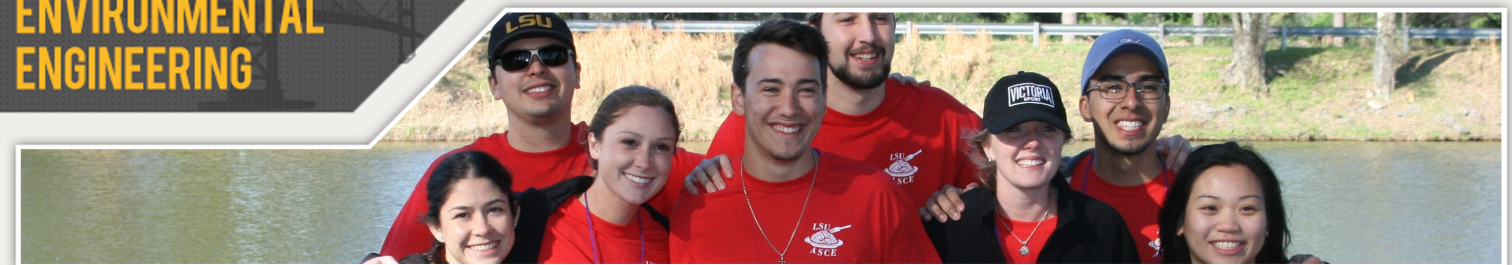


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FROM THE DEPARTMENT CHAIR

A letter from George Z. Voyiadjis



I am pleased to highlight some of the key items and recognitions presented in this newsletter.

The new Coastal Protection and Restoration Authority's (CPRA)-funded LSU Center for River Studies (CRS) is nearly complete. The facility is located on the Baton Rouge Water Campus, just south of the I-10 bridge between Nicholson Road and River Road. Adjacent to it is the Water Institute of the Gulf, which is currently under construction near the old city dock. The opening of the facility is expected to be in late 2017 or early 2018.

The third ASCE at LSU Career Fair held on November 7 was a great success and had the highest student attendance of any fair yet. This event also had the most organizations of any ASCE Career Fair to date, all of which were recruiting civil engineers. Building connections and hearing from professionals in the engineering fields are extremely beneficial for young prospective engineers, and the ASCE Career Fair is the best way for civil engineering students and employers to connect.

Dr. Navid Jafari in the Department of Civil and Environmental Engineering has been awarded a

RAPID (Rapid Response Research) grant from the National Science Foundation (NSF). The grant is to be used for unmanned aerial vehicles and smartphones to create highly accurate 3-D and profile maps of the storm debris so the city can understand the full extent of what needs to be removed. This is a funding mechanism NSF uses for proposals having severe urgency with regard to availability of, or access to, data, including quick-response research on natural disasters.

Drs. Clint Willson and Scott Hagen, two civil and environmental engineering faculty, are part of a new Gulf Research Program of the National Academies of Sciences, Engineering, and Medicine and the Robert Wood Johnson Foundation grant, *Inland from the Coast: A Multi-Scalar Approach to Regional Climate Change Responses*. This is a \$2.9 million project with research findings that will be put into practice through local partnerships with professional architects, engineers, landscape architects, planners, policymakers, and community members.

Sincerely,
Dr. George Z. Voyiadjis
*Boyd Professor, Chair
Bingham C. Stewart
Distinguished Professor*

ALUMNI REGISTRATION & UPDATES

The Department of Civil & Environmental Engineering is always interested in how our alumni are doing. We hope you will take the time to send your updates to mlane10@lsu.edu or, if you prefer, you can "snail mail" them to:

Department of Civil and Environmental Engineering
Louisiana State University
Attn: Madison Lane
3255 Patrick F. Taylor Hall
Baton Rouge, LA 70803-6405

Please include basic information, such as your full name, year of graduation, degree, mailing address, email address, telephone number, company, and your title/position. For your update, please include information on your recent professional and personal developments, along with a high-quality photo, if available.

Thanks for staying in touch!

