Summer 2014 VOL. 13, No. 2



# CIVIL REMARKS

A. JAMES CLARK SCHOOL of ENGINEERING

www.cee.umd.edu

A NEWSLETTER FOR ALUMNI AND FRIENDS OF THE DEPARTMENT OF CIVIL & ENVIRONMENTAL ENGINEERING AT THE A. JAMES CLARK SCHOOL OF ENGINEERING, UNIVERSITY OF MARYLAND, COLLEGE PARK.

#### IN THIS ISSUE:

- I SCHWARTZ APPOINTED CHAIR
- 2 ADDRESSING A NATIONAL SECURITY THREAT
- 6 EDUCATION NEWS
- 7 FACULTY NEWS
- 8 STUDENT NEWS: UNDERGRADUATE
- 12 STUDENT NEWS: GRADUATE
- 13 ENGINEERS WITHOUT BORDERS UPDATE
- 14 ALUMNI NEWS

Could Membrane Technology Help Researchers Tackle Water Scarcity Worldwide?

> UMD Researchers Are Developing Cutting-Edge Water Treatment, Reutilization and Management Techniques to Promote Sustainability

## departmentnews



### Schwartz Appointed Chair of Department of Civil & Environmental Engineering

On Jan. 6, 2014, Professor Charles W. Schwartz assumed the role of chair of the A. James Clark School's Department of Civil and Environmental Engineering.

1

Schwartz received his B.S., M.S., and Ph.D. degrees in Civil Engineering from Massachusetts Institute of Technology. An international leader in the field of pavement engineering, he has published extensively in the areas of pavement analysis and design, viscoelastic-viscoplastic constitutive modeling, and pavement material characterization and testing. Schwartz has led major research projects sponsored by the National Academies, the Federal Highway Administration, and other infrastructure agencies. He is an associate editor for the International Journal of Pavement Engineering and serves on several other journal editorial boards.

Schwartz currently chairs national pavement-related committees for the Transportation Research Board of the National Academies and for the American Society of Civil Engineers. He also teaches undergraduate and graduate courses that span the areas of numerical analysis, pavement design and analysis, advanced soil mechanics, computational geomechanics (including pavement mechanics), and civil infrastructure systems.

"Civil and environmental engineering has a rich history at Maryland, spanning over a hundred years since the department was established in 1908," Schwartz said. "Our engineering alumni and faculty are actively engaged in research that impacts current and future engineering needs, solving complex problems facing infrastructure, energy resources and a sustainable future. UMD's proximity to Washington, D.C. enables our faculty and researchers to inform policymakers and to advise the engineering mission agencies.

"Civil and environmental engineering touches every one of us, every day," he continued. "From the roads and bridges we travel on the way to work, the foundations and structures that support our homes and offices, the water flowing from our faucets, the airports we dash through on vacations, and the rail and port facilities that transport our goods, there are few aspects of our daily lives that are not impacted by a civil engineer."

Schwartz extends his thanks to his predecessor, Dr. Ali Haghani, for his years of service to the department, as well as faculty, staff and students for their support and dedication to building a stronger, sustainable future.

"Looking to the future, we will continue to build on the successes and strengths of our department and programs," Schwartz said. "Our unique position offers us the opportunity to create a stronghold of interdisciplinary expertise, increase and enhance collaborative research opportunities, and be a guiding force in the future of civil and environmental engineering."



### departmentnews

#### Addressing a Threat to National Security Research Professor Galloway Takes to Capitol Hill to Discuss the Impact of Climate Change on U.S. Military Operations



Gerald Galloway

Floods, major storms, droughts and rising temperatures have no doubt been the focus of many discussions on the impact of climate change. But, this spring, Department of Civil and Environmental Engineering Research Professor Gerald Galloway trekked to Capitol Hill to address how the changes impacting our planet pose not only an environmental threat, but also a threat to national security.

A retired U.S. Army brigadier general, Galloway was one of three military leaders invited to speak before the Bicameral Task Force on Climate Change on March 13, 2014. He was joined by retired Brigadier General Stephen Cheney, Chief Executive Officer of the American Security Project, and former Captain Jon Gensler, a Cambridge Leadership Associates consultant.

Each of the three discussed how climate change will act as a "threat multiplier" in the most volatile regions and will stress supplies and access to military installations around the world.

"The potential impact of climate change on our fixed [military] installations is real, and the impact will require increased attention for preparation for climate-related events," Galloway told the Task Force.

At the most basic level, rising temperatures will impact soldiers who are forced to train under intense heat with equipment that may not be resilient enough to handle the extreme temperatures, he noted.

"It's going to get hotter, wetter and drier," Galloway cautioned. "We saw what Superstorm Sandy and Hurricane Katrina did to the ability of the nation to move in and around those affected areas. Imagine if that had happened at a time of great national crisis.

"When communities and installations are unaware of their vulnerability to these events – and that's one of the challenges – the results can be disastrous," he continued. "A failure to be prepared shifts the military's focus from being ready to deploy at a moment's notice to recovering from the disaster that's just hit them."

But, of course, climate change poses a threat to more than the military buildings and structures themselves. Climate change can also impact the surrounding communities, which in turn affects the military's access to support systems and supplies.

"During the big flood of the Mississippi River in 1993, we shut down transcontinental railroad movements and we shut down bridges across the Mississippi," Galloway said. "We don't want to see those things happen. We want to be better prepared because it could be the lifeline that is cut at a time when we need it to be open."



The National Guard Command Center in Arlington, Va. PHOTO COURTESY OF U.S. ARMY STAFF SGT. JIM GREENHILL.

In addition to military interests on home soil, the impact of climate change abroad poses a tremendous concern for U.S. military operations. For example, the Thailand floods of 2011 revealed another consequence of climate change when factories throughout the country were shut down, thereby interrupting the supply of parts to the United States. As a result, the flood also shut down factories and operations within the United States that threatened to "disrupt the supply line" to the U.S. military, Galloway noted.

"The U.S. is known for its rapid response to disasters," he said, adding that, while the nation can celebrate the positive impact it has made by delivering aid to regions affected by natural disasters, the

> United States must help foster disaster preparation and resilience abroad to effectively safeguard against whatever Mother Nature might have in store down the line.

> "Climate change will require not only the honing of our capacities to provide disaster relief, but also more emphasis on helping our partners develop their capacity to deal with disasters," Galloway said.

> Fortunately, efforts have been made to lay the groundwork for greater involvement in disaster resilience efforts abroad. For example, the U.S. Army Corps of Engineers is helping with water-resource planning

efforts in Southeast Asia and building capacity that enables those countries to be more resilient, Galloway said.

