

IQ - ISEE Quarterly

An update from the Institute for Sustainability, Energy, and Environment

What's new in research ...

iSEE Professor Stephen P. Long Takes Part in Paris Climate Conference

In December, 195 countries came together to craft a landmark agreement to reduce carbon emissions and control global warming at the 21st Conference of the Parties (COP21) to the United Nations Framework Convention on Climate Change (UNFCCC).

And the University of Illinois played its role in the Paris conference. Among the contributions was a Dec. 2 appearance by iSEE researcher Stephen P. Long, a Professor of Crop Science and Plant Biology and a renowned climate expert.

In his panel session before lawmakers, thought leaders, political staff members, and concerned citizens, Long pointed out that agricultural innovation is needed now — not later — to avoid food shortages in a world with an ever-changing climate and a growing population.

Long was part of a slate of six speakers invited by the Grantham Centre for Sustainable Futures at the University of Sheffield to discuss the research challenges associated with developing a climate-smart agri-food system. Each speaker presented for five minutes, then took part in a question-and-answer session.

“With the projected increase in global food demand — which the United Nations says will be 70 percent more by 2050 — we have to increase productivity per unit area of land we’re using now,” said Long, the Gutsell Endowed Professor at Illinois, and a Fellow of the Royal Society (2013), the American Academy for the Advancement of Sciences (AAAS), and the American Society for Plant Biology (ASPB). “Right now society is pushing back on agricultural innovations. We actually need to overcome that;



otherwise, we’re going to create more problems for ourselves.

“Given that we’ll need 70 percent more food by 2050, we need to be doing this now because we cannot afford to wait.”

[Hear the audio or read an Illinois Public Media interview with Long after the conference.](#)

[Get Grantham Centre’s slideshow presentations.](#)

Long is a co-Primary Investigator in the iSEE-funded Plants *in silico* research project. [Read more about the project here.](#)

And please turn to Page 5 for more information about the upcoming Plants *in silico* Symposium in May.

What's inside ...

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What's new in research (continued) ...

In the Spotlight: Matthew Alonso

In the Stored Solar Stove lab, Matt Alonso is a jack-of-all-trades as he seeks to understand how to collect, store, and recover solar energy for household cooking. He manages undergraduate students, collects data during cooking experiments, searches for new energy-storing materials, and tests the properties of those materials.

A Ph.D. candidate in Agricultural and Biological Engineering, Alonso completed a Masters in Mechanical Engineering with a focus on projection micro stereolithography in 2010. Afterward, he followed his passion for teaching as an instructor in the Illinois Engineering First-Year Experience (IEFX) program.

During that time he started conversations about the global cooking problem — 4 million deaths a year from inhaling smoke and particles from wood and other solid-fuel cooking fires — with adviser Bruce Litchfield. The two advised several groups of undergraduates working on a solar cooking projects, but had met failure in all attempts.

“Bruce and I didn’t understand why, and that’s why we wanted to go and give it a better push,” he said.

The idea for addressing the health risks of fire cooking had been in the back of Alonso’s mind for several years since a visit to his wife’s grandmother in Ecuador.

“I woke up in the morning and went to breakfast, and I walked into a cloud of smoke. This was something that was really new to me: the idea of having a wood fire indoors,” he said. “But wow, there it was, a wood fire in the corner of the room throwing all this smoke and soot into the air. I had no idea half the world was still cooking on fire.”



Let's Go to the Video!

► [Hear Matthew Alonso talk about the Stored Solar Stove project on iSEE's YouTube channel.](#)

Solar seemed a simple way to eliminate smoke but wasn't terribly practical, he said. With help from Litchfield, he set out to find a material and design that could store energy at a high enough temperature to cook on quickly.

“The initial work was really on the side. It was garage science, you know, begging and borrowing supplies to test,” he said.

It wasn't long until he had his first breakthrough.

“I cooked a 10-ounce steak, a pound of

sausage, and a couple cups of rice on the stored energy. That was more than 3,300 calories of food. It was really important for us to see that it can actually happen,” he said. “Now we just want to make it even better.”

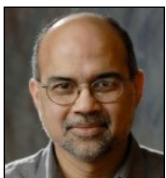
Alonso and his wife have lived in Champaign and Urbana for more than 10 years, and he has found ways to give back to the community. He has been a mentor for the CU 1-to-1 program and engages the community in STEM (science, technology, engineering, and math) outreach.

“I think being involved in iSEE has made me more vocal, getting a bit more involved in social responsibility,” he said.

