

CCEE NEWS

Civil, Construction, and Environmental Engineering
www.ce.ncsu.edu



Spotlight: Structures and Mechanics

Stabilizing Roads and Cost

Assessing Effects of Chilean Earthquake

Ideas That Matter: CCEE Prof Leads TEDxNCSU

Kimley-Horn Mentors Student KHAMpetitors

New Environmental Engineering Master's Degrees

Alumnus Peter Lehrer is First Among Builders





Department Head's Message



By the time you read this, the end of the semester will be upon us with all of the usual pressure to finish grading homework, projects, exams, assign course grades, perhaps participate in a final defense for an M.S. or Ph.D. student, address other end-of-the-year deadlines, and start thinking about pre-

paring for the spring semester. As I write this letter, there is considerable uncertainty about budgets for both the second half of the 2010/11 fiscal year and the upcoming 2011/12 budget cycle. We are working to insulate the department to the maximum extent possible.

Our departmental graduation will take place on Friday, December 17 at 2:00 PM at the McKimmon Center. The university graduation follows on December 18. We expect to graduate approximately 100 students with B.S. degrees in Civil Engineering, Construction Engineering and Management, and Environmental Engineering, in addition to 55 students at the Masters level and 10 with Ph.D. degrees. Graduation is a proud moment for many, and it is fun to watch the students celebrate with their friends, families, and professors.

My first semester as Department Head has been busy but productive. We have initiated searches for the Edward I. Weisiger Chair in Construction Engineering and Management, several faculty positions across the department, a teaching faculty position, and a construction extension specialist. I hope that we can begin to describe our new faculty in the Spring of 2011.

Our ABET accreditation visit took place in early November. Preparation for ABET is an ongoing 6-year cycle of assessment and continuous improvement, and I would like to recognize all of those faculty members who played key roles in the development of the materials required for our ABET visit. In particular, **Mo Gabr**, **David Johnston**, and **Joel Ducoste** led multi-year self-studies of the BSCE, BSCM, and BSENE degrees, respectively, with assistance from **Jim Nau**. All faculty served

as chairs or members of departmental assessment committees that produced evaluations of student achievement for the self-study reports. Faculty compiled detailed course materials for ABET review. Many faculty and students met with ABET evaluators. Departmental staff provided essential support to compile materials and prepare for the visit. This is a monumental and critical effort. While our reviewers had some suggestions for improvement, our programs are in excellent shape and represent curricula and content of which we can be proud.

As a result of equipment funds provided by the university, we are in the midst of a number of improvements to our undergraduate laboratories and classrooms. We received funds for equipment and renovations. This includes a number of new pieces of equipment in the geotechnical lab along with stainless steel counter tops to improve functionality, an additional experimental station for the construction laboratory to accommodate more students, projects to reduce the background noise from air handlers in the environmental and hydraulics laboratories, and the installation of power at each student desk in a classroom. Each of these activities will improve the quality of what we are able to provide to our students.

We continue to work hard to identify additional space adjacent to Mann Hall and to use space more efficiently within the building. We are doing some renovation in Mann Hall to create additional office space and will be moving some activities to Daniels Hall across the street. Space is a theme that you will likely hear about frequently until our new home on Centennial Campus is ready. Unfortunately, construction of our pending new home on Centennial campus, Engineering Building V (EB-V), is several years and a stronger economy away.

Thanks again for your interest and continued support; it means a lot to us. Best wishes for the holiday season and a great start to 2011.

Morton A. Barlaz
Professor & Head

About the cover: Photos shown are of construction equipment applying load to stabilized soils (see Page 6), a pedestrian bridge designed and built by CCEE (Pages 4-5), ships sunk or heaved onto a jetty in Chili (Page 7), and students preparing a technical and cost proposal for a Kimley-Horn and Associates sponsored competition (page 9).



Congratulations to the Class of 2010

On December 17, the Department of Civil, Construction, and Environmental Engineering will welcome relatives and friends of our Fall 2010 Class to share in our commencement ceremonies. This ceremony celebrates years of hard work for our graduating students, including 10 doctoral, 55 masters, and 100 bachelor students.

The ceremony will be held at 2:00 PM in the McKimmon Center. The commencement speaker will be **Pamela B. Townsend**, Vice President, AECOM, Inc. Ms. Townsend is a registered professional engineer with more than 25 years of diversified experience. She received a BSCE from NC State University in 1984, graduating summa cum laude (4.0 GPA) and was ranked first in the College of Engineering. In 1987, she received an MSCE, also from NC State, with a major in structures and minor in geotechnical engineering.



For more than 20 years, Ms. Townsend has worked for AECOM, a global provider of professional, technical and management support services to a broad range of markets, including transportation, facilities, environmental, energy, water, and government. She has worked in all of these sectors serving a wide variety of clients. She is currently AECOM's Southern States District Operations Manager managing the firm's transportation operations in North Carolina, South Carolina, Georgia, Tennessee, Alabama, and Louisiana.

