CIVIL and ENVIRONMENTAL ENGINEERING

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UPDATE

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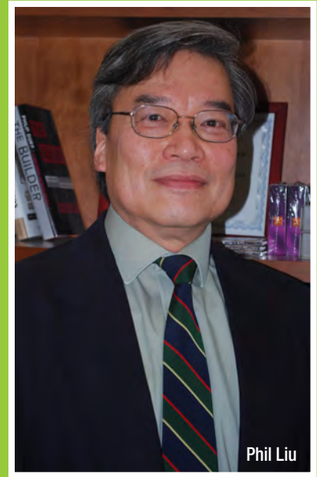
INSIDE:

Rewards of Research: CEE Faculty Receive Honors for Groundbreaking Work

Cornell University

FROM THE Director



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Dear alumni and friends,

We begin this year's issue by spot-lighting prestigious professional recognition a few of our faculty members have received this past year. The awards have come from the organizations of the National Academy of Engineering, American Society of Civil Engineers, American Association of Engineering Societies, and the Society for Industrial and Applied Mathematics. Professor Shoemaker and Stedinger's research and teaching abilities (along with my own) have culminated in receiving said recognition for our lifelong work.

In addition to these recognitions, the School welcomes two new faculty members to the environment mission area. Professor Pat Reed, coming from Penn State, began his career in CEE on July 1, 2013. His primary interests involve sustainable water management around conflicting human and ecological demands. Assistant Professor Damian Helbling came to us in January 2014 from the Swiss Federal Institute of Aquatic Science and Technology (Eawag) in Switzerland. Helbling studies water quality in relation to human and ecosystem health. More about their research focus is detailed within this newsletter.

As we welcome Reed and Helbling, we also continue our faculty renewal process. I am pleased to report that we have recruited an outstanding new faculty member in the Civil Infrastructure area, who will join us in Fall 2014. The faculty search for the CornellTech project is still on-going, and we will initiate more searches in the coming academic year. However, in order to attract outstanding new faculty, we must upgrade our laboratory/teaching facilities, thus we are planning a renovation project for the Environmental Processes Laboratory. A fund raising campaign for the project has begun.

As we greet new faculty, we have two faculty retiring this year: Professors Jim Bisogni and Tony Ingraffea have announced their intentions to retire at the end of this academic year. Professor Bisogni joined the School in 1973, and Professor Ingraffea started in 1977, both have made tremendous contributions to the growth and reputation of CEE. More about their careers can be found in the following pages.

Lastly, in 2015, Cornell University and CEE will be celebrating its 150 year anniversary. To begin reflecting on the School's history, Professor Emeritus John Abel and Jim Allen, CALS '69 tell us about Camp Cornell – how it got started, and what it was like. After reading this article, we hope you will share your stories and pictures of Camp Cornell along with any news you have to share with us at civil_env_eng@cornell.edu. We enjoy hearing from you.

Do not forget to join your classmates, faculty and staff at our annual Alumni Breakfast during reunion weekend, see the date and time on the back page. We look forward to seeing you there!

Sincerely,

Class of 1912 Professor and CEE Director

Rewards of Research: CEE Faculty Receive Honors for **Groundbreaking** Work

BY LAUREN CAHOON ROBERTS

Last year and this spring have been filled with distinctions and honors for many faculty members in CEE. In particular, faculty who focus on environmental and water issues in their research have been singled out. From optimizing groundwater restoration, to developing international tsunami warning systems, to quantifying flood risks, the scope and importance of CEE faculty research has now been recognized by four prestigious organizations, the American Society of Civil Engineers (ASCE), the National Academy of Engineering (NAE), the Society for Industrial and Applied Mathematics (SIAM), and the American Association of Engineering Societies (AAES), highlighting the research and teaching excellence that this School has to offer.

The ASCE, founded in 1853, is America's oldest national engineering society, representing over 145,000 members of the civil engineering profession worldwide. In 2013, the ASCE recognized Philip Liu and Jery Stedinger as Distinguished Members, a distinction given to only about 10 people each year. They join professors Christine Shoemaker, Pete Loucks and Fred Kulhawy, who were previously inducted as ASCE Distinguished Members. "Distinguished membership is the highest accolade a civil engineer can get aside from ASCE president," says Jane Alspach, Senior Manager of Honors and Awards with the ASCE.

On top of these honors, Stedinger was also awarded the ASCE Ven Te Chow award, which is given to "individuals whose lifetime achievements in the field of hydrologic engineering have been distinguished by exceptional achievement and significant contributions in research, education or practice." Christine Shoemaker was also singled out this year by the ASCE's Environmental & Water Resources Institute (EWRI), who gave her the Margaret Petersen Award for her "technical achievements, ASCE leadership, and commitment to mentoring women pursuing engineering careers . . ."

Stedinger has also been elected as a member of the NAE, which, founded in 1964, is a member of the National Academies and provides engineering leadership in service to the nation. Stedinger's election this spring is an honor that, according to the NAE website, "is one of the highest professional honors accorded an engineer." Stedinger joins his colleagues Professors Christine Shoemaker, Tom O'Rourke, Pete Loucks and Wilf Brutsaert who are already NAE members.

Shoemaker has additional accolades; she has been awarded the 2014 National Engineering Award from the AAES, which acts as the umbrella organization for multiple different engineering societies, serving as "the voice of the engineering profession in the United States." Previous winners have included University Presidents. And, last but not least, she was also elected a Fellow in SIAM in 2014.

Professor Christine Shoemaker was "very pleased and very surprised," to receive these honors. When Shoemaker first came to Cornell's CEE, she focused on civil engineering problems with an environmental focus, and later was appointed chairperson of the department of Environmental Engineering. "I think at that time I was one of the first women in the country to be a chairperson of any engineering department at a research university," says Shoemaker. "My department was very enlightened in the mid 80's to have encouraged the Dean to select a woman as department chair. That was the most difficult job I ever had, I think; to be chair of a department of all men, in a college that was almost all men, given the societal attitudes at that time" she says. "Half the department was older than me, and I wasn't a 'real' civil engineer." Nevertheless, her unusual expertise was ultimately a boon. "Having a Ph.D. in mathematics enabled me to move into new research areas that a traditional civil engineer wasn't trained to do. I also did a lot of self-study about environmental engineering since protecting the environment was my goal."

For example, Shoemaker used mathematical optimization methods to efficiently find the best solutions for groundwater treatment methods without having to use computationally expensive analyses. "These algorithms can tell you the best way to clean up groundwater, how quickly it can be remediated, and what the cost will be," she says. "Models for these systems are very nonlinear and difficult to deal with."

