering Assistant Professor Diwakar Shukla, who works in molecular modeling and simulations; Plant Biology Assistant Professor James O'Dwyer, who specializes in mathematical ecology; and Xinguang Zhu, Group Leader at the Institute of Computational Biology in the Chinese Academy of Science and a photosynthesis expert.

Renewable Energy Sources for Transportation

Electrical and Computer Engineering Professor Thomas Overbye's project, "Interdependent Critical Infrastructure Systems for Synergized Utilization of Multiple Energy Sources toward Sustainable Vehicular Transportation," addresses the energy transitions and sustainable infrastructure themes. The project will create a framework for new strategies to expand and operate interdependent critical infrastructure systems (ICIs) — using multiple

renewable energy sources to improve regional and national transportation systems.

Overbye has expertise in power and energy systems operation and control. He will work with Civil and Environmental Engineering Professor Ximing Cai, who does modeling of water-food-energy systems and infrastructure; Agricultural and Consumer Economics Professor Madhu Khanna, an expert in environmental and economic policy analysis; CEE Associate Professor Yanfeng Ouyang, who works with logistics systems and transportation networks; and CEE Assistant Professor Ashlynn Stillwell, a water-energy nexus scholar.



OVERBYE



PAN

Crude Oil Pollution Treatment

Bioengineering Assistant Professor Dipanjan Pan's project, "A Nanotechnology Approach for Efficient Crude Oil Pollution Treatment via Entrapment, Dispersal and Removal using Nano-CarboScavengers," addresses the water and land stewardship and sustainable infrastructure themes. Its purpose is to optimize a Nano-CarboScavenger (NCS), a particle designed to adsorb oil and remove it from water.

Pan has expertise in developing carbon nanoparticles. He will work alongside Illinois Sustainable Technology Center Senior Research Engineer B.K. Sharma, who specializes in biofuels, biolubricants, and alternative fuels.

RESEARCH UPDATES: Woody Polyculture Project

The goal of the Multifunctional Woody Polyculture (MWP) project is to find alternatives to traditional row crops in the Midwest — combinations of plants that yield many food and fuel options, including fruits and nuts. Project updates:

- In May 2015, Primary Investigator Sarah Taylor Lovell and her team planted 12,000 trees and shrubs in seven different field trials (*see diagram below*) at the University's Energy Farm. Accounting systems are in place to collect all relevant data for a Life Cycle Assessment and economic analysis of the woody polyculture agricultural model.

- To understand how polyculture planting and vertically layering plants affects the sunlight each plant receives, the team modeled spatial variation in light intensity under a wide range of planting regimes (like the seven test plots) and time periods with a particular focus on understory light conditions. This is called the Gap Light Index.

- iSEE helped the project leaders submit proposals for additional research funding totaling \$4.5 million in 2014-15 (*details on page 5*).

- The MWP team has grown to 16 faculty, postdoc and student researchers (*list on page 14*).

- Additionally, Lovell was promoted to Associate Professor of Crop Sciences in August 2015.

Read more at <http://sustainability.illinois.edu/woody-polyculture-project/>.



Sonny An / iSEE

Rows of trees and shrubs were planted in May.



Paul Littleton

The farm features seven different mixes of plants.

RESEARCH UPDATES: Smart Water Disinfection Project

The Smart Water Disinfection (SWD) project seeks to understand pathogen infectivity and how to control it at the molecular level. Lead by PI Benito Mariñas and co-PIs Yi Lu, Joanna Shisler, and Madhu Viswanathan, the team will develop a real-time sensor to detect infective pathogens and a method to neutralize pathogens and disinfect the water — and create a business implementation strategy focused on long-term fiscal sustainability through local entrepreneur markets. Project updates:

- Much time has been spent in the lab testing virus inactivation rates and mechanisms of free chlorine and low- and medium-pressure ultraviolet light to better understand how and why these disinfectants work.

- The search continues for an aptamer, an antibody-like DNA strand capable of binding to a specific target, for the active adenovirus particle. Once found, this aptamer will be used to create a “dipstick” test for active viruses in water. Several test procedures have been optimized through first-round experiments.

- In February, student team member Daniel Mosiman traveled to Uganda as part of a civil engineering course supported by the Safe Global Water Institute at Illinois. His observations on specific regional disinfection needs, educational needs, and water collection safety will inform the eventual business plan for the “dipstick test” technology.

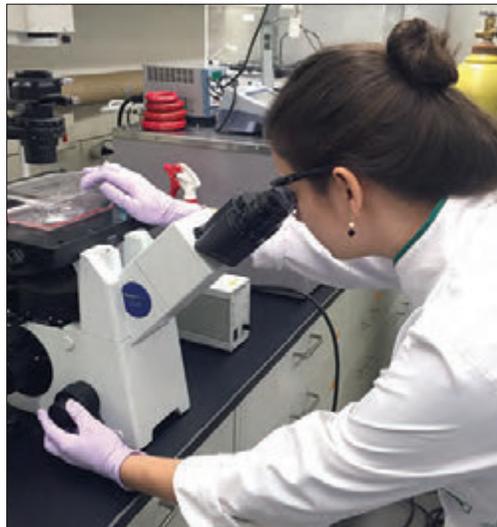
- In June, Shisler published a paper on some of the research conducted thus far. Her article, titled “Waterborne Viruses: A Barrier to Safe Drinking Water” and co-authored by Mariñas and graduate student Aimee Gall, was published in the journal *PLOS Pathogens* and can be read at <http://bit.ly/1HvpUIQ>.

- iSEE helped facilitate proposals for external funding totaling \$3 million in

2014-15 (*details on page 5*).

- The SWD team leadership has grown to eight faculty and student researchers (*list on page 14*) — with dozens more undergraduates doing field work.

Read more at <http://sustainability.illinois.edu/smart-water-disinfection-project/>.



Olivia Harris / iSEE

Graduate student Kelley Goncalves examines treated viruses for structural damage under a microscope.

RESEARCH UPDATES: Stored Solar Stove Project

The Stored Solar Stove (SSS) project, lead by PI Bruce Litchfield, works with “the global cooking problem” — the fact that 3 billion people still cook meals over solid fuels, resulting in 4 million deaths from smoke and soot inhalation each year. Project updates:

- A trip to India during the past year allowed researchers to examine different methods by which people in the states of Tamil Nadu and Haryana prepare food.