Honors, Awards, and Events

- ◆ Fall 2010 graduation ceremonies for the Department will take place on Friday, December 17 at 2 P.M. at the McKimmon Center.
- ◆ A retirement reception will be held in honor of Dr. **David W. Johnston** on January 13 from 3:00-5:00 PM in the lobby of Mann Hall.
- ◆ Dr. **Rae Zimmerman**, Director of the Institute for Civil Infrastructure Systems (ICIS) and Professor of Planning and Public Administration at New York University, will speak on January 18 regarding linkages between extreme events and civil infrastructure.
- ◆ The **40th Henry M. Shaw Lecture** will be delivered February 17 in CCEE by **J. Carlos Santamarina**, Goizueta Foundation Professor in the School of Civil and Environmental Engineering at the Georgia Institute of Technology. Dr. Santamarina will speak on "The Role of Civil Engineers in the Energy Challenge."
- ◆ **Roberto Nunez**, Senior Construction Extension Specialist, was selected as a Fellow of the American Concrete Institute.
- ◆ Dr. **H. Christopher Frey** was invited as a featured speaker at an International Workshop on Mobile Source Emission Testing and Modeling, to be held in Xiamen, China on December 16-18. The workshop is sponsored by the Ministry of Environmental Protection in China, the Transportation Research Board (TRB) Committee on Air Quality, and others.
- ◆ Dr. **Bastian Schroeder** and Dr. **Nagui Rouphail** of the Institute for Transportation Research and Education received the D. Grant Mickel Award from the Transportation Research Board. This award is given each year for the best paper in the area of transportation operation, safety, and maintenance and will be presented in Washington, DC on January 24.
- ◆ **Brandon Graver**, an MS student working with Dr. **H. Christopher Frey**, was featured in the Southeastern Transportation Center's (STC's) Summer 2010 Research Spotlight for his work on measuring the activity, energy use, and emissions of passenger railroad locomotives.



In the Spotlight: **Structural Engineering and Mechanics**

*The Department of Civil, Construction, and Environmental Engineering (CCEE) is comprised of six “groups” that represent key disciplinary areas. The groups include: **structural engineering and mechanics; water resources and environmental engineering; transportation systems and materials; computing and systems; geotechnical and geoenvironmental engineering; and construction engineering and management.** This is the first in a series of articles that profile each of these groups.*

Structural Engineering and Mechanics (SEM), with nine fulltime faculty members and several active emeritus professors, is the second largest group in CCEE. Students who focus in SEM are highly trained to design and maintain the backbone of society’s built infrastructure. In particular, design of buildings and bridges in the face of natural hazards such as earthquakes and hurricanes is a primary focus. SEM faculty, students, and graduates are trained to work on a wide range of infrastructure systems, including roadways, water, oil and gas pipelines, nuclear, coal and solar energy systems, electricity grid systems, communication towers, and offshore platforms.

Research and teaching by SEM faculty span theoretical, experimental, and computational studies from nanometer scale to large structures. Experimental research ranges from nano-indentation to large-scale testing at the unique Constructed Facilities Laboratory (CFL). Theoretical and computational research also spans multiple scales, including quantum and atomistic simulation of materials systems, finite element simulation of structural systems, and large-scale geophysical simulations. The SEM group is developing novel and resilient structural materials and systems that are capable of self-monitoring for safety and maintenance, thus contributing to the sustainable built infrastructure.

- ♦ **Preparation of Students for Professional Practice:** The most successful engineers are those who can apply fundamental knowledge to the problem at hand. Students take courses on materials, structural analysis, and computational methods, and gain hands-on-experience implementing their theoretical knowledge. Students have many opportunities outside of the classroom to enhance their professional preparation. For example, undergraduate students actively participate in the annual ASCE Carolinas Conference by building a concrete canoe and steel bridge each year (NCSU will be hosting the Carolinas Conference in 2011). Career opportunities for our graduates include design of bridges and buildings, and forensic investigation, repair, and rehabilitation of all types of structures. The latter opportunities are especially important given the aging of the nation's infrastructure. SEM graduates are hired by engineering design firms, state and federal transportation organizations, the energy sector, and other industries, such as automobile, shipbuilding, and aerospace.
- ♦ **Extension and Public Service:** It is imperative to translate research into practice. SEM faculty participate on various technical committees of the American Society of Civil Engineers (ASCE), American Concrete Institute (ACI), American Society of Mechanical Engineers (ASME), Precast/Prestressed Concrete Institute (PCI), and the Transportation Research Board (TRB). SEM faculty actively disseminate their research via peer reviewed journal papers, seminars and short courses. Many SEM faculty members also serve on editorial boards of national and international technical societies.
- ♦ **Highly Distinguished SEM Faculty:** Emeritus professors **Paul Zia** and **John Hanson** are members of the National Academy of Engineering (NAE). Many other SEM faculty are honorary or distinguished members and fellows of ACI, ASCE, PCI, and the American Academy of Mechanics (AAM). SEM faculty have received many national and international awards for their research, publications, and service to professional societies and the public.



Structural Engineering and Mechanics (continued)

- ♦ **Research Activities:** Current research projects range from enhancing the performance of existing buildings, bridges, towers, power plants, and aerospace structures to designing novel, economical, and sustainable new structures. At the CFL, Professors **Sami Rizkalla**, **Rudi Seracino**, and **Paul Zia** are developing innovative strengthening and rehabilitation techniques using advanced fiber reinforced polymers. Professors **Mervyn Kowalsky** and **Jim Nau** use the CFL to conduct unique large-scale testing on concrete and steel structures to help understand their complex failure under extreme earthquake loadings. Research by Professors **Vernon Matzen**, **Abhinav Gupta**, **Ajaya Gupta**, and **David Tung** at the Center for Nuclear Power Plant Structures, Equipment and Piping ranges from rational design of piping components to probabilistic seismic analysis of structural and nonstructural components.



