SID AND REVA DEWBERRY DEPARTMENT OF CIVIL, ENVIRONMENTAL AND INFRASTRUCTURE ENGINEERING CLASS OF 2014 CELEBRATE THEIR ACCOMPLISHMENTS
April 20, 2015

Dear Members and Friends of the Civil Engineering Institute,

It is a great honor to become the Chair of the Civil Engineering Institute (CEI) in its 25th year of serving George Mason University. From its founding in 1989 as the Urban Systems Engineering Institute to today’s formulation as the Civil Engineering Institute in support of the Sid and Reva Dewberry Department of Civil, Environmental and Infrastructure Engineering, much has changed. The department has a much larger program with more students and faculty, with greater requirements, but what has not changed is the commitment of the CEI members to support the department’s advancement.

During this past year CEI was proud to be a partner with the University to achieve the following:

• Provided guidance to the department on curricula enhancement;
• Identified adjunct faculty and guest speakers;
• Held our 8th Annual Awards Luncheon where engineering excellence and leadership was honored;
• Sponsored critical funding for students so they could participate in learning experiences through Chi Epsilon, ASCE, DBIA, Engineers for International Development (EiID), and SAME;
• Funded scholarships and fellowships for deserving students, including for the first time, graduate students through the newly established Balfour Beatty Distinguished Graduate Fellowship;
• Through CEI member companies, provided in-kind equipment to enhance teaching using state-of-the-art equipment;
• Held numerous counseling and advisory sessions for students to assist in their career opportunities;
• Offered internship and placement opportunities to students.
• Provided general support of the program and students.

Much remains to be done as the demand for talented engineers from our program continues to increase. CEI fulfills a vital role in assisting the department as we can leverage outside resources and ensure the relevancy of the program to the industry and region. As financial stresses continue to challenge the University, we can also ensure critical funds are available to enhance the student learning experience and attract the most outstanding faculty. Join with us as we build upon our legacy and meet the challenges incumbent upon one of the fastest growing civil engineering programs in the United States.

The Board of Directors takes great pride in presenting this 2014 Annual Report. The Institute continues to run on a sound fiscal basis and is looking forward to another great year. Join with us in this endeavor.

Sincerely,

S. Richard Benton, P.E., FASCE, DBIA
Chair
growth

Since joining the Sid and Reva Dewberry Department of Civil, Environmental and Infrastructure engineering Department in 2010, I have witnessed the continued evolution and expansion of our research and teaching program to address 21st century engineering challenges with the most advanced technology, a global perspective and an interdisciplinary approach. The Civil Engineering Institute has left its mark on every facet of this development through for example, support of our undergraduates with international experiences, fellowship support for graduate student research, provision of state of the art laboratory and field equipment and industry expertise and vision to inform the direction of our graduate curriculum and prepare students for work in an innovative, global marketplace. The annual report presents a snapshot of our faculty and students’ scholarly activity in 2014 as well as service to the local, regional and international community.

CEIE continues to be an exciting place to learn as evidenced by our continued increase in student enrollment. In 2014, 66 BS degrees, 20 MS degrees and 3 PhD degrees were conferred and we expect 69 seniors to complete their BS degrees in FY 2015. To support our growing enrollment and strategic expansion of our research program, two new faculty, Dr. Viviana Maggioni and Dr. Anthony Battistini, joined our department in 2014, expanding our expertise in advanced technology, water resources/environmental engineering and structural engineering.

In 2014, we expanded our capital resources with the addition of the Advanced Infrastructure Monitoring Lab (AIM). The AIM laboratory houses a variety of non-destructive evaluation (NDE) equipment, as well as purpose-built facilities for the design and construction of inspection robots. The laboratory also offers high-performance computing capabilities and in-house image analysis software. As AIM Lab director, Dr. David Lattanzi will work with students in the lab on a variety of research initiatives, including drone-based bridge inspection and 3D printed structures. In support of the expansion of our geotechnical research and teaching program, Dr. Burak Tanyu has procured a resilient modulus/permanent deformation apparatus used to perform a variety of experiments to determine the modulus and deformation of soils and aggregate under variable traffic loads. This addition was made possible by the generous contributions of the Virginia Department of Transportation, ECS, Geocomp, and the Volgenau School of Engineering Dean’s office.

The continued expansion of the department’s research program includes recruitment of 11 new PhD students, 25 new MS students, 7 new MEng students, 8 new Non-degree students and a robust undergraduate research program. Undergraduate research ranges from the study of biodegradation of hydraulic fracturing fluids to virtual bridge inspection and the study of precipitation satellite data. Our undergraduate research program supports the development of creative problem solving and data mining and analysis skills,
experience with advanced laboratory and computing technology and opportunities for public presentation of research findings. During the course of their research experience, many of these students develop an interest in graduate studies and research.

In summer 2014, the Department hosted its second year of the Summer Research Experience for Foreign University Students (SREFUS). Drs. Ferreira, Kosoglu, Lattanzi, Maggioni, Tanyu and Zhu hosted 10 students from China, Italy, Pakistan, Taiwan and Turkey for a 3 week research experience in residence at GMU. Students worked side by side with GMU undergraduate and graduate students engaged in research in our laboratories and the field.

