

# The **Bridge**

## Industry Advocacy a Boost to New Online Master's Degree

CEE's new online master's degree in Supply Chain Transportation and Logistics (SCTL) will launch this fall. This fee-based program is a cooperative initiative with Professional and Continuing Education. Anne Goodchild, SCTL director of academic operations and CEE associate professor, and Bill Keough, director of program operations and affiliate associate professor, worked for the past two years to get this program funded, approved, and staffed. The Board of Regents gave it the green light in late 2012.

Local support from within the profession was critical for success. Goodchild and Keough recruited a board of advisors composed of VP-level executives at Boeing, Costco, Starbucks, Paccar, REI, the Port of Seattle, WSDOT, and other firms. The board has been instrumental in helping shape the program's content to meet the skill gaps they see in the workforce, and in getting the word out to employees who could benefit from enrolling.



Port of Seattle image by Don Johnson

The program is aiming for an initial cohort of 25 students, and begins with a one-week residency at the UW in September. During this session students will meet the instructors and the advisory board, and get to know members of their cohort while completing the first course in the program, Logistics and Analysis. More information is available at [supply-chain-transportation.uw.edu](http://supply-chain-transportation.uw.edu). ■

## COE Diamond Award Honors Jon Magnusson



Benaroya Hall, Experience Music Project, Seattle Central Library, Safeco Field, and Seahawks Stadium are among local landmarks designed in collaboration with Jon Magnusson (BSCE '75) and his structural and civil engineering firm. UW campus buildings include the Paul G. Allen Center. With professional licensure in 24 states, Jon has led Magnusson Klemencic Associates on projects in 47 states and 51 countries, with total value of projects designed exceeding \$87 billion. These achievements have earned him the 2013 College of Engineering Diamond Award in the category of Distinguished Achievement in Industry. His many professional honors include awards of excellence from The American Council of Engineering Companies (ACEC), Structural Engineer of the Year awards in 2001 from ACEC of Washington and 1999 from the Structural

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## Message from the Chair

Greg Miller

Looking back over the time since I became chair in December 2009, I've found it to be one of those experiences that aligns with Charles Dickens' description of France in *The Tale of Two Cities*: "It was the best of times, it was the worst of times." The "worst" part has been driven primarily by serious budget reductions in a time of high student demand, but the "best" part is what I would like to describe here. The sidebar on page 3 summarizes department highlights over the past several years, all accolades and activities involving students, faculty, staff, and alumni. Good departments strive to excel in all aspects of their mission, and I believe UW CEE is a great example.

As alumni and friends we all can continue to be proud of our department. The challenge we face is to maintain such excellence while growing to meet student and societal demand. The fundamental role of state funding has largely eroded. Although now we are playing by a different set of rules, our mission remains focused on providing outstanding public education and research.

Of the approximately 6,500 active CEE alumni, about 400 of us made gifts to CEE in 2012. This roughly six percent participation rate is relatively low compared to the overall UW rate of just over 14 percent. It's clear that we CEE alumni have room to do more in this regard. When the state was largely taking care of business, the need for private support was different than today. As someone in the 94 percent who did not regularly support the department, I had to re-evaluate my own past habit of benign neglect.

To encourage expanded participation in giving to CEE, we have created a matching gift challenge described in the Alumni Highlights section. Later this year we will release a new strategic plan that will identify how expanded giving will help us achieve specific goals. If you have not been in the habit of contributing to CEE, this is a great time to start, and as I found out for myself, it's simple to donate online ([ce.washington.edu/alumni/give.html](http://ce.washington.edu/alumni/give.html)). ■

## Remembering John F. Ferguson

Long-time CEE faculty member and former chair John Ferguson passed away unexpectedly on March 29. The UW recruited John in 1974 to direct the environmental engineering program. Under his leadership, the program grew to international prominence.

John was one of the few environmental engineering professors equally at home directing state-of-the-art research on environmental microbiology and chemistry and also applications to drinking water, domestic and industrial wastewater, and contaminated soils and sediments. In recent years his work focused on the fate of endocrine-disrupting chemicals in wastewater and novel technologies to degrade those compounds, and on corrosion and metal release in water distribution networks. He won numerous best paper awards and was widely sought to serve on

"John was a kind, generous, and humble colleague and mentor. He will be remembered for his good nature, his humor, his sharp intellect, and his dedication to the CEE Department and the environmental engineering profession."

Professor Greg Miller

advisory panels by the National Science Foundation, Environmental Protection Agency, the National Institute of Environmental Health Sciences, and other organizations.

