FALL 2018

UMASS AMHERST The BRIDGE Newsletter of the Department of Civil and Environmental Engineering

STRUCTURAL ENGINEERING AND MECHANICS
Faculty and students in the Brack Structural Engineering Laboratory

cee.umass.edu
Dear Students, Alumni, and Friends,

A student’s undergraduate experience is influenced by many factors, including the quality of the faculty in the student’s disciplinary field, the teaching infrastructure of the department, the faculty in other parts of campus, and the quality of the student’s undergraduate colleagues. In addition, and particularly for those disciplines that are preparing students for a profession, the opportunity to have “experiential learning” can be extremely important. Here, I am using the phrase “experiential learning” to include student organizations, opportunities to work with faculty and graduate students in their research, and performing internships. Experiential learning is typically defined as “learning through doing,” as well as developing knowledge, skills, and values from experiences outside a traditional academic setting.

In the Civil and Environmental Engineering Department at the University of Massachusetts Amherst, our undergraduate students have the opportunity to engage in a wide variety of different types of experiential learning. Aside from classes with laboratories or “capstone” projects, the most common way to receive this type of experience is through student organizations.

We are extremely proud of our student organizations. These organizations include the UMass Student Chapter of the American Society of Civil Engineers (ASCE), our Engineers Without Borders Chapter, the Institute of Transportation Engineers Chapter, our Chi Epsilon Chapter, the Associated General Contractors Chapter, and the Women in Transportation Society Chapter. In this issue of The Bridge, you will read about a number of our student organizations and their activities over the last six months including our ASCE design team competitors (the Seismic Design Team, the Concrete Canoe Team, and the Steel Bridge Design Team).

All of these organizations offer opportunities to gain valuable skills that will be useful in future professional careers. These skills include effective teamwork, techniques for building consensus and group decision making skills. Several of these organizations also offer the opportunity to increase a student’s awareness of community needs and social-economic issues. When students become fully engaged in these organizations, they may have the opportunity to serve on the executive boards, participate in fund raising, attend regional leadership conferences and define the mission and goals of these organizations.

I encourage every student to reach out to one, or hopefully more, of these student organization chapters, to get involved, and to consider chapter leadership positions. These organizations offer our undergraduates a chance to engage with other students, to provide service to our department and other students, to create a sense of community within the department and to develop life-long memories and friendships. Over the past decade, ten of our students have been recognized by UMass Amherst as “21st Century Leaders” and have proudly sat on the stage at the Undergraduate Commencement to be recognized by the Chancellor. All of these students were leaders in one of our student organizations.

Do not let your undergraduate years pass without getting involved in one of our organizations and making a difference.

Sincerely,

Dr. Richard N. Palmer
Department Head
Civil and Environmental Engineering

IN THIS ISSUE

Feng Distinguished Lecture Series …… 3
AEESP Distinguished Lecture Series …… 4
CEE Career Fair ………………………… 5
Alumni News ………………………… 6 - 7
Faculty Spotlight: Dr. Sergio Breña … 8
Faculty Spotlight: Dr. Casey Brown … 9
Faculty Spotlight: Dr. Eric Gonzales … 10
Faculty Retirement: Dr. David Ahlfield … 11
New Faculty ………………………… 12
Faculty Research ………………………… 13
Student Activities ……………………14-15

CEE ADVISORY BOARD

Richard Aquadro, Aquadro & Cerruti, Inc.
Thomas Bailie, Bond Brothers
Richard Bedard, CH2M Hill, retired
Katelyn Biedron, Camp Dresser & McKee, Inc.
Ruth Bonisignore, Flink Consulting LLC
Tina Udden Colgan, CH2M Hill
Jon Dietrich, Fuss & O’Neill, Inc., retired
Jeffrey Dirk, Vanasse & Associates, Inc.
Jennifer Jordan, JCK Underground, Inc.
Stephen Kellogg, SRKellogg & Associates
Tiffany Labrie, Tighe & Bond
Scott MacLeod, Skanska USA Building, Inc.
Theresa McGovern, VHB
Scott Michalak, US Army Corps of Engineers
Mark Pelletier, STV Incorporated
Anthony Puntin, BETA Group, Inc.
Peter Quigley, Thornton Tomasetti
Heather Scranton, Haley and Aldrich, Inc.
John Sullivan, Boston Water & Sewer
Matthew Valade, Hazen and Sawyer P.C.
Robert Weimar, Wright-Pierce
Ellen White, Patrick Engineering

The Bridge
The Bridge will be published in the Fall and Spring semesters by the Civil and Environmental Engineering Department at the University of Massachusetts Amherst.

Email your news, contributions, and suggestions to Editor, Amy Feliciano: afeliciano@umass.edu

University of Massachusetts Amherst
Department of Civil and Environmental Engineering
224 Marston Hall
130 Natural Resources Rd.
Amherst, MA 01003-9303

2 The Bridge | Fall 2018 | CEE.UMASS.EDU
On October 4th, 2018, Desmond F. Lawler, Nasser I. Al-Rashid Chair in Civil Engineering and a member of the Academy of Distinguished Teachers at the University of Texas presented "Re-envisioning Wastewater Treatment for the 21st Century". The philosophy of municipal wastewater treatment has changed only slowly in the past 100 years. Protecting aquatic life from immediate death due to low oxygen levels was the primary motivation and the goal. The passage of the Clean Water Act in 1970 reflected a broader view to include concerns about eutrophication by nutrients and ecological and human health concerns with the naming of “priority pollutants.” Nevertheless, the central concept was that discharge concentrations would be acceptable if they took advantage of the assimilative capacity of receiving waters; that is, if they limited the harm to acceptable values. Now we are embarking on a new philosophy in which we think of wastewater not as a problem for disposal but as a resource. In his talk, he made the case that wastewater treatment needs to be changed, perhaps radically, to reflect the new philosophy and to meet the needs of the 21st century. The thrust of the presentation explored some possibilities for these radical changes and he backed them up with preliminary engineering calculations.