The SREFUS program allowed us to expand our international reputation as did another new initiative with Beijing Jiaotong University (BJTU). In 2014, GMU signed two Memorandums of Understanding with the School of Transportation at BJTU to promote research collaboration and student exchange. One agreement creates the opportunity for undergraduate students with senior standing from BJTU to spend a portion of the summer conducting research with faculty in our department. The second MOU establishes a dual masters degree program between GMU and BJTU. The Department is currently exploring expansion of the program to the School of Civil Engineering at BJTU.

As part of our strategic expansion of our research program to address regional, national and global challenges in civil engineering, we are pleased to announce the establishment of the Bill and Eleanor Hazel Endowed Chair in Civil and Infrastructure Engineering. The endowed was announced at a celebration in May 2014 to honor Bill Hazel's life and his significant contributions. Pulitzer Prize-winning author David McCullough served as the event’s keynote speaker, focusing on the history of the Panama Canal: one of the world’s great civil engineering achievements, and a source of inspiration for Bill Hazel. We are grateful to the Hazel family, to Mr. Sid Dewberry for his vision for this initiative and the many donors who made the Endowed Chair possible. The faculty search for the first Bill and Eleanor Hazel Endowed Chair in Civil and Infrastructure Engineering is currently underway.

As we grow and increase our national and international reputation, it is inevitable that our best will draw attention and be called to serve our profession in other significant and influential ways. Dr. Deborah Goodings, the Dewberry Professor and Chair of the Department since 2009, was selected in December 2014 to serve as the director of the National Science Foundation’s Division of Civil, Mechanical, and Manufacturing Innovation (CMMI). With an annual portfolio of over $200 million dollars, the CMMI division has a mission to fund fundamental research and education in support of advances in the disciplines of civil, mechanical, industrial and manufacturing engineering, materials design and the reduction of risks and damage resulting from earthquakes and other natural and technological hazards. During her Intergovernmental Personnel Act appointment with NSF, Dr. Goodings will remain in close contact with the department serving as an advisor. Her numerous initiatives have been critical to the Department’s upward trajectory and we will continue to value her insight and support of our development.

As we move ahead in 2015, we remain grateful for our partnership with local, federal and state research laboratories who provide laboratory space and research opportunities for our faculty and students, and our industry partners who provide focus to our research and teaching endeavors, expert adjunct practitioner faculty who deliver state of the art design knowledge, and employment opportunities for our students. We are especially grateful for the indefatigable support of the Civil Engineering Institute and their vision of our Department as a global leader in civil and infrastructure engineering education. Our partnership with industry defines us and we look forward to another year of success with our industry partners beside us.

Sincerely,

Liza Wilson Durant, PhD
Acting Chairman of the
Sid and Reva Dewberry Department of Civil, Environmental and Infrastructure Engineering
More than 300 people attended the Civil Engineering Institute Awards Luncheon and Annual Meeting in 2014, with 27 firms and individuals sponsoring full tables. The first attempt in February was canceled due to one of Washington’s largest snowfalls. Attendees found time in their calendars, however, to come together for the event rescheduled for March 4.

Guests were welcomed by Mr. Hardeep Rana, the Civil Engineering Institute chairman. Dr. Peter Stearns, retiring from his leadership position as provost of George Mason, expressed his undiminished enthusiasm for the university and stressed the importance of community support, nowhere more evident than at these CEI gatherings. Volgenau Dean Kenneth Ball echoed Provost Stearns’ optimism; voiced his admiration for the department’s vision and its success in turning that vision into reality; and congratulated the civil engineering practice community for its enduring partnership.

New Civil Engineering Institute board members were elected. Outgoing and continuing Civil Engineering Institute board members were recognized for their service. Dr. Goodings, as CEIE department chairman, provided an overview of the department’s current status and described the department’s ambitions for the next year.

Mr. Rana introduced the distinguished 2014 Engineering Excellence and Leadership awardee, John T. Hazel, Jr., known to most in Northern Virginia as Til Hazel. Mr. Hazel has been a major force in shaping the urban development of Northern Virginia, beginning with his extensive practice in land use law, and expanding into direct partnership in some of the region’s largest development projects. His remarks, entitled Transportation and Politics, began with an assessment of successes and disappointments in Northern Virginia’s transportation planning process, and concluded with his views on choices facing the region in both the near term and longer term.

Former CEI President Hardeep Rana, P.E. and Dr. Deborah Goodings present the 2014 Engineering Excellence in Leadership Award to John T. Hazel, Jr.

George Mason University Civil Engineering Institute 2014 Awards Luncheon and Annual Meeting Special Sponsors

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The Civil Engineering Institute is a nonprofit corporation registered in the State of Virginia since 1989, with the purpose of assisting the Sid and Reva Dewberry Department of Civil, Environmental and Infrastructure Engineering program of George Mason University. The objectives of the Civil Engineering Institute include:

- Advising on curricula changes to keep the program on the leading edge of the professional practice.
- Providing a liaison with the business community for teaching and advising.
- Assisting in internship placement for students.
- Assisting in securing nationally-recognized faculty by raising private eminent scholars endowments.
- Fundraising for scholarships, student activity support, and academic program assistance to supplement that provided by the university.