Simultaneously, Shoemaker spearheaded an international project to bring information on groundwater pollution to developing countries. "These developing countries were agrarian and didn't' have a lot of industrial pollution, but it was growing," she says. Her goal was to help prevent the contamination–rather than help clean it up. To do this, Shoemaker helped organize and raise money from the United Nations for expert-led workshops around the world, an effort that lasted for roughly ten years. "For a lot of places, our workshops were the very first meetings on groundwater contamination in these countries," she says. "There were many more after that, but ours were the ones that got things started." Since then, Shoemaker has continued to apply her mathematical expertise for environmental benefit. A recent project focused on the Cannonsville Reservoir, that provides water to New York City, which has no filtration plant, and would

need to spend $8 billion to build one. Shoemaker has created models to predict the impact of different strategies on reducing pollution. She is also using her models to analyze the integration of hydropower with wind power, and how to predict geological and hydrological effects of carbon sequestration. Shoemaker is also working with Jery Stedinger to analyze optimal functioning of the Bonneville Power Authority to ensure it meets the region's power needs without waste and ecological damage.

While Shoemaker's optimization algorithms have had broad-reaching benefits for environmental problems, they have an even wider reach beyond natural resources and pollution. "We've developed a methodology and algorithms that can also be used for many problems that arise in engineering and other fields," she says.

Professor Jery Stedinger's ASCE Ven Te Chow award was given for his "pioneering contributions to hydrologic and statistical methods used worldwide to quantify flood risk, address dam safety issues, drought risk, evaluate water resource system operation and evaluate drought risk." His induction into the NAE cited his use of statistical methods in flood risk assessment and optimization methods in hydropower system management.

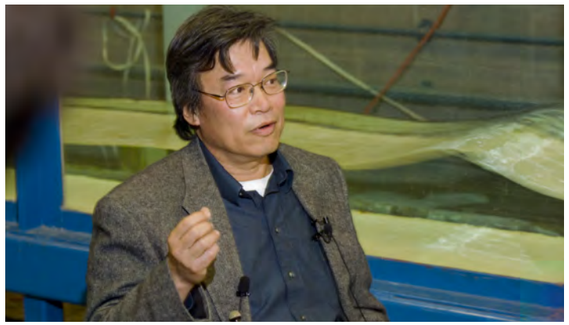
Since joining the CEE faculty in 1977, Stedinger has tackled optimization problems related to the design and operation of reservoir systems including hydropower operations. Stedinger's research had a dramatic impact on flood risk assessment procedures by illustrating the potential value of incorporating historical data, such as flood markers on old buildings, checking old newspaper records, or pursuing other records. He was also the first to point out the importance of the lack of evidence of flooding when creating flood frequency models. "People would say, 'we don't have any records of floods in this area, so we don't have any information.' To the contrary, you actually have important information–it means there have *not* been any floods for that period of time that exceed some threshold–that tells you a lot," he explains. Stedinger didn't stop with records that people left. He collaborated with dendrochronologists to determine when large floods have occurred as far back as 200 years earlier thanks to evidence from scarred and fallen trees in a river basin. In arid, desert regions of the Southwest, Stedinger looked at even older data by working with geomorphologists, who used ancient sediment lines in caves and overhangs to determine the magnitude of floods over a period as long as 2000 years. "We demonstrated that the value of such data was remarkable, and well worth its collection and use in flood frequency analysis," Stedinger says.

In addition to his flood frequency work, Stedinger pioneered the use of a statistical framework known as Generalized Least Squares (GLS) into a "workhorse" for regional analysis of hydrologic statistics. "The methods we developed have been used by the U.S. Geological Survey since 1985," says Stedinger. "It became the gold standard for doing that kind of analysis."

Stedinger says the tight-knit and collaborative atmosphere within CEE has contributed to his successful career. "I really appreciate having such wonderful colleagues. It creates an atmosphere of support," he says.

Professor Philip Liu received his Distinguished Membership last year for "pioneering contributions in coastal engineering research that has helped define the current state of the field and for development of models to assess tsunami inundation/damage and for educating the next generation of coastal engineers."

As Director of the School of CEE and a Class of 1912 Professor, Liu has already been widely respected in his field, but the ASCE recognition solidifies his place as a thought leader in tsunami and coastal oceanography research. His work has focused on tsunami dynamics and origins, water wave theory, and how ocean and tsunami waves affect coastlines. Liu combines theoretical and mathematical modeling of wave behavior with physical laboratory models such as the water flumes of the DeFrees Hydraulics Laboratory at Cornell.



"Over the years we have developed several different models that help us understand wave dynamics better," says Liu. "From a practical perspective, we developed a tool that helps engineers design coastal structures and estimate how a structure is going to behave."

In the early days of his research, Liu says it wasn't easy to find funding–very few large tsunamis had occurred, thus research on these phenomena wasn't considered pressing. Nevertheless, Liu and his colleagues continued their work, investigating the use of ocean buoys as a potential offshore warning system for tsunamis. The U.S. government was reluctant to spend money on more than a couple of these buoys–that is, until in 2004, when a massive and deadly tsunami in the Indian Ocean devastated coastal areas in Indonesia, Sri Lanka, and Thailand killing over 230,000 people in 14 countries. Suddenly, tsunami research was paramount. "It was then the U.S. government said, 'let's do something about this,'" says Liu. Now, there are 39 warning buoys in the Pacific Ocean alone.

In addition to tsunami research, Liu and his research group study a broad array of problems in the field of fluid mechanics and hydrodynamics, including wave-seafloor interactions, sediment transport, wave propagation and breaking, the effect of landslides on wave behavior, and quantifying uncertainties in predictions about inundation zones.

Patrick Reed Brings a World of Experience to Cornell

BY LAUREN CAHOON ROBERTS

Patrick Reed has made a career out of managing water resources, an interest that began with a powerful event. While getting his degree in geological engineering at the University of Missouri, Reed's hometown, St. Louis, was hit by the '93 flood of the Mississippi. "Pre-Katrina it was the largest natural disaster in U.S. history," Reed says. "So I got to see my friends and family impacted by all of that . . . we saw homes float down the Mississippi."

The already enormous river swelled to 20 times its typical width. Tributaries that normally flowed into the river suddenly flowed backwards as the Mississippi waters traced their way back up the creeks. "Whole areas of St. Louis were submerged," says Reed. "Luckily, where we lived was a high point. But it was a high point where you could see all the devastation."

The disaster had a lasting impact on Reed. "I got to see decisions up close and personal–do you save St. Louis, and if you do, you have to sacrifice an entire smaller town," he says. "As a college student I got to see some of the behind-the-scenes technical aspects of those decisions. It shaped me." From then on, he became deeply interested in managing water resources, and went on to get his masters and Ph.D. in civil and environmental engineering at the University of Illinois at Urbana-Champaign.

As his career progressed, Reed began developing management tools that bridge computer science, operations research, and water resources, ultimately joining the faculty in the Department of Civil and Environmental Engineering at Penn State. There he initially focused on groundwater management and monitoring, and soon expanded his work to hydrology related to the Susquehanna River basin (Figure 1). He also began developing new software frameworks linking optimization, uncertainty analysis, and visualization. While his focus had originated from the need to manage water systems, these tools have broad applicability to any complex engineered system. "You have these very complicated design systems where it's very difficult to understand cause and effect or their tradeoffs," says Reed. "So my tools explain these things, to help decision making."