"And, [these efforts] put the United States in a good light," he added. "[These countries] see the face of the United States dealing with an issue – and dealing with it in a way that benefits them not only today, but also helps them move better into the future."



Watch the full video of Research Professor Galloway's presentation on Capitol Hill.

#### COVETSTORY

#### The Search for a Solution: UMD Researchers Address Water Quality Issues at Home and Across the Globe

According to the World Health Organization (WHO), today, nearly 800 million people across the globe - one-tenth of the world's total population - lack access to safe water.

Day in and day out, thousands of men, women and children in developing countries trek miles in search of water, often settling for unsanitary waterways as their source for survival. As a result, 3.4 million people die each year due to water-related diseases, which represents the leading cause of disease and death around the world, the WHO says.

In efforts to contribute to the worldwide search for a solution, Civil and Environmental Engineering (CEE) Assistant Professor Baoxia Mi is researching new techniques for high-performance water treatment.

Mi, who also directs the University of

Maryland's (UMD) Membrane Innovation Lab, is investigating how graphene oxide (GO) nanosheets can be used to synthesize a radically new class of layered water purification membranes. As a next-generation, ultrathin, high-flux and energy-efficient membrane, grapheme oxide holds great promise for water purification, as well as desalination, hydrofracking water treatment and energy production, and biomedical and pharmaceutical applications. In fact, GO membranes are thought to increase the rate at which water permeates the membrane, meaning that salt rejection is more controlled by pore size than by semi-permeable membranes that are presently used in desalination.

Knowing this, Mi is also investigating how these nanosheets can be used to surface-modify existing membranes for highperformance water treatment.

Mi's research on graphene oxide membranes recently won her a National Science Foundation Faculty Early Career Development (CAREER) award for her proposal titled, "Graphene-enabled Synthesis and Surface Modification of Water Separation Membranes."

Additionally, Mi contributed an article titled "Graphene oxide membranes for ionic and molecular sieving" to the Feb. 14, 2014 issue of Science magazine.

According to Mi, membrane technology is generally considered one of the most effective strategies to tackle water scarcity worldwide; however, high-energy requirements and long-term fouling issues have



PHOTO COURTESY OF ALAN

An urban stream where rain from a line of severe thunderstorms the night before caused a minor flood event. UMD researchers are developing new techniques for high-performance water treatment and water reutilization.

#### **COV**ETSTORY

posed major obstacles to the widespread application of this technology. But, Mi hopes that the graphene-based technology she proposed will be highly fouling-resistant and capable of removing various contaminants from water.

Even more, Mi is optimistic that the graphene-based membrane technology will be very useful not only for drinking water purification and wastewater reuse, but also for renewable energy production, biomedical sensing and artificial organ development.

#### Using Solar Power in Times of Emergency

Mi, along with a team of CEE students – Catherine Birney, Michael Lee, Vincent Fiedler and Elizabethe Manzi – recently launched efforts to develop a system for emergency drinking water supplies that offers sustainable water purification technology that can be used for both emergency and household drinking water.

Their project – Solar-Powered Membrane System for Emergency Drinking Water Supply – uses a system that will integrate two emerging membrane processes, forward osmosis and membrane distillation, and it can be used for the on-site treatment of various water sources including contaminated field water, brackish water, stormwater and gray water. Mi's team will also operate the system under atmospheric pressure and low temperatures, providing greater flexibility for scaling up and down for on-site water treatment.



Solar-powered forward osmosis (FO) and membrane distillation (MD) system for emergency drinking water supply. Image provided by Membrane Innovation Lab.

This new system has a number of advantages over existing water purification technologies, including enhanced energy sustainability through the use of solar energy, high-quality product water and low environmental impact.

#### Merging Wastewater Treatment and Electricity Generation Efforts

CEE Professor Alba Torrents and her lab have also explored a new approach to wastewater treatment by using a sediment microbial fuel cell (SMFC) not only to treat water, but to also produce useful energy in the process.

Wastewater treatment plants (WWTP) are often the largest consumers of power in their communities. In fact, up to 30 percent of a WWTP's operating costs are from energy consumption, which accounts for 3 percent of all electricity used in the United States and other developed countries.

Wastewater contains significant amounts of organic matter, and the ability to harvest energy stored in this matter could transform wastewater from a community's costly problem to a sustainable fuel source. Currently, the most widely used wastewater treatment process in the United States is the activated sludge process, which utilizes mechanical aeration of wastewater to facilitate the breakdown of organic matter by aerobic bacteria, Torrents noted. But, such processes forgo the chemical energy stored in the organic matter as such energy liberated by the reaction dissipates as heat.

Knowing this, CEE graduate student Maia Tatinclaux and Torrents have worked in cooperation with Dr. Lenny Tender and the U.S. Naval Research Laboratory, and D.C. Water to assess the feasibility of adapting SMFCs for the treatment of domestic wastewater in order to reduce a treatment plant's energy consumption and produce useful power.

The SMFC generates electrical power by oxidizing organic matter residing in marine sediments using oxygen in overlying water. SMFCs exploit the naturally occurring transition from oxic water to anaerobic sediment in marine environments.

Previous studies investigating the use of SMFCs for wastewater treatment have used platinum as an oxygen reduction reaction (ORR) catalyst, but the financial



Two-liter batch reactors (with primary effluent from a large WWTP) with floating carbon cloth air cathodes and graphite disk anodes were tested to compare fuel cell performance with and without an ORR catalyst.



cost of doing so is very high. That is why Tatinclaux and Torrents have explored the use of  $M_nO_x$ , a much cheaper and easy-to-synthesize catalyst.

While preliminary results illustrate a faster ORR, Tatinclaux and Torrents are still exploring challenges with the long-term function of such catalysts.

#### A Local Focus

The Clean Water Act establishes the basic structure for regulating discharges of pollutants into U.S. waters and regulating quality standards for surface waters. But, as toxicologists and public health scientists continue to work towards understanding the impact of water pollutants on human health and the environment, it is clear that proper analytical techniques and equipment play a crucial role in understanding these health impacts.

Recognizing this, CEE Associate Professor Ahmet Avdilek, CEE Assistant Professor Baoxia Mi, and CEE Professors Allen P. Davis and Alba Torrents put forth a proposal to bring the latest state-of-the-art instrumentation to UMD this summer, allowing researchers and students to measure and analyze dozens of water contaminants including metals and organic pollutants. The instrumentation will allow UMD researchers to leverage funding from many organizations and expand their research, thereby advancing understanding of the environmental chemistry and transport processes that affect the environmental behavior and fate of a wide range of pollutants.