- To replicate the feel of cooking over fire (the most dominant type of cooking in developing countries), a solar storage material must gather large amounts of energy from sunlight and then release that energy evenly at high temperature when taken out of the sun and into the home. So far, the team has had the greatest success with certain types of salt blocks.

- In cooking tests over prototype designs, researchers have achieved a consistent boil time of less than five minutes for 1 liter of water. They’ve

also been able to cook simple meals — their specialties are na’an and roti breads.



Olivia Harris / iSEE

Undergraduate student Sid Madhubalan checks the boiling speed of water heated over a salt mixture. The Stored Solar Stove team is still looking for the ideal mixture that will produce the most stored heat.

- iSEE helped the project leaders submit proposals for additional research funding totaling \$150,000 in 2014-15 (*details on page 5*).

- In addition to its iSEE funding and grant requests, the project received \$10,000 from the Student Sustainability Committee to use toward a campus prototype; \$30,000 for lab trials from the Research Board at the U of I; \$10,000 from the Office of Public Engagement for outreach activities; \$50,000 from National Science Foundation I-Corps for market research; and a 90 percent match for business start-up expenses from the University of Illinois Research Park.

- The SSS team has grown to 13 faculty and student researchers, including

two high schoolers (*see list on page 14*).

Read more at <http://sustainability.illinois.edu/stored-solar-stove-project/>.

RESEARCH UPDATES: iSEE Thematic Research Teams

WOODY POLYCULTURE TEAM

Name	Title
Sarah Taylor Lovell, PI	Associate Professor of Crop Sciences
Nick Paulson, co-PI	Associate Professor of Agricultural and Consumer Economics
Michelle Wander, co-PI	Professor of Natural Resources and Environmental Sciences
Wendy Yang, co-PI	Assistant Professor of Plant Biology
Jeremy Guest, co-PI	Assistant Professor of Civil and Environmental Engineering
Bruce Branham, co-PI	Professor of Crop Sciences
Tito Lavaire	Research Technician
William Eddy	Postdoctoral Associate in Plant Biology
Ronald Revord	Doctoral student in Natural Resources and Environmental Sciences
Kevin Wolz	Doctoral student in Ecology, Evolution, and Conservation Biology
Diana Kapanzhi	Doctoral student in Environmental Engineering
Eric Wolske	M.S. student in Crop Sciences
Matthew Wilson	M.S. student in Crop Sciences
Joseph McAsey	M.S. student in Crop Sciences
Erik Stanek	Undergraduate student in Natural Resources and Environmental Sciences
Sameer Andani	Undergraduate student in Cellular and Molecular Biology

SMART WATER DISINFECTION TEAM LEADERS

Benito Mariñas, PI	Professor and Head of Civil and Environmental Engineering
Joanna Shisler, co-PI	Associate Professor of Microbiology
Madhu Viswanathan, co-PI	Professor of Business
Yi Lu, co-PI	Professor of Chemistry
Aimee Gall	Doctoral student in Environmental Engineering
Bernardo Vazquez Bravo	Doctoral student in Environmental Engineering
Kelley Goncalves	Doctoral student in Molecular and Cellular Biology
Shiliang Tian	Doctoral student in Chemistry

STORED SOLAR STOVE TEAM

Bruce Elliott-Litchfield, PI	Professor of Agricultural and Biological Engineering
Tami Bond, co-PI	Professor of Civil and Environmental Engineering
Madhu Viswanathan, co-PI	Professor of Business
Joe Bradley	Teaching Associate at IEFX-Illinois Engineering First-Year Experience
Matthew Alonso	Doctoral student in Agricultural and Biological Engineering
Keilin Jahke	Doctoral student in Agricultural and Biological Engineering
Samantha Lindgren	Doctoral student in Agricultural and Biological Engineering
Emily Floess	M.S. student in Civil and Environmental Engineering
Blake Banks	Undergraduate student in Chemical Engineering
Sid Madhubalan	Undergraduate student in Mechanical Engineering
Catherine Zhou	Undergraduate student in Chemical Engineering
Omeed Salo	University High School Student
Rahi Salo	University High School Student

RESEARCH UPDATES: iSEE Thematic Research Teams

STORMWATER AND MOSQUITO CONTROL TEAM LEADERS

Name	Title
Brian Allen, PI	Assistant Professor of Entomology
Carla Cáceres, co-PI	Professor of Animal Biology
Allison Hansen, co-PI	Assistant Professor of Entomology
Juma Muturi, co-PI	Medical Entomologist
Marilyn O'Hara Ruiz, co-PI	Clinical Associate Professor
Arthur Schmidt, co-PI	Research Assistant Professor
Shaowen Wang, co-PI	Professor of Geography & Geographic Information Science
Derek Wildman	Professor of Molecular and Integrative Physiology
Anand Padmanabhan	Senior Research Scientist in the CyberGIS Center
Andrew Mackay	Postdoctoral Associate in Entomology
Allison Gardner	Doctoral student in Entomology

CROP RESPONSE TO CLIMATE CHANGE TEAM LEADERS

Stephen Long, PI	Professor of Plant Biology
Amy Marshall-Colon, co-PI	Assistant Professor of Plant Biology
Harry Edward Seidel, co-PI	Director of National Center for Supercomputing Applications
Diwakar Shukla, co-PI	Assistant Professor of Chemical and Biomolecular Engineering
James O'Dwyer, co-PI	Assistant Professor of Plant Biology
Xinguang Zhu, co-PI	Group Leader of Institute of Computational Biology at Chinese Academy of Science
Donna Cox	Director of Advanced Scientific Visualization at National Center for Supercomputing Applications
John Hart	Professor of Computer Science
Donald Ort	Professor of Plant Biology
Cameron Pittlekow	Assistant Professor of Crop Sciences
Raymond Plante	Senior Research Programmer at National Center for Supercomputing Applications