Reed's software harnesses the power of Darwinian natural selection as a method of letting engineered systems "fight to survive" on a computer, determining which one is optimal. "The idea is that you simulate natural selection, it's an effective way to go through very complicated spaces to try to get optimal tradeoffs," he says. Reed's technology incorporates visualizations of these potential tradeoffs; graphs of data points undulate and scatter as the algorithms work their magic, ending with a final layout displaying the tradeoff landscape, enabling a user to view the 'what ifs' of each decision.

These tools have proven useful to a number of industrial partners; the Aerospace Corporation has used them to design U.S. satellite constellation systems, along with a startup airline logistics company, as well as many other businesses that require methods to analyze complex engineered systems.

Reed is also applying these tools to even deeper problems—such as climate change. Currently, he's working on a collaborative project involving more than 20 institutions examining climate risk and decision-making. "There's well-defined uncertainty, which is, you have a strong understanding of how to define it, why it's there, how it's distributed," says Reed. "And then there are deep uncertainties, which, you're not even sure what the possibility space is." Climate change is an example of deep uncertainty, in which experts don't know the future population distribution, or the effects of a changing climate, or what the legal or political context of a decision will be.

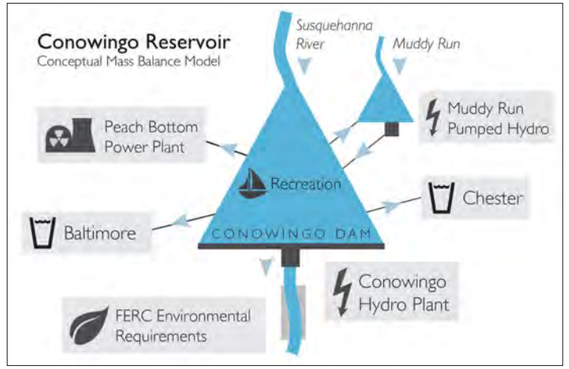


Figure 1

Reed will continue the work he started prior to joining Cornell's School of Civil and Environmental Engineering, tackling the questions of how humanity should manage climate risks, along with research related to helping urban water utilities manage their water resource portfolios. He is also leading a Blue Waters project, which uses one of the largest supercomputers in the world to discover new design strategies for observing global precipitation via space. Reed also has active collaborations with institutions in Milan and London examining how best to manage water supply and reservoir operations in major river basins.

While his work has taken him around the world, including a stay on Italy's famed Lake Como, Reed believes Ithaca is hard to beat. "I chose Cornell because of the quality of life in terms of the surrounding community and town," he says. "That, combined with the caliber of the university and the freedoms supported in the University, you'd be hard pressed to find anything better in my book."

Damian Helbling Applies Innovative Approaches to Environmental Problems

BY LAUREN CAHOON ROBERTS

If you ask Damian Helbling, one of CEE's newest faculty members, which books had the most significant impact on his academic interests, he'll list three–*Silent Spring*, an ecological classic; Our *Stolen Future*, which describes the dangers of endocrine disruptors; and *Environmental Organic Chemistry*, a hefty textbook that "describes our current state of knowledge on how chemicals behave in the environment" says Helbling. These three books helped direct Helbling to his current path; investigating how man-made contaminants move and change through natural and engineered water systems, and how to lessen their impact on humans and the environment.

Helbling majored in civil engineering with a minor in environmental engineering at Pennsylvania State University as an undergrad, and spent a formative summer doing an NSF research fellowship in Bozeman, Montana. This was Helbling's first foray into studying aquatic contaminants; he helped examine the feasibility of man-made wetlands as filtration systems for residential waste and run-off. He examined the transport of chemical contaminants as they moved through the maze of biofilm-laden root systems of cattails and bullrushes. "The experience was huge in solidifying my interest in environment engineering," says Helbling.

After graduating and working for consulting firms that helped drinking and waste water treatment plants manage and update their distribution systems, Helbling entered a M.S./Ph.D. program in civil and environmental engineering at Carnegie Mellon University. There, he studied the use of sensor networks to monitor Pittsburgh's century-old (or older) drinking water system. "There's a lot of control over water quality in the water treatment process, but once you release the water into the distribution system a lot can happen before the water reaches the tap," says Helbling. This was problematic, since the aging pipes that made up the city's system were often breaking, routinely shooting "geysers up through the streets." Helbling investigated whether and how water quality sensors could measure and mitigate an accidental or purposeful contamination event in the drinking water system. "It's a tough problem," says Helbling. "Water utilities have limited resources to deploy, maintain, and monitor sensor data. What parameters make the most sense to monitor and how do you effectively place sensors in a distribution system to ensure detection of contamination events?" Using experimental simulations and models, Helbling and his colleagues analyzed these different objectives individually in an effort to identify the ideal sensor parameters and how to place them in the distribution system.

During this time, Helbling read *Silent Spring* and *Our Stolen Future*, which sparked his interest in the links between aquatic ecosystems and human health and development. The textbook *Environmental Organic Chemistry* pointed him to his next destination: the main author of the textbook, Rene P. Schwarzenbach, worked as a renowned environmental chemist at the Swiss Federal Institute of Aquatic Science and Technology (Eawag), the institute in Switzerland known for its research in this area. "That was the nexus of the universe for people doing this kind of work," says Helbling, "so I ventured to the nexus of the universe" as a post-doc.

There, he focused on predicting where organic chemicals end up in the environment, and how they transform. Traditional analytical methods look for the specific chemicals, yet natural chemical reactions can change a contaminant's structure slightly, disguising it from monitoring efforts yet still leaving it a dangerous pollutant. With roughly 75,000 different man-made chemicals poured into the environment on a daily basis from human activity, this presents a staggering problem in terms of anticipating how each and every contaminant could transform. Helbling wants to solve this problem by taking a generalist approach: "if we haven't studied a certain chemical in significant detail," he says, "can we make predictions on how it will transform in the environment and whether or not the transformation products will still pose a risk?"

Helbling started tackling this problem at Eawag, and continues the work at Cornell, where he recently started as an Assistant Professor in January 2014. He uses high-resolution mass spectrometry to propose the structures of the products of chemical transformations with a high degree of confidence. "The instrument measures the exact mass of these chemical products," he says, which enables them to indirectly deduce the molecular formula, and, potentially, the chemical structures of contaminant breakdown-products. "This streamlines the process. You can make proposals on the structures of these chemicals with much higher confidence."

At Cornell, Helbling will also focus on how to revolutionize wastewater treatment systems. A new approach is sorely needed—wastewater treatment plants were originally designed to protect humans from the spread of infectious diseases. Later, they were revamped to remove nutrients that were damaging surface water systems. "Now, we want them to protect us from these tens of thousands of chemicals in our water–that's my primary motivation," says Helbling.

With his array of ambitious research aims, Helbling has come to the right institution. When he was applying to faculty positions, Cornell's reputation, as well as its broad vision and goals, appealed strongly to Helbling's drive and multi-faceted research interests. "The School of Civil and Environmental Engineering was very supportive of my research ideas," he says. "I had a strong sense that they were interested in what I was doing, and wanted to help me get it off the ground."