John was repeatedly pressed into departmental leadership roles, serving as associate chair from 1987–92, and chair from 1992–97, and twice as acting chair, from 1986–87 and 2006–07. John retired from teaching in 2007 but remained active in research, professional service, and student advising.

He was an enthusiastic leader and contributor on collaborative research with department and other UW colleagues, and with national and international university associations.

John earned his BS ('63), MS ('64), and PhD ('70) degrees in civil engineering at Stanford University. He then served as a research fellow at Harvard University before starting his professorial career on the faculty at the Johns Hopkins University. ■



## Bernard Amedei Is 2013 Evans Lecturer

The founder of Engineers Without Borders USA, Bernard Amedei, will speak at the 2013 Daniel L. and Irma Evans Lecture on Thursday, May 30 at 4:30 pm in Kane Hall 220. Amedei's lecture is titled "Engineering in Sustainable Human Development: Challenges and Opportunities." He is a professor of geotechnical engineering and geomechanics at the University of Colorado Boulder and has won numerous national and international honors for his professional and service work.

While discussing the engineering challenges of adding two billion people to the global population in the next

two decades, Amedei will emphasize the close link between human development and sustainable development, two concepts prominent in the discussion of poverty reduction. Both concepts contribute to securing

healthy, productive, and meaningful lives for all. Students and alumni are encouraged to attend this free lecture.

A reception with the speaker will follow the lecture. ■



*Bernard Amedei in a vortex of African children.*

## CEE Highlights: 2010 – April 2013

### Honors

- 2 new National Academy of Engineering members
- National faculty awards (CAREER, Higgins Lecture, Academic Engineer of the Year, etc.)
- 1 Dean's Medal winner (top engineering undergraduate)
- 1 UW Distinguished Teaching Award
- 1 UW Distinguished Staff Award
- 2 College of Engineering Innovator Awards
- 2 Diamond Awards (college recognition of outstanding alumni)

### Academics

- 12 faculty promotions (indicative of good hiring and mentoring)
- 3 tenure-track professors, plus one research faculty member, hired (more searches under way, but offset by retirements)
- Numerous national student scholarships and fellowships (NSF, NASA, etc.)
- Major junior year curriculum revision implemented
- 2 new self-sustaining online MSCE programs launched, joining online MSCE program in Construction Engineering
- On-campus, self-sustaining Professional Master's Program (PMP) developed and launched, with strong enrollments (we have the 5th largest PMP at the UW)

### Other Initiatives

- Formed new Visiting Committee/External Advisory Board
- New fundraising program launched ■

## Paula Hammond Drew a Crowd to the 2012 Wenk Lecture

Paula Hammond, former Washington State Secretary of Transportation, was the featured speaker at the fifth annual Edward Wenk, Jr. Endowed Lectureship in Technology and Public Policy. Large groups of students and alumni attended her October 25 presentation on "Engineers in Public Service."

The Edward Wenk Jr. Endowed Lectureship brings distinguished practitioners to the university to address the intersection of civil and environment engineering and public policy. The lectureship was made possible by a generous donation from Dr. Edward Wenk, Jr., emeritus professor of civil and environmental engineering and science policy advisor to the U.S. Congress and three presidents. Through his gift and support from his widow, Betty Wagner, we continue to share Dr. Wenk's legacy with students and the academic community. ■

## Magnusson Wins Award *(continued from page 1)*

Engineers Association of Washington, and Engineer of the Year in 2003 from the Washington Society of Professional Engineers. In 2011 Jon received the Designer Lifetime Achievement Award from the American Institute of Steel Construction, with special recognition for maintaining the voice of reason in discussing structural integrity after the 9/11 tragedies. He holds honorary membership in the American Institute of Architects and Distinguished Member grade in the American Society of Civil Engineers.

The Diamond Awards event is Friday, May 31, on the UW Seattle campus. More information is at: [enr.washington.edu/alumcomm/diamond/index.html](http://enr.washington.edu/alumcomm/diamond/index.html). ■

## Looking at Water Chlorination in a New Light

Free chlorine, the active ingredient of common household bleach, is by far the most widely used disinfectant for drinking water worldwide. It is cheap, easily used, portable, and in general highly effective for protecting water supplies from contamination by pathogenic viruses and bacteria. However, some important pathogenic agents, including the protozoans *Giardia lamblia* and *Cryptosporidium parvum*, exhibit considerable resistance to chlorine. This shortcoming has contributed to the adoption by many water utilities of more effective disinfectants such as UV light and ozone. These processes also have drawbacks, as they require much more substantial investments in equipment and energy.