By participating in a variety of Civil Engineering Institute activities – academic, leadership, educational and social – companies and individuals become integrated into the most quickly advancing civil engineering program in the Washington D.C. metropolitan region.

The 28 members of the Civil Engineering Institute Board in 2014 represent contractors, public utilities, developers, and design firms across the spectrum of civil engineering, in addition to civic-minded individuals eager to support the department’s mission to educate the coming generation of new engineers. More information is available on the department website at http://civil.gmu.edu/about-cei.

**ANNUAL DUES FY2014**

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In 2014, Mr. Hardeep Rana completed two years of outstanding service as chairman of CEI and Mr. Richard Benton, P.E., became CEI chairman. Mr. David Laib accepted the position of CEI vice-chairman. Dr. Deborah Goodings, P.Eng., completed her service as Executive Director in 2014, and she is succeeded by Dr. Liza Wilson Durant. Mr. Brian Chromey, P.E., serves as the appointed CEI Treasurer.

The Civil Engineering Institute is grateful for the service of Mr. Lou Canonico of christopher consultants, Mr. John Groupe of the Engineering Groupe, and Mr. Edward Venditti of Pennoni, who are leaving the CEI Board after years of generous service.
The faculty and graduate students of the Sid and Reva Dewberry Department of Civil, Environmental, and Infrastructure Engineering are engaged in interdisciplinary implementation of the most cutting edge technological tools to address the civil engineering challenges of the 21st century. The following are highlights of new, developing research programs within the department.

**Dr. Celso Ferreira’s** research group (http://frg.vse.gmu.edu/) focuses on investigating and developing solutions that increase society’s resilience with respect to water related natural hazards. They are currently investigating the natural environment’s potential to mitigate hurricane flood impacts to critical infrastructure. Dr. Ferreira’s research considers the impact of climate change, sea-level rise, urbanization and environmental degradation on engineering design. His group works across spatial scales and their projects range from international (e.g. the Bay of Bengal) to regional and local applications (e.g. the Chesapeake Bay region, Northern Virginia, Baltimore and Washington DC metropolitan areas). In addition to advances in water resources, environmental and coastal engineering, his team works in a highly interdisciplinary environment providing expertise to climate scientists, systems engineers, ecologists, social scientists, public policy makers and public health scientists. His work combines field instrumentation for environmental monitoring, numerical modeling, High Performance Computing (HPC) and Geographical Information Systems (GIS).

**Dr. David Lattanzi’s** research group (http://frg.gmu.edu) is primarily working on two initiatives which leverage artificial intelligence techniques to assist engineers.

The first examines how computer vision can be used to assist inspectors performing structural assessments, either during routine maintenance or during post-disaster scenarios. Their research methodology employs a combination of advanced 3D geomatics and machine learning to conducting assessments. The second initiative examines how to better incorporate artificial intelligence techniques into the structural prototyping process. Dr. Lattanzi’s team collaborates with the US Forest Service, and the Virginia DOT, and receives significant support from the National Science Foundation as well as the NVIDIA corporation.

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**RESEARCH ASSISTANTS**

**SETH LAWLER AND JUAN LUIS GARZON HERVAS** COLLECT STORM SURGE DATA IN THE CHESAPEAKE BAY
Dr. Viviana Maggioni’s research group focuses on the application of remote sensing techniques to estimate and monitor hydrological variables. It is an interdisciplinary team with interests that lie at the intersection of water resources engineering, hydrometeorology, and remote sensing. Research activities include study of the degree of accuracy in the measurement of precipitation from satellites, remote sensing applications on urban storm-water modeling and application of multi-dimensional stochastic error schemes to hydrologic models. Her group has applied climate modeling and remotely sensed earth observations to such diverse topics as the study of malaria cases in the Amazon Basin and locust swarm behavior in Saharan Africa. Dr. Maggioni’s group is building a bridge between remote sensing, environmental impacts and human health.

Dr. Burak Tanyu’s Sustainable Geotransportation Infrastructure (SGI) research group (http://geotrans.vse.gmu.edu/home) focuses on applied research in geotransportation. His research group is currently evaluating the effects of aggregate shape on performance of base pavement layers, developing methods to recycle concrete and asphalt in road and retaining structures, and developing a design methodology to construct bridge abutments using an innovative geosynthetics/soil structure as an alternative to conventional abutments constructed with concrete.

Additionally, Dr. Tanyu is collaboratively working with Dr. Ferreira on developing a methodology to estimate infrastructure damage caused by hurricane floods and associated scour. Dr. Tanyu also collaborates with Drs. Leshchinsky and Olsen from Oregon State University in developing an algorithm to map existing landslides that threaten transportation infrastructure. The group’s research activities have been funded by transportation agencies including the Virginia DOT and FHWA/NCHRP.