Remembering **Summer Survey Camp**: Cornell Pioneers Experiential Learning

BY JOHN ABEL AND JIM ALLEN

As Cornell approaches its sesquicentennial in 2015, Civil Engineering (CE) alumni from the classes of the 1940s to the early 1960s have kindly shared their memories of one of the formative experiences of their undergraduate days: Summer Survey Camp (5 weeks of tent living for a required 5-credit course). But further examination of the 86-year history (1877-1963) of the camp reveals a larger-than-reminiscent significance. Not only was survey camp the first of its kind (and later much imitated) in U.S. CE education, but it was also the very first example at Cornell of "experiential learning," the component of engineering education that now permeates most fields at Cornell and across the country. While surveying has now virtually disappeared from CE baccalaureate curricula nationwide, and "Camp Cornell" is but a source of tales for those attending their 50+ reunions, the story behind its origin, duration, and demise reveals its significance in the evolution of engineering education.

Civil engineering at Cornell began with the University's founding, and at Cornell's first commencement in 1869, all engineering graduates were in fact CEs. The first professor of CE, appointed in 1868, was William Charles Cleveland, who worked as the sole CE faculty member to gradually expand the curriculum, including the establishment of graduate degrees, until his death in 1873, when there were 94 students enrolled. It was his successor, Estevan Antonio Fuertes (1838-1903), hired in 1873 to be Dean of the Department of Engineering, who truly built Civil Engineering at Cornell. Fuertes had been the engineer for the Croton Aqueduct project in New York and in 1870-71 was commissioned by President Ulysses S. Grant to survey the isthmus for a possible canal. With his broad professional experience and perspective, he soon led the nation in establishing laboratory work as a necessary adjunct to the engineering curriculum at Cornell. Among his first efforts in this direction was organizing in 1874 a two-week fieldwork project for CE juniors and seniors to begin a geodetic and hydrographic survey of Cayuga Lake. By 1877, such a surveying project was formalized within the curriculum as an annual summer activity, the official beginning of Cornell's Summer Survey Camp (Figure 1). Later under Fuertes' leadership, various models, instruments and lab equipment were acquired, and newly built CE facilities were inaugurated at Lincoln Hall in 1889 and at the Fall Creek Hydraulic Laboratory in 1898. (In 1890, his appointment was changed to Dean and Director of the College of Civil Engineering.)

Figure 1: Summer Survey Camp students, Class of 1878

In his book, *Cornell University: A History* (New York, 1905), W. T. Hewett reports on the extent of the summer camp efforts of CE students over the last quarter of the 19th century. The Cayuga Lake survey took four summers, 1874-78, and was followed by surveys of the other major Finger Lakes: Seneca 1878-83, Keuka 1884-88, and Canandaigua 1888-90. The quality of the resulting maps led to their acceptance by the U.S. Geological Survey and publication by New York. Subsequent lake-survey projects included Skaneateles (1890-94), Owasco (1894-96) and Otisco (1897), and starting in 1898 attention shifted to mapping the Fall Creek Watershed.

Surveying at distances far from the campus required accommodation for the students and staff. In the late 1880s, students slept in boxcars on railroad sidings near the lakes being surveyed. The location of the survey camp shifted with different projects, so the boxcars became limiting. Tents were the most ready alternative and larger tents could serve both for studying and eating. In addition to food and quarters, there were other practical considerations. Field training in surveying required an accepting local population. Professor S.L. Boothroyd, the camp director in 1912, once encountered a farmwoman armed with a double barrel shotgun; she accused the professors and students of trespassing and demanded a monetary fee. There were other challenges to student health and safety aside from inhospitable landowners. The Finger Lakes were large and cold, so drowning was a worry; and in summer, malaria was a risk due to nearby swamps. The faculty ultimately recognized that changing camp locations annually prevented a uniform experience in survey techniques for all students. A permanent camp, if ideally located, would allow students to safely manage the various surveying projects – mapping, hydrographic, geodetic, route layout – from inception to completion.

By the 1920s, two local families had acquired joint ownership of a 400-acre farm on the east side of Cayuta Lake (sometimes called Kayutah), about 25 miles SW of Ithaca. Albert G. Stone, an Ithaca banker, wanted a portion of the land as a summer retreat, while Fred R. Allen wanted the fields to support his inlet valley farm. Unfortunately, Fred died in the great flu epidemic after World War I; and Susie R. Allen, his widow with two children, inherited his partnership interest in the property. These two unlikely partners, a banker and a widow, became the original benefactors for Camp Cornell. Although permission to use the Allen/Stone property was apparently not documented in any deed, lease, or memorandum of understanding, permission was somehow granted, and the CE faculty wasted no time in selecting a large, well-drained field that was adjacent to County Route 6, within walking distance of the lake, and bordering on the rural Connecticut Hill area. Construction of the Summer Survey

Figure 2: Camp Cornell dining hall and tents. The original sign was rescued in 1995 by James Allen, CE '34.

Figure 3: Camp Cornell faculty, staff and students, 1961, in Havana Glen, the mapped site. Co-author Jim Allen, the "camp boy" on the staff, is in the first row, 4th from right; and co-author John Abel, a student, is in the second row, 9th from left.

Figure 4: Visitor at today's Camp Cornell monument. The benchmark at right is located nearby the replica of the original sign.

Camp included tent platforms for housing faculty and students, a permanent mess hall for meals and lectures, an instrument building for storage of equipment, and latrines (Figure 2). A sign was erected and a permanent Cornell benchmark (registered with the USGS) was established as the reference point for many of the projects (Figure 4 right). The 1929-1930 Courses of Study, CE 213: Summer Survey is the first to clearly identify Cayuta Lake as the location for Camp Cornell.

The Cayuta Lake camp was used nearly every summer from 1929 through 1963 (Figure 3 shows campers from 1961, including the authors of this article). A comparison of the course descriptions from 1929-1937 with those from 1960-1962 shows a remarkable continuity of professional project content over the decades: a topographic survey and map with emphasis on transit-stadia and plane table-stadia methods, a hydrographic survey of Cayuta Lake, baseline taping, precise leveling, and astronomic observation for azimuth and time/position. Added in the later years were a route surveying and layout project, triangulation with repeating and direction type optical-reading theodolites, and (consistent with the Cornell faculty expertise developed after WWII) the application of aerial photography.

The Summer Survey Camp course was discontinued in 1963-64, and control of the Cayuta Lake campsite reverted to the landowners. In 1995, owner James Allen '34 (son of Fred and Susie Allen and a Cornell CE alumnus) found the camp sign shown in Figure 2 among the rubble of the abandoned instrument building and returned it as a memento to the School of CEE. The site of the camp, with none of its structures surviving, is currently subsumed by Lake Grove Park, a summer-resort camping area owned by the Allen family descendants. But in the past two years, they have constructed a historical monument to the camp with a duplicate of the original sign and some information plaques at the site of the surviving benchmark (Figure 4).