Dr. Lawler obtained his B.S. in Civil Engineering from the University of Notre Dame in 1968, and his M.S. and Ph.D. from the University of North Carolina (Chapel Hill) in 1975 and 1980, respectively. He has been on the faculty at UT since 1980, teaching both undergraduate and graduate courses on water and wastewater treatment throughout that time. His research focuses on physical/chemical treatment processes for water and wastewater. Throughout his career, he has studied particle removal processes and more recently has been studying desalination, processes for the removal of pharmaceuticals and personal care products, and the removal of inorganic contaminants from drinking water. He served on an advisory panel for the City of El Paso in their investigation of direct potable reuse (DPR) and participated in an NSF/NWRI workshop on DPR.

Dr. Lawler has received numerous teaching awards at UT. His contributions to research and education have been recognized with major awards by the American Water Works Association (A.P. Black award, 1999), Water Environment Federation (Gordon Fair Distinguished Engineering Educator Award, 2009), American Membrane Technology Association (Water Quality Person of the Year, 2010), and the Association of Environmental Engineering and Science Professors ("Distinguished Lecturer" for 2012-13; Charles R. O'Melia Distinguished Educator Award, 2012; and Outstanding Contribution to Environmental Engineering Education, 2015). Dr. Lawler co-authored a text book on "Water Quality Engineering: Physical-Chemical Treatment Processes" with Mark Benjamin (U. of Washington), published by Wiley in 2013.
Can Engineering Controls Shape the Drinking Water Microbiome and Reduce the Risk of Opportunistic Infections?

Presented by Dr. Lutgarde Raskin
Altarum/ERIM Russell O’Neal Professor of Engineering, Department of Civil and Environmental Engineering, University of Michigan, Ann Arbor, MI
2018-2019 AEESP Foundation Distinguished Lecturer

On October 24th, 2018, Dr. Lutgarde Raskin, AEESP Distinguished Lecturer presented her lecture, “Can engineering controls shape the drinking water microbiome and reduce the risk of opportunistic infections?” The lecture series was hosted by the Department of Civil and Environmental Engineering, UMass Amherst and co-hosted by Northeastern University, Roger Williams University, Smith College, University of Rhode Island and Worcester Polytechnic Institute.

Biological treatment processes and particularly biofiltration have gained tremendous popularity in the drinking water field over the past decade. However, we do not yet understand how biofiltration, disinfection, and transport of treated water through distribution systems and building plumbing influence tap water and human microbiomes. Most microbes in biofilters mediate positive impacts through removal of contaminants, but others have the potential to cause disease. In high-income countries, the risk of waterborne infection is often due to exposure to opportunistic pathogens, such as Legionella pneumophila and nontuberculous mycobacteria.

This presentation showed that these microbes, present in source water microbiomes, are only partially removed and sometimes are selected for by current treatment practices and therefore become integrated in the diverse microbial communities in drinking water. Waterborne infections by these microbes mainly affect immunocompromised individuals, a rapidly expanding subset of the population, and result primarily from inhalation of aerosols. These findings call for an increased understanding of how drinking water aerosols impact our respiratory tract microbiomes. We have begun to address this challenge by focusing on cystic fibrosis, a condition known to predispose individuals to polymicrobial respiratory tract infection. The presentation concluded by discussing steps water quality engineers and drinking water utilities can take to reduce risk of opportunistic infections while maintaining drinking water treatment objectives.

The lecture and poster session that followed were attended by more than 50 students and faculty, including visitors from the engineering programs at Smith College, Northeastern University, Roger Williams University, and the University of Rhode Island. In her lecture, Dr. Raskin presented a new paradigm for thinking about the way we treat water for drinking in the US and challenged attendees to discuss what the future of water treatment should look like, and our role in creating it. After the lecture, Dr. Raskin and attendees engaged with the 20 undergraduate and graduate students who presented posters about their research while we enjoyed light refreshments and conversations about research in environmental engineering and careers in the field.

Above: UMass Amherst Graduate Student Research Poster Session. Back row, left-right: Dr. Amy Mueller (Northeastern University), Dr. Emily Kumpel, Dr. Lutgarde Raskin, Dr. Caitlyn Butler, and Dr. Niveen Ismail (Smith College). Front row, left-right: Dr. Boris Lau, Dr. Chul Park, Dr. Ameet Pinto (Northeastern University), Dr. Joseph Goodwill (University of Rhode Island), and Prof. Nicholas Tooker.
On October 19, 2018, 30 companies participated in the Fall CEE Career Fair. The CEE Career Fair is a biannual event in the Civil and Environmental Engineering Department. Our first CEE Career was organized in Spring 2003 by then Department Head Alan Lutenegger and Associate Department Head Michael Switzenbaum. The first fair had 12 companies participating and has grown to include as many as 32 companies participating. A Fall CEE Career Fair was added in 2006 due to the popularity of our Spring CEE Career Fairs.

Many companies participate in both the Spring and Fall Career Fairs where they have access to all the CEE students to discuss summer positions, co-ops and permanent positions and can make competitive offers or schedule interviews with CEE students.

