

The Bridge

COLLEGE OF ENGINEERING
UNIVERSITY of WASHINGTON



Vernon Hammer

Emeritus Professor Creates Indelible Legacy

An extraordinary new gift to the department reflects the generosity and vision of a former faculty member. Through careful estate planning, Professor Emeritus Vernon Hammer left more than \$1 million in his will to benefit the students of Civil & Environmental Engineering. Professor Hammer chose to honor his mother through his giving and his estate established the Helen E. Zromkowski Endowed Fund in CEE. It will help support students, undergraduate or graduate, with financial need.

After earning an SM degree at Harvard, Vernon Hammer entered the U.S. Public Health Service and served in the Caribbean area during World War II. He was appointed an instructor in general engineering in 1947, became a full-time faculty member in 1953, and by 1962 had risen to chairman of general engineering. In 1971 he was appointed associate dean of the College of Engineering and professor of civil and environmental engineering. From 1973–1976 he headed CEE's Water and Air Resources Division. Hammer taught courses in solid waste management until his retirement in 1981.

The department is grateful to Professor Hammer and his family for their generosity and for creating a lasting legacy that will benefit our most deserving students. To learn more about giving through your estate or other planned giving inquiries, please contact Megan Kagel, CEE advancement officer, at (206) 685-1378 or mkkagel@uw.edu.

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Valle Program 30th Anniversary

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EARTHQUAKE AFTERMATH

Mark Eberhard Called to Haiti

Professor Marc Eberhard led a five-person team sent to evaluate damage from the magnitude-7 earthquake that struck Haiti on January 12. The team, sponsored by the national Earthquake Engineering Research Institute, provided engineering support to the United States Southern Command, which is responsible for all U.S. military activities in South and Central America. It also responded to engineering requests from the U.S. Agency for International Development.

The team found no surface evidence of the fault that might have caused the quake, but installed four instruments to measure aftershocks and help pinpoint the epicenter. Knowing the location will help to understand the cause and forecast the likelihood of future quakes in the area.

During their week in Haiti, the team assessed damage in the worst-hit places, including the port in Port-au-Prince, the cathedral, the National Palace, the Hotel Montana, and an international school. They



Marc Eberhard stands on collapsed pavement.

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Chair's Corner

Greg Miller

Since becoming department chair in December, I have talked with faculty, staff, students, and alumni about the department's current status and future directions. Because so much is happening, it is helpful to look at the principal components of people, activities, facilities, and relationships within and outside the institution. This message can only touch on several highlights of this exciting time for CEE.

Starting with people, we have healthy enrollments of great students at the undergraduate and graduate levels. Student demand continues to outpace our capacity, most dramatically in a 50% increase in the number of graduate applications. Given dwindling state support campus-wide, we are looking into creative ways to meet educational demands, including high-impact enrollment proposals and new professional master's degree programs.

We are in the midst of significant faculty changes; roughly one-third of the faculty has been here six years or less, and in the next five to eight years we expect another influx of new people. Our new faculty are outstanding, and their openness to interdisciplinary collaboration bodes well for the department. Good relationships are building among the senior and junior faculty, creating a strong combination of system memory and wisdom and the new energy and ideas that each generation brings.

Of course, we continue to benefit from our excellent staff. Although much of what they do is invisible to students, their contributions are critical to our overall success.

Another highlight is that research awards increased 40% this past year. Although research is often considered a separate enterprise from the educational mission, the two are closely coupled, and expanded research activity helps us on the education front. One example is increasing opportunities for undergraduate students to participate in research projects, an excellent complement to classroom experiences.

I have much nostalgia for More Hall, having been around, first as a student and a faculty member for 35 years, but our cramped and aging facilities definitely hamper our ability to grow our program in size and quality. (We thought the building was pretty old when I was an undergraduate in the seventies). Some interesting conversations are addressing this issue in a much broader framework than simply replacing More Hall. Stay tuned.

