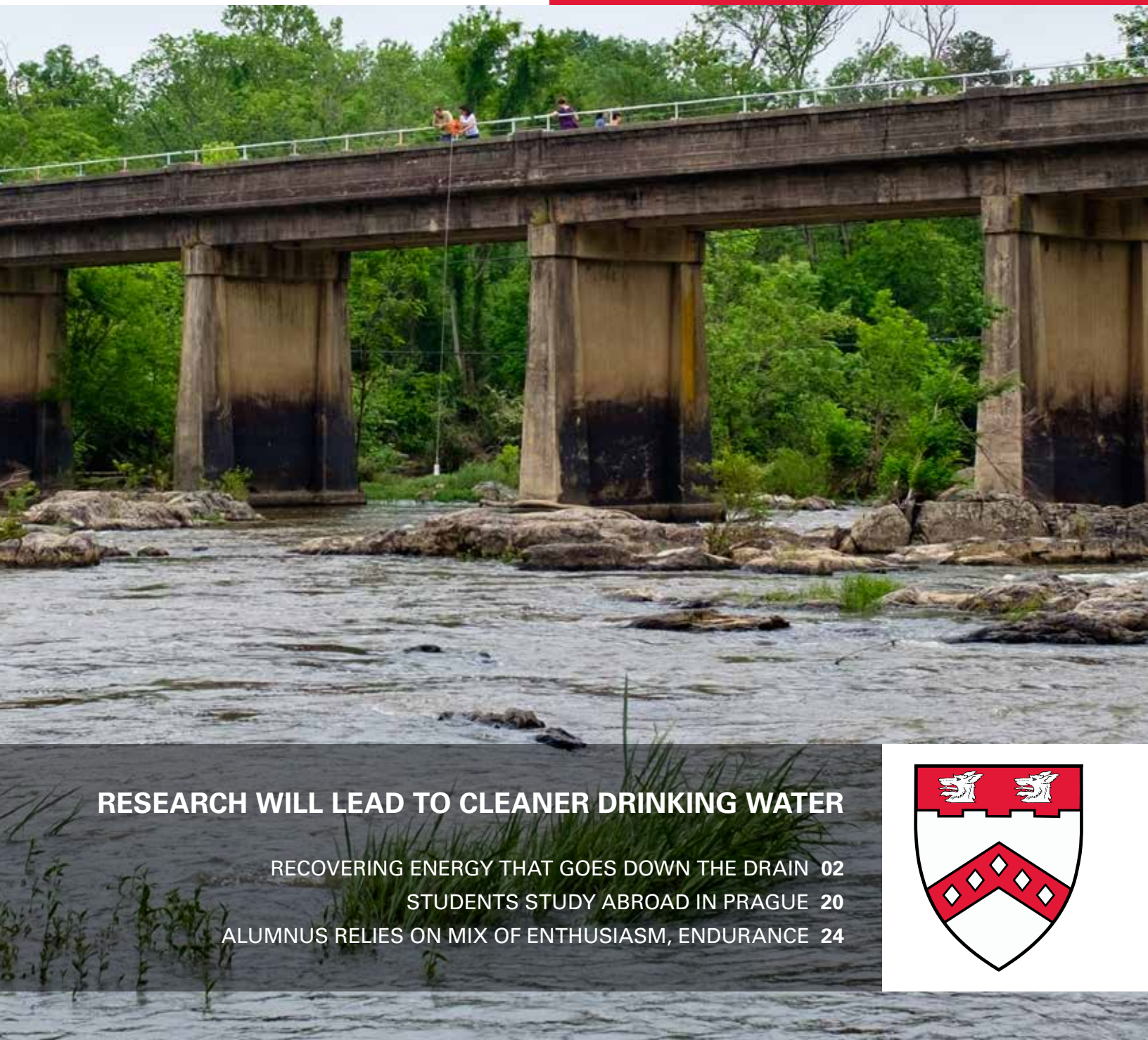


**NC STATE**

Engineering

# CCEE NEWS

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

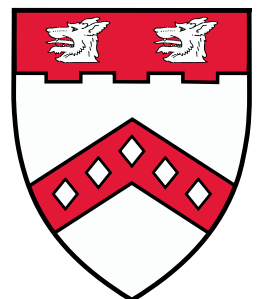


## RESEARCH WILL LEAD TO CLEANER DRINKING WATER

RECOVERING ENERGY THAT GOES DOWN THE DRAIN 02

STUDENTS STUDY ABROAD IN PRAGUE 20

ALUMNUS RELIES ON MIX OF ENTHUSIASM, ENDURANCE 24





# IN THIS ISSUE

**EDITOR** Chris Frey

## CCEE PUBLICITY COMMITTEE

Chris Frey (Chair), Emily Berglund (Student Groups Editor), Doug Call (Awards Editor), Casey Dietrich (News Blog Editor), Julie Williams Dixon (Writer and Contributing Photographer), Andy Grieshop (New Projects Editor), Tasnim Hassan (Research News Editor), Ed Jaselkis (Alumni Briefs Editor), Mervyn Kowalsky (Calendar Editor), Lindsay Smith (Development Editor), and Billy Williams (Features Editor).

## OTHER CONTRIBUTORS TO THIS ISSUE

John Baugh, Ashly Cabas Mijares, Francis de los Reyes, Abhinav Gupta, Kevin Han, Detlef Knappe, Brina Montoya, Mohammad Pour-Ghaz, Ranji Ranjithan, William Rasdorf, and John Stone.

## PRODUCTION STAFF

Jennifer Cox, Brent Lancaster, Candice Wallace, Sha Liao, College of Engineering

*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

**ASSESSING EARTHQUAKE DAMAGE IN ECUADOR: WHEN RESEARCH REALLY HITS HOME**  
PAGE 16

*Ph.D. student Ana Gabriela Haro's research took her home to Ecuador to lend a hand after a natural disaster.*



## DEPARTMENT NEWS PAGE 02

- › **RESEARCH UPDATES** PAGE 02
- › **NEW RESEARCH** PAGE 06
- › **AWARDS AND HONORS** PAGE 13



## STUDENT NEWS PAGE 17

- › **UPDATES FROM STUDENT GROUPS** PAGE 17
- › **RISE STUDENTS MAKE THE MOST OF THEIR SUMMER** PAGE 21
- › **SPRING 2016 GRADUATION** PAGE 22



## ALUMNI AND DEVELOPMENT NEWS PAGE 23

- › **MULKEY RECEIVES WATAUGA MEDAL** PAGE 23
- › **FIRM OF THE MONTH** PAGE 26
- › **ALUMNI NEWS AND UPDATES** PAGE 27

## ABOUT THE COVER

A team led by Dr. Detlef Knappe is assessing the level of 1,4-dioxane in North Carolina's Cape Fear River watershed with testing on the Bynum Bridge over the Haw River.

# LETTER FROM THE DEPARTMENT HEAD MORTON A. BARLAZ



Welcome to the Fall 2016 newsletter. This is an exciting time to update our friends on activity in the department. On March 15, the voters in North Carolina passed a bond referendum that provided partial funding for our department to move to Centennial Campus into a new building named EB-Oval (see page 25). I have been working with the faculty and with Weisiger Distinguished Professor Emeritus Dr. **David**

**Johnston** to define our needs and priorities as we prepare for building design. The Edward P. Fitts Department of Industrial & Systems Engineering and some of the College of Engineering dean's office will also be moving into EB-Oval. The present schedule calls for the department to occupy EB-Oval for the Fall 2020 semester. There are lots of opportunities to name the various classrooms and laboratories in the building.

EB-Oval is an example of society's growing recognition of the importance of building and maintaining civil infrastructure. As all of our readers are aware, civil engineers are often taken for granted and underappreciated until there is an emergency, whether it is unbearable traffic, flooding, drought, aging bridges or water of questionable safety. I enjoy explaining this to new students in the department to give them a sense of the opportunities that lie ahead. Fortunately, the market for our students is very strong – it is a great time to study civil, construction and environmental engineering!

We welcomed 226 new undergraduates into our degree programs in civil, environmental, and construction engineering this year as well as about 100 new graduate students. We started the semester with our traditional welcome back ice cream for all of our students. I used the opportunity to meet with new undergraduates to the department and encouraged them to take advantage of the programs that make NC State a great university, including our student organizations and undergraduate research.

I am pleased to welcome two new faculty to the department, Dr. **Kevin Han** joins us after completing his Ph.D. at the University of Illinois. His expertise is in visual analytics and its application to construction progress and performance monitoring. Dr. **Ashly Cabas** joins us after completing her Ph.D. at Virginia Tech. Her expertise is on the assessment of seismic hazards and the physical effects of ground motion. Ashly, and

her husband, Dr. **Celso Castro**, who is starting a position in Biological and Agricultural Engineering, first came to NC State for our summer practicum when they were undergraduates at the Universidad Católica Andrés Bello in Venezuela.

I am proud of the accomplishments of our student groups. Our **ASCE student chapter** received a Letter of Honorable Mention for its outstanding activities and the steel bridge team competed at the national level in Utah this past June. Our **ACI chapter** was named an Excellent Chapter by the national organization, and our **Engineers Without Borders chapter** completed a water collection project in Bolivia. There is more detail in the Student Chapters section.

This newsletter features research briefs from our faculty, highlighting contributions to civil infrastructure including research on concrete deterioration, roadside assistance programs to keep traffic moving, contaminants in drinking water, energy from a difficult to manage waste, and a personal account of how our research in earthquake engineering has applications at home in Ecuador. These briefs are just a few examples of how civil, construction, and environmental engineers are working to improve public welfare and environmental sustainability.

As you read this newsletter, I hope that you get a sense of all of the wonderful activities in our teaching, research, and extension programs. I have explained budget reductions in past letters and asked our friends and alumni for help. Many of you have responded and your contributions are sincerely appreciated. Private support must increase to simply continue, not to mention enhance, what we do. Please make a contribution to the department a regular event. Your gifts provide help with the special things that make us excellent, whether it is field trips for undergraduates, allowing graduate students to make a presentation at a conference, or helping to recruit and retain the best students and faculty in the world. We need your support as we continuously work to excel in all that we do. Please let me know if you are in the area and would like to tour our facilities.

Thank you.