To connect with the LSU College of Engineering, please visit <http://www.lsu.edu/eng/index.php>





UPDATE FROM ASCE

During the 2017 fall semester, the American Society for Civil Engineers at LSU hosted eight chapter meetings. Guest speakers from the ASCE Baton Rouge chapter, SIGMA Consulting Group, Clear World, Stanley Consultants, and Geoengineers spoke to the chapter, as well as Dr. Rodolfo Aguilar, a member of the LSU Hall of Distinction for Civil and Environmental Engineering. Since the spring of 2017, ASCE has increased meeting rates from monthly to weekly to give its members access to as much information as possible. There has also been an effort to find speakers to represent as many different focuses of civil engineering as possible. Additionally, we are excited to welcome the future leaders of LSU's chapter of ASCE that were elected during the general body meeting of October 3, 2017. The elections were held early in the semester with the hopes of providing sufficient time to pass along advice and mentorship to those replacing current officers. These officer-elects spent the fall semester learning about their duties and responsibilities in order to start strong for their official terms in the spring.

Our Steel Bridge and Concrete Canoe teams are hard at work preparing for the ASCE Deep South Competition in March. With lessons learned during last year's competition in mind, the Steel Bridge team is finalizing its design and moving forward with the fabrication process, while the Concrete Canoe team has begun rowing practices. Both teams offer unique and valuable experiences that provide an understanding of leadership, organiza-

tion and project management that are hard to obtain elsewhere. The members of these self-motivated teams are extremely proud of the work that they put in before the competition each year, and we are all anticipating a very competitive representation by our ASCE chapter and the LSU Department of Civil Engineering.

The third ASCE at LSU career fair held on November 7 was a great success, with the highest student attendance of any fair yet. This career fair also had the most organizations participating of any ASCE Career Fair to date, all of which were recruiting civil engineers. Building connections and hearing from professionals in the engineering fields are extremely beneficial for young prospective engineers, and the ASCE career fair is the best way for civil engineering students and employers to connect. Of course, we also always welcome speakers for future meetings, in addition to this opportunity. If you or your company are interested in sharing your experience at one of our meetings, please contact: asce@lsu.edu or visit www.lsuasce.weebly.com. As always, we would love to hear from you!



DISHILI YOUNG
NEEL-SHAFFER INC.
BS IN CIVIL ENGINEERING



Neel-Shaffer Inc. has named Dishili Young to manage the company's Louisiana transportation and civil design group and provide client services in Louisiana and a nine-state area. Young was a project manager/senior engineer for the Baton Rouge office of Chicago Bridge & Iron Co. and has a bachelor's in civil engineering from LSU.

ALUMNI ACHIEVEMENTS



KAREN HOLDEN
PROVIDENCE
BS IN CIVIL ENGINEERING

Karen Holden was named one of the 2017 Influential Women in Business by *Baton Rouge Business Report*. She graduated from LSU in 1989 with a degree in civil engineering. In 2000, she and three colleagues started their own engineering firm, Providence. Today, Holden is the CEO of Providence and a pioneer for women in the local engineering community. Recently, Holden has been an influential force in moving the region forward in terms of transportation. Providence is the prime consultant working with the Department of Transportation and Development to identify improvements and perform the environmental assessment to increase traffic mobility.

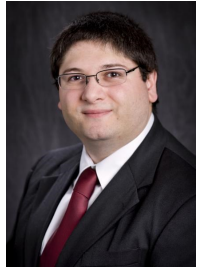


ROBERT E. JEWELL
ADAMAN & ASSOCIATES
BS IN CIVIL ENGINEERING

Adaman & Associates has promoted Senior Consultant Robert E. Jewell to branch manager of the Baton Rouge office. Jewell was the project engineer and operations manager of the Baton Rouge office. He graduated from LSU with a bachelor's in civil engineering.