In respect to our relationships across campus, we want to create stronger, formal partnerships with the newly formed College of the Environment and the recently renamed College of Built Environments (formerly School of Architecture). Our students and faculty already benefit from collaborations with these units, but new opportunities ahead can expand our understanding of civil and environmental engineering's role in the world at both the technical and the policy levels to ensure we contribute to addressing the next generation's challenges.

I look forward to continuing this conversation in future newsletters.



Roger Garratt

2010 Evans Lecture Spotlights Renewable Energy

**Thursday, May 20 4:30 pm
UW Kane Hall, Room 110**

Roger Garratt, director of resource acquisition at Puget Sound Energy, will share PSE's vision of what renewable energy can bring to our region in a talk titled "Renewable Energy Seems Like Old Times." He will discuss the

challenges of integrating these new forms of energy into our electric infrastructure from a technical and public policy standpoint and will give an overview of developments in other countries and across the U.S. He has been instrumental in building PSE's wind power facilities and leads their efforts in a range of new technologies from wind and solar to biomass and electric vehicles.

The Daniel L. and Irma Evans Lectureship in Civil and Environmental Engineering was established in 1982 by the three Evans sons – Dan, Robert, and Roger – to honor the human values and broad societal outlook of their parents.

The lecture is free and open to the public, with a reception to follow. If you would like to join us, please RSVP to Heather Wilson at (206) 543-8883 or hwilson@u.washington.edu.



Dennis Lettenmaier

Lettenmaier Elected to NAE

Professor Dennis Lettenmaier is one of just 68 new members nationwide elected this year to the National Academy of Engineering. He earned one of engineering's highest honors for his contributions to hydrologic modeling for stream water quality, climate trends, and improved water management.

Lettenmaier holds an endowed position, the Robert and Irene Sylvester Professor of Civil & Environmental Engineering. Among numerous professional affiliations, he is a Fellow of the American Geophysical Union (AGU), American Meteorological Society, and American Association for the Advancement of Science. He is president-elect of the Hydrology Section of the AGU and associate editor of *Water Resources Research*. The American Society of Civil Engineers honored him with its Huber Research Prize in 1990.

The department is proud that he is both a long-time faculty member and a UW alumnus. He earned his BSME in 1971, his doctorate in CEE in 1975, and joined the faculty in 1976.



Professor Steve Burges Retires

After 40 years on the CEE faculty, Professor Stephen Burges is retiring to emeritus status in June. Steve has a tremendous record of contribution, with educational and research interests ranging broadly over hydrology, water resources management, and stream and river channel dynamics. A recent international symposium held in his honor featured colleagues, former students, and collaborators from around the world presenting outstanding technical work and personal reflections on Steve's influence on their work and in their lives.

"Steve has been a singular presence in the department for literally as long as I've been here, so his retirement will take some adjusting to, but he has always taken seriously the role of mentoring his junior colleagues, so I think he can trust us to keep the place running well in the future," said CEE chair Greg Miller.

A native of Australia, Burges earned his doctorate at Stanford University. He is a fellow of the American Society of Civil Engineers, American Geophysical Union (AGU), and American Association for the Advancement of Science. He was president of the AGU Hydrology Section (1994–1996). Among his many honors are ASCE's 2008 Ven Te Chow Award for lifetime achievement in hydrologic engineering and the 2003 Ray K. Linsley Award from the American Institute of Hydrology.

Susan Bolton Receives Diamond Award

Over the past four years, Professor Susan Bolton, faculty advisor to the UW Student Chapter of Engineers Without Borders (EWB-UW), has mentored more than 150 students in their pursuit of engineering solutions to improve the quality of life in several impoverished villages in a remote, mountainous area of Bolivia. For this work, the College of Engineering honored Bolton on May 7 with its annual Diamond Award for Distinguished Service.



Bolton and her student teams work with villagers to implement sustainable changes including installing well-ventilated cook stoves to improve indoor air quality and stabilizing an unpaved road to enable better access to schools, markets, and health clinics for more than 5,000 people. The national EWB honored the UW chapter with its 2008 International Humanitarian Award.

Bolton is an adjunct professor CEE and a professor in the College of Forest Resources. In nine visits to Bolivia since 2006, she has developed a multicultural teaching method that emphasizes hands-on engineering problem solving.