UMD's campus itself is a large urban Continued on next page.

#### COVETSTORY



entity, with a population that can frequently exceed 50,000. The metropolitan area surrounding College Park is highly vulnerable to urban infrastructure challenges due to its proximity to the nation's capital, its presence in the Anacostia River and Chesapeake Bay watersheds and the high standard of living common to the area, Aydilek, Mi, Torrents and Davis noted. As such, the campus has the capacity to serve as an urban test bed for integrating water and watershed resiliency research and education – and it can play a major role in improving the local and regional campus environment.

Davis has been highly involved with installing novel research and education stormwater management systems on campus.

For nearly 20 years, Davis has worked with Prince George's County, and the county has pitched in with its most recent project to help bring novel stormwater technologies to the UMD campus.

In addition to modifying one of the existing stormwater technologies on campus, the county has helped build two new projects, the most recent of which is a rain garden/bioretention garden at UMD's Public Health Garden, a student teaching and community garden used to demonstrate sustainable agriculture and environmental best practices in support of public, environmental and community health. Funded by Prince George's County and the Maryland Department of Natural Resources, the bioretention garden drains stormwater into a cistern, allowing UMD to manage the stormwater, clean it and use the remaining water for irrigation. Researchers are using the bioretention garden to address stormwater issues on campus as well as to discharge clean water to local streams and ultimately, the Chesapeake Bay, Davis said.

#### **Disaster Preparation**

In addition to tackling water scarcity and treatment challenges, UMD researchers are working to safeguard against flooding and other threats posed by both heavy rains and droughts.

With the launch of the Center for Disaster Resilience (CDR), researchers are working to assist individuals, communities and governments in understanding and reducing the catastrophic effects of natural hazards. A team of risk and resilience experts and their partners in government, private practice and academia, provide risk assessment, risk communication and risk reduction capabilities to help decision-makers in building community resilience.

UMD's campus offers a prime location with the District of Columbia, Baltimore, Annapolis and Ocean City all nearby, making it ideal for both understanding and serving the urban and coastal infrastructure challenges of the region.

Specializing in flood and coastal risk management, the center can help communities integrate the complex science and engineering of flood risk analysis with the often confusing policies around land-use, building codes and environmental protection to improve watershed and coastal planning. The center excels at bringing stakeholders together to find and implement sustainable, disaster resilient solutions. Even more, CDR provides technical capabilities in water resource engineering and risk assessment.

For more information about the Center for Disaster Resilience, visit civil.umd.edu/cdr.

## educationnews



#### CATT Lab Expands Regional Integrated Transportation Information System

The CATT Lab recently received \$4 million in funding from the Maryland State Highway Administration to expand features and functionality for the Regional Integrated Transportation Information System (RITIS). This interactive, web-based system consolidates and fuses billions of real-time data points daily from transportation and public safety agencies across the country. This data includes everything from traffic speeds and volumes, to accident information, transit locations, weather data, and computer aided dispatch information from law enforcement officials. It is used by more than 3,200 traffic planners and operations specialists, the military, law enforcement, the Federal Emergency Management Agency (FEMA), the secret service, and hundreds of university researchers around the world. This funding will be used to harden RITIS and build new functionality that will help better serve Maryland transportation, emergency operations and public safety officials through real-time situational awareness and advanced visual analytics tools for making better operational decisions.

### UMD, Politecnico di Torino Partner to Provide CEE Students an Opportunity Overseas

Recognizing the unique challenges engineering students face when looking to pursue study abroad opportunities, a team of University of Maryland Civil and Environmental Engineering (CEE) professors have

joined forces with academics from the Doctoral School of the Politecnico di Torino in Italy to provide engineering students a oneof-a-kind educational opportunity.

As part of a joint effort between UMD's CEE faculty and Politecnico's Department of Environment, Land and Infrastructure Engineering (DIATI), the project titled, "Advanced Models, Methods and Materials for Sustainable, Safe and Smart Infrastructures" offers students at both universities – and other programs in Italy

the chance to study from five courses of excellence in the fields of transportation and infrastructure engineering. Because Politecnico di Torino features a diverse student population – about 40 percent of students are from countries outside Italy – all five courses will be taught in English. Topics covered include theoretical foundations and applications to transportation case studies, geographic information systems-based evaluation and optimization of highway alignments, characterization and performance of highway materials, and quality control of highway materials.

While the first leg of the program will wrap up in late June, CEE Associate Professor Dimitrios Goulias – who will lead the last of the five courses slated for late spring – believes the program launch could signify the beginning of a long, successful partnership between the two universities.

"This is an exciting opportunity, as Politecnico di Torino boasts the top engineering program in Italy," Goulias said. "We're hoping to build a long-term partnership, whereby more CEE students will work towards the goal of gaining experience abroad."

### **INAUGURAL PROJECT MANAGEMENT SYMPOSIUM**



#### When: June 9-10, 2014 Where: Stamp Student Union

The University of Maryland's Project Management Center for Excellence and the Silver Spring Chapter of the Project Management Institute will host the region's first annual Project Management Symposium on June 9-10, 2014, at the Stamp Student Union on the University of Maryland campus.



For the full schedule of events and registration information, visit the Project Management Symposium website.

## facultynews

## ••••••••

### Davis Contributes Expertise to EPA, ASCE Initiatives



A leading researcher on urban stormwater management and physiochemical treatment processes, CEE Professor Allen P. Davis was recently named a principal investigator for a \$2.2 million U.S. Environmental Protection Agency

Allen P. Davis

multi-institution center awarded to the University of South Florida (USF).

The Center for Reinventing Aging Infrastructure for Nutrient Management (RAINmgt) was established to address the impact of nutrient pollution from wastewater and stormwater runoff in efforts to reduce pollution, improve water quality in coastal urban areas and reimagine aging coastal urban infrastructure systems for nutrient recovery and management. RAINmgt's ultimate goal is to develop the science behind new technology and management innovations while providing new knowledge for students, community members and other stakeholders.

Davis contributed extensive research on maximizing nitrogen removal from stormwater using bioretention projects—special strips of greenery that capture and filter storm runoff before it enters the watershed.

Such technologies offer major improvements to help curb water pollution and could one day be used by housing developments or businesses to reduce their environmental footprints, Davis said.

Davis is one of 14 investigators affiliated with RAINmgt.

### Davis Named Inaugural Editor of ASCE Journal

Davis was also named the inaugural editor for the American Society of Civil Engineers (ASCE) *Journal of Sustainable Water in the Built Environment.* 

With its first publication slated for January 2015, the new journal will serve as a home for the discussion of sustainable water issues in the built environment. The online journal will publish contributions on topics such as urban stormwater quantity, quality, treatability and impacts; water harvesting and rainwater beneficial use; low-impact development and green infrastructure and water policy.

