UNC CHARLOTTE
The WILLIAM STATES LEE COLLEGE *of* ENGINEERING

Newsletter: FALL **2017**

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CEE News
CIVIL & ENVIRONMENTAL ENGINEERING Department

LETTER FROM CEE Department Chair

As you know, civil and environmental engineering is a diverse field of study. The practice of our discipline manifests itself in various ways in both the public and the private sector. In this installment of the newsletter, you'll see just how varied and interdisciplinary water resources engineering can be.

In the article entitled "A Passion for Clean Water", we've profiled four graduates of UNC Charlotte who work in the delivery of public water services to Charlotte and surrounding Mecklenburg County. Three of those individuals graduated from our department and have gone on to blaze trails in environmental policy and management nationally and around the world. We also shine the spotlight on our graduates who have done award-winning structural design work in the public sector. I think it is safe to say that our graduates are making a big impact as designers and as policy makers.

Our student organizations have been extremely busy this fall. This is evidenced in multiple articles featuring our student chapters of ASCE, AWWA, and Habitat for Humanity. They were involved in events on and off campus. Their activities included coordinating the first ever blood drive for the College of Engineering and helping with the annual "Homecoming" house build the week before our 49er Football Homecoming game. Our students are the best! Be sure to read the spotlights on the undergraduate students as well as the piece about our former scholar-athlete whose jersey was retired this year.

Not only are we known for our exceptional students, but we do some great research as well. Our multi-million dollar transportation center, Center for Advanced Multimodal Mobility Solutions and Education (CAMMSE), is doing very well. CAMMSE Director, Dr. Wei Fan, has been busy building partnerships in the U.S. and in China. We added additional classes (undergrad and graduate) around multimodal mobility, and we also held a Transportation Summer Camp in 2017 for K-12 students. Many more good things are coming so stay tuned.

In many of these stories I think you'll see people who have found Civil Engineering to be more than just a job. In the drive and passion these people exhibit, you will see that they have also found their calling, one that allows them to express their creativity and their technical savvy as they provide a service to the community. Thanks to all who have shared their stories.

James D. Bowen
Professor and Acting CEE Department Chair

CEE @ A GLANCE

UNDERGRAD STUDENTS:	DOCTORAL STUDENTS:	MASTERS STUDENTS:	FACULTY MEMBERS:
440	65	56	25

UPDATED: NOVEMBER 2017

IN THIS Issue

ASCE STUDENT CHAPTER

The ASCE Student Chapter had a busy fall semester at UNC Charlotte. Capitalizing on the momentum from the Carolinas Conference in the spring, the chapter had a hand in four major events in the College of Engineering. In October, a number of our members participated in the Habitat for Humanity (HfH) Homecoming Build on campus. This event was a joint effort with the HfH student chapter.

ASCE hosted Alumnus Dr. Brian Zapata ('03, '07, '12) in October as well as guest speakers from RS&H and I-77 Mobility Partners. During the later part of the month, the ASCE chapter partnered with AWWA, ITE, NSBE and SHPE student chapters to hold the first ever College of Engineering Blood Drive. The Community Blood Center of the Carolinas was instrumental in making the drive a huge success. ASCE collected 31 pints of blood which saves 93 lives according to the Community Blood Center. The Blood Center was amazed at the amount of people that showed up to help. They had to turn away many people because they did not have enough supplies.

Chapter meetings are held twice a month. If you would like to speak at a student chapter meeting, please contact chapter president, Matt Benfield, at mbenfie5@uncc.edu.

We are prepared for Carolinas Conference this year more than ever before! The concrete canoe team poured the canoe November 17th so they now have ample amount of time to finish it. The canoe has never been poured in the Fall semester according to Dr. Brett Tempest who was amazed at the amount of drive the concrete canoe team has displayed. Steel bridge is nearly a month ahead of schedule as they have completed the design and have started fabrication on January 12th. We look forward to being highly competitive in this years Carolinas Conference at Duke with hopes of sending these teams to the National level. ◆

Courtesy: Matt Benfield

ASCE Student Chapter President, Matt Benfield donating blood

AWWA-WEF chapter at the 97th Annual Conference

AWWA-WEF STUDENT CHAPTER

The American Water Works Association-Water Environment Federation (AWWA-WEF) student chapter at UNC Charlotte participated in several collaborative ventures during the fall semester. The chapter joined the AWWA-WEF Young Professionals group for a stream clean up event in nearby Campbell Creek. They took part in the AWWA-WEF 97th annual conference. And they hosted speakers from WK Dickson and Charlotte Stormwater Services during their monthly meetings.

Charlotte Stormwater Services sponsored the Campbell Creek Steam Clean up event on September 9. Over 150 bags of trash were collected. This was a joint effort with the Young Professionals as well. They wrapped up the day with a picnic at Reedy Creek shelters.

The 97th AWWA-WEA took place at the Raleigh Convention Center during November 12-15. The UNC Charlotte student chapter attended November 13. Three members participated in poster competition: Fateme Barancheshme, Vivek Pulikkal, and Amirhossein Rezaei.

The chapter is planning to join the ASCE student chapter during the Carolinas Conference in April. The spring semester holds more possibilities for collaboration and growth. If you would like to speak at one of their monthly meetings, please contact chapter president Heather Oakes at hmorga17@uncc.edu. ◆

Courtesy: Fateme Barancheshme and Heather Oakes

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ALUMNI SPOTLIGHT: Kendal McAteer

Kendal McAteer graduated in May 2001 with a BSCE degree, with a concentration in structures. Two years later, he earned his MSCE, also with a concentration in structures.

During his senior undergraduate year, Kendal interned part-time at Ralph Whitehead Associates (RWA) in Charlotte. There, he gained insight into working in the private sector as well as experience with computer aided drawing or CAD. After graduation, RWA offered him a full-time job. In time, he designed bridges for highways in North and South Carolina, as wells as several bridges for the original "blue line" light rail system in Charlotte.