**TO MAKE AN IMPACTFUL GIFT, PLEASE CONTACT
 DR. GEORGE Z. VOYIADJIS (VOYIADJIS@ENG.LSU.EDU)**

CEE FACULTY ACHIEVEMENTS



Dr. Michele Barbato, associate professor in Civil and Environmental Engineering, was awarded the 2017 LSU College of Engineering Award for Instructor Excellence (Longwell Award). This award was set up to recognize the contribution of LSU faculty who participate in the early years of a student's journey in the College of Engineering. These early courses play a critical role in undergraduate retention and set the tone for our students' future success. Dr. Barbato has also been named chair of the EMI Dynamics Committee and started his tenure on October 1, 2017. The purpose of the EMI Dynamics Committee is to provide expertise and service to the civil engineering profession regarding all aspects of structural dynamics, including soil-structure interaction, earthquake engineering, active and passive structural control, computational algorithms, system identification, and wind-induced vibration.



Dr. Steve C.S. Cai, Edwin B. and Norma S. McNeil Distinguished Professor, has received the Michael Gause Distinguished Service Award from the American Association for Wind Engineering (AAWE). The award reads "In recognition of his contributions to wind engineering for involvement in AAWE activities, research, consulting, and outreach."



Dr. Qin J Chen, CSRS Distinguished Professor in coastal engineering, has received the Louisiana Engineering Society James M. Todd Technological Accomplishment Medal. The James M. Todd Medal is awarded for distinguished service by an engineer for technological advancement or discoveries as contributions to the advancement of engineering. The purpose of honoring engineers with this award is to encourage and inspire other engineers to reach even greater heights of professional achievement.



Dr. Clint Willson and Dr. Scott Hagen, two civil and environmental engineering faculty, are part of a new Gulf Research Program of the National Academies of Sciences, Engineering, and Medicine and the Robert Wood Johnson Foundation grant, *Inland from the Coast: A Multi-Scalar Approach to Regional Climate Change Responses*. This \$2.9 million project brings together faculty from 10 departments at Louisiana Sea Grant, University of New Orleans, and LSU, including the Coastal Sustainability Studio, the Center for Coastal Resiliency, the Life Course and Aging Center, and the Center for River Studies. Research findings will be put into practice through local partnerships with professional architects, engineers, landscape architects, planners, policymakers and community members.



TWENTY-TWO INCOMING FRESHMEN RECEIVE SCHOLARSHIPS

Twenty-two incoming freshmen were recent recipients of competitive scholarships offered by the LSU College of Engineering. Four of the recipients are highlighted here.



Colin Herbert was awarded the LSU Engineering Traditions Scholarship. This \$10,000 scholarship honors the legacy of alumni by "paying it forward" to future leaders of the industry. It is awarded to those pursuing a degree in engineering, construction management, or computer science. Herbert, whose father graduated from LSU with a degree in mechanical engineering, is pursuing a major in computer science. Herbert began programming at just 11 years old and said learning how to code was the first step in helping him find his career path. The LSU Engineering Traditions Scholarship, he said, gives him the opportunity to move one step closer to his dreams.

Jennafer Zimmerman also received the LSU Engineering Traditions Scholarship. Zimmerman said this scholarship not only eased the stress of deciding between multiple schools but also helped her continue her family's legacy. Both her father and brother graduated from LSU with degrees in agricultural and mechanical engineering, respectively. While she claims she was anti-engineering for a while, once her dad suggested industrial engineering she thought it might be a good fit for her because she likes efficiency and organizing.



Madison Hasenkampf received the Ronald E. and Cecilia M. Rinard Scholarship. This scholarship is awarded annually to a small group of students majoring in either petroleum engineering or environmental engineering and totals \$48,000 over a recipient's college career. Hasenkampf, a Baton Rouge native and environmental engineering major, said she was both thrilled and honored to be awarded the scholarship. She chose environmental engineering as her major because of its hands-on nature and multiple opportunities for internships and research. Although LSU is one of the few universities she was interested in that offers the major, she said another reason she was committed to come here was because of the appeal of the new labs and classrooms featured in Patrick F. Taylor Hall.

Matthew Hosman, a mechanical engineering freshman, said he chose to attend LSU because he felt a personal connection to the university. Hosman is a New Orleans native who has moved to multiple countries on his journey to LSU. His family currently resides in Canada because of his father's job as an engineer for ExxonMobil. Receiving the Chevron Energy Leaders Scholarship excited Hosman because it meant recognition for his hard work. He likes knowing that now it is not only him that wants and expects him to succeed, but that there are other people who hope he can do the same.