#### Aydilek, Co-PIs Receive Major Research Instrumentation Program Grant



Professor Ahmet Aydilek and his team of co-principal investigators were named one of three groups of winners of the A. James Clark School's Major Research Instrumentation (MRI) program grant

CEE Associate

Ahmet Aydilek

for their proposal "Acquisition of Analytical Instrumentation to Support an Urban Environmental Resiliency Initiative."

The program will award \$416,000 to Aydilek and his team - which includes CEE Professors Allen Davis and Alba Torrents. and CEE Assistant Professor Baoxia Mi - to advance their study of urban infrastructure resiliency by improving the analytical instrumentation available for environmental engineering research and education. The four hope to use the new instrumentation to further investigate reuse of waste materials in the urban environment and treatment of urban stormwater runoff to minimize environmental impacts. Additionally, the proposed instrumentation will provide for graduate and undergraduate student training in the use of state-of-the-art analytical equipment.

#### Professor Ayyub Named Editorin-Chief of First Journal of Risk and Uncertainty in Engineering Systems



CEE Professor Bilal M. Ayyub was recently named editor-in-chief of the first Journal of Risk and Uncertainty in Engineering Systems, jointly produced by the American Society of Civil Engineers (ASCE) and the

Bilal M. Ayyub

American Society of Mechanical Engineers (ASME). Ayyub first proposed the journal, which will address risk and uncertainty in engineering topics relevant to both civil and mechanical engineering.

Covering risk and uncertainty in engineering poses the challenge of dealing with issues that are multidisciplinary, cross-cutting and system centric. To expand on areas of reliability research, the journal will encompass both the ASCE and ASME communities and cut across committees, councils, divisions and institutes. The journal aims to meet the needs of researchers and engineers for addressing risk, disaster and failure-related challenges due to the many sources and types of uncertainty in design, analysis, operation and lifecycle management of not only existing but also modern engineering systems.

Ayyub, who is also the director for the Center for Technology and Systems Management, is engaged in research activities that focus on uncertainty modeling and analysis, systems modeling, decision analysis, homeland security, various defense and infrastructure systems, safety systems and mathematical modeling using statistics, probability theory and the theory of evidence. Ayyub is also an ASCE, ASME Society of Naval Architects and Marine Engineers (SNAME) and Society for Risk Analysis (SRA) Fellow.

Prior to assuming his role as editor-inchief of the journal, Ayyub was appointed to the ASME Board on Research & Technology Development (BRTD) as chair of the Research Committee on Risk Technology. The BRTD identifies research needs and opportunities for new ASME products and services and oversees the research committees in the Center for Research and Technology Development.

#### Gabriel Named to Two Associate Editor Positions



Steven Gabriel

CEE and Institute for Systems Researchaffiliated Professor Steven Gabriel was recently named associate editor for *Optimization and Engineering* (Springer) and associate editor for *Energy Strategy Reviews* (Elsevier).

A multidisciplinary journal concerned with the application of optimization methods in all areas of engineering, *Optimization and Engineering* serves as a forum where engineering researchers can obtain information about new developments in optimization, and researchers in mathematical optimization can read about the successes of and opportunities for optimization in the various engineering fields.

*Energy Strategy Reviews* provides authoritative content on strategic decision-making and vision-sharing related to society's energy needs. Additionally, the journal stimulates the exchange and sharing of knowledge and best practices in energy strategy, planning and implementation.

## studentnews: undergraduate

#### CEE Senior Named Marshall Scholar, NSF Graduate Research Fellowship Recipient



has been named a 2014 Marshall Scholar and the recipient of a National Science Foundation (NSF) Graduate Research Fellowship. Hylton is one of

approximately 40

CEE senior Erin Hylton

Erin Hylton

Marshall Scholars selected from a pool of more than 900 nominees nationwide to receive a scholarship, which fully supports two years of graduate study in the United Kingdom.

"Erin's achievement places her in the front ranks of aspiring global leaders and reminds us all of the outstanding caliber of Maryland's students," said History Professor Richard Bell, University of Maryland's (UMD) faculty advisor for United Kingdom postgraduate fellowships.

Founded by a 1953 Act of the United Kingdom Parliament and named in honor of U.S. Secretary of State George C. Marshall, the Marshall Scholarships commemorate the humane ideals of the Marshall Plan, which contributed vitally to the reconstruction of Europe following World War II, and they express the continuing gratitude of the British people to their American counterparts. Prominent Marshall Scholars include U.S. Supreme Court Justice Stephen Breyer and Pulitzer Prize winning author and journalist Thomas Friedman.

Hylton has focused her academic and future professional pursuits on water resource engineering and aims to devote her career to improving water resource access and quality in the developing world. With the support of the Marshall Scholarship program, Erin will first pursue a master's degree in hydrology and sustainable development at Imperial College London, followed by a master's degree in water science, policy and management at the University of Oxford.

According to Hylton, "Water is our most basic and precious natural resource, and its allocation must be balanced across a variety of conflicting uses, from irrigation and energy to sanitation and consumption. As a Marshall Scholar, my studies will prepare me to design and execute context-sensitive water management practices that will help propel us toward a sustainable hydrologic future."

At UMD, Hylton has served as president of Engineers without Borders and was co-founder and president of Maryland Sustainability Engineering. A member of the University Honors Program and a Federal Semester participant, Erin has held internships with the Environmental Protection Agency and with ICLEI-Local Governments for Sustainability USA. She has conducted research on the robustness of mathematical models used to estimate the magnitude of extreme flooding events. After her junior year, Hylton carried out an independent summer research project in Sao Paulo, Brazil, analyzing the social and ecological impacts of the Belo Monte dam project. During her senior year, she studied abroad in Denmark, where she took graduatelevel coursework in civil engineering.

Hylton has received numerous awards and citations for academic excellence and civic contributions from the Clark School and the Department of Civil and Environmental Engineering. She is a previous winner of two national scholarships – a 2012 Udall Scholarship recognizing her environmental leadership and a 2013 Boren Scholarship to pursue advanced Portuguese language studies in Brazil.

Marshall Scholarships finance young Americans of high ability to study for graduate degrees in the United Kingdom. As future leaders with a lasting understanding of British society, Marshall Scholars strengthen the enduring relationship between the British and American peoples, their governments and their institutions. Their direct engagement with Britain through its best academic programs contributes to their ultimate personal success. A two-year award, the Marshall Scholarship covers all university fees and cost of living expenses and includes an annual book grant, thesis grant, research and daily travel grants, and fares to and from the United States.

