



CIVIL TALK

Department of Civil and Environmental Engineering Annual Newsletter

2010

2010 Life-Long Learning Conference

The 2010 Lifelong Learning Conference will be held on October 7-8, 2010 in Provo, Utah. The conference will be on Thursday and Friday of Homecoming weekend, and is shaping up to be even better than the first Lifelong Learning Conference held in 2008. This great biennial event is a new tradition for alumni to return to Provo, foster new and old relationships, and participate in two days of relevant technical training that provide certified “Professional Development Credit” for continuing licensure requirements – not to mention all the sights, sounds, and energy of a BYU Homecoming weekend!



The 2010 Life Long Learning Conference has been designed to provide beneficial information to engineers at various stages of their career, from entry level to top management. Presentation topics include Managing a Business Through Challenging Economic Conditions, Forensic Engineering, Sustainable Development, and state-of-the-practice technical presentations from BYU CEEn Faculty and professional experts. Featured presentations will include the I-15 Corridor Expansion through Utah County, Lake Powell Pipeline Environmental Study, and the 2010 Chile Earthquake. The Central Utah Branch Monthly

meeting will also be incorporated into this event with a special presentation by Blaine Leonard, P.E., 2010 ASCE National President. The conference is sure to be an informative and enjoyable event for all who attend and it is a great opportunity to network with your peers and former classmates. A total of 14 professional development hours will be available for participants who attend both days of the conference.

The conference registration is \$475 per attendee for the full registration and increases to \$525 after September 1, 2010. Single day registration is also available. Online registration and information regarding the conference is available at <http://ceen.et.byu.edu> -- make sure to check back for program updates! Sponsors are still needed and information is available on-line for your organization to show your support for this event and BYU’s Civil and Environmental Engineering program.

To encourage early registration for this event and to help provide needed scholarship funds for our students, any donation to the Scholarship Society between \$100 and \$499 received by the department between now and July 31, 2010, will receive a 25% reduction in the conference registration fee. Donations between \$500 and \$999 will receive a 50% reduction and donations of \$1000 and greater will receive one free registration. When making such a donation, please call Janice Sorenson first (801-422-2817), to express interest in both donating and receiving a discount.

Scholarship Contribution (received by July 31, 2010)	Reduction in Lifelong Learning Fee
\$100 to \$499	25%
\$500 to \$999	50%
\$1,000 and over	100%

Message from the Chair



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Dear Alumni and Friends,

It has been another very exciting and busy year for our department and I am pleased to tell of some of the significant things that have happened. During the past two years the department has completed successful evaluations from both ABET – the national Accreditation Board for Engineering and Technology – as well as the seven year internal review from the BYU Office of Planning and Assessment. Both of these reviews confirmed that we have gifted students, outstanding faculty, and particularly strong alumni. We remain fully accredited by ABET.

Our student enrollment continues to increase. Last fall semester 435 undergraduates and 60 graduate students were registered – the largest enrollment ever. I expect the coming fall semester will show an additional increase. We have been identified as one of the ten largest undergraduate programs at the university. Word continues to spread that becoming a Civil Engineer provides a very exciting and satisfying career. In addition, we are one of the top 40 (of 208) programs in the nation in the number of BS graduates per year and in the top 20 (of 170) in the number of MS graduates per year. We relish the opportunity to serve as many qualified students as possible.

As you read this newsletter you will be pleased to see the numerous and varied activities in which our students and faculty are involved. Student participation in ASCE, EERI, and ITE activities provide wonderful leadership, professional, and social involvement opportunities. We know such participation provides additional strength to an already rigorous academic program. In addition, the international experiences provided by both the Mexico Engineering Study Abroad and the China Megastructures class opens the vision of what it means to be a global engineer. We are happy that the China experience is expanding to include a class in Megacities (i.e., Transportation). Fifty-three of our students are involved in these life changing experiences in Mexico and China this year. In addition, the consequential research projects being conducted by our faculty involve both undergraduate and graduate students as research assistants.

All of these research projects have multiple positive outcomes including providing new and important knowledge to our profession, engaging students in a high impact learning experience, allowing a close student-faculty mentoring experience, and providing a significant means of financial support for students.

We are very pleased to be working with the Civil and Environmental Engineering Scholarship Society in planning the second Life-Long Learning Conference to be held during the BYU homecoming week this fall. I hope you can come. This is a wonderful opportunity to return to campus with your family and couple a meaningful technical educational opportunity with the exciting and fun BYU Homecoming festivities.

As always, the department welcomes your continued interest and support. Please feel free to visit us anytime and provide us information you would like us to know. Most importantly, stay connected with us. I wish you the best in all that you do.

Sincerely,

Steve Benzley

Recent Grads Establish Endowed Mentoring Fund

Wendy Thompson & Heather Burnham Give Back

As Wendy Thompson began her last semester at BYU in 2009 she felt “an overwhelming sense of gratitude” for the scholarships and mentored learning grants that carried her through financially trying times. She decided to try and pay back the money she had received. By reviewing the list of scholarships and grants she received she calculated that over half had come during her last two years at BYU. Furthermore, this exponential increase in funds was a direct result of her joining the BYU Highway and Materials research group directed by Dr. W. Spencer Guthrie. Working on this research also helped her land a job during a historically difficult time for civil engineers.