RENEWABLE ENERGY FOR TRANSPORTATION TEAM LEADERS

Thomas Overbye, PI	Professor of Electrical and Computer Engineering
Ximing Cai, co-PI	Professor of Civil and Environmental Engineering
Madhu Khanna, co-PI	Professor of Agricultural and Consumer Economics
Yanfeng Ouyang, co-PI	Associate Professor of Civil and Environmental Engineering
Ashlynn Stillwell, co-PI	Assistant Professor of Civil and Environmental Engineering
Hadi Meidani	Assistant Professor of Civil and Environmental Engineering
Albert J. Valocchi	Professor of Civil and Environmental Engineering
Shaowen Wang	Professor of Geography & Geographic Information Science
Hao Zhu	Assistant Professor of Electrical and Computer Engineering

CRUDE OIL POLLUTION TREATMENT TEAM LEADERS

Dipanjan Pan, PI	Assistant Professor of Bioengineering
B.K. Sharma, co-PI	Senior Research Engineer in Illinois Sustainable Technology Center
John W. Scott	Senior Analytical Chemist in Illinois Sustainable Technology Center
Santanu Chaudhuri	Principal Research Scientist in Illinois Applied Research Institute
Santosh Misra	Postdoctoral Associate in Bioengineering
Enrique Daza	Graduate Student in Bioengineering

RESEARCH UPDATES: iSEE Team-Building Expertise

In March, iSEE demonstrated its leadership of interdisciplinary research — and its ability to acquire federal funding — at the University of Illinois at Urbana-Champaign with the announcement of a new project to model the impact that extreme natural and human-made events can have on communities and ecosystems.

The Institute helped secure more than \$220,000, including direct pay for student researchers, from the U.S. Army Construction Engineering Research Laboratory (CERL), which will fund the study titled “System Dynamics Modeling of the Ecosystem-Infrastructure Interface.”

Primary Investigators Paolo Gardoni, an Associate Professor in the Department of Civil and Environmental Engineering (CEE), Yanfeng Ouyang, an Associate Professor of CEE, and Colleen Murphy, an Associate Professor in the College of Law and the Department of Philosophy, will lead a team that will examine how communities respond to the social, economic, infrastructure and environmental repercussions of possible natural events such as earthquakes, tsunamis, and hurricanes — as well as human actions such as terrorist attacks or interventions.

The project’s focus is to predict measures of impact of future events, using an extensive database and additional modeling to predict the extent of the

impact and the length of recovery. It will go beyond the traditional measures of impact like fatalities and injuries. The team will also build sophisticated mathematical models to understand vulnerability of complex interdependent infrastructure systems — such as water pipelines, roadways, power grids, and communication networks — that are closely attached to communities.

The team, featuring members with very different expertise, will look at engineering, social, economic, legal, and political aspects. The genesis for the project started with iSEE, which sought out specific researchers and multiple disciplines.

“The Institute was very instrumental in defining the scope of the project and in making sure it fit within CERL’s interest areas,” Gardoni said. “(iSEE Director) Evan DeLucia and (Managing Director) Jenny Kokini did a great job of matchmaking, which was essential in putting the right team together, then put a lot of effort into the scope, interest and intellectual value of our research.”

Without iSEE, the project would not have come together, Gardoni said. “It is difficult to start research like this within the traditional boundaries of a department, and having an institute bringing together people from across campus is a huge added benefit for our research community.”



GARDONI



MURPHY



OUYANG

RESEARCH UPDATES: Water at Illinois

In 2014-15, iSEE Director Evan DeLucia brought together Illinois faculty members and those working at the state surveys and other divisions of the Prairie Research Institute to form a Water Scholars group on campus.

The Institute created a preliminary brochure to show the many areas of wa-



ter research strength on the Illinois campus. As a result, the Scholars formed a Water Council, a group of Scholars whose purpose is to co-alesce the scholarly efforts on campus to better market

Illinois as a powerful resource for interdisciplinary research into water issues. This Council has helped shed light on potential funding opportunities for Illinois researchers, and it has identified potential teams for proposals.

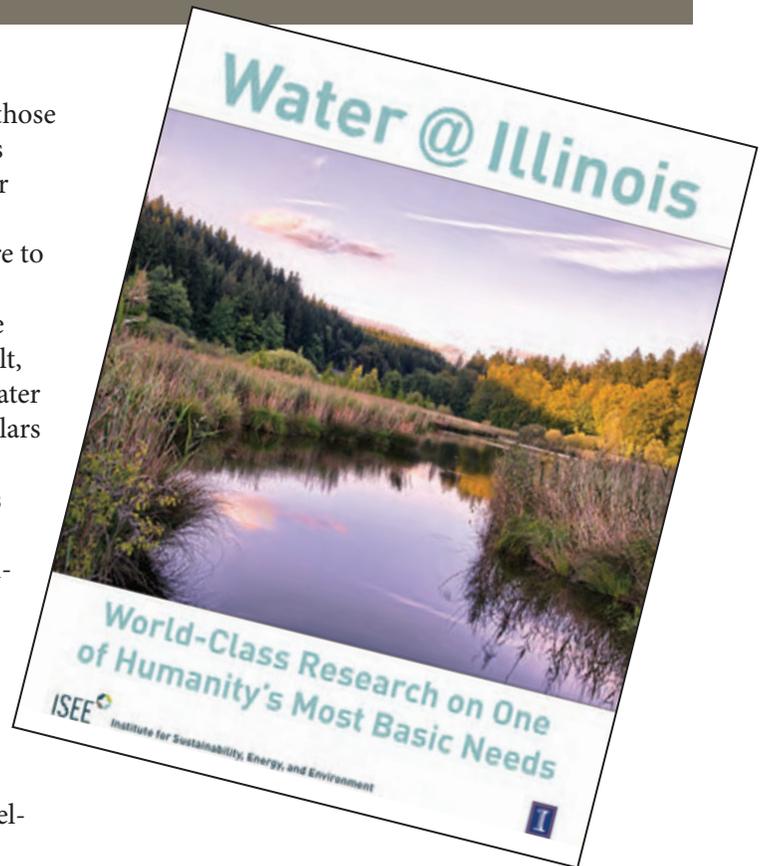
The resulting Water at Illinois website (water.illinois.edu) went live in Summer 2015, listing four primary areas of water research excellence on campus:

- Adapting in a Changing Climate;
- Sustainable Water, Food, and Energy;
- Safe Drinking Water and Public Health; and
- Resilient Watersheds and Ecosystems.