Pedestrian bridge in downtown Raleigh designed and built by NCSU students. Received the first-place award from the NC Chapter of ACEC (American Council of Engineering Companies).



Seismic Testing of Steel Bridge Bent for Alaska DOT

Professor **Tasnim Hassan's** research focuses on the seismic and low-cycle fatigue failures of welded joints of steel building and piping components, very high temperature constitutive modeling and multiscale modeling for the next generation of nuclear power and aerospace industries. With the eventual goal of devising superior structural materials, Professors **Chris Bobko** and **Kerry Havner** conduct detailed analytical and experimental research towards a fundamental understanding of metallic, geologic, and cementitious materials at the microscopic level. The computational research by Professor **Murthy Guddati** is aimed at developing and employing techniques for quantum, atomistic and mesoscopic modeling of material systems and finite element simulation of larger-scale structural systems.

Research in SEM is sponsored by various agencies including the **National Science Foundation**, the **Department of Defense**, the **Department of Energy**, the **National Cooperative Highway Research Program**, the **Federal Highway Administration**, the **Alaska** and **North Carolina** state **Departments of Transportation**, and construction, petroleum, aerospace, and nuclear industries. Many SEM research activities include cooperation with other disciplines at NCSU, such as Mechanical and Aerospace Engineering, Materials Science and Engineering, Nuclear Engineering, and Mathematics, as well as with other universities and national laboratories.



Stabilizing Soils and Road Construction Cost



Sangchul Pyo and Brent Robinson (not pictured) apply seismic wave to the subgrade to estimate shear modulus.

Road construction crews, particularly working in eastern North Carolina, frequently encounter soft soils that are too unstable to properly support roads. Roads built over such soils can suffer surface depressions, damage to pavement, and a need for costly repairs. The location of soft soils is difficult to predict. Thus, in some cases these soils are not discovered until the construction crew happens upon them. With the clock ticking, leading to cost overruns, the crew has to find a fast solution. The practical response is to remove soft soils and replace them with stable soil obtained from another location, which is costly and time consuming. However, faculty and students in CCEE are designing techniques for stabilizing soft soils that could help keep projects on budget and schedule.

Dr. **Mo Gabr** and Dr. **Roy Borden** are lead investigators of a project for the **North Carolina Department of Transportation** to develop more cost-effective approaches to stabilizing soft soils. The long-term goal of this work is to help NCDOT and its contractors more effectively respond to unplanned encounters with soft soils during the course of road construction projects, thereby leading to fewer delays and lower costs.

Recent graduate **Ben Cote** (MS, 2009) and PhD degree candidate **Brent Robinson** were involved as research assistants in last year's laboratory phase of the project. They developed criteria for the depth of soft soil that needs to be re-

moved and evaluated the effectiveness of various chemical and mechanical soil stabilization approaches. Cote, now at GEI Consultants in Connecticut, is involved in a geotechnical investigation at the World Trade Center site in New York. Robinson is a partner of GRL and Pile Dynamics, Inc. in Ohio, where he is responsible for their research activities.

With the laboratory phase now complete, the study team has partnered with NCDOT and **Barnhill Construction Company** of Tarboro, NC to evaluate selected stabilization approaches in the field. Barnhill is the contractor for the widening of US 17 north of New Bern, NC. At the US 17 site, four test pads are planned for installation. Each test pad, which is 12 feet by 50 feet, will be mechanically stabilized with polymeric reinforcement sheets or chemically stabilized with cement.

MS student **Tim Cowell** and PhD students **Young Jin Park** and **Sangchul Pyo** are installing sensors in the test pads to monitor soil performance, moisture, and temperature. Construction trucks will drive on the test pads over a two week period, during which Cowell and Pyo will analyze data from the soil performance sensors. The data measured in the field will be used to confirm or refine the criteria developed in the laboratory for soft soil stabilization. The results of this project will be used by NCDOT, Barnhill, and others, to better respond to surprise encounters with soft soils.



Dr. Billy Edge Leads ASCE Team to Evaluate Effects of Chilean Earthquake



Scientists and engineers have been studying the effects of the very powerful earthquake that occurred off the west coast of Chile in February 2010. The 8.8 magnitude quake caused significant damage to buildings, roads, bridges, water systems, telecommunication, electric power and other lifeline facilities. The quake also generated a tsunami that caused extensive damage to the coastline. Chile has a history of earthquakes and a modern attitude to risk management which provided an excellent opportunity for scientists to learn from the disaster.



As part of its disaster response procedure, the American Society of Civil Engineers (ASCE) forms technical teams to study infrastructure damage caused by natural or man-made disasters. Such studies are conducted so that engineers may learn from the disaster, and that those lessons learned may be documented to inform future actions. The ASCE sent three technical assessment teams to Chile in an effort to learn from the performance of the region's various infrastructure systems.