#### 8

## UMD Team Awarded an EPA 2013 People, Prosperity and the Planet Grant CEE Senior Receives NSF Graduate Research Fellowship

A University of Maryland (UMD) team – comprised of Department of Civil and Environmental Engineering (CEE) students Catherine Birney, Michael Lee, Vincent Fiedler and Elizabethe Manzi, and CEE Assistant Professor Baoxia Mi – has been awarded a 2013 People, Prosperity and the Planet (P3) Phase I grant from the U.S. Environmental Protection Agency (EPA). Additionally, Birney, a CEE senior, received a National Science Foundation (NSF) Graduate Research Fellowship for her involvement with the project.

The team's proposal, Solar-Powered Membrane System for Emergency Drinking Water Supply, is aimed at developing a system for emergency drinking water supplies that offers sustainable water purification technology that can be used for both emergency and household drinking water. According to their P3 grant page, this system will integrate two emerging membrane processes, forward osmosis (FO) and membrane distillation (MD), and it can be used for the on-site treatment of various water sources including contaminated field water, brackish water, storm water and gray water. In addition, the system will utilize solar panels as its sole energy source. The system will also be operated under atmospheric pressure and low temperatures, providing greater flexibility for scaling up/down for on-site water treatment.

This new system has a number of advantages over existing water purification technologies, including enhanced energy sustainability through the use of solar energy, high-quality product water and low environmental impact.

"The portable aspect of the system is significant because, with every natural disaster, people are left without access to clean water, and this system can be brought to those affected very quickly," Birney said. "And, although we focused on making our system portable, this technology can be scaled up and used permanently in a community. If brought to developing countries, the mortality rates due to waterborne diseases will drop significantly. This method of water purification could also be used to desalinate ocean water much more cheaply than current methods, and without the use of fossil fuels."

The P3 Award competition considers projects that address challenges related to a wide range of categories: water, energy, agriculture, built environment, and materials and chemicals. Through this EPA program, college students can benefit people, promote prosperity and protect the planet by designing solutions that move the United States toward a sustainable future.

## studentnews: undergraduate

### Concrete Canoe, Steel Bridge Teams Take ASCE Mid-Atlantic Competitions by Storm



On a warm, sunny weekend in early April, the Department of Civil and Environmental Engineering's (CEE) Concrete Canoe and Steel Bridge teams ventured to the U.S. Naval Academy in Annapolis, Md. to participate in the 2014 American Society of Civil Engineers (ASCE) Mid-Atlantic Competitions.

Concrete Canoe set a new record for the University of Maryland (UMD), placing first in four of five racing categories and second in the men's sprint race by a difference of fewer than nine seconds.

Designed to provide students with a practical application of the engineering principles they learn in the classroom, along with important team and project management skills they need in their careers, the ASCE Concrete Canoe competition challenges students' knowledge, creativity and stamina while showcasing the versatility and durability of concrete as a building material. But, UMD's Concrete Canoe team was hard at work long before competition week arrived.

According to ASCE UMD President Tess Niehoff, a CEE senior, preparation for the event is a 12-month project. As last year's project manager, Niehoff experienced firsthand the amount of work students must dedicate to design, fund and build their canoe – even more, the training students undergo to ready for race day.

"I love everything about the Concrete Canoe competition," Niehoff said. "Being able to see fellow students grow through this program is incredible. I've learned so much through my involvement with ASCE and Concrete Canoe, and being able to see other people develop new skills and build friendships has been great. That's my favorite part - you can put so much into your work with Concrete Canoe, but you also get so much out of it in return. And, I love seeing other people get as much out of it as I have over the years."

"I have learned a lot of lessons covering every aspect of running a project, from dealing with people to managing money," added this year's co-project manager, Chris Woodruff, also a CEE senior. "To have all our work validated with the best finish UMD has had since the team was restarted in 2007 feels great."

In the endurance races, UMD women and men edged the other five participating schools, finishing 6:21.74 and 5:15.53, respectively. In the sprint division, both the women's and co-ed UMD teams finished first in their categories, with impressive times of 1:59.08 and 3:25.96, respectively. The men's sprint team placed second with a recorded time of 1:40.27, edging out the third-place team by less than half a second.

Collectively, UMD's Concrete Canoe team finished second overall in the Mid-Atlantic competition after placing second in both the presentation and final product categories.

Just a mile away from the academy's College Creek, the UMD Steel Bridge team showcased their work outside Navy-Marine Corps Memorial Stadium.

The ASCE Steel Bridge competition invites participants to design and build an approximately 20-foot span bridge from pieces that must meet particular size requirements. The bridges are tested to hold up to 2,500 pounds of vertical load with minimal bowing and swaying, all while maintaining safety considerations.

UMD's Steel Bridge team first started in 2010 with only a few members, and its original bridge design featured a single rail space truss with an under truss bracing system that demonstrated great structural support and allowed for minimal pieces to be used.

Today, the team boasts more than a dozen members.

### Singh Named University Innovation Fellow

CEE undergraduate Meenu Singh was recently named a University Innovation Fellow by the National Center for Engineering Pathways to Innovation (Epicenter), along with Aerospace Engineering major Atin Mittra.

The University Innovation Fellows program offers undergraduate students in engineering and other fields training and support to become leaders who catalyze change on their home campuses. To showcase their enthusiasm for innovation and entrepreneurship, Singh and Mittra put together a YouTube video highlighting initiatives around the UMD campus.

Sixty-six university students were selected from 45 higher education institutions across the United States. The University Innovation Fellows program is run by Epicenter and funded by the National Science Foundation as a partnership between Stanford University and the National Collegiate Inventors and Innovators Alliance.



View Singh and Mittra's video.

## studentspotLight

### Elizabethe Manzi Sets the Bar High in Gymnastics, Engineering

Since the age of five, Elizabethe Manzi was destined to be a gymnast.

After Manzi's parents were challenged to keep their toddler from attempting her own stunts – which most often involved climbing on household furniture – they decided to take her to a gym to allow her to release some of her excess energy.

Little did they know at the time that their decision to do so would spark a passion for gymnastics that would span two decades and counting.

Inspired by her sister, who achieved her childhood dream of becoming a professional ballerina with the New York City Ballet Company, Manzi set out to pursue a dream of her own. Her efforts landed her first place on the balance beam at the Junior Olympic National Championships Competition in 2009 and placed her on the fast-track to collegiate gymnastics.

"Moving onto college gymnastics, team successes – rather than individual accomplishments – became paramount," says Manzi, adding that to date her biggest accomplishment has been earning the opportunity to compete for four years on balance beam and the uneven bars with the University of Maryland (UMD).