Over the years the CEE Career Fair has turned out to be an event where a majority of the companies participating in the fair have alumni from our program representing them. It's a great opportunity for the CEE students to network with perspective employers and alumni of the department.
Alumnus Jennifer Jordan Awarded Senior Alumni Award

Ms. Jordan received her B.S. degree in Civil Engineering, followed by her M.S. degree in Civil Engineering (Environmental Geotechnics) from the University of Massachusetts, Amherst in 1993 and 1996, respectively.

Throughout her career as either the lead geotechnical engineer or project manager, Ms. Jordan has had key roles and contributed invaluable expertise to the success of projects including the Narragansett Bay Commission Combined Sewer Overflow Abatement Program, the Central Artery (I-93)/ Third Harbor Tunnel (I-90) Project, Route 7 Moveable Wittppen Bridge over the Hackensack River in New Jersey, and the District of Columbia Water and Sewer Authority’s DC Clean Rivers Project. In addition to her technical project work, Ms. Jordan has been the department head and office manager for large and mid-sized engineering firms including Jacobs Engineering and McMillen Jacobs Associates. Focused on developing future generations of engineers, Ms. Jordan has dedicated considerable time and energy toward mentoring and developing young engineers in underground engineering and project management. Today, in addition to her strategic and operations role at JCK Underground, Ms. Jordan is the geotechnical and tunnel design manager on Alexandria Renew Enterprises’s $550M combined sewer overflow abatement program.

Beyond her corporate responsibilities, Ms. Jordan has served as the Chair of the Boston Society of Civil Engineer’s Geo-Institute Committee, is an active member of the University of Massachusetts Amherst, Civil and Environmental Engineering Advisory Council, is a member of Underground Construction Association Women in Tunneling, and is a registered professional civil engineer in Massachusetts, Connecticut, Rhode Island, District of Columbia, Pennsylvania, and Virginia. She is also an avid fan and coach for youth baseball and softball. She lives in Lexington, MA with her husband John Baron (’96), and two children, Christopher and Isabelle.

Alumnus Kenneth B. Canty Awarded Junior Alumni Award

Kenneth Canty was born in Boston MA., where he attended East Elementary, Dedham Country Day, and Thayer Academy. He attended the University of Massachusetts at Amherst and received his B.S. degree in Civil Engineering in 1998 and earned his Professional Engineer status in South Carolina in 2008. During and after college he worked for Modern Continental Construction Company where he worked as project engineer on construction of the Multilevel, Precast Segmental Interchange which was the largest and most complicated part of the Central Artery/ Tunnel Project part of the “Big Dig” in Boston, MA. He moved on to South Carolina and worked for Flatiron Structures Company as field engineer coordinating, designing, scheduling, supervising and developing procedures for methods and procedures for the Arthur Ravenel Bridge Replacement Project over the Cooper River and from there he went on to be assistant project manager for the demolition of the Silas N. Pearman and John P. Grace Memorial Bridges in Charleston, South Carolina.

Mr. Canty has been able to grow and expand his company specializing in civil, mechanical, electrical, and renovation, restoration, adaptive reuse and rehabilitation work in spite of the economic downturn. Freeland Construction has its headquarters in Charleston, South Carolina and regional offices up and down the eastern seaboard, including New England, Washington, DC and Florida.

Mr. Canty was married in 2002 to Aretha Canty from New York City, and is the proud father of 2 children ages 8 and 9 and the family resides in Charleston, SC. Mr. Canty is a member of the Charles Metro Chamber of Commerce, Society of American Military Engineers, National Association of Small Disadvantaged Businesses, and the Greater Charleston Business Alliance. He is also active in the Autism Community as both of his children are on the Autism Spectrum and is driven by the hope of an eventual cure to this condition that affects so many families.

Mr. Canty’s long range goal is to develop and expand his company throughout the east coast and because of his respect for the quality of the education he received at UMass he would like to use the close proximity to UMass to recruit, mentor and train engineers for the future.

When Mr. Canty is not working, he enjoys unique opportunities to do things that have nothing to do with his chosen profession. This includes all aspects of the shooting sports and operating high performance vintage vehicles. Mr. Canty holds a black belt in the Japanese martial art of Kodokan Judo and is still an active weightlifter.

He has been a member of Phi Beta Sigma Fraternity, Inc. for over twenty years and is active in his local chapter.
Ruth Bonsignore Exerts Game-Changing Influence on CEE and Far Beyond

Alumna Ruth M. Bonsignore ’83 serves as the chair of the Civil and Environmental Engineering Advisory Board, has been a longstanding member of the Advisory Board, was a 2011 recipient of the College of Engineering Outstanding Alumni Award, and was the 2015 recipient of the Jane Garvey Transportation Leadership Award. In 2017, she founded Flink Consulting, which provides management and advisory services for institutions, companies, and agencies to address today’s and tomorrow’s transportation needs. And those accomplishments don’t even begin to describe her consummate career.

Governor Charlie Baker appointed Bonsignore to the Board of Directors of the Massachusetts Department of Transportation (MassDOT) in 2015. As part of her board responsibilities, Ms. Bonsignore chaired the Capital Program Committee, sat on the Performance & Asset Management Advisory Council, and represented the board on the Green Line Extension internal project management team.

Bonsignore has 35 years of consulting experience in transportation planning and design. Until 2015 she served as senior vice president at the Massachusetts-based consulting firm of VHB, directing more than 400 transportation professionals. She has consulted with the Federal Highway, Transit, and Aviation Administrations, National Park Service, and the U.S. Fish and Wildlife Service, state departments of transportation throughout the east coast, many regional agencies, and local cities and towns. Bonsignore’s private-sector practice has focused on transportation master planning and design for higher education, entitlements for complex urban redevelopment, and special events management.