Morton A. Barlaz  
Distinguished University Professor  
CCEE Department Head

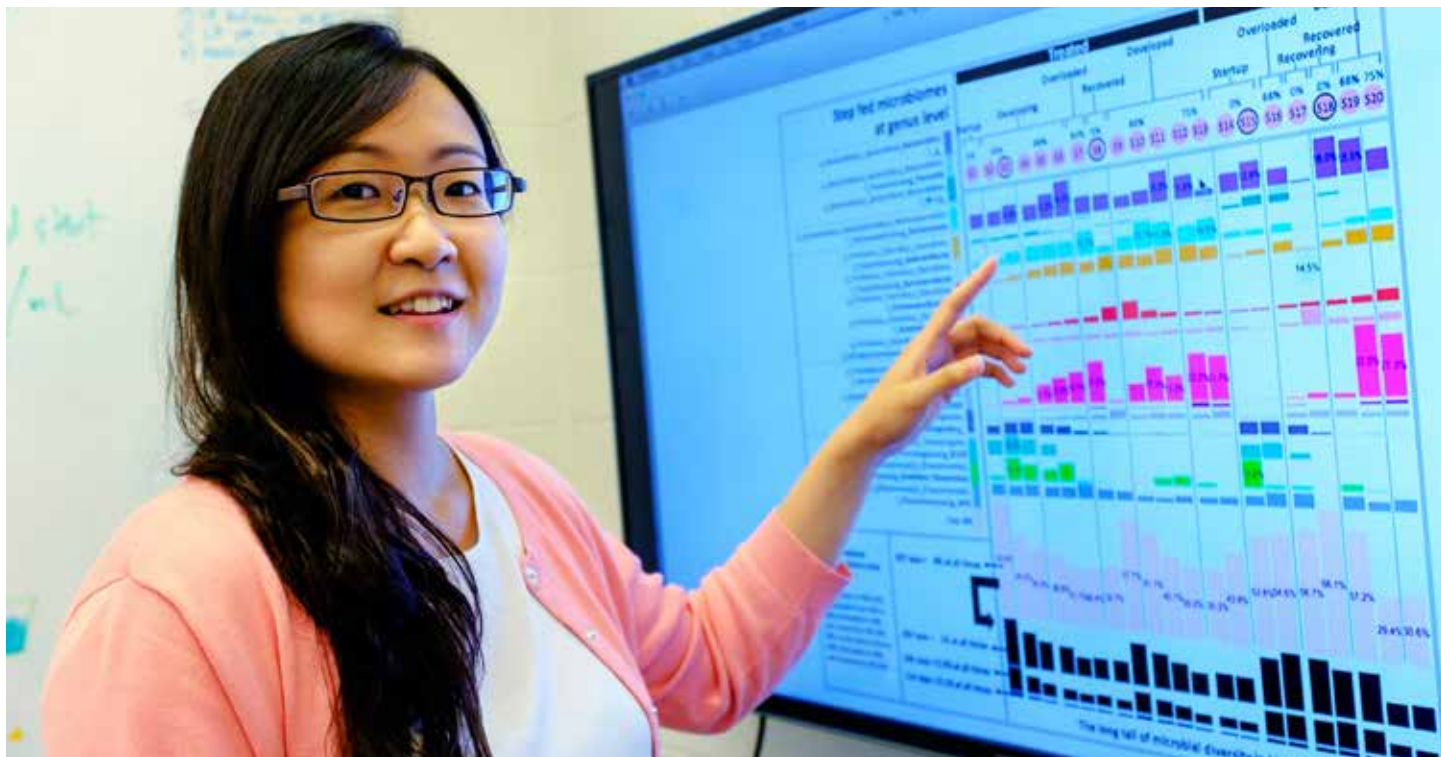
## CCEE AT NC STATE SUSTAINABLE INFRASTRUCTURE FOR SOCIETY

- \$18.6 million** in research expenditures
- 167** ongoing research projects
- 12** winners of CAREER and other NSF young faculty awards
- 49** faculty members
- 309** graduate students
- 762** undergraduate students



# RESEARCH UPDATES

## Recovering energy that goes down the drain



Ling Wang explains the graphic display of microbial communities.

In the U.S., more than 5.4 billion gallons of fats, oils, and grease (FOG) go down the drain, enroute to a wastewater treatment plant. However, FOG could be a useful source of energy to help run the wastewater treatment plants. Dr. **Francis de los Reyes** and Ph.D. student **Ling Wang** (MSENE, '12) are exploring ways to get micro-organisms to do the work needed to convert FOG to methane. Methane can be used as a fuel to power machinery at a treatment plant.

In previous work, Wang and **Elvin Hossen** (MSENE, '14) were able to achieve the highest methane yields ever reported

for anaerobic co-digestion of wastes that contain fats, oil and grease. Using "step feeding" and another strategy called "pulse feeding", they were able to develop what seemed to be a "super" bioreactor, increasing methane yield by 336 percent.

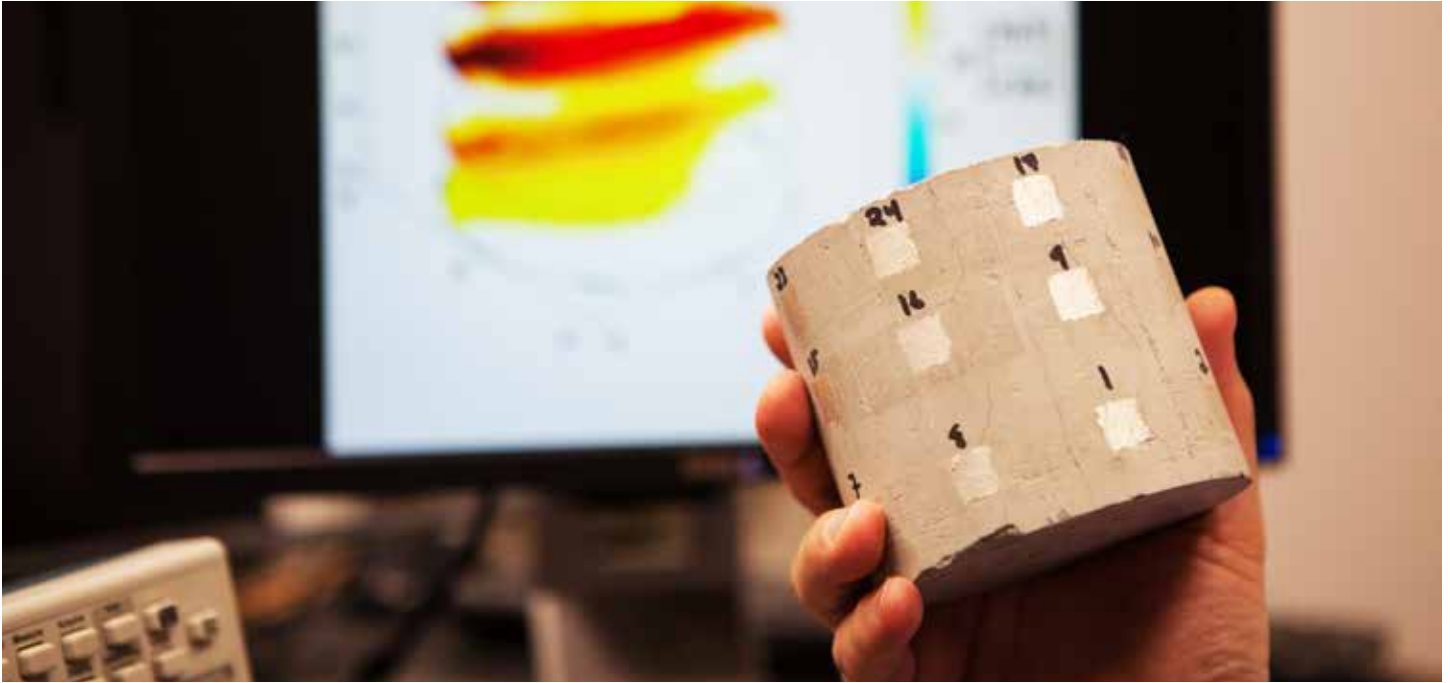
In recent work, using DNA sequencing methods, Wang was able to determine which organisms contributed the most to the high performing microbial communities. These results help in figuring out how microbial communities can be actively shaped to achieve a performance goal, such as higher methane yield.

The next step is to use RNA analysis to examine the different functional genes involved. The study is an excellent example of how interdisciplinary research – in this case a blend of engineering, ecology, biotechnology and genetics – can lead to potentially significant solutions to environmental and energy problems. The work is funded by the **NC Water Resources Research Institute**, and Drs. **Tarek Aziz** and **Joel Ducoste** are co-investigators.

The **5.4 billion gallons** of FOG can potentially generate **5 million MWh of electricity** – enough to power about **39,000 homes** in the U.S.



# What does moisture flow in porous media look like?



Close up of concrete specimen and the imaging of moisture content.

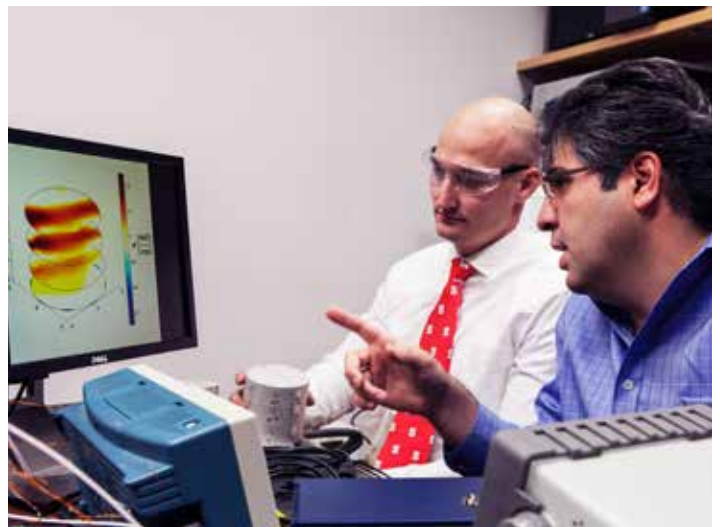
Moisture and salt ingress are the leading causes of the deterioration of reinforced concrete structures, such as bridges and parking decks. Significant damage can occur when salts used during winter for de-icing make their way into concrete, especially through cracks. In addition to compromising the concrete, moisture and salt can cause corrosion of reinforcing steel within the concrete. Affordable techniques for detecting and quantifying the moisture content, and moisture movement, in concrete are needed to better understand the degradation mechanisms, leading to the ability to design more durable structures.

CCEE researchers developed techniques to visualize how moisture moves inside concrete using Electrical Impedance Tomography (EIT). “We have developed new techniques to look at moisture movement in concrete and within cracks, which is a very difficult thing to do,” Dr. **Mohammad Pour-Ghaz** explains.

Current techniques available to measure moisture in cement-based materials include X-ray tomography or neutron tomography. “The existing techniques are very expensive, invasive and limited to small material geometries, so our method is really attractive,” Pour-Ghaz says. The use of EIT is cheaper and easy to implement and makes it possible to compare the durability performance of different cementitious materials and quantify the effect of cracks and damage on service life of concrete infrastructure. The data from this

technique can also be used to validate models of moisture and ion ingress in cementitious infrastructure materials.

Ph.D. students **Danny Smyl**, **Reza Rashednia** and **Milad Hallaji** worked under the direction of Pour-Ghaz and Dr. **Aku Seppänen** from the University of Eastern Finland. The research team also worked closely with the **NCSU High-Performance Computing** (HPC) facility to achieve the image reconstructions necessary to visualize the moisture flow.



Mohammad Pour-Ghaz and Danny Smyl discuss Electrical Impedance Tomography results.

# Industrial wastewater contaminant found in NC drinking water

## Are existing standards sufficient to assure the safety of our drinking water?

1,4-dioxane is classified as an “emerging contaminant” and is deemed a “likely human carcinogen” by the EPA. Because it is not on the list of regulated chemicals, no one had been looking for it. “This illustrates that our current framework for assuring drinking water safety is outdated,” Dr. Detlef Knappe says. “The EPA has not regulated any new chemicals in over twenty years.”

CCEE investigators estimate that more than a million people in the Cape Fear River Basin are drinking water with elevated levels of 1,4-dioxane, also referred to as dioxane. Dioxane is an industrial solvent and a byproduct generated in the production of plastics, laundry detergents and shampoos. The U.S. Environmental Protection Agency (EPA) classifies dioxane as a likely human carcinogen.

A 2013 EPA survey of drinking water quality indicated that some of the highest concentrations of dioxane in the United States were found in North Carolina. A team led by Dr. **Detlef Knappe** sought to identify sources of dioxane and its occurrence throughout the Cape Fear River watershed. Additionally, they examined the effectiveness of removing dioxane in drinking water treatment plants and by home filtration devices.

Principal sources of the contaminant were industries in three communities located in the headwater region of the watershed. Dioxane concentrations in the drinking water source of one small community frequently were 10-100 times higher than the NC stream water quality standard. The conventional drinking water treatment processes of this community were not able to remove dioxane. In a community further downstream, a water treatment plant using ozone was able to lower dioxane levels by about two-thirds. Commercially available home filtration devices did not effectively remove 1,4-dioxane. While a custom filter that was prepared by the research team with a new carbonaceous resin removed about 75 percent of dioxane from tap water, this is not adequate to protect public health and additional technologies are being evaluated.

**Catalina Lopez-Velandia** (MSENE 2016) organized field sampling campaigns and investigated the effectiveness of home filtration devices. Ph.D. students **Zachary Hopkins** and **Amie McElroy** (co-advised by Dr. **Michael Hyman**, Plant and Microbial Biology, NC State University) continue to investigate biofiltration and ozonation as possible treatment options for 1,4-dioxane.

The research was funded by the **North Carolina Urban Water Consortium** and a **National Science Foundation RAPID Grant**. Knappe’s team collaborated with the **North Carolina Department of Environmental Quality** and three public water utilities.



Researchers worked from atop the Bynum Bridge to obtain water samples from the Haw River.



Ph.D. student Amie McElroy processes water samples.



# What are the benefits of keeping traffic moving?



Incident Management Assistance Patrol operations keep drivers safe and minimize disruptions by getting stranded vehicles back on the road as quickly as possible.