"My teammates and coaches have been family to me, and I am so appreciative of the chance to train to accomplish huge goals together in a sport we are all so passionate about."

But, Manzi's go-getter spirit and determination have driven her to succeed not only on the beam and uneven bars, but also throughout her academic career.

A civil engineering major with a minor in international engineering, Manzi first started at UMD as an undecided engineering major, certain she was called to pursue exciting work that is both technical and hands-on.

"I have always liked math and science, and I wanted to work towards a fulfilling career where I could improve the lives of others through technology," she said.

One of the biggest influences in her decision to pursue engineering was her father, who works at Sony Aviation as Chief of Maintenance.

"He knows how to fix everything from airplanes, cars and vacuum cleaners to broken childhood toys – and, he is the most intelligent, hardworking person I know," she said, adding that it was her mother who helped her narrow her focus to civil engineering.

"Living in close proximity to New York City as a kid, I was fascinated by skyscrapers, urban living and architecture," Manzi said. "Since then, my interest in civil engineering has grown. Trips to European cities, Maryland engineering coursework, internship experience in construction, and research experience in sustainable practices have amplified my passion for civil engineering and provided me with a more direct focus for the future."

An Engineering Honors Program student and a member of the UMD chapter of Chi Epsilon, Manzi has proven herself an all-star, juggling the demands of both engineering coursework and an intense training schedule.

"It has certainly not been easy," she said, "but I believe both passions have provided me with a balanced education. [Balancing both] forces me to manage my time efficiently, and I have gotten accustomed to this lifestyle over the years."

Even in high school, Manzi would drive straight from class to gymnastics practice, which often lasted five hours or more. Still, Manzi finds the balance beam and uneven bars to be her perfect escape.





Elizabethe Manzi with Brett Nelligan, head coach of the Terrapin gymnastics team.

"It may seem counterintuitive that more work can be reenergizing, but it definitely has provided me with a fulfilling work-life balance," she said. "The love I have for both engineering and gymnastics also makes the schedule not seem like 'work.' I have learned so many applicable skills through my engineering courses and gymnastics career, and I'm so thankful I have been able to pursue both."

Since her earliest days at UMD in 2010, Manzi has developed a strong interest in green technology and mitigating the problems associated with dense urban development. She will attend Stanford University graduate school next year to earn her M.S. in civil engineering to learn more about sustainable design and construction, as well as how buildings can be retrofitted to be low-impact. Even more, she wants to explore the interdisciplinary nature of building construction as she believes merging the gap between architects and engineers is crucial for advances in urban development in years to come.

As far as her future in gymnastics?

"I plan to stay active and take up sports I have not been able to participate in over the years, due to the fear of getting hurt – such as long-distance running and snowboarding," she said, acknowledging that gymnastics is "a sport for the young."

"On the other hand," she continued, "I would love the chance to coach in the future and stay involved, because this sport is so important to me. My coach always says, 'Once a Terp, always a Terp,' and I know I will always be a part of the Maryland gymnastics family."

### studentspotLight

### From the Boxing Ring to Whiting-Turner: Matthew Goodman Demonstrates Why His Love for a Challenge

Has Pushed Him to Succeed



For as long as he can remember, Matthew Goodman, a senior CEE major with a minor in project management, has had a knack for construction projects.

As a toddler, he fussed with Lincoln Logs and LEGO blocks for hours; but, by his high school days, Goodman's love for "building things with his own hands" carried him through woodshop and sparked an early interest in engineering.

"I was always interested in finding out how things worked," Goodman said, admitting that he has had a love for science and math since his grade-school days. "Engineering provided me with an opportunity to learn firsthand how math and science play a role in the final outcome of a project – whether it's something as simple as an assignment in woodshop or something as big as a bridge or building."

But, while Goodman built his love for engineering throughout his years at the University of Maryland, so, too, did he discover a new passion – boxing.

Growing up, Goodman's involvement in the sport hardly extended beyond roughhousing with neighborhood friends. As a UMD freshman, however, Goodman found himself drawn to the Terps Boxing Club table at the First Look Fair.

Before he could realize it, he had fallen in love with the sport.

"I spent my whole first year with the team training to get in shape and learning the fundamentals and techniques," Goodman said. "I see boxing as the ultimate competition. I'm a very competitive person and I love the nature of the sport. Your teammates and coaches help you reach new levels of success but, when you're in the ring, it's just you versus your opponent. You're the only two people who can affect the outcome of the match, and I love that aspect of it."

By sophomore year, Goodman began competing with the team, but in his junior year, he suffered a setback when he tore his anterior cruciate ligament (ACL).

"I had to get surgery right away, but I stuck around to help the rest of my team," Goodman said.

After enduring a rehabilitation process, Goodman returned in full competition mode and was voted a co-team captain his senior year. Additionally, as a member of the Intercollegiate Boxing Association, Goodman was invited to represent the United States in a competition at the University of Portsmouth in Portsmouth, United Kingdom, during which elite U.S. boxers faced off against U.K. competitors.

As a student who always aspired to study abroad, the event marked a once-in-a-lifetime opportunity for Goodman, who participated in five days' worth of events before taking some time to explore nearby London. Goodman admits he never studied abroad during his undergraduate career, but he does not regret the many hours he has devoted to both engineering and boxing.

"Balancing the demands of an engineering degree and boxing has certainly been dif-

ficult," he said. "It takes a lot of time management – every week, I have to plan ahead when I'll have time for homework, for studying, for training, for sleep, even, while still making it to practice and workouts. It takes a lot of sacrifices – and you have to be willing to put aside some of the social aspects college life presents. But, it is definitely worth it – I would never change a thing about my experience.

"I like challenging myself and, with boxing and engineering, there is a constant mental challenge," he continued. "I am the type of person that gets bored if I don't feel challenged, so balancing boxing and engineering has been exciting for me. And, one of the things I have loved most is that – for both engineering and boxing – your results are a product of the time and effort you dedicate. The more you give, the more you get. It's definitely rewarding to see that."

Goodman notes that some of his proudest accomplishments include making Dean's List each of his four years at the University of Maryland, as well as graduating with honors. Additionally, Goodman has participated as a member of UMD's Concrete Canoe team in both his junior and senior years, and he has served as a Resident Assistant.

Moving forward, Goodman is excited to take on new challenges and responsibilities. He recently accepted a position with the Whiting-Turner Contracting Company, where he will specialize in construction management.

But, while he holds bold plans for his future in civil engineering, Goodman hopes to stay active in boxing – even despite suffering a second ACL tear earlier this year.