In 2005, he became a registered PE in North Carolina and took a job with Bulla Smith Design Engineering (BSDE) in Charlotte. At BSDE he was reunited with his college roommate and fellow UNC Charlotte graduate Michael Todd (BSCE 2001). For the last 12+ years, Kendal and Michael have worked together at BSDE designing buildings across the Southeast U.S., both public and private. A large percentage of his work has focused on higher education and includes academic, residential, and student services buildings. He's a LEED accredited professional, a credential that signifies core competency in green building principles.

Kendal has performed structural design for several projects on the UNC Charlotte campus, including the Popp-Martin Student Union, Hunt Hall, Levine Hall, the PORTAL Building, and the Hauser Alumni Pavilion. Other notable projects across North Carolina include the Reich College of Education at Appalachian State University, the Overlook Hall at UNC Asheville, and the UNC Greensboro Dining Hall Renovation, which won the 2015 WoodWorks Regional Excellence Award.

After 18 years of collaborative work, in May 2017 BDSE merged with Stanley D. Lindsey and Associates (SDL). Kendal is currently a Senior Structural Engineer in the Charlotte office of SDL. Through his work with BSDE and SDL, he has gained extensive experience in designing with steel, concrete, masonry, light gauge metal framing, wood framing, heavy timber, and glu-lam. "My job gives me opportunities to be involved in every aspect of a project," he says, "from concept, to design, all the way through construction."

Kendal has worked on dozens of projects over the years, but he is particularly proud of the buildings that he has been able to design for his alma mater. "It is always enjoyable," Kendal adds, "to come back and play a role in the growth of UNC Charlotte." Thanks for all you've done to add function and beauty to our campus, Kendal. Well done. ◆

Courtesy: Kendal McAteer

ALUMNI SPOTLIGHT: Michael Todd

In 1997, **Michael Todd** was accepted into UNC Charlotte's Wal-Mart Competitive Edge Scholar Program. He graduated in May 2001 with a Bachelor of Science in Civil Engineering and a concentration on structures.

Immediately after school, he moved to Winston-Salem to work for the design firm owned by John S. Clark Construction Company. He was an E.I. at the time. While there, his focus included foundations for industrial buildings, wood framed commercial, and small assembly and recreation structures. Michael left John S. Clark in January 2005 for the opportunity to move back to Charlotte and began work at Bulla Smith Design Engineering (BSDE). In the fall of the same year, he earned his North Carolina PE license.

In May 2017, BSDE merged with Stanley D. Lindsey and Associates, Ltd. (SDL), a structural engineering firm with offices in Nashville and Atlanta. Michael is currently a Senior Structural Engineer at SDL. He has had the privilege of working on many buildings at UNC Charlotte. These include the Popp-Martin Student Union and timber bridge, the Johnson Band Center, and the Hauser Alumni Pavilion, to name a few.

Michael has done design work for a number of universities and colleges in North Carolina, in addition to commercial and municipal projects. He enjoys the challenge that engineering design gives him, particularly the complex jobs. Among Michael's favorites is the UNC Greensboro Dining Hall renovation project. It involved five conjoined buildings constructed over a 34-year span, employing different construction methods. His firm added a 105-foot span, wood-framed pentagonal roof in the center of the building to link all the wings with an open floor. Michael has continued to grow in his knowledge and abilities over the 13 years since the move back to Charlotte. Great job, Michael. ◆

Courtesy: Michael Todd

ALUMNI: Share Your News

Please send us news of your latest accomplishments, awards, or recognition.
Email your announcement to the department at cee.dept@uncc.edu.
Be sure to include your: Name, mailing address (if updated), company name, degree, major and class.

CEE STUDENT SPOTLIGHTS: Enduring Connections

Aaron Butler

CEE Senior **Aaron Butler** grew up in Maxton, North Carolina, in the Sandhills region of North Carolina near Lumberton. One of his first loves, dirt biking in the sandy trails around his parents' home, led to an enduring connection to the outdoors.

Following a recommendation from his high school guidance counselor, Aaron enrolled in East Carolina University's pre-med program in August 2013. Unfortunately, Aaron grew disinterested in the seemingly endless amounts of memorization required for medical studies. He started wondering if his analytical nature might be better suited for a career path that would also allow him to work outdoors — civil engineering.

Aaron started in the CEE program at UNC Charlotte in August 2015. The natural beauty of the campus and new facilities appealed to him, but he was also drawn to the growth potential in the Charlotte metro area. In time, he got involved with student organizations like ASCE and ITE. Making Chancellor's and Dean's Lists* led to being inducted into Tau Beta Pi. This past summer, he interned with Norfolk Southern in Atlanta.

Even with a busy schedule of classes and extra-curricular activities, Aaron makes time for family, especially since the passing of his dad. Aaron is driven to pass on a love of the outdoors and dirt biking to his nephew.

After graduating in May 2018, Aaron plans to attend grad school in CEE. His sights are set on being an engineering manager one day. "If you apply yourself," he says, "you can achieve [anything]."

Years ago, he'd heard that studying engineering was too hard. Stories about the high failure rate had turned him away. Thank goodness, he made a connection with a career path that suits him well. Best wishes, Aaron. ◆

Sean McFee

Florida native, **Sean McFee** moved to Asheville, North Carolina in 2000 following a few years of junior college in Pensacola. After graduating from UNC Asheville with a BS in Music Technology, Sean got a job at a recording studio and worked as a Recording Engineer for about two and a half years.

Later pursuits included over three years of working as a stone mason then a few years as a carpenter. But when he saw his 64-year-old boss still working on rooftops after many decades in the trade, Sean decided to make a life change. He applied to engineering schools in North Carolina and started classes at UNC Charlotte in 2015.