Wendy determined that by setting aside a significant portion of her salary, in one year she would be able to give back 100% of the scholarship and grant money she received at BYU. Wendy explained her idea to a fellow BYU graduate and colleague, Heather Burnham, and the two contacted their alma mater to see if they could set up a Pavement and Materials Endowed Mentorship Fund. BYU agreed and the two young philanthropists are planning to have the fund fully endowed by the end of this year, leveraging their donations with employer matching. Thank you, Wendy (on right in picture) and Heather (on left in picture)!!

Did You Know?

- (1) That you can endow a scholarship in perpetuity for \$50,000 (payable in 5 years)?
- (2) That you can endow a mentorship* in perpetuity for \$50,000 (payable in 5 years)?
- (3) That you can donate your appreciated stock or real estate; and by doing so avoid capital gains, receive a tax deduction, and receive a lifetime income for you and your spouse?
- (4) That the department is appreciative of any size gift that you can make now that will help maintain scholarships for our students during these difficult times?

Note that employer matching funds are included in any endowment.

To contribute, go to the BYU Civil Engineering website at <http://ceen.et.byu.edu> and click on the “Contribute to CEEn” link.

*Mentorships provide funds to hire students to work in the labs, furthering research and assisting professors.

Please help us update our alumni database with your current contact information and preferences. Return the form on page 11 or visit <http://ceen.et.byu.edu> and click on the “Alumni Update” link.

EERI



The BYU chapter of the Earthquake Engineering Research Institute (EERI) “erupted” in 2009 after lying dormant for a number of years. EERI students successfully competed in the 2009 Seismic Design Competition held in Salt Lake City, taking 2nd place out of 18 schools. EERI increased their membership from 2 to 25 students and entered the 2010 Seismic Design Competition in San Francisco, taking 4th place out of 22 schools. Videos of their 6-foot-tall balsa wood skyscraper being demolished in an earthquake simulation can be seen on www.et.byu.edu/groups/eeri.

In addition to the competition, EERI hosted several guest speakers:

- Ramin Golesorkhi, a Principal from Treadwell & Rollo
- Jerod Johnson, a Principal from Reaveley Engineers & Associates
- Les Youd, an emeritus faculty from Brigham Young University

2009 & 2010 have been good years for EERI and they expect equally good years in the future.

ITE



The BYU student chapter of Institute of Transportation Engineers (ITE) has also had a successful year. Last May, Jeremy Searle and Scott Shea attended the ITE Intermountain Section Conference in Jackson Hole, WY, where Scott was awarded the Annual ITE Scholarship for \$2,000. Over the past school year ITE held numerous activities and socials. In October, ITE provided service for the community by doing a road cleanup along Highway 89. For the Fall opening social ITE held a BBQ for students and provided information about ITE and the transportation engineering field. A winter social was held in January, where students were provided with pizza and listened to Ryan Hales, P.E. of Hales Engineering, speak about data collection. The closing social included Subway sandwiches and a talk by Jay Nielson, P.E., P.T.O.E., and Second Vice President of ITE Intermountain Section. BYU ITE submitted a proposal this year to complete a data collection project for International ITE. Beating out competitors from 23 other universities, BYU ITE was awarded a \$1,000 grant. The project has successfully been completed and submitted. This June, BYU ITE student chapter officers are planning to attend the western ITE District Conference in San Francisco where they will compete in the ITE Traffic Bowl and the MiteY Race competitions.

ASCE

Fall 2009

President:	Bryan Wilson
1 st VP:	Sam Lasley
2 nd VP:	Gabriel Smith
Secretary:	Taylor King
Treasurer:	Matthew Kelly
Publications:	Jessica Hanson

Winter 2010

President:	Steven Lord
1 st VP:	Thomas Hodge
2 nd VP:	Grant Ensign
Secretary:	Katy Wallis
Treasurer:	Seth Law
Publications:	David Wilson

Faculty Research - Long-Term Bridge Performance

Dr. W. Spencer Guthrie was invited last year by Utah State University researchers to join them as a member of the “Western Team” of the Long-Term Bridge Performance Program (LTBPP) funded by the Federal Highway Administration. The “Eastern Team” consists of personnel at the Virginia Transportation Research Council and Virginia Tech. Both teams work under the direction of the principal investigators at Rutgers University. The overall goal of the LTBPP is to develop a better understanding of how highway bridges perform under a variety of service conditions. Dr. Guthrie is specifically tasked with investigating concrete material properties and the state of corrosion of reinforcing steel in selected concrete bridge decks.