The site, which has individual pages and links for each water scholar who has joined the group, also contains links to the numerous funded

water centers on campus, as well as to labs and other facilities that do major research into water issues.

iSEE intends to continue convening the Water Scholars regularly, and it will remain active in supporting the Water Council in its grant endeavors as well.



RESEARCH UPDATES: Energy at Illinois

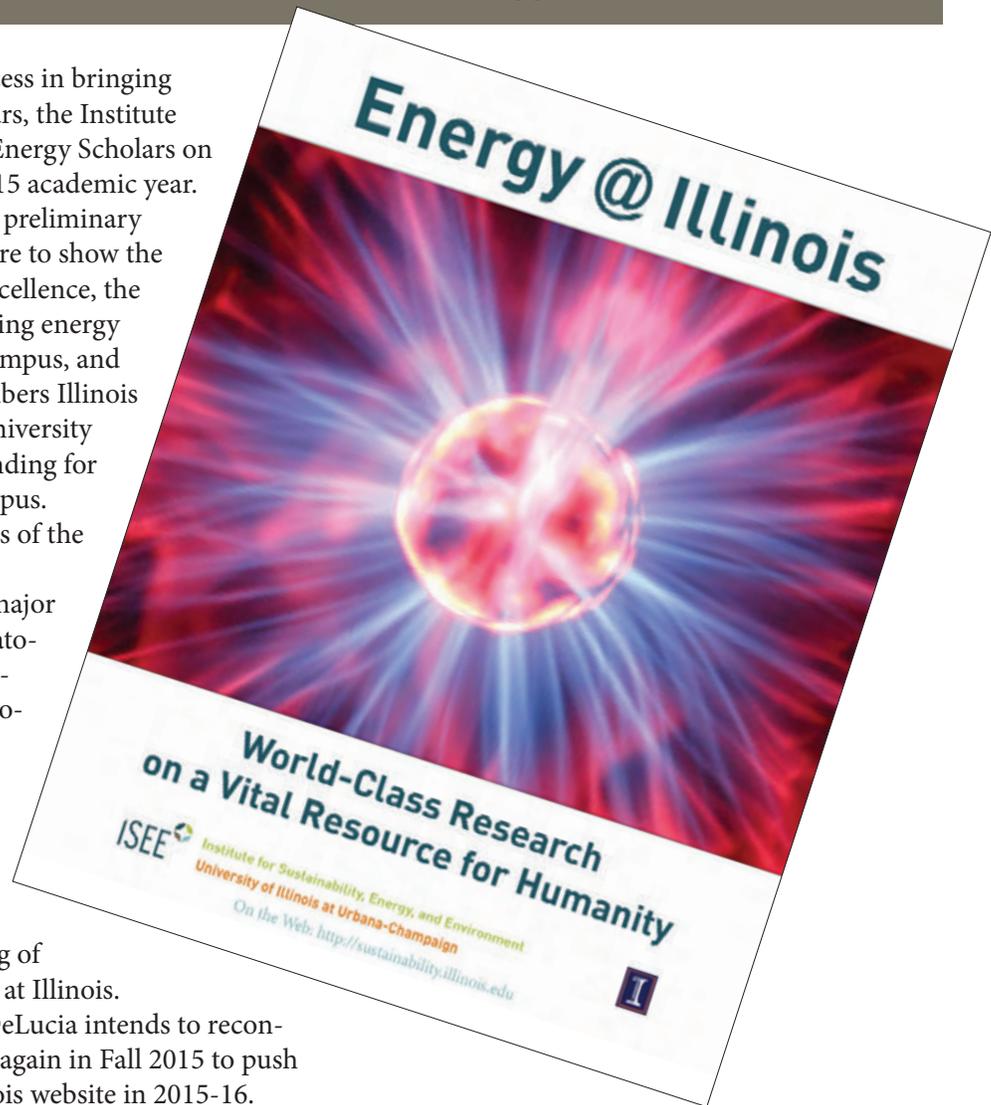
In addition to its success in bringing together the Water Scholars, the Institute began bringing together Energy Scholars on campus during the 2014-15 academic year.

Again, iSEE created a preliminary “Energy@Illinois” brochure to show the many areas of research excellence, the diversity of disciplines doing energy research on the Illinois campus, and the sheer strength in numbers Illinois has that could help the University pursue major external funding for collaborations across campus.

Some of the highlights of the brochure include:

- Descriptions of 17 major funded centers and laboratories on the Urbana-Champaign campus that do innovative energy research;
- Profiles of three scholars — as an example of the dozens whose energy work is featured on campus; and
- A preliminary listing of energy research strengths at Illinois.

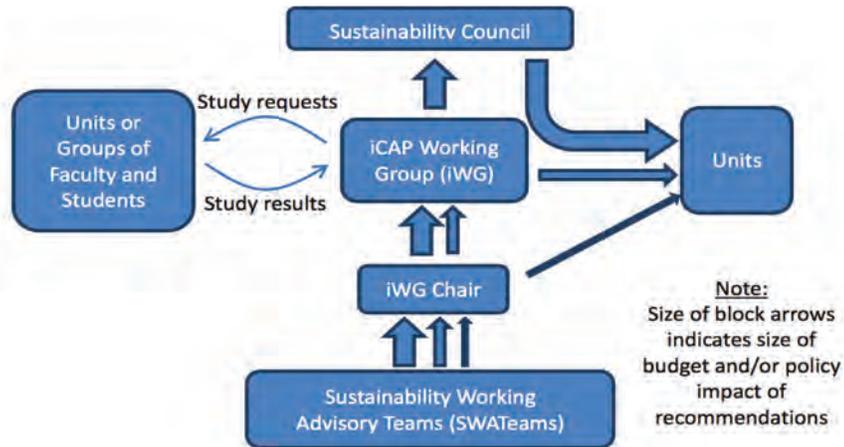
iSEE Director Evan DeLucia intends to reconvene the Energy Scholars again in Fall 2015 to push toward an Energy at Illinois website in 2015-16.