[Read more on the Stored Solar Stove project.](#)

[Matthew Alonso's full iSEE profile.](#)

iSEE Progressing with Energy Scholars Project



During the Fall 2015 semester, the Institute moved ahead with plans to coalesce the Illinois Energy Scholars in the hopes of bringing together researchers across campus on teams that will pursue external funding opportunities. The Scholars met in November.

In December, an Energy Council was formed to steer

the next steps for the Scholars, and Nuclear, Plasma, and Radiological Engineering Professor Rizwan Uddin (left) was elected Chair of the Council.

The Council will work with iSEE to get an Energy at Illinois website up and running during the Spring 2016 semester. More coming soon!



What's new in campus sustainability ...

iSEE Launches Certified Green Office Program 2.0

Enrollment is now open for iSEE's new-and-improved Certified Green Office program — our initiative to help individual campus offices and units reduce their environmental footprint.

Last year, 26 offices participated in the program, in which iSEE connected with more than 1,200 employees who contributed their part to reduce campus carbon dioxide emissions. Now, our goal is to engage at least half of campus full-time staff by FY20 to create a bigger impact.

In preparation for the relaunch, several changes were made to the program's structure and resources to make participation easier and its impacts larger. The most noticeable change is elimination of a strict start and end date of the program.



iSEE will now enroll offices and accept completed applications on a rolling basis throughout the year. Certifications will be valid for one year from the time of completion. We hope this will allow more units to participate because they can work at their own pace.

To become a Certified Green Office, a group — not just those labeled “office” — that occupies space in a campus building or is affiliated with the University is eligible. The office must undertake five required sustainable actions — plus others of their choice to reach bronze, silver, or gold certification status.

Read more about the program and check out our list of sustainable actions at <http://go.illinois.edu/greenoffice>.



Housing Earns Prestigious

Governor's Sustainability Award

On Oct. 27, University Housing became a first-time winner of the Illinois Governor's Sustainability Award.

Regarded as the “Emmy Awards for Sustainability,” the annual Governor's Award conferred by the Illinois Sustainable Technology Center (ISTC, a division of the Prairie Research Institute) honors public organizations in Illinois for their implementation of sustainable principles and practices.

iSEE nominated Housing for the award in May 2015 in recognition of its outstanding sustainability efforts.

Reduction of food waste played a big part in Housing's award submission. Through trayless dining, use of an organic food digester, and participation in food donation programs, Dining Services has cut back on food orders (preventing leftovers and reducing shipping emissions) and vastly reduced the number of plastic bags of food scraps sent to the landfill.

Housing is dedicated to reducing other kinds of waste, too. During dorm move-out each May, Housing holds a salvage drive to collect furniture, clothing, appliances, and canned and boxed food that may otherwise end up in the garbage because it didn't fit in the car. Thanks to \$300,000 worth of lighting upgrades and efficiency projects in resident dorm rooms and common areas, Housing's facilities are also wasting less energy.

[Read the full article on the award on iSEE's website.](#)

[Read more about sustainability efforts on the Housing website.](#)

Bike Share Pilot Moves Forward

During the Fall '15 semester, iSEE shepherded a pilot program to test the effectiveness of a bicycle sharing program on Illinois' Urbana-Champaign campus. Student project leaders Catherine Kemp and Noah Feingold recruited 27 volunteer student riders to share the use of 12 bicycles at 11 parking stations around campus for their everyday travel needs.

The program, aimed at making bicycle travel more accessible to the campus population is relatively simple in its operation: After pay-

ing a small subscription fee, users download a phone app providing a map of available bikes. To “check out” a bike, users just click the bike's icon on the app, tap their phone to the electronic lock to release it, and then enjoy unlimited use of the bike during the one- to two-hour checkout session.

After reviewing feedback from the fall, iSEE will take the next steps in the pilot phase. The Institute will consider scaling up the program to 50 bikes and several additional parking stations.



What's new in education ...

SEE Fellows Program Starts Enrolling

At the end of Fall 2015, the Institute enrolled its first class of Sustainability, Energy, and Environment Fellows Program (SEE FP) students.

Starting in Spring '16, the 11 accepted undergraduates into this new campuswide minor will begin developing a systems perspective of sustainability and the environment, and finish their studies with a hands-on campus sustainability capstone project.

"There's a lot of student interest in this program. We're really encouraged by the fact that we had more than 30 students attend a November info session about the minor," said Madhu Khanna (right), Associate Director for Education and Outreach at iSEE. Many of these students were freshman and not ready to apply yet, she said, but their applications are expected in coming semesters.