In April, **Dr. Billy Edge**, Professor of Civil Engineering and Head of the Coastal Engineering Program of the UNC Coastal Studies Institute, led a technical assessment team from ASCE's Coasts, Oceans, Ports and Rivers Institute (COPRI) to investigate the impact of both the earthquake and tsunami on the region's seaports and the effect they had on inland travel, structural and non-structural damage, and sediment deposits. "Our investigation of the effects of the earthquake and tsunami on the ports in Chile clearly showed that proper design, planning and construction are very effective in reducing damage and destruction caused by natural disasters," Edge said. "Moreover, we feel that proper planning for emergency response is critical to avoid unexpected damages." Edge stated that "because Chile is in a very active seismic zone, the country has developed a forward thinking attitude to seismic codes and standards. This is a major reason that this, the 5th largest recorded earthquake in history, caused less than 600 deaths." Still the sheer magnitude of the quake was responsible for destroying 370,000 homes, 4,000 schools, and 79 hospitals.



In general, most modern port terminals built to Chile's current seismic codes survived with little damage while the older structures suffered much damage. One of the most intriguing losses, said Edge, was the loss of a fishing community due to the land rising 4 to 6 feet out of the sea. This left boats, docks, piers, and ramps above navigable water in many cases, closing off access to the sea. A report of the resilience and robustness of port facilities will be generated from this investigation which will lead to a better understanding of the requirements of planning, designing, constructing and maintaining port infrastructure and coastal communities.



Spreading Ideas That Really Matter

TED is a small nonprofit devoted to “Ideas Worth Spreading.” It started in 1984 as a conference bringing together people from three worlds: **T**echnology, **E**ntertainment, **D**esign. Over the years, the intellectual scope and geographic reach of TED has grown. CCEE faculty member Dr. **Francis de los Reyes** was a 2009 TEDIndia Fellow. “Attending TEDIndia was really inspiring,” says de los Reyes, adding “I met a lot of young people who were heads of NGOs, or doing really significant things in creative ways.” He organized the first TED event at a university in North Carolina, TEDxNCSU, because at NCSU “we are not only doers, but also thinkers.” The theme of the conference, held October 23, was “What Really Matters?” The conference highlighted that NCSU is “full of people who are doing positive things.”

Marshall Brain, founder of HowStuffWorks, challenged the audience to ask each day WWIDWME (what would I do with my existence), and to consider how individuals and groups should “think about giving, design, and unity.” **Santiago Piedrafta** of NCSU’s Department of Graphic and Industrial Design spoke about problems that do not have only one solution. **Blair Kelley** of NCSU’s Department of History spoke on race relations in the United States. Virtual reality was the focus of comments by Claudia Kimbrough of the College of Management. Caldwell Fellow and philanthropist **Saul Flores** spoke of a journey through South America and the plight of immigrants. **Marian McCord**, Director of Global Health Initiatives and a faculty member in the College of Textiles, showed how research led to a low cost product for



The audience prepares for the start of a TEDxNCSU session.



Dr. Francis de los Reyes leads off TEDxNCSU

feminine hygiene in developing countries. **Mike Giancola** of NCSU’s Center for Student Leadership, Ethics, & Public Service spoke on food and hunger in the developing world.

TEDxNCSU was made possible by the volunteer support of many individuals, including CCEE students **Tino de la Cruz**, **Tony Sobremisana**, **Xia He**, **Lele Bao**, **Siddharth Lokenini**, **Wei Yu**, **Qixun Zhou**, and **Yi Wang**. The event was supported in part by CCEE, with primary sponsorship from the NCSU College of Engineering and the University Sustainability Office.

According to de los Reyes, “the conference challenged the participants to think about bigger issues.” Although broad in scope, activities such as TEDxNCSU are relevant to engineers and individuals.

“For CCEE, it means we need to consider the impacts, problems, and solutions” that we work on. “At the end of the day, individuals can do something to change the world.”



Kimley-Horn Conducts Engineering Proposal Competition

Thirty-three CCEE undergrad and graduate students participated in a weekend long competition November 5-7, 2010 that was coordinated by Kimley-Horn and Associates (KHA). The students formed eight teams to prepare proposals for a hypothetical but realistic three million gallon water tank in Durham County, and to compete for scholarships of \$500 per person for each member of the winning team.

On Friday afternoon KHA engineers gave the students a Request For Proposals (RFP) from the City of Durham. The RFP required a written proposal and presentation to justify the choice of one of three Durham County sites and for a basic water tank design. The students visited a similar tank in Raleigh.



Kick-off Meeting

The student teams worked throughout the weekend in Mann Hall. Saturday morning began with breakfast provided by KHA. KHA staff answered questions and mentored the teams throughout the day. Teams were on their own Saturday night and Sunday morning as they put the finishing touches on their proposals and presentations. Sunday lunch was provided by KHA to the teams and an evaluation committee of practicing engineers. On Sunday afternoon, the evaluation committee listened to the team reports and reviewed their proposals.



The winning team at work

On Friday, November 19, everyone reconvened for awards and discussion. Each member of Escher Solutions, the winning team, received Certificates of Excellence and a scholarship. The Escher Solutions team members were **Christine Nguyen** (team manager), **Kelly Herrick**, **Dan Claff**, and **Devanshi Shah**.

KHA engineers **Richard Rohrbaugh** (BSCE '81) and **Ryan Lewis** (BSENE '04) debriefed the teams regarding their overall good performance and the importance of balancing the technical and business aspects of a proposal. They stressed quality control and professionalism in proposal preparation and presentation, and gave the students tips based on their consulting experiences.