CAMPUS SUSTAINABILITY UPDATES: 2015 iCAP

Procedure for Formulating & Evaluating Campus Sustainability Policies & Initiatives

Approved by Office of the Chancellor on June 4, 2014



The 2015 Illinois Climate Action Plan (iCAP) is awaiting final approval by upper campus administration after a lengthy but fruitful process (see figure above) shepherded by the Institute and Ben McCall, iSEE's Associate Director for Campus Sustainability.

Discussions about the new document — an update to the 2010 iCAP, which had an overall stated goal of campus carbon neutrality by 2050 and eight targets for completion in 2015 — started with an October 2014 forum to discuss campus progress over the past five years and potential new goals for the future.

Meantime, the six Sustainability Working Advisory Teams (SWATeams) began working on 2015 updates to their sections of the Plan, and the iCAP

Working Group (iWG) began, along with iSEE staff, to start drafting new 2015 iCAP language (see lists of team members on pages 20-21).

By May 2015, iSEE opened a public comment period for the new document, and after comments and revisions were concluded, the 2015 iCAP was presented to the Sustainability Council, a group of top-level campus administrators (see page 20), for consideration.

The iWG also has received several recommendations from the SWATeams on campus sustainability improvements during the past year, including the hiring of a Sustainable Transportation Coordinator for the campus. Those recommendations have been sent to the appropriate campus entities for adoption.



CAMPUS SUSTAINABILITY UPDATES: Leadership

A glance at the campuswide groups iSEE convened in 2014-15 to tackle campus sustainability issues:

SUSTAINABILITY COUNCIL

The Council is made up of top-tier leaders on the University of Illinois' Urbana-Champaign campus. It provides strategic direction and oversight of the campus sustainability initiative, including major campus policies regarding sustainability, energy conservation and eco-friendly practices.

The 2014-15 members:

Name	Title
Phyllis Wise, Chair	Chancellor, University of Illinois at Urbana-Champaign
Evan DeLucia, Vice Chair	Director, iSEE
Ilesanmi Adesida	Provost and Vice Chancellor for Academic Affairs, University of Illinois at Urbana-Champaign
Peter Schiffer	Vice Chancellor for Research, University of Illinois at Urbana-Champaign
Renee Romano	Vice Chancellor for Student Affairs, University of Illinois at Urbana-Champaign
Dan Peterson	Vice Chancellor for Institutional Advancement, University of Illinois at Urbana-Champaign
Allan Stratman	Executive Director, Facilities & Services
Robert Hauser	Dean, College of Agricultural, Consumer, and Environmental Sciences
Andreas Cangelaris	Dean, College of Engineering
Barbara Wilson	Dean, College of Liberal Arts & Sciences
Tanya Gallagher	Dean, College of Applied Health Sciences
Roy Campbell	Chair, Senate Executive Committee
Mitch Dickey	President, Illinois Student Senate
Amy Liu	Chair, Student Sustainability Committee
Ben McCall (Non-voting Attendee)	Associate Director for Campus Sustainability, iSEE
Stephanie Lage (Secretary)	Assistant Director, iSEE

iCAP WORKING GROUP

The Illinois Climate Action Plan Working Group (iWG) is made up of representatives from major stakeholder groups across campus, and it was tasked with a) reviewing Sustainability Working Advisory Team (SWATeam) recommendations and transmitting them to the affected units or to the Sustainability Council, as appropriate; and b) initiating a process for a 2015 revision of the iCAP. The 2014-15 members:

Name	Title
Ben McCall, Chair	Associate Director for Campus Sustainability, iSEE
Morgan Johnston	Associate Director for Sustainability, Facilities & Services
Lowa Mwilambwe	Director, Illini Union (representing Student Affairs)
Matthew Tomaszewski	Associate Provost, Capital Planning (representing Office of the Provost)
Nancy O'Brien	Chair, Senate Committee on Campus Operations (representing Academic Senate)
Drew O'Bryan	Chair, Student Sustainability Leadership Council
Kevin Duff	Assistant Director of Planning and Design (representing Office of Business and Financial Services)
Rob Fritz	Director of Facilities, Beckman Institute (representing college-level facility managers)
Stephanie Lage (Secretary)	Assistant Director, iSEE

CAMPUS SUSTAINABILITY UPDATES: Leadership

A glance at the campuswide groups iSEE convened in 2014-15 to tackle campus sustainability issues:

SUSTAINABILITY WORKING ADVISORY TEAMS

In Fall 2014, iSEE charged six teams consisting of faculty, staff, and students to examine the six broad themes within the Illinois Climate Action Plan. Among their duties, these Sustainability Working Advisory Teams (SWATeams) will recommend concrete steps the campus should take to meet its iCAP targets — and members also will develop suggested revisions and updates to the plan. The 2014-15 teams:

ENERGY CONSERVATION AND BUILDING STANDARDS

Name	Title
Brian Deal	Associate Professor, Urbana and Regional Planning
Scott Willenbrock	Professor, Physics
Fred Hahn	Associate Director of Engineering Services, F&S
Karl Helmink	Energy Conservation and Retrocommissioning, F&S
Claire McConnell	Student
Dhara Patel	Student
Claudia Szczepaniak (Clerk)	Student

ENERGY GENERATION, PURCHASING, AND DISTRIBUTION

Name	Title
Angus Rockett	Professor, Materials Science and Engineering
Scott Willenbrock	Professor, Physics
Mike Larson	Utility Production/Electricity Purchasing, F&S
Tim Mies	Deputy Operations Director, Energy Farm
Drew O'Bryan	Student
Nathan Wells	Student
Rob Klein (Clerk)	Student

TRANSPORTATION

Name	Title
Wojtek Chodzo-Zajko	Professor, Kinesiology and Community Health
Bumsoo Lee	Professor, Urban and Regional Planning
Richard Langlois	Senior e-Learning Professional, Tech Services
Peter Varney	Director of Transportation and Auto Services, F&S
Garrett Fullerton	Student
Grace Kyung	Student
Justin Licke	Student
Ben Cigelnik (Clerk)	Student

WATER AND STORMWATER

Name	Title
Mary Pat Mattson	Assistant Professor, Landscape Architecture
Lance Schideman	Assistant Professor, Ag and Biological Engineering
Keith Erickson	Utility Distribution, F&S
Kishore Rajagopalan	Associate Director, ISTC
Lance Langer	Student
Amy Liu	Student
Danielle Thayer (Clerk)	Student

