



## *Welcome from the Department Head*

Mississippi State's Civil and Environmental Engineering Department proactively uses teaching, research, and service to educate baccalaureate, masters, and doctoral students. We feel the first, best calling of our students is to become Professional Engineers by becoming competent, dynamic, and ethical engineers of the future. This E-newsletter is our effort to share a snippet of a few of the achievements we have made during this higher education journey.

**Mississippi State University chapter of Engineers Without Borders USA completes the construction and implementation of their ninth well in Zambia.**

Several Mississippi State University students have been involved with a five-year project with Engineers Without Borders USA and Simwatachela Sustainable Agriculture and Arts Program. SSAAP is a not-for-profit program aimed at providing clean water for drinking and agriculture to the communities in Simwatachela, Zambia.

Before the start of this project in 2013, most people were relying on hand-dug wells. Shallow and uncovered, these wells were dirty and easily contaminated, but were still used for drinking, washing, and providing for animals in equal measure. During the dry season, many smaller wells would dry up completely or turn to mud, which local residents would have to use or travel for miles in search of an alternative.

MSU's engineering students helped to provide borehole wells which were significantly deeper, offering clean water, uncontaminated by runoff or fertilizers, which won't dry up during the dry season. Emily Farrar, an MSU student and former president of the MSU chapter, noted that "the availability of water changes every aspect of their lives and opportunities. It is hard for the members of the community to further themselves through education when they spend half a day or more walking for water, or cannot receive a teacher due to the lack of a clean water source."

This August, the team completed its ninth well. All total, these wells can provide clean, drinkable water for approximately 10,000 people; about half the people in the chiefdom. In addition to drilling the boreholes, they are empowering the people in the communities by providing them with the tools and knowledge to maintain the wells and keep them in working order. This will ensure that these wells are a suitable source of water for many years to come.

But the project does not only provide wells. MSU EWB and SSAAP teamed up in other ways. "It is reasonable to expect that nine potable water wells would have an impact," says Dennis Truax, faculty advisor for MSU's EWB. "So, too, have the animal husbandry, hygiene, sports education, teaching, and arts and crafts-based entrepreneurial programs help improve lives and change the quality of lives for those in the Simwatachela Chiefdom. Also, this program has changed the lives of every person who has participated in the Mississippi State team over the years, by proving a global view of the diversity of roles engineers play planning, designing and construction a better quality of life for those who live half a planet away."





Dr. Farshid Vahedifard publishes letter in *Science* on environmental issues in engineering.



Dr. Farshid Vahedifard has been an assistant professor in the Civil and Environmental Engineering department since 2012, focusing on geotechnical engineering. A letter was published in *Science Magazine* this September with Dr. Vahedifard as lead author in which they examine the Louisiana flooding earlier this year. The article points to a number of different contributing factors leading to the flooding, including the fact that, as the authors note, "...the majority of the 160,000 km earthen levees across the United States are in marginal condition".

Assessing the structural integrity of earthen levees is a topic which Dr. Vahedifard has examined in multiple recent publications. In August 2015, he published a letter in *Science Magazine* with a coauthor from the University of California and a student from Mississippi State, in which they called for further research on the effects of earthen levees in California. The same authors then published an article this June in the *Journal of Geotechnical and Geoenvironmental Engineering* detailing the dangers of extended drought, which weaken levees, leaving them in danger of failure in the event of any other environmental event, such as a flood or earthquake. Since a majority of levees in California are in urban areas, their failure has the potential of negatively affecting large populations.

As Dr. Vahedifard and coauthors conclude in their most recent *Science Magazine* letter, the main issue is the compounding of multiple environmental and anthropogenic factors. The authors call for further research so that we can fully understand how these factors interact with one another in order to prevent future disasters.

Congratulations to Dr. Isaac Howard for receiving the 2016 ASCE Mississippi Section Engineer of the Year Award.

Dr. Isaac Howard was named the recipient of the 2016 ASCE Mississippi Section Engineer of the Year Award this October. According to the ASCE website, this award is given to an ASCE member "who has contributed substantially to the status of the engineering profession by establishing a reputation for professional service and ethics." Nominees for the award are judged based on technical contributions to the field of civil engineering, as well as professional advancement and service to the community.

Dr. Howard is an associate professor and Materials and Construction Industries Chair in the Civil and Environmental Engineering department at Mississippi State University. He is also the Director of the Construction Materials Research Center, which focuses on materials studies, primarily those involved with highways and transportation, such as asphalt and cement. The Center works with about ten students from Mississippi State University every year and releases an average of fifteen publications a year.



*Contact Us!*  
501 Hardy Road  
235 Walker Engineering Bldg  
Box 9546  
Mississippi State, MS  
39762-9546  
p. 662.325.3050  
f. 662.325.7189



<http://www.cee.msstate.edu/>