Have you ever been in a collision or broken down on a freeway? Even if you were able to make it to the shoulder, being in a disabled vehicle is a dangerous and uncomfortable situation. You might have been fortunate enough to benefit from the skilled response from North Carolina's freeway service patrol program known as IMAP (Incident Management Assistance Patrol). Disabled vehicles have negative impacts that go beyond the person driving that vehicle. For example, other vehicles may slow down to look at or avoid the disabled vehicle, leading to delay for thousands of other travelers. Such delays also increase fuel consumption.

The North Carolina Department of Transportation (NCDOT) began a four-year IMAP-sponsorship agreement with State Farm Insurance in May 2016. Like many state DOTs with pressing maintenance and construction needs, NCDOT finds that resources to operate service patrol programs are scarce. The sponsorship provides funding support, but NCDOT still manages the program.

In order for NCDOT to evaluate IMAP operation, the department needed a way to answer two fundamental questions. First, how much does an IMAP patrol route cost to operate? Second, what are the monetary benefits of the IMAP patrol route?

A CCEE project team recently developed a tool for answering these questions. The Java-based computer tool tallies costs for specified IMAP patrol routes and uses a cutting-edge freeway modeling program called FREEVAL (FREeway EVALuation) to accurately estimate savings in traveler delay and fuel consumption directly attributable to IMAP service. The FREEVAL

modeling encompasses an entire hypothetical year and evaluates IMAP impacts within the context of seasonal variations in traffic demand and weather events.

Early testing of the tool indicates that benefit-to-cost ratios for IMAP operations are quite favorable, on the order of 14 to 1. The actual ratio is likely to be higher, since the tool accounts only for delay and fuel benefits but does not quantify the benefits of reduced variability in travel time and reduced stress for travelers in need of service. The tool also provides NCDOT with estimates of the increase in dependability of travel time resulting from IMAP service.

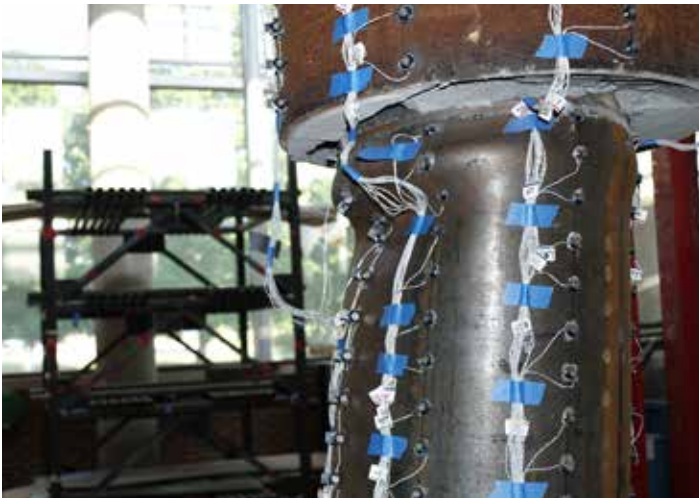
Dr. **Billy Williams** (BSCE '84, MSCE '90) led the project, and **Tai Jin Song** (Ph.D. CE '16) served as the lead graduate research assistant. Other key contributors were Dr. **Nagui Roupail**, **Sankey Kim** (Ph.D. CE '14), Ph.D. student **Lake Trask**, and computer science graduate student **Gowtham Ramesh**.



IMAP vehicles provide patrol operators with the power and tools necessary to safely and efficiently deal with the full range of freeway incidents.

# NEW RESEARCH PROJECTS

In the first eight months of 2016, CCEE faculty members received more than \$8 million dollars of research support from state, federal, and private sources. This support will enable 20 CCEE faculty members, their teams of graduate, undergraduate and postdoctoral researchers and their collaborators to address a diverse range of problems to help improve infrastructure and the environment in North Carolina and across the US and globe.



Closeup of testing of a critical grouted shear stud connection. A new project will test this connection under 'Alaskan' conditions. (Photo: Mervyn Kowalsky)

Dr. **Andy Grieshop** is part of a team awarded a four year grant from the US National Science Foundation (NSF) to study how human activity is linked with global and regional climate change in southern and eastern Africa through biomass combustion, land-use change and other processes. The team will be led by Dr. **Pam Jagger** from University of North Carolina-Chapel Hill (UNC-CH) and includes other researchers from UNC-CH and the Stockholm Environmental Institute.

Dr. **Murthy Guddati** and Dr. **Ralph Smith** of the Department of Mathematics were awarded a three-year grant from NSF to enhance methodologies developed by Guddati's group to estimate the material properties of layered structures and quantify uncertainty of these properties. Applications considered in the project include geotechnical site characterization, nondestructive testing of composite materials and ultrasound imaging to diagnose cardiovascular health.

Dr. **Daniel Obenour** and co-investigators from multiple programs, including the NC State Department of Agricultural and Resource Economics, have received funding from the US Environmental Protection Agency to study the societal benefits of water quality improvements to urban streams. Dr. Obenour will lead a modeling case study examining how pollution reductions and other best management practices can improve the water quality, biodiversity, and societal valuation of urban streams in central North Carolina.

Food waste is currently the largest constituent of waste disposed in landfills, and there is increasing interest in diverting food waste from landfills to composting or anaerobic digestion. Dr. **James Levis** received funding from the Environmental Research and Education Foundation (EREF) to use the Solid Waste Optimization Life-cycle Framework (SWOLF; [go.ncsu.edu/swolf](http://go.ncsu.edu/swolf)) developed at NC State to assess and develop food waste management strategies to cost-effectively reduce environmental impacts.

Dr. **Abhinav Gupta** received funding from the Electric Power Research Institute (EPRI) and Dominion Power to conduct an exploratory study at the Center for Nuclear Energy Facilities and Structures (CNEFS). He will use state-of-the-art methods to model coupled building-equipment systems during earthquakes. This study will evaluate seismic margins, which are of great interest to the nuclear power industry since the Fukushima nuclear power plant flooded as a result of an earthquake.

Drs. **Elizabeth Sciaudone** and **Margery Overton** were recently awarded funding from the U.S. Army Corps of Engineers (USACE) to research the effect of constructed beach berms on wave runup and overtopping. They will work in collaboration with the Town of Kitty Hawk, private consultants, and researchers at USACE to compare real-world measurements at a beach nourishment project with state-of-the-art numerical modeling. This work will help refine design guidelines for locations where dunes are critical for protecting infrastructure from storm damage.

Several CCEE researchers have been funded by the US Department of Homeland Security, via UNC-CH, to improve our ability to predict and prevent coastal flooding. Dr. **Casey Dietrich** is working with partners at the University of Texas at Austin to speed up a model for coastal flooding by using parallel computing, thus enabling faster forecasting and more time



for decision makers during storms. Drs. **Mo Gabr** and **Brina Montoya** are working with a team using remote sensing to provide high resolution measurements of levee deformation in the California delta. They will then integrate measurements and modeling to assess the performance and health of delta levees.

Drs. **James Nau**, **Mohammad Pour-Ghaz** and **Mervyn Kowalsky** received funding from the Alaska Department of Transportation (AKDOT) to study improvements to a new steel bridge system recently developed at NC State. This design is simple to construct and has improved seismic behavior compared to traditional designs. This research program will optimize the grout that is a key component of the bridge and study the behavior of the system under low temperature conditions. Drs. **Kowalsky**, **Nau** and **Rudi Seracino** received additional funding from AKDOT to develop models for the seismic response of keyway joint bridges. The project will use large-scale tests and simulations to develop models for bridge engineers to better predict the performance of bridge structures.

In a project funded by the NC State Water Resources Research Institute (WRI), Drs. **Tarek Aziz** and **Obenour** are monitoring three local water supply reservoirs to better understand the role of mixing on suppression of harmful algal blooms (HABs). HABs can result in water-bound toxins that pose a threat to human and ecosystem health. The project will use field measurements and modeling to develop tools that predict HAB formation and assess engineering solutions to suppress blooms. In another WRI-sponsored project, Drs. **Joel Ducoste** and **Pour-Ghaz** will evaluate alternative materials for use in precast concrete structures to reduce or eliminate corrosion products that can lead to the formation of calcium-based fat, oil, and grease (FOG) deposition in sewer systems.

Several faculty members received funding from the North Carolina Sea Grant Program (NCSGP) for studies related to the North Carolina coast. Dr. Obenour received funding to create a model to forecast 'dead zones' and algal blooms in the Neuse River Estuary. Dr. **Obenour** will work with Drs. **Hans Paerl** and **Ben Peierls** of the UNC Institute of Marine Science to provide seasonal and long-range forecasts relevant to fisheries and water quality management. Drs. **Dietrich** and **Overton** received support to couple models for waves, flooding and erosion during hurricanes along the North Carolina coastline. The project will extend an existing coastal erosion model and apply it to Hatteras Island. Model results will be used to improve flooding predictions for landfalling storms along the NC coast.

Dr. **Cassie Castorena** received funding from the North Carolina Department of Transportation (NCDOT) to develop guidelines for the application of crack sealants on roadways to avoid loss of skid resistance. Crack sealing is used to slow pavement deterioration, but it can reduce skid resistance, if it

covers too much of the pavement, and create a potential safety hazard. This project will help minimize these safety hazards.

In cross-disciplinary research funded by NCDOT, Drs. **Pour-Ghaz**, **Gabr** and **Detlef Knappe** will investigate the interaction of subsurface contaminants, such as fuel hydrocarbons and chlorinated solvents, with subsurface infrastructure. The research will study the effects of subsurface contaminants on the long-term performance of materials.

In a NCDOT-funded project, Drs. **Richard Kim** and **Guddati** will evaluate the reliability of the methods used in NCDOT's state-of-the-practice pavement design program. Dynamic modulus, the primary material property of asphalt concrete used in this design process, must be estimated for existing asphalt layers before rehabilitation design. Methods for this estimation will be developed and evaluated using a state-of-the-art wave propagation approach to measure pavement surface deflections.

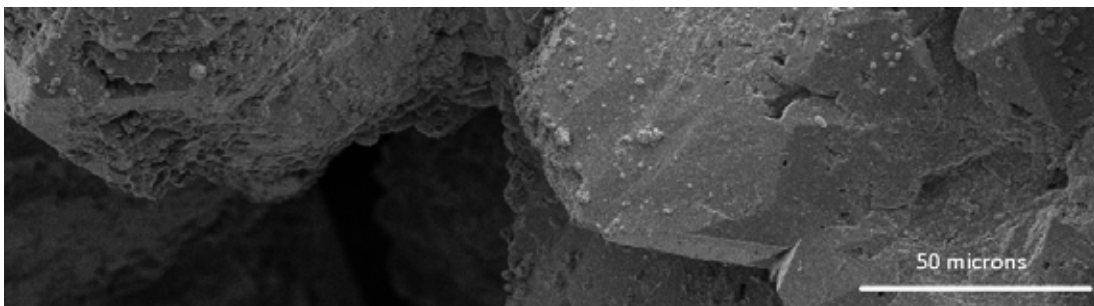
Dr. **George List** received funding from the US Department of Transportation (USDOT), via a University of Maryland research center, for several projects. One project aims to investigate how connected vehicles (CVs) can be used to enhance traffic flows on roads with changing grades and will include field measurements in a roadway tunnel. A second project will develop methods for evaluating freight management on the basis of reliability, costs/benefits, and environmental and economic impacts. A third project will explore new ways to use traffic sensor data to enhance freight movement and network performance.

In addition, see stories on an NSF CAREER award and a new U.S. Department of Energy-funded project on page 8 for more new research.



CCEE graduate student Jeremy Smithheart (left), John Fear (Deputy Director of NC Sea Grant and NC Water Resources Research Institute), and Dr. Robyn Smyth (Bard College) move between sampling locations on Jordan Lake during field work to measure water quality and characterize turbulent mixing within the lake. (Photo: Tarek Aziz)

## Dr. Brina Montoya wins prestigious CAREER award



Dr. Brina Montoya

Two particles similar to those found in mine tailings shown bonded together with cement produced by bacteria.

**D**r. **Brina Montoya**, assistant professor in the department, has received a Faculty Early Career Development Award from the National Science Foundation (NSF). The award, known as the NSF CAREER Award, is one of the highest honors given by NSF to young faculty in science and engineering. This award increases the number of CAREER and other NSF young faculty awards in the department to 12.