The pilot phase of the program is underway, with the primary objective of developing robust test protocols for application in the broader program. The scope of the pilot program includes testing of bridges in California, Florida,

Minnesota, New Jersey, New York, Utah, and Virginia. In the West, Dr. Guthrie’s LTBPP team has completed evaluations of the Utah Pilot Bridge in Perry, Utah, and the California Pilot Bridge in Sacramento. Testing included determination of cover depth, electrical continuity of reinforcing steel, concrete resistivity, Schmidt rebound number, half-cell potential, and steel corrosion rate. In addition, samples were removed for determination of chloride concentrations and concrete stiffness, strength, density, absorption, permeability, and other properties at the BYU Highway Materials Laboratory. Testing of the Minnesota Pilot Bridge is scheduled for later this year.



Several BYU students have participated in the LTBPP research, including Mark Butler, Jeff Hoki, Shar Montgomery, Natasha Padgett, Maile Rogers, Scott Shea, and Eric Sumsion. Dave Anderson, Manager of BYU Civil Engineering Laboratories, also assisted with field work. Asphalt Zipper, Inc. provided a miniature prototype milling machine that was effectively used to remove the nearly 8”-thick asphalt overlay at selected locations on the Utah Pilot Bridge deck surface. Six of the team members, including Dr. Guthrie, participated in the recent Transportation Research Board meeting in Washington, D.C., where they co-presented their findings at a session specifically devoted to LTBPP research.



Faculty Research - Utah Lake Tributaries Project

Dr. Wood Miller and Dr. Brett Borup, along with 2 masters degree students, Bryan Martinez and Jared Marelli, are conducting a research project on sampling and evaluating the flow rates and water quality of the 15 major tributaries to Utah Lake. These are critical measurements for the modeling and management of Utah Lake. The lake is a focal point of water resource and recreational development in Utah Valley. Current water data is sparse and misconceptions occur about the lake, which could be put into perspective with better data, improved modeling, and more general information about the lake.

The LKSIM model (developed by Dr. LaVere Merritt, BYU Professor Emeritus) is used by local agencies to simulate Utah Lake water quantity and quality over time. The main use of the LKSIM model is to determine water availability and quality responses to various uses and management scenarios where multimillion dollar issues are being considered. This research project will update the flow and quality data sets and enhance the hydrologic correlations, which drive the LKSIM model. The model will then reflect current tributary conditions and insure the accuracy of the simulations.

Discharge, temperature, pH, DO, conductivity and turbidity are measured each month or twice a month at each stream location. Water samples are also taken which include four bottles for chemistry, filtered metals, filtered nutrients, and non-filtered nutrients and are delivered to the State lab for analysis. More extensive samples are also periodically taken, which include three additional bottles for total metals, TOC, and BOD.

Tables and graphs for each of the tributaries have been made in order to correlate the sampling results. The 8 ions used in the LKSIM model to characterize Utah Lake water quality are specifically TDS, HCO₃, Ca, Cl, Mg, K, Na, and SO₄. Also, the nutrients, NH₃, NO₂ + NO₃, and total phosphorus, are being tracked. In addition, updated correlations between new precipitation indices and other tributary flows are being made because some precipitation stations around Utah Lake have been discontinued. Preliminary results show that a few tributaries have quality data and correlations between hydrology and water quality which are similar to previous results, but many are different. These differences are likely due to changes on the streams and changes in land use and development around Utah Lake.

Faculty Research - Hyperstructures

Can We Build Them, and Will They Come?

Throughout the world, people are migrating to cities at an unprecedented rate. As populations, fuel prices, commute times, and environmental concerns increase in the future, so will the need for high-density urban habitats.



Figure 1: GAS Paradigm (Hong Kong)

The 20th century model for high-density cities, referred to as the Ground Access Skyscrapers (GAS) paradigm, consists of a cluster of commercial and residential skyscrapers in which horizontal movement is limited to the ground level (see Figure 1). It's no coincidence that the acronym "GAS" also suggests excessive consumption of fossil fuels. Indeed, 48% of the energy consumed on the planet is expended to heat, cool, and power buildings -- only 27% is consumed by cars, trucks, and trains. The amount of energy required to heat and cool buildings largely depends on the amount of exposed surface area. As seen in Figure 1, minimizing exposed surface area was not a priority in the 20th century, but it must be a priority for the 21st century.

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Faculty Research - Hyperstructures

Continued from page 6



Figure 2: Vulnerable Skyscrapers (NY)



Figure 3: X-Seed 4000 (Tokyo)



Figure 4: Ziggurat (Dubai)



Figure 5: Crystal Island (Moscow)



Figure 6: Parkview Green (Beijing)

Hyperstructures: Can We Build Them, and Will They Come?

On 9-11 (Figure 2) we witnessed how vulnerable tall, slender, disconnected skyscrapers are to terrorist attack because they lack multiple escape routes and the structural redundancy that comes through inter-connection.

Visionary arcologists (architect-ecologist) have proposed an alternative high-density paradigm called the hyperstructure for the 21st century. Hyperstructures are defined here as enormous, high-density habitats that include the following four features: 1) multiple levels for horizontal movement; 2) minimal exposed surface area and enclosed controllable microclimates; 3) structural forms that are lighter and more redundant than slender disconnected skyscrapers; and, 4) a variety of concepts for harvesting solar, wind, and geothermal energy and recycling water.

