NC STATE
Engineering

CCEE NEWS

DEPARTMENT OF CIVIL, CONSTRUCTION, AND ENVIRONMENTAL ENGINEERING
NC STATE UNIVERSITY | SPRING 2016

COOKSTOVE RESEARCH AIMS TO CLEAR THE AIR

IN THIS ISSUE

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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.

IN THE SPOTLIGHT

ENGINEERING STUDENTS TAKE TOP HONORS IN THREE MINUTE THESIS COMPETITION

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Three of the top 10 contestants are CCEE Ph.D. students

ABOUT THE COVER
A CCEE faculty-student team conducted emission testing in rural Malawi as part of research on implementation of cleaner cookstove technology.

LETTER FROM THE DEPARTMENT HEAD MORTON A. BARLAZ

Welcome to the spring 2016 newsletter. It is a pleasure to update our friends on happenings in the department. I am writing this letter just after our December graduation. It is always satisfying to watch as the next generation of engineers graduates (see article on page 22). Graduation is an uplifting reminder of our mission.

Perhaps the biggest news of the decade is that we are very close to having a clear path to a new building on Centennial Campus. On March 15, North Carolina voters will be asked to approve a bond referendum that includes about 50 percent of the cost of Engineering Oval, a new building on Centennial Campus that will house much of our department as well as Industrial and Systems Engineering and the Dean's Office. I am optimistic about the bond's approval and excited for the opportunity to participate in the design of a modern engineering building that will serve our students and faculty for decades to come. Naming opportunities are available and we would love to hear from you.

I would like to welcome **Lindsay Smith**, our new director of development. Lindsay joins us after working as the senior director of annual giving at Guilford College in Greensboro, NC. Lindsay is replacing **Lora Bremer**, who will serve as the executive director of major gifts and campaign planning for the College of Engineering and continue to work with CCEE.

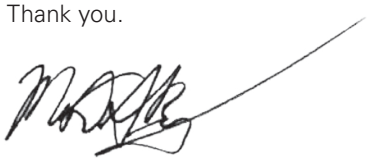
Dr. **John Stone**, a professor in our Transportation Systems group, is planning to retire in the summer of 2016 after 36 years in the department.

This newsletter features five research briefs from our faculty, highlighting the department's contributions to civil infrastructure. Dr. **Joe DeCarolis** is developing models to project the makeup of the U.S. energy grid. Dr. **Andy Grieshop** is working to reduce emissions from indoor cookstoves that affect nearly three billion people who cook on biomass burning stoves. Drs. **Sankar Arumugam**, **Emily Berglund** and **Kumar Mahinthakumar** are working to understand the technical and social factors that influence water consumption in the U.S. and how we respond to water scarcity. Drs. **Murthy Guddati**, **Shamim Rahman** and **Mervyn Kowalsky** are developing a portable device that can be used in the field to estimate the depth of piles supporting bridges. Dr. **Chris Frey** is comparing the fuel efficiency ratings posted on new cars with actual efficiencies when vehicles are driven under real world conditions.

Our student groups continue to bring a variety of extracurricular experiences to our programs including conference attendance, site visits and service projects. I would like to personally acknowledge and thank the leaders of our student groups for their drive and motivation to embrace all aspects of our profession through their leadership. I also thank three members of our Advisory Board, **Bill Pope**, **David Simpson** and **Stacey Smith**, who are serving as advisers to the student groups.

As you read this newsletter, I hope that you get a sense of the wonderful accomplishments in our teaching, research, and extension programs and our contributions to sustainable infrastructure. Again this year, the university suffered a 2 percent budget cut and the department paid the price. Please make a contribution to the department a regular event. Your gifts provide help with the special things that make us strong, whether it is field trips for undergraduates, allowing graduate students to make a presentation at a national conference, or helping to recruit and retain the best students and faculty in the world. We need your support as we strive for excellence in times of decreasing public funding for our mission. Your past support is heart warming.

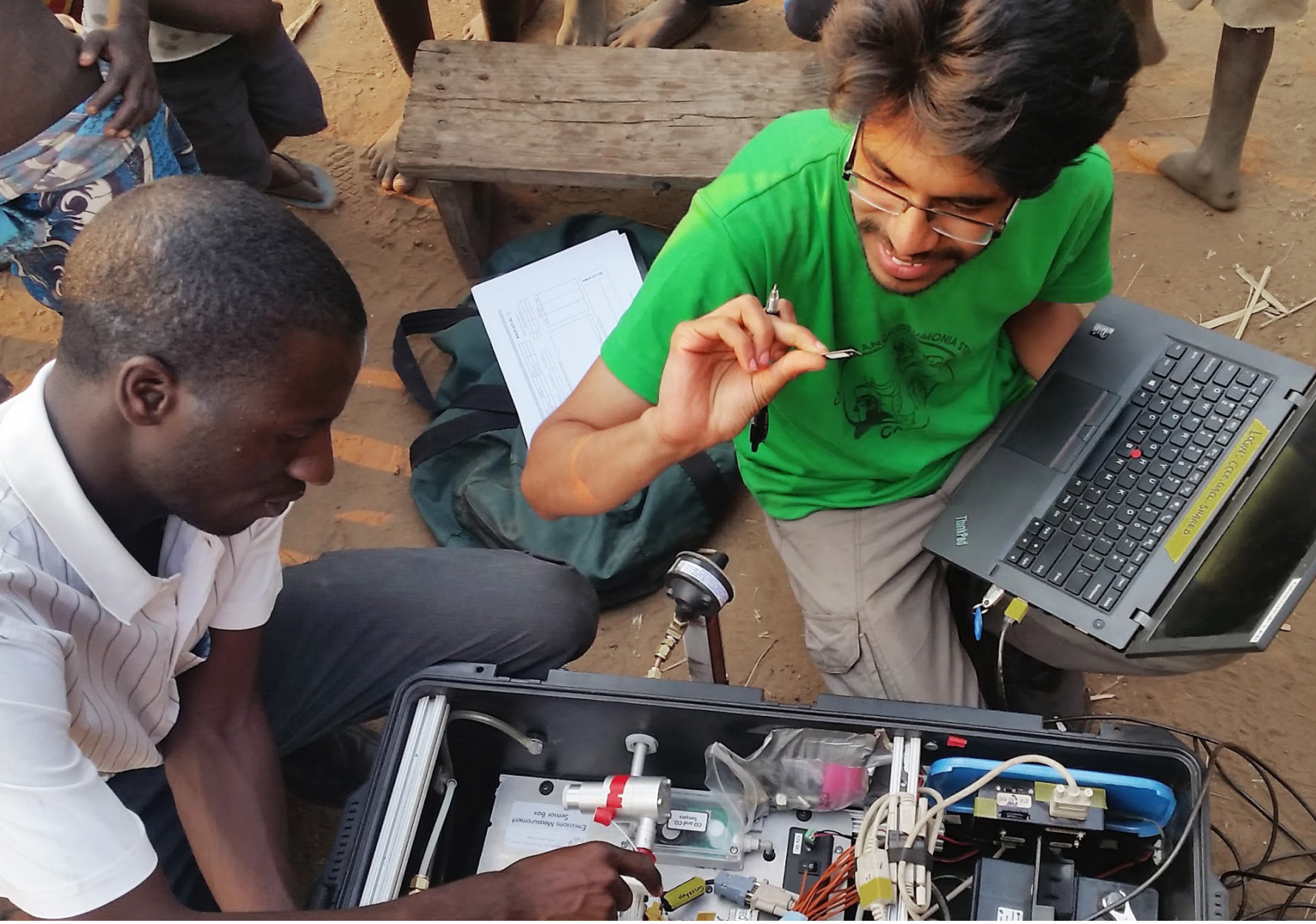
Thank you.



Morton A. Barlaz
Distinguished University Professor and
CCEE Department Head

CCEE AT NC STATE SUSTAINABLE INFRASTRUCTURE FOR SOCIETY

$18.6 million in research expenditures
156 ongoing research projects
12 winners of CAREER and other NSF young faculty awards
48 faculty members
336 graduate students
754 undergraduate students



Ph.D. student Roshan Wathore, right, preparing for in-home emission testing. (Photo by Dr. Andrew Grieshop)

Will cleaner burning cookstoves lead to cleaner air? CCEE investigators assess emissions in rural Malawi

Nearly three billion people, including the vast majority of the residents of sub-Saharan Africa, burn wood and other biomass for cooking, heating and lighting. Emissions from these fires have huge impacts on human health, the environment and the climate.

While modern fuels like natural gas or electricity would clearly address this issue, much of the population in places like Malawi is simply too poor to afford them, and there is little infrastructure in place anyway. Less than 10 percent of people in Malawi have access to grid-based electricity.

Improved "gasifier" cookstoves hold great potential for reducing black carbon (BC) emissions, one of the pollutants that has especially strong climate and air pollution impacts.