The demise of surveying within the CE curriculum in the several years following the last summer camp is attributable to changes in engineering education, the CE profession, and technology. By the mid-1960s, the Cornell engineering curriculum reverted from 5 years to 4, with a concomitant de-emphasis on "how to" courses such as surveying and drawing and an increased focus on design and theory. Surveying continued to be taught at community colleges, and the field practice fell increasingly to technicians supervised by engineers. At the same time, there was increased differentiation between professional licensing in land surveying as opposed to engineering. However, through the activities of past-faculty members such as Donald Belcher and Ta Liang, Cornell CEE became noted for contributions to air photo interpretation and photogrammetry, and continued to offer elective courses in these subjects, with a gradual transition to research and teaching in "remote sensing" that includes satellite imagery as well as air photos. Finally, the entire fields of measurement and mapping have been transformed through the development of lasers, microprocessors, GPS, and computer-aided applications.

Nevertheless, experiential learning as pioneered by Cornell CE continues to thrive today in a variety of courses, projects, and competitions across the engineering curriculum. For example, current CEE students participate in the ASCE-sponsored steel bridge and concrete canoe competitions as well as in several multidisciplinary programs such as AguaClara, which designs sustainable water treatment systems that at present serve 30,000 people in 8 Honduran communities.

About the Authors: Jim Allen, CALS '69, served as the last "camp boy" in 1961. He is a retired Navy physician. John Abel, CEE '63, attended summer camp in 1961. He is Professor Emeritus of CEE.

Anthony R. Ingraffea

Anthony Ingraffea, known to most as "Tony," has announced his intention to retire on June 30, 2014. He enjoyed two years as a structural engineer with the Grumman Aerospace Corporation and two years as a county engineer with the Peace Corps in Venezuela before earning his doctorate at the University of Colorado in 1977. Since then, he has taught structural mechanics, structural engineering, and fracture mechanics at Cornell.

Throughout his career, Ingraffea has focused on computer simulation and physical testing of complex fracturing processes. He and his students have published over 250 papers in these areas, and performed pioneering research in the use of interactive computer graphics in computational fracture mechanics. His group has won several national awards for their research, including a NASA Group Achievement Award in 1996 and a NASA Aviation Safety Turning Goals into Reality Award in 1999 for his work on the issues of aging aircraft. Ingraffea has also twice won the National Research Council/U.S. National Caommittee on Rock Mechanics award for outstanding research. He has achieved both of the highest awards in fracture mechanics: the George Irwin Medal, and becoming a Fellow of the International Congress on Fracture. Additionally, he was appointed to the Dwight C. Baum Professorship in Engineering at Cornell in 1992. Finally, since 2006, Ingraffea has been Co-Editor-in-Chief of the field's most influential journal, *Engineering Fracture Mechanics*. Moving forward, Ingraffea will continue to consult on fracture problems in industry and in government through Fracture Analysis Consultants, a company he helped form in 1988.

In addition to his achievements in research, Ingraffea has received numerous school and college awards for his outstanding teaching at Cornell, and is one of only three CEE professors to have been named a Weiss Presidential Teaching Fellow. Throughout his teaching career, Ingraffea believed that the "what" is just as important as the "how" in learning: "I know from my teaching experience, and from the literature of educational psychology, that clarity of presentation, responsiveness to student needs, and, most importantly, remembering what it was like to be a student, are the most important aspects to effective pedagogy."

Community service has been an important aspect of Ingraffea's career. He has enjoyed participating in STEM (Science, Technology, Engineering, and Mathematics) K-12 outreach programs in various inner-city school districts to encourage and inspire interest in students from under-represented groups. In the past five years, his research in rock fracture has led him to international prominence in the so-called "fracking" problem related to energy policy. In 2011, *TIME Magazine* named him one of its "People Who Mattered" for his efforts in public education and legislative advocacy on this issue. He frequently appears on national TV and in documentaries exploring the environmental, health and climate change connections. He will continue as President of Physicians, Scientists, and Engineers for Healthy Energy, an NGO which he helped to found in 2010.

Ingraffea is an avid fly fisherman and enjoys both local waters and a yearly trip to Alaska, where he has been known to give guided fishing tours. He and his wife, Janet, plan to stay in Ithaca and enjoy traveling more to visit their four children and three grandchildren in various parts of the country.

Symposium and Dinner on September 27

In honor of Professor Ingraffea, CEE will host an all-day retirement symposium followed by a dinner on Saturday, September 27, 2014. Further information will be posted on the CEE website by early summer. http://cee.cornell.edu

James J. Bisogni, Jr.

Associate Professor James "Jim" Bisogni will be retiring from the School of Civil and Environmental Engineering on June 30, 2014. Bisogni has contributed considerably to the academic, administrative, and teaching excellence of CEE throughout his 32 years on the faculty. After earning his bachelor degree in Civil Engineering from Lehigh University in 1968, he came to Cornell to garner a M.S. in 1970 and a Ph.D. in Environmental Engineering in 1973. On his leaves from Cornell, Bisogni spent six months at Eastman Kodak as a consultant and process engineer in 1975, and was a visiting associate professor of civil engineering at MIT in 1981.

Bisogni has served as the Director of Graduate Studies for both the graduate field of Civil and Environmental Engineering and the minor field of Environmental Quality since 1987. He has served as Acting Director of CEE from January 1982 to July 1983, Associate Director from January 1981 to January 1982, and Chair of Master of Engineering since September 2009. Bisogni has served as faculty advisor to Cornell's chapter of Chi Epsilon. He is a member of the American Society of Civil Engineers, the New York Water Pollution Control Association, the Association of Environmental Engineering Professors, and the International Association on Water Pollution Research.

Bisogni's research and expertise has focused primarily on applying chemical and physical principles to solve water and wastewater treatment and water quality issues in natural systems. He has taught, at least once, every course offered by the Environmental Processes subject area. He expanded his teaching horizons when he and Professor Gerhard Jirka developed a course which combined Environmental and Fluid Mechanics fundamentals. In addition to serving on many committees within the College and at the University level, Bisogni has won a number of teaching awards. Lastly, he has been involved as a consultant to more than fifteen industries and engineering consulting firms.

Bisogni and his wife Carole, a faculty member in Human Ecology, plan to stay in Ithaca and enjoy travel to visit their sons and grandchildren. Since Bisogni and one of his sons both have joint U.S. and Italian citizenships, travel to Italy is clearly on the agenda. Running races and daily runs will occupy his newly spare time.

A gathering to recognize Professor Bisogni's retirement will be held for faculty and staff.

AguaClara

An AguaClara Group Team.

AguaClara's team won the coveted P3 (People, Prosperity and the Planet) award from the U.S. Environmental Protection Agency (EPA) for their project, "Stacked Rapid Sand Filtration – A Robust Filtration Process For Sustainable Drinking Water Infrastructure." Cornell's team, one of seven winners in the 2013 competition, was recognized for their innovative solutions to some of today's toughest public health and environmental challenges. Their project description read: "Suitable drinking water is a critical need world-wide, and fresh water is the limiting resource on the planet for the foreseeable future. Cornell University students have built an innovative municipal water treatment system in Honduras that uses a stacked rapid sand filter. They are now improving the design to reduce the energy and water required for maintenance, lower capital and operating costs, and simplify daily operation."

