

IQ - ISEE Quarterly

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

What's new in campus sustainability ...

Wind PPA, Biomass Boiler Show Campus Commitment to Renewables

In December, two campus renewable energy ideas that iSEE helped push became a reality:

Wind PPA

The campus took a major step toward one of its Illinois Climate Action Plan (iCAP) goals via a [10-year power purchase agreement \(PPA\)](#) with EDP Renewables North America LLC for at least 25,000 megawatt hours (MWh) a year of wind-generated electricity. This purchase will increase campus' clean energy total to 33,200 MWh/year, nearly 9 percent of projected FY17 annual electricity consumption.

"Lowering emissions from energy use is a monumental piece of the iCAP and its stated goal for campus to be carbon neutral by 2050, and I am proud to see Facilities & Services taking the steps needed to make it happen," iSEE Director Evan H. DeLucia said.

The iCAP includes an objective to increase purchasing of clean energy to 120,000 MWh per year by 2020. The new PPA pushes campus past more than one-fourth of that objective.

The agreement was the product of one of the first recommendations that came from iSEE's formal campus sustainability process, which the Chancellor approved in June 2014. One month later, campus and F&S administrators received the Energy Gener-

ation, Purchasing, and Distribution (EGEN) SWATeam's recommendation that campus pursue PPAs with "one or more wind farms as soon as possible." [Read iSEE's take on the PPA.](#)

Biomass Boiler

Major upgrades to the heating systems in the main greenhouse at the Illinois Energy Farm are almost complete after the arrival of the biomass boiler, which will begin heating that facility before the end of winter.



In this greenhouse, researchers study energy crops from tropical climates — a climate that is expensive to re-create using 8,000 gallons propane in the middle of Illinois' winter months. The state-of-the-art 198 kW Heizomat boiler will burn part of the Farm's energy crop harvest to heat water that will be piped through the greenhouse and help maintain the conditions needed for research while reducing greenhouse gas emissions by ~60 tons per winter.

The purchase of the boiler and its installation were supported by grants from the Illinois Clean Energy Community Foundation (ICECF), the Student Sustainability Committee (SSC), the Dudley Smith Initiative, the F&S Revolving Loan Fund, and proceeds from the 2015 campus sale of verified carbon credits to Chevrolet.

[Find updates on the iSEE website.](#)

What's inside ...

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In the Spotlight: Ron Revord

Ron Revord is a Ph.D. student studying plant breeding and genetics. Specifically, he focuses on the development of a new variety of hazelnut tree that will thrive and be profitable in mixed-species agricultural systems.

A featured plant in many of the test plots at the iSEE Agroforestry for Food project's research site, the hazelnut can be an important part of the agricultural ecosystem. When processed, hazelnuts produce large amounts of oil that can have similar industrial applications as soybean oil. However, the hazelnut species currently available at nurseries are not bred for Midwest conditions, Ron said.

Modern soy has been engineered through breeding and genetic modification over decades to fight disease, repel pests and produce lots of food. To a large extent, hazelnuts have not been bred like this — but must be to become economically viable.

Ron is the beginning of that breeding program. In partnership with Rutgers University and sponsored by the Agroecology and Sustainable Agriculture Program, Ron identifies specific genetic markers for disease resistance and high crop production in a test group of hazelnut plants. When two plants with the identified desirable genes are bred together, he screens the offspring's genes to see if they possess enough of the desired traits. This eliminates some of the time-consuming trial and error in creating the next generation of plants — and researchers will need to create many generations to finally get all the required genes into one plant.

"Because of our collaboration with Rutgers University, we're only seven or so years away from having a viable variety for commercial hazelnut production in the Midwest. That may come off as a lot of years ... but there are zero



varieties right now," Ron said. Although hazelnuts have been selectively bred in the past, it was never with a Midwestern agricultural application in mind. He is starting nearly from scratch.

Ron completed a Bachelor's degree in Molecular and Cellular Biology at the University of Illinois in 2012, and he was looking for "something more applicable to big-world problems today."

He found that something in sustainability. For the last two years of his undergraduate experience, Ron conducted undergraduate research on native biofuel crops with DoKyung (D.K.) Lee's laboratory at the Energy Farm. His time spent with this lab group deepened his interest in the feasibility of mixing ecology and agriculture.