The SEE FP is offered in partnership with six academic units — the Department of Agricultural and Consumer Economics

(ACE), the Department of Civil and Environmental Engineering (CEE), the School of Integrative Biology (SIB), the Department of Natural Resources and Environmental Sciences (NRES), the School of Earth, Society and Environment (SESE), and the Department of Urban and Regional Planning (DURP) — which are also contributing teaching faculty.

Beginning in January 2016, the first minor-related course is being taught. ENVS 301: Tools for Sustainability is being team-taught by Khanna, Professor of Agricultural and Consumer Economics (ACE); Jeremy Guest, Assistant Professor of Civil and Environmental Engineering (CEE); Lulu Rodriguez, Associate Professor of Agricultural Communications; and Daniel Miller, Assistant Professor of Natural Resources and Environmental Sciences (NRES).

Update: Fall 2016 enrollment is now open through March 1. [Students may sign up for an info session using a web form here.](#) [More details about the SEE FP and courses on our website.](#)



What's new in campus sustainability (continued) ...



Facilities & Services

Illinois a Winner in Kill the Cup Campaign

The University of Illinois at Urbana-Champaign took home first prize for Social Impact in its division of the national Kill the Cup campaign, a competition between 16 universities seeking to raise awareness about the wastefulness of disposable paper and Styrofoam cups.

For six weeks in October and November, more than 180 students took photographs of themselves using reusable mugs rather than nonrecyclable to-go cups at campus coffee shops, nabbing Illinois the first place spot for participation in our four-school division. iSEE Intern Katie Pollman was one of the organizers of the campaign here.

In addition, Illinois ranked fourth overall for Waste Reduction. At our designated competition coffee shop — the Espresso Royale Cafe on the corner of Oregon Street and Goodwin Avenue (next to Krannert Center for the Performing Arts) in Urbana — reusable mugs were used for 14.7 percent of drinks purchased during the competition.

As a reward for students' efforts, campus will receive \$500 from the Kill the Cup organizers to be used on future sustainability campaigns.



Solar Farm Up, Running

The University of Illinois' 5.87-megawatt solar farm was officially opened for business on Nov. 19, 2015.

The 20-plus-acre site (containing more than 18,000 solar panels) is expected to provide 2 percent of campus' total electrical energy needs.

Funded in part with more than \$1 million from the Student Sustainability Committee (SSC), the farm begins as a 10-year power purchase agree-

ment and will be operated by Phoenix Solar Inc.

As part of fulfilling the project's goal of providing solar data for research and education, a [Solar Farm online dashboard](#) has been created. The website provides hourly information on the array's energy production and impact to campus.

[Learn more about the solar farm in Facilities & Services' news release about the farm's opening.](#)



What's new in outreach ...

Psi Symposium Set for May 18-20

SAVE THE DATE: The iSEE-funded Plants *in silico* Project team will hold a research symposium May 18-20, 2016, at the National Center for Supercomputing Applications (NCSA).



Plants *in silico* (Psi) is a global research effort to provide comprehensive computer modeling of plants, growth, and productivity — at the molecular, cellular, plant, and ecosystem

levels.

The ultimate goal of the project is to accelerate food and bioenergy production in a changing climate.

By using computer modeling, scientists

can conduct their experiments much more quickly than by examining each growth cycle in a field.

The Psi Symposium will feature presentations by experts in modeling plant processes, leaders in achieving *in silico* representation of other organisms, and computational scientists.

The workshop portion of the Symposium will facilitate collaboration and map a course to achieve plants *in silico*.

[Stay tuned to our Symposium page for news on registration, speakers, and accommodations.](#)

[Read more about the Plants *in silico* Project on the iSEE website.](#)



iSEE Congress 2016 to Explore Future of Energy

The Institute has set Sept. 12-14, 2016, for its third annual iSEE Congress, and the working title of the event is “Energy 2030: Paths to a Sustainable Future.”

The conference, which will be in the Alice Campbell Alumni Center, will kick off with a keynote address the evening of Sept. 12, then contain plenary sessions and other keynote speakers the following two days.

According to iSEE Associate Director Madhu Khanna, the purpose of this year's iSEE Congress is to assemble leading national and international scientists from different disciplines to present the latest research on the potential for improvements in energy efficiency, alternative forms of renewable energy, and other forms of low-carbon sources of energy to meet societal needs for electricity, transportation, and heating more sustainably in the future.

The conference will advance understanding about the technological breakthroughs and global policy solutions for enhancing



energy conservation and reducing the carbon footprint of energy consumption. The event will provide a forum to not only discuss the near- and medium-term challenges on the path toward sustainable energy consumption, but also to highlight an agenda for actionable research and policy directions that could contribute to long-term solutions.