This year's competition featured approximately 300 student innovators showcasing their sustainable projects designed to protect public health and the environment, encourage economic growth, and use natural resources more efficiently. A panel of expert judges, convened by the American Association for the Advancement of Science, selected winners from 45 teams after two days of judging. This year's competitors proposed potential solutions to worldwide environmental problems, many of them in developing countries.

In addition, the AguaClara team won second place in the 2013 ASCE Sustainable Development Award for their stacked rapid sand filter. ASCE recognized AguaClara as an example of a sustainable engineering project that promotes long-term, community driven, innovative approaches to preserve and enhance quality of life in developing countries.

ESW

Engineers for a Sustainable World (ESW) Project class

Tech Exchange–new solar panel. l to r: Mauro Lopez, Elise Goldfine, and Jorge Lopez.

The ESW Solar Cooker and Human-Powered Electricity Generation classes worked on several alternative energy projects this year with exciting results that hold promise for people in developing countries. The Solar Cooker class, comprised of 39 registered students and six teams, tackled practical projects such as: three different forms of a solar-powered water distiller, a portable solar oven, a Fresnel lens and thermal concentrator grill and a PV Panel with a novel solar food dryer attached. The Human-Powered Electricity Generation class, made up of 32 registered students and five team projects, worked on a Solar Kiosk, an ERG rowing machine generator, two bicycle generators, and a programmable device for monitoring input and output power from these systems.

Five participants in the course worked with members from Nicaraguan groups, Las Mujeres Solares de Totogalpa and Grupo Fenix, which operate in a small, rural village in the north of the country to foster the development and use of alternative energy technologies in their homes. The Cornell group traveled to Sabana Grande, Nicaragua, where the members collaborated in building a new collapsible and portable solar cooker, a new solar-powered water distiller, and a PV panel. Students built these in cooperation with the women of Las Mujeres, a woman-owned and run Nicaraguan collective that promotes the use of alternative energy methods in their community.

Student participants stayed in family homes, making for a wonderful and very instructive experience that has been deeply influential and life-changing for all participants. Students from these independent study courses last spring were beneficiaries of support from Engaged and Service Learning, a program in CALS that supports international learning projects.

These classes continue to be popular and draw students from all engineering disciplines and many other colleges.

ASCE

American Society of Civil Engineers

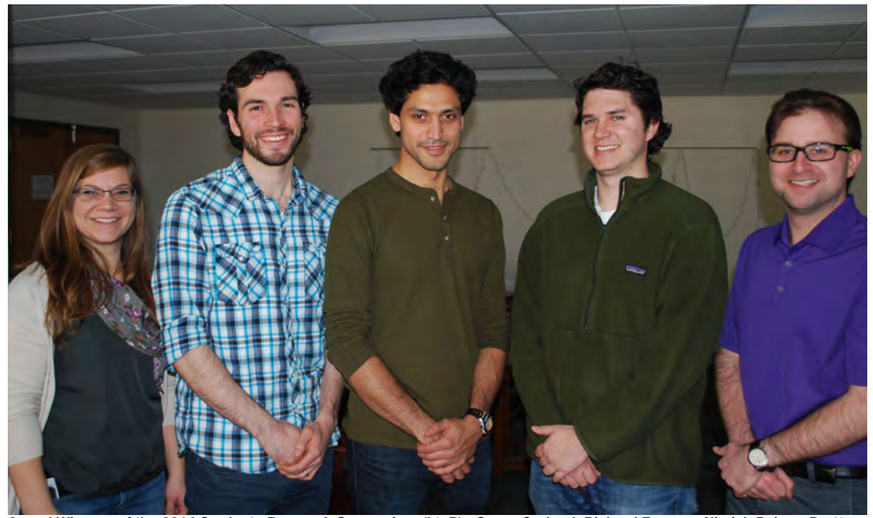
ASCE students at work on the steel bridge.

By the time this publication goes to press, Cornell's ASCE student members will have hosted the 2014 ASCE Regional Conference. The annual steel bridge and concrete canoe competitions will have taken place on campus and in Ithaca waters on April 24-26th. Our ASCE student chapter has worked hard to prepare for this exciting event while designing and building their own steel bridge and concrete canoe for competition.

ASCE students at work on the concrete canoe display model.

CEE Graduate Research Symposium

BY CHRIS DAWSON



Award Winners of the 2014 Graduate Research Symposium (LtoR): Casey Garland, Richard Zamora, Nimish Pujara, Brett Davis, Albert Cerrone.

The Sixth Annual CEE Graduate Research Symposium was held Friday, March 21 in McManus Lounge. The fast-paced program included presentations by 18 CEE graduate students on topics as varied as probabilistic modeling of wind loads, using bacteria-inoculated mulch to remove the contaminant TCE from groundwater, and modeling landslide-generated water waves using depth-integrated equations. This symposium was organized and presented by the CEE Graduate Student Association and featured faculty judges and cash prizes. Yitian Sun and Mian Wang served as Chairs of the GSA's Symposium effort and their work paid off in a smoothly run and academically stimulating day.

The official program ran from 9:00 a.m. to 2:30 p.m. and concluded with the awarding of prizes for the five highest-scoring presenters. The graduate students each had ten minutes to talk about an aspect of their current research. Audience members then had three minutes for questions. During the course of the day, a total of nine CEE faculty served as judges. One of the judges, Professor Damian Helbling, had this to say, "As a new faculty member, I found the symposium to be a fantastic venue to meet and interact with the current graduate students and to be introduced to the breadth of research taking place in the School."

The symposium offered students an opportunity to talk about their research with a more diverse audience than usual. "It's a chance to practice public speaking and presenting your technical work to a general audience," says structural engineering major Brett Davis. "The challenge is being able to describe your research with sufficient technical detail so that the audience, who might not be experts in the specific field, can relate and take something away from the presentation."

Graduate student Rick Zamora agrees, "The symposium is an ideal format for students to practice presenting their research to a general technical audience. This practice pays off down the road when students are interviewing for jobs or presenting their research to funding organizations." Presenter and Graduate Student Association President Alin Radu said, "All in all, I think that the symposium is good practice for future conferences and job interview presentations. You also get to know the subjects covered by your colleagues in the department and this could sometimes lead to interdisciplinary research collaborations."

The faculty judges used a rubric consisting of three criteria to evaluate each presentation. Students were scored on how appropriate and understandable their content was for an audience with a wide variety of CEE and engineering backgrounds, on how well the visual aids were organized and used to convey the presenter's ideas, and on presentation skills such as eye contact and clarity and speed of speech.