Sean's background in masonry and concrete served him well as the captain of the ASCE student chapter concrete canoe team during the Carolinas Conference in Spring 2017. And it didn't hurt that canoeing happens to be a long-standing hobby. The Dean's List* senior plans to continue his engineering studies with our CEE Early Entry MS Program. The concentration for his BS degree is structural engineering, so he will work with Drs. Nicole Braxtan and Brett Tempest — two of our structural faculty members.

His time at UNC Charlotte has been extremely rewarding. Sean has made invaluable connections with faculty, fellow students, and industry partners. A seemingly chance meeting with someone at Stalite Aggregate near Charlotte led to a connection with a local high school teacher making concrete canoes with his students. This encounter may lead to a civil engineering competition between area high schools on UNC Charlotte's campus, which would be a first for the university.

Sean McFee's degree path is proof that things can work together for good in time. Persistence and focus were his keys to success. Great job, Sean. ◆

*To qualify for the Chancellor's List during the fall or spring semester, a full-time student must earn a grade point average of at least 3.8 in 12 or more semester hours of credit graded A, B, or C, with no grade less than C. To qualify for the Dean's List during the fall or spring semester, a full-time student must earn a grade point average between 3.40 and 3.79 in 12 or more semester hours of credit graded A, B, or C, with no grade less than C.

SPOTLIGHTED Journal Papers & Textbooks

Dr. Mei Sun – Hao Z., Sun M., Ducoste J., Benson C.H., Luettich S., Castaldi M.J., Barlaz M.A.. "Heat Generation and Accumulation in Municipal Solid Waste Landfills" Environmental Science & Technology, 2017.

Dr. Olya Keen –1: Keen, O., Bolton, J., Litter, M., Bircher, K. and Oppenlaender, T. Standard reporting of Electrical Energy per Order (EEO) for UV/H2O2 reactors (2017) Pure and Applied Chemistry (in press). **2:** Lucas, D. Petty, S., Keen, O., Luedeka, B., Schlummer, Weber, R., M., Barlaz, M., Yazdani, R., Riise, B., Rhodes, J., Nightingale, D., Diamond, M., Vijgen, J., Lindeman, A., Blum A., and Koshland, C. Methods of responsibly managing end-of-life foams and plastics containing flame retardants: Part I (2017) Environmental Engineering Science DOI: 10.1089/ees.2017.0147. **3:** Lucas, D. Petty, S., Keen, O., Luedeka, B., Schlummer, Weber, R., M., Barlaz, M., Yazdani, R., Riise, B., Rhodes, J., Nightingale, D., Diamond, M., Vijgen, J., Lindeman, A., Blum A., and Koshland, C. Methods of responsibly managing end-of-life foams and plastics containing flame retardants: Part II (2017) Environmental Engineering Science DOI: 10.1089/ees.2017.0380. **4:** Kennedy Neth, N. L., Carlin, C.M. and Keen, O.S. (2017) Doxycycline transformation and emergence of antibacterially active products during water disinfection with chlorine. Environmental Science: Water Research and Technology 3, 1086-1094.

Drs. Pulugurtha and Duddu –1: Yesantarao, V. R. S. Sudheendra and Srinivas S. Pulugurtha. (2017). Evaluating the Influence of a Freeway Capacity Improvement Project on Travel Time Based Performance Measures Within Its Vicinity. 4th Conference of Transportation Research Group of India (CTRG), Mumbai, India, December 17-20. **2:** Teketi, Nutan and Srinivas S. Pulugurtha. (2017). Effect of Pedestrian Hybrid Beacon Signal on Operational Performance Measures at the Mid-block Location and Adjacent Signalized Intersections. 4th Conference of Transportation Research Group of India (CTRG), Mumbai, India, December 17-20. **3:** Venu Madhav Kukkapalli and Srinivas S. Pulugurtha. (2017). Effect of Detector Placement; Train and Traffic Characteristics on Operational Performance of At-grade Railroad Crossings. 4th Conference of Transportation Research Group of India (CTRG), Mumbai, India, December 17-20. **4:** Mane, Ajinkya and Srinivas S. Pulugurtha. (2017). Applicability of Unconventional Intersection Designs Over Pretimed Signalized Intersection Design Along a Coordinated Corridor. 4th Conference of Transportation Research Group of India (CTRG), Mumbai, India, December 17-20. **5:** Duddu, Venkata R., Srinivas S. Pulugurtha, and Pooya Najaf. (2017). Using Link Level Archived Automatic Vehicle Location Data to Assess Transit System LOS at Bus-stop Level. 4th Conference of Transportation Research Group of India (CTRG), Mumbai, India, December 17-20. **6:** Pulugurtha, Srinivas S. and Swapneel R. Kodupuganti. (2017). Travel Time and Reliability Thresholds for Freeway Links from Planning Perspective. 4th Conference of Transportation Research Group of India (CTRG), Mumbai, India, December 17-20. **7:** Kenny, Raunak, Akhilesh Chepuri, Shriniwas Arkartkar, Gaurang Joshi and Srinivas S. Pulugurtha. (2017). Study of Transit Reliability on Bus Routes- A Case Study of Indian Cities. 4th Conference of Transportation Research Group of India (CTRG), Mumbai, India, December 17-20.

Dr. Jy Wu – Wu, J. S., H. K. Tseng, J. C. Ferrell, X. Liu. (2017) Transforming Waste Management Operations to Green Energy Initiatives: Opportunities and Challenges, International Journal of Energy Economics and Policy. ◆

AIRPORT PLANNING Course Offerings

Jack Christine, Chief Operating Officer of Charlotte Douglas International Airport (CLT), has been teaching a class in airport planning and design in the department since Fall 2016. The idea for the first class originated during a conversation with Dr. John Daniels and others in the department about the unique learning environment at CLT. Due to the success of the design and planning course, a course in Terminal Planning & Design was taught in the spring 2018 semester. This new class had a maximum capacity of 30 students and was cross-listed with the School of Architecture.