NSF will provide \$500,000 in funding over five years to support her project, "Stabilization of Mining and Energy Related Byproducts using Bio-Mediated Soil Improvement."

The goal of Montoya's research is to develop sustainable methods to stabilize mining and energy related byproduct materials using natural biological processes. Mining generates

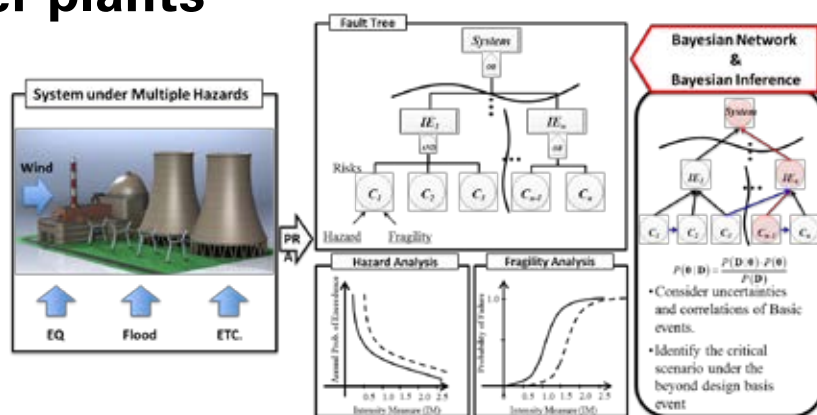
large volumes of byproduct material and these materials must be stored for hundreds to thousands of years. Often it is the management of the generated byproducts that is one of the most difficult challenges for industry.

The project endeavors to explore biological processes that can be used to prevent the failure of the byproduct containment systems. These processes will improve the stability of the byproduct materials as well as potentially immobilize trace elements they contain.

Montoya received a B.S. in civil engineering from California Polytechnic State University, San Luis Obispo, and an M.S. and Ph.D. in civil engineering from the University of California, Davis.

## Departmental center receives funding to improve risk models for nuclear power plants

**A** multi-institutional team led by faculty from the NC State Center for Nuclear Energy Facilities and Structures (CNEFS) has been awarded a \$4 million Consolidated Innovative Nuclear Research (CINR) Integrated Research Project (IRP) by the US Department of Energy (DOE). The project will focus on development and application of a data-driven methodology for validation of risk-informed safety margin characterization (RISMC) models in nuclear power plant safety assessment. RISMC is an integrated deterministic/probabilistic safety analysis methodology developed in the DOE's Light Water Reactor Sustainability program. This project intends to develop a methodology for validation of models such as those for flooding risk assessment. The project team consists of a group of scientists and engineers from NC State University, Purdue University, George Washington University, Ohio State University, Idaho National



Risk-informed safety margin characterization for nuclear plants.

Laboratory, Oak Ridge National Laboratory, and industry. The NC State team includes CCEE professors Drs. **Abhinav Gupta** and **John Baugh**, and Department of Nuclear Engineering professors Drs. **Nam Dinh**, **Maria Avramova**, and **Igor Bolotnov**. This is the first time that a DOE-CINR IRP has been awarded to NC State as the lead organization.



## FACULTY NEWS

### Ashly Cabas Mijares brings expertise in geotechnical engineering



Dr. Ashly Cabas Mijares

**Dr. Ashly Cabas Mijares** joined the CCEE faculty in August 2016 as an assistant professor. Her research is on assessment of seismic hazards, including the effects of local soil conditions on ground motion intensity, the associated uncertainties, and correlations to

structural response and damage. A long-term goal of her work is to improve the accuracy of predicting the response of a site to an earthquake, which would fundamentally enhance performance-based earthquake engineering design methodology.

Dr. Cabas is currently teaching CE 342 Engineering Behavior of Soils and Foundations. In the future, she would like to teach CE 746 Soil Dynamics and Earthquake Engineering and CE 744 Foundation Engineering. Additionally, she is planning to develop new graduate courses focused on risk analysis in geotechnical engineering and basic principles of soil-structure interaction.

Dr. Cabas seeks to “promote critical and independent thinking in my classes.” She wants her students to “become successful researchers and professionals with a strong sense of service and ethics.”

Cabas earned her diploma in civil engineering, at the Universidad Católica Andrés Bello (UCAB) in Caracas, Venezuela, and M.S. and Ph.D. degrees in civil engineering from Virginia Tech. The focus of her graduate research was advancement of the current understanding of the impact that local soil conditions have on ground motions.

In 2007, Cabas participated in the CCEE Summer Practicum at NC State. During the practicum, Venezuelan undergraduate students participated in lectures and field trips organized by CCEE faculty. Cabas explained, “this is why having the opportunity to start my academic career at NC State has such tremendous meaning to me.”

### Kevin Han brings expertise in construction engineering



Dr. Kevin Han

**Dr. Kevin Han** joined the CCEE faculty in August 2016 as an assistant professor. His research focus is on automating the management of civil infrastructure systems including planning, construction, operation and maintenance. The goal of his research is to “help

government to make civil infrastructure decisions that are more sustainable at city, county, state, and national levels.”

He will teach an undergraduate and graduate course in building information modeling (BIM) and a new graduate course on visual sensing and analytics for civil infrastructure systems. He is also developing a course on robotics in construction with two electrical and computer engineering faculty. The robotics course will be project-based and will be offered to seniors and graduate students in several departments.

Dr. Han wants “to help students learn the latest innovative efforts” in industry. Han says, “knowing that civil and construction engineering is as enticing as other fields can attract younger talents to our field.”

Han joined CCEE because “the department wants junior faculty to be successful.” Furthermore, he was able to “easily identify collaborators in various areas.”

Han’s doctoral work focused on automating construction management processes using visual data (images, videos, and 3D point clouds) and BIM. Dr. Han recently completed his Ph.D. in civil engineering at the University of Illinois, Urbana-Champaign, where he also earned a Master of Computer Science. He earned a M.S. in civil and environmental engineering and a B.A. in architecture, with a minor in structural engineering, from the University of California at Berkeley.

# Dr. John Stone retires after 35 years of faculty service



Dr. John Stone

After nearly 35 years of dedicated service, CCEE bids fond farewell to Dr. **John Stone**. Stone joined the transportation systems faculty in 1981 as an assistant professor after completing his doctoral degree at the University of Virginia. In addition to research spanning a broad range of transportation planning topics, from livable communities to building the first statewide network traffic model for North Carolina, Stone spearheaded the creation of a summer practicum for rising civil engineering seniors from Universidad Catolica Andres Bello (UCAB) in Caracas, Venezuela in 2001. Under Stone's continued leadership, more than 200 students from five Latin American countries have benefited from the program, including new faculty member and summer practicum alumnus **Ashly Cabas Mijares** (see page 9). Among the numerous courses Stone has taught, he is proudest of his work with seniors as the lead instructor for many years of the transportation engineering capstone project course. Stone's former students hold positions in academia, research institutes, and state and local DOTs, and also serve as consultants in international aviation, on World Bank and Asian Development Bank projects, with national and international transportation planning firms, and on Wall Street. During this past year, Stone was instrumental in helping the department to prepare for its ABET accreditation visit.

## NC STATE Engineering ENGINEERING ONLINE

Online graduate degree programs  
designed to meet the needs of  
practicing engineers



Providing quality distance education  
programs to alumni and practicing  
engineers since 1978

- Earn a degree that best fits your lifestyle and work responsibilities
- Same academic requirements as on campus
- Study at one of the top-ranked online engineering programs

Online Master's Degree Programs

- Master of Civil Engineering
- Master of Environmental Engineering

Visit: [EngineeringOnline.ncsu.edu](http://EngineeringOnline.ncsu.edu) | [www.ccee.ncsu.edu/academics](http://www.ccee.ncsu.edu/academics)



# SYMPOSIA

## Symposia highlight graduate student research in geotech, computing and environment

Departmental graduate programs in geotechnical engineering, computing and systems, and environmental, water resources, and coastal engineering sponsored several symposia during Spring 2016 that highlighted graduate student research.



Dr. Mo Gabr (sixth from left) and graduate students in geotechnical engineering.

### GEOTECHNICAL ENGINEERING

The second annual Geotechnical Engineering Symposium was hosted by the Geo-Institute graduate student organization. More than 30 engineers from local agencies and consulting firms attended. **Al Tice**, from Amec Foster Wheeler, gave the keynote address on the Cape Hattaras Lighthouse relocation project. "I think students benefit greatly by seeing how practitioners react to their research, and seeing what questions they ask," Tice remarked. Presentations were also given by graduate students and practicing engineers.

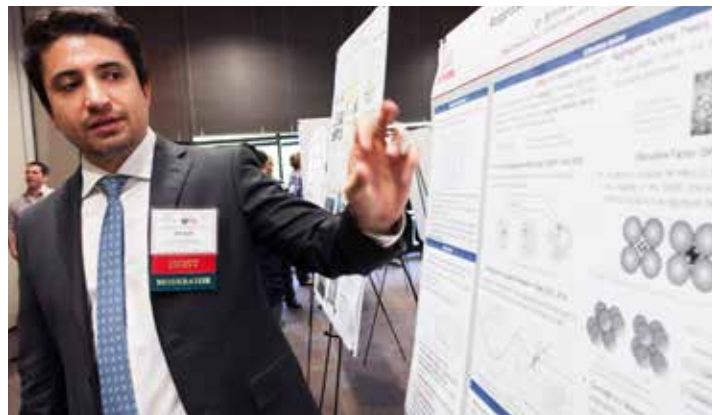
**Saket Kabra** (MCE '16), who presented his research, was interested in meeting potential employers. According to Kabra, "this is a great symposium for networking." In particular, Kabra found the interaction with potential employers helped "me understand whether I want to work in the field, or work in the office as a design engineer."

### COMPUTING AND SYSTEMS

The Computing and Systems Group held its first Research Symposium this past Spring. Nineteen students presented posters on the development of new models, mathematical algorithms, and software. Ph.D. candidate **Dominic Libera** led the student committee in organizing and hosting the event. "Our department is very diverse in the types of research, and this symposium gives us the chance to focus on the modeling side, which is not always easy to present."

Eight judges from local companies, governmental agencies, and NC State University, listened to short presentations by students about their posters. Graduate student **Tristan Dyer** received the Best Research Poster award for work on storm surge modeling and graduate student **Seung Beom Seo** received the Most Innovative Research Award for work on groundwater pumping and stream flow.

Dr. **Dan Loughlin** (Ph.D. CE '98) from the US EPA gave the keynote presentation. He described models he developed to assess environmental impacts of alternative energy policies and state-level climate actions. Loughlin emphasized how his career has been enhanced by his graduate work at NC State.



NC State graduate student Arash Bazorgi presents his research.

## ENVIRONMENTAL, WATER RESOURCES, AND COASTAL ENGINEERING

The walls of the Duke Energy Hall in Hunt Library were lined this past March with almost 50 colorful posters exhibiting the research of Masters and Ph.D. students in the Environmental, Water Resources and Coastal (EWC) Engineering program. Dr. **Tarek Aziz** describes the poster symposium as a valuable experience for graduate students and noted, "it's also a great chance to see our alumni and let local practitioners see what we are doing."

A panel of 24 judges from engineering consulting firms, research agencies, and the City of Raleigh spent several hours evaluating posters. Finalists for best posters included **Laura Garcia-Cuerva, Harold Hounwanou, Zack Hopkins, Amanda Karam, Ayse Karanci, Catalina Lopez-Velandia, and Ling Wang.**

Dr. **Tami Bond**, of the University of Illinois at Urbana-Champaign delivered the keynote talk regarding energy use for the poorest billion people on the planet. Dr. Bond's research



M.S. student Alexandre Mangot, left, answers questions posed by Dr. Joel Ducoste.

focuses on measuring and mitigating emissions from cookstoves and other combustion sources. These emissions are both a human health issue and a major cause of climate change.