Interestingly, under natural sunlight and monochromatic UVA radiation (such as that emitted by black lights), free chlorine breaks down (or photolyzes) to yield a substantial proportion of ozone in oxygenated waters, in addition to a variety of other reactive oxygen species (Figure 1). Under such conditions, we might expect free chlorine and these photochemically generated oxidants to act in tandem to more effectively inactivate various waterborne pathogens than would be achievable using chlorine alone. With this chemistry in mind, a team of researchers in Civil & Environmental Engineering (CEE) and Environmental and Occupational Health Sciences (EOHS) has been exploring the possibility that inactivation of waterborne pathogens could be enhanced by photochemically “activating” free chlorine during conventional chlorination.

Principal investigator and CEE assistant professor Michael Dodd leads a project team including CEE graduate student Peiran Zhou, recent graduate Jenna Forsyth (MS '12), and co-PI

and EOHS associate professor Scott Meschke. The team has confirmed this approach can greatly accelerate inactivation of chlorine-resistant *Bacillus subtilis* spores, common surrogates for chlorine-resistant pathogens such as *C. parvum*.

For example, as shown in Figure 2, under conditions typical of drinking water treatment (e.g., 10°C, pH 8), the rate of spore inactivation can be increased by nearly 400% by irradiating chlorine-containing solutions with simulated sunlight generated by a Xenon-arc lamp system. No spore inactivation is observable under the same conditions during irradiation with simulated sunlight in the absence of free chlorine, confirming that enhancement is attributable to chlorine photolysis rather than sunlight itself. Similar results have been observed under natural sunlight, during experiments conducted on the roof of More Hall. With support from a recent grant by the National Science Foundation, the project team is now focused on validating the utility of this approach for inactivation of the waterborne human pathogens

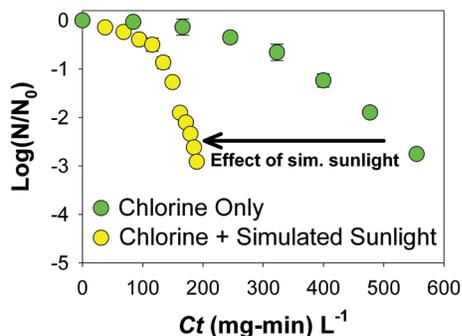


Figure 2: *B. subtilis* spore inactivation in chlorine-containing solutions initially dosed with 8.5 mg/L as Cl<sub>2</sub> at pH 8 and 10° C, with and without continuous exposure to simulated sunlight. *N* represents number of viable spores, and *Ct* is the integrated product of chlorine concentration in each solution versus time (i.e.,  $Ct = \int_0^t C_{\text{chlorine}} dt$ ).

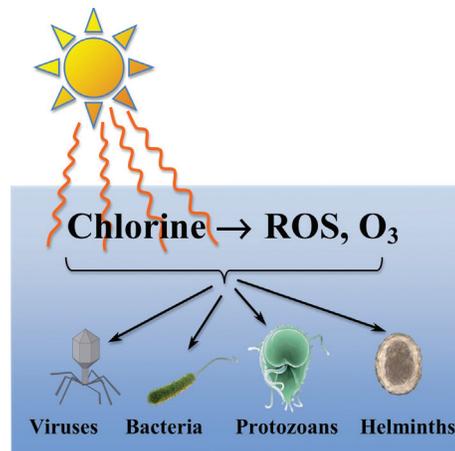


Figure 1: Solar photolysis of chlorine in oxygenated aqueous solution can lead to generation of ozone (O<sub>3</sub>) and various reactive oxygen species (ROS). These can act in parallel with free chlorine to synergistically enhance inactivation of chlorine-resistant microorganisms.

*C. parvum*, *Mycobacterium avium*, and Coxsackievirus B5.

“Application of such an approach could offer considerable benefits over existing alternatives to chlorine-based disinfection processes,” Dodd says. “Chlorination is still practiced at the vast majority of municipal water treatment facilities, and this process could be technically feasible for many. Furthermore, the use of sunlight or artificial UVA radiation as light sources could provide significant cost and energy savings over more energy-intensive alternatives such as ozonation or UVC irradiation.”

His team believes that sunlight-enhanced chlorination could prove especially useful for disinfection of chlorine-resistant pathogens during point-of-use applications in developing societies. Both solar disinfection (or SODIS) and chlorination are already frequently but separately applied in such scenarios due to their ease of use and low cost.