The classes have been an opportunity to expose students to the job prospects that exist in the field of aviation for planners, engineers and architects. One of Jack's former students now works in Wilmington for Talbert, Bright & Ellington, an aviation design firm. "My hope ," Jack shares, "is that we can continue to offer the Airport Planning & Design course each fall and the Terminal Planning & Design course in the spring." In the future, Jack wants to offer other courses related to airport engineering, operations, and management. To find out more about this class offering, contact cee.dept@uncc.edu ◆

Jack Christine holds a BS in Airport Management and Aviation Safety as well as a Masters degree in Public Administration from the University of North Carolina at Charlotte. He started with the Airport as a Planning Assistant in 1997.

A PASSION FOR Clean Water

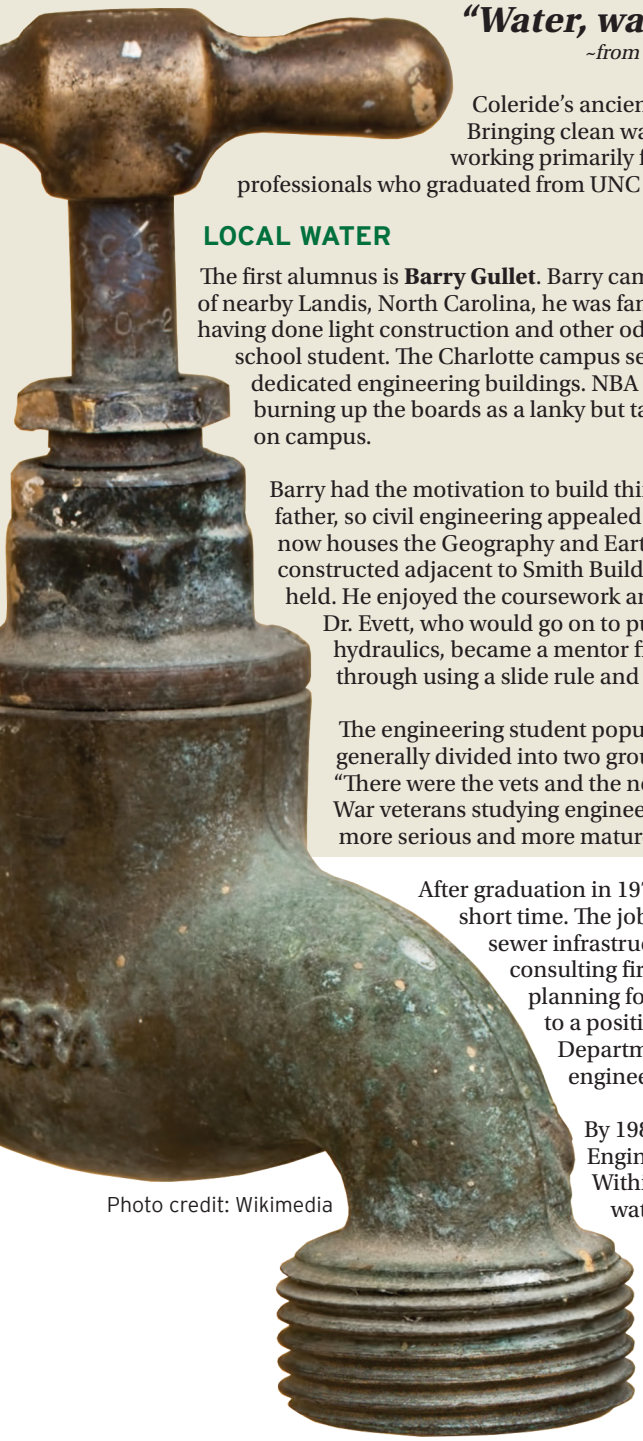


Photo credit: Wikimedia

"Water, water everywhere, nor any a drop to drink."

~from the Rime of the Ancient Mariner by Samuel Taylor Coleridge, 1798.

Coleride's ancient mariner was in dire straits, and obviously in need of a water resources engineer. Bringing clean water to people is the business of specially trained engineers, scientists, and technicians working primarily for municipalities. This article shines the spotlight on four of these water resources professionals who graduated from UNC Charlotte between 1970 and 1990.

LOCAL WATER

The first alumnus is **Barry Gullet**. Barry came to UNC Charlotte in 1974. A resident of nearby Landis, North Carolina, he was familiar with working at a public utility, having done light construction and other odd jobs at the local water plant as a high school student. The Charlotte campus seemed big, Barry recalls, with a handful of dedicated engineering buildings. NBA great Cedric "Cornbread" Maxwell was burning up the boards as a lanky but talented sophomore when Barry set foot on campus.

Barry had the motivation to build things, thanks to his construction worker father, so civil engineering appealed to him. The McEniry Building, which now houses the Geography and Earth Sciences Department, was just being constructed adjacent to Smith Building where most of Barry's classes were held. He enjoyed the coursework and the faculty. Civil engineering professor Dr. Evett, who would go on to publish textbooks in fluid mechanics and hydraulics, became a mentor figure to Barry as he navigated his way through using a slide rule and learning to use Fortran and punch cards.

The engineering student population at UNC Charlotte then was generally divided into two groups of students, according to Barry. "There were the vets and the non-vets," he says, referring to the Vietnam War veterans studying engineering with him. The vets tended to be more serious and more mature in his estimation.

"It's really important to have an MBA. That is, a mop and bucket attitude."

~ Barry Gullet on professional success

After graduation in 1978, Barry returned to Landis for a short time. The job market was good; work in water and sewer infrastructure was plentiful. He got a job with a consulting firm in Asheboro and did infrastructure planning for about six months then transitioned to a position with Charlotte Mecklenburg Utility Department (CMUD) for a position with more engineering design responsibilities.