Students said that the weekend was challenging and broadening. They gave suggestions for next year and noted that they very much appreciated the KHAmpetition. Department Head **Mort Barlaz** complimented the students for taking advantage of the special extra-curricular occasion that demonstrated how their course work can be applied to actual problems.

Other key contributors to the KHAmpetition were: KHA employees **Chad Beck** (BSCE '04), **Zak Purvis** (BSME '02), **Jeremy Rivenbark** (BSENE '99), **Kelly Sizemore** (BAPSY '03) and **Kevin Carter**; City of Raleigh employees **Kenneth Walldrop** (BSNE '93) and **Tim Woody** (BSBAE '83); City of Durham employee **Don Greeley**; and CCEE professors **Roy Borden** and **John Stone**.



Students Promote Licensure and Career Preparation

The NCSU student chapter of the Professional Engineers of North Carolina (PENC) was reactivated in 2009. **Susan Dunn** and **Angela Mastropole**, both masters students in environmental engineering, are leading the chapter under the guidance of Dr. **Joel Ducoste**, a professor in CCEE, and **Mark McIntire** (BSENE '95; MCE '97), Stearns & Wheler. The student chapter is open to all engineering students. PENC strives to introduce undergraduate and graduate engineering students to the support they need to successfully finish their degrees at NC State and start their careers. Students have the opportunity to network with professional engineers, faculty, and future colleagues. PENC holds monthly meetings that feature a professional engineer from the community, including engineers in industry, government, and private practice. Invited speakers give an overview of their company or organization and offer advice on what they look for in entry level engineers. During the Fall of 2010, the chapter hosted speakers from Stearns & Wheler, Kimley-Horn and Associates, and Ashland Construction Company. Last year, PENC held several events in addition to the monthly meetings, including a field trip to Progress Energy's Shearon Harris Nuclear Plant, a tutorial on 'Speed Interviewing' just prior to the Engineering Career Fair, and participation in Boy Scout Engineering Day.



Members of the student chapter visit Shearon Harris nuclear power plant near Raleigh, NC.

Engineers Without Borders at NCSU



Students at the Village Learning Center in Lower Allentown, Sierra Leone

Engineers Without Borders-USA (EWB-USA) is a non-profit humanitarian organization that provides engineering services to implement the infrastructure necessary to meet basic human needs in developing nations. Through sustainable engineering projects, EWB strives to improve the quality of life in the communities it serves. Dr. **Matt Evans** is advisor of the NC State chapter of EWB. The chapter is currently working on three projects, one of which involves a clean water system to be implemented in Lower Allentown, Sierra Leone. Ravaged by a ten year long civil war, Allentown was the site of terrible violence, and has been attempting to rebuild since the 2001 armistice. This project deals specifically with a school and community center called the Village Learning Center, where children attend school during the day, and women can get an education at night. The Clean Water System project is being led by **Ross Varin**, a senior in Environmental Engineering.

The next step for the project is an assessment trip to Lower Allentown in late December and early January. Ross and fellow project member **Megan Smithmyer**, a junior in chemical engineering, will be traveling with their professional mentor, **Crag Perry**, a project manager at **ms consultants**. This trip will provide the group with information regarding available drinking water resources, material availability, and mapping, and the opportunity to build a sustainable relationship with the community. Varin and Smithmyer will be putting engineering skills they have learned at NC State to practical use for the sustainable development of Allentown. More information on EWB-NCSU is available on their website at www.ewbncsu.org.



Students Learn From Alumni About Site Preparation



CE 549 students by the soil nail wall

NC State's **Centennial Campus** is a hotbed of construction activities. Thus, it provides a real-world laboratory for students in the geotechnical program to observe first hand the key challenges of preparing a new site for a major building project.

Graduate students in **CE549 Soil and Site Improvement**, taught by **Dr. Roy Borden**, recently toured the **James B. Hunt, Jr. Library Project** under construction on **Centennial Campus**. The students inspected the site and a recently completed soil nail wall. Soil nail walls are one of the earth retention technologies that allow for basement construction in dense urban areas.

Mark Collins, Fred Donaldson, and **Mahmoud Farawi** of **Skanska USA Building** generously hosted the meeting, provided safety equipment, and offered their on-site office facilities for a seminar. Donaldson explained why a temporary retaining wall was needed and the thought process behind selecting a soil nail wall as the temporary earth retention method.

Jeffrey Coonse (BSCE '96; MSCE '99), P.E. and **Ben Possiel** (BSCE '06; MSCE '08), both graduates of NC State and employees of **Subsurface Construction Company, LLC**, the soil nail wall contractor, presented a seminar on soil nail wall construction. Coonse noted, "The graduate students showed the breadth of their studies by asking thoughtful questions regarding design methodologies, construction sequence, and cost benefits. NC State continues to show its dedication to educating students by applying classroom knowledge to field applications."