PURCHASING, WASTE, AND RECYCLING

Name	Title
Dilip Chhajer	Professor, Business Administration
Warren Lavey	Adjunct Professor, Law
Bart Bartels	Technical Assistance Engineer, ISTC
Marcy Wright	Administrative Associate, OBFS
Elizabeth Shancer	Student
Karin Hodgkin Jones	Student
Divneet Dhillon (Clerk)	Student

AGRICULTURE, LAND USE, FOOD, AND SEQUESTRATION

Name	Title
Bruce Branham	Professor, Crop Sciences
Neal Merchen	Professor, Animal Sciences
Brett Stillwell	Architect, Capital Planning, F&S
Carol Strohbeck	Asst. Director of Dining Services, University Housing
Dawn Aubrey	Associate Director, Housing and Dining Services
Alexandra He	Student
Amanda Jacobs	Student
David Gu (Clerk)	Student

CAMPUS SUSTAINABILITY UPDATES: iSEE Initiatives

The Certified Green Office Program is the Institute's first initiative to engage the campus community in a commitment to sustainability. More details:



• During the inaugural 2014-15 program, 27 offices agreed to five basic commitments to become a Certified Green Office:

- Appoint a Sustainability Ambassador,
- Adopt a sustainable travel policy;
- Use 30% recycled-content and FSC-certified paper;
- Identify, label and communicate the location of office recycling stations; and
- Turn off and unplug all unnecessary electronics.

• Of the participating offices, 23 chose to go the extra mile, selecting from among 17 extra suggested commitments to earn a Gold, Silver, or Bronze level of achievement.

• One significant milestone during the first year of the Certified Green Office Program was an April 2015 deal between Office Depot OfficeMax and F&S Stores & Receiving. The agreement allows for reams of 30% recycled office paper to be sold through iStores, the University's own marketplace, for 14 cents less than virgin paper through iBuy. A commitment from Housing (a Gold-level Certified Green Office) was key to forming this deal.

Green Office Stars

A few large campus units went above and beyond the minimum requirements of the program, setting great examples for other campus units:

• Campus Recreation has placed plastic bottle recycling bins throughout their facilities, uses natural lighting (rather than electricity) whenever possible, and encourages employees to turn off a power bar on their desk at the end of the day (*see photo*).

• University Housing and Dining staff switched more than 100 print magazine subscriptions to an electronic format or canceled them altogether to save paper. Housing also reduced transportation emissions by educating employees about using public transportation and offering easy instructions to set up video teleconferencing.



iSEE intends to expand and refine the program in 2015-16; stay tuned for more information at <http://sustainability.illinois.edu/certified-green-office-program/>.

CAMPUS SUSTAINABILITY UPDATES: Campus & iSEE

Both Illinois and iSEE have been busy in the past year working on initiatives to make campus more sustainable. A major campus effort: Facilities & Services (F&S) started building a 5.87-megawatt solar farm on campus (*see page 23 for more about the farm and one of its major funding sources, the Student Sustainability Committee, or SSC*).

Other examples:

- In March 2015, F&S officially incorporated the Campus Bike Plan into the University of Illinois at Urbana-Champaign's Master Plan. iSEE Graduate Student Intern Grace Kyung was among the contributors to this plan, which outlines campus bike infrastructure, street usage guidelines, and education and enforcement of bike policies.

- Kyung also authored a Sustainable & Alternative Transportation web page — outlining several campus transportation options — that can be found at <http://sustainability.illinois.edu/sustainable-alternative-transportation/>.

- With a \$5,000 grant from the Champaign-Urbana Public Health District in 2014-15, Kyung began an initial study for a campus bicycle sharing program. In June 2015, iSEE hired two student

interns to facilitate the establishment of a two-year pilot program, which has received \$86,795 from the SSC. Undergraduates Noah Feingold and Catherine Kemp will spend 2015-16 preparing and implementing the program, which will be turned over to a newly hired Active Transportation Coordinator at F&S.

- iSEE started developing a program to collect Styrofoam from across campus and densify it to enable recycling. With help from SSC, iSEE is purchasing a Styrofoam densifier that will be housed at a community recycling facility. iSEE interns will develop and



Tony Mancuso / iSEE

The biodiesel reactors that will convert waste vegetable oil into diesel on campus.

start a system for collecting Styrofoam.

- In Spring 2015, iSEE acquired two biodiesel reactors for a campus program that will facilitate conversion of waste vegetable oil from the campus dining halls into biodiesel — which will be used by the campus fleet and/or agricultural equipment. The program is expected to start in 2015-16.

- iSEE has also chosen to become an active participant in the 2015 Kill the Cup University Challenge. In October 2015, iSEE intern Katie Pollman will engage with students to persuade them to ditch wasteful paper cups and use a reusable cup instead at restaurants and coffee shops.

CAMPUS SUSTAINABILITY UPDATES: Funding

The Institute is glad to play a role in some of the funding options the Illinois campus has for sustainability projects. Here are two:

Chevrolet

In Spring 2015, the University received \$832,885 from Chevrolet through the Bonneville Environmental Fund for a sale of campus Verified Carbon Units.

In the deal negotiated in Spring 2014 by iSEE, Chevrolet will retire the carbon credits — earned through the good work Illinois did in the past several years to reduce its greenhouse gas (GHG) emissions — on behalf of the environment.

Campus agreed to match 50 percent of the Chevy sale, bringing the total to nearly \$1.25 million.

iSEE and Facilities & Services have agreed to add \$750,000 of that total to the campus Revolving Loan Fund (RLF), which was set up as a funding source for utility conservation projects with less than 10-year payback periods. As of 2015, the fund had grown to \$3,190,213; with the addition of the Chevrolet money, the new total will be more than \$3.94 million.

The remaining amount from the carbon credit sale, nearly \$500,000, will be used to support fur-

ther reductions of campus GHG emissions.

Student Sustainability Committee

iSEE is proud to become even more closely tied with the Student Sustainability Committee (SSC) moving forward. Expanding on its role as a signatory for SSC funding allocations, iSEE now is home to the SSC Coordinator's office and offers support to the Committee as needed.