X-Seed 4000 (Figure 3) is the tallest structure ever fully envisioned. It was created for Tokyo by the Taisei Corporation in 1995, but never intended to be built. It has a 6000-m-wide base and a height of 4000 m, making it taller than Mount Fuji. Ziggurat (Figure 4) is a gigantic, carbon-neutral pyramid that was officially unveiled by the Dubai-based organization, Timelinks, in October, 2008. Timelinks claims that this 1470-m-high pyramid will be able to sustain a community of one million inhabitants. Ziggurat is actually a cluster of buildings that are interconnected with an extensive three-dimensional transportation network including both electric vehicles and pedestrian bridges. Ziggurat has only been conceptually envisioned at this point, and the structure has not yet been fully designed. Crystal Island (Figure 5) is a 450-m-tall spiraling tent-like hyperstructure with four times the floor space of the Pentagon. In December, 2007, the city of Moscow gave preliminary approval to Sir Norman Foster and Partners for the project; as of 2009, construction has been postponed indefinitely due to the global economic crisis. The incredible multi-use structure features 900 apartments, 3000 hotel rooms, an international school for 500 students, cinemas, a theater, a sports complex, and much more. The building makes use of solar panels, wind turbines, thermal buffers, natural ventilation, and natural lighting. Parkview Green (Figure 6) is an 87-m-tall quarter-pyramid in Beijing whose construction is nearly complete. Designed by Integrated Design Associates and the Arup Group, it encases two 18-story and two 9-story interconnected buildings in a microclimate shield made of glass and ethylene-tetra-fluoro-ethylene (ETFE), the same material used in the Olympic Water Cube. In the extreme seasonal temperature variations in Beijing, the shield limits the need for air conditioning in scorching summers, and reduces heat loss during freezing winters. It has been pre-certified for the LEED platinum rating, the highest given by the U.S. Green Building Council.

Professors Balling, Schultz, Richards, Hotchkiss, and Rollins have teamed up with Professor Matthew Jones (mechanical engineering), Soren Simonsen (architect), and Kathleen Hill (urban psychologist) to study hyperstructures and answer such questions as: How much energy can be saved? Are they safe? How much will they cost? Will people be happy living in them?

Faculty Research - Dr. Gus Williams

Dr. Gus Williams has begun new research sponsored by the National Nuclear Security Agency (NNSA) Office of Nuclear Nonproliferation Research and Development (NA-22). Dr. Williams teamed with the Utah State University Electrical Engineering department for this study. Their specific goal is to develop algorithms that can exploit hyperspectral image (HSI) data from long-wave infrared imaging spectrometers, a remote sensing technique. They want to find ways to determine what solids (such as feed stocks related to uranium production) might be in a scene and at what concentrations.

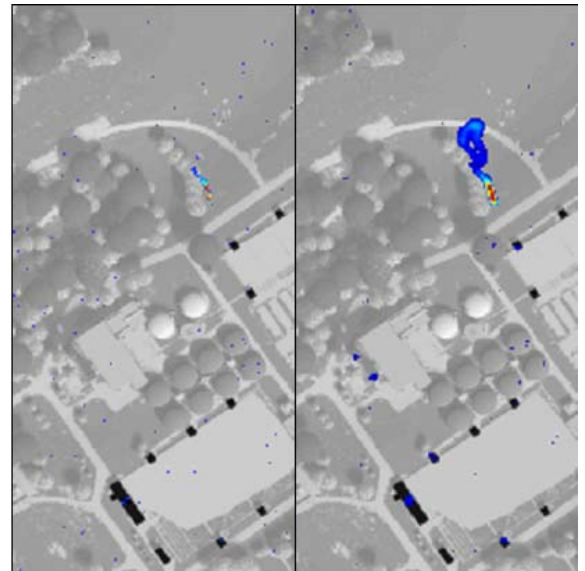
This research will provide algorithms to separate intrinsic solids signatures from measured spectra to provide more accurate solids detection and identification. The research will provide basic scientific information on processes that affect and change spectra and how these processes impact data exploitation. These algorithms will provide a method to condition library spectra before comparison for both solids detection and identification and for analytical studies. The team will deliver algorithms and reports to facility transfer of this technology to on-going NA-22 research in this field.

The constancy of gas spectra measured in the field has led to the successful detection and identification of gasses using hyperspectral data through comparisons with spectral libraries. However, the variation observed in the field-measured spectra of solid materials suggests that additional research is needed to identify spectral features that are intrinsic to a given solid material for this same purpose. Dr. Williams proposed a data driven approach for embedding (i.e., unfolding) of hyperspectral data as a process to reveal features of solids spectra that are intrinsic to a given material and to separate these features from sources of variation. Using the intrinsic spectral features, they will then investigate the detection and identification of solids.