Amy Haugerud Is Graduation Speaker

Amy J. Haugerud (BSCE '77) is the second woman in Seattle to found her own civil engineering firm. Over 25 years RoseWater Engineering provided services for hundreds of projects throughout the Pacific Northwest. Haugerud retired from the business in July 2009 after leading her company through a merger with GHD, an international professional services company.



She has received several awards including the 1999 Seattle Mayor's Small Business Award, the 2005 Engineer of the Year from the American Council of Engineering Companies (ACEC) Washington, and the 2006 Nellie Cashman Woman Business Owner of the Year award.

Haugerud served as president of the ACEC of Washington and on the national ACEC board of directors, and on the board of the Seattle Chapter of ASCE.

On June 13 graduating students will celebrate their great accomplishment and receive a welcome to the profession from this outstanding alumna.

Funding for Greenroads

Professor Steve Muench's innovative Greenroads project is gaining momentum, fast. Greenroads is a performance metric that assesses the sustainability of new, reconstructed, and rehabilitated roads, awarding points for approved sustainable choices, thus providing a means to certify projects. The system, which evolved from master's thesis work by 2007 Swedish Valle Scholar Martina Soderlund, has just garnered key financial support.

Greenroads has won a \$50,000 Commercialization Gap Innovation Fund grant from the UW Center for Commercialization (UWC4C).

The team will use the funds to test the Greenroads metric in realistic settings. These awards support projects that UWC4C believes have a high chance of commercialization and where gap funding can accelerate the process. The award also includes access to seasoned business executives and entrepreneurs who can offer guidance on market analysis, venture funding, and other aspects of technology commercialization or new company formation.

In February 2010 the Federal Highway Administration (FHWA) awarded a \$700,000 contract to engineering solutions firm CH2M HILL and their UW Greenroads team partner to develop a model process and web-based highway sustainability self-evaluation tool.

Muench's team, led by doctoral student Jeralee Anderson, will do most of the core work. The advanced state of Greenroads research and development efforts to date will enable delivery of an operational self-evaluation system to FHWA by late 2010.

The Greenroads team also is applying the sustainability performance metric to about 15 case studies for federal agencies, state DOTs, and local agencies. Requests for information and evaluations are coming into the UW and CH2M HILL at an accelerated pace, especially since release of the complete Version 1.0 manual, which is available for download at www.greenroads.us.



Climate Warming Requires New Approach to Columbia Basin Dam Management

Pioneers in climate change research (including CEE's own Dennis Lettenmaier) began to realize in the early 1990s that projections for climate warming in the 21st century would change patterns of stream flow in the western U.S. and could significantly disrupt water resources systems. Predicted hydrologic changes for the Pacific Northwest, and other mountain regions, include less springtime snowpack, earlier snow melt, earlier peaks in river flow, and lower summer flows.

As part of a set of legally binding agreements that seek to balance hydropower generation, flood risks, irrigation, and other needs, Northwest water managers use a system based on the analysis of historical stream-flow records to determine when to evacuate storage reservoirs for flood control and when to begin refilling them in the spring. These traditional analyses assume a stable climate, but projections show that climate change will affect the balance between flood control and reservoir refill. In the last decade water managers have raised many questions about how to respond to these kinds of impacts, especially in the Columbia River basin, the nation's largest hydropower system.

"Anticipated dramatic changes in the snowpack ultimately will affect when water comes into the Columbia's reservoirs," said Alan Hamlet, CEE research assistant professor, who works in the UW's Climate Impacts Group. "We are trying to develop new tools and procedures for generating flood control operating rules in response to

these changes in hydrology, and to test how well they work in practice."

Over the last five years, Hamlet and CEE researchers Se-Yeun Lee and Professor Stephen Burges have collaborated on a series of studies with UW alumna Carolyn Fitzgerald (MS CEE '03), chief of water management in the Seattle District Office of the U.S. Army Corps of Engineers. Their investigations used optimization approaches to develop new procedures for rebalancing reservoir operations for flood control and refill objectives in the Columbia basin.