Dr. Shanjiang Zhu’s research group seeks to provide answers to critical policy questions regarding the performance, potential, and sustainability of transportation systems in a changing world. As part of the TransInfo University Transportation Center, Dr. Zhu’s group has been funded by USDOT to investigate innovative applications of both conventional and emerging transportation data to improve congestion mitigation, traveler information, and incident management systems. His research group also works closely with VDOT to address regional transportation problems through the evaluation of the transportation impact of the Silver Line and traffic incident patterns in Northern Virginia. Dr. Zhu also collaborates with research teams at the University of Maryland to evaluate integrated congestion mitigation strategies in mega-cities. He was named the recipient of the International Transport Forum’s 2014 Young Researcher of the Year Award for his contributions in this field.
With over 100 actively engaged graduate students in the Sid and Reva Dewberry Department of Civil, Environmental and Infrastructure Engineering, the number of graduate students engaged in high impact research is on the rise. The following student highlights represent the breadth of student research inquiry.

**PHD STUDENT ALI KHALOO USES VIRTUAL REALITY TO GET A NEW PERSPECTIVE ON BRIDGE ENGINEERING**

Aiyoub Abbaspour (PhD Student – Tanyu Research Group) is engaged in gradient ratio experiments, evaluating the clogging potential of recycled concrete and a typical underdrain geotextile fabric used in Virginia roadways. The outcome of this research study will provide scientific assessment of development of calcium-based ions over freshly produced and aged recycled concrete stockpiles and potential for the calcium-based ions to precipitate and clog the underdrain systems. The findings of this study will be used to revise the VDOT specifications allowing use of recycled concrete aggregate as part of base course. This change will provide significant cost savings that will be beneficial to taxpayers in the Commonwealth of Virginia.

Juan Luis Garzon Hervas (PhD student – Ferreira Research Group) is working on a National Science Foundation (NSF) funded project that is part of a multi-million dollar multi-institution research endeavor. Juan is part of an interdisciplinary team of researchers developing an integrated model, the Integrated Hazard, Impact, and Resilience Model. The model will enhance our understanding of the impacts of repeated hurricanes and heat waves on regional vulnerability and resilience and aid in developing approaches for improving resilience to these repeated hazards. Juan is specifically working on identifying innovative methods to integrate storm surge modeling into an interdisciplinary modeling framework. He is also focusing on the search for the “perfect storm” and the potential for extreme flooding conditions as a result of complex interactions of amplifying the tidal resonance inside the Baltimore Harbor. This work, when completed, will have a direct impact on engineering flood risk analyses for areas along the mid-Atlantic coast that include critical infrastructure and highly populated areas.

Ali Khaloo (PhD student – Lattanzi Research Group) is researching how to combine computer vision and artificial intelligence to conduct structural analysis. He is developing techniques to automatically convert digital images into finite element models of structures to facilitate an entirely novel method for inspectors and engineers to assess the integrity of structural systems. Ali will present his research at the annual Structures Congress, as well as the highly-regarded International Workshop on Computing in Civil Engineering.
Meredith Jackson Morgan (Ph.D student, Zhu Research Group) is investigating methods to improve corridor travel time prediction using probe data collected by the third party and thus enhancing corridor traffic management. Her research uses advanced data mining techniques to identify dynamic patterns in traffic time along congested corridors. Traffic patterns identified through this process will be integrated in a corridor traffic management system by considering dynamic behavioral reaction of travelers to various management strategies. Meredith has developed a regional traffic simulation system to test her strategies. This work could support traffic management agencies to optimize operations of facilities such as shoulder lanes, variable message signs, and ramp meters.

Aneel Mousam (MS Student – Maggioni Research Group) is testing the hypothesis that climate changes have played a key role in the recent increase of malaria cases in Peru.

Malaria cases reported by the Peruvian Ministry of Health demonstrate a 61% reduction of malaria in the last decade (2001-2010), however during the years 2011-14 malaria increased by over 2.5 fold. Past studies have indicated that there is a strong association between climate variability and malaria rates. Climate data, such as precipitation, temperature, humidity and surface pressure simulated by the NASA MERRA model during a 10-year time series (2004-2013) will be used to verify this hypothesis.

Maryam Zavareh (PhD Student – Maggioni Research Group) is monitoring the George Mason University (GMU) campus watershed and its contribution to the Chesapeake Bay, the largest estuary in the United States. Her project seeks to provide a unique combination of hyper-resolution environmental data collection (in-situ observations, remotely-sensed data, model simulations), and real-time and long-term predictions to advise decision makers on storm-water quality and quantity management practices. This will enable sustainability, improve facility management and optimize planning of stormwater quality and quantity.
2014 OSCAR RESEARCH GRANT Awardees

Our research endeavors enrich the undergraduate experience. Ten Undergraduate students were awarded research grants from the GMU Office of Student Scholarship, Creative Activities, and Research to pursue research at the direction of CEIE faculty.