NA-22 has identified the detection, identification, and characterization of solids materials related to nuclear nonproliferation as a high priority scientific problem. NA-22 has identified HSI as the most application technology for stand-off detection in denied areas. Preliminary data indicate measured solids spectra are significantly modified in the environment due to a number of difficult to quantify processes. If this research is successful, and intrinsic or invariant features of the measured spectra can be identified and separated, this research could significantly increase the accuracy, or even the possibility, of stand-off solids detection, identification, and characterization. This approach is statistically based and complements the physics-based approaches being done at the National Laboratories.

The HSI solids identification problem is well suited to this technical approach. Data collection results in large datasets amenable to statistical analysis. Chemical spectroscopy has shown that materials have unique spectra that can be used for identification and characterization. Recent NA-22 sponsored data collections have shown however, that solids materials are difficult to detect, identify, and characterize in the environment because of the myriad number of confounding factors that affect the measured spectra. This approach will use nonlinear embedding to reduce the data dimensionality of the field measured spectra. Research in other fields has shown that a few of the reduced dimensional groups will be related to features intrinsic or invariant with regards to the subject solid material providing a means to detect, identify, and potentially characterized the material.

The work, as proposed, is designed to heavily involve graduate students, from the upper-division undergraduate through doctoral level.



An example from our previous research in gas detection. The left image shows the results with a standard detection algorithm. The right image shows the increased sensitivity using our filter algorithms.

International Experiences - Mexico Study Abroad

The goal of the Mexico Engineering Study Abroad (MESA) program is to provide students in our department an opportunity to apply their skills and expertise in water resources to help solve problems involving water quality and flooding in Mexico. The BYU MESA students are formed into teams and matched with like teams of students from universities in Mexico. Each team has a specific real world problem to analyze using tools learned in their classes. Teams communicate by long distance for three months and then the BYU teams head to Mexico for a week to work with their partners. Results generally include project reports that are used in Mexico to help solve the issues that have been analyzed, and new and lasting friendships with engineering students in Mexico.

One half of the MESA class this year teamed with students from the University of Zacatecas to work on flooding problems in four communities and transportation snarls in Zacatecas. The week-long trip to Zacatecas was very successful due to a growing relationship with Eng. Prof. Oscar Dzul (to the right of Dr. Rollin Hotchkiss), who prepares his students well to work with us.



The other half of the MESA class this year teamed with researchers from CIATEJ in Guadalajara, Mexico and students from the University of Veracruz in Poza Rica, Mexico to work on water quality monitoring, evaluation, and simulation for three rivers in the northern part of the state of Veracruz as well as a flooding model for the Cazonces River, which passes through Poza Rica. This was the first year our program has participated in Veracruz, but it was an amazing experience for students and faculty from both institutions. The experience was enhanced by generous donations from the Mosaic Foundation, that provided resources for our team to purchase water quality monitoring equipment that will be useful on this and other projects for the University of Veracruz.



International Experiences - China Study Abroad



For the past two years, the Department of Civil & Environmental Engineering (CEEN) has provided students the opportunity to expand learning from the classroom to that of a global environment. The China Megastructures class has opened up the world to structural engineering students, providing them with an opportunity to become engineers for the 21st Century in accordance with the Ira Fulton College of Engineering and Technology strategic initiatives: 1) Leadership; 2) Innovation; 3) Global Awareness; 4) Character Development; and, 5) Technical Excellence. Approximately 50 percent of the structural engineering students in CEEN have taken advantage of this opportunity and have greatly benefited from

this experience. China, in its splendor and remarkable size, provides a world of opportunities for students to learn and understand how they can be part of a global environment, particularly with respect to civil engineering practice.

A second area that has emerged from the studies in China is that of megacities (cities with a population of 10 million or more) and the transportation engineering components of such cities. Transportation and the engineering of transportation are global topics, topics at the forefront of the economic success of many developed and developing countries, including China. Professor Grant G. Schultz traveled with the China Megastructures group during the Spring 2009 Study Abroad. During this trip he was able to make contact with professionals and academics in Beijing and Shanghai. Through these contacts, he has been able to establish a network wherein BYU students work jointly with students from the Beijing University of Technology and Tongji University in Shanghai to study transportation issues in megacities. Dr. Schultz will expand the opportunities of students in CEEN by offering a 3-credit-hour CEEN 594R course entitled “China Megacities” during Spring 2010.



The China Megacities course will truly aid students in becoming engineers for the 21st Century and will provide students an opportunity to expand their knowledge of transportation engineering in a global environment. It will help students to be exposed to a number of innovative designs while providing them the opportunity to identify their own solutions to transportation problems in China. Students will improve their technical excellence as they apply the skills they have learned to the challenges faced by China. They will have opportunities for leadership as they communicate and interact with fellow students, professors, engineers, and workers not only here in the United States, but China as well.

Finally, the course will develop the character of the students as they see the impact of engineering projects on a global perspective from pollution to noise, and everything in between. This will help instill in the students a moral responsibility towards the human and environmental impact of engineering projects.