By 1984, he was promoted to Assistant Chief Engineer in CMUD. Along the way, he had earned his professional engineer registration. Within eight years, he was promoted to Deputy Director of CMUD. After 18 years of designing water infrastructure, Barry moved into the role of Director for Charlotte Water (formerly CMUD).

Barry takes pride in the work done by the 900 plus employees of Charlotte Water. "We do work that matters," Barry shares. "People depend on our service. Everybody that you see or drive by [on the streets of Charlotte and surrounding areas] uses our service each day." With a $400 million dollar budget, the department serves all six municipalities of Mecklenburg County through a unique cooperative agreement. His days of designing wastewater treatment plants are over but he still has a hand in building sustainable water infrastructure and strong interdependent relationships as Charlotte Water Director.

While he enjoyed his work in the private sector as a consulting engineer, Barry says he appreciates seeing the complete lifecycle of projects as an engineer working for a public utility. The diversity of the projects he's worked on throughout the years has kept him interested. In January 2018, Barry Gullet retired from Charlotte Water with 39 years of service. Not bad for a job he only planned on keeping for five years.

SPANNING THE GLOBE

Jackie Jarrell

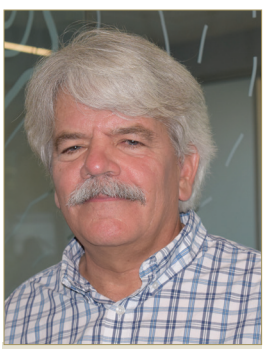
Jacqueline "Jackie" Jarrell graduated from UNC Charlotte with a BS in Civil and Environmental Engineering in 1984. In 1989, she started work with Charlotte Water (then CMUD) as an engineer doing hydraulic modeling. In time, she moved to industrial pretreatment. Then in 1999, she moved into wastewater treatment plant (WWTP) operations, overseeing the operations and maintenance of Charlotte Water's five activated sludge treatment plants and the residuals program (also known as biosolids). Jackie even became a certified WWTP operator.

Even though she was a registered professional engineer (PE), Jackie found herself drawn toward the operations side of the business, not design like most PEs. But working in WWTP operations suited her just fine. She got to see the practical side of water resources engineering. Jackie is currently Operations Chief over waste water and water treatment facilities for Charlotte Water.

For the past four years, Jackie has been volunteering as a Water Environment Federation (WEF) trustee. WEF is an international organization for water quality professionals. She holds this prestigious position while still employed at Charlotte Water. She became involved in WEF and in North Carolina's sister organization, NC Water Environment Association, early in her career. Now, as a WEF Board of Trustee member, Jackie helps govern the WEF, which provides networking and professional enrichment for both engineers and operators around the world.

In 2015, Jackie and her Charlotte Water colleagues were awarded the Gascoigne Wastewater Treatment Plant Operational Improvement Medal. The medal is awarded to the author(s) of an article which presents the solution of an important and complicated operational problem within a full-scale, operating wastewater treatment plant which is appropriately staffed.

NOT JUST FOR ENGINEERS



Rusty Rozzelle

Native Charlottean, **Rusty Rozzelle**, graduated from UNC Charlotte with a BS in Earth Science in 1979. Prior to graduation, he had worked as an intern at the City of Charlotte's only landfill. This environmental experience opened doors of employment for him with Mecklenburg County in 1980 as an environmental, health, and safety (EHS) worker. Rusty's initial duties in this new role included solid waste and vector control. Over the next year and a half, he transitioned into the role of County EHS supervisor. And then two years later, he became the EHS Program Manager. Fast forward 32 years, Rusty supervises the County's 30-person EHS Program, which consists of earth scientists, engineers, and support staff.

Rusty and his staff work in tandem with Charlotte Water. In fact, the partnership between the City of Charlotte and Mecklenburg County dates back to 1972 when CMUD (pronounced "see mud" by some) was formed in the wake of the federal Clean Water Act enactment. This unique partnership is credited as the reason why the greater Charlotte metro area is known for its cutting edge water quality control measures like vegetative buffer areas on all the city's streams. Together, the two agencies have developed far-reaching effective environmental policy, which served as a model for other high-density urban areas in the nation.

Rusty has stayed put with the county for more than three decades. "It's never the same day twice," Rusty says. He has deep roots in local history. In fact, the Rozzelle family legacy goes way back to the 1700s when the Rozzelle Ferry was used to traverse the Catawba River, around 15 miles northwest of Charlotte. Rusty's desire to make a lasting difference compelled him to remain with Mecklenburg County.

"I wanted to make a big footprint," Rusty adds. "To make the environment better." In his mind, the way to do that was to work in the public sector, creating a long-lasting impact by helping to write environmental policy. To Rusty, his main job, his calling in fact, is to protect access to clean water. "That's my passion," he states, adding that to live a life with passion is the best life possible.

CONTINUED ON PAGE 8

"PASSION" Continued from page 7

IN THE FLOW


Daryl Hammock

Daryl Hammock's early passion was fluid mechanics, the study of water flow through pipes and along surfaces like streets and yards. That strong interest led to a desire to apply his high aptitude in math and science to civil engineering. Daryl entered UNC Charlotte in 1987 as a civil engineering student and has vivid memories of campus. The classes were small, he recalls, but every class was full. Corridors in Smith Building were always bustling with activity. The College's rapid growth meant a lot of changes, including the creation of Mosaic, the new computer lab for engineering students only.

After a few years as a full-time student, he went into part-time status and he got a job as a CADD operator, taking a few credit hours, and eventually graduated with his BS in 1993. Eventually, Daryl was able to get hired on as a hydraulic engineer at a local design firm (now STV Engineering) where he designed storm drainage and erosion control features for bridges and highways. Two years later, he left the private sector and went to work for Mecklenburg County doing stormwater management. In 1997, he transitioned into a project manager role for the City of Charlotte. While there, he passed the PE exam and became a registered engineer.