"I have to get another surgery this year, but I plan to get back into boxing as soon as I can," he said. "I've talked to other graduating students about training together and staying involved in the sport. I think coaching would be a lot of fun – being able to help out other students, not just in the ring, but also by mentoring them."

After all, Goodman admits education will remain a big part of his life, even after he earns his degree.

"I love to learn," he said. "I really understand the importance of education and I love having the opportunity to learn and experience new things. I want to build on that in my career moving forward, and I am excited to learn more about the industry and how I can make an impact through my work."

## studentnews: graduate

#### Hu Awarded Ann G. Wylie Dissertation Fellowship



Environmental engineering Ph.D. student Meng Hu was recently awarded the Ann G. Wylie Dissertation Fellowship, a onesemester award to support outstanding doctoral students who are in the final

Meng Hu

stages of writing their dissertation.

Advised by Civil and Environmental Engineering (CEE) Assistant Professor Baoxia Mi, Hu has focused his research on membrane technologies to promote the water-energy nexus. Most recently, he has worked on synthesizing next-generation high-performance graphene-based membranes for water purification, desalination and salinity-gradient power generation.

The graphene-based membranes are found to outperform their commercial counterparts by a factor of four to 10, Hu noted. Additionally, this new type of membrane also presents fascinating transport mechanisms.

Hu and Mi are filing a patent on their exciting research and looking for industrial partners to commercialize the technology to alleviate the water and energy crisis.

#### Romero Receives American Chemical Society's Student Education Award

CEE Ph.D. candidate Adrian Romero was recently given the 2014 Student Education Award by the American Chemical Society (ACS) AGRO Division.

As part of the award, Romero is invited to give a presentation at the 13th International Congress of Pesticide Chemistry in San Francisco, Calif., in August of this year. Additionally, the prize consists of \$800 toward his presentation and conference costs.

Romero, a student of CEE Professor Alba Torrents' lab, will present his work titled, "Improving continuous monitoring of VOC emissions from alternative fertilizers." His research evaluates the effectiveness of online sensor technology to provide continuous monitoring of odorous volatile organic compounds emissions from biosolids and is part of his Ph.D. work both in Torrents' lab and Agricultural Research Service-U.S. Department of Agriculture (ARS-USDA) labs.

### Four Civil and Environmental Engineering Students Named 2014 Future Faculty

CEE students Arefeh Nasri, Yang (Carl) Lu, Michael Maness and Gabriela Niño de Guzmán have been selected by the A. James Clark School of Engineering for the 2014 Future Faculty Program. This program was created to cultivate the next generation of engineering teachers.

Arefeh Nasri is a Ph.D. candidate in Transportation Engineering working with Dr. Lei Zhang. She received her M.S. in Transportation Planning from Rutgers University in 2009. Her research focuses on the relationship between landuse and transportation, and she is in particular interested in investigating how the overall physical form of urban environment influences people's travel behavior and their automobile use.

Yang (Carl) Lu is currently a Ph.D. candidate work-

ing with Dr. Gang-Len Chang in the Traffic Safety and

Operations Lab. He received his B.S. in Automation from

Beijing Jiaotong University, Beijing, China, in 2008 and his

M.S. in Civil Engineering from the University of Maryland

(UMD), in 2012. Lu's research interests include freeway oper-

ation, network traffic control, traffic simulation and railway



Arefeh Nasri



Yang (Carl) Lu

operation. Michael Maness is a Ph.D. candidate in Transportation Engineering with research interests in travel demand modeling, travel behavior analysis and social network analysis. His research focuses on social interactions in travel decision-making through the incorporation of social models into statistical and agent-based models.

Gabriela Niño de Guzmán is a Ph.D. candidate in the Environmental Engineering program, focusing on the development of a reactive permeable barrier and its subsequent microbial colonization for the effective, long-term remediation of groundwater at a Superfund site in Beltsville, Md. Her research interests include microbiology, environmental chemistry, sustainable materials, and environmental restoration.

The Future Faculty Program's mission is to increase the number of highly qualified teachers the Clark School produces for the world's engineering school and prepare select Clark School doctoral students to achieve career-long success in the academic world as teachers and researchers. As part of the program, select students are provided a \$3,000 travel

stipend to present their research at a professional conference. A goal of the program is to have its graduates placed in leading institutions where their impact can be greatest and where they can continue to partner with the Clark School.



Michael Maness



Gabriela Niño de Guzmán

12

## studentnews. graduate

### Andrade IUPAC 2014 AGRO New Investigator Finalist



Natasha Andrade

CEE Ph.D. student Natasha Andrade was selected as one of three finalists for the International Union of Pure and Applied Chemistry (IUPAC) 2014 Division of Agrochemicals (AGRO) New Investigator Award in recognition of her work on the environmental bioavailability of pesticides at the University of Maryland.

Andrade has been awarded a \$1,000 prize and was invited to present her work

and compete for the New Investigator Award at the 248th American Chemical Society National Meeting in San Francisco, August 2014. The competing work is titled "Utilizing thin-film solid-phase extraction to assess the effect of organic carbon amendments on the bioavailability of DDT and dieldrin to earthworks."

The work focuses on a quick and easy technique to estimate the bioavailability of organic pollutants in soil matrices.

Andrade is currently a lecturer in the Department of Civil and Environmental Engineering.

## engineerswithoutborders

### Engineers Without Borders Tackles Stormwater Management in Ethiopia First-ever UMD EWB Crowd Funding Campaign Proves a Success

Nearly five years ago, the University of Maryland chapter of Engineers Without Borders (EWB) took its first steps to support the Ejere community in Addis Alem, Ethiopia. Addis Alem, a town of only 14,000 people – most of whom lack access to basic health provisions like clean drinking water and adequate latrines, grapples with a tremendous rainy season every July through September. During this time, the marketplace – the driving force behind the community's livelihood – becomes extremely difficult to navigate as conditions prevent vendors from doing business.

To help the community, UMD's EWB team has developed alternative designs for the Ejere marketplace to protect vendors and residents from intense sun or heavy rainfall. To build on these plans, EWB plans to send yet another team to the community this summer to teach the Ejere people how to overcome the challenges posed by the harsh climate. By making the Ejere people self-sufficient, EWB hopes to instill within them the confidence and knowledge to continue to make improvements to the marketplace design, even after the EWB project is complete.

To further EWB's mission in Ethiopia, the UMD chapter recently launched its first-ever online crowd funding initiative, through which the team exceeded its fundraising goal of \$4,000 in nearly half the time allotted for the campaign.