[Read the full Ron profile on the iSEE website.](#)

[More about the Agroforestry for Food project on the iSEE website.](#)

Sun Buckets Students Earn Ocean Exchange Award

In November, student researchers in the iSEE-funded Stored Solar Stove Project were named recipients of The Ocean Exchange's 2016 Gulfstream® Navigator Award.

Presented at The Ocean Exchange's Annual Event, this \$100,000 award honors an outstanding innovation that demonstrates positive impact on the environment, economies, and health while respecting cultures around the world and has applications across multiple industries.

Sun Buckets, created by a team led by Agri-

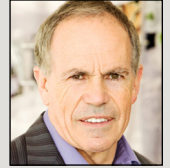
cultural and Biological Engineering Professor Bruce Elliott-Litchfield, are portable stored-solar-energy cookstoves that allow users to cook without fire, fuel, or emissions. The vessel emulates the temperature of fire and allows users to cook where and when they wish, even when the sun isn't shining. Team member Samantha Lindgren presented the world-changing solution on Nov. 10, and Sun Buckets earned the Navigator Award in a people's choice vote.

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

[More about the project on the iSEE website.](#)

U of I Researchers Publish Studies on Crops, Climate, Soil

• Crops *in silico* PI Stephen P. Long, a Professor of Plant Biology and Crop Sciences, was recognized in the New York Times and

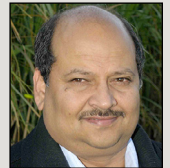


LONG

Science Magazine for his published breakthrough in photosynthesis research. Long's team achieved a 20% increase in yield in tobacco — but believe that increase will be applicable to food crops as well. [Read the NYT article.](#)

• Meantime, iSEE Steering Committee member Praveen

Kumar, a Professor of Civil and Environmental Engineering, and Long published findings in *Global Change Biology*, which showed that by decreasing the leaf area on a soybean plant by 5%, crop yield can increase by 8%. Extra leaves affect sunlight and water resources.



KUMAR

[Read the article.](#)

• iSEE Director Evan H. DeLucia, a Professor of Plant Biology, and his team published findings on the vicious cycle between



DeLUCIA

climate change, carbon storage in soil — and the soil's fertility. [Read more.](#)

What's new in education ...

New Levenick iSEE Teaching Fellows to Shepherd Minor Capstone Experience

The Institute for Sustainability, Energy, and Environment (iSEE) has named Animal Biology Professor Ken Paige and Civil and Environmental Engineering Professor Jeffery Roesler the first Levenick iSEE Teaching Fellows as they prepare to teach the fall 2017 ENVS 492 course that will provide capstone research projects for the campuswide undergraduate sustainability minor at Illinois.

Paige, an expert in evolutionary ecology, and Roesler, whose research is primarily focused on construction materials and transportation engineering, will lead the new capstone course for the Sustainability, Energy, and Environment Fellows Program (SEE FP), iSEE's minor offered in collaboration with six academic units on campus.

In this final piece of the minor degree, students will apply sustainability assess-



PAIGE

ROESLER

ment tools, such as life-cycle analysis, cost-benefit methods and impact analysis to real-world problems related to sustainability of campus and/or the community to be developed in collaboration with campus, Facilities & Services, local sustainability planners, private firms, and non-government organizations. Field site visits will be arranged during regular class time to visit local buildings, businesses, civil and environmental infrastructure facilities.

Course activities are a blend of case study discussion, problem identification, site visits, and analysis. Team projects will develop collaboration skills, communication skills and project management skills. The course is designed for junior and seniors with an objective of engaging these students nearing completion of the minor in addressing broad societal challenges related to sustainability.

The appointments of Paige and Roesler were made possible by generous gift from Illinois alumnus Stuart L. Levenick and his wife, Nancy J. Levenick, of Peoria.

[More about the new Teaching Fellows and the Levenick iSEE Fellows Program.](#)

[More about ENVS 492 and other iSEE featured courses.](#)

[More about the SEE FP \(enrollment is now open in the minor through March 1!\)](#)

What's new in outreach ...