Bonsignore earned her B.S. in Civil and Environmental Engineering from the University of Massachusetts and her Master’s in Transportation from the Massachusetts Institute of Technology. Like many CEE students at UMass Amherst, Bonsignore said she benefited immensely from her involvement in funded undergraduate transportation research, working with Professors John Collura and Paul Shuldiner.

Clients seek out Bonsignore for her creative thinking, her strategic approach to our nation’s transportation challenges, and her continued search for the best possible solutions to address today’s mobility needs. As an example, Bonsignore managed a groundbreaking effort to rewrite the Mass-achusetts Highway Design Guide — a process and document which redefined the Commonwealth’s approach to transportation projects, emphasizing multimodal accommodations (bicyclists, pedestrians, and transit users), and integrating context-sensitive design principles throughout the project development process.

It is safe to say that the UMass Amherst Civil and Environmental Engineering Department, the College of Engineering, and transportation throughout the Commonwealth and beyond wouldn’t be what it is today without Ruth Bonsignore.

CEE Alumna Tiffany Labrie Chosen Business West's 40 Under 40 Class of 2018

Tiffany Labrie, who earned her B.S. and M.S. degrees from the Civil and Environmental Engineering (CEE) Department and is a member of the CEE Advisory Council, has been chosen by the Business West Staff for its 40 Under 40 Class of 2018. The program, which garnered 180 unique nominations this year, was launched in 2007 to honor young professionals in Western Massachusetts for their career achievements and service to the community. The criteria include excellence within one’s profession, a commitment to giving back to the community, dedication to family and work/life balance, and a focus on what else one does in each of those realms.

Business West celebrated the class of 2018 at its annual 40 Under Forty Gala on June 21 at the Log Cabin Banquet & Meeting House in Holyoke.

Labrie, age 36, is a project manager and Associate at Tighe & Bond Inc. In that capacity she manages planning-, design-, and construction-phase services for water and wastewater conveyance and treatment projects at Tighe & Bond, a 107-year-old engineering and environmental-services consulting firm. She has a B.S. in civil and environmental engineering and a M.S. in environmental engineering from UMass Amherst.

Labrie is also the clerk of the Southampton Planning Board and lives in Southampton with her husband, Jason, her daughters, Natalie and Robyn, and her rescue dogs, Amelia and Coco.

“I have many passions,” as Labrie said in her Business West write-up. “I guess that’s why I am always saying I need more hours in the day. I am passionate about my work and providing high-integrity, practical solutions to my clients’ challenges. I am passionate about my alma mater and its thriving Civil Engineering program that now enrolls more than twice as many students as when I was there, and is now more students’ first-choice school rather than their backup.”

Labrie added that “I am passionate about being a good mom and trying my best to balance quality time with my daughters, with teaching them what a mom can do in her professional career. I love watching my girls find their passions — dancing and doing gymnastics, riding their bikes, and playing in the mud.”

Labrie noted that she has many other passions as well, including serving the community with such programs as the Distinguished Young Women of Greater Easthampton and Help Our Kids Inc. and its annual event called Fitting for the Future, which provides Springfield-area foster teens with formal and business wear for those important events in high school, such as graduation and prom.

“Finally,” concluded Labrie, “I love dogs, and I wish I could adopt all the dogs needing homes. Someday, I hope to train to be a therapy team with one or more of my dogs.”
Professor Sergio F. Breña, who was elected as a Fellow of the American Concrete Institute (ACI) in 2009, has been with the faculty at the University of Massachusetts Amherst since 2000 and was recently appointed Associate Department Head. He has more than 22 years of experience in laboratory and field testing of structures and structural systems and has published over 50 papers in peer-reviewed journals and conference proceedings.

As a professional engineer from 1993 to 1996, Breña was the chief design engineer in Mexico City on projects that included the seismic rehabilitation of telephone buildings and the structural design of commercial and residential buildings. From 1992 to 1993, he was the chief design engineer in the tunnel design area responsible for supervising design of tunnels, vertical shafts, pump houses, and other structures for the Mexico City deep-drainage system and Metro. In addition, he was a design engineer from 1991–1992 involved in the structural design of the seismic retrofit projects of existing reinforced concrete buildings for TELMEX (State-owned Mexican Telephone Company).

Breña’s research interests include design and behavior of reinforced and prestressed concrete structures, use of fiber-reinforced materials in civil infrastructure applications, and field performance of bridges and buildings. Recent research projects include: investigations on the use of fiber-reinforced composites to strengthen existing reinforced concrete beams and columns; design and behavior of structural concrete elements using strut-and-tie models; earthquake performance of coupling beams; field performance of integral abutment bridges; live-load testing of existing bridges; laboratory testing of structural integrity requirements for progressive collapse resistance of concrete buildings; development of high-early strength concrete mixtures for bridge decks; and modeling of rehabilitated concrete columns for improved disaster resilience.

After the magnitude 8.8 Maule Earthquake in Chile in 2010, he was selected to participate with the ASCE/SEI reconnaissance team that traveled to the area affected by this disaster to document the performance of rehabilitated structures. In 2017, he was part of the earthquake reconnaissance team that was sent by ACI after the magnitude 7.1 Central Mexico Earthquake to document the performance of rehabilitated buildings in Mexico City.

Among his other academic positions, Breña was: a visiting professor at the Pontificia Universidad Católica de Valparaiso in Valparaiso, Chile, in 2011; a visiting professor at the École Polytechnique Fédérale de Lausanne School of Architecture in Lausanne, Switzerland, in 2009; and an adjunct professor at the Iberoamericana University in Mexico City from 1991 to 1996.