In addition to EWB's achievements in Ethiopia, members of the UMD chapter also recently sent a team of engineering and public health students and professionals to Compone, Peru to implement a liquid drip chlorination system in Ayllu San Isidro, a community sector with which EWB has worked since 2009. During the three-week trip, which took place this past winter, the engineering team constructed a system that drips concentrated chlorine into the community's water supply to disinfect the water. Meanwhile, the public health team focused on educating the community on water-related health issues.

Most recently, the Peru project has focused on a water treatment project for another sector: Centro, Compone. Following the success of the recent implementation, EWB is currently preparing for an assessment trip to gather information on the possibility of implementing a



similar disinfection system to treat water in Centro. The EWB team plans to return to Peru in late August to monitor the system it previously implemented, determine the feasibility of liquid drip chlorination for the new sector and further educate the community on waterrelated health issues.

In addition to these projects, the Maryland Sustainability Engineering (MDSE) will soon work again with the Madieu Williams Foundation and the community of Calaba Town, Sierra Leone. With the support of the Marvin Weissberg Foundation, MDSE will travel twice to Sierra Leone this summer to implement a rainwater catchment and water treatment system on the Abigail D. Butscher Primary School. The team will also soon begin construction of the selfdesigned Abigail D. Butscher Seconday School, which will be the first secondary school in Sierra Leone to be completely subsidized. Between these two projects, MDSEF hopes to curtail waterborne illnesses that plague the primary school's 300 students from lack of clean drinking water and promote better learning environments by increasing the available classroom space.

### alumninews

## CEE Alumnus Regan Named CEO of Whiting-Turner



Timothy J. Regan

Civil engineering alumnus Timothy J. Regan ('77, B.S.) has been named Chief Executive Officer of the Whiting-Turner Contracting Company. He is the third CEO in the company's rich, 105-year history.

Regan's tenure at Whiting-Turner spans more than three decades, and most recently he served as Executive Vice President of the company. The news of his promotion follows the passing of the company's long-time CEO, Willard Hackerman, who lived until the age of 95.

"Literally every one of us has spent our entire Whiting-Turner career under the steady hand and inspirational leadership of Mr. Hackerman," said Regan in statement issued by the company. "He can never be replaced... he is a legend for his good works."

A 1977 graduate in civil engineering, Regan remains close to his alma matter and currently serves on the Clark School's Board of Visitors.

Whiting-Turner employs more than 2,000 people in 18 states and the District of Columbia, and in 2013 the company brought in approximately \$5 billion in revenue. The Baltimore-based company developed several landmark buildings in its home city, including Harborplace, the Meyerhoff Symphony Hall, and M&T Bank Stadium, home of the Baltimore Ravens football team.

In addition to supporting the Clark School's longstanding Whiting-Turner Business and Entrepreneurial Lecture Series, Whiting-Turner has also supported the Whiting-Turner Internship-Scholarship program, University Incentive Awards, the Charles Irish Professorship, and the Charles Irish Laboratory at the University of Maryland.

Whiting-Turner is also a Clark School Corporate Partner, a sponsor of UMD's 2011 Solar Decathlon Team, host of the annual Clark School Alumni Reception at the Engineers Club in Baltimore, and contributes the service of many Whiting-Turner Leaders on University of Maryland boards, including the Clark School Board of Visitors.

### Civil and Environmental Engineering Students Win 2014 Alumni Cup

On a rainy Friday afternoon, an enthusiastic crowd of students, faculty, staff and alumni lined the spiral staircase in the Kim Engineering Building to watch the 2014 Clark School Alumni Cup. And, for the second consecutive year, the students from the Department of Civil and Environmental Engineering (CEE) took home first place.

The Alumni Cup is an annual



engineering design competition that was started in 2012 by the University

of Maryland Alumni Association, Engineering Chapter. The event takes place each year during National Engineers Week, a weeklong celebration held to increase awareness of the field for the general public, students, educators and parents.

A week before the Alumni Cup, teams of undergraduate students from each of the Clark School's eight academic departments were tasked with designing a machine that could move a CD/DVD at least two feet, insert it into a CD/DVD drive and play the contents of the CD/DVD. Given a small stipend, the teams were able to design, build and test their machines before the competition.

After three exciting rounds, the panel of judges announced the CEE team as the winners with the best overall design, presentation and team spirit.

#### Alumnus Appointed Director of Climate Change Science Institute



CEE alumnus Jack D. Fellows ('76, B.S., '78, M.S., '84, Ph.D.) has been appointed director of the Climate Change Science Institute (CCSI) at Oak Ridge National Laboratory (ORNL). He will lead and continue to

Jack D. Fellows

develop programs and strategic initiatives for ORNL in climate change science.

Fellows succeeds founding CCSI Director James J. Hack, who said Fellows "brings [to CCSI] decades of highquality experience in developing and leading large programs and interacting at the highest levels across government agencies engaged in the study of the climate system."

"Jack Fellows is a welcome addition to our climate change science program," said ORNL Director Thom Mason in an Oak Ridge Today article. "His extensive experience in directing research and education programs, most recently as vice president for the University Corporation for Atmospheric Research, will be particularly valuable as CCSI moves forward in its work of advancing the understanding of the Earth system, describing the consequences of climate change, and evaluating and informing policy on the potential outcomes of responses to climate change."

Fellows' experience as vice president for the University Corporation for Atmospheric Research and co-founder of the U.S. Global Change Research Program will help support CCSI, as the institute aims to provide knowledge that assists decision-makers in assessing risks to infrastructure, the environment and human health, and to weigh the costs and benefits of related policies and practices.

Established in 2009, CCSI is comprised of more than 100 ORNL staff and post-graduate researchers who receive research funding in excess of \$35 million per year. By moving his talents to the Oak Ridge, Tennessee institute, Fellows hopes to build on the existing strengths of the institute while enhancing their responsive climate adaptation activities.



A. JAMES CLARK SCHOOL OF ENGINEERING

Department of Civil and Environmental Engineering 1173 Glenn L. Martin Hall, Building #088 University of Maryland College Park, MD 20742 Nonprofit Org. U.S. Postage PAID Permit No. 10 College Park, MD

CIVIL REMARKS is published for alumni and friends of The Department of Civil and Environmental Engineering at the A. James Clark School of Engineering, University of Maryland.

Alumni news and comments are welcome! Please contact us at: Department of Civil and Environmental Engineering 1173 Glenn L. Martin Hall, Building #088 University of Maryland College Park, MD 20742 Follow us on Twitter: @UMDCivil

B

Department Chair: Dr. Charles W. Schwartz Editor: Alyssa Wolice Graphic Designer: Jason Quick



(301) 405-7768