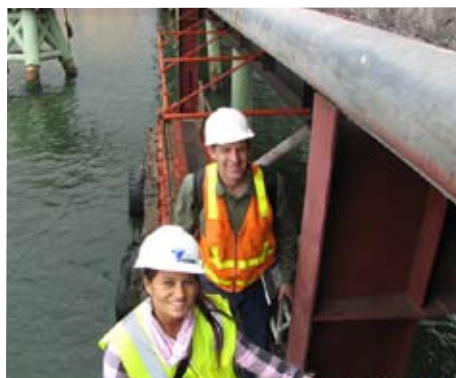


International Experiences - Lateral Spreading in Chile

Professor Kyle M. Rollins, of the BYU Civil & Environmental Engineering faculty, recently returned from a post-earthquake reconnaissance visit to Chile. Chile was subjected to a Magnitude 8.8 earthquake, the 5th largest earthquake in recorded history. Dr. Rollins was part of an eight person team funded by the National Science Foundation to document geotechnical aspects of the earthquake.

In about one week, the team traveled over 700 miles across Chile to document damage to bridges, buildings, highways, ports and dams caused by poor soil performance. A major source of damage to ports and bridges is a phenomenon known as liquefaction in which loose saturated sand is transformed into a weak fluid by earthquake shaking. Liquefaction causes buildings and highway fills to sink while port walls may slide towards the sea. Dr. Rollins is a member of GEER (Geo-engineering Extreme Events Reconnaissance), which typically sends a team to investigate the aftermath of major earthquakes. The goal of the GEER team is to “turn disaster into knowledge.” Lessons learned from this major event will be invaluable for improving design methods for future earthquakes. Dr. Rollins was selected for the team because of his expertise with liquefaction and foundation performance.

Although Dr. Rollins has conducted research to simulate earthquakes using explosives, he admits that, “there is simply no substitute for the ‘full-scale laboratory’ provided by a real earthquake.” While many failures were observed, the engineers were encouraged that structures designed using modern codes fared much better than older structures. The efforts of the Chilean engineers to improve seismic safety codes resulted in fewer deaths than in other recent earthquakes despite the magnitude of the quake.



Prof. Kyle Rollins and Constanza Lobos, Chilean engineering student, inspect port facilities in Coronel, Chile following quake.



Failure of highway embankment over soft ground in Magnitude 8.8 Chilean earthquake.



Prof. Kyle Rollins (BYU Civil Engineering Dept.) in a fissure formed by failure of roadway over soft ground.

International Experiences - Portugal & Australia

Groundwater Management

Dr. Norman L. Jones has been working with several organizations in Australia, including the Bureau of Meteorology, to help design tools and strategies for managing groundwater data in geographic information systems.

Dr. Jones is planning on attending an international conference on salt-water intrusion of coastal aquifers in June in the Azores. He will also be presenting a paper at this conference.



New Project Management & Leadership Course

During the Winter 2010 semester Dr. Fernando Fonseca and Dr. Jim Nelson piloted a new graduate course on Project Management and Leadership. The objective of the course is to teach leadership and project management principles while allowing students a significant management and teamwork experience as part of their research or project.

This class is available to graduate students involved in either a research or a design project. Students practice the principles discussed in class by mentoring a team of students in the senior capstone class. The graduate students serve as project managers and as mentors to the project teams. This past semester, six graduate students participated with the following projects: 1) June Sucker passage through diversion dams on Hobble Creek; 2) Sandy City Falcon Way storm drain; 3) analysis of water quality conditions in Veracruz, Mexico, using QUAL2K; 4) water quality monitoring in the Tuxpan river in Veracruz, Mexico; 5) pavement design for State Road 201 using cement-treated rubblized road base; and 6) development of water quality and quantity information management system for the state of Veracruz, Mexico.

Dr. Nelson and Dr. Fonseca developed the course with significant help from alumni who were recruited by members of the Scholarship Society; in particular Gene Shawcroft and Jeff Armstrong. Topics discussed included developing specifications and RFP/RFQ, developing a contract/fee for services, project scope, establishing vision and alignment of purpose, team building, project management approaches, self management and goal setting, delegation, risk management, communications, evaluations, conflict resolution, partnering, professional licensure, public speaking and information sharing, Ergonomics, persuasiveness, situational leadership, and family leadership. The primary text was an ASCE publication, "Engineering Your Future" by Stuart G. Walesh. In addition, students read the following books: "*Who Moved My Cheese,*" "*The Five Dysfunctions of a Team,*" and "*Ergonomics.*"

Faculty and alumni taught this course and contributed greatly to make it possible. The instructors were (from CUWCD) Gene Shawcroft, Mike Whimpey, KC Shaw, Jim Brooks, and Gerard Yates; (from WWCllyde) Dustin Olson; (from Jacques & Associates) Sydne Jacques; (from CH2M Hill) Mike Mickelson; (from HNTB) David Farnsworth; (from USBR) Bruce Barrett; (from Armstrong Forensic) Jeff Armstrong; (from Corollo Engineers) Rick Wheadon; (from UDOT and ASCE) Blaine Leonard; (from BYU) Greg Danklef, Dr. Val Hawks, Dr. Nelson, Dr. Williams, and Dr. Fonseca.