[Stay tuned for more Congress updates in the coming months by visiting the iSEE website.](#)

iSEE Takes Lead on Events for Sustainability Week 2015; Earth Week Next

Along with a campus tree walk in the front and side yards of the Illini Union and a tour of the campus waste handling station during Sustainability Week — Oct. 19-23, 2015 — iSEE was proud to host two major events:

- The 2015 Illinois Climate Action Plan (iCAP) was officially released on Wednesday, Oct. 21, at the iCAP Forum. With special guest Peter Schiffer, Vice Chancellor

for Research, the event reaffirmed campus' commitment to environmental stewardship, and told of the progress campus has made thus far toward its goals. [Learn more about the iCAP on the iSEE webpage.](#)

- Also on Oct. 21, Filmmaker Shalini Kantayya came to campus to discuss and screen her “Catching the Sun” documentary. The film examines the clean energy future through the eyes of American workers

training for jobs in the solar industry.

We interviewed Kantayya before the event about her environmental philosophy and filmmaking style. [Read her advice to young activists in our Q&A here.](#)

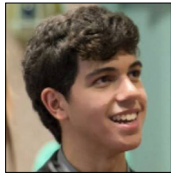
NEXT UP: The Institute is looking forward to supporting campus events for Earth Week 2016, which will be April 18-22. [Stay tuned to our Annual Events page for details as they become available.](#)

What's new with the Student Sustainability Committee ...

New SSC Chair Taking the Reins

The Student Sustainability Committee is proud to welcome its newest full committee Chair, Paul Couston.

Couston, a Freshman in Industrial Engineering, has had a lifelong interest in sustainability, and he was heavily involved in spearheading green initiatives at his high school. From his first day on the Urbana-Champaign campus, he knew he wanted to get involved in environmentalism at the University of Illinois.



Couston is the fourth person to serve as chair of SSC since it began allocating funds in 2007, and he says he's thrilled for the opportunity.

When asked why he wanted to serve on the committee, he shared "From the Solar Farm to the Sustainable Student Farm, the SSC has a history of excellence and efficiency. I view my service as SSC Chair as a way of giving back to my campus.

"As I transition into this role, I expect the next few years to

Funding Applications Due Feb. 9

It's not too late to apply for Student Sustainability Committee grants! Students, faculty, and staff are encouraged to submit project proposals for the Spring 2016 funding cycle by Feb. 9, 2016.

Past funded projects have ranged from \$500 to more than \$500,000, and range from the Sustainable Student Farm to a lighting retrofit at Krannert Center for the Performing Arts.

[For more information, please visit SSC's website.](#)

become some of the most productive years for sustainability on campus."

[For a full listing of SSC members, visit the Committee website.](#)

In Tune: The Sonified Sustainability Festival

The Student Sustainability Committee (SSC) has funded the first-ever Sonified Sustainability Festival for the Spring 2016 semester. A celebration of sustainability in the arts, this series of programming will bring musicians with environmentally responsible practices from across the country to perform on campus.

The festival serves the educational mission of SSC by partnering with Krannert Center for the Performing Arts on a performance project for the first time.

"This is the first time SSC's had the opportunity to help support a project that links sustainability with the arts, and we're very excited to help support it," said Micah Kenfield, staff advisor to SSC.

The first Sonified event of the semester will feature Tom Nunn and Paul Winstanley performing "Music for Hard Times" at 7:30 p.m. Feb. 18 at Krannert Art Museum as part of the Sudden Sound Concert Series. Since 1976, Nunn has built and performed on handcrafted instruments using recycled and repurposed materials. His innovative instruments combine cardboard boxes, washers, combs, and other objects to create experimental and often improvised music.



Leading up to Earth Week, the Sonified Sustainability Festival will host Ken Butler, a Brooklyn-based artist who has been performing since 1978 on hybrid musical instruments created primarily from urban detritus such as tennis rackets, hockey sticks, umbrellas, axes, snow shovels, rakes and discarded metal. From April 12 through May 2, Ken Butler's Hybrid Visions will be on display at the Illini Union Art Gallery.

The formal opening will take place at 4:30 p.m. April 14. Butler's exhibition will feature his hybrid musical instrument sculptures, which serve Butler's commitment to reimagine our relationship with

the objects around us.

The culminating event will take place at the start of Earth Week on Saturday, April 16, at Krannert Center for the Performing Arts. This all-ages event, admission-free to campus and community audiences, will feature live music by Butler performing with his sculptural "hybrid instruments." Area musicians and interactive art making focused on sustainable practices in the arts, and an accompanying information fair will provide greater visibility of local projects, programs and organizations working toward a sustainable future.

[More details may be found on the Sonified website.](#)