Breña is a lifetime member of the Mexican College of Civil Engineers. He earned the Texas Department of Transportation 2000 innovator award, he received a Concrete Research Council Research Fellowship in 2009–2010, he was awarded a Daniel P. Jenny Research Fellowship (2009–2010, 2010–2011), and that same organization gave him its 2011 Young Educator Award. The UMass Amherst ASCE Student Chapter recognized him in 2005 and 2015 as Faculty of the Year, and he has served as faculty advisor for the ASCE student chapter from 2015–2018.

Breña has been a member of the American Concrete Institute (ACI) since 1990, the Precast/Prestressed Concrete Institute (PCI) since 2003, the American Society of Civil Engineering since 1990, the Earthquake Engineering Research Institute since 1990, the Structural Engineering Institute of ASCE since 1996, the Boston Society of Civil Engineers since 2000, and the American Institute of Steel Construction since 2003.

Breña is currently a voting member of a subcommittee for the ACI Building Code and a voting member of the PCI Design Handbook committee. These two documents are used widely in the U.S. and abroad for design of reinforced and prestressed concrete structures.
Dr. Casey Brown, Professor, Environmental and Water Resources

Dr. Casey Brown is a professor in the Civil and Environmental Engineering Department at UMass Amherst and adjunct associate research scientist at Columbia University. His primary research interest is the development of analytical methods for improving the use of scientific observations and data in decision making, with a focus on climate and water resources, and he has worked extensively on projects around the world in this regard.

Brown's work has been funded by the National Science Foundation, NOAA, Department of Defense, World Bank, the US Army Corps of Engineers, and many others. As a principal and co-principal investigator, Brown has received approximately $10 million in support from over 14 different funding agencies.

As the head of the Hydrosystems Research Group, Professor Brown says that “The goal of our research is to improve our understanding of human-hydrologic systems so that they can be managed sustainably.”

The findings of his research will provide insight for planning and adapting the design and operation of water resource systems for a future of change. Brown's research approach is broadly characterized as systems analysis, employing a systems framework informed by hydroclimate science with a primary application to human-hydrologic systems.

This approach is applied in several focus areas. One is climate risk assessment and management in infrastructure systems, based on the fact that human-hydrologic systems and water infrastructure are particularly vulnerable to climate variability and change. In this context, Brown asks, “How should we quantify the risks of climate change to hydrologic systems and infrastructure? Can we design our water infrastructure to be adaptive to changing climate conditions and resilient to climate surprises?”

A second area of research is in decision making and risk. "Advances in hydrologic and climate monitoring and forecasting provide decision makers with unprecedented information upon which decisions can be based," says Brown. "However, the information is often unfamiliar to decision makers in source and formation and also accompanied by uncertainty.” Brown has therefore developed a process called “decision scaling,” which is designed to tailor hydrologic and climate information so that it suits the needs of decision makers.

Brown’s third area of research is sustainability in human-hydrologic systems, whose goal is “to understand and characterize human-hydrologic systems and how they respond to climate, demographic, land use, and institutional change.” The understanding produced through this scientific analysis is used to model the response of human-hydrologic systems to possible interventions for sustainability.

Among other accomplishments and honors, Brown has received the California Climate Science Service Award for 2014, the 2014 CEE Outstanding Researcher Award, the 2012 College of Engineering Outstanding Junior Faculty Award, the Presidential Early Career Award for Science and Engineering from NOAA, a 2011 National Science Foundation CAREER Award, and the ASCE Huber Research Prize in 2011.

Brown has a Ph.D. in Environmental Engineering Science from Harvard University and led the water team at the International Research Institute (IRI) for Climate and Society at Columbia University. He holds an M.S.C.E. degree from UMass Amherst.

Recently Dr. Brown received over $500,000 from the Rockefeller Foundation to support his groundbreaking research and analysis of freshwater resilience. This renewed funding brings the Rockefeller Foundation’s support of Brown’s research to a total of $1.6 million over the past four years.

Brown’s landmark work, conducted in collaboration with the World Bank, is bringing specific improvements to water management in Mexico City and the country of Tanzania, the two pilot demonstrations. But it also has worldwide implications because Brown’s methodology can be applied across the globe.

The purpose of Brown’s effort is to provide world-class technical expertise in support of the joint Rockefeller Foundation-World Bank freshwater resilience partnership, which promotes, demonstrates, and communicates the principles of freshwater resilience and thus improves scientific understanding of human-hydrologic systems so they can be managed sustainably.

Above: UMass Ph.D. student Sarah Freeman leads a discussion of water users at a recent workshop in Guanajuato, Mexico. Prof. Brown and the World Bank organized the workshop as part of their research on freshwater resilience in the Valle de Mexico and Mexico City.
Dr. Eric Gonzales has been a welcome and productive addition to the Civil and Environmental Engineering Department since arriving here in 2014 as a transportation expert. He has served as the principal or co-principal investigator on seven externally funded grants totaling more than $1,094,824 million ($452,892 as PI), he has accumulated 15 significant awards and honors since 2006, and he has published 12 papers in peer-reviewed journals, one peer-reviewed book chapter, 18 peer-reviewed conference proceedings, 32 additional conference papers and presentations, and seven impactful reports.

The research interests of Gonzales are in the operation, control, and design of urban transportation networks. His research bridges the fields of traffic flow theory, transportation systems modeling, and economics to improve the design and management of multimodal traffic and transit networks.