The Symposium was sponsored by **McKim and Creed, Freese and Nichols, Hazen and Sawyer, CDM Smith, EREF, Geosyntec, AECOM, Dewberry, Smith Gardner, O'Brien and Gere, SCS Engineering**, and the **Research Triangle Chapter of the Air and Waste Management Association.**

## CCEE students make impressive showing at graduate Research Symposium

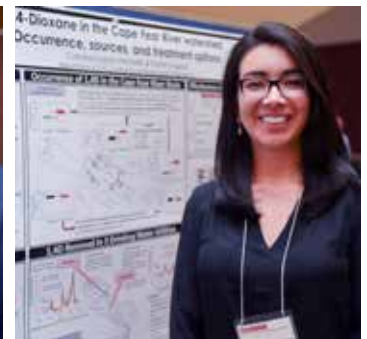
An astounding array of cutting edge research was on display at the Eleventh Annual campus-wide Graduate Student Research Symposium held on March 23. Participation in this event is highly selective. Winning is even more selective. CCEE students brought home two of the three awards given in engineering.

**Resulali Orgut**, who won a second place, is a Ph.D candidate in construction engineering. "I am really happy about winning an award. But more than that I'm grateful for how this process taught me to clarify and condense my research findings," Orgut says. "A few weeks before the event we had an opportunity to do a practice session with the Graduate Programs Committee in our department. They helped me target my message better. They reminded me that answering the 'so what?' question is essential."

**Catalina Lopez-Velandia**, who won a third place award, is a second year master's student within the Environmental and Water Resources Group. She's no stranger to presenting her research, having participated in large industry conferences twice



Resulali Orgut, a fourth year Ph.D. candidate in construction, won second place for his poster "Metrics that Matter: Improving Progress and Performance Assessment in Construction Projects."



Catalina Lopez-Velandia, a master's student in environmental engineering, received third place for her poster "1,4 Dioxane in the Cape Fear River Watershed."

in 2015, and more recently at two other research symposia on campus in 2016. Lopez-Velandia says she likes to present her research in story telling form, and knows that understanding your audience is critical.



# AWARDS & HONORS

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



Dr. Mohammad Gabr

Dr. **MOHAMMAD GABR**, Professor of Geotechnical Engineering, was selected for the American Society for Engineering Education (ASEE-SE) Southeastern Section Outstanding Teaching Award. The ASEE-SE praised Dr. Gabr for his exceptional contributions to Civil Engineering education through the development and offering

of new courses, leading the department effort for the 2010 ABET accreditation, improvement of laboratory experiences for distance education students and introduction of sensors into the undergraduate geotechnical curriculum. He received the award at the ASEE-SE 2016 Annual Conference held March 13 – 15 in Tuscaloosa, Alabama.



Dr. Louis A. Martin-Vega (left) and Dr. Joseph DeCarolis (right)



James Rispoli

Mr. **JAMES RISPOLI**, CCEE Professor of the Practice, was named a Distinguished Member of the American Society of Civil Engineers (ASCE). In the Society's 163-year history, only 679 people have been selected for this honor and only 213 are currently living. Mr. Rispoli is recognized for prominence in construction

and infrastructure management, environmental and nuclear facilities operations, and leading the U.S. Department of Energy Office of Environmental Management in adopting changes in construction project management. He was honored at the ASCE 2016 Convention, Sept. 28 through Oct. 1, in Portland, Oregon.

Dr. **JOSEPH DECAROLIS**, CCEE Associate Professor, received the 2016 Alcoa Foundation Engineering Research Achievement Award. This honor recognizes outstanding research by young faculty members at NC State. Dr. DeCarolis developed an open-source energy model, Tools for Energy Model Optimization and Analysis (TEMOA), which was noted as a significant contribution to the field. Dr. DeCarolis received the award during the spring 2016 College of Engineering faculty meeting.

# AWARDS



Dr. **RICHARD KIM**, Jimmy D. Clark Distinguished University Professor of Transportation Systems and Materials, was selected as a member of the NC State Research Leadership Academy and a 2016 Alumni Association Outstanding Research Awardee. The Research Leadership Academy, established in 2016, operates as the faculty-driven epicenter for the development and implementation of best practices in the empowerment of research faculty at all levels at NC State. The Alumni Association Outstanding Research Award, one of the most prestigious alumni association faculty awards in the country, was given to Dr. Kim for his leadership in research and commitment to excellence.



Dr. Sankar Arumugam

The award event was held at the Dorothy and Roy Park Alumni Center on Centennial Campus on April 28, 2016.

Dr. **SANKAR ARUMUGAM**, Professor and University Faculty Scholar, was selected as one of the “20 Influential Professors of Environmental Engineering”

by [OnlineEngineeringPrograms.com](http://OnlineEngineeringPrograms.com). This list, which includes faculty from Johns Hopkins and Columbia University, was created to recognize outstanding professors and their contributions to education and online learning.

Dr. **DETLEF KNAPPE**, Professor of Environmental Engineering, was appointed to serve on the Environmental Protection Agency (EPA) Science Advisory Board (SAB) Drinking Water Committee. This national committee provides advice to the EPA Administrator on technical aspects of EPA’s national drinking water standards program. His appointment will continue through September 2018.

Dr. **RUDI SERACINO**, Professor of Structural Engineering, received one of three NC State Outstanding Global Engagement Awards. This award encourages and recognizes outstanding accomplishment in globally engaged teaching, research, extension, and/or engagement and economic development by faculty of NC State.



Dr. Rudi Seracino

Dr. **ALI VAZIRI ASTANEH**, a 2016 Ph.D. graduate, was selected as a finalist for the Robert J. Melosh Medal for the best student paper in finite element analysis. His paper, titled “Efficient Forward and Inverse Algorithms for Guided Wave Inversion,” was one of six selected from numerous entries submitted from across the world. After graduating from NC State, Dr. Astaneh was awarded a Peter O’Donnell, Jr. Postdoctoral Fellowship at the Institute for Computational Engineering and Science at the University of Texas at Austin. His Ph.D. advisor at NC State was Dr. **MURTHY GUDDATI**.

**ZISU HAO**, a Ph.D. candidate in Environmental Engineering, won the First Place Poster Award at the 2016 Global Waste Management Symposium (GWMS) held September 1-3, 2015 in Indian Wells, Calif. His poster was titled “Temperature Prediction in Landfills: Model Formulation and Initial Simulations.” Drs. **MORTON BARLAZ** and **JOEL DUCOSTE** are Hao’s advisors.

**DOMINIC LIBERA**, a water resources engineering Ph.D. candidate, received a Global Change Graduate Fellowship from the Department of the Interior’s Southeast Climate Science Center. The one year fellowship includes stipend and tuition



# HONORS

support in addition to a one week training session on decision making from the United States Geological Survey climate science center. Libera's research will focus on using water quality models for developing total nutrient forecasts over the Southeast. His advisor is Dr. **SANKAR ARUMUGAM**.

**JINUNG DO**, a geotechnical engineering Ph.D. candidate, and **CASEY SHANAHAN**, a recent geotechnical engineering M.S. graduate, won the first prize poster competition award at the fifth annual North Carolina Renewable Ocean Energy Symposium. Their poster, titled "Bio-Mediated Soil for Mitigation of Scour at Anchoring Foundation Supporting Marine Hydrokinetics Devices," was presented at the UNC Coastal Studies Institute (CSI) in Wanchese, NC in March 2016. Both Do and Shanahan were advised by Drs. **BRINA MONTOYA** and **MOHAMMAD GABR**.

**DANNY SMYL**, a civil engineering Ph.D. candidate, was one of five NC State students awarded a US Fulbright Scholarship for the 2016-2017 academic year. Smyl will conduct a research project titled "Electrical Methods to Improve Monitoring of Structural Health" at the University of Eastern Finland. Smyl, who earned B.S. and M.S. degrees in civil engineering from the University of Kansas, is a Marine Corps veteran who served as a platoon

project titled "Precast Segmental Cylinder Piles with Corrosion Resistant Transverse Reinforcement." The goal of this prestigious fellowship program is to engage young engineering students in the precast concrete industry while providing research experience of value to both the student and the industry. Since 1971, PCI has awarded 144 fellowships to more than 50 universities. Strahler, who is advised by Dr. **GREGORY LUCIER**, received the award in July 2016.



From left: Leah-Craig Fleming, Yon-Soo Lee, Morgan Westbrook, Jacob Monroe, and Dr. Tarek Aziz (undergraduate advising coordinator)



Meghan Strahler

commander and assistant operations officer in Afghanistan. He is advised by Dr. **MOHAMMAD POUR-GHAZ**.

**MEGHAN STRAHLER**, an M.S. graduate student, was awarded a Precast/Prestressed Concrete Institute (PCI) Daniel Jenny Fellowship for her

Four exemplary CCEE undergraduate seniors received the CCEE Department's most prestigious awards. **LEAH-CRAIG FLEMING** (water resources) won the Leadership Award, **MORGAN WESTBROOK** (structural engineering) received the Humanities Award, **JACOB MONROE** (environmental engineering) won the Scholarly Achievement Award, and **YON-SOO LEE** (structural engineering) received the Citizenship and Service Award. Lee was also awarded the COE Engineering Senior Award for Citizenship and Service from among a dozen engineering departments representing several thousand students. They received their awards at the College of Engineering Senior Awards Banquet in May.



# Assessing earthquake damage in Ecuador: when research really hits home

“I see that my country needs help from professionals and students like me. I plan to return to teach in Ecuador and to continue my research so I can be involved in creating new guidelines and regulations for design and construction of structures.” — **ANA GABRIELA “GABBY” HARO**

In the aftermath of the devastating 7.8 magnitude earthquake that struck the coast of Ecuador in mid-April of 2016, **Ana Gabriela Haro** worried about her family and friends back in her home country. Her parents and brother still live near the capital, Quito, in a mountainous region over a hundred miles from the center of the earthquake, yet they had felt it strongly. “They were scared because it was so strong, and even though the structures there were definitely not affected the way they were along the coast, the fear of aftershocks was high,” Haro relays.

Haro is a Ph.D. student in the Department whose research focuses on the stability of reinforced concrete structural walls. Her interest in earthquake engineering had already led to her participation in the Clearinghouse Program within the **Earthquake Engineering Research Institute** (EERI). “At first after the earthquake in Ecuador I was going to help out virtually, but then I was asked to be part of a team that would travel to Ecuador to do research and documentation on the ground,” Haro explains.



Gabby Haro carefully documents cracks in a wall pier test conducted for the Alaska Department of Transportation.



Gabby Haro documents damaged reinforcement at the base of a column.

The EERI team of six flew into Quito, and on the first day of her trip Haro was able to see her family. “They wanted me to inspect their house to see if it was safe,” she recalls. It was. But from Quito as the team traveled closer to the center of the earthquake, Haro saw the destruction and suffering first hand. “I saw so much devastation and sadness. People had lost everything including their homes and their jobs.”

Haro and the team took more than 6,000 photographs of buildings and infrastructure damaged or destroyed by the event. She says the work was even more exhausting because of heat and humidity levels as they covered an expansive area, including six major cities, in only five days.

After the team returned from the field, they disseminated the findings for use by the earthquake engineering and risk mitigation community. Results and photographs are available online at [www.eqclearinghouse.org/2016-04-16-muisne](http://www.eqclearinghouse.org/2016-04-16-muisne).

# STUDENT NEWS



Shams Tanvir, Tanzila Khan, Nikhil Rastogi, Maryam Delavarrafiee, and Sanjam Singh at the Air & Waste Management Association Annual Meeting in New Orleans.

The NC State Chapter of the **AIR & WASTE MANAGEMENT ASSOCIATION** (A&WMA) organized a visit to the US EPA's Aerosol Test Facility (ATF) at Research Triangle Park (RTP) in March. The ATF has a wind tunnel, large enough to accommodate adult-sized manikins used in measurements of human exposure to air pollution. Dr. **Russell Weiner** and Dr. **Lewis Weinstock** led the tour. The students also learned about ambient air quality monitoring stations.

In June, graduate students **Maryam Delavarrafiee, Tanzila Khan, Nikhil Rastogi, Sanjam Singh, and Shams Tanvir** presented their research at the A&WMA Annual Meeting held in New Orleans, La. The students were awarded travel scholarships from the A&WMA's RTP chapter.