Today, Daryl is Assistant Manager of the City's stormwater utility. His time is spent on things like environmental regulation, budgets, and citizen relations – far removed from the design work he did early in his career. He found the adjustment to engineering management difficult at first. On-the-job training and connections with mentors like Barry Gullet (the then Charlotte Water Director) made that transition easier. His program consisted of 30 people back in 1997 when he first came on staff with the city. Now, it's made up of about 135. This number includes engineers, construction managers, scientists and support staff. Daryl's group partners closely with Rusty Rozzelle's shop at Mecklenburg County. He's proud of their joint accomplishments, which include 20 miles of stream restoration and hundreds of stormwater control measures (SCMs) like natural buffers and rain gardens installed through the City of Charlotte initiatives. These engineered measures remove sediment, chemicals, and oil from stormwater runoff which can pollute streams and rivers.

> **"I wanted to make a big impact."**
>
> ~ Rusty Rozzelle, on choosing an environmental career path in the public sector

Partnerships beyond the city have been instrumental to Charlotte's water quality improvements too. Daryl credits these interagency collaboration to their success. Researchers like Dr. Bill Hunt at NC State University provided the scientific foundation for trailblazing stormwater management applications in large urban areas. Financial backing from the NC Department of Environmental Quality helped leverage local funds for many of the water infrastructure projects. Additionally, buy-in from surrounding municipalities and stakeholders has been instrumental. Over the course of his career, Daryl has taken risks, particularly with watershed restoration, which have led to an award-winning highly-effective municipal stormwater utility.

The career paths highlighted in this article have all been diverse and sometimes circuitous. All four individuals have taken risks. They've entered the public sector as engineers, scientists, and managers and have stayed for decades. The common thread? Satisfaction with having a hand in something that will last to the next generation. ◆

RESOURCES: WEF.ORG

IN MEMORY OF:

Deborah "Debbie" Craig passed away on June 30, 2017 after an eight-year battle with metastatic breast cancer.

Debbie was a graduate of Science High School of Newark, NJ. In 2005 she became employed with University of North Carolina at Charlotte as an Administrative Specialist for the Department of Computing and Informatics and the Department of Civil Engineering after moving to Charlotte, North Carolina.

Debbie was also a dedicated member of Oak Grove Missionary Baptist Church located in Harrisburg, NC. Besides the gift of her beautiful smile, she also had a spirit of servitude. Her heart was truly for the heart of others.

SOURCE: Lamb Funeral Home, Concord NC

Jacob Wesley Webb passed away Oct. 27, 2017, from injuries sustained in a vehicle accident.

A 2012 graduate of Mt. Pleasant High School, Jacob was 2016 graduate of the University of North Carolina at Charlotte with a Bachelor of Science in civil engineering. At UNC-Charlotte, he played for the Mean Green Rugby Team. He was a member of the MPHS Marching Band and was an Eagle Scout with BSA Troop 84.

In addition to his parents, Jacob is survived by a host of family including two brothers, Riley Webb and Samuel Webb, and a sister, Alison Webb. ◆

SOURCE: Gordon Funeral Home, Mt. Pleasant NC

STUDENTS Building Hope

HABITAT FOR HUMANITY CAMPUS CHAPTER

The UNC Charlotte Habitat for Humanity (HfH) Campus Chapter has been doing a Homecoming Habitat House Build since 2013, the year of the first 49er Football season.

The student body and community combine efforts to raise the funds and provide the volunteers to build the house during 49er Homecoming week. This is a fitting way to make the annual UNC Charlotte Homecoming a real homecoming for a hard-working family.

Pictured to the right are some of our hard-working (and fun-loving) CEE students led by Matthew Benfield, ASCE Chapter President (the guy in the red hardhat in danger of being 'hammered' by his mates), on the build site, many of whom belong to the ASCE Student Chapter.

The campus HfH chapter, led by CEE Senior Lisa Apapdu, is active during the Spring semester with community builds and the Habitat for Humanity 5K race, which raises funds for the Homecoming house.

Formed in 2009, the UNC Charlotte Habitat for Humanity chapter is a recognized student-led, student–initiated organization working in partnership with the Charlotte Habitat for Humanity affiliate. The four key functions of a campus chapter are to build, fundraise, advocate and educate. The UNC Charlotte HfH student chapter works "to educate the campus and local community about affordable housing issues and the work of Habitat for Humanity, as well as build and rehabilitate homes in partnership with God, Habitat affiliates and homeowners." Email CEE_Dept@uncc.edu if you would like to be involved. ◆ SOURCE: Inside UNC Charlotte newsletter

HONORING A CEE Scholar-Athlete

(L-to-R): Russ Slade, Track Coach Bob Olesen, Cassie Ficken Slade

Former track and field All-American and Conference USA Athlete of the Year **Cassie Slade (Ficken)** had her jersey retired in a ceremony at the 49ers Football Homecoming game on October 18, 2017.

Cassie's athletic accomplishments are awesome. She was the sixth former UNC Charlotte cross-country/track & field student-athlete to have her jersey retired. In the CEE Department, though, Cassie is known for your academic endeavors. In 2006, she graduated cum laude with both a bachelor's in civil engineering and later earned a master's degree in civil engineering.

After graduating, Cassie returned to her home state and settled in Highlands Ranch, Colorado, where she works as a civil engineer and continues to run. She married Russell Slade, a standout Charlotte runner in his own right, in 2008, and the two continue to train. Cassie finished seventh from a field of eight in the Women's 10,000m in the 2011 Pan American Games.