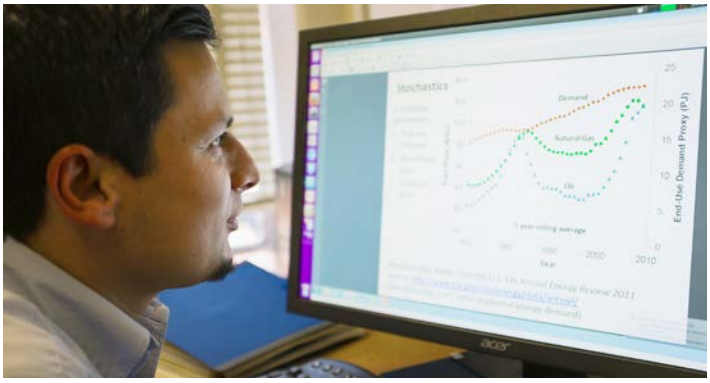
Building on a body of collaborative laboratory and field research that has focused on cookstove replacement programs in rural India, Dr. **Andy Grieshop** and Ph.D. student **Roshan Wathore** conducted cookstove emission testing in rural Malawi during September of 2015. They spent several weeks establishing relationships with villagers and performing tests in more than 25 homes and an orphanage. Grieshop and Wathore built mobile, battery-powered equipment to measure various pollutants including black carbon particles. Unfortunately, preliminary results suggest that the stoves are not performing as well in Malawian households as they have in controlled

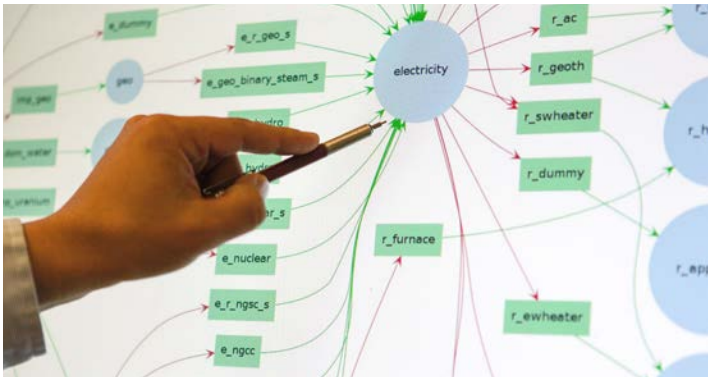
laboratory tests. Identifying the technical and human challenges associated with adoption of new technologies will provide continuing insights into how to address this pervasive and complex global issue. "It may be as simple as insuring the end user understands the fuel has to be chopped up into smaller pieces to make the stoves work efficiently," Grieshop speculates. Ongoing research in this area is being conducted by Grieshop's team.

The study in Malawi was performed in collaboration with Dr. **Kevin Mortimer** from the **Liverpool School of Tropical Medicine**, and the international non-profit organization **Concern Universal**. ▪

A woman in rural Malawi starts a gasifier stove inside her home. (Photo by A. Grieshop)

CCEE professor works with international researchers to develop guidelines for energy system modeling





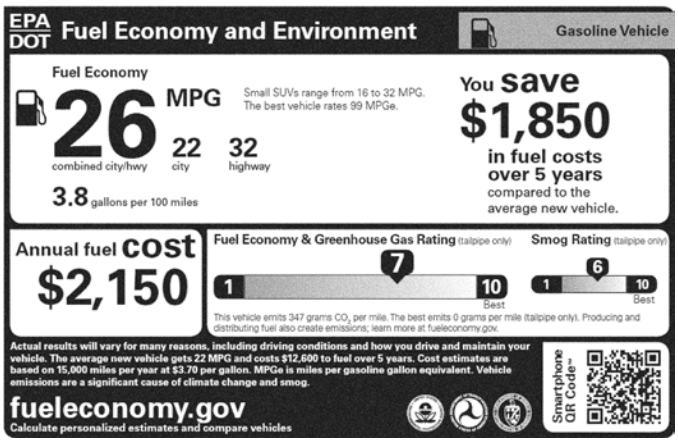
Dr. Joe DeCarolis working on his own open source energy system model called "Temoa."

Sustainable energy development worldwide requires planners and analysts to anticipate possible future outcomes in a world filled with uncertainty. Computer models represent a critical tool that can be used to examine how energy systems might evolve over time under different assumptions. Energy system models can address questions such as "How might the current 23 percent share of coal in the U.S. energy system change under future climate or energy policies?" The models consider resource availability and pricing, technology innovation, and changes in demand over time. Despite the critical importance of such questions to decision makers, there is little formal guidance regarding how best to develop and apply energy system models in a way that yields useful insight. Dr. **Joe DeCarolis**, who employs energy system models in his research program, spent a month this past summer as a fellow at University College London (UCL) in its **Whole Systems Energy Modelling (wholeSEM)** consortium. DeCarolis collaborated with a team of UCL researchers to outline a set of guiding principles for model-based analysis, including approaches to consider future uncertainty and ways to communicate model-based results to decision makers. ▪

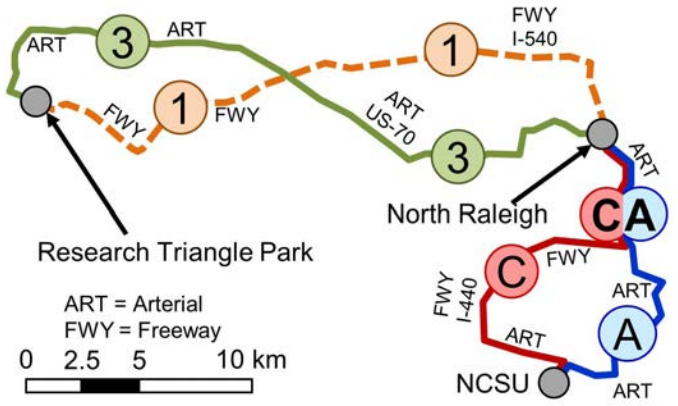
- Which energy technologies are likely to be deployed under specific policy scenarios?
- How might innovation affect technology deployment?
- How can we develop robust energy planning strategies given large uncertainties?

How good are vehicle fuel economy ratings?

Every car sold in the U.S. has a fuel economy rating from the U.S. Environmental Protection Agency and the U.S. Department of Transportation. These ratings are based on tests conducted in a laboratory. In 2006, the rating scheme was revised because of widespread complaints that real-world fuel economy was often worse than the ratings. However, there has not been a systematic evaluation of the current rating scheme. Dr. **H. Christopher Frey** and Ph.D. student **Tanzila Khan** have recently completed the first such study. Since 2008, Dr. Frey's group has measured real-world fuel economy over 110 miles of driving in the greater Raleigh area for 122 passenger vehicles, including coupes, sedans, hatchbacks, minivans, pickup trucks, and sport utility vehicles. On average, real-world fuel economy was found to be slightly better than rated fuel economy, although the difference was not large. There are some vehicles for which real-world fuel economy is over-estimated and, thus, for which consumers might perceive that the ratings are not accurate. The fuel economy rating scheme could be improved by replacing standard laboratory driving cycles with driving cycles more representative of real-world operation. This work was presented at the annual meeting of the Transportation Research Board on January 12, 2016 and is accepted for publication in the *Transportation Research Record*. ▪

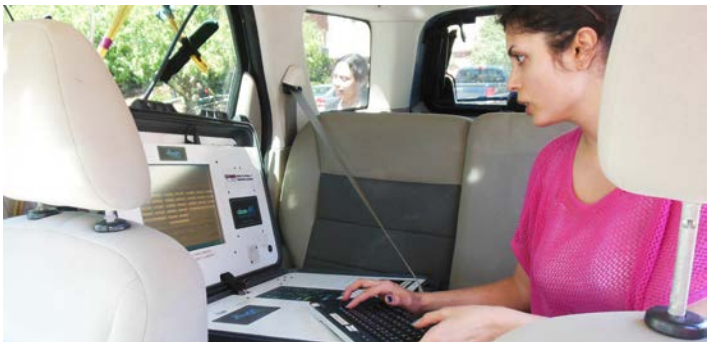


Each new vehicle sold in the U.S. has an official fuel economy rating, but how accurate is the rating?



Each of 122 vehicles were driven on 110 miles of routes in Raleigh, NC and Research Triangle Park, NC.

Exhaust emissions are continuously sampled from the tailpipe during real-world data collection.



Ph.D. student **Maryam Delavarrafiee** prepares a sport utility vehicle for field data collection by installing a Portable Emission Measurement System.

Engine data are downloaded continuously using the On-Board Diagnostic (OBD) link located under the dashboard, as shown in the upper right.

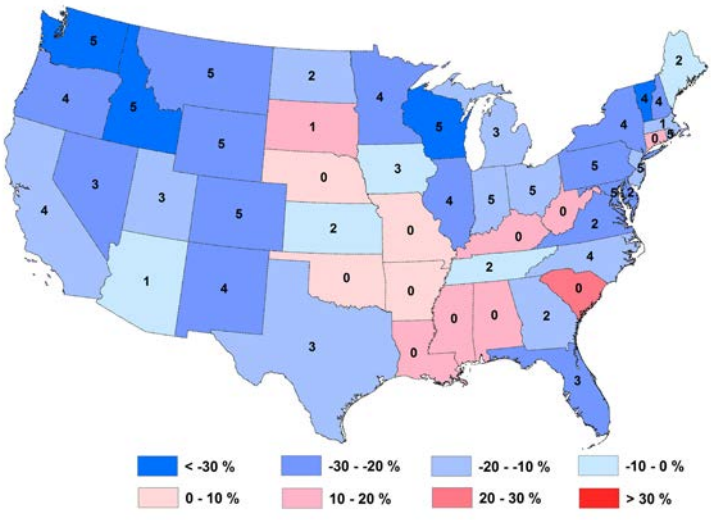
How do we plan for use of a dwindling water supply?

CCEE researchers are identifying the principal drivers behind public water consumption to help develop conservation strategies.

Water is becoming a scarce resource around the world as rainfall becomes increasingly variable. U.S. public water supply systems are stressed. Climatic changes, along with people's resistance to altering water usage, create challenges in matching supply with demand. Dr. **Sankar Arumugam**, with Drs. **Emily Berglund** and **Kumar Mahinthakumar**, along with students **Seung Beom Seo** and **Rajarshi Das Bhowmik**, identified the principal drivers behind public water consumption to help develop strategies for increasing water use efficiency. In conjunction with investigators from **Arizona State University** and **Florida International University**, the team examined public water usage from 1985 to 2010. Factors examined included drought, population growth, wealth, education level, economic productivity, and investment in water infrastructure.

Significant differences were observed in water usage between the North and South. Northern populations have decreased, demand has lessened, and water usage efficiency has increased. In the South, both population and demand for water have increased, while efficiency has decreased. This is, in part, a result of a larger number of individuals who own land in the South, which translates to more people watering lawns.