Nine **AMERICAN CONCRETE INSTITUTE** (ACI) student chapter members and their faculty advisor **Roberto Nunez**, along with **John Conn**, ACI Director of chapter activities, traveled to Panama City, Panama, from March 9-11, 2016. "Our trip to Panama was a success," said Nunez. The chapter met with project directors at the Panama Canal, Tocumen Airport, and Panama Metro. The chapter also trained and conducted ACI certification for 16 Panamanian engineers and technicians and presented seminars on concrete technology to 73 Panamanian engineers. The student members who participated in the trip were **Ruben Auvert, Matthew Edwards, Nasser Kareem, Mason Manhertz, David Schoch, Jacinth Smith, Andrew Takla, Jeremy Whisnant, and Joseph Weaver**.

Last year, the **AMERICAN GENERAL CONTRACTORS** (AGC) and **NATIONAL ASSOCIATION OF HOME BUILDERS** (NAHB) chapters sent six members to The Associated Schools of Construction Competition in Greensboro, NC to compete in

the Open Concrete division. The six-person team was tasked with providing an estimate and schedule for a three million gallon clarifier. The team finished first place in the division, ahead of Auburn, Florida, UNC Charlotte and Virginia Tech. This was NC State's first 1<sup>st</sup> place finish in the competition.

The **ASCE STEEL BRIDGE TEAM** earned 1<sup>st</sup> place in both the efficiency and stiffness competitions at the Regional Carolinas Conference held last spring at NC A&T University in Greensboro. The strong performance in each of the evaluation categories earned the bridge team 2<sup>nd</sup> place overall and an invitation to the ASCE National Competition at BYU in Utah in May. Competing at the national level for the first time, the Steel Bridge Team represented itself well and received numerous compliments from other universities on the simplicity and elegance of their design. The competition provided a great learning opportunity, as well as lasting memories for the students. At the beginning of the 2015-2016 school year, the bridge team set a challenging goal to beat the previous year's 3<sup>rd</sup> place finish at the Carolinas Conference. Bridge Team co-captain, **Aaron Stroud** (BSCE '16), said their "goal from the beginning was to improve." "Working on the steel bridge team for two years is one of my most cherished experiences at NC State," according to co-captain **Winston Allgood**, (BSCE '16). The team's trip to Utah was sponsored by generous contributions from ASCE, local engineering firms, and CCEE alumni.

NC State's Concrete Canoe team placed 4<sup>th</sup> overall at the regional conference against 11 teams. They also earned 1<sup>st</sup> place in the Oral Presentation and 3<sup>rd</sup> place in the Men's Endurance race. "We're very proud of how we did this year and look forward to doing even better next year," said Sophomore co-captain **Shawnak Doshi**. Junior co-captain **Luke Fearington** added, "The whole canoe team really appreciated the assistance of our faculty advisors **Steven Welton** and **Ben Smith** and all of the extra hours they took to support us."

On April 24<sup>th</sup>, 2016, the A.P. Norwood Chapter of **CHI EPSILON** at NC State held its spring awards banquet. More than 25 new members were initiated. Newly elected chapter president **Chris Pinkus** noted that "the most illustrious moment thus far in my collegiate career remains my initiation into the A.P. Norwood Chapter of the Chi Epsilon." "I await the many great things in store for our chapter this year."





NC State Student Chapter of ASCE - 2016 Steel Bridge Team at National Competition at BYU in Provo, Utah. Pictured from left to right: Shane Estridge, Daniel Robinson, Joel Sanchez, Will Swaringen, Winston Allgood, Colby York, Andrew May, and Aaron Stroud.



Spring 2016 Chi Epsilon inductees include - Row 1: Grayson Fulp, Eric Polli, Ran Lin, Jimmy Tabet, Asa Godfrey, Margaret Ray, Caitlin West, Katelyn Mueller, Lydia Seabrook; Row 2: Nicholas Errico, Jeffrey Coggins, Nicholas Crowder, Zachary Evans, Giju Lee, Scott Sallade, Meredith Bullard, Daniel Furr, Jacob Monroe; Row 3: Jacob Hudson, Andy Takla, Andy Wagner, Adam Smits, Chris Pinkus, Russell Smith, Jeb Smith, Machel Morrison, Slaton Bitting, Resulali Orgut, Elizabeth Lattimore, Amelia Coley. Not pictured: Leo Barclay, Michelle Lin.

In April, a group of undergraduate students represented NC State during the 2016 **EARTHQUAKE ENGINEERING RESEARCH INSTITUTE (EERI)** Seismic Design Competition in San Francisco, California. Preparations for the competition started in October of 2015 when the undergraduate team attended a series of weekly seminars developed by graduate students on the topic of earthquake engineering and learned about fundamentals of earthquake engineering, structural dynamics, and seismic design. Entry into the competition was contingent upon a design proposal that the team submitted in December. The proposal, which included geotechnical and architectural aspects, earned 2<sup>nd</sup> place overall out of a group of 45 universities. During the competition, the NC State team had the opportunity to interact and exchange ideas with a diverse group of students, faculty, and practitioners. The NC State EERI student chapter plans to enter the 2017 Seismic Design Competition in Portland, Oregon.

In May, the NC State University **ENGINEERS WITHOUT BORDERS** chapter hosted a benefit dinner in support of projects in Sierra Leone and Bolivia. The dinner was attended by 65 people from the Research Triangle area and included a silent auction of crafts from project sites, and a talk by NC State graduate student **Adam Walters** on the nuances of the implementation of international projects and personal experiences with global health. Project leaders for Sierra Leone and Bolivia gave presentations on their progress and goals. The dinner raised \$1,200 for the chapter.

Members of the student chapters of the **INSTITUTE OF TRANSPORTATION ENGINEERS, AMERICAN SOCIETY OF HIGHWAY ENGINEERS, AMERICAN RAILWAY ENGINEERING AND MAINTENANCE-OF-WAY (ITE-ASHE-AREMA)**, visited Norfolk Southern's Linwood Yard outside of Charlotte and a new intermodal terminal in Charlotte. Students got a behind-the-





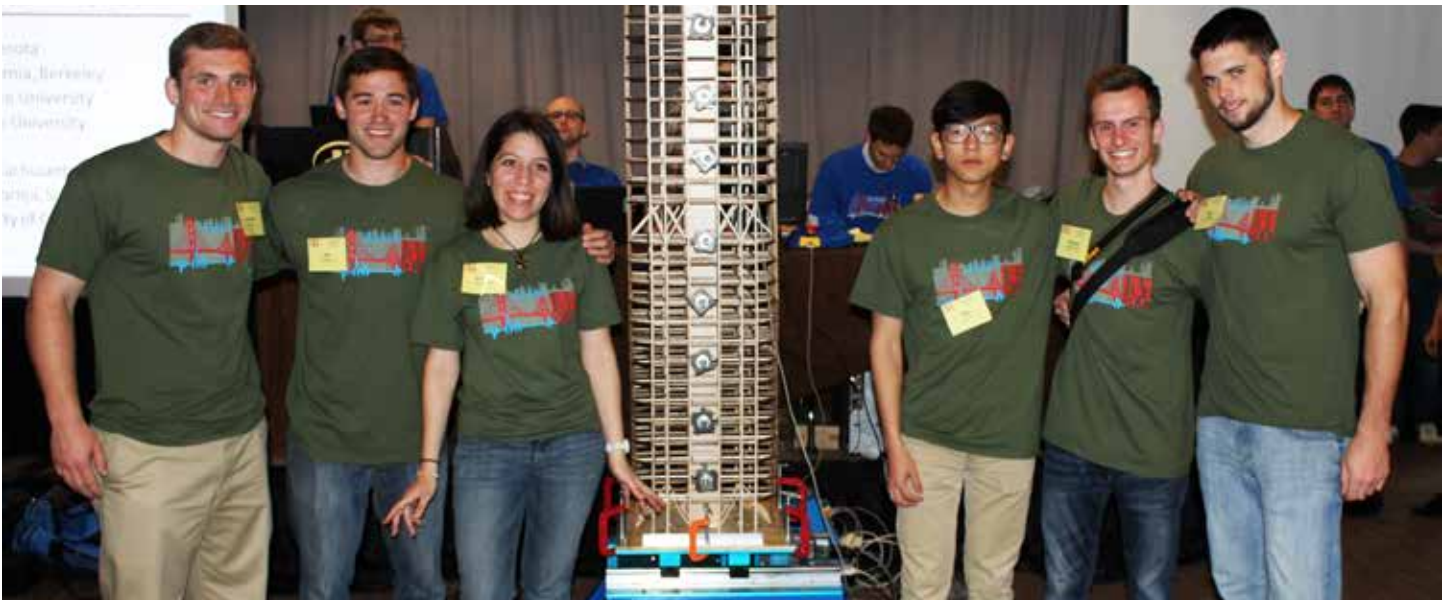
NC SafeWater Big Sweep Event. Students are pictured, from left to right: Amie McElroy, Tracey Sisco, Charlie Aiken, Hillary Stoll, William Perry, Dominic Libera, Roshan Wathore, Amanda Karam, Catalina Lopez, Fausto Ortiz and Andres Zapata.

scenes look at daily railroad operations and an up close look at a major classification yard and an intermodal terminal.

NC **SAFEWATER** had a fun and active spring semester. Speakers from **Peace Corps Engineers**, **CDM Smith**, and **Hazen Sawyer** presented a variety of topics at monthly meetings. **Thomas Worley-Morse** of Hazen and Sawyer spoke regarding water reuse. The Peace Corps meeting attracted undergraduate and graduate students interested in exploring engineering opportunities in the developing world. A social event held at Player's Retreat in January, with the Young Professional

chapter of NC SafeWater, provided an opportunity to connect with water professionals. NC SafeWater once again participated in the Big Sweep, where more than 15 volunteers helped to clean Rocky Branch Trail.

The student chapter of the **PROFESSIONAL ENGINEERS OF NORTH CAROLINA** (PENC) toured **Citrix's** state-of-the-art facility in downtown Raleigh on August 11. As part of the tour, students learned about the electrical, structural, and architectural features of the building.



NC State EERI team during shaking table test of the 2016 Undergraduate Seismic Design Competition. From left to right: Grayson Fulp, Leo Barclay, Ariadne Palma Parra, Giju Lee, Nicolas Chomette, and Sean Casady.



Civil engineering study abroad professors and students in front of the Czech national transportation research group (CDV) in Brno.

## Civil engineering summer 2016 study abroad in Prague, Czech Republic

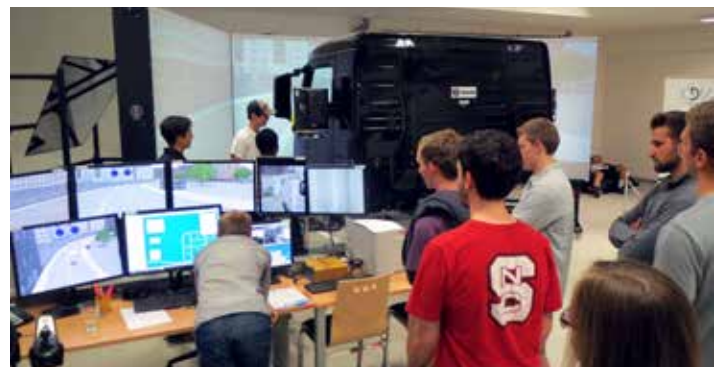
From May 16 to June 26, a group of 23 students and three faculty from the Department participated in the 5th Civil Engineering Summer Study Abroad program in Prague, Czech Republic. The Prague experience focused on three themes: (1) high-density city evolution and development with an emphasis on architecture; (2) city planning emphasizing long term urban development; and (3) public transportation networks including rail, street cars, and buses.

The students were accompanied by Professor **William Rasdorf**, Lecturer **Steve Welton**, and Adjunct Professor **Daniel Findley** from the Institute of Transportation Research and Education. Students enrolled in one or two of CE 301 (Civil Engineering Surveying and Geomatics), CE 305 (Introduction to Transportation Engineering), or CE 426 (Steel Design). The group utilized the facilities of NC State's only satellite campus, the **Prague Institute**, which provided housing, classroom facilities, and program support. Centrally located in this historic medieval city, the Prague Institute was an ideal learning and cultural immersion center for the program. Taylor Forbis, senior in CCEE, said that study abroad "allowed me to get ahead in my major classes while staying in Prague, experiencing a great classroom environment and relationship with professors, and seeing the world with a different perspective."