GEAUX ENGINEERING

STUDENTS SPEND SUMMER AT NOAA NWC INNOVATORS PROGRAM

Kathleen Eubanks and Chris Turnipseed spent part of this past summer as student research fellows at the 2017 NOAA National Water Center (NWC) Innovators Program: Summer Institute in Tuscaloosa, Alabama. NOAA established this program with the Consortium of Universities for the Advancement of Hydrologic Science Inc. (CUAHSI) to engage the academic community in research to advance the mission of the NOAA National Weather Service Office of Water Prediction at the NWC. The key activity of the Innovators Program is a seven-week Summer Institute at the National Water Center, bringing graduate students and faculty advisors together with National Water Center staff to conduct group projects that involve rapid prototyping of new ideas. The intent is to create an innovation incubator where students from many universities can exchange ideas and advance concepts that, although developed over a short timeframe and study areas, are illustrative of issues that affect the functioning of the National Water Model across the continental United States.

As two of 32 fellows representing 25 universities, they worked on projects designed to contribute to the NWC goals of enhancing water-related products and decision-support services across the country. Eubanks, a MS student in coastal and ecological engineering, worked with students from Penn State and Iowa State on a project aimed at using public input to create better online flood mapping tools. Turnipseed, a PhD student in civil engineering, evaluated the performance of a hyper-resolution hydrologic and hydraulic model in a low-gradient watershed. He worked with students from the University of Florida and Iowa State. Eubanks, Turnipseed, and their advisor, Clint Willson, would like to acknowledge and thank CUAHSI for this wonderful opportunity.

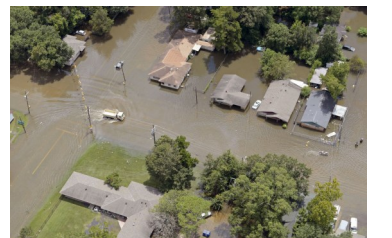


VALERO MAKES \$1 MILLION GIFT TO LSU COLLEGE OF ENGINEERING

LSU's College of Engineering received a \$1 million dollar gift from Valero Energy Corporation to support the education and hands-on experiences for engineering students. Valero Energy Corporation is an international manufacturer and marketer of transportation fuels and other petrochemical products. Officials say the Valero Fund at the LSU Foundation will acquire cutting-edge equipment for undergraduate education and research labs and offer technology support for research by College of Engineering faculty. Judy Wornat, dean of the College of Engineering, says the gift will provide the next generation of LSU engineers with a state-of-the-art learning environment that better prepares them for the jobs in the industry.

ACADEMIC TEAM AT LSU RECOMMEND POLICIES TO AVOID 2016 FLOOD REPEAT

Researchers have collected reams of data since last summer's flood, and now LSU has assembled a group of academics and professionals it believes can translate that information into new policies for political leaders. Various flood mitigation strategies have been proposed in Louisiana, such as better infrastructure, more wetlands mitigation, higher building elevations, moratorium on floodplain construction, and a switch from slab-on-grade construction to piers. Jeff Carney, director of the Coastal Sustainability Studio at LSU, will lead the LSU effort. Carney's team includes scientists, planners, and architects. The state is working to create a new, high-tech hydrological model of the Amite River flood basin, and an LSU civil engineer working on that effort will also contribute to the resiliency group.