Afsana Anwar  
Mentor: Dr. Viviana Maggioni  
Research Project: To What Degree of Accuracy Can We Measure Precipitation from Satellites Over Oceans?

Rebecca Brenneis  
Mentor: Dr. Viviana Maggioni  
Research Project: A Comparison of Satellite Precipitation Data with Locust Swarm Behavior in Saharan Africa

Jeff Bynum  
Mentor: Dr. David Lattanzi  
Research Project: Bringing 3D Printing Into the Engineering Classroom

Dominick Casciano  
Mentor: Dr. Liza Wilson Durant  
Research Project: Hollow Glass Microspheres as Lightweight Aggregate in High-Performance Concrete

Saeideh Fahoul  
Mentor: Dr. Laura Kosoglu  
Research Project: Stone Restoration Treatments as Montmorillonite Swell Inhibitors

Andrea Fraser  
Mentor: Dr. Liza Wilson Durant  
Research Project: Microbial Degradation of Organic Compounds in Hydraulic Fracturing Produced Waters

Jana Haddad  
Mentor: Dr. Celso Ferreira  
Research Project: The Insider’s View of the Storm: Analyzing the Watershed Response at George Mason University

Jared Keller  
Mentor: Dr. David Lattanzi  
Research Project: Drones: An Alternative Bridge Inspection Method

Justin Kurz  
Mentor: Dr. Liza Wilson Durant  
Research Project: Graphite Nanomaterials as Concrete Reinforcing

Santosh Neupane  
Mentor: Dr. Celso Ferreira  
Research Project: Killer Cold Waves: What is Causing it in Nepalgunj?
Student-driven extracurricular activities are invaluable for developing skills in engineering and in teamwork. They provide an avenue for practicing engineers and students to connect directly. Faculty advisors support, rather than lead student initiatives, but nonetheless play important roles in keeping the students on track and vouching for them as projects and fundraising rise in complexity. Many of these activities are underwritten by the Civil Engineering Institute.

The GMU Chapter of Chi Epsilon, the national civil engineering honors society, inducted 12 new members in 2014, bringing the total number of GMU Chi Epsilon members to 92 since the chapter was founded.

In April, 2014, the NoVAPost of the Society of American Military Engineers (SAME) hosted its annual luncheon at GMU. The speaker, Steve Hargan, Business Development Manager for the Loudoun County Department of Economic Development, spoke about how Loudoun County’s growth has been fueled by the ongoing Metrorail Silver Line project. The GMU Chapter of SAME was awarded the 2013 Distinguished Student Chapter Award in May 2014.

In May 2014, Engineers for International Development (EiID) sent a team of ten students and two professional advisors to Sabana Grande, Nicaragua. The implementation trip served as the completion of a two phase project to provide a water storage and distribution system to the local community. During this time, the students and volunteers of EiID installed over 2 miles of PVC pipe, assembled and installed 30 water stations, and erected an 8 foot tall CMU block base to support a 10,000 liter water storage tank. The successful completion of this project has provided more than professional design and field experience for the students; it has provided hope and new opportunities for the community members. Now, children can focus on being children instead of having to walk long distances in order to access water. Community elders no longer have to worry about having someone physically capable of carrying buckets of water to their homes. Most importantly, the community may now grow and develop thanks to the health improvements brought by access to clean water. These rewards continue to inspire and motivate the student engineers of EiID to continue to serve others through their profession. Mathew Doyle, P.E. and Chris Triolo of the Fairfax County Department of Public Works and Environmental Services accompanied students on the implementation trip.
In Fall 2014, EfID expanded its portfolio of projects by making plans for an assessment trip to Puerto Cabezas, Nicaragua. In January, 2015, EfID conducted the assessment trip to collect data and survey information for a future project to be implemented in May 2015. The team was comprised of four students and two professional advisors, who were able to gather information and data for two potential projects in Puerto Cabezas, as well as three future projects. The focus of the assessment was the collection of GPS information, establishment of current water conditions, and understanding of the needs of the communities. EfID has decided to focus on two projects for May 2015 that will improve the water quality and access at both a feeding center and an orphanage. The feeding center provides a nutritious meal once a day to approximately 600 kids living in Puerto Cabezas. Mathew Doyle, P.E. and Dr. Anthony Battistini will accompany the students on the implementation trip in May 2015.

Over the past year, the GMU Student Chapter of the American Society of Civil Engineers held 9 professional meetings with speakers addressing engineering and ethics topics ranging from the merits of PE licensure to bridge failures in the United States. The student chapter of ASCE also hosted a career fair with 17 companies and several career panels and student resume workshops in preparation for the event. The ASCE students remain the largest organization within CEIE and supports students’ professional development with professional meetings, field trips to civil engineering projects such as the Inter County Connector (ICC) in Maryland and participation in the regional ASCE Virginia’s Conference.

This year, students participated in two major community service events. During the USA Science and Engineering Festival, the GMU steel bridge team built and displayed their bridge and taught young students about designing and building engineering structures and shared their enthusiasm for the profession. Students also supported the community by participation in the DC Building Industry Association (DCBIA) Community Improvement Day. This project enabled ASCE students to serve the community by helping to plan and develop a children’s park in the heart of Washington, D.C.