Students had the opportunity to take tours and visit museums that demonstrated the development and evolution of Prague

infrastructure. For example, with regard to infrastructure, the group visited the Prague Wastewater Treatment Plant Museum. In addition, the students visited religious, cultural, and historical sites in Prague and surrounding cities, such as Karlštejn and Kutna Hora. The Institute hosts arranged a three-day field trip to the historic towns of Pavlov and Kimulov in the southeast of the Czech Republic. **Morgan Sanchez**, Senior in CCEE, remarked that the trip was the "opportunity of a life time, I've never felt more connected and encouraged in any classroom setting."

Previous programs were held in Australia, China, and the Czech Republic.



Study abroad students on a tour of the Czech national transportation research center (CDV) in Brno, examining a driving simulator. Several students were able to drive the simulator.



# What did you do on your summer vacation? For RISE students the answer is anything but ordinary.

**P**aola Armada Rodriguez is a rising senior at Polytechnic University of Puerto Rico in San Juan, but she spent her summer here at NC State assisting with research in the department. She is focused on continuing her studies at the graduate level and NC State is on the list of schools to which she will apply.

Armada was one of 14 undergraduates who participated in CCEE's first annual RISE (**Research Internship Summer Experience**) program. It is designed to attract talented undergraduate and graduate students interested in summer research internships in our department.

"At graduate student recruiting events we repeatedly received inquiries about summer internship and research opportunities," Dr. **Ranji Ranjithan** relays, "so we decided to create a formal program to make those experiences available within our department." Ranjithan, director of graduate programs within CCEE, says that RISE offers a chance for the department to get to know students who are potential applicants for graduate programs and a chance for students to get to know NC State and CCEE. "The primary goal is that we want to increase the quality and diversity of the applicant pool." Of the 14 RISE students, 12 were from groups that are underrepresented in engineering.

**Shannon Hurtado Reyes**, who is from Colombia, South America, is a rising senior studying at Benedict College in Columbia, South Carolina. "NC State is one of my top picks for graduate school. This program has given me a chance to get to

know some of the professors I want to work with, and to see how the lab runs," Reyes explains. She worked with **Francis de los Reyes**, and was also mentored by Ph.D. student **Ling Wang**. "The experience has been really good. I've done some research before, but what I'm doing here is new to me. I'm learning about gas chromatography. Ling Wang is also giving me tips about applying to graduate school."

Across the country, REU (Research Experience for Undergraduates) programs continue to be a major tool aimed at increasing awareness of STEM (Science, Technology, Engineering and Math) research, especially to students from underrepresented groups. In addition to conducting research with their mentors, each week the RISE students participated in common activities, including seminars aimed at developing research skills such as conducting a literature review, analyzing and visualizing data, writing a research abstract and preparing a research poster. The eight-week RISE program culminated with the presentation of research posters at the 15th Annual Summer Undergraduate Research Symposium that showcased the work of more than 300 visiting summer researchers.

Thirteen CCEE faculty members, including professors from Transportation Systems, Structures and Mechanics, Computing and Systems, and Environmental and Water Resources, were involved in mentoring the RISE students. Additionally several CCEE Ph.D. students helped guide the RISE students.



Paola Armada Rodriguez helped develop a technique using inkjet printers with modified cartridges to print sensors used in electrical impedance tomography. Armada worked closely with Professor Mohammad Pour-Ghaz, and Ph.D. students Danny Smyl and Reza Rashetnia.





Rear Admiral Doug Morton awards diploma to Jeb Stuart Smith.

## Rear Admiral Doug Morton delivers graduation advice: your exams may be over, but life is like a pop quiz.

As Rear Admiral **Doug Morton** (BSCE '83) looked out into the faces of bachelor's, master's and Ph.D. students who were celebrating their dream of achieving a hard earned engineering degree, he told them this day was also the culmination of a goal he had back in 1983. "When I was graduating 33 years ago, I wanted to be chosen as one of the speakers for the university wide ceremony. I wrote my speech, practiced, and auditioned. They did not choose me, so today is the fulfillment of one of my dreams." He joked with the audience that as a well-organized engineer he never lost anything and that he still had the speech he'd written more than three decades ago. That was not the speech he gave though.

**"I heard someone say earlier that your exams are over, but that is not accurate. Your exams are just starting. Life is going to throw you a lot of pop quizzes."**

Morton has spent a long and successful career in the US Navy. He has risen through the ranks to the highest levels, traveled the globe solving problems and meeting engineering challenges. He is currently serving as director of Energy and Environmental Readiness on the Chief of Naval Operations staff. He is a Seabee combat warfare officer, a registered professional engineer, and a member of the Defense Acquisition Corps. His advice to the graduates: Be ready for some pop quizzes because life is unpredictable. "I heard someone say earlier that your exams are

over, but that is not accurate. Your exams are just starting. Life is going to throw you a lot of pop quizzes." Morton cited examples of life's pop quizzes such as landing good jobs, losing jobs, losing colleagues and friends along the way, and having to respond to sudden changes in regulatory requirements.

Morton went on to relay four character traits he said all members of the Navy are taught. He said developing these would better prepare the graduates for the career and life challenges that inevitably will come their way. First, he spoke of 'Accountability' and reminded graduates of the code of ethics inherent in the civil engineering profession. "Do not do work you are not prepared for," Morton said, but countered with the second trait, 'Initiative,' and reminded students that they know more than they think they do and should not be afraid to step up and give their opinion. The third trait he encouraged students to remember was 'Integrity' followed by 'Toughness.' "You will make mistakes, and you will have failures. You will let others and yourself down sometimes, but you have to get back up." Morton encouraged the attendees to remember those four character traits when facing life's "pop quizzes."

**In May 2016, there were a total of 120 undergraduate degrees awarded, and 43 graduate level degrees.**

# CCEE alumna Barbara H. Mulkey receives 2016 Watauga Medal



George Worsley and Barbara Mulkey pause for a photo with Chancellor Randy Woodson, center, at the conclusion of the 2016 Founders' Day and Watauga Medal ceremony.

**Barbara H. Mulkey** received NC State University's highest nonacademic honor in March, during the annual Founders' Day observance. The NC State University Board of Trustees has bestowed the Watauga medal each year since 1975 in recognition of extraordinary service and commitment to the university. Mulkey, who earned her bachelor's and master's degrees in civil engineering from NC State, has a lengthy record of service that includes chairing the Board of Trustees (2011-13).

"Barbara Mulkey has been a wonderful leader for NC State both in official roles, such as chair of the Board of Trustees, and a little more behind the scenes, as a pioneer and inspiration for women students in engineering," said Chancellor **Randy Woodson**, who presented the medal alongside Dr. **Jim Owens**, current chair of the Board of Trustees and himself a Watauga Medalist (2006).

The medal is named for the Watauga Club, a progressive group founded in 1884 by young men committed to promoting North Carolina's educational, agricultural and industrial development. Its early activities included urging state leaders to open the North Carolina College of Agriculture and Mechanic Arts, now NC State.

During his remarks, Woodson highlighted the university's history as a land-grant institution, established through the federal Morrill Act to transform public higher education by expanding opportunity and adding practical and applied agriculture, technology and science to classical curricula. On March 7, 1887, the General Assembly passed the bill that founded the university, which opened to students in October 1889.

In addition to her 2007-15 service on the Board of Trustees, Mulkey's past and current NC State affiliations include:

- Board of Visitors (vice chair)
- NC State Investment Fund Members Board

- University Engagement Advisory Board
- Board of Trustees of the Endowment Fund (chair)
- Engineering Foundation Board
- Civil Engineering Advisory Board
- Kenan Institute for Engineering, Technology and Science Board
- State Club (founding member)
- Alumni Association (honorary lifetime member)

The retired founder and chair of **Mulkey Engineers and Consultants**, Mulkey is a member of NC State's W.C. Riddick Lifetime Giving Society and the Chancellor's Circle, and established the Mulkey/Shelton Leadership Award Endowment for engineering students. The Cary resident has been honored as a College of Engineering Alumnus of the Year and Distinguished Engineering Alumni Award recipient. In addition to serving as an inspirational speaker at university and college events, Mulkey has mentored many students.

In receiving the Watauga Medal, she spoke of her pride in NC State's mix of traditional and cutting-edge programs, sense of family, and outstanding educational, research and statewide outreach programs. Mulkey said that most of all, she enjoys interacting with students — including scholarship winners, participants in entrepreneurship initiatives, and scholars who are the first in their family to attend college or who struggle to pay for school.

**George L. Worsley Jr.** was also honored with a Watauga Medal. In addition to volunteer roles, Worsley enjoyed an outstanding 41-year career at the university, including 28 years as vice chancellor for finance and business and as NC State's chief financial officer.

# Enthusiasm is common. Endurance is rare. Alumnus Glenn Futrell has a powerful blend of both.



Glenn Futrell at Pirates Cove Marina, Manteo NC.

**M**ann Hall first opened its doors in 1964. It was the newest building on campus, and became the home of the Department of Civil, Construction, and Environmental Engineering. On the first floor, a graduate student in his final year of study had his first office. “I almost feel like somebody upstairs was looking after me,” says **Glenn Futrell**, (BSCE '63, MSCE '65) and he's not referring to the professors on the 3<sup>rd</sup> and 4<sup>th</sup> floor. “I first considered structures, and then transportation, but there were no research positions open. But there was a spot open with Dr. **Harvey Wahls** in soils and geotechnical engineering. I really understood and enjoyed the subject. I just got it! It was an important turning point and the best thing that could have happened for me.”

Futrell goes on to say that the second best thing that ever happened to him professionally was landing his first job at **Law Engineering and Testing Company** in Charlotte. He was soon promoted to branch manager of their Raleigh office, and says his time there laid the groundwork for future successes.

He met **Robert Owens** during this time, and together they founded **Soil & Material Engineers (S&ME)** in 1973. They started with five employees. By 1986, when it was featured on the cover of *Engineering News Record*, it was the fifth largest geotechnical engineering firm in the U.S., boasting 1,000 employees in 35 branches throughout the Southeast. Under his leadership, the firm expanded to include environmental engineering and hazardous waste site remediation. S&ME was purchased by Westinghouse in 1987. Futrell stayed on as president for three years, but in 1990 left to begin work on Pirates Cove, a residential community in Manteo, NC.

Pirates Cove was more than two decades in the making, persisting through three economic cycles. “Luckily we were finished before the big recession of 2007,” Futrell declares. Beyond the unique soil engineering challenges of building on a peninsula, Futrell says it was the financial aspects of the development, and the sales and marketing, that he found most trying. “I learned on the go, so to speak,” he says. “If I have anything, it's persistence,” he continues. “No one can outwork me in that sense.”

Glenn Futrell grew up on a farm in Wayne County, NC and says he learned his work ethic from his parents. He also relays that he had another role model as a young child. His father's best friend was **Raymond Bryan**, (BSCE '53) president and part owner of **T.A. Loving Construction Company**. “Mr. Bryan was my role model - an engineer who had gone to NC State. That's where my inspiration came from.”

Futrell remembers his time at NC State, from 1959 through 1965, very fondly. “None of what's happened to me would have happened without the background I got at NC State. I could never give back enough to compensate for what it gave me.”

Futrell has given back on many fronts. As a member of the Board of Directors of the **NC State Engineering Foundation Inc.** for more than two decades, he says he's pretty sure it's the longest tenure of anyone ever to serve, and included two years as president. He served eight years on the **NC State Wolfpack Board**, as well as on the board of the **Coastal Studies Institute (CSI)** in Manteo. Futrell was integral to the acquisition of the land and the environmental permits for the property surrounding the CSI. He endowed the Glenn Elliott Futrell Scholarship for CCEE students in 1997, and more recently established the Glenn E. Futrell Distinguished Professorship in Civil, Construction, and Environmental Engineering, held by internationally renowned CCEE researcher Dr. **H. Christopher Frey**.



Not prone to singing his own praises, Futrell humbly relays that the thing he's proudest of when it comes to supporting NC State is facilitating a relationship between his friend **Marc Basnight** (NC Senate 1984 to 2011) and several NC State chancellors and deans. "I know Marc really well and I set up meetings between him and Chancellor **Larry Monteith**, and later Chancellor **Marye Ann Fox**, and our current Dean of Engineering **Louis Martin-Vega**." Basnight became a strong advocate for NC State and the College of Engineering (COE) during his long tenure.