SSC funds more than \$1.1 million each year in innovative, sustainable projects. Its mission is to make the University of Illinois at Urbana-Champaign a leader in campus sustainability. SSC does this through reviewing, recommending, and funding projects that increase

environmental stewardship, inspire change, and impact students. The SSC reviews and recommends projects to be funded from two student fees: the \$12 Sustainable Campus Environment fee and the \$2 Cleaner Energy Technologies fee.

At more than \$1 million awarded in 2013, one major SSC-backed project is now coming to fruition: With SSC's funding support, F&S is constructing a 20.8-acre, 5.87 megawatt solar farm on south campus (*see figure*). When completed, the farm will produce 7.86 million kilowatt-hours, or about 2 percent of the campus electrical demand.



CAMPUS SUSTAINABILITY UPDATES: Recognition

Over the last year, the Institute for Sustainability, Energy, and Environment has supported dozens of organizations and individuals to promote a campus culture of sustainability.

The University of Illinois' dedication to a greener Urbana-Champaign campus was noted in 2014-15 with several awards, including:

- **Back-to-back**

STARS Gold Rating. In 2015 — for the second time in a row — Illinois earned Gold Level honors in the Sustainability Tracking, Assessment & Rating System (STARS), the nation's most comprehensive sustainability rating system. The Urbana-Champaign campus was one of 51 schools — and one of three in the Big Ten Conference — to achieve Gold in the latest, more stringent version 2.0 of the STARS system. The program has ranked 143 schools thus far with its STARS 2.0 tool; 722 overall have registered to use STARS reporting.

- **Princeton Review's 2015 Top 50 Green Colleges.** The University of Illinois

at Urbana-Champaign was No. 24 on the list. The Princeton Review evaluates more than 800 schools per year.



- **2015 Campus Conservation Nationals Top 20%.** In its second year of the energy-saving competition, Urbana-Champaign dorm residents reduced energy by 7.9% to place in the top 20 percent of schools participating, and No. 1 in the Big Ten.

- **Sierra Club Cool Schools 2015.** Illinois was ranked 38th of 153 four-year higher education institutions — and third in the Big Ten — in the Sierra Club Magazine's annual contest.

- **Small Steps Big Wins Earth Week Challenge.** The University of Illinois finished in sixth place thanks to the almost 700 "sustainable actions" performed by 70 Illinois students. Together, they reduced their carbon emissions by 1,513 pounds and saved \$502.

See more about these awards and other past campus honors at

<http://sustainability.illinois.edu/recognition/>.

EDUCATION UPDATES: SEE Minor, iSEE Courses



Tony Mancuso / iSEE

iSEE's first major education initiative is the development of a campuswide undergraduate minor in sustainability, and progress was made toward that end in 2014-15.

In October 2014, the Institute brought together campus department heads and leading corporate, governmental and NGO employers to identify the skills and training needed for students to make a professional contribution to sustainability efforts. The roundtable discussion (*photo above*) helped iSEE formulate the minor.

This minor, named the Sustainability, Energy, and Environment (SEE) Fellows Program, will promote systems-level thinking about issues of sustainability. Students will develop an integrative understanding of sustainability and understand the trade-offs, barriers, and implications for sustainable decision making. The minor will replace the existing Environmental Fellows Program and provide a broader opportunity for interdisciplinary educa-

tion, internships, and capstone research projects in the area of sustainability.

The minor continues to make its way through the academic vetting process, and we expect approval in Fall 2015 with an expected start date for students in 2016.

In the meantime, iSEE Associate Directors Ben McCall and Madhu Khanna had new courses approved:

- In Fall 2015, McCall is teaching ENVS 491: Sustainability Experience, in which students will work with faculty, staff, and/or the Student Sustainability Committee to advance campus sustainability goals and the Illinois Climate Action Plan.
- In Spring 2016, Khanna will lead the team-taught ENVS 301: Tools for Sustainability, which will “teach systems-thinking skills to enable better understanding of the different dimensions of sustainability — and the problems and trade-offs involved in achieving that sustainability.”

EDUCATION UPDATES: Lavey/Rosencranz Scholars

In July, the Department of Natural Resources and Environmental Sciences (NRES) and iSEE announced funding awards to advance the scholarship of three University of Illinois at Urbana-Champaign graduate students researching the impacts of climate change on public health.

The 2014-15 Warren Lavey and Dr. Holly Rosencranz Research Awards in Climate Change and Public Health — \$3,000 apiece — were allotted to Surendra Karki, Pathobiology; Nora Sadik, Civil and Environmental Engineering; and Erin Welsh, Integrative Biology. Here's more about each student:

- Karki will work with Marilyn O'Hara Ruiz, Clinical Associate Professor and Director of the GIS and Spatial Analysis Lab in the U of I Department of Pathobiology, and Nancy Westcott, Research Atmospheric Scientist at the Midwestern Regional Climate Center in the Illinois State Water Survey.

His research will explore the impact of extreme weather events on the risk from the West Nile virus in South Cook County, Illinois. Specifically, he will examine and model the relationship between mosquito abundance and temperature and rainfall by comparing averages, then by the effects of extreme rainfall events and increased temperatures.



KARKI



SADIK



WELSH

- Sadik — who will work with Illinois CEE Professor Helen Than Nguyen, Illinois Microbiology Professor Joanna Shisler and Makerere University (Uganda) Agricultural and Bio-Systems Engineering Professor Noble Banadda — is researching climate change, water ecology, and public health in urban Kampala, Uganda.

In particular, the research will examine extreme weather effects on clean drinking water supplies as well as water for agriculture.

- Welsh will work with Illinois Entomology Professor Brian Allan and Dr. Jose Loaiza of INDICASAT in Panama. She is investigating tick-borne disease transmission with expected continued climate change in Central Panama.

The research will integrate field surveys, tick survival enclosures, and genomic analyses to address how climate conditions shape the ecology of ticks and their accompanying bacteria.