Optimization models use tools such as linear programming and dynamic programming to provide optimal decisions for a given set of forecast conditions and water management objectives. These techniques date back to World War II, but have been primarily used for short-term planning in a water resources applications. Advances in computing and data analysis now make the method practical for long-term planning.

Reservoir operations are complex, so trial and error adjustments in flood control are not likely to identify the best solutions. Optimization allows managers to efficiently search all possible outcomes and identify the best reservoir operating policies for conditions that were not anticipated by the original designers of Columbia's flood control operating plan.

The CEE team created a computer program that compared historical conditions with a scenario where temperatures are 2 degrees Celsius higher on average than today, a change expected in the Pacific Northwest by the second half of the century. The simulations



Bonneville Dam spillway structure.

suggested water managers could successfully deal with warmer conditions by refilling the system's reservoirs as much as one month earlier in the spring. These adjustments can reduce projected losses of summer hydropower production in the Columbia basin by about 25%.

"It could be many years before climate change management practices are formally adopted, but this study is a first step," Hamlet said. "Future research will focus on designing specific operational procedures for flood control that use state-of-the-art stream-flow forecasting procedures and do not require repetitive updates as the climate warms."

Earthquake (from page 1)

photographed damage in smaller towns and evaluated the safety of hospitals, schools, bridges, and other critical facilities.

Many people asked the team members to inspect buildings where the occupants were camped outside because they feared a collapse. "We focused on identifying serious versus cosmetic damage. Probably the most satisfying thing we did was walk through buildings and get people back inside," Eberhard said.

Eberhard's team included engineers from two universities and a structural engineering firm, plus a seismologist from the U.S. Geological Survey. You can read a blog compiled by several engineering teams and see photos at: <http://neescomm.blogspot.com/>. Scroll to the bottom of the home page and click "Older Posts" to access the Eberhard team blog.



Alan Hamlet



Laura Lowes Named ACI Fellow

Laura Lowes, CEE associate professor, was recently elected a Fellow of the American Concrete Institute (ACI). This honor recognizes members who have made outstanding contributions to the production or use of concrete materials, products, and structures in the areas of education, research, development, design, construction, or management, and who have made significant contributions to ACI through committees or local chapters.

Lowes is a current member and former co-chair of ACI's committee on Finite Element Analysis of Reinforced Concrete Structure, member of the committee on Seismic Repair and Rehabilitation, and associate member of the committee on Shear and Torsion. She is also a member of the American Society of Civil Engineers (ASCE), the ASCE Methods of Analysis Committee, and an associate editor of the ASCE *Journal of Structural Engineering*.

Professor Lowes' research addresses nonlinear analysis and performance-based seismic design of concrete structures, including developing numerical models for building joints and performance-based design tools for bridge columns and building frames. She has won several previous awards including the George Nassar Award from the Precast/Prestressed Concrete Institute.

CEE Student Honored for Master's Thesis

Yegor Malinovskiy received a 2009 University of Washington Distinguished Thesis Award for his master's thesis entitled "Video-Based Vehicle Detection and Tracking Using Spatio-Temporal Maps." This thesis grew out of work with his advisor, Professor Yinhai Wang. He developed a new image-processing algorithm to improve identification of vehicles in traffic by using video captured from standard traffic cameras. His approach captured sequences of longitudinal image scan line slices and mapped them to a reassembled composite image so vehicle features can be tracked in real time as simple lines, analogous to position-time plots. This system is much less sensitive to errors and has much higher detection accuracy than do current systems.



The UW Distinguished Thesis Award, initiated in 2008, recognizes outstanding work by graduate students completing their degrees. Malinovskiy is now a doctoral student and is continuing to research data-gathering tools that can improve traffic flow, with the associated direct and indirect positive effects on people's lives, the environment, and energy use.

Chi Epsilon Honors Einer Handeland

The UW chapter of Chi Epsilon, the national honor society for civil and environmental engineers, inducted UW alum Einer Handeland, PE (BSCE '66, MSCE '77) as a Chapter Honor Member at a formal initiation ceremony and dinner in April. Fewer than 1,700 engineers nationwide have received this distinguished award recognizing the contributions of honorees to the profession.