Efficiency has improved in urban counties relative to rural ones and in counties with higher income and education. However, the research showed that water utilities typically did not respond quickly enough to drought conditions, often waiting too long to enforce water use restrictions. This forces even more drastic responses by the utilities. The study was part of the **Water Sustainability and Climate (WSC)** initiative funded by the **National Science Foundation**. ▪



Percentage change in total public water use per capita between 1985 and 2010. Numbers on each state indicate the number of five year periods between 1985 and 2010 during which per capita withdrawals decreased.

Dr. Murthy Guddati reviews an EDAR plot.

CCEE researchers develop a portable device to estimate the embedded depth of pile foundations

Of North Carolina's approximately 13,000 bridges, an estimated 40 percent are structurally deficient or functionally obsolete. One of the main causes is scouring, the erosion of soil around the foundation. A critical step in assessing bridge condition is to estimate the depth of the embedded pilings that support the bridge. However, there are often no accurate records of the original pile length and the current method used to assess pile length is unreliable. Dr. **Murthy Guddati** and Ph.D. student **Vivek Samu** have developed a non-destructive testing method named Effective Dispersion Analysis of Reflections (EDAR). EDAR combines innovative use of signal processing with mathematical manipulations rooted in guided wave propagation theory, an area that Guddati has been working in for more than a decade. EDAR is more reliable than the current state of practice.

With funding from the **North Carolina Department of Transportation** and **Alaska Department of Transportation**, and in collaboration with Dr. **Shamim Rahman**, Dr. **Mervyn Kowalsky**, and Ph.D. student **Ali Vaziri**, Guddati and Samu have built a portable testing system based on EDAR that includes a hammer, tablet, data acquisition system and accelerometers. Laboratory and preliminary field tests confirm that the device provides reliable and accurate estimates of the embedded pile depth, signaling significant potential for routine use across the nation. ▪

Ph.D. student Vivek Samu field testing the portable EDAR system.

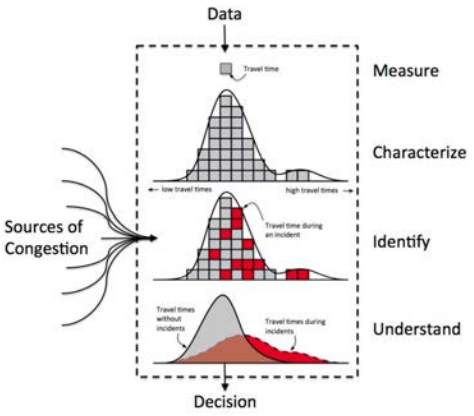
North Carolina is 13th in the nation for number of bridges that are state maintained, but the problem of failing bridges is a nationwide challenge. An estimated one in nine of the nation's 600,000 plus bridges is rated structurally deficient.

NEW RESEARCH

In the last few months of 2015, CCEE faculty received nearly a million dollars of research support from state, federal, and private sources. This support will enable 11 CCEE faculty, their teams of graduate, undergraduate and postdoctoral researchers and their collaborators to address a range of problems on scales ranging from parts per billion of a contaminant to ecological conditions in the Gulf of Mexico.

Dr. **DETLEF KNAPPE** received funding from the **National Science Foundation** to study a class of chemicals, perfluoroethercarboxylic acids (PFECAs), that have recently been found in the Cape Fear River in North Carolina. This research will develop an analytical method and measure PFECA concentrations and mass flows in the Cape Fear River, and assess the fate of PFECAs in the river and in drinking water treatment plants. PFECA concentration data will be used to estimate human exposure via consumption of drinking water.

Dr. **MOHAMMAD POUR-GHAZ** received a grant from the **Environmental Research and Education Foundation** to identify factors that contribute to premature deterioration of concrete overlays that form the tipping floors at municipal solid waste transfer stations. The research will produce specifications, performance requirements and a structural design methodology to minimize premature deterioration of these concrete surfaces. These improvements will provide owners with significant cost savings.

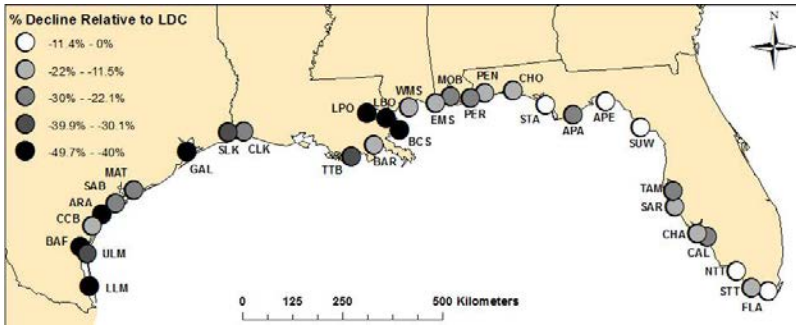


In a new project, CCEE faculty will quantify sources of travel time delay to help identify unusually long travel times and their causes.

Drs. **BILLY WILLIAMS**, **NAGUI ROUPHAIL** and **GEORGE LIST** received funding from the **North Carolina Department of Transportation** to implement recently developed tools that enable state of the art monitoring and analysis of travel time reliability. Travel time reliability measures the extent of unexpected delay. Thus, improved travel time reliability helps travelers more accurately plan for the amount of time a trip will take.

Drs. **MURTHY GUDDATI**, **MERVYN KOWALSKY** and **SHAMIM RAHMAN** received continued funding from the **Alaska Department of Transportation** to develop a nondestructive test method to estimate the embedded length of pile foundations. More details on this project are on page 6.

Dr. **DANIEL OBENOUR** received a grant from the **National Oceanic and Atmospheric Administration (NOAA)** to assess the ecological conditions of estuaries across the U.S. Gulf of Mexico and Pacific coasts. This work, which will be based on advanced statistical models, will help identify sensitive fish species, key stressors, and highly impacted estuaries. The results will enable development of guidance for future restoration efforts. Dr. Obenour also received funding from NOAA to help put into regular operation previously developed models to forecast the "dead zone" in the northern Gulf of Mexico.



Average estimated reduction in fish species presence relative to baseline "least disturbed conditions."

Drs. **TAREK AZIZ** and **DANIEL OBENOUR** of CCEE and Dr. **Astrid Schnetzer** of the Department of Marine, Earth, and Atmospheric Sciences were awarded a **Research Innovation Seed Funding (RISF)** grant from NC State to study the interplay of mixing, light, and phytoplankton growth in reservoirs. The project will use a lab-scale reactor to simulate natural and engineered reservoir conditions. Results will help to explain the role of natural and artificial mixing in suppressing harmful algal blooms.

The Center for Nuclear Facilities and Structures (CNEFS), led by Dr. **ABHINAV GUPTA**, has received a grant from **Idaho National Laboratory (INL)** to develop a model to predict the effects of aging of piping systems on seismic performance evaluations. The research aims to identify "hot-spots" of aging-related degradation in piping systems to help prioritize needs for monitoring and testing. ▪

The ReNeWS workshop was hosted at the Wilmington Hilton Riverside on the Cape Fear River.

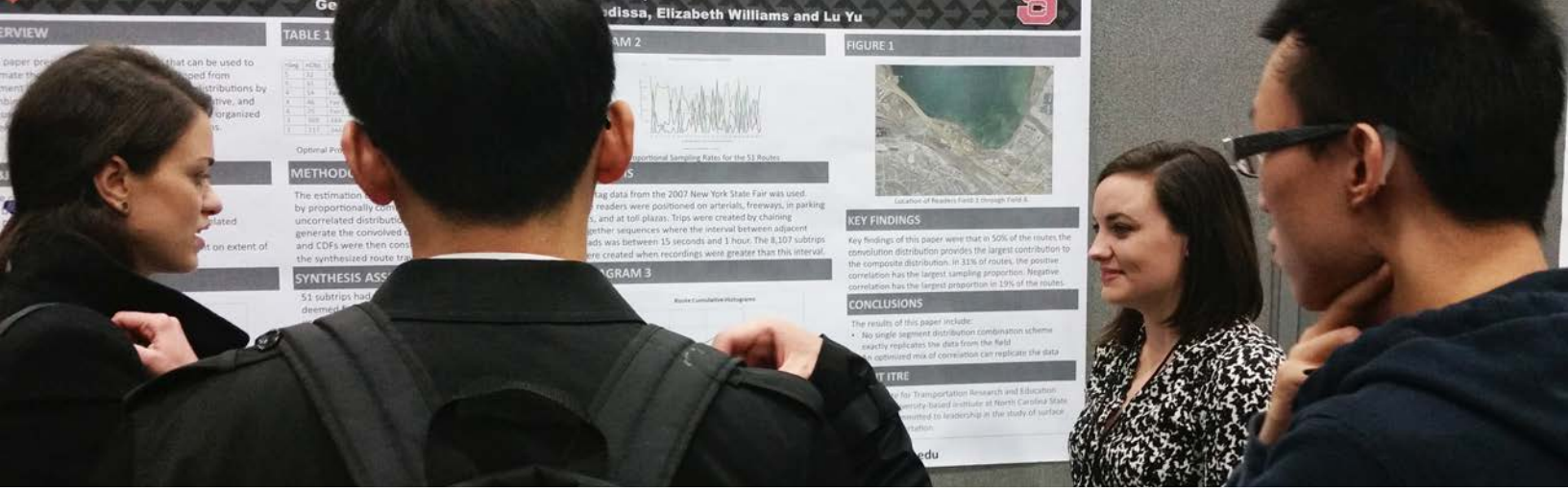
Brainstorming interdisciplinary solutions to water resources problems