More than 30 CEIE students attended the American Society of Civil Engineers Virginia’s Conference hosted by the University of Virginia April 3-6, 2014. Students from civil engineering programs in Virginia, West Virginia, and the District of Columbia competed in a variety of civil engineering competitions and challenges including the year-long steel bridge design-build competition and the design-build-race concrete canoe competition. This year’s GMU canoe won a number of heats against other regional universities, finishing in first place in the Men’s Slalom/endurance race, first place in the Co-ed Sprint, second place in the Men’s Sprint and third place in the Women’s Sprint. Students also won second place in the Sustainable Land Development competition.
GMU’s ASCE steel bridge team loads the bridge at the annual Virginia conference.
In 2014, the Sid and Reva Dewberry Department of Civil, Environmental and Infrastructure Engineering graduated its first two undergraduate students with Departmental Honors. These two students undertook graduate civil and environmental engineering and communications coursework in addition to meeting the requirements for the BS degree and while maintaining a GPA of 3.5 or better during their entire GMU career. Before they graduated, they answered a few questions about their experiences at GMU:

**Kelsey Ryan**

**What is your “home town”?**
I grew up in a military family, so I have lived all over the country. My family currently resides in the Northern Virginia area in Sterling.

**Why did you choose GMU?**
Mason offers the perfect balance between academics and athletics for me. Mason has given me the opportunity to continue my competitive swim career in a great program as well as join an exciting, dynamic engineering program.

**Did you arrive at GMU as a freshman?**
Yes, I have been at Mason since the fall 2011 semester.

**What drew you initially to CEIE?**
I have always had a love for math and science, and was drawn to an engineering degree. The work of civil engineers, in particular, is wide spread, and it is exciting to be a part of a challenging and impactful field.

**You are both interested in water and environment. What led you to that decision?**
As a competitive swimmer and collegiate athlete, I clearly have a love for water. However, my interest in water and the environment spans beyond the pool deck. I was originally drawn to water and environmental engineering because it is becoming ever more important for humans to be conscious of the impact they are having on the environment with current and future actions. We must find new, innovative solutions to meet the challenges of low impact and sustainable development. I find this to be very exciting and motivating for my career.

**Describe one or two aspects of your time at GMU that really stand out in your memory of your BS-CIE.**
Swimming in college has been a dream of mine since middle school, and so many of my most memorable experiences at Mason are related to the swim team.

Mason has helped me achieve big successes both in the pool and in the classroom. I couldn’t ask for anything more in a college experience.

Another aspect of my time at Mason that was memorable was my involvement with the ASCE concrete canoe team my sophomore year. I rowed in a number of races at the first ASCE canoe competition Mason has ever participated in. ASCE gave me the opportunity to participate in some very cool engineering competitions that again supplemented my civil engineering education and career development.

**Did you have a summer engineering job of particular note? If so explain why this experience was significant.**
I had the opportunity to work as a summer intern at both a construction company and an engineering design firm. While I have chosen to pursue design work in the future, both of these jobs were extremely important in my development as an engineer. Exposure to both sides of the industry greatly supplemented what I was learning in the classroom and gave me real insight into what a civil engineer can do in practice.

**What are your after-graduation plans near term and longer term?**
I will be staying at Mason for the next year to complete my Masters in Environmental and Water Resources Engineering. After that, I plan to work full-time and pursue my licensure as a professional engineer.
ANDREA FRASER

What is your “home town”? Northern New Jersey.

Why did you choose GMU? I was looking for a good civil engineering program and I appreciated the vibe and size of campus.

Did you arrive at GMU as a freshman? Yes.

What drew you initially to CEIE? I was initially interested in drinking water and distribution but through opportunities at Mason I am beginning an exciting career with environmental engineering and microbiology.

You are both interested in water and environment. What led you to that decision? I have always loved civil infrastructure. My Americorps position working on environmental justice projects in the inner-city sparked my specification in the environment.

Describe one or two aspects of your time at GMU that really stand out in your memory of your BS-CIE. Getting involved with the accelerated master’s program and the CEIE honors program allowed me to take graduate level courses as an undergrad. One of my best experiences was taking a graduate crisis communication course where I studied science communication and engineering. Examining my major from a different angle was incredibly rewarding. I participated in crisis simulations and discussed my engineering passion with people who understand communication in very technical ways. It was a great interaction that gave me more confidence in sharing what I have learned in my field with diverse audiences. There are many amazing faculty in the CEIE department that I have worked with as well. My success at GMU would not be possible without the help of my incredible adviser, Dr. Liza Durant.

Did you have a summer engineering job of particular note? If so explain why this experience was significant. I have had a gratifying experience working with US Geological Survey on novel hydraulic fracturing research. This opportunity was facilitated by the CEIE department and the GMU Undergraduate research scholars program. This has been a crucial and rewarding step on my academic path.

It has been a great experience as an engineer in this microbiology lab because I have a different academic background than most in my group, therefore I can bring new things to the project like equations or different applications. I have also been able to interact with other student researchers, which has been very fun and insightful.