Jeffrey Coonse and Ben Possiel

New Civil Engineering Curriculum

Students entering NC State this fall were greeted by a new civil engineering curriculum. Last academic year, the Undergraduate Programs Committee, under the direction of Dr. **Roy Borden**, hammered out the new program which was approved by the faculty during the spring 2010 semester. The new program offers greater flexibility to address the increasing number of domains of expertise and practice within the civil engineering profession. The first two years remain essentially unchanged and are comprised largely of math, basic science, and fundamental engineering science courses. Beginning with the junior year, however, greater flexibility has been built in. Students select five introductory courses from eight areas within civil engineering which include coastal engineering and water resources, computing and systems, construction engineering and management, environmental engineering, geotechnical engineering, structural engineering, transportation engineering, and construction materials. During the senior year, students select seven additional civil engineering electives, chosen from the same eight areas. One of the seven CE electives must be the capstone design course, and three laboratory experiences are required. Thus, students can develop a broad plan of study, or they can focus within one or two areas of civil engineering.

The new civil engineering curriculum is available on NC State's website at:

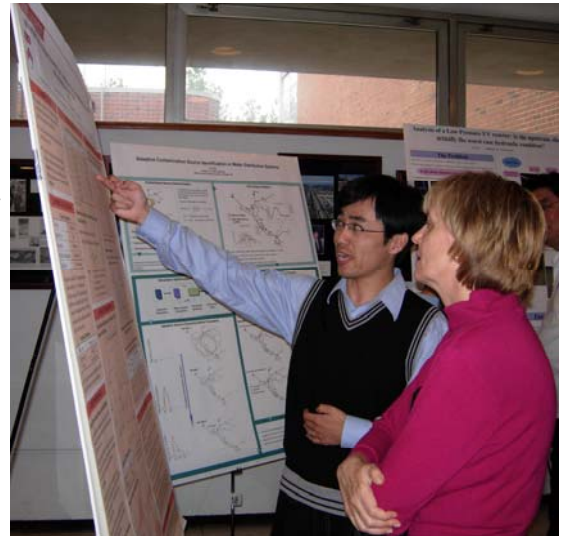
http://www.ncsu.edu/majors-careers/degree_requirements



CCEE Formalizes Graduate Programs in Environmental Engineering

The Department has been offering graduate course work in environmental engineering for many years and recently received formal approval to offer a graduate degree program in environmental engineering. Strong demand for graduates in ENE continues to grow among governmental environmental agencies at the federal, state, and local level, engineering consulting companies that provide environmental services, industrial companies, environmental services providers, non-profit research institutes, non-governmental organizations, and many others.

At the undergraduate level, the CCEE Department offers B.S. degrees separately in Civil Engineering (CE), Environmental Engineering (ENE), and Construction Engineering and Management (CEM). The B.S. ENE program is ranked 12th nationally by U.S. News and World Report. However, the graduate ENE program has been offered only as a concentration under the existing thesis-based MS Civil Engineering (MSCE) and non-thesis Master of Civil Engineering (MCE) degrees. Many of the over 60 Civil and Environmental Engineering departments nationwide offer graduate degrees in ENE separate from degree offerings in Civil Engineering. Thus, to improve recognition of this active program, the Department initiated a process in 2008 to establish master's degree programs in ENE.



A graduate student presents his environmental engineering research during an annual spring symposium.

A small committee of faculty, including **H. Christopher Frey**, **Downey Brill**, and **Joel Ducoste**, developed proposals for the new degrees, which were approved by department faculty, higher levels at NCSU, and the University of North Carolina (UNC) system. Final approval was received on May 12, 2010 from the UNC General Administration. The department is now implementing three new programs, including: (1) **Master of Science in Environmental Engineering (MSENE)**; (2) **Master of Environmental Engineering (MENE)**; and (3) a **distance education** version of the MENE offered via the College of Engineering's Engineering Online program. Of 23 graduate courses offered by ENE faculty, 13 are available via Engineering Online.

The MSENE requires a 6 credit hour thesis as part of the program of study. The MENE degrees can be only courses, or can include an optional 3 credit hour project. Students currently enrolled in the MSCE or MCE degrees who wish to switch to the corresponding MSENE or MENE degrees can easily do so. The MSENE and MENE degree options are already being selected by new applicants to the department's graduate programs.

The master's programs in ENE provide students with skills necessary to develop solutions for challenging environmental problems in many key areas, including: air quality and air pollution prevention and control; coastal systems; environmental systems analysis; groundwater hydrology, contamination, and remediation; geoenvironmental engineering; energy, environment, and climate; environmental exposure and risk assessment; solid waste management; surface water quality; water and wastewater treatment; and water resources. We expect to graduate our first MS ENE student, **Ye "Ginny" Cao**, this December, and look forward to the continued success and growth of the vital graduate ENE programs.



Dream Builder



Peter M. Lehrer (BSCE-Construction Option, 1963), identifies himself as “an engineer first, and a builder second.” He is without doubt first among builders. Mr. Lehrer was on campus October 25 to present in NCSU’s Entrepreneurs Lecture Series, where he was introduced by **Chancellor Randy Woodson**.

Mr. Lehrer’s first job as an engineering graduate was with Morse/Diesel, where he rose through the ranks to president of the Eastern Division. Mr. Lehrer co-founded Lehrer-McGovern, which grew to one of the largest and most respected construction management firms in New York City. The firm merged with Australian owned Bovis Ltd, to become a world leader in construction.