A senior project manager at Parsons Brinckerhoff, Handeland has focused on traffic and structural projects, including the West Seattle Bridge, the 520 Bridge, and the Viaduct. He is deeply rooted in the Seattle transportation community, mentors young engineers, and is active in APWA, ASCE, and Seattle Rotary.

Chi Epsilon honors academic excellence by inviting the top 30% of CEE students to become members. The chapter serves the department and community through outreach projects such as reforestation efforts, Habitat for Humanity, and the College of Engineering Discovery Days, April 23–24.



OneBusAway Wins WTIA Award

OneBusAway, a suite of tools to make using public transit easier for King County riders, won the Washington Technology Industry Association's 2010 Industry Achievement Award in the category "Best Use of Technology in the Government, Non-Profit, or Education Sector."

Developed by PhD students and transit riders Brian Ferris in Computer Science & Engineering and Kari Watkins in Civil & Environmental Engineering, OneBusAway is designed to improve public transit usability and satisfaction. The site combines integrated and interfaced transit rider tools including route maps, timetables, a trip planner, real-time tracker, and service alert integration.

OneBusAway tools, used by more than 5,000 riders every day, are accessible via web, cell phones, smart phones, and text-messaging. The Explore Tool is a nifty feature that makes it easy to search for restaurants, parks, shops, or anything else you might be looking for that is just one bus ride away.

For more information visit <http://onebusaway.org>.

CEE is Now on Facebook!

Connect with classmates and learn what the department is up to by joining the UW Civil Engineering fan page on Facebook. This is a great way to keep in touch and stay informed about news, events, and awards. It's fun, convenient, and we would love to stay in touch with you. Log on and find out what all the buzz is about at <http://www.ce.washington.edu>.



Alumni Highlights

CEE Benefits from Construction Industry Generosity



Earlier this year, the department received an encouraging boost to support faculty and students focused on construction engineering. Tom (BSCE '68) and Marilyn Draeger, along with their partners at the Beavers Charitable Trust, established the Tom and Marilyn Draeger/Beavers Charitable Trust Endowed Professorship.

This endowment will enhance the University's ability to recruit and retain distinguished faculty and support the teaching, research, service, and professional development

activities of the professorship holder. This faculty member will have expertise relating to the heavy construction industry, structures, construction, soils, or transportation, and will encourage students to explore a career in this field.

As the senior vice president of the Bechtel Group and the president of Bechtel Construction Operations, Tom Draeger was responsible for the functional direction, personnel administration, and operations of Bechtel's global construction activities. He has overseen major civil, airport, rail, and transportation projects around the world, including the Hanford remediation contract in Eastern Washington and construction of the new Tacoma Narrows Bridge.

Draeger is a Fellow of the American Society of Civil Engineers (ASCE) and was honored with its OPAL Lifetime Achievement Award in 2007. He also is president of the Beavers, a social and honorary organization formed and managed by construction companies and individuals engaged in heavy-engineering construction.

"This professorship emphasizes the training and graduation of civil engineers ready to go into the construction industry," Draeger said. "We were inspired to make this gift to ensure the preparation of future engineers entering this great profession."

Golder Associates Celebrates 50th Anniversary by Supporting Students

Golder Associates, an international geotechnical engineering firm, has reached a major milestone this year — 50 years in business as an employee-owned company. Founded in Toronto, Golder Associates now has more than 7,000 employees and offices in more than 150 countries worldwide. To celebrate this achievement, the company is supporting the next generation of civil and environmental engineers.

Golder Associates Seattle Operations has created an endowment at the UW, the Golder Associates 50th Anniversary Endowed Student Support Fund in Civil and Environmental Engineering. It will benefit graduate students studying geotechnical engineering, surface water, groundwater, environmental science, or energy. The company's goal is to transition this fund into an endowed fellowship through continued corporate support of the endowment.