Thirty two professors, research scientists, and graduate students from NC State, with backgrounds in engineering, natural sciences, social sciences, and communication, participated in the ReNeWS Interdisciplinary Research Leadership Summit, held in Wilmington, NC in October. ReNeWS is the Research Network for Water Solutions, a one-year project supported by the NC State Office of Research, Innovation, and Economic Development. The goal of the summit was to provide the opportunity for researchers across the NC State campus to meet and discuss water issues and develop an interdisciplinary research agenda. CCEE participants included Drs. **Arumugam**, **Aziz**, **Berglund**, **Knappe**, **Obenour**, **Patskoski**, and **Ranjithan** and graduate student **Laura Garcia-Cuerva**. All attendees are active researchers exploring water resources problems. Discussions ranged from unregulated chemicals in the environment to the influence of population growth and climate change on water supplies. Participants were grouped in interdisciplinary teams to create new research ideas for important water resources problems. **Joel K. Bourne**, who is the author of "The End of Plenty: The Race to Feed a Crowded World" delivered the keynote address on food and water scarcity. ▪

CCEE welcomes Lindsay Smith, new director of development

In November of 2015, **Lindsay Smith** joined the NC State Engineering Foundation as director of development. Smith is enthusiastic in her new role as the major gifts contact for the Department of Civil, Construction, and Environmental Engineering. With a Bachelor of Arts in communication from UNC Chapel Hill, Smith began her career in fundraising working for United Way of Greater Greensboro. In 2012, she transitioned to Guilford College as the director of the Quaker Club. In this role, she was responsible for fundraising for Guilford's 18 athletic teams. Just prior to her new position in CCEE, she served as the senior director of annual giving and was responsible for securing leadership level gifts at Guilford. Smith says she is eager to begin relationship building with the department's friends and alumni, which number in the thousands. "I'm reading a book that Dean

Martin-Vega loaned me called 'A Century of Innovation - Twenty Engineering Achievements That Transformed Our Lives' and I'm fascinated by the role of civil engineers in society's infrastructure. I can't wait to connect with our alums and share information about the current research, instruction and student programming taking place in the department," Smith relayed. She will be working closely with Lora Bremer, who is transitioning from CCEE to serve as the executive director of major gifts and campaign planning for the College of Engineering. ▪



Master's student Elizabeth Williams (BSCE 2014) (on the right) discusses her co-authored paper on route travel times at a TRB poster session.

NC State prominent at Transportation Research Board Annual Meeting

The Transportation Research Board (TRB), a division of the National Research Council (NRC), holds the major annual meeting for transportation-related research. The 95th TRB Annual Meeting was held on January 10-14, 2016. For many years, the TRB annual meeting has been the cornerstone activity of the student chapter of the Institute of Transportation Engineers (ITE). This year, 36 student members made the trip and many were involved in oral and poster presentations. Examples include Eisenhower Fellow **Andy Wagner**'s presentation on "Applications of Bluetooth Probe Data for Freeway Systems," and CCEE Senior **Caroline Bojarski**'s presentation of her invited paper on "Positive Train Control: A Progress and Projection Analysis." In total, 31 papers were presented by researchers affiliated with the department. Student researchers were co-authors on many of these papers.

CCEE's string of best paper awards is now at four years and counting. The Work Zone Traffic Control committee's 2016 best paper award went to "Innovative Work Zone Capacity Models from Nationwide Field and Archival Sources," by **Chunho Yeom** (Ph.D. 2015), former post-doctoral research associate **Ali Hajbabaie**, **Bastian J. Schroeder** (BSCE 2004, MSCE 2005, and Ph.D. 2008), master's student **Chris Vaughan** (BSCE 2007), **Xingyu Xuan** (MSCE 2014), and **Nagui M. Rouphail**. The findings in this paper enable transportation system managers to provide improved mobility through better understanding and prediction of the impact of work zones on freeway speeds and throughput. Another CCEE paper, by Ph.D. student **Tanzila Khan** and **H. Christopher Frey**, was recognized by the TRB Transportation and Air Quality committee as its "spotlight paper" based on having the top reviews out of 110 papers submitted to the committee (See page 4 for more details).

Approximately one third of the papers presented by department affiliates were identified by TRB as "practice-ready." The contributions of these papers span topics ranging from improved accuracy of vehicle fuel-use and emission models to an asset management framework for critical earth retaining walls. Two key areas of CCEE contributions, represented by several papers each, were: (1) asphalt testing, maintenance and repair; and (2) strategies for the safe and efficient design and operation of a newer type of unconventional interchange.

CCEE and ITRE hosted a reception for alumni, friends, and supporters. The reception provided an opportunity for faculty and students to say "thank you" to alumni, friends, and supporters of the department's integrated education and research mission. The reception would not have been possible without the generous help of our sponsors, including: Platinum level sponsor **Kittelson & Associates**, Inc.; Gold level sponsors **AECOM**, **Kimley-Horn**, **McKim & Creed**, **Q-Free Open Roads**, **Ramey Kemp & Associates**, and **Transpo Group**; Silver level sponsors **DigiWest**, **Forum 8**, **HNTB**, **HW Lochner**, **IEM**, **Mulkey Engineers & Consultants**, **Troxler Electronic Labs**, and **WSP Parsons Brinkerhoff**; and Bronze level sponsors **Assets Management Associates**, **ETC Institute**, **Metropia**, and **UNC Charlotte**.

Personal costs to the students were kept low through the generous support of: **Southeastern Transportation Research**, **Innovation**, **Development and Education Center (STRIDE)**; **University of Maryland National Transportation Center**; **NC State Student Government**; **CCEE**; **Institute for Transportation Research and Education (ITRE)**; and the chapter's fundraising activities. ▪

The new I-35W bridge spanning the Mississippi River in Minneapolis, just days before its dedication in December of 2008.

2015 Zia Lecture highlights I-35W bridge replacement

The 14th Annual Paul Zia Distinguished Lecture was given on Monday, September 21, 2015 at the McKimmon Center on the North Carolina State University Campus. This year's focus was Structural Failures and featured the I-35W Bridge Collapse and Replacement in Minneapolis, Minn.

More than 500 people attended to listen to three dynamic speakers who each contributed to what many considered to be the best Zia Lecture ever in this prominent series. Dr. **Henry Petroski**, Aleksandar S. Vesic Professor of Civil Engineering at Duke University, kicked off the presentations with a synopsis of the history of structural engineering and failures. Dr. Petroski highlighted the evolution of design for bridges and how, with each iteration in design, the industry learns something new, especially from failures. **John McGormley**, principal of Wiss Janney Elstner Associates, provided an overview of the investigation of the collapse of the I-35W Bridge. He discussed the investigation process and explained in detail the reasons for the collapse.

Closing out the presentations, Ms. **Linda Figg**, president and CEO of Figg Engineering, gave a wonderful and upbeat presentation on the replacement of the I-35W bridge. Ms. Figg's presentation highlighted the design and construction of a new structure under very tight timeframes and how the team embraced the opportunity to bring the community into the process. The design and construction team, led by Figg Engineering and FlatIron Construction, found innovative ways to incorporate community input into the design of the bridge substructure units, lighting, and art components. By using innovative structural techniques, the bridge was completed in record time and the interstate was back serving the driving public less than 14 months after the collapse.

This annual lecture honors Professor Emeritus Dr. **Paul Zia**, former CCEE professor and department head, and a structural engineer who is eminent in research, professional society leadership and practice.

To continue Dr. Zia's legacy, the Zia Lecture provides funding for the Paul Zia Student Education Endowment. Anyone interested in contributing to the Paul Zia Student Education Foundation, can do so by contacting Lindsay Smith at **lksmith4@ncsu.edu**. ▪

Paul Zia, center, listens to speakers.

Linda Figg of Figg Engineering speaks on the replacement of the I-35W bridge.

The eight lane steel truss arch I-35W Mississippi River Bridge collapsed during evening rush hour on August 1, 2007. Thirteen people were killed and 145 people were injured. A replacement bridge was built on an accelerated schedule at the same location, and was completed three months ahead of schedule.

Rescuers search for victims in the Mississippi River after the crash. Photo by Eric Brandt

The National Transportation Safety Board determined that the probable cause of the collapse was inadequate load capacity due to a design error.
Photo by Tony Webster

Several vehicles were left stranded on the collapsed bridge while others fell into the Mississippi River. Photo by Tom Ruen

Rear Admiral Doug Morton talks with a student after the panel discussion.

Engineering and leadership: a clear view from the top

*On November 9, 2015 at a leadership seminar moderated by **Jim Rispoli**, Professor of the Practice in CCEE, more than a hundred students and faculty had a chance to submit questions and hear insights from Mr. **James Dalton** (MSCE 1992) and Rear Admiral **Doug Morton** (BSCE 1983). Both alumni are native sons of North Carolina who have risen to positions of prominence and spent decades working around the globe.*

Rear Admiral **Doug Morton**'s father gave him some of the best, and some of the worst, guidance he ever received. Morton could go to college anywhere he wanted, but only an education at NC State would be paid for. Morton was happy to oblige. He'd grown up attending sporting events and other activities on campus because his father was an alumnus. But two of his father's directives after that proved erroneous. When Morton started dating during his sophomore year, his father alleged, "You're an average student at best, and this will be the end of you." Morton and "the girl" have been married more than three decades. Likewise, when Doug Morton decided to become a dormitory resident advisor, his father again predicted "That will be the end of your academics." Not so, says Morton. In fact, he attributes his success in the Navy in part to the leadership skills he learned being an RA at Becton Hall. "You have to be adaptable. Think on your feet. Not get too excited. Nobody wants the leader to have their hair on fire. Especially the Admiral."

> "You have to be adaptable. Think on your feet. Not get too excited. Nobody wants the leader to have their hair on fire."

Doug Morton is one of only five "flag" officers among 1,500 officers in the U.S. Navy Civil Engineer Corps, a testament to his strong leadership skills. Another strong leader is Mr. **James Dalton**, who is now part of the Senior Executive Service, U.S. Army Corps of Engineers. Dalton is in the top 1 percent of all government employees, receiving the same protocol as a General when he travels.