We are considering how to integrate this course and a complementary course on business practices, as well as instituting better overall integration to our senior capstone program on a permanent basis. The ME En department has run one of the most successful capstone programs in the country for years. A foundation of their program is the educational grants provided by outside companies to sponsor the development of design projects. Students learn through participation in real-world problems, while companies benefit from innovative solutions developed by the students mentored by faculty. We are interested in finding similar partners within our profession. If you have ideas and/or would like to participate in sponsoring a project, please contact Dr. Fonseca (ffonseca@et.byu.edu).

Dr. Rollin Hotchkiss Addresses the University



On December 8, 2009 Professor Rollin H. Hotchkiss addressed the University in the campus wide Devotional. His message, “God Loves You” focused on five facets of his testimony that show God loves us.

Dr. Hotchkiss testified of the following:

- God loves us because He grants unto us the revelator known as the Holy Ghost.
- God loves us because He restored the priesthood, the Aaronic priesthood in particular, to the earth. He testified that His love is manifest through the gift of the ministering of angels that can protect and comfort us as we learn more about Him.

- Heavenly Father loves us because He blesses us so much as we try to serve Him. He meets us much more than halfway when we act on the smallest seed of faith. He blesses us along our journey back to His presence when we incline our ear and heart toward Him.
- God loves us because He wants us to have everything that He has; He puts no limits on how much we can learn, grow, and progress. Our friend Stephen R. Covey calls it “an ‘abundance mentality’ versus a ‘scarcity mentality’” (Alma 42:8) based on the plan that can ‘bring to pass [our] immortality and eternal life’ (Moses 1:39).
- God loves us because He sent His Son to atone for our sins and for the sins of all humankind everywhere. This is the most powerful manifestation of all.

Dr. Hotchkiss closed by asking, “What are you going to do? He asked that we might feel inspired this season to use Heavenly Father’s love for us as a verb. And he prayed that what we need to do will be revealed to us through prayer. He said that “The Primary children have it right, ‘I know my Father lives and loves me too. The Spirit whispers this to me and tells me it is true. And tells me it is true.’”

If you would like to hear Dr. Rollin Hotchkiss’ devotional address, please go to
<http://byub.org/talks/Talk.aspx?id=3946>

Awards and Recognitions

Faculty Awards



Dr. Mitsuru Saito- was awarded the 2009 Outstanding Faculty Award in the Department of Civil and Environmental Engineering. He also became a Fellow of the Institute of Transportation Engineers (ITE) in October of 2009.

Dr. Saito



Dr. Grant Schultz- received the ITE Western District Outstanding Transportation Educator Award for 2008-2009. Dr. Schultz was also advanced to the grade of Fellow within ITE.

Dr. Schultz

Student Awards

BYU EERI Student Chapter- The BYU EERI student chapter took 2nd place in the 2009 Seismic Design Competition held in Salt Lake City, Utah.

BYU ITE Student Chapter- The BYU ITE chapter was awarded a \$1,000 grant for their proposal regarding traffic data collection. Twenty-three universities applied for the grant and only 5 were awarded.

M. Scott Shea- Awarded a \$2,000 scholarship from the Intermountain Section of ITE.



The Civil Seven

Civil Seven- an intramural basketball team started by four Civil Engineering students won the intramural championship for their division. Their division consisted of 164 other teams. The Civil Seven's team members included (back row) David Young*, Joseph Campbell, Jonathan Ralph, Trevor Hawkes*, (front row) Thomas Griffiths*, Ryan Taylor, Chris Yeates*, and Brock Weaver.

* Members of The Civil Seven team who are Civil Engineering majors.

Civil Talk
Brigham Young University
Civil & Environmental Engineering
368 Clyde Building
Provo, UT 84602-4081



Fish Fry and Scholarship Donations

Scholarship Society Annual Alumni Fish Fry, Chicken, & Golf Tournament

Don't miss this chance to celebrate and reunite with old BYU friends. Come to the Civil & Environmental Engineering Scholarship Society Alumni Homecoming and Reunion.

When: Homecoming Weekend, Friday, October 8
Where: Clyde Building Student Lounge
Time: Social Hour 5:00 p.m. - 5:30 p.m.
Dinner & Program 5:30 p.m. - 7:30 p.m.

The Second Annual Civil Engineering Golf Tournament will be held Saturday, October 9, 2010 at Fox Hollow Golf Course (formerly Tri-City Golf Course) in conjunction with BYU Homecoming. See back page for more information and RSVP with the Fish Fry!

We will be finished by 7:30 p.m. which will enable you to enjoy other Homecoming activities that evening.