Gonzales has worked extensively with public transit agencies to improve demand-responsive paratransit services for customers with disabilities, starting with a 2012 project working with New Jersey Transit. Gonzales and his students developed models to estimate the effect of demand patterns and geographic arrangement of service areas on the operations and costs of the service. As the U.S. population ages, demand for paratransit services is increasing, and agencies are looking for ways to serve these users more cost-effectively.

In addition, Gonzales recently worked with the Pioneer Valley Transit Authority to investigate the potential cost savings for partnering with taxis to lower operating costs.

Recently, at a May 29, 2018, “listening session” convened by the Governor’s Commission on the Future of Transportation, Gonzales focused on “Autonomous Vehicles for Ride Sharing.” Gonzales spoke about how transportation network companies, such as Uber and Lyft, could be the first to employ fleets of autonomous vehicles. These companies already provide a communication platform for ride sourcing, meaning they match people looking for a ride with a driver in the area.
As Professor David P. Ahlfeld, P.E. (a Registered Professional Engineer in the State of Connecticut) prepares to retire from the Civil and Environmental Engineering (CEE) Department at the end of 2018, he will leave as his legacy an admirable portfolio of more than 50 papers in refereed journals, eight books and chapters in books, almost 40 conference proceedings, and nearly 40 technical reports.

In addition, between 1989 and 2014, Professor Ahlfeld received approximately 50 research grants as a principal and co-principal investigator. This funding totals more than $8,245,915 to support his research dealing with groundwater flow and contaminant transport, water resources engineering, systems analysis, and mathematical modeling.

Ahlfeld has been associated with: the Groundwater Management Group, which has created groundwater management software that is now widely distributed by the USGS; the Fish Passage Engineering group, which initiated the now international Fish Passage Engineering conference series; and the Quabbin/Wachusett modeling group, which analyzed water quality and quantity for Massachusetts reservoirs.

Dr. Ahlfeld, who came to UMass Amherst in 1998 as an associate professor, has been a full professor in the CEE department since 2004 and the Associate Department Head from 2012-2018. He has also served as the Chief Undergraduate Advisor since 2012. He was the chair of the ABET Coordinating Committee for the 2007 and 2013 accreditation cycles and has served in many other administrative roles. Before that, from 1988 to 1998, he had been on the faculty of the Department of Civil and Environmental Engineering at the University of Connecticut. Ahlfeld had been a lecturer and research associate at Princeton University from 1986 to 1988.

Professor Ahlfeld has a wide-ranging teaching record offering over 25 different courses to approximately 2,500 students at both the undergraduate and graduate levels. He has also supervised eight Ph.D. students and about 30 M.S. students during his career.

Ahlfeld has performed journal and proposal refereeing for many journals and agencies and has served as associate editor for Water Resources Research and the Journal of Hydrology. He has also served on 13 national and society committees over the years.

Ahlfeld earned his B.S. in Environmental Resources Engineering at Humboldt State University in Arcata, California, in 1983. He received his Ph.D. (1987) and M.A. (1985) in Civil Engineering from Princeton University.

Having established such a high bar of professional accomplishment, David Ahlfeld will be missed dearly by the CEE department and the College of Engineering.

In addition to continuing some of his professional activities, Ahlfeld looks forward to spending more time with family and friends; working on building projects and on his land; and more hiking and beach time.

Above: Getting ready to move a cord of firewood.

Above: At the beach house, enjoying the wind.

Left: Working with granddaughter in the shop.

Above: CEE Annual Picnic
2018 as a hydrologist. He received a degree in Environmental Engineering (2002) from the Technical University of Crete in Greece, and a M.Sc.E. (2004) and a Ph.D. (2009) in Civil and Environmental Engineering from the University of Washington. After spending two years as a post-doctoral researcher at Ohio State University’s Byrd Polar Research Center, he went on to become a Research Scientist at NASA’s Jet Propulsion Laboratory in 2011.

Dr. Andreadis has a broad interest in water resources and his research has focused on the intersection between applied hydrologic modeling and remote sensing, data assimilation, as well as the study of large-scale hydrology as it relates to climate change and environmental monitoring.

In 2015 he was the recipient of the NASA Early Career Achievement Medal for his work in developing a framework for assimilating satellite and other datasets into land surface models. Dr. Andreadis is a member of NASA’s upcoming Surface Water and Ocean Topography (SWOT) satellite’s science team developing algorithms for the mission’s data products, while also leading two projects that build capacity for agricultural and hydrological forecasting in developing countries including Kenya, Ethiopia, Vietnam and Cambodia.

Prof. Nicolas Tooker
Professor of Practice
Civil and Environmental Engineering

Congratulations to Prof. Nicolas Tooker who joined the department in Fall 2018. He received a B.S. in chemical engineering from Montana State University Bozeman, an M.S. in civil and environmental engineering from the University of California Davis, and he is currently completing his Ph.D. in civil and environmental engineering at Northeastern University. His research focused on improving the stability of biological phosphorus removal processes for wastewater treatment. The process he worked on allows facilities to improve their water quality without addition of chemicals, and also provides improved ability to recover phosphorus as a fertilizer.

Tooker previously worked as a consulting engineer at Tighe & Bond in Westfield, MA, where his work focused on phosphorus and nitrogen removal upgrades at municipal wastewater facilities across New England. He was a co-lead design engineer on the first project in the U.S. to use cloth media filters for meeting a total phosphorus permit limit of 100 parts per billion.

Tooker is an active member of the New England Water Environment Association (NEWEA) where he serves as the chair of the Student Activities Committee and is a member of the Plant Operations Committee. Tooker comes to UMass Amherst with connections to partners in industry and academia throughout New England and the country that he plans to leverage for bringing a practical approach to his teaching.