What are your after-graduation plans near term and longer term? I am currently applying to PhD programs to study urban systems through microbiology. I plan to get my PE as well and explore global applications of my work after academia.
Two new faculty joined the department in 2014. **Dr. Viviana Maggioni** brings expertise in hydrometeorology and remote sensing applications in atmospheric and hydrologic science, weather and climate prediction, and land data assimilation systems and surface modeling. **Dr. Anthony Battistini** brings expertise in the stability of steel structures, fatigue, connection detailing, and cast steel applications. He has experience conducting tests on full scale cross frame systems as well as individual components to assess fatigue behavior of cross frames for steel bridge applications.

**Lisa Nolder**, former Director of Graduate Student Affairs for the Volgenau School of Engineering, joined the Department as the new Associate Director of Undergraduate Programs. Ms. Nolder holds a graduate degree in higher education administration and brings significant experience in student advising and program management and will serve as the point person for all undergraduate programs including student advising, retention, recruiting and advancement.

**DR. VIVIANA MAGGIONI**

The National Science Foundation has selected **Dr. Deborah J. Goodings**, the Dewberry Professor and Chair of the Department since 2009, to serve as the director of the National Science Foundation’s Division of Civil, Mechanical, and Manufacturing Innovation (CMMI). With an annual portfolio of over $200 million dollars, the CMMI division has a mission to fund fundamental research and education in support of advances in the disciplines of civil, mechanical, industrial and manufacturing engineering, materials design and the reduction of risks and damage resulting from earthquakes and other natural and technological hazards. George Mason University has granted a leave to Dr. Goodings for the duration of the NSF appointment, and Volgenau Dean Kenneth Ball has appointed Dr. Liza Wilson Durant to lead the CEIE Department in the interim.
Full-time faculty form the backbone of the Sid and Reva Dewberry Department of Civil, Environmental, and Infrastructure Engineering. They teach classes; advise students; oversee student chapter activity; conduct research; envision and implement new curricula; serve in leadership roles in civil engineering professional societies; and administer a program for 400 students. These outstanding faculty members include:

Anthony Battistini, Assistant Professor. Ph.D., University of Texas. **Expertise:** Stability of steel structures; steel bridge design, connection detailing; engineering education

Liza Wilson Durant, Associate Professor and Acting Department Chairman. Ph.D., The Johns Hopkins University. **Expertise:** environmental engineering; contaminant fate, transport, and bioremediation; water treatment.

Celso Ferreira, Assistant Professor. Ph.D., Texas A&M University. **Expertise:** water resources and coastal engineering; storm surge inundation prediction; geographic information systems.

Deborah Goodings, P.Eng., FASCE, D.GE., Dewberry Professor of Civil Engineering. Ph.D., Cambridge University. **Expertise:** geotechnical engineering; extreme geotechnics; particulate mechanics. (On leave to the National Science Foundation as Director of the Civil, Mechanical, and Manufacturing Innovation Division.)

Mark Houck, P.E., FASCE., D.WRE., Professor. Ph.D., The Johns Hopkins University. **Expertise:** water resources; infrastructure security; water management.

Laura Kosoglu, Assistant Professor. Ph.D., Virginia Polytechnic Institute and State University. **Expertise:** geotechnical engineering; water resources; geo-environmental engineering.

David Lattanzi, P.E., Assistant Professor. Ph.D., University of Washington. **Expertise:** structural engineering; structural health monitoring; computer vision.

Viviana Maggioni, Assistant Professor. Ph.D., University of Connecticut. **Expertise:** environmental engineering; remote sensing; hydrometeorology.

Burak Tanyu, Assistant Professor. Ph.D., University of Wisconsin. **Expertise:** geotechnical engineering; engineering geology; geo-environmental engineering.

Girum Urgessa, P.E., Associate Professor. Ph.D., University of New Mexico. **Expertise:** structural engineering; computational mechanics; composite materials.

Mohan Venigalla, P.E., Associate Professor. Ph.D., University of Tennessee. **Expertise:** transportation engineering; transportation planning; transportation air quality.

Shanjiang Zhu, Assistant Professor. Ph.D. University of Minnesota. **Expertise:** transportation engineering; transportation economics; route choice and optimization.

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**DR. SHANJIANG ZHU RECEIVES THE INTERNATIONAL TRANSPORT FORUM’S 2014 YOUNG RESEARCHER AWARD IN LEIPZIG, GERMANY**
The introduction of practicing engineers into the civil engineering curriculum enriches students’ educational experience, and George Mason University is ideally located to take advantage of the surrounding vibrant community of practitioners, researchers, and other professionals. Some come to deliver guest lectures. Others mentor students in senior design projects. Still others interact with students outside of the classroom. The most committed of these join the ranks of our practitioner adjunct faculty taking full responsibility for a course, preparing and delivering lectures, grading assignments, and engaging with students to bring them insights distilled from the world of practice, a contribution which is especially important in senior and graduate level design courses.