Dalton came to NC State pursuing a master's degree in 1992. He came seeking knowledge in pavement design and soils because he'd had what he termed "some embarrassing failures" at his most recent assignment in Saudi Arabia, where he was in charge of designing and building a city in the desert. From drilling wells, designing and constructing water and sewage

"Pay attention to the ways you can become a leader. Step up when others won't or don't. Try to have a diversity of experiences."

plants, housing and schools – everything had to be built from the ground, or the sand, up. When C-130 planes began sinking on a paved airstrip, he needed to understand why.

Dalton says that leadership did not come naturally for him. His advice: "Pay attention to the ways you can become a leader. Step up when others won't or don't. Try to have a diversity of experiences." He went on to caution against pursuing a job just because of the potential for rising to higher levels more quickly. "If you don't develop your expertise, you don't have anything to rely on," he relayed. He followed with, "My word of caution is not to try to rise too quickly, but find something you can be very good at."

"If you don't develop your expertise, you don't have anything to rely on. Find something you can be very good at."

A student asked, "How do you start an engineering career in the Corps?" Dalton replied, "There are so many opportunities within the Army Corps of Engineers for an engineer to get started, especially if you like what I call 'horizontal engineering,' which is hydraulics or hydrology, or working on levees or dams. We've got a huge portfolio of infrastructure that needs engineering attention."

"Environmental engineering is a part of everything we do. It's not just a bumper sticker, or an add-on."

In response to an inquiry about the prospects for environmental engineers, Dalton emphasized that there are numerous opportunities for all types of engineers, citing 19 subgroups of practice that are within his responsibility including civil, environmental, and mechanical engineers as well as coastal and electrical engineers and architects. He mentioned there are positions for regulators in charge of protecting wetlands and wildlife species. "Environmental engineering is a part of everything we do. It's not just a bumper sticker, or an add-on." ▪

The full panel discussion and Q&A is available at **go.ncsu.edu/ccee_seminar_151109**

Dr. Morton Barlaz, right, introduces the panel for the leadership seminar. From left to right are Jim Rispoli, Rear Admiral Doug Morton, and Mr. James Dalton.

AWARDS &

CCEE faculty and students have received university, national and international awards and honors and other forms of recognition in recent months.

Dr. David Johnston

Dr. **DAVID JOHNSTON** was elected to the prestigious **National Academy of Construction (NAC)**. Members are selected based on the significance of their contributions to the engineering and construction industry, recognition as an industry leader by peers, and demonstration of outstanding personal integrity and concern for the health of the entire industry. Dr. Johnston was inducted on October 23, 2015 at the NAC Annual Meeting in Charleston, SC.

Dr. Paul Zia

Drs. **SAMI RIZKALLA**, **PAUL ZIA**, and **GREGORY LUCIER** were awarded the **American Concrete Institute (ACI) Charles S. Whitney Award**. **Gary Klein** of Wiss, Janney, Elstner Associates, Inc. shares this award with the NC State researchers. They were recognized for "significant advances in design of precast structures, especially precast members used in parking structures," and will receive the award at the ACI Spring 2016 Concrete Convention and Exposition in Milwaukee, Wis.

Dr. Gregory Lucier

Dr. Sami Rizkalla

Dr. Brina Montoya

Dr. **BRINA MONTOYA** received the **American Society of Civil Engineers (ASCE) Casagrande Award**. The award provides professional development opportunities for outstanding young practitioners, researchers, and teachers of geotechnical engineering. Dr. Montoya was selected for her "innovative research in the application of biologically induced carbonate precipitation to address geotechnical problems of critical importance." She received the award in February 2016 during the Geotechnical and Structural Engineering Congress in Phoenix, Ariz.

Dr. Morton Barlaz

Dr. **MORTON BARLAZ**, CCEE department head and professor of environmental engineering, has been named a **Distinguished University Professor** by Dr. Louis Martin-Vega, Dean of the College of Engineering. A candidate for the title "must be an outstanding faculty member … who has achieved recognition well above the criteria for full professor and be considered one of the best scholars in the discipline," according to the university's policies.

& HONORS

Dr. Richard Kim

Dr. **RICHARD KIM** was elected as a **Fellow of the Korean Academy of Science and Technology (KAST)**. KAST is the nation's highest integrated think-tank for science and technology, analogous to the National Academy of Science in the U.S. Kim received the award in January 2016 in Korea.

Dr. Chris Frey

Dr. **H. CHRISTOPHER FREY** was appointed to the **Particulate Matter Review Panel** of the **Clean Air Scientific Advisory Committee (CASAC)** of the **U.S. Environmental Protection Agency**. The panel will advise the EPA Administrator on whether a revised particulate matter National Ambient Air Quality Standard (NAAQS) is needed to protect public health. Frey was also elected to the **Board of Directors** of the **Air & Waste Management Association**.

Four CCEE Ph.D. students received poster awards at the joint **North Carolina American Water Works Association and Water Environment Federation 95th Annual Conference** in Raleigh, NC in November 2015. **JONATHAN MORENO-BARBOSA** (advised by Dr. **DETLEF KNAPPE**) won first place for his poster titled "Implications of Potential New Regulatory Scenarios for the Removal of Carcinogenic Volatile Organic Compounds by Granular Activated Carbon"; **CATALINA LOPEZ-VELANDIA** (advised by Dr. **DETLEF KNAPPE**) won second place for her poster titled "1,4-dioxane: Occurrence, Sources and Treatment Options for an Emerging Surface Water Contaminant"; and **AMANDA KARAM** and **CATHERINE MCMILLAN** (advised by Drs. **FRANCIS DE LOS REYES**, **JOEL DUCOSTE**, **JIM LEVIS**, and **RANJI RANJITHAN**) won third place for their poster titled "Photochemical Micro-sensors for Evaluating Light Distributions within Photosynthetic Bioreactors for Biofuel Production."

Maryam Delavarrafiee

Ph.D. student **MARYAM DELAVARRAFIEE** (advised by Dr. **H. CHRISTOPHER FREY**) received a **Student Merit Award** from the **Exposure Assessment Specialty Group** of the **Society for Risk Analysis**. The award is based on her research paper, "Empirical Comparison of Fine Particulate Matter Exposure Concentrations in North Carolina State University Campus Buses and a Personal Passenger Car." Ms. Delavarrafiee presented her research at the SRA Annual Meeting during December 7-9, 2015 in Arlington, Va., where she received the award.

Ph.D. student **DIEGO AGUIRRE REALPE** was the first runner-up in the **2015 Deep Foundations Institute (DFI) Educational Trust Student Paper Competition** for his paper titled "Soil–Structure Interaction of Reinforced Concrete–Filled Steel Tubes." Aguirre Realpe, who is advised by Dr. **MERVYN KOWALSKY**, received the award at DFI's 40th Annual Conference in Oakland, Calif. in October 2015.

Ph.D. student **REZA RASHETNIA** received a graduate fellowship from the **American Society for Nondestructive Testing (ASNT)** in recognition of his research on Large-Area

AWARDS & HONORS

Reza Rashetnia (left), Terry Clausing (ASNT president; right)

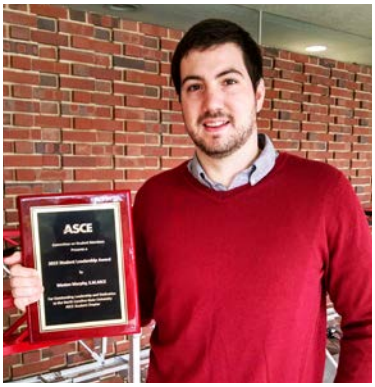
Electrical Resistance Tomography Based Sensing Skin for Reinforced Concrete Structures. Rashetnia, who is advised by Dr. **MOHAMMAD POUR-GHAZ**, received the award at the October 2015 Annual ASNT Conference in Salt Lake City, Utah.

Three CCEE Ph.D. students received awards during the department's Fall 2015 Graduate Awards Ceremony. **HARITHA MALLADI**, advised by Dr. **AKHTAR TAYEBALI**, received the **Freese and Nichols Graduate Fellowship**. **SHAMS TANVIR**, advised by Drs. **NAGUI ROUPHAIL** and **CHRIS FREY**, received the **Bruce Edward Matthews Graduate Fellowship**. **DIEGO AGUIRRE REALPE**, advised by Dr. **MERVYN KOWALSKY**, received the **Concrete Reinforcing Steel Initiative (CRSI) Graduate Student Award**.

Haritha Malladi (left), Dr. Akhtar Tayebali (right)

Dr. Billy Williams (left), Shams Tanvir (right)

Four CCEE undergraduates were awarded scholarships from **The Southeastern Association of State Highway and Transportation Officials (SASHTO)** in Fall 2015 based on their outstanding academic performance. The winners were civil engineering students **KATELYN MUELLER**, **THOMAS MORAN**, and **NICK JONES** and environmental engineering student **JING WU**.



Weston Murphy

WESTON MURPHY, a senior undergraduate student in civil engineering, received the **2015 ASCE Student Leadership Award** in recognition of his work as captain of the steel bridge team. Through his efforts, the NC State Bridge Team was one of only three at the 2015 Carolinas Conference that completed all of the qualifications and successfully supported the full loading. ▪

Engineering students take top honors in Three Minute Thesis Competition

On October 28th, at the 3 Minute Thesis Competition, 10 finalists passionately and concisely communicated their research projects. From an original field of 28, three of the final 10 were Ph.D. students from the Department of Civil, Construction, and Environmental Engineering, including **Johnsie Lang**, **Haritha Malladi**, and **Rahnuma Sharin**.