OUR LADY OF THE LAKE ANNOUNCES PARTNERSHIP WITH THE COLLEGE OF ENGINEERING

Our Lady of the Lake and the LSU College of Engineering have partnered to create a new healthcare systems engineering collaborative, the first of its kind in Louisiana. The two organizations will work together to pursue effective solutions for advanced healthcare and improved human wellness in the Baton Rouge community and across Louisiana. The partnership will focus on working with industrial engineers, clinicians, and patients to identify and improve healthcare-related processes. The organizations will work together on real-world solutions to enhance patient care by focusing on areas such as lean healthcare process improvement, data-driven healthcare process changes, and quality-led engineering healthcare. The College of Engineering will also develop a Master of Science in Healthcare Systems Engineering program to help expand the population of healthcare specialists with a systems engineering perspective in Baton Rouge and across the state. Healthcare systems engineering as a science produces superior methods of patient care delivery by incorporating efficiency and reliability into evidence-based medicine. The Healthcare Systems Engineering Program at LSU will introduce students and healthcare professionals into systems fundamentals of industrial engineering. The program is an important step forward in LSU's commitment to positively impact the health and well-being of Louisianans. The College of Engineering's new partnership with Our Lady of the Lake demonstrates one of the many opportunities we have to apply LSU's expertise to benefit our state. Pending Louisiana Board of Regents and LSU Board of Supervisors approval, students will be able to enroll in classes for this program in the 2018-2019 school year. Courses will all be online and open to students and healthcare professionals from anywhere in the world.

CEE FACULTY ON THE AFTERMATH OF HURRICANE HARVEY

LSU's own environmental engineering professor, John Pardue, was featured in two articles regarding the aftermath of Hurricane Harvey, one in *Newsweek* and one in *The Associated Press*. Pardue, whose team researched the aftermath of Hurricane Katrina, says the scope of effort in response to Hurricane Harvey has been much less than that of Katrina. Pardue and his team sampled standing water after Katrina and explained how he did not see much communication from the EPA about what its tests were finding in the early days of Harvey. EPA has been largely criticized for its response to Hurricane Harvey. Pardue noted that the thing about floodwaters is that even though they pick up concerning substances, they also, by their nature, dilute them. "Nine trillion gallons of water, you can do some math on that and you can see that dilutes even the most toxic chemicals that are there," Pardue assured.



Many early concerns in Houston focused on the large industrial sector built up around its shipping channel. Pardue, who has researched storage tanks holding crude oil, gasoline, and other contaminants, emphasized that storage tanks can be real threats when they do actually fail. During Hurricane Harvey, more than two dozen storage tanks failed, spilling at least 145,000 gallons of fuel and spewing toxic pollutants into the air. These tank failures follow years of warnings that the Houston area's petrochemical industry was ill-prepared for a major storm. Federal and state rules require companies to be prepared for spills, but mandate no specific measures to secure storage tanks at refineries, chemical plants, and oil production sites.

Although Florida has no oil refineries, it has more than 20 petroleum product storage terminals in coastal communities and about 30 chemical companies with a presence in the state, including a significant number of facil-

ities in the Tampa Bay area. To which Pardue commented, "Tampa Bay is one of the most vulnerable cities in the country to hurricanes. But there's no requirement that says when you're in a hurricane zone you've got to do things differently." He continued, "if we're going to put some of these facilities in harm's way, it would be great to have some specific regulations."



PREVENTING OIL SPILLS AND PROTECTING SHIPWRECKS

Navid Jafari, assistant professor in civil and environmental engineering, and geotechnical engineering graduate student Jack Cadigan participated in a field cruise the first weeks of June in the Gulf of Mexico that resulted in a publication in *Science* magazine. Scientists are using the sunken tanker, *Virginia's*, movements to understand how changes in the weather are reshaping the seafloor. The *Virginia's* movements are easily deciphered when large storms and hurricanes roll through the gulf, like the ones in 2004 and 2005. When it comes to movements not caused by violent storms, researchers concluded that masses of cold air that regularly move over the gulf in the winter can stir up waves and pressure differences that can help push the sediment seawards at rates of up to a meter per year. This research is important because underwater mudslides pose a threat to oil pipelines and historic shipwrecks. The findings have implications for both efforts to prevent oil spills and protect historic wrecks.



Faculty Achievements



LSU RESEARCHERS EARN GRANT TO HELP HURRICANE HARVEY-IMPACTED COMMUNITIES PRIORITIZE DEBRIS CLEANUP

After Hurricane Harvey hit Beaumont, Texas, in September, residents began to clean up their homes and neighborhoods. As a result, construction debris, trash, and other items began lining the streets in growing piles. Assistant professor in civil and environmental engineering Navid Jafari has been awarded a \$40,000 National Science Foundation RAPID grant. The grant is to be used for unmanned aerial vehicles and smartphones to create highly accurate 3-D and profile maps of the storm debris so the city knows the full extent of what it needs to remove.