“Such an approach would combine two simple, widely practiced disinfection strategies into a single package, with potentially significant improvements over either strategy on its own,” says Dodd. ■

## Awards & Accolades 2012–2013

### Faculty Honors



#### **Mike Dodd Receives NSF CAREER Award**

Assistant Professor Mike Dodd has won a 2013 Faculty Early Career Development (CAREER) award from the National Science Foundation. His NSF-funded research will provide the first systematic investigation into the use of disinfectant and antiseptic agents expressly for the degradation and deactivation of antibiotic resistance genes in water treatment and healthcare practice. High public awareness of the societal importance of antibiotic resistance also represents an exceptional opportunity to engage K-12 teachers and students in strengthening STEM curricula. Dodd joined the CEE faculty in 2009. His research characterizes homogeneous and heterogeneous redox reactions in engineered and natural aquatic systems, particularly for optimizing pollutant and pathogen elimination during water and wastewater treatment.

#### **Anne Goodchild Chairs TRB Committee**

Associate Professor Anne Goodchild is the new chair of the Transportation Research Board's (TRB) Intermodal Freight Transportation Committee. Its scope includes all aspects of research pertaining to intermodal freight transport. Goodchild joined the faculty in 2005. Her research interests focus on the analysis of logistic systems, with an emphasis on freight transportation. Other research experience includes minimizing emissions in strategic routing and schedule planning in urban pick-up and delivery systems, policy and technology implementations to improve intermodal interfaces, and the relationship between freight activity and the economy.

#### **Puget Sound Engineering Council Honors Scott Rutherford**

The Puget Sound Engineering Council (PSEC) recently selected Professor G. Scott Rutherford as the 2013 Academic Engineer-of-the-Year. PSEC is an organization of local chapters of national or international engineering and scientific societies. Its mission is to increase public awareness and appreciation of engineering, science, and technology. Rutherford has served on myriad local, regional, and state commissions and committees including the Seattle Design Commission, the Regional Transit Authority Expert Review Panel, and the State Transportation Policy Steering Committee. He chaired the Department of Civil & Environmental Engineering from 2002 to 2006. Although retired from the university, he continues to serve by leading the Valle Scholarship and Scandinavian Exchange program.

### Student Honors

#### **Nathan Cai Receives the Best Dissertation Award**

Zhenxiao (Nathan) Cai (PhD, '12) received the American Water Works Association (AWWA) Outstanding Dissertation Award for 2012. This award encourages academic excellence in the field of public water supply. Cai's doctoral work investigated the mechanisms of fouling in membrane systems with pre-coated adsorbents by exploring the sensitivity of the fouling behavior to adsorbent particle size and membrane pore size.

#### **Student Team Competes in GeoPredictions Challenge**

CEE senior Collin Foxley and graduate student Collin McCormick placed fifth in a national GeoPredictions student competition in San Diego in March. GeoPredictions is part of the GeoChallenge, a set of student competitions sponsored by ASCE's Geo-Institute. This year's challenge was to predict rising water level after a landslide of fill on a slope.

#### **Global Social Entrepreneurship Competition**

Shengkun Yang (BSCE, '12) recently participated in the Global Social Entrepreneurship Competition sponsored by the UW Foster School of Business. GSEC challenges university-level students worldwide to use business principles to create sustainable, positive solutions to some of the world's most pressing issues related to poverty, health, and development. Shengkun's team, AquaFiltro, developed two types of water treatment products, a basic model ceramic filter and a deluxe model ceramic filter, to provide household drinking water treatment techniques in Ghana.

#### **Cathy Liu Reaps Multiple Honors for Transportation Work**

Doctoral student Cathy Liu received the International Institute of Transportation Engineer's 2012 Daniel B. Fambro Student Paper Award. The competition encourages student members to conduct and report on original research in traffic or transportation engineering and recognizes outstanding accomplishment. Liu's paper, "An Analytical Framework for Managed Lane Facility Performance Evaluation," also won the Best Student Paper Award in the Western ITE, where she also received the Outstanding Graduate Student Award. In addition, the Women's Transportation Seminar (WTS) awarded her the Helene M. Overly Memorial Scholarship for 2012–2013. International recognition came when Beijing Jiaotong University, where she earned her BS, honored her with the Outstanding Student Award for exceptional dedication to the transportation profession. ■

## UW Will Host National Student Steel Bridge Competition



More than 600 students and volunteer judges will descend on campus May 31 to June 1 to put their bridges to the test

in the National Student Steel Bridge Competition.