New Faculty

Dr. Kostas Andreadis
Assistant Professor
Environmental and Water Resources

Congratulations to Dr. Kostas Andreadis who joined the department in September 2018 as a hydrologist. He received a degree in Environmental Engineering (2002) from the Technical University of Crete in Greece, and a M.Sc.E. (2004) and a Ph.D. (2009) in Civil and Environmental Engineering from the University of Washington. After spending two years as a post-doctoral researcher at Ohio State University’s Byrd Polar Research Center, he went on to become a Research Scientist at NASA’s Jet Propulsion Laboratory in 2011.

Dr. Andreadis has a broad interest in water resources and his research has focused on the intersection between applied hydrologic modeling and remote sensing, data assimilation, as well as the study of large-scale hydrology as it relates to climate change and environmental monitoring.

In 2015 he was the recipient of the NASA Early Career Achievement Medal for his work in developing a framework for assimilating satellite and other datasets into land surface models. Dr. Andreadis is a member of NASA’s upcoming Surface Water and Ocean Topography (SWOT) satellite’s science team developing algorithms for the mission’s data products, while also leading two projects that build capacity for agricultural and hydrological forecasting in developing countries including Kenya, Ethiopia, Vietnam and Cambodia.

Prof. Nicolas Tooker
Professor of Practice
Civil and Environmental Engineering

Congratulations to Prof. Nicolas Tooker who joined the department as a Professor of Practice in Fall 2018. He received a B.S. in chemical engineering from Montana State University Bozeman, an M.S. in civil and environmental engineering from the University of California Davis, and he is currently completing his Ph.D. in civil and environmental engineering at Northeastern University. His research focused on improving

Above: Making Our Planet Great Again with a live Julia data assimilation demo by Kostas Andreadis.
Geotechnical

Professor Don DeGroot and geotechnical engineering graduate students examining results of an undrained direct simple shear test being conducted on a soft coastal Louisiana soil. The test is part of a research program on resiliency of coastal Louisiana marshes and the use of nature-based features to protect against rising sea level and storm surge. The work is part of the Ph.D. dissertation of Arash Pirouzi (far right); other graduate students include (left to right): Yiming Cao, Shreeya Pandey, Andrew Rohrman, and Hossein Ganji.

Transportation

UMass CEE researchers, Drs. Song Gao (left) and Eleni Christofa (far right), and research assistants, Sayeeda Ayaz, Aikaterini (Katerina) Deliali Hossein Ghafourian, and Nicholas Fournier, in collaboration with MIT Professors Moshe Ben-Akiva and Jessika Trancik, recently finished a project sponsored by Advanced Research Projects Agency - Energy, (ARPA-E) of the Department of Energy. The project developed "Sustainable Travel Incentives with Prediction, Optimization and Personalization" (Tripod), a system that incentivizes travelers to pursue specific routes, modes of travel, departure times, ride sharing, trip making, and driving styles in order to reduce energy use. Tripod presents users with real-time travel information, as well as personalized options via a smartphone app, and it includes a reward points system to incentivize users to adopt energy-efficient travel options, such as taking transit instead of driving, or traveling during off-peak hours. Reward points, or tokens, could be redeemed for prizes or discounts at participating vendors, or could be transferred amongst users in a social network.

Environmental and Water Resources

Professor Casey Brown's Hydro Systems Research Group is leading the Freshwater Resilience by Design initiative, funded by the Rockefeller Foundation and conducted in partnership with the World Bank. The team is helping the World Bank and their water management partners in Tanzania and Mexico to incorporate resilience into their water planning. Left is a picture of participants in a recent workshop held at UMass. The project also consists of field work.

Structural Engineering and Mechanics

Professors Simos Gerasimidis and Sergio Breña are currently working on a project sponsored by MassDOT to develop load rating procedures for steel bridges that contain end damage caused by corrosion. Beams obtained from a bridge replacement project are being tested at the Brack Structural Engineering Laboratory to measure parameters that will assist the researchers develop load rating recommendations. The project has several major activities, including finite element simulations of damaged steel girders, that will be calibrated based on test results from the laboratory. UMass Amherst graduate students Georgios Tzortzinis (Ph.D.) and Brendan Knickle (M.S.) are conducting the research activities for this project.
Graduate Student Spotlight: Casey Fontana, Structural

Casey Fontana is a Ph.D. student in civil and environmental engineering, advised by Dr. Sanjay Arwade and Dr. Don DeGroot. She received her B.S. in civil engineering from The College of New Jersey in 2014. Her work has been primarily funded by the NSF IGERT program at UMass, an interdisciplinary cohort of Ph.D. students, faculty, and industry members devoted to advancing the U.S. offshore wind industry. Casey has always felt strongly about contributing to clean energy development - she is thrilled to research wind energy topics for her doctoral work, and will be continuing in the wind energy industry following the completion of her degree. “The wind energy community is full of vibrant, driven, and extremely intelligent individuals. I have been humbled to collaborate with some of them, and I happily look forward to a long future in this field of work.”

Her structural and geotechnical engineering is aimed at reducing the high cost of offshore wind energy, as offshore development locations offer better wind resources and proximity to population centers. Her initial work on fixed-bottom turbines investigated the sensitivity of a turbine’s structural response to increased foundation damping, as current design standards may assume an overly conservative stiffness at the soil-pile interface. Her primary project, however, has explored the design and dynamics of a multiline anchor system, in which floating offshore wind turbines share anchors instead of each being moored separately. Implementation of this system could result in lower costs for materials, installations, and geotechnical site investigations.