RAPID stands for Rapid Response Research and is a funding mechanism NSF uses for proposals having a severe urgency with regard to availability of, or access to, data, including quick-response research on natural disasters.

Dr. Navid Jafari is working with another team from the University of Texas at Arlington. Anand Puppala, associate dean for research in UTA's College of Engineering and a professor in the Civil Engineering Department, is the principal investigator on the grant. Junzhou Huang, an associate professor in the Department of Computer Science and Engineering, is the co-principal investigator. Jack Cadigan, a civil engineering masters student,

and Brendan Copley, an undergraduate, are participating in the research project as well.

The UTA team piloted the UAV, creating flight paths and waypoints, geotagging the images using high-precision global navigation satellite system. The UAV is then flown over 15 stockpiles in the Beaumont area, which takes about 15 minutes per stockpile. Then, they use software to build 3-D models and orthophotos, which are used to estimate the volume and area of the stockpiles to centimeter-grade accuracy. The process also indicates areas where pavement is damaged, which will allow the city to dedicate resources to those repairs.

Beaumont owns a UAV used to find where chemicals were leaking from local factories damaged in the storm and make repairs within hours. "The use of unmanned vehicles has opened dozens of new opportunities for civil engineers to make a difference in disaster recovery efforts," Department Chair George Voyiadjis said. "Dr. Jafari and his team were able to respond quickly and develop a procedure to provide accurate predictions of debris volumes, which will help cities thoroughly conduct debris management and removal operations in a timely manner. This method will be useful in future efforts in similar hazard events."



RIVER MODEL FEATURED IN THE NEW CENTER FOR RIVER STUDIES

The Center for River Studies, a collaborative partnership between the Coastal Protection and Restoration Authority and LSU, is an unprecedented effort to showcase Louisiana's working delta, the state's coastal program, and research dedicated to coastal restoration and river management. The primary focus of the Center for River Studies is to operate one of the world's largest physical models of the Mississippi River to produce qualitative land-building results associated with sediment diversion in the lower river. Based on exact parameters of the river's physical and dynamic properties, the model will flow sediment and water, covering a 14,000-square-mile section of southeast Louisiana, including Terrebonne, Barataria, Breton Sound, and Pontchartrain Basins.

The center will provide an opportunity for researchers, scientists, and engineers to develop coastal knowledge that can be exported to other coastal communities around the world. In addition to the river model, the Center for River Studies also features a 10,000-square-foot interactive coastal exhibit area that features seven distinct coastal-related educational themes. The model will serve as an important tool for research and for engagement with coastal stakeholders and visitors.



FAST FACTS

- Total Project Budget = \$18M
- The CPRA scoped, funded, and managed 100% of the design and construction of the Center for River Studies and Lower Mississippi River Physical Model.
- Nearly 70% of the consultants, contractors, and sub-contractors that designed and constructed the Center for River Studies are Louisiana companies.
- The Lower Mississippi River Physical Model, a 90 x 120 foot movable bed physical model, is one of the largest of its kind in the world!
- The facility was specifically designed for the model. The foundation, overhead gantry crane, walk-bridge, interior drainage, electrical system and data infrastructure were all designed to facilitate the model and exhibit.
- One hour of model testing time = one year of natural river time, therefore 100-year project scenarios will take approximately 100 hours on the model.
- The model will flow sediment and water, covering a 14,000-square-mile section of southeast Louisiana including Terrebonne, Barataria, Breton Sound, and Pontchartrain Basins.
- Model panels are routed using a highly accurate Computer Numerical Controlled (CNC) Router. The router is fed with 3-D CAD files that are derived from actual survey data throughout the model domain.
- Each panel took approximately 18 to 24 hours to route.
- The model domain includes 179 miles of Mississippi River from Donaldsonville to the Gulf of Mexico.
- Twenty high-resolution digital projectors are mounted above the model and will be able to merge together and project aerial photographs, project features, diversion outputs, and other simulations/animations.
- When fully assembled, the model will be as heavy as a loaded 737 jet and be supported by more than 1 mile of steel beams.



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