"We are so excited to have the opportunity to host the national competition. It is an honor to be involved in an event of

this magnitude," said Rosslyn Luke, UW team co-captain and NSSBC co-student director. "Our team has a great design this year, so we are looking forward to seeing how we match up at a national level. Go Dawgs!"

**Volunteer Judges Needed!** If you would like to assist, please review the Judge's Interest Letter at [ce.washington.edu/students/NSSBC.html](http://ce.washington.edu/students/NSSBC.html) or email the

organizers at [uwsteelbridge@gmail.com](mailto:uwsteelbridge@gmail.com). Co-organizers are the American Institute of Steel, the American Society of Civil Engineers, and UW CEE.

Alumni are invited to attend NSSBC and a pre-competition brunch hosted by CEE on Saturday, June 1. For more information and to RSVP, contact Katie Frisbie Buntzen at [frisb@uw.edu](mailto:frisb@uw.edu) or 206.616.8310. ■



## Gates Award Honors Dan and Nancy Evans

To honor their commitment to the UW, the university awarded Dan (BSCE '48; MSCE '49) and Nancy Evans the 2012 Gates Volunteer Service Award, which recognizes volunteerism that inspires

others. Dan and Nancy have left an indelible mark on the UW and beyond. They have provided philanthropic support to the UW for more than four decades and have held more than a dozen leadership roles. Dan has served

two terms on the Board of Regents and as UW Foundation chair. Nancy served on the School of Public Health's inaugural visiting committee and as honorary chair of the Evans School's 50th Anniversary Gala.

They were honored for their achievements at the UW Annual Recognition Gala last November. The University and the UW Foundation present the Gates Volunteer Service Award annually to recognize and honor individuals whose extraordinary volunteer efforts have encouraged others to support the UW through time, service, and philanthropy. ■

## Tom and Marilyn Draeger and the Beavers Honored at Professorship Installation

Associate Professor Steve Muench has been named the inaugural Tom and Marilyn Draeger/Beavers Charitable Trust Endowed Professor in Civil Engineering. The department honored Professor Muench and donors Tom (BSCE '68) and Marilyn Draeger and the Beavers at a professorship installation event on April 11. The professorship enhances the university's ability to recruit and retain distinguished faculty in CEE, especially those with expertise in areas related to heavy construction, structures, construction, soils or transportation. It also

serves to encourage students to enter into the field of heavy construction engineering. For information on how to establish a professorship or other endowment in the department, please contact Megan Ingram at [mkingram@uw.edu](mailto:mkingram@uw.edu) or 206.685.1378. ■



L-R: Tom Draeger, Steve Muench, and Sam Baker of the Beavers Charitable Trust

## CEE Strategic Challenge

CEE is excited to announce a matching gift challenge to encourage new and multi-year support for the CEE Strategic Support Fund. Thanks to an unrestricted bequest gift, \$50,000 is now available to match first-time and three-year pledged gifts of \$500 or more.

### Matching Gifts to Meet Needs

Gifts to the CEE Strategic Support Fund help the department meet the growing need for qualified engineers by increasing access to CEE degrees. Your support will help:

- Make civil and environmental engineering education more affordable – gifts to this fund provide supplemental scholarship and fellowship resources.
- Increase the capacity to accept more students – gifts are used to enhance and expand classroom and lab space, and to develop curriculum models to give students streamlined access to required coursework.
- Support recruitment of top-notch faculty, which, in turn, draws more top-quality students.

### Challenge Details

Matching funds are available for any first-time gift or three-year pledged gift of \$500 or more.

Gift Type	Your Gift	Match Provides
New gift of \$500+	\$1	\$1
Three-year pledge of \$500/yr+*	\$1	\$2

\*Match made only in year one of pledge.

If you would like to participate in the challenge, please contact Katie Frisbie Bunten, assistant director of advancement, 206.616.8310 or [frisb@uw.edu](mailto:frisb@uw.edu). Or visit [ce.washington.edu/alumni/give.html](http://ce.washington.edu/alumni/give.html) for more details and to make a gift online. ■

## Rocking the Boat: Paving the Way for Women in Civil Engineering



Amy Haugerud

Their first meeting was in October 1983. A couch served as a conference room and a newborn slept nearby as they talked business.