JOHNSIE LANG, Ph.D.
Civil Engineering Dissertation:
"Leaching of Poly- and Perfluoroalkyl Substances (PFASs) from Landfills."
Research advisor:
Dr. **Morton Barlaz**

HARITHA MALLADI, Ph.D.
Civil Engineering Dissertation:
"Reduce and Recycle: How to Turn Our Black Roads Green."
Research advisor:
Dr. **Akhtarhusein Tayebali**

RAHNUMA SHAHRIN, Ph.D.
Civil Engineering Dissertation:
"Measuring Microscale Strength of Cement: Why? How?"
Research advisor:
Dr. **Chris Bobko**

Malladi was the overall winner of the competition. Her research involves recycling old asphalt by incorporating it into new asphalt for road construction. This technology diverts tons of old road asphalt waste from landfills. Malladi graduated in December and is visiting a number of other universities to learn about their research programs. She plans to log hundreds of miles around the country visiting various universities "to see what other researchers are up to." Malladi is passionate about the importance of science communication, a skill she honed while participating in Preparing Future Leaders (PFL), a leadership program offered through The Graduate School. It's a skill that will serve her well since she's interested in teaching at the college level, as well as continuing her research.

In February, Malladi will compete at the next level of the Three Minute Thesis Competition, which will be held on the campus of UNC Charlotte. Competitors will come from schools throughout the Southeast. ▪

Haritha Malladi is measuring the dimensions of cored asphalt concrete specimens for a dynamic modulus test. She says she loves the hands-on aspect of her research.

Three Minute Thesis (3MT) Explained

The 3MT competition originated at the University of Queensland, Australia in 2008 and is held now at almost 200 universities in 17 countries. The exercise creates an atmosphere where very complicated research topics must be quickly explained in language that everyone can understand. A good presentation leaves the audience wanting to know more.

In a world where the value of communicating effectively about science and engineering is increasingly recognized, this competition plays an important role.

You can watch short videos of the 10 finalists at:
www.youtube.com/user/NCSUGraduateSchool/videos

STUDENT NEWS

NC State AGC took first place in the Open Concrete Division of the Associated Schools of Construction Competition.

The **AIR & WASTE MANAGEMENT ASSOCIATION** (A&WMA) student chapter held a career panel in October with speakers from government, industry, and consulting. Discussions between the panel and the attending students touched on a broad array of career advice. For example, when choosing a career path, students should consider factors such as type of work (e.g., research, consulting, regulatory), resources to support one's work (e.g., quality of equipment), work-life balance in terms of work hours and vacation time, level of responsibility, opportunities for advancement, and ability to publish and share at conferences or in journals. Panelist Dr. **Wan Jiao** (Ph.D. 2013) of ICF International advised international students to know visa rules and procedures and to put extra work into overcoming language and communication barriers, such as practicing for interviews. Panelist **Corey Mocka** of the NC Department of Environmental Quality advised students that networking is essential to landing the right job and is more effective than simply submitting online job applications.

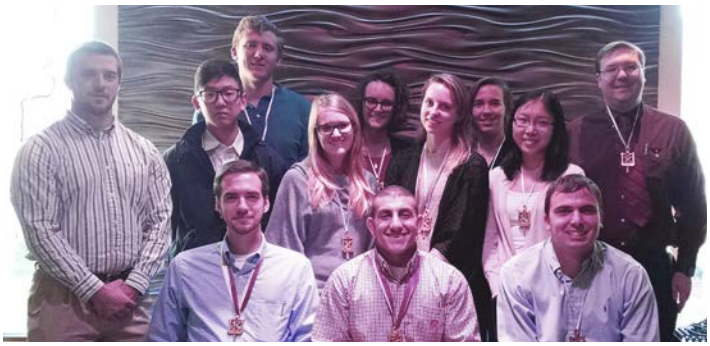
The **AMERICAN CONCRETE INSTITUTE** (ACI) held ACI certification programs and attended international conventions in Kansas City, Mo. and Denver, Colo. The chapter was recognized in ACI's *Concrete International Magazine* (October 2015) as an example of how student chapters add value to local ACI chapters, especially by sharing knowledge and resources with a growing number of student members.

The **AMERICAN SOCIETY OF CIVIL ENGINEERS** (ASCE) student chapter is preparing for the steel bridge and concrete canoe competitions to be held at the Carolinas Conference at NC A&T in Greensboro at the end of March. The chapter participated in a Shack-a-thon held on the Brickyard to raise money and awareness for Habitat for Humanity. The chapter seminar series recently featured presentations by **David Markwood** and **Ben Pope** of AECOM regarding the role of GIS in support of water resources engineering as it relates to floodplain modeling and mapping.

NC State-ACI Team at the ACI Convention, Denver, Colo., Nov 11, 2015.

The **ASSOCIATED GENERAL CONTRACTORS** student chapter finished first in the Open Concrete division construction competition at the Associated Schools of Construction meeting held in Greensboro on October 28-30, 2015. The competing six person team provided an estimate and schedule for a three million gallon water treatment clarifier in only 12 hours. During the competition, they were bombarded with change orders. Their work culminated in a complete proposal for the project. This was NC State's first 1st place finish in the competition.

CHI EPSILON helped with the Engineering Open House and inducted new members.



Chi Epsilon hosted a lunch to welcome new members. Seated in the front row are: Jeb Smith, Andy Takla and Thomas Dewolfe. Standing from left to right are: Scott Sallade, Giju Lee, Jacob Hudson, Lydia Seabrook, Meredith Bullard, Katelyn Mueller, Caitlin West, Michelle Lin, and Andy Wagner.

The **CIVIL ENGINEERING GRADUATE STUDENT ASSOCIATION** (CEGSA) organized an ice cream social to promote interaction among graduate students working in different sub-disciplines within the department. The group helped develop a lesson plan for middle school students, in collaboration with middle school teachers, at the 2nd annual Scientific Research and Education Network (SciREN) Triangle event held in September at a local museum. The lesson was about material properties, including an experiment and materials needed for the experiment. CEGSA member **Abhilash Kusam** spoke with students in the Science Explorers Club at Dillard Drive Middle School regarding civil engineering. **Mary Rawls** shared information about science and engineering with female middle school students at East Cary Middle School.

Ph.D. students Srikanth Ramoju, Abhilash Kusam and Haritha Malladi, left to right, at the 2nd Annual SciREN Triangle Lesson Plan Workshop.

The **EARTHQUAKE ENGINEERING RESEARCH INSTITUTE** (EERI) hosted Professor **Robert Olshansky** of the University of Illinois, who spoke on "Cities, Earthquakes, and Time." Dr. Olshansky was EERI's 2015 Distinguished Lecturer.

In early October, the NC State Chapter of **ENGINEERS WITHOUT BORDERS** organized and hosted the 2015 EWB Southeast Regional Conference. The conference drew nearly 100 attendees, including representatives from the national organization (EWB-USA) and members from student and professional chapters across the country. Attendees shared experiences on topics ranging from chapter best practices to innovative water and energy solutions for developing countries. Dr. **Francis de los Reyes** gave a welcoming keynote address regarding his research on water and sanitation in developing settings and associated challenges and opportunities. The conference included a tour of NC State's Hunt Library: Many visitors remarked on how impressed they were by NC State's facilities and academic and research programs.

The **INSTITUTE FOR TRANSPORTATION ENGINEERS** (ITE) student chapter, in cooperation with the **American Society of Highway Engineers** (ASHE) and the **American Railway Engineering and Maintenance-of-Way Association** (AREMA) student groups, participated in the inaugural meeting of the Intelligent Transportation Society of the Carolinas, toured the intermodal freight facility at Charlotte-Douglas International Airport, and attended the annual AREMA conference in Minneapolis, Minn. Students attended the annual ITE meeting, where the chapter received the Paul Cribbins Cup as the outstanding student chapter in the state. Furthermore, the chapter won the Traffic Bowl competition.

A group of students from the ITE/ASHE/AREMA chapter visit and tour the intermodal freight facility at Charlotte-Douglas International Airport.

NC SAFEWATER chapter members served as judges at the annual Water Tower Competition for local elementary and middle school students. Chapter members helped the students to build small water towers after school and taught them about drinking water treatment, storage, and distribution.

PROFESSIONAL ENGINEERS OF NORTH CAROLINA hosted elementary students from Odyssey of the Mind to teach them what civil engineers do.

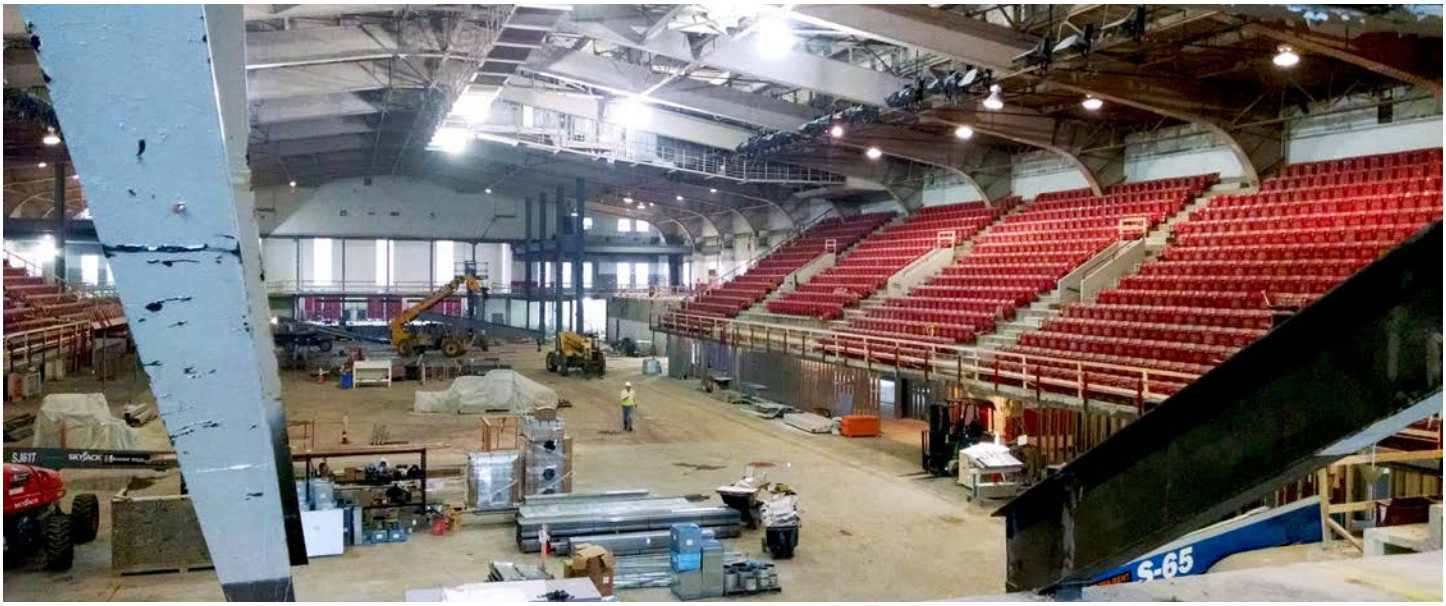
Other department-affiliated student chapters are also very active, including **GEO-INSTITUTE GRADUATE STUDENT ORGANIZATION**, **NATIONAL ASSOCIATION OF HOME BUILDERS**, and **TAU BETA PI**. ▪

The "block S" that was on the Reynolds Coliseum basketball court from 1975 to 1991.