"Glenn is a valued alumnus, and a true ambassador for the College of Engineering, and the department," **Lora Bremer** (NC State Engineering Foundation) emphasizes. "He's a trusted advisor, and we turn to him often for advice and guidance. He's been a great help in promoting and supporting the new **Engineering Oval Building** on Centennial Campus" (see inset).

Glenn Futrell is an ardent supporter, giving from the heart of his time, his expertise, and his financial resources. He likes to point to a book by Angela Duckworth entitled "Grit," which he says "puts into words what I never could." He shares a copy of a book review in which he's highlighted this passage: "The grittiest people have developed long-term goals and are constantly working toward them. Enthusiasm is common. Endurance is rare."



## OUR NEW HOME WILL BE EB-OVAL.

Civil, Construction, and Environmental Engineering (CCEE) will share the 212,000 square foot building with the Edward P. Fitts Department of Industrial and Systems Engineering and the College of Engineering Dean's Office.

Planned occupancy in Fall 2020.

The building will provide modern research laboratories for all programs in CCEE.

The building will allow us to consolidate activity that currently takes place in Mann, Broughton, Burlington and Daniels Hall under one roof.



Mann Hall, the building that opened when Glen Futrell was finishing up his six years at NC State Engineering, has been the home of the Department of Civil, Construction, and Environmental Engineering for 51 years. Plans call for CCEE to be housed in the Engineering Oval building, slated to be completed by 2020 on Centennial Campus. Glenn Futrell has been a tireless supporter for the construction of this new building.

# 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 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.



**Fluor** is one of the world's largest publicly traded engineering, procurement, construction, maintenance, and project management companies. Fluor works with governments and clients in diverse industries around the world to design, construct, and maintain complex and challenging capital projects. Fluor has been a proud supporter of NC State University as a corporate sponsor for many years, and employs a national mix of approximately 50 NC State alumni across all disciplines. The CCEE department uniquely addresses one of Fluor's strategic directions, to grow the construction side of our business. With regional offices in Greenville, SC and Charlotte, NC, and a consistent pipeline of construction projects across Virginia and the Carolinas, many of which are centered around the Research Triangle Park area, Fluor has a strong interest in NC State students looking for an opportunity to work on some of the world's most challenging projects.



On October 18, 2014, **AECOM** and the NC State Engineering Foundation formed the AECOM-NC State Academic Alliance. Through the alliance, AECOM sponsors a number of activities at NC State, including the Dr. **Paul Zia Lecture Series**, the **Structural Engineering and Mechanics (SEM) Symposium**, the **CCEE and Institute of Transportation Research and Education (ITRE) Reception** at the Transportation Research Board (TRB) annual meeting, and the **Environmental, Water Resources and Coastal Engineering (EWC) Symposium**.

AECOM is built to deliver a better world. We design, build, finance and operate infrastructure assets for governments, businesses and organizations in more than 150 countries with more than 90,000 employees. As a fully integrated firm, we connect knowledge and experience across our global network of experts to help clients solve their most complex challenges, including delivering clean water and energy; planning new cities; restoring damaged environments; connecting people and economies with roads, bridges, tunnels and transit systems;

designing parks where children play; and helping governments maintain stability and security. We connect expertise across services, markets, and geographies to deliver transformative outcomes.

Here in North Carolina, AECOM employs more than 400 professionals in two Raleigh-area offices and has nearly 500 employees across the state. AECOM ranked #1 in *Engineering News Record's* "Top 500 Design Firms" for a 7<sup>th</sup> consecutive year. A Fortune 500 firm and named one of *Fortune* magazine's "World's Most Admired Companies" for the second consecutive year, AECOM had revenue of approximately \$18 billion during fiscal year 2015. See how we deliver what others can only imagine at [www.aecom.com](http://www.aecom.com) and @AECOM.



**Freese and Nichols** is proud to support the Department of Civil, Construction, and Environmental Engineering, and we're proud to call NC State our home. Professional service has long been a priority of ours, which is why we chose Centennial Campus for our Raleigh office. Whether we're hosting technical workshops, funding scholarships, or serving on the CCEE Industry Advisory Board, our partnership enables us to invest in engineering students and faculty, and it connects us to the research and innovation that drive our technical solutions.

In the same way that we serve the engineering community, we serve communities across North Carolina. We plan, design and manage public infrastructure projects, and we also guide our clients through every step of those projects. We call this being a trusted advisor, and it's what sets Freese and Nichols apart. We set out to build long-term relationships so we become part of your community.

From Morganton to Morrisville, from Hickory to Holly Springs, we know the cities where we work, and we develop relationships at every level of the organization. Whenever there's a problem, we answer the call. That's the kind of company we are.

Learn more about our work and our opportunities at [www.freese.com/careers](http://www.freese.com/careers).

# ALUMNI NEWS



Zahra Aghazadeh Ardebili

**ZAHRA AGHAZADEH ARDEBILI** (Ph.D. CE '15) is currently serving as a geotechnical professional for AECOM.

**CEDRICK J. BUTLER** (MSCE '15) is a project engineer with DPR Construction's Raleigh-Durham office. He recently developed a safety incident tracking tool that provides the ability to document and maintain a better history of safety incidents. Butler is currently working on a pharmaceuticals construction project.



Cedrick J. Butler

**JO SIAS DANIEL** (MSCE '96, Ph.D. CE '01) is a professor at the University of New Hampshire. She received a Fulbright Scholar Award for 2015-16 from the US-UK Fulbright Commission and spent four months in Nottingham, U.K. She worked with faculty and students at the Nottingham Transportation Engineering Centre at the University of Nottingham on research related to recycled asphalt materials and the impacts of climate change on pavement performance.



Dr. Jo Sias Daniel

**DAN FINDLEY** (BSCE '05, MSCE '06, Ph.D. CE '11) is a senior research associate for the Institute for Transportation Research and Education (ITRE) and an adjunct instructor at N.C. State. He recently contributed a chapter to the 7<sup>th</sup> edition of the *Traffic Engineering Handbook* for the Institute of Transportation Engineers. Earlier

this year, he co-authored *Highway Engineering: Planning, Design, and Operations* with fellow department alumni **Bastian Schroeder** (BSCE '04, MSCE '05, Ph.D. CE '08) and **Chris Cunningham** (BSCE '02, MSCE '05), and ITRE colleague **Tom Brown**.

**MICHAEL B. GWYN** (BSCE '80, Master of Engineering '94) is the president of Benham, a Haskell company, and senior vice president of Haskell. He has been named a Fellow of the American Society of Civil Engineers. He is on the Board of Advisors for the Construction Industry Institute and on the Board of Directors of the World Affairs Council of Charlotte.



Elizabeth Craig Howey

**ELIZABETH CRAIG HOWEY** (MSCE '92) is a senior geotechnical project manager with HDR, Inc. She was recently named a project associate and is currently involved with the construction of the Bonner Bridge replacement on North Carolina's Outer Banks after working as a member of the project design team.

**BEN T. MIELKE** (BSCE '09, MSCE '11) is a senior engineer at Thornton Tomasetti, Inc. He is currently working on the foundation design for one of the tallest high rise buildings in downtown Miami. He is also performing structural inspections of a new roof system currently being installed on the Miami Dolphins Stadium.

**VIC O'JANPA** (BSCE '03, MSCE '05) was recently appointed a chief estimator for the construction firm Brasfield and Gorrie in Raleigh. At 34, he is the youngest employee in the history of the company to hold the position. Since 2006, he has estimated more than 100 health care and commercial projects, including the Metlife at Weston Lakefront development in Cary, NC. He is also a speaker for various construction engineering classes at NC State.



**TODD ST. JOHN** P.E. (MSCE '94) is a project manager/engineer with Kimley-Horn and Associates, Inc. in Raleigh, NC. For the past 12 years, he has been responsible for designing and implementing stormwater, stream, wetland, and other natural system restorations as well as coordinating environmental permitting. This fall, he plans to travel to Nicaragua with his family to explore opportunities to help folks establish economically sustainable projects that could include combining tourism, agriculture, silviculture, reforestation, low impact development, and/or renewable energy.

**R. WAYNE STOCKS** (BSCE '86) is a managing principal at Thorton Tomasetti, Inc. and is the Mid-Atlantic South U.S. regional leader. He received his M.S. structural engineering from the University of Texas at Austin in 1987. He has a son who is 2016 graduate of UNC-Chapel Hill, a daughter who is a freshman at Rice University, and an 8<sup>th</sup> grade daughter.

**TODD W. WHISENHUNT** (MSCE '04) is a senior associate at Thorton Tomasetti, Inc., where he is currently the project manager for a \$1 billion corporate headquarters facility. Prior to this project,



Behdad Yazdani

he was project manager for the New Kellogg School of Management at Northwestern University in Evanston, Ill.

**BEHDAD YAZDANI** (MSCE '13) won the 2<sup>nd</sup> place MS Thesis Award from the Air & Waste Management Association for his thesis entitled "Road Grade Quantification Using GPS in On-Board Vehicle Emission Measurements." Yazdani is with Trinity Consultants doing air quality and permitting work in Baton Rouge, La.

## Department Advisory Board

The following distinguished alumni and friends of the department currently serve on the Department Advisory Board:

### **Alan L. Stone**

Vice President  
Hazen and Sawyer

### **Hans G. Warren, Jr**

President  
Warco Construction Inc.

### **Jonathan Holtvedt**

Project Engineer  
Balfour Beatty Construction

### **Bill Pope**

President/Owner  
Pope Custom Homes

### **Heather Denny**

President & CEO  
McDonald-York Building Company

### **Mike Wayts**

Principal, Vice President  
Freese and Nichols, Inc.

### **Barry Gardner**

Executive Vice President  
& Chief Marketing Officer  
Shelco Construction Company Inc.

### **Jim Trogdon**

National Transportation Director  
SAS

### **Richard R. Rohrbaugh**

Senior Vice President/Consultant  
Kimley-Horn & Associates Inc.

### **Dan Pleasant**

Chief Operating Officer  
Dewberry

### **Joe Hines**

Principal  
Timmons Engineers

### **Stacey Smith**

President/Chairman  
Smith Gardner, Inc.

### **David B. Simpson, Jr.**

President and CEO  
Simpson Engineers & Associates

### **John Jenkins**

Vice President/Manager of Land  
Planning & Design  
Stewart Engineering

### **Suzanne M. Beckstoffer**

Former Director, Technology  
Development  
Newport News Shipbuilding

### **Glenda Gibson**

Vice President  
Mott McDonald

### **John Lucey**

President/CEO  
McKim & Creed

### **Tyler Highfill**

President/Owner  
Highfill Infrastructure Engineering

# Support the Department

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.

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.

For our corporate partners, please consider becoming a "Firm of the Month." See more details on page 26.

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.

Thank you for supporting CCEE.

**Morton Barlaz**, Department Head  
**barlaz@ncsu.edu** | **919-515-7212**

**Lindsay Smith**, Director of Development  
**lksmith4@ncsu.edu** | **919-515-7738**

Checks should be made payable to:  
**NC State Engineering Foundation, Inc.**  
**Campus Box 7901**  
**Raleigh, NC 27695-7901**

You can also use your credit card to make a gift.  
Visit **[www.engr.ncsu.edu/foundation](http://www.engr.ncsu.edu/foundation)**.

## 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 Lindsay Smith at [lksmith4@ncsu.edu](mailto:lksmith4@ncsu.edu):

**Name, Mailing and Email Address**  
**Company Name and Address**  
**Degree, Major and Class Year**  
**Announcements**

Department of Civil, Construction, and Environmental Engineering  
NC State University  
Campus Box 7908  
Raleigh, NC 27695-7908

Non-Profit Org.  
US Postage  
**PAID**  
Raleigh, NC  
Permit #2353

# CHECK OUT CCEE AT NC STATE

[www.ccee.ncsu.edu](http://www.ccee.ncsu.edu)

**f** [facebook.com/ccee.ncsu](https://facebook.com/ccee.ncsu)

 [@NCStateCCEE](https://twitter.com/NCStateCCEE)

1,000 copies of this document were printed at a cost of \$4,110.