Please RSVP the information listed below in one of the following ways: 1) online at <http://ceen.et.byu.edu> and click on the link for the CE Homecoming Fish Fry; 2) Call (801) 422-2811; or, 3) Mail this form to BYU Civil Engineering, Fish Fry, 368 Clyde Building, Provo, UT 84602.

Golf Tournament Fish Fry Both

Name: Last _____ First _____ M.I. _____

Address _____ City/State/Zip _____

Email _____ Phone: Home _____ Cell _____

Number Attending Fish Fry: Adults _____ Children _____ Number Attending Golf Tournament _____

Names of people attending Golf Tournament _____

Please RSVP by Monday, October 4, 2010

BYU Civil & Environmental Engineering Scholarship Donations

Please direct my gift to College Annual Fund/Civil Engineering: 30120438

Name _____ Date _____

Address _____

City/State/Zip _____

Phone _____ Fax _____ Email _____

Alumni Friends of BYU

Select Amount

\$25 \$50 \$150 \$300 \$1,000 \$2,500 Other _____

Please make checks payable to BYU Civil Engineering. You may also donate via **credit card** by visiting our department website, <http://ceen.et.byu.edu> and click on the "Contribute to CE En" link.

**If you desire, you may also include a separate letter of explanation regarding this donation.

Scholarship Society
Brigham Young University
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Alumni Updates

Hunter Young '07

Hunter was promoted last year and was also awarded the 2008 Analyst of the Year for the California Region out of approximately 60 candidates. He and his wife, Rosa Young have a 2-1/2 year old daughter and have another child due this April. Hunter has been busy preparing for the professional engineering exam and is also teaching early morning seminary from 6-6:50 a.m.

Christopher Anderson '99

Christopher has been employed at PacifiCorp Energy as a Project Manager for a little more than a year. His focus is on clear air projects especially low NOx retrofits at the company's seven Wyoming and Utah thermal (coal) plants. At PacifiCorp he is currently responsible for environmental/air retrofit projects at the Huntington and Wyodak Plants. He is very interested in sustainable baseload and renewable energy development and constructed projects, particularly nuclear and geothermal plants. He worked as PM/Engineer for a renewable energy start-up firm in the Salt Lake City, Utah area for a short time before PacifiCorp with focus on small hydroelectric and solar (PV and CPS) projects. He enjoys working in the power and utility industry and believes that he has finally found his niche. Some of his previous experience was in transportation, environmental, project management, geotechnical, construction and hydrology/hydraulics. He has worked on projects with a total cost of \$62M. After graduation from BYU and 3.5 years of work experience with RB&G Engineering in Provo, Utah he attended The University of Texas at Austin pursuing a Master of Science in Engineering in 2002. He graduated from this program in late 2003 with a masters degree in Construction Engineering and Project Management. He worked for URS Corp. in the SLC Department of Energy (DOE) office for 3.5 years as a civil engineer with primary responsibility for the design and construction of private and DOE facilities. In early 2004, Christopher received his PE license from the State of Utah. In January 2007, he received a PE license in the State of Texas. He is a Certified Project Manager (CPM), which is similar to the PMP program through the Project Management Institute (PMI). In the spring of 1999, he married his college sweetheart, Marieta Weber (BS 1998). They are the parents of three children, Talmage (age 9), Grant (age 5), and Elise (age 2). Christopher enjoys being with his family, hiking, gardening and spending time outdoors; his other fervor is his love of BYU and Texas sports.

Welcome to the Department

Welcome Kim Glade!

In April the Civil and Environmental Engineering Department hired Kim Glade as the new Department Secretary. Kim and her husband live in Sandy Utah. Between them they have seven children and will welcome their 10th grandchild in September. Kim has lived all over the United States, but made a final move to Utah in 2002. Kim enjoys reading, spending time with her grandkids, and traveling around this beautiful state. She considers joining this wonderful department a great blessing and looks forward to many good years ahead.



Second Annual Civil Engineering Golf Tournament!!

The Second Annual Civil Engineering Golf Tournament will be held Saturday, October 9, 2010 at Fox Hollow Golf Course (formerly Tri-City Golf Course) in conjunction with BYU Homecoming. Meet at the golf course at 8:00 a.m. and there will be a shotgun start at 8:30 a.m. The Golf Tournament is open to all Civil Engineering Alumni and their family and friends. The tournaments will be a 4-man scramble (9 holes). There will be prizes awarded to the first place team, the person with longest drive, and the person closest to the hole. The cost to enter this tournament is \$35.00 per person or \$140 per team. Included in the cost is greens fees, a cart, a sleeve of balls, and lunch! Get your team together or just sign up and be placed on a team. Space is limited to 72 players, so RSVP soon to ensure your spot (first come - first serve). To RSVP, see page 17, call us at (801) 422-2811, or visit our website at <http://ceen.et.byu.edu> and click on the link for the Second Annual Civil Engineering Golf Tournament (please let us know your name, e-mail, phone, how many will be playing, and the names of the people that will be playing).

Fox Hollow Golf Course is located at 1400 North 200 East, American Fork, Utah.



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