Mr. Lehrer’s partnership with Gene McGovern is chronicled in a commissioned educational documentary film, “Dream Builders,” that won several awards this year. Examples of Lehrer-McGovern projects include Euro Disneyland, Canary Wharf in London, and the Petronas Towers in Kuala Lumpur, Malaysia. Since 1996, as head of Lehrer LLC, Mr. Lehrer provides consulting services to clients involved with major development projects, including Columbia University’s multi-billion dollar Manhattanville campus, Bloomberg Headquarters, Whitney Museum of American Art and the JetBlue Terminal at JFK.

Mr. Lehrer credits his degree at NC State with providing a “comfort factor” and “good foundation of knowledge” that allowed him to “quickly move through the construction process and not feel I had any limitations.” Mr. Lehrer is “able to conceptualize what something will look like” by reading a set of plans, much in the way a layperson reads a newspaper. Both he and his wife Eileen credit his successful career to his belief in himself, his motto “anything is possible, never give up,” and hard work.

Mr. Lehrer points out that large civil infrastructure projects typically involve multiple teams with a variety of international linkages. Thus, he recommends that students take advantage of opportunities to develop business and communications skills. Many large construction companies are global. Mr. Lehrer participated in many projects in which an understanding of foreign business culture is critical to developing and managing a project. Mr. Lehrer advises that students should have an “awareness that you need to prepare” for an international business meeting by learning key aspects of culture.

Communication skills are a key ingredient to a successful career. Engineers are always presenting themselves and their ideas to clients and others. To emphasize the importance of communication, Mr. Lehrer points out that he has selected project team members based on presentations from candidates. The candidates who best demonstrate depth of knowledge and well-organized and articulated ideas are the ones who rise to the top.

Students face a fork in the road each time they make a decision about what major to declare, or what job to take. In this regard, Mr. Lehrer cites Yoga Berra: “when you come to a fork in the road... take it.” “Making money isn’t really that important” early in one’s career; instead, he advises: “position yourself to be successful” and “follow your passion.”

SAVE THE DATE

**Alumni Lunch
with
Dr. Mort Barlaz, CCEE
Department Head**

- Jan. 6: Raleigh State Club
- Jan. 11: Greensboro Green Valley Grill
- Jan. 12: Charlotte Sullivan’s Steakhouse

Additional information will be emailed to CCEE Alumni by Lora Bremer



Family of Alumnus Establishes Civil Engineering Endowment

The family of a North Carolina State University engineering alumnus established a \$25,000 scholarship endowment in the College of Engineering. The **Lin Wiggins Memorial Scholarship** was established in memory of **Carson Olin "Lin" Wiggins, Jr.**, who graduated from NC State in 1976 with a bachelor's degree in Civil Engineering.

The Wiggins' family, who gathered at NC State on June 18 for a ceremony celebrating the gift, established the endowment to encourage young civil engineers to follow in the footsteps of Wiggins. Wiggins, an engineer with the NC Department of Transportation for more than 25 years, helped create a unique software tool that allowed state bridge inspectors to work more efficiently. This boosted safety because more bridges could be inspected more quickly.



Family of Lin Wiggins

The scholarship will be designated to children and grandchildren of active or retired DOT employees. The endowment is an enhancement of an annual scholarship the Wiggins' family established in 2004 that has provided \$500 per semester to selected civil engineering students. This endowment will help support civil engineering students find solutions to many of the great sustainability and infrastructure challenges we face as a society.

Stephen Shane Fincher Memorial Foundation



Carolyn Fincher and Henry Sherrill
Stephen's mother and stepfather

Stephen Shane Fincher (BSCE '88), passed away unexpectedly on December, 11, 2008 leaving a large void in the lives of his family and friends. Steve was a charismatic, well-loved individual. Anyone who encountered Steve immediately surmised that he had never met a stranger and truly enjoyed life. As a successful builder and President of Premiere Building Company, Steve had a unique style of building homes and contributed to many projects inside the beltline.

Steve was a loyal NC State fan and a member of the Wolfpack Club who prided himself in rarely missing a State game. A Golf Tournament was held at the Lonnie Poole Golf course on the NC State Centennial Campus on Friday, November 12, 2010 to celebrate the memory of Stephen Shane

Steve was
"larger than life"

Fincher. Proceeds from this event will be used for the Stephen S. Fincher Scholarship Fund to students pursuing degrees in Civil Engineering.

The idea of creating a foundation to honor the memory of Steve was conceived by Charlie Futrell, one of Steve's best friends. Steve tried to bring smiles to the faces of those around him and invited them to become a part of his vision to make a difference in the lives of others. Steve was "larger than life," and in his memory, this foundation was established to provide scholarship funds to assist students pursuing Bachelor's, Master's or Doctoral degrees from North Carolina State University's College of Engineering.

Further information about the Stephen Shane Fincher Memorial Foundation can be found at:

<http://stevefinchermemorial.com/index.html>



Alumni Updates

Eric Solano (MSCE '96; PhD '99) passed the P.E. exam in December '08 and has been employed by RTI International for the past 10 years. He is currently Leader of the Integrated Solid Waste Management Model Development Team which has developed a quantitative framework and mathematical model to aid in decision making for integrated municipal solid waste (MSW) management.

Karen Karvazy (BSENE '95) is currently living in the New York City area. Following her years at NC State, she completed an MS in engineering and pursued a career in water/wastewater engineering, with a focus on sustainable design. She has taken the last few years to raise a family but remains very active in committee work through the Environmental Water Resources Institute of the ASCE.