Amy Haugerud (BSCE '77) first learned about Anne Symonds (BSCE '75, MSCE '78) while interviewing with a civil consulting firm in Bellevue. Amy was seeking advice on her next career move and learned Anne had started her own firm. Shortly

after opening RoseWater Engineering, Amy called Anne and asked for a meeting.

Anne had established her business, Anne C. Symonds Consulting Engineers, in spring 1980. It was the first female-owned firm of its kind registered in Washington. In 1983 a new state law required public agencies and schools to use minority and women-owned businesses (M/WBEs) for a portion of their contracts, so business was growing fast. Anne could have regarded the upstart sitting across from her on the couch as competition. Instead, she welcomed Amy with open arms.

"I think I looked at Amy and said, 'You know, there's plenty of work to go around. So, let's work together.'"

Thus began their longstanding friendship. Both worked out of their homes for the first few years. Anne moved her operation downtown in 1984 and Amy did the same a year later. Anne's first major project was the design renovation for three King County pump Stations in West Seattle. Within a year of opening, RoseWater Engineering was awarded its first project, as a prime consultant for the design of two Metro Park & Ride lots on Vashon Island.

Their early achievements surely helped pave the way for future female engineers in the state. However, Anne and Amy never truly thought of themselves as pioneers. They were simply doing what they had always wanted to do.

Despite early roadblocks—pre-college tests indicated they ought to be nurses or teachers, professors refused to acknowledge them in class, and male colleagues asked them to make copies—they never hesitated to pursue their goals. They are humble about the strides they made and appreciate the value of having role models.

"It's hard to develop a dream in a vacuum," Anne says.

Both believe the visibility of their companies encouraged other women to go into the field. They not only hired women, they provided alternatives to working for large firms where glass ceilings often loomed. Today, more than 230 minority/women-owned engineering and construction companies are registered with the Washington Office of Minority and Women Business Enterprises.

The BSCE class of 1975 had three women among its 109 members. In 2011, 31 percent of the CEE undergraduates were women.

Anne and Amy assumed even more visible roles in the profession when they became presidents of what is now the American Council of Engineering Companies. Anne was the first female president in 1996 to 1997, and Amy followed from 1998 to 1999. Their appointments may seem commonplace now, but the very organization they were elected to lead had once considered lobbying against the M/WBE requirements.

The BSCE class of 1975 had three women among its 109 members. In 2011, 31 percent of the CEE undergraduates were women. While women account for 52 percent of the overall enrollment at UW, concern persists about the future of women in engineering.

"It's still odd that girls aren't expected to do as well in the STEM fields," says Amy.

Several programs associated with the college expose more young women to STEM degrees and careers. Women in Science & Engineering (WiSE), Society of Women Engineers UW, and the ADVANCE programs are creating more opportunities for professional, academic, and aspiring engineers and scientists to connect.

With every generation, a career in engineering has become easier for women to pursue. As the next generation of women enters the field, Anne and Amy share this advice:

*Ask as many questions as possible.*

*Don't be afraid to rock the boat some.*

*Never lose your sense of humor. ■*



Anne C. Symonds

## The Bridge

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# The Bridge

## Canoe Team #1 at Regionals ... On to Nationals!

**Regionals:** @Oregon State University, April 25–27

**Nationals:** @University of Illinois at Urbana-Champaign, June 20–22

A UW Concrete Canoe team had not made it to a national competition since 2010 so the 2013 team was barking for a win. They came through with a surging performance at regionals in a boat named “Undammed” to honor the once again free-flowing Elwah River.

“We have quite a few dedicated underclassmen,” said team co-captain and CEE senior Charlie Abrahamson. “We also slimmed down and streamlined our racing design and doubled the strength of our concrete mix from last year.”

The Huskies took first overall, winning the co-ed sprints and men’s slalom/endurance races. They received perfect scores for their oral presentation and final product and placed second in design paper.

To learn more about Concrete Canoe: [asce.org/concretecanoe](http://asce.org/concretecanoe); to support the UW CEE Team, contact [uwconcretecanoe@gmail.com](mailto:uwconcretecanoe@gmail.com). ■



Top Left to Top Right: Vera Hoang, Josh Cihak, Peter Huynh, Zach Schrempp, Marissa Karpack, Charlie Abrahamson, Kenna Foster, Sally Choi, Jamie Shinsato, Lyle Summers, Nick Orsi, Alex Lamb. Bottom Left to Bottom Right: Ian Dahl, Kristina Low, a Dubs look-alike, Laura McFarlane, Fabia Fu, and Nigel Lyons