Mark your Calendars: Some Upcoming Events in 2017

• **Earth Week: April 17-22.** Coordinated by the Students for Environmental Concerns (SECS) and supported by iSEE, the week offers a time for the campus community to enact change and real movement toward affecting our campus environment and Mother Earth. [Schedule coming soon on the iSEE webpage.](#)

• **Yoshi Ogura Lecture: 3-5 p.m. Monday, April 17.** The Department of Atmospheric Sciences Colloquium, location TBA, will feature Illinois alumna Katharine Hayhoe, Associate Professor of Political Science and Director of the Climate Science Center at Texas Tech University. [More info coming soon on the DAS website.](#)

• **Charles David Keeling Lecture: 5-7 p.m. Tuesday, April 18.** Atmospheric Sciences Professor Emeritus John E. Walsh, former Director of the NOAA/Alaska Cooperative Institute for Arctic Research, will deliver this year's talk in the NCSA Auditorium. [More info coming soon on the iSEE website.](#)

• **MillerComm Lecture: 4-6 p.m. Thursday, April 20.** Kim Cobb, Professor of Earth and Atmospheric Sciences at Georgia Tech, will deliver this public lecture in Spurlock Museum's Knight Auditorium. [More info coming soon on the iSEE website.](#)

• **Crops *in silico* Symposium and Workshop: June 26-28 at University of Oxford, UK.** *Csi*, an iSEE seed-funded project, is

hosting its second annual gathering (the 2016 event was on the U of I campus) for experts in experimentation, agronomy, physiology, plant development, phenotyping, as well as experts in computational modeling, software development, and data visualization. The event aims to harness the great strides in understanding of plant function from genes to whole plants, to accelerate forward approaches to crop breeding and bioengineering. [Read more on the *Csi* website.](#)

• **iSEE Congress 2017: Sept. 18-20.** This year's Congress will be called "Building Resilience to Climate Change" and will assemble leading national and international scientists from different disciplines to advance scientific understanding about the impacts of climate change on the agricultural sector, on ecosystem services, and on human livelihoods and wellbeing, particularly among the most vulnerable sections of society. The event will provide a forum to discuss the near- and medium-term options for building resilience to climate change and policy directions that could contribute to long-term solutions. [Schedule, speakers, and more details coming soon on the iSEE webpage.](#)

• **Sustainability Week: Coming in October.** Our annual celebration of the great work the U of I campus is doing to reach carbon neutrality. [Schedule will be posted soon on the iSEE webpage.](#)

What's new with the Student Sustainability Committee (SSC) ...

Spring 2017 Film Series Set

The Student Sustainability Committee kicked off its spring film series Jan. 19 with a screening of "Just Eat It," a lighthearted documentary about food waste and its impact on the environment.

Film screenings will continue throughout the spring semester, with documentaries such as "Racing to Zero" (chronicling municipal efforts to move toward zero waste) and "Bikes vs Cars" (describing the struggles active transportation faces worldwide and ways to overcome them).

Screening dates and times will be announced on SSC's [Facebook page: UIUCssc](#) (or search for "Student Sustainability Committee") as well as its [Twitter feed: @ssc_uiuc](#).



'Just Eat It' filmmakers Grant Baldwin and Jenny Rustemeyer.

Spring Funding Deadline Feb. 5

Have an idea how to transform campus to make it more sustainable?



Consider applying for project funding through SSC! The committee's next deadline for Step 1 pre-proposals is 11:59 p.m. Sunday, Feb. 5.

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

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

ECBS SWATeam Renews Illini Lights Out in 2016-17

In November, iSEE's [Energy Conservation and Building Standards \(ECBS\) SWATeam](#), with funding from the Student Sustainability Committee (SSC), renewed efforts to turn off lights and close windows for the weekend in buildings on the Main Quad.



In just 30 minutes on Friday, Nov. 17, Illini Lights Out volunteers turned off 660 lights and closed eight windows in buildings on or near the Quad. The ILO event was repeated in December, and the ECBS team is planning monthly events during the spring 2017 semester starting in February.

[Visit the Facebook event page for the latest.](#)

Certified Green Office Program 3.0 Launched

In January, iSEE launched its 3.0 version of the Certified Green Office Program, an initiative to help implement sustainable practices into the campus workplace.

By updating their daily practices, groups ranging from small offices to entire departments can reduce their environmental footprint, help the campus save money, meet Illinois Climate Action Plan (iCAP) objectives and commitments, and respond to the over-

whelming interest of staff, students, faculty, and the surrounding community in creating a more sustainable University.

iSEE has now expanded the list of elective green actions offices can take to reach bronze, silver, or gold certification — and streamlined the enrollment and reporting process: *It only takes five easy steps*

to become a Certified Green Office!

[Read more at go.illinois.edu/greenoffice.](#)