Gregory L. Williams (BSCE '87) was recently promoted to Chief, Engineering Branch of the Wilmington District of the U.S. Army Corps of Engineers. He has over 20 years of experience with the Corps and private industry. Prior to his promotion, he worked for 8 years as the Chief of the Coastal, Hydrology and Hydraulics Section for the Wilmington District.

Share Your News:

Keeping your contact information current enables us to keep you up to date on events in the department and elsewhere.

Have a professional or personal update? We would like to hear from you! Please send us your latest news (e.g., career accomplishments, awards, recognitions, marriage, births, retirement) so we may share your news in future issues. Send the following information and/or news stories to lora_bremer@ncsu.edu

Name, Mailing & Email Address
Company Name & Address
Work & Cell Phone Numbers
Degree, Major & Class Year
Announcements

Widi Agoes Pratikto (PhD '92) is currently Secretary General of the Developing-8 (D-8) Organization for Economic Cooperation. Developing-8 is a group of countries (Bangladesh, Egypt, Indonesia, Iran, Malaysia, Nigeria, Pakistan, and Turkey) who formed an economic development alliance with the objectives of improving the position of member states in the global economy.

Jana C. Stewart (BSENE '05) is currently a Storm Water Engineer with the City of Greensboro. Jana passed the PE exam in April 2010 and is taking storm water classes through the BAE Department at NCSU.

Ben Burgess (BSCCEM '06) passed the Florida P.E. exam (Spring 2010) and is enrolled at the University of Florida working towards a graduate degree in Business Administration (MBA). Ben is employed as a Project Manager at A.J. Johns, Inc., a site development and roadway contractor in Jacksonville. He manages approximately \$10 million of construction projects with the City of Jacksonville as well as private developers.

Investing in the Department: We ask you to invest in our future and make a commitment to the NC State College of Engineering. Your gift will have a tremendous impact in helping us take CCEE to a new level of excellence. As a result, we anticipate having better educated and prepared students entering the work force which will raise the visibility and build the stature and prestige of the CCEE Department. There are many ways to give to the Department. Whether an annual gift, an endowed gift, or a one-time gift, it will make a significant impact on current as well as future students and faculty at NC State University.

Checks should be made payable to: **NC State Engineering Foundation, Inc., designated for CCEE** and mailed to: **North Carolina State Engineering Foundation, Inc., Campus Box 7901, Raleigh, NC 27695-7901**

You can also use your credit card to make an outright gift. Log onto:

<http://www.engr.ncsu.edu/foundation/index.php> and follow the instructions. To talk to someone or for additional information, please contact: **Lora Bremer**, Director of Development, CCEE Department:
Phone: 919-513-0983 • **Email:** lora_bremer@ncsu.edu



Firm of the Month: Views from Participating Firms

The idea for the firm of the month was suggested by the CCEE Departmental Advisory Board. The firm of the month program is our way of thanking and promoting our corporate partners while at the same time educating our students. This program provides participating firms with name recognition for recruiting and business opportunities, demonstrates to students ways that they can use their degrees after graduation and provides information on employment opportunities.

NC State is an important partner for **Kimley-Horn and Associates**. We are proud to have been the first Firm of the Month because we consider our engagement with the Civil, Construction, and Environmental Engineering Department an important part of giving back. As practicing professionals, we believe it is important to show students the results-side of engineering.



We encourage our professional staff to give back to their universities. As the Firm of the Month we hosted an informal drop-in lunch for students which gave a forum for some of our younger NC State graduates to interact with current students. Being engaged with students and faculty through the Firm of the Month program also allows us to show what Kimley-Horn is about. That kind of exposure means we can put a public face on tangible examples of real world projects, how we work in integrated teams, and what it means to serve clients.

**We are proud to have been
the first
"Firm of the Month"**

We know that some students will want to seek a consulting career. Continuing engagement with the CCEE Department allows us to interact with promising students and gives them the chance to learn about the engineering business. We believe this helps students improve their ability to make good career choices and set a successful path for themselves. Our firm is actively engaged with universities around the country, and our engineering professionals and human resources staff consistently say that NCSU/CCEE graduates are among the most capable, grounded, and well-rounded that we have recruited. Consequently, being the Firm of The Month, along with our other involvement, returns real dividends. These forums improve our ability to attract and recruit excellent engineers who will be the foundation of our firm for years to come.

Richard Rohrbaugh (BSCE '81, PE), Principal and Sr. Vice President, Kimley-Horn and Associates, Inc.

McDonald York Building Company was honored to be selected as "Firm of the Month."



We take great pride in our long and close relationship with the University, and this recognition shows the respect that exists at the University for McDonald York. It gave us the opportunity to make the students and faculty more aware of our company which has been very helpful in our recruiting efforts.

CCEE News is published by the Department of Civil, Construction, and Environmental Engineering to share information among faculty, staff, students, alumni, and friends of the Department. This issue was produced by Chris Frey, Editor and Bonnie Diaz, Managing Editor. Additional contributors to this issue are: Mort Barlaz, Chris Bobko, Roy Borden, Lora Bremer, Susan Dunn, Billy Edge, Mo Gabr, Murthy Guddati, Tasnim Hassan, Mervyn Kowalsky, Jim Nau, John Stone, Ross Varin, and Paul Zia.