Renovation of historic Reynolds Coliseum serves as classroom for structural engineering students

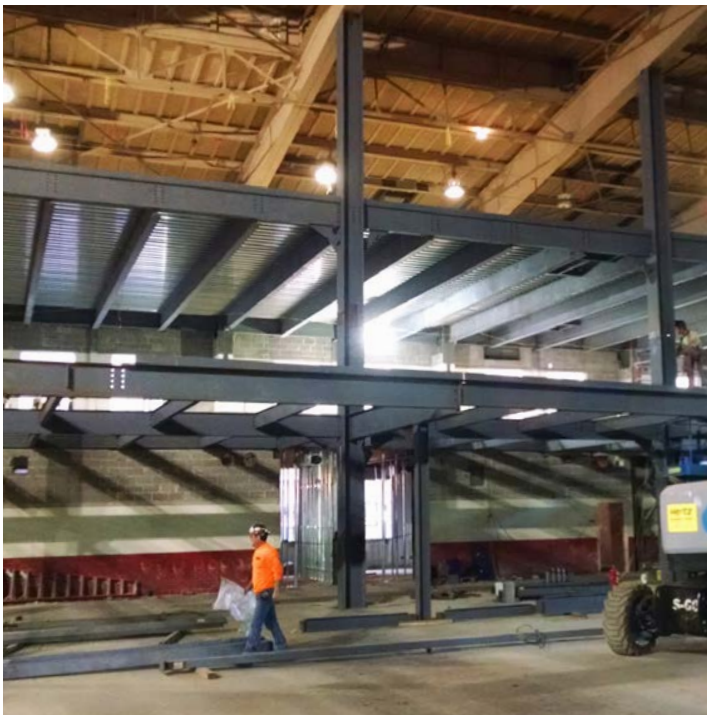
Students in CE 420, Senior Structural Engineering Project, and in CE 426, Steel Design, each had the opportunity to see engineering in action at NC State's historic Reynolds Coliseum, only a short walk from Mann Hall. Reynolds Coliseum is perhaps most famous for being the venue of the 1983 National Championship run of Jim Valvano's "Cardiac Pack" men's basketball team, and was often featured in nationally televised games as one of the loudest and toughest home courts in college basketball. Reynolds has hosted many events, including speeches by sitting U.S. Presidents Lyndon Johnson, Ronald Reagan, George H.W. Bush and Barack Obama. The Coliseum is undergoing a $35 million major renovation, the first since it opened in 1949. The renovated Coliseum will be a multi-use facility that will be home to Wolfpack wrestling, volleyball, and women's basketball.

CE 426 students visit Reynolds Coliseum to view renovations.

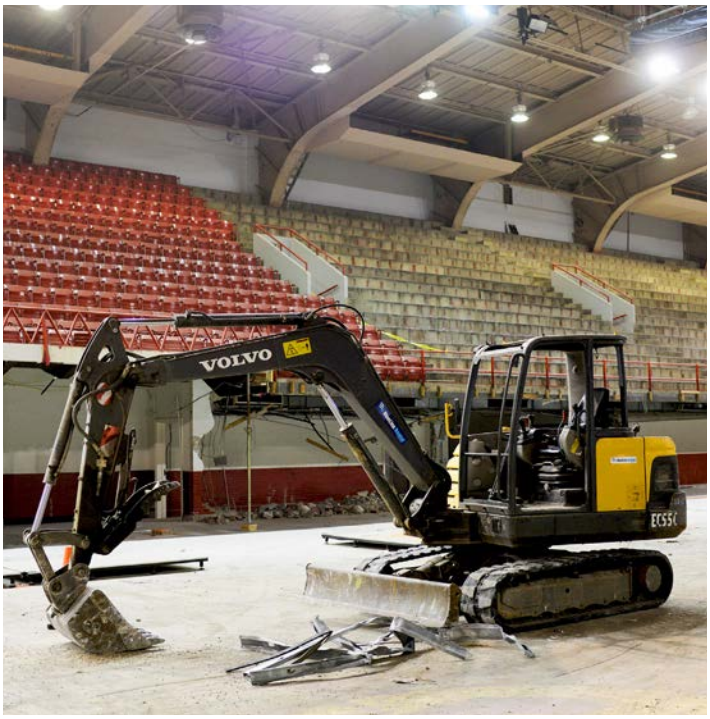


Reynolds under renovation with the removal of the south seats and the north entry visible in the background due to the removal of the lobby wall.

A key goal of the work is to preserve the exterior while making major changes to the interior. On November 3, 2015, the CE 420 students learned from **Jim Estep**, project manager for DANIS Construction, of the challenges in renovating such a large facility, including the detailed phasing, shoring, and sequencing to protect the existing structure while new steel work is installed. **Michael Forsyth**, engineering intern for LHC Structural Engineers, explained how extensive research and investigation was needed, including poring over old photographs to understand the existing structure before trying to make changes. The field trip for CE 426 students focused on the large scale of steel components and examples of both bolted and welded steel connections. According to instructor **Steve Welton**, the value of these field trips is that students get to "see examples of the concepts discussed in class as they relate to real problems and issues that have to be addressed and solved as a part of structural engineering." ▪



View of the added steel framing being installed in Reynolds Coliseum.



Example of equipment used during the renovation.

After his graduation address, CCEE alumnus Sam McCachern congratulates Patrick Lee Kieran, BSCE.

The laws of supply and demand are on your side: Graduation speaker and alumnus delivers encouragement and advice

When **Sam McCachern** PE (BSCE 1985) graduated 30 years ago, the economy was just beginning to rebound after two grim recessions in the early 80s. He took a job with Thomas and Hutton in Savannah, Georgia. He thought he'd work there a few years then make his way back home to North Carolina. Three decades later, he is president and chief executive officer at T&H. At the CCEE graduation ceremony on December 17, 2015, McCachern delivered some hard-won, real-world advice. He opened with a dose of encouragement.

> *"What a great time to graduate with a civil, construction, and environmental engineering degree. The baby-boomers are retiring, the infrastructure is failing and Congress just passed a multi-year transportation-funding bill. Translate that as jobs, need and opportunity. Congratulations – the laws of supply and demand are on your side."*

McCachern urged graduates to seek out the most senior engineers within the firms where they gain employment "because that's who can teach you what you need to know." He pointed out that there are five generations within the workplace and explained that this has significant ramifications for communication styles. Observing that graduates will likely be called on to wear many different hats within their career, McCachern cited engineer, contractor, advisor, banker, lawyer and regulator as the roles that he has filled. Finally, he urged the graduates that "in what sometimes seems like a disposable world we all need to remember the power of perseverance."

He closed with a clear message of the importance of giving back to the university, the profession, and the community. McCachern has been a tireless advocate for all three, and cites community organizations as a place to learn to be a leader. ▪

129 Degrees Awarded Fall 2015

Bachelor's	55
Master's	56
Doctorates	18

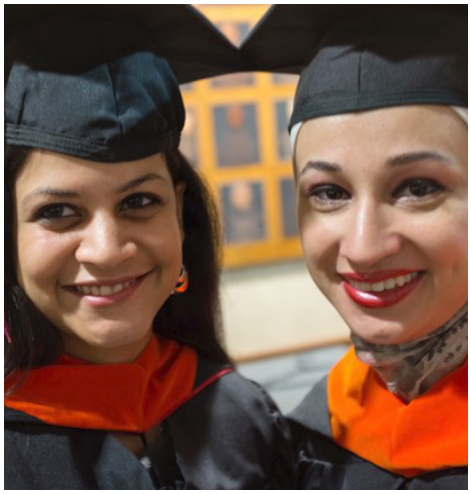
Photography by Julie Williams Dixon

CCEE students put the finishing touches to caps and gowns before the ceremony. Left to right are Goutam Raj Panda and Siddharth Sanjay Khot, both 2015 Master of Civil Engineering graduates.

Katherine Harrison gathers with family and friends.

Kimberly Hanson adjusts her cap before the ceremony.

Mary Fontana, BSENE, celebrates with her father before the ceremony.



Master's graduates Shilpi Singh, left, and Haneen Alqadi, right.

Dr. Morton Barlaz awards diploma to Cedric Butler.

A grandstand view: one alumnus' motivation for giving back

Richard Sloan (BSCE 1958) has what he terms "a grandstand view" from the ridge top where he lives looking east to the Tennessee River. "I got tired of city living, so I retired to the river. I think that's my country background coming out." But he knew this river long before he retired to her banks. His primary job with the Tennessee Valley Authority (TVA) was to inspect its dams and navigation locks. "I chased the dams right on up from the headwaters to where the Tennessee dumps into the Ohio," he recounts. "That is about 650 miles of commercially navigable waters."