She currently holds the 49er record in the indoor 3,000-meter and outdoor 5,000-meter events. Cassie is one of only two women to represent the 49ers at the NCAA Cross Country, NCAA Indoor Track and Field, and NCAA Outdoor Track and Field Championships, during their careers. Well done, Cassie. We're proud of you. ◆

SOURCE: 49er News and Wikipedia.com

A HISTORY Moment

During her collegiate running career, Cassie won eight individual conference titles, and earned all-Region honors in both cross-country and track and field. She is one of the most prolific distance runners in 49er history. (SOURCE: 49er News)

If you have a bit of CEE historical trivia to share, please send it to us at cee.dept@uncc.edu.

RAIL RESEARCH: International Train Competition

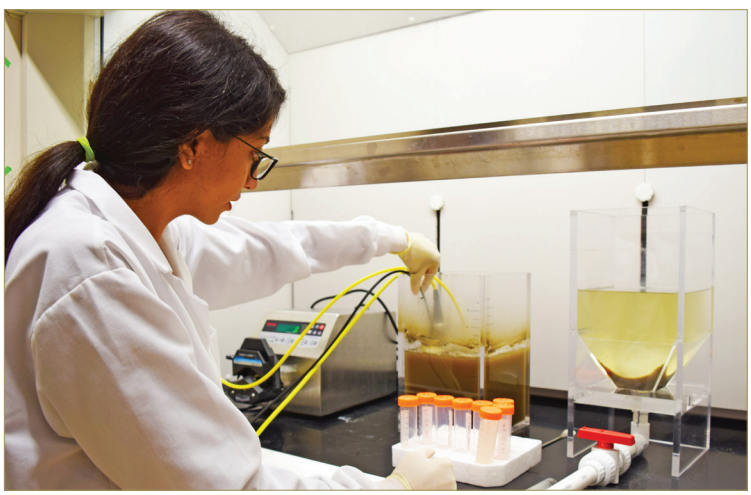
CEE Student, Nick Frayer, laying track in the UK.

Two CEE undergraduate students, **Nick Frayer** and **Austin Lukavsky**, were part of a diverse team of railway engineering students from around the world last summer. They took part in the Institution of Mechanical Engineers (IMechE) Railway Challenge in England. The team, which also included undergraduate, postgraduate, and PhD students from other universities, was led by researchers at the Birmingham Centre for Railway Research and Education (BCRRE) at Birmingham University, about two hours northeast of London.

Each summer, the Railway Challenge brings together competitors from universities and industries around the world. The Challenge involves two key elements. First, the trains are put through a track-based challenge focused on energy storage, traction, ride comfort, and noise reduction. Then the students are tested on the design, business case and innovation of their park-gauge hydrogen-powered train during the presentation phase. The Birmingham team did very well; they placed second, missing first place by a slim margin.

In an effort to expand UNC Charlotte's railway engineering research, **Drs. Shen-en Chen and Nicole Braxtan** initiated a UNC Charlotte crowdfunding project for our "green train" during November. They raised $4,355 of their $5,000 goal. The funds will go toward training and travel expenses for two more students to attend the annual competition during Summer 2018. If you would like to donate, contact us at ce.dept@uncc.edu. ◆ Source: University of Birmingham, UK

UNDERSTANDING ANTIBIOTIC RESISTANCE in Wastewater Treatment Plants



CEE Grad Student, Fateme Barancheshme with the bioreactor

Antibiotic resistance is growing at an alarming rate, and chances are that we will soon run out of treatment options. According to a recent announcement by World Health Organization, antibiotic-resistant infections have been characterized as the greatest risk to health, expected to reach a time in the future when people fear common infections and threats on their lives from minor surgery. It is reported that drug-resistant tuberculosis kills around 2.5 million people each year (WHO 2017).

Antimicrobial resistant bacteria (ARB), in particular, are severe public health issues. Bacterial infections that cause serious outbreaks are even more deadly if they are associated with antibiotic resistance. "Proliferation of ARBs is an on-going global health concern, thus it is critical to understand their existence and proliferation in environmental systems," says CEE Assistant Professor **Dr. Mariya Munir,** who has been doing pioneering research in this area to understand the development of antibiotic resistance in wastewater treatment plants. Increased levels of ARB carrying antibiotic resistance genes (ARGs) in the environment, especially in water and wastewater have been reported. Wastewater can provide favorable conditions for the growth and propagation of antibiotic resistant bacteria, as well as the transfer of their genes to other species. Dr. Munir's work in this area has gained immense attention with highly cited publications.

Currently, Dr. Munir is collaborating with CEE Associate Professor **Dr. James Amburgey** to construct a bench-scale bioreactor to study the impact of non-toxic metal concentrations on the development of ARGs during wastewater treatment process. A strong link exists between antibiotic use and the emergence of antibiotic resistant bacterial pathogens in the environment. Heavy metals along with antibiotics also create a selective pressure in the environment that leads to resistance. It has been observed that it will be more ecologically favorable for a bacterium to survive and acquire resistance in an environment with multiple stresses, for example antibiotics and heavy metals. Dr. Munir believes that the presence of metals in wastewater treatment plants could be one of the factors responsible for selection of antibiotic resistance among exposed bacteria in the environment. Further understanding of this process is needed to help mitigate this problem. Dr. Munir is also working towards different strategies and ways to combat this emerging issue. ◆

Courtesy: Dr. Mariya Munir

Sources: WHO. 2017. "Antibacterial Agents in Clinical Development: An Analysis of the Antibacterial Clinical Development Pipeline, Including Tuberculosis." World Health Organization.
Mao D, Yu S, Rysz M, et al. Prevalence and proliferation of antibiotic resistance genes in two municipal wastewater treatment plants. Water Res. 2015;85:458-466.
Baker-Austin C, Wright MS, Stepanauskas R, McArthur JV. Co-selection of antibiotic and metal resistance. Trends Microbiol. 2006;14(4):176-182.