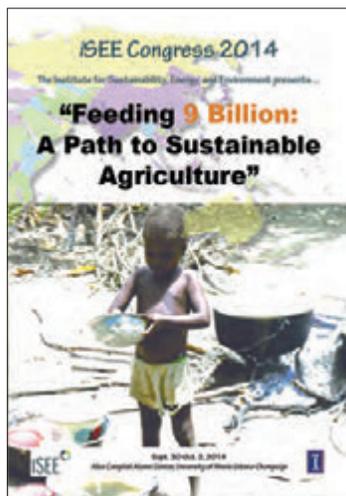
Lavey, an Adjunct Professor of Law and an Adjunct Assistant Professor in Natural Resources and Environmental Sciences at Illinois, and Rosencranz, an Assistant Professor of Clinical Medicine at the University of Illinois at Chicago College of Medicine, have long been concerned with public health issues.

OUTREACH UPDATES: iSEE Congress 2014, 2015

Each fall, iSEE hosts a major scientific Congress highlighting a specific facet of global sustainability. The Institute assembles leading national and international experts from varying disciplines to foster serious discussions about solutions to grand world challenges. A look back and a look ahead:

- The inaugural Congress, “Feeding 9 Billion: A Path to Sustainable Agriculture,” was Sept. 30-Oct. 2, 2014, on the Urbana-Champaign campus. More than 250 registrants attended over three days to hear 23 speakers present their research and observations about the current and future challenges to the global food system.

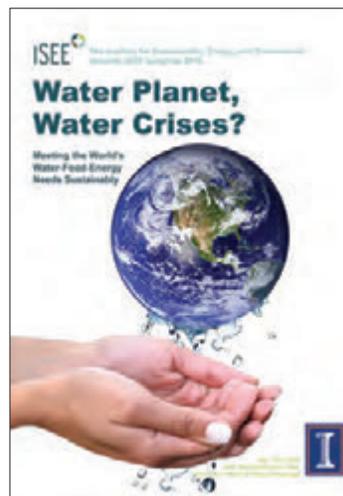
Agriculture’s high demand for water, fossil fuels, and land were explored as major barriers to supplying enough food sustainably for the predicted population of 9 billion. Climate change was also much discussed for its ability to change the conditions agricultural systems have operated under for so long. Many speakers emphasized the need



for balance — between cultivation and ecosystem services, between a good crop and depleting water resources, and between innovation and social norms. Improved irrigation, genetically modified

organisms, bioengineering, and precision agriculture were all discussed as keys to increasing agricultural production to keep up with ever-growing demand.

Videos of iSEE Congress 2014 presentations are available on iSEE’s YouTube channel: <https://www.youtube.com/playlist?list=PLPJTODSuRLzoFJG4RURwHRZ4q6LgH5ZmW>.



Meeting the World’s Water-Food-Energy Needs Sustainably,” is set for Sept. 14-16, 2015 — and more than 350 people are expected to attend.

This time, the spotlight will be on water: its shifting availability, its governance, its ties to human health and ecosystem services, and most of all its complex relationships with food and energy production.

OUTREACH UPDATES: iSEE Participation on Campus

In addition to its own events, iSEE is dedicated to bringing educational opportunities to the students and the community to nurture sustainable decision making. Here are some of the main events the Institute took part in during 2014-15:

- Sustainability Day 2014.

Co-sponsors iSEE and the Illinois Sustainable Technology Center (ISTC), a division of the Prairie Research Institute, invited members of campus and community to an Oct. 21 screening of the documentary film “Plastic Paradise: The Great Pacific Garbage Patch,” followed by a question and answer session with the film’s primary maker and star, Angela Sun. Her message was clear: Disposable plastics are pervasive in our lives, and they are doing more harm than good.

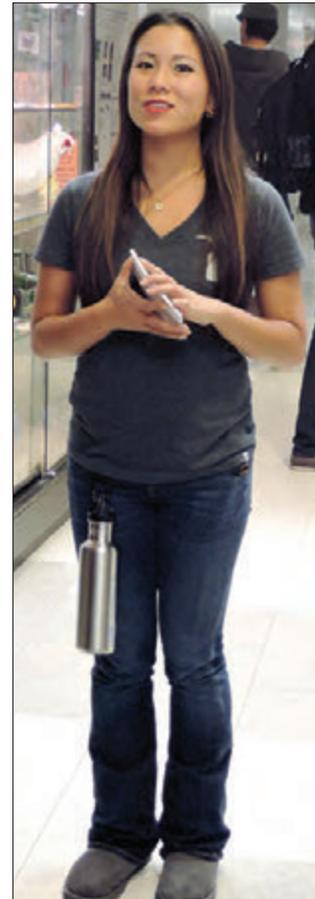
- Earth Week 2015, organized by the Students for Environmental Concerns (SECS). In an Earth Day (April 22) event co-sponsored by the ActGreen student group and iSEE, green marketing guru Jacquelyn Ottman visited campus to give an inspiring keynote address on the

theme of transforming sustainability challenges into opportunities — no matter what field of work you are in.

- Arbor Day Celebration. On April 24, the University of Illinois at Urbana-Champaign took a step towards becoming an official Tree Campus USA School by planting a new tree on the Main Quad. Students passing by stopped to throw a shovel of dirt or two to welcome the newest addition to the Illinois Main Quad landscape, sponsored by iSEE and Facilities & Services.

- Upcoming: In recent months, iSEE has been preparing a conference for local businesses to learn about saving energy in their facilities. At the Community Conversation on Energy Conservation, iSEE will bring business and sustainability experts together to discuss why saving energy is a prudent business move — and to highlight programs to track energy use and spur reduction.

For more about iSEE’s participation in campus outreach activities, please visit the website at <http://sustainability.illinois.edu/annual-events-conferences/>.



Olivia Harris / iSEE

iSEE brought filmmaker and TV personality Angela Sun to campus for Sustainability Day 2014.

MORE ABOUT iSEE: Be Reached, Reach Us



**Institute for Sustainability,
Energy, and Environment**

ON THE WEB

MAIN WEBSITE: sustainability.illinois.edu

WATER AT ILLINOIS WEBSITE: water.illinois.edu

iCAP PORTAL WEBSITE: icap.sustainability.illinois.edu

STUDENT SUSTAINABILITY COMMITTEE WEBSITE: ssc.sustainability.illinois.edu

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TWITTER: twitter.com/sustainILLINOIS (@sustainILLINOIS)

GOOGLE PLUS: plus.google.com/101194230489291155598/about

YOUTUBE: bit.ly/iSEEyt