She completed a research internship at Vryhof Anchors in Rotterdam, Netherlands, and this industry perspective both verified the feasibility of the novel anchoring concept, and guided the direction of her next research steps. Her computational research has yielded two papers published in the Journal of Wind Engineering and the Journal of Wind Energy and three papers presented at the International Conference on Ocean, Offshore & Arctic Engineering, the International Conference on Structural Safety & Reliability, and the International Ocean & Polar Engineering Conference.

What UMass Amherst student organization are you involved with?
Treasurer of the UMass Amherst Chapter of American Society of Civil Engineers (ASCE), Peer Mentor in UMass Residential Life.

Are you involved in research or experiential learning?
I am a member of the Kumpel Research Group.

Undergraduate Student Spotlight: Stephen Stamegna

What are your plans after graduation in 2019?
Travel in Europe, obtain a full-time position at a civil engineering firm or construction management firm.

How has been your experience at UMass CEE been?
I have very much enjoyed my time in UMass CEE. I have received so many valuable skills through the curriculum, from the professors, during research, and my involvement in ASCE. I have learned how to approach problems in a unique and methodical way and I have gained hands-on experience in an interdisciplinary array of fields.

What do you value the most from your UMass experience?
Learning how to critically think, being exposed to a wide variety of circular and extracurricular activities and developing my organizational skills through the challenging environments that I have been placed in.

What UMass Amherst student organization are you involved with?

Treasurer of the UMass Amherst Chapter of American Society of Civil Engineers (ASCE), Peer Mentor in UMass Residential Life.

Are you involved in research or experiential learning?
I am a member of the Kumpel Research Group.
American Society of Civil Engineers, ASCE

ASCE has had a great past year. Our three build teams, ASCE Concrete Canoe, AISC Steel Bridge, and EERI Seismic Design, were all able to compete for the first time in several years. Our Steel Bridge Team scored first place in aesthetics and our Seismic Design team finished within the top 50% of the national competition.

Our goals for this year are to further strengthen our build teams and increase underclassman engagement. We have already had a successful chapter meeting and formed our design teams for the year. If you want any more information about our events or would like to support us, email us at umassamherstasce@gmail.com.

Engineers Without Borders, EWB, Ghana Program

The UMass Amherst EWB Ghana Program travelled to Saviefe-Deme for an 11-day trip this past August to construct nine household biosand filters and conduct hydrogeological tests to assess for borehole rehabilitation. The travel team consisted of seven students and their professional mentor, Dr. Wayne Bates, a registered Professional Engineer from Tighe & Bond, Westfield, MA.

In Ghana, the travel team purchased all of the materials necessary to build the biosand filters in Ho, a small city near Saviefe-Deme. Biosand filters are designed to be a simple, cost-effective way of killing pathogens in water with materials consisting of everyday items like sand, gravel, buckets, and piping. Over the next few days, the team worked together with members of the community to build the filters. The team performed E. coli tests on some of the drinking water sources in the community, and discovered a particularly high concentration of the bacteria in one of the hand-dug wells. Thus, the team decided to build one of the filters close to this well. The team also conducted public health surveys on 16 families, and hired a hydrogeologist to run tests on the boreholes in the community.

With the new information from the hydrogeologist, the team now plans to rehabilitate the low-yield boreholes in Saviefe-Deme, and increase the access to clean water.

Institute of Transportation Engineers, ITE

Summer 2018 was a busy summer for UMass ITE Student Chapter with students attending both the Northeastern ITE Annual District Meeting in Lake George where students presented posters and the ITE International Annual Meeting in Minneapolis, Minnesota where students both presented posters and competed in the Collegiate Traffic Bowl.

We have already started what looks to be a busy fall semester starting off with a newly appointed Executive Board, holding our first monthly meeting of the fall semester, and one student member being awarded the NEITE Desjardins Award at the MAITE Annual Meeting. The Student Chapter plans to hold and attend yearly events like Adopt-A-Highway cleanup, Hot Chocolate Run to Benefit Safe Passage, our annual Holiday Party in December, and regional ITE meetings. The Student Chapter plans to host new events this semester like Bike Safety Seminars at local schools, Bike donation event for Bob “The Bike Man” and help plan the SaferSim Meeting being held at UMass on November 16-18.

Women in Transportation Society, WTS

UMass WTS Student Chapter welcomed Ms. Clary Coutu, Director of Environmental Affairs of Keolis Commuter Services, to speak at the WTS Spring speaker series in February 2018. The student chapter volunteered at the WTS booth at the MassDOT Innovation Conference in Worcester in April.

UMass WTS members attended the 2018 Transportation Camp New England at MIT. The students had the opportunity to learn first-hand about the current technological advances in transportation and technology during that event. The student chapter met with Mr. Vinay Mudholkar at UMass, who has been the lead on many rail projects across the U.S. The students gained knowledge about high speed rails during their discussion with him.

This year, the chapter attended the WTS-Boston 2018 Annual Scholarships and Awards Dinner in Boston in June. The chapter president Sayeeda Ayaz received the WTS-Boston Member Graduate Scholarship this year. In October, UMass WTS volunteered at the Geek is Glam Girl Scouts STEM Expo at WPI, Worcester.
The College of Engineering relies upon the philanthropic support of alumni, friends, and corporate partners to maintain the excellence of our educational and research programs.

Your contribution to the Department of Civil and Environmental Engineering will be put to work immediately providing the tools our students and faculty need to change the Commonwealth, the nation, and the world.

For more information on ways to give, please visit www.umass.edu/giving/.