We recognize and thank the following professionals for their assistance to the department as practitioner adjunct faculty in 2014.

- Mr. Rich Benton, SR Benton & Associates, LLC
- Mr. David Binning, Applied Engineering Management Corporation
- Ms. Barbara deBoinville, independent consultant
- Dr. Cerasela Cristei, Parsons Brinckerhoff
- Mr. Matthew Doyle, Fairfax County Dept. of Public Works & Environmental Services
- Mr. Morgan Eddy, Steele Foundation, LLC
- Dr. Alex Faghri, Virginia Department of Transportation
- Mr. William Fry, First Financial Group
- Dr. Joseph Hartmann, Federal Highway Administration
- Mr. David Hieber, Dewberry
- Mr. Sean Kennedy, REI Structural Engineers
- Dr. William Kelly, American Society of Engineering Education
- Dr. Tarek Kewaisy, Amman & Whitney Consulting Engineers
- Dr. Mohamed Hassan, Hassan Consulting Group
- Mr. David Laib, Balfour Beatty Construction
- Mr. Michael Loulakis, Esq., Capital Project Strategies
- Ms. Genelle McDonald, Balfour Beatty Construction
- Dr. Joseph Manous, U.S. Army Corps of Engineers
- Mr. John Matusik, Concurrent Technologies Corporation
- Mr. Duane Reget, Trademasters Service Corporation
- Mr. Christopher Reseigh, Consultant (ret. Parsons Brinckerhoff)
- Mr. Harold Rodriguez, Jacobs Engineering
- Mr. Joseph Schroedel, Society of American Military Engineers
- Mr. Eric Teitelman, Fairfax County Department of Transportation
- Dr. Hemanth Thippeswamy, Fairfax County Government
- Mr. Richard Thoesen, City of Fairfax
- Dr. J.Q. Yuan, Professional Service Industries (for Federal Highway Administration)
DR. CELSO FERREIRA’S RESEARCH GROUP INSTALLS WEATHER STATION TO COLLECT REAL TIME EXTREME WEATHER EVENT DATA ON THE GMU CAMPUS. TO ACCESS THE DATA: HTTP://MWDIS.ORG/EXTRA/STATION/DETAIL/23
The consolidated treasurer’s report for the Civil Engineering Institute appears opposite for the university’s fiscal year from July 1, 2013 to June 30, 2014.

The upper portion of the report summarizes Institute income in FY14, derived principally from two sources: Civil Engineering Institute membership dues; and earnings from the Civil Engineering Institute annual meeting, which after expenses, netted $3,391.49.

The middle portion of the report summarizes expenses, including George Mason University Foundation management fees (6 percent of income); two senior design graduation dinners and class photo graduation gifts; student project travel for ASCE and EID; instructional support; and Civil Engineering Institute Board meeting expenses. In the first quarter of 2015, the CEI Board has committed to endow a new scholarship fund to honor the achievements of Professor Michael J. Casey, former member of the CEIE faculty.

The department is grateful for the important ongoing support of the Civil Engineering Institute.

GMU’S CONCRETE CANOE TEAM CAPTAIN, DOMINICK CASCIANO STANDS WITH THE 2014 CANOE AND THE TRANSPORTATION RIG STUDENTS DESIGNED TO SAFELY TRANSPORT THE CANOE TO COMPETITION AT THE UNIVERSITY OF VIRGINIA.
GEORGE MASON UNIVERSITY
CIVIL ENGINEERING INSTITUTE
CONSOLIDATED TREASURER'S REPORT FY 2014

CEI ACCOUNT

Opening Balance July 1, 2013 $ 13,761.95

Income
Member Dues $ 24,100.00
Contributions $ 480.00
CEI Annual Meeting $ 24,725.00
Total $ 49,305.00

Total Funds Available $ 63,066.95

Expenditures
GMUF Administrative Fees (6% of Income) $ 2,859.98
Meeting Expense $ 1,764.35
Graduation Ceremony Luncheon $ 9,372.94
CEI Annual Meeting $ 21,333.51
Student Travel (EfID and ASCE) $ 12,000.00
Instruction Support $ 2,000.00
Operating Expenses $ 25.00
Total $ 49,355.78

Closing Balance June 30, 2014 $ 13,711.71

SCHOLARSHIP ENDOWMENT FUNDS

CEI SCHOLARSHIP

Gift Value June 30, 2013 $ 87,041
Contributions during FY 14 $ -
FY 14 Scholarship payout $ -
Net Earnings FY 14 $ 7,177
Distribution for current use* $ -
Market Value, June 30, 2014 $ 86,583
GMU'S STEEL BRIDGE TEAM ATOP THEIR DESIGN AT THE 2014 VIRGINIAS CONFERENCE AT THE UNIVERSITY OF VIRGINIA.

ON THE COVER:
ASSESSING PH OF RECYCLED CONCRETE AGGREGATE MIX IN THE LABORATORY

GEORGE MASON UNIVERSITY
Civil Engineering Institute (CEI)

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VOLGENAU SCHOOL OF ENGINEERING

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