One of the faculty judges, Professor Patrick Reed, gave a well-received keynote address during the catered lunch in McManus Lounge. "I quite enjoyed the symposium and very much appreciate the opportunity to speak to the students," said Reed. "This is a great forum for the graduate students and faculty to interact while learning about the breadth of work being explored at Cornell."

After the final presentations were complete, the participants adjourned to the CEE Class of 1961 Graduate Student Lounge in Hollister Hall for the awards announcements and an ice cream social. The CEE Graduate Student Association awarded a total of $1,200 to five presenters, including $500 to top-scoring speaker Rick Zamora. Zamora spoke about his research in Professor Derek Warner's lab into the chemo-mechanical origin of hydrogen assisted cracking in aluminum alloys.

Nimish Pujara, another of the prize-winners, was impressed by the range of topics covered. "The problems that are being worked on in this School and the methods used are quite diverse. I was happy to have an opportunity to listen at an event where so many ideas were so well-explained." CEE Director Phil Liu concurs, "This symposium really reflects the diversity of the School in terms of research areas and students' backgrounds." Graduate student Casey Garland appreciated the symposium as a welcome break from her usual tasks, "It gave me the opportunity to step out of my day-to-day tasks of running experiments and processing data to explain what I do and why it matters."

Art Nilson Memorium

Arthur H. Nilson, of Cataumet, Massachusetts, age 87, died at his Cape Cod home on February 26, 2014. Dr. Nilson was a Professor in the School of Civil and Environmental Engineering at Cornell for 35 years, where he specialized in teaching and research in the field of structural analysis and design. He was chairman of the Department of Structural Engineering (within CEE) for five years. He was the author of over 40 technical papers, as well as two books on design of concrete structures. His textbooks were considered standard works in this country and abroad for many years. They were widely adopted throughout the U.S., and were translated into several foreign languages.

Professor Nilson received a bachelor of science degree from Stanford University, master of science from Cornell University, and a doctorate in engineering from the University of California at Berkeley. He held visiting appointments at Manchester and Salford Universities in England and at the Politechnico de Milano in Italy. Upon his retirement from Cornell in 1991 he moved first to coastal Maine and then to Cape Cod. He was an enthusiastic sailor for all of his life, owned many boats, and particularly loved coastal cruising in New England waters from the Long Island Sound to the central Maine coast.

He played clarinet and saxophone for pleasure and professionally during his high school years, leading to a lifelong love of music of the "swing" era of the 30's and 40's, and well as of classical music. An enthusiastic photographer, he created a gallery of photos based on his travels at home and abroad. He was a skilled woodworker, built furniture, and did extensive cabinet work over the years.

Nilson had a strong interest for many years in residential architecture. He designed and had built four residences in New York State, Maine, and Massachusetts, the first of which was selected for publication in a national home magazine. Nearly one-thousand sets of plans were sold. His architectural tastes ran toward what he described as "conservative contemporary" and all featured studio ceilings, extensive use of glass, and wide balconies.

Professor Nilson is survived by his wife Linda, by four children of a previous marriage: Russell Nilson of New Orleans, Sheryl Sedgwick of Charlottesville, VA, Carol Hansen of Ithaca, NY, and Kim Kabbes of Washington, D.C. and by four grandchildren.

McGuire memorial gathering held on September 7, 2013

Professor Bill McGuire receiving in 1991 a picture of the Bayonne Bridge. In 2013, his family returned the picture to CEE as a memorial.

Marketa McGuire Elsner, Bill's granddaughter and a civil engineer with the U.S. Bureau of Reclamation, spoke at the gathering.

Greg Deierlein '81, former faculty colleague and now Professor at Stanford, was one of the speakers at the McGuire memorial.

Professor Bill McGuire's former Ph.D. students at his Memorial gathering on September 7, 2013. l to r, with a * indicating those for whom Professor McGuire was chair of their Special Committee: Prof. Emeritus John Abel, Yeong-Bin Yang,* Marcelo Gattass, Donald White,* John Gross,* Carlos Pesquera,* Samir Hanna, Jerry Hajjar, Ronald Ziemian*. Yang, Pesquera and Ziemian were speakers at the memorial.

Reunion Breakfast 2013

Class of 1953 l to r: Don Unbekant, Bill Albers, George Leyh

Class of 1963 l to r row 1: Richard Feliciano, Michael Ratner, K.T. Mao, row 2: Richard Brustman, John Lutz, George Weiss, Jr., row 3: Jim Warren, Kenneth Arnold, Cliff Argue

Class of 1973 l to r: Bill Horowitz, Brad Preston, Robert Kosobucki

Class of 1983 l to r: Jim Hamilton, Sally Olsen, Richard Fox, Bryan Clark, Mauro Chiaverini

Class of 1998 l to r front Row: Torin Linton, Susan Knack-Brown, Asher Linton, Back Row: Joanna Beck, Linnea Linton, Prof. Ken Hover, Alex Brown, Steve Linton

Class of 2008 l to r: Alissa Diminich, Jared Spaans, David Railsback, Jennifer O'Neill Miller

Student

Geoffrey Bomarito, currently a CEE Ph.D. structural engineering student, was selected as one of 25 winners in the 2013 IGERT Video and Poster Competition, hosted by the National Science Foundation.

Recipients of Co-op Recognition:

Nominations for the Co-op Student of the Year award are submitted by supervisors who have worked closely with a Co-op student that they feel has demonstrated leadership, initiative, and innovation in the Co-op position.

Awardees are:

Ruju Mehta, 2014, studying Environmental Engineering, was named Co-op Student of the Year. She worked for National Grid in Hicksville, New York.

Luyan Sun, 2015, studying Environmental Engineering, was named Co-op Student of the Year with Distinguished Honors. She worked for ARCADIS in Arlington, Virginia.

Alumni

Roland Abi Nader MEng 2004, is a civil engineer and senior project manager with AECOM Technology Corporation, he is "one of seven employees to be recognized and selected for *Engineering News-Record's* New York "2014 Top 20 Under 40" on the basis of his experience in managing an implementing complex projects."

Gregory Fenves '79 executive vice president and provost and professor at The University of Texas at Austin, was recently elected to the National Academy of Engineering for "contributions to computational modeling, creation of open source software for earthquake engineering analysis, and academic leadership."

John Paxton '73, MEng '74, "goes to work in one of the world's most iconic buildings: the Pentagon. As Assistant Commandant of the Marine Corps, Paxton is a four-star general and the service's number-two officer. One of the highest ranking military officers in Cornell alumni history, Paxton didn't take ROTC; the former civil engineering major signed up after stopping at a recruiter's table in Barton Hall. His office, complete with a view of the Washington Monument, is on the Pentagon's coveted outer ring. In addition to a painting depicting the Corps' origins in the Revolutionary War, the decor includes photos of Paxton's father, three uncles, and an aunt—all World War II veterans—as well as six clocks set to various time zones where Marines are serving around the globe." To read an interview Cornell writer, Beth Saulnier, had with Paxton, (published in the May/June 2013 online issue of *Cornell Alumni Magazine*) visit: http://cornellalumnimagazine.com/index.php?option=com_content&task=view&id=1634&Itemid=9

Daniel Sperling '73 a professor of Civil Engineering and Environmental Science and Policy and director of the Institute of Transportation Studies at the University of California, Davis, is one of two recipients of the 2013 Blue Planet Prize. The prize has been described as the Nobel Prize for the environmental sciences. The prestigious Blue Planet prize, announced by the Asahi Glass Foundation of Tokyo, acknowledges Sperling for his "ability to bring together top thinkers and strategists in academia, government and industry to develop new vehicle-and fuels-policy approaches that are models for the world."