Bob Anderson (UW Geology '83), vice president of Golder Associates Inc. for the Western United States, says that Golder's vision is to be the most respected ground engineering and environmental services firm in the world. "Supporting higher education as the source of top talent and advanced research is key to our success," he said. "As Golder grows worldwide and in the Pacific Northwest, we depend on high-quality graduates and collaboration with institutions like UW to bring the innovative, effective solutions that our clients expect."



Stuart Stringer in front of the "Baldwin" load testing equipment in the Structures Lab.

New Fellowship Has Seismic Impact

Despite the economic downturn, companies continue to support our students through scholarships and fellowships. One is Moffatt & Nichol, which has awarded a fellowship to CEE graduate student Stuart Stringer (BS '08) after consultation with professors Dawn Lehman and Charles Roeder.

Moffatt & Nichol plans and designs coastal infrastructure worldwide focused on ports, harbors, urban waterfronts, and marinas and their associated environmental, water resource, transportation, and energy projects.

"Given the status of funding for higher education, especially in the state of Washington, it is more critical than ever for us to invest in educating our students," said Tom McCullough, vice president and branch manager of Moffatt & Nichol's Seattle office. "Today's students represent the hope upon which our profession's future rests, and they are the foundation for meeting today's challenges."

As an undergraduate, Stuart held a paid internship at the company, working part time during the school year and full time in summer. His graduate research focuses on how container ship wharfs perform under earthquake loading. The goal is to develop a new design for the connection between the concrete piles and wharf deck to improve performance of the structure.

"It is awesome to see a consulting design firm like Moffat & Nichol invest in young engineers to help build the future of the small niche market of waterfront engineering. It is equally amazing to be the subject of that investment," Stuart said.



"It was exhilarating to be immersed in research in a completely new way. My experience in Norway was amazing and my worldview has widened. I am positive my Valle experience will continue to enrich my life and career."

Valle Scholarship and Scandinavian Exchange Program Celebrates 30 Years

Preparing people for life-long learning, leadership, and service through cooperative international education has been the mission of the Valle Scholarship Program at the University of Washington for three decades. It is the legacy of Henrik Valle, a Norwegian immigrant who became a respected leader in Seattle's construction industry.

Valle earned a civil engineering degree in Norway, but spoke no English when he arrived in Seattle in 1925. He literally started at the bottom as a laborer digging the basement for the first Frederick and Nelson store. Twenty-five years later he was the general contractor for a \$10 million project to add five stories to the Frederick and Nelson building (now owned by Nordstrom). His company worked on other prominent local projects including the Seattle Art Museum in Volunteer Park, several wings of Virginia Mason Hospital, and Boeing Company buildings.

Valle's desire to enhance his profession and foster the exchange

of expertise and building practices between the U.S. and his homeland inspired a \$3 million gift to the UW College of Engineering in 1980. Through the Valle Trust Endowment, the Valle Scholarship Program fulfills a dual mission: to promote and fund the exchange of graduate students between the UW and programs in the Nordic countries, and to support outstanding graduate students in Civil & Environmental Engineering and Built Environments programs including architecture, urban planning, landscape architecture, and construction management.

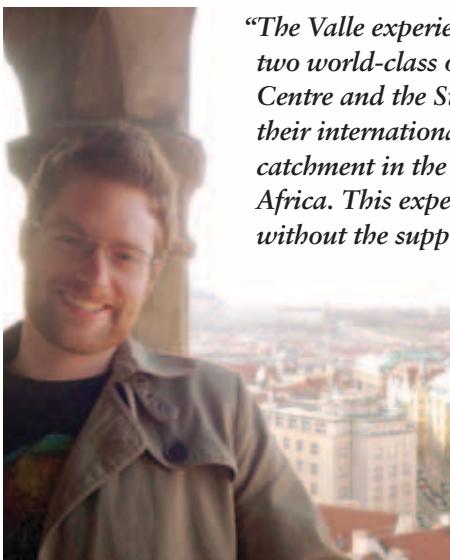
Originally, the Valle Trust funded exchange scholars to and from Norway, Sweden, Denmark, Iceland, and Finland. Exchanges with the Baltic countries of Estonia, Latvia, and Lithuania began in 2005. To date, the now \$12-million trust has funded more than 600 scholars, most completing master's degrees or working on doctoral research at the UW.