WATER TREATMENT DESIGN: A Hands-on Experience

PHOTO CREDIT: Pixabay Stock Photos

CEE Associate Professor **James Amburgey** has taught wastewater treatment plant (WWTP) design for a number of years. The course is listed as CEGR 4242, Wastewater Treatment Design in the UNC Charlotte undergraduate catalog. Students enjoy an innovative teaching experience which includes creating a music video about what they've learned in class. According to a popular professor review website, one student "learned a LOT of information easily due to [Dr. Amburgey's] effective, interactive teaching style." Quite an accomplishment for a class which covers the analysis and design of wastewater treatment processes, water quality testing, nutrient removal, and disinfection methods at a WWTP.

Dr. Amburgey, whose research focus areas includes environmental pathogen and bioterrorism detection methods, serves as part-time Director of Research for the Center for Disease Control and Prevention. He graduated from UNC Charlotte with a B.S.C.E in 1998 and earned a M.S. and Ph.D. from Georgia Tech in 2000 and 2002, respectively. ◆

CEE RESEARCHERS: Transportation Center Update

The Center for Advanced Multimodal Mobility Solutions and Education (CAMMSE, for short) had a successful first year. Last year the Center received $7.7 million from the U.S. Department of Transportation to establish an innovative transportation research center, focusing on improving the mobility of people and goods.

UNC Charlotte researchers (including Center Director Dr. Wei Fan and Dr. Yu Wang of Computer Science) have published fifteen peer-reviewed journal papers, made eight presentations and published one technical research report. Research results have been published in several high-quality journals (for instance, Journal of Advanced Transportation, ASCE Journal of Transportation Engineering, Part A: Systems, Accident Analysis and Prevention, Transportation Letters: the International Journal of Transportation Research, IEEE Transactions on Vehicular Technology, IEEE/ACM Transactions on Networking, IEEE Transactions on Mobile Computing, IEEE Internet of Things Journal, and Personal and Ubiquitous Computing).

Center personnel (consisting of Dr. Wei Fan, Dr. Miguel Pando, Dr. David Weggel, Dr. Martin Kane, and Dr. Yu Wang) worked closely as a group. The staff collaborated with Tongji University, Nanjing University of Science and Technology, Beijing Institute of Technology in 2017 and also built a strong working relationship with North Carolina DOT, Charlotte Area Transit System, Centralina Council of Governments, and Illinois Institute of Technology. Six invited presentations were made at Tongji University, Huazhong University of Science and Technology, University of Science and Technology of China, and UNC Smart and Connected Cities Workshop. A short tutorial was given at 2016 NSF I/UCRC ROSE-HUB Fall Meeting. In 2017, six other presentations were made. These included presentations at the Transportation Research Board 96th Annual Meeting, the 2017 Southern District ITE Annual Meeting, the UNC Charlotte Research Institute Spring Reception, and the Professional Engineers of North Carolina Annual Meeting.

Additionally, Center Director Dr. Wei Fan has been serving as an Associate Editor for the IEEE Transactions on Intelligent Transportation Systems, and ASCE Journal of Transportation Engineering, Part A: Systems, while also sitting on the editorial board for four other journals. UNC Charlotte researchers also chaired and served on several other professional committees and review panels (e.g., NSF, NCHRP and PENC). Dr. Weggel developed an effective data management plan for the Center.

Center staff taught a total of five existing undergrad courses and six existing graduate courses. Seven graduate students are involved with CAMMSE research projects. Drs. Pando, Weggel, and Kane successfully held the UNC Charlotte Transportation Summer Camp in the summer of 2017. The camp offered materials, structural, geotechnical, environmental, transportation, and general civil engineering topics were presented through hands-on activities and learning modules. CEE undergraduate and graduate students have benefited from the Center too. Eight UNC Charlotte ITE student chapter bi-weekly seminars and four UNC Charlotte transportation graduate students weekly seminars have been held since the Center opened.

CAMMSE continues to grow. Find out more about the Center partners at https://cammse.uncc.edu/. ◆

Courtesy: Dr. Wei Fan

Visit cee.uncc.edu for more information

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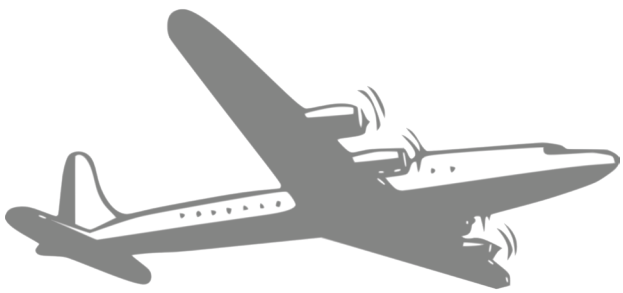
UNC CHARLOTTE
The WILLIAM STATES LEE COLLEGE *of* ENGINEERING

NEW Scholarship



Talbert, Bright and Ellington Inc. has provided $5,000 for an expendable scholarship in the name of CEE alumnus **Carl M. Ellington, Jr**. The purpose of the fund is to provide scholarship support to incoming engineering freshmen from Mecklenburg County who are registered as full-time students. They must have a documented autism spectrum disorder, developmental disorder, learning disability, or brain trauma.

The benefactor of this scholarship, Carl Ellington, graduated from UNC Charlotte in December 1980 from the Department of Civil and Environmental Engineering. He was licensed as a Professional Engineer in 1985. At that time Carl worked at Charlotte/Douglas International Airport in the capacity of Airport Engineer. From the late 80s through mid-1993, he served as Director of the Myrtle Beach Airport. Since 1994, Carl has been a principal in Talbert, Bright and Ellington, Inc., an airport development consulting firm with offices in Charlotte, Wilmington, Richmond, and Columbia.

If you would like to know more about the scholarship, please contact the UNC Charlotte scholarships office at scholarships@uncc.edu. Read more about our connection with airport design and planning on page 5 of this issue. ◆