Faculty

John Abel was awarded the Eduardo Torroja Medal by the International Association for Shell and Spatial Structures (IASS) on September 23, 2013 during its annual symposium, held in Wroclaw, Poland. This is the highest honor of the IASS and is named for the renowned Spanish engineer who founded the association of engineers and architects in 1959.

Todd Cowen is a recipient of the 2013 College of Engineering's James and Mary Tien Excellence in Teaching Award.

Ricardo Daziano won a prestigious Faculty Early Career Development award from the National Science Foundation, for his proposal of "Advanced Demand Estimators for Energy-Efficiency in Personal Transportation."

Fred Kulhawy is the recipient of the 2014 Martin S. Kapp Foundation Engineering Award from the Geo-Institute of ASCE. In addition, Kulhawy is the recipient of the "Geo-Institute Hero Award." The award is presented to an individual who has provided significant contributions to the Geo-Institute, the geo-profession, or global welfare, as selected and honored by the annual Geo-Congress conference organizing committee.

Pete Loucks, a lecture series has been established in his honor by the International Commission on Water Resources Systems (ICERS) of IAHS (International Association of Hydrological Science). The lecture series, to be an anuual event, will be given by scientists who have provided outstanding contributions to the field of water resources assessment and management. Loucks will give the first lecture in Bologna, Italy on June 4, 2014.

Tom O'Rourke has been selected by the ASCE's Technical Council on Lifeline Earthquake Engineering to receive the 2014 Le Val Lund Award for Practicing Lifeline Risk Reduction.

Just before this newsletter went to the printers, ASCE announced that O'Rourke has been named a Distinguished Member of the American Society of Civil Engineers in recognition for his leadership and contributions in the "safety and security of critical infrastructure through earthquake protection of water supply, gas, liquid fuel, and transportation systems."

Patrick Reed was selected to participate in the National Academy of Engineering's 2013 U.S. Frontiers of Engineering Symposium. The goal of the program is to bring together engineers from all disciplines to facilitate cross-disciplinary exchange and promote the transfer of new techniques and approaches across fields in order to sustain and build U.S. innovative capacity.

Mark Turnquist is a recipient of the 2013 College of Engineering's James and Mary Tien Excellence in Teaching Award.

Derek Warner was selected to participate in the National Academy of Engineering's 2013 U.S. Frontiers of Engineering Symposium. The symposium brings together engineers (ages 30-45) from U.S. companies, universities, and government labs to discuss leading-edge research and technical work across a range of engineering fields.

Monroe Weber-Shirk is a recipient of the 2013 College of Engineering's John Swanson '61 ME in honor of his mother, Dorothy G. Swanson Excellence in Teaching Award.

Contact us with your news:

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607.255.3690
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Lab Renovation in Environmental Processes Area

Cornell's Hollister Hall has been the home to groundbreaking research in the fields of civil and environmental engineering since the 1950s, and continues to support faculty and students with facilities, classrooms, and equipment. Nevertheless, to keep pace with rapidly advancing technology and methods, improvements are necessary for the Environmental Processes (EP) Laboratory, a plan which CEE Director Philip Liu aims to start this coming year.

With your support, the School has already successfully renovated and established state-of-the-art laboratories which include the Bovay Laboratory Complex, a 12,500-sq-ft space for civil infrastructure research, and the DeFrees Hydraulics Lab, which houses wave tanks, wave-current flumes, and wind tunnels for hydrology and fluid mechanics research. While these facilities have, in part, placed CEE in its current position of research and educational excellence, Liu says more advancements are needed, particularly for the EP Lab. "Our plan is to make this area into a much better, more modern space," he says. "We really need to renovate to attract new faculty members." The majority of the School's faculty is senior level, thus "our highest priority is faculty renewal in a timely fashion." For example, Liu explains, "prior to recruiting Damian Helbling (see page 6), the School decided to renovate lab space and purchase new equipment, including a high-resolution mass spectrometer. This was something that was truly needed for modern research," he says.

Beyond the equipment, the space badly needs upgrades including HVAC, fume hoods, environmental chambers, student work stations, lighting, electronic controls and data acquisition technology. With this renovation the new EP Lab would be able to serve multiple functions related to teaching, student projects and research. The renovation plans are developed with the flexibility to address the varying needs of new faculty. "What the space becomes may very well hinge upon the needs of new faculty hires," says Liu. "We have projected roughly six to seven million dollars for this initiative," says Liu. "Our hope is that with combined efforts from the College, alumni and research funds we will be able to create a research and teaching facility that will support and inspire new faculty to lead the way in civil and environmental engineering work."

Alumni support has been very valuable to the School. Without the support of our alumni for new endeavors in instructional needs, our activities would be limited. The following three funds are important ways to contribute to the success of the School.

Environmental Processes Laboratories Fund

This fund has been established to receive contributions in support of the environmental processes laboratory renovation. Contributions to this fund will help CEE leverage support from the College and other funding sources. EP teaching and research focuses on water, water treatment processes, sustainable energy, environmental protection, remediation technologies and the fate and transport of contaminants. Your involvement in this initiative will greatly be appreciated.

Damian Helbling in EP Lab

CEE Unrestricted Alumni Fund

Gifts to the Annual Fund are unrestricted. This is a gift that is not designated to a specific program but does make a major difference. Unrestricted funds allow CEE the flexibility to provide support to areas that otherwise might not be realized. As an example, unrestricted gifts are used to assist with undergraduate student needs such as travel to conferences and competitions, student projects, undergraduate student organization events and other educational enrichment activities.

Richard N. White Instructional Laboratory Fund

Gifts provided through this fund are used for equipment upgrades to support the latest technology in our Labs. The White Instructional Lab Fund has added great value to CEE. Our students have benefitted through the new technologies that are now available to them. This fund will continue to help support future instructional and research operations.

Yes, I would like to support the CO14SMAE3 CEE Spring Newsletter Mailing.

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2014 College of Engineering Phoenix

Reunion 2014:

June 5-8

Saturday, June 7

Alumni breakfast buffet: Plan to attend this year's CEE alumni breakfast–especially if it's your reunion year. The breakfast is free and will be held from 7:30 to 9:30 a.m. in McManus Conference Center, 166 Hollister Hall. All alumni(ae) and their families are invited. Please let us know if you are planning to attend the breakfast at civil_env_eng@cornell.edu or by phone at 607-255-3690.

Homecoming 2014:

October 17-18

Cornell versus Lehigh