"The Valle Program is especially seeking doctoral students to par-

"The Valle experience offered an opportunity to work with two world-class organizations, the Stockholm Resilience Centre and the Stockholm Environment Institute. Via their international network, I led a modeling effort of a catchment in the Volta River Basin, in Burkina Faso, Africa. This experience would have been impossible without the support of the Valle Program."

ticipate in research at the UW," says Professor Scott Rutherford, program director. "We encourage Valle alumni and associates to encourage outstanding students to apply."

Six scholars from Scandinavian and Baltic countries are at the UW for the 2009–10 academic year and seven UW students are in Scandinavia. Among them are Patrick Keys and John Werner (photos).



UW master's student Patrick Keys is a Valle scholar in water resources hydrology at the University of Stockholm.



UW master's student John Werner did structural engineering research at the Norwegian University of Science and Technology in Trondheim (Henrik Valle's alma mater).

Valle Scholarships have influenced the careers of hundreds of scholars worldwide. Many Valle alums are highly skilled professional engineers, architects, and urban planners engaged in significant and innovative building and environmental projects. Valle scholar Martina Soderlund from Sweden earned her MSCE at the UW in 2007 and is now working on sustainable building design for Stantec Consulting in Vancouver, B.C. Her cutting-edge Greenroads project with CEE Professor Steve Muench is winning awards and making headlines (see page 5).

"The Valle Scholarship Program has had a major influence in my life and my career," said Soderlund. "It gave me the chance to pursue studies and research within the sustainability field that I am most passionate about. I would probably not be where I am today if it were not for the Valle Program."

A continuing UW goal is to stay connected with Valle alumni and develop strong partnerships with Nordic institutes. Anyone with a UWnetID can follow current scholars, research, and cultural exchanges on the Valle weblog at <https://depts.washington.edu/vallelog/blog/>.

For more information about opportunities to participate in joint research activities through scholar exchanges, or to make a gift, visit <http://www.engr.washington.edu/valle/> or email valle@engr.washington.edu.

The Bridge

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Kudos to Concrete Canoe and Steel Bridge Teams

This year's regional competition for both teams was April 22–24 at Washington State University in Pullman in conjunction with the annual American Society of Civil Engineers student conference. Teams from the Pacific Northwest vied for the chance to compete in Nationals in San Luis Obispo, Calif., in June.

The Concrete Canoe team won first place overall among 11 schools and is headed for Nationals. The team placed first in the paper and presentation sections, first in men's and women's sprint races, third in the final production component, and fourth

overall in the races. Co-captains Elyse Hanson and Nick Connolly led five women and five men in refining design and construction elements, including improved accuracy and quality controls to construct a canoe that is just a half-inch thick.

"Sustainability is the trend this year," said Hanson, "and building materials include more aggregates, fiberglass, and glass microspheres so the canoes are lighter and more flexible."

To top it off, CEE junior Kunal Vaswani placed second in the Concrete Horseshoe Competition. The canoe teams construct two concrete horseshoe pitches and compete using concrete horseshoes!

The Steel Bridge team of 15–20 undergraduates built a 21' × 4.5' bridge that weighed approximately 150 lbs.



Members of the Steel Bridge team outside More Hall.

and had to withstand weight of 2,500 lbs. Criteria for judging included deflection, weight, construction, and assembly speed. The team placed sixth among 14 teams in a high-caliber competition with numerous outstanding designs.

"Our team performed well and the bridge had a maximum displacement of just 1.2 inches," said Lorne Arnold. "We learned a lot during the design and fabrication process and through seeing the designs of other universities, and the juniors are excited to start leading next year's team."

For more competition results, visit the 2010 ASCE Pacific Northwest Regional Conference website at <http://asce.ce.wsu.edu/pnwrc2010/canoe.html>.



The Dawgs Are #1! Members of the canoe team on the banks of the Snake River in Pullman.