It was roads, not rivers, that got him interested in engineering. A native of the North Carolina piedmont, he spent one summer working on the highways outside of Asheville. That got him thinking about building roads and bridges, which sent him in pursuit of a civil engineering degree.

He earned his diploma in 1958 and immediately had two job offers. One would have taken him to Los Angeles, and one would land him in Knoxville in the mountains of East Tennessee. He chose the latter.

> "I don't think I can make anyone understand how important that department was to me. How important the degree was."

Sloan spent his entire career with TVA, retiring in 1988. He has vivid memories of the work. "It was not a job that would suit a claustrophobic person, or appeal to someone who had a fear of heights," Sloan advises and goes on to describe how much of the structural inspecting had to be done in very cramped areas. This might also explain why he and his wife sought open space after they retired.

They also sought meaningful ways to give back, and have generously gifted to the NC State College of Engineering, the NC Zoo, and many other causes that were important to them. A widower since 2005, Sloan said over the past few years he decided to focus his gifts by giving more to fewer places. In addition to a planned gift from his estate, he contributes annually, designating his funds directly to the Department of Civil, Construction, and Environmental Engineering. "I don't think I can make anyone understand how important that department was to me. How important the degree was."

Richard Sloan was born in the depths of the Great Depression, to a rural family with few means. He worked his way through college, saying there were times he had very little to eat. "I got through by the skin of my teeth. I just came from nowhere, with no prospects, and when I earned that diploma, it changed my life. Literally. Forever. I just hope I can make a difference for somebody else." ▪

> "I just hope I can make a difference for somebody else." - Richard Sloan, BSCE 1958

Richard Sloan stands in his backyard, with his "grandstand view" over his shoulders.

Firm of the Month: view from a participating firm

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 educating our students about current engineering practice. This program provides participating firms with name recognition for recruiting and business opportunities, demonstrates to students the ways that they can use their degrees after graduation and provides information on employment opportunities.

McAdams is honored to be included in the "Firm of the Month" program by the Department of Civil, Construction, and Environmental Engineering. Proud supporters of Wolfpack nation, McAdams is led by President & CEO **Mike Munn**, PE (BSCE-Construction Option, 1995). An alumnus of the NC State engineering program, Mike is a testament to the quality of education that the CCEE department provides. "As a student at NC State, and having ties to the area, I looked for local opportunities where I could grow my career after graduation. Landing at McAdams was a blessing in so many ways. Being a locally founded firm, I value our established roots in this area and I see first-hand, year after year, the amazing students that come out of the NC State program." Munn goes on to say, "The outstanding pipeline of talent from NC State benefits our growing firm, and we look forward to continuing our partnership." For more than 35 years, McAdams has been the trusted partner for those in the business of creating new land development projects – in both the public and private sector. Known in the region for excellence in client service, timely project completion and unsurpassed design expertise, we are proud that a vast majority of our staff - surveyors, engineers, landscape architects and designers - once walked the same campus as all of you.

Corporate partners invited to join Firm of the Month program

For our corporate partners, please consider becoming a Firm of the Month. To become a Firm of the Month, a company financially supports the department. Many firms also recruit our students for internships, co-ops or future employment and partner with faculty on research projects.

As part of the Firm of the Month program, the director of development arranges for display space in Mann Hall. Each month, hallways on classroom floors, walls in the main lobby and display cases in the lobby are used to showcase the current firm. Information about the firm will be included as a continuously running loop on a monitor in the lobby and the firm will have the opportunity to host information sessions for student groups. The firm supplies approximately 25 color posters of different worksites and projects. The firm can also supply banners, blueprints, models or any display items to be put in cases.

For more information about the Firm of the Month program, please contact:
Ms. Lindsay Smith, Director of Development
919-515-7738 | lksmith4@ncsu.edu.

ALUMNI NEWS

Dr. Ali Abbasian-Hosseini

ALI ABBASIAN-HOSSEINI (Ph.D. 2015) joined PCL Construction in November 2015 as a bridge construction field engineer. He currently works on the Bonner Bridge Replacement Project on the North Carolina Outer Banks, which is the largest new project funded by the NC Department of Transportation in 2015.

SHAFIQUL BARI (Ph.D. 2001) received his MBA in 2009 from the University of Michigan. Currently, he is the manager of revenue operations at Consumers Energy in Jackson, Michigan. Recently, he led an initiative to reform the Energy Assistance system in Michigan for low-income families. He also leads his company's cross-functional team to improve overall customer experience with their call centers, phone system, and digital interfaces.

TIMOTHY C. BECKER (Ph.D. 2012) leads curriculum and faculty development as director of learning at Kiewit University, the corporate university for Kiewit Corporation of Omaha, Nebraska. Tim serves the community as a member of several non-profit boards.

SUZANNE BECKSTOFFER (BSCE 1982) has recently been appointed to a three-year term on the Industry Advisory Council for ABET, the accrediting agency for academic programs in applied science, computing, engineering and engineering technology around the world. Suzanne is the director of engineering for Newport News Shipbuilding in Newport News, Va.

Dr. Hyung-Wook Choi

HYUNG-WOOK CHOI (Ph.D. 2009) joined the Greenhouse Gas Inventory and Research Center of Korea in Seoul, Korea in 2010 as a senior researcher. He has conducted research to develop the Measurement, Reporting and Verification System for the Greenhouse Gas (GHG) inventory used in the Korea Emission Trade Scheme and National GHG inventory. He participated in the preparation of Korea's 3rd National Communication in 2011 and the 1st Biennial Update Report in 2014 under the United Nations Framework Convention on Climate Change.

Dr. Michael Creed (second from left) receives the 2015 NC State Distinguished Engineering Alumnus Award. Other award winners include, left to right, Raymond T. Odierno, Elin E. Gabriel and Jeffrey E. Williams. Standing beside Dr. Creed is Dr. Louis Martin-Vega, NC State dean of engineering.

MICHAEL W. CREED, Ph.D., PE (BSCE '73, MSCE '84), chairman of the board and co-founder of McKim & Creed, Inc., was named as one of four 2015 Distinguished Engineering alumni by the College of Engineering. Dr. Louis Martin-Vega, NC State dean of engineering, noted Dr. Creed's vital financial support for CCEE. Dr. Creed served as an original member and subsequent chair of the CCEE advisory board, chaired the department's Zia Distinguished Lecture Series for three years, served as a guest lecturer in CCEE and volunteers with student organizations.

SERENA HENDRIX GILLES (BSCE 2006, MSCE 2008) worked in the industrial sector for seven years, completing design and analysis projects for power plants, aluminum smelters, and paper mills. Serena received her PE license before making the transition to the commercial and retail sectors, and currently works as a senior structural engineer for Nishkian Dean in Portland, Ore.

JON HOLTVEDT, EIT (BSCE 2015) served as project engineer for Balfour Beatty Construction on the Green Level High School project in Cary, NC. He is currently pursuing a master's in construction engineering at NC State.

Ben Lord

BEN LORD (BS ENE, 2013) received his MS in civil engineering, with a focus in water resources, in 2015 from the University of California at Davis. At UC Davis, he developed an optimization model to aid the California

State Government in administering water rights law during the current drought. Ben has returned to the Triangle and accepted a position as an environmental engineer at RTI International.

LUIS A. MATA, Ph.D., PE, LEED AP (MS 2005; Ph.D., 2008) recently joined The University of Toledo (UT), Ohio, as an assistant professor in construction engineering technology. Previously, he was assistant professor in civil engineering at Lawrence Technological University in Michigan, where he directed research studies on pervious concrete pavement systems and cost control in the modification and maintenance of nuclear power plants.

LAUREN MCCAULEY, LEED AP (BSCE 2014) is a senior project engineer with Balfour Beatty Construction. She is currently working on the Green Level High School project in Cary, NC. McCauley will begin pursuing her MCE in the spring semester of 2016.

OKTAY URAL (Ph.D. 1964) was the first to receive a Ph.D. in civil engineering with a focus in structures from NC State. He recently received the honor of distinguished professor in civil engineering (professor emeritus) from Florida International University.

AIDCER L. VIDOT (Ph.D. 2008) and **LUIS A. MONTEJO**, PE (Ph.D. 2008) are associate professors at the University of Puerto Rico at Mayaguez. Their research focuses on the monitoring, assessment, and design of civil infrastructure subjected to seismic loads and is supported by the National Science Foundation, the Puerto Rico Strong Motion Program, the US Nuclear Regulatory Commission, and the Department of Homeland Security.

Aidcer Vidot and Luis Montejo

TREY WARREN (BSCE 2011) married Sally Turner of Raleigh on October 10, 2015. They will reside in Charlotte, where Trey works for Warco Construction. ▪

Department Advisory Board

The following distinguished alumni and friends of the department currently serve on the board

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There are many ways in which you can help to advance our mission of research and education as we prepare the next generation of civil, construction, and environmental engineers to build sustainable infrastructure for society. We invite each of you to become a regular supporter.

An annual gift to the CCEE Enhancement Fund makes it possible for us to provide our students with the best possible education and extracurricular experiences. Contributions to the enhancement fund allow us to respond immediately to emerging needs and exciting challenges. Your donations fund recruitment and retention of the best and brightest faculty, all of our student organizations, field trips to complement classroom instruction, graduate student recruiting and assistantships, and opportunities for faculty and students to make presentations at conferences in their fields of study and research.

In addition to annual support, there are a number of events throughout the year for which specific sponsorships are available, including graduate student symposia in which students present posters to describe their master's and Ph.D. research, the Zia Symposium, the welcome back ice cream social, and perhaps most immediate – we need a sponsor for the semi-annual newsletter. If you would like to discuss an annual donation, sponsorship opportunities or other ideas, please contact us. Naming opportunities for our new building on Centennial Campus, Engineering Oval, are also available.

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Whether an annual gift, an endowed gift or a one-time gift, your support will have a significant impact on current as well as future students and faculty in Civil, Construction, and Environmental Engineering.

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