



## 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 [jmueller@lsu.edu](mailto:jmueller@lsu.edu) or, if you prefer, you can "snail mail" them to:

**Department of Civil and Environmental Engineering**  
**Louisiana State University**  
**Attn: Julie Mueller**  
**3418 Patrick 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  
[www.eng.lsu.edu/alumni/update](http://www.eng.lsu.edu/alumni/update)



Welcome to another issue of our newsletter. I would like to take this opportunity to illustrate the research and education activities of our department, the achievements of our faculty, and the successes of our students. This newsletter features these issues for this academic year 2013-2014.

Our faculty members continue to conduct cutting-edge research on many fronts and receive national recognition. In this newsletter there is a special focus on the aging infrastructure and its associated issues. In addition, there is an article on using NASA data to predict oyster contamination. These are pertinent issues for our state and country. In student news, our student organization chapters are, as always, active and growing.

It is my pleasure to introduce to you our latest CEE Hall of Distinction inductee: Mr. William E. Rushing. He is the Vice President of Waldemar S. Nelson & Co., Inc. and the Incoming President of the American Institute of Concrete. The department

## FROM THE DEPARTMENT CHAIR

A letter from George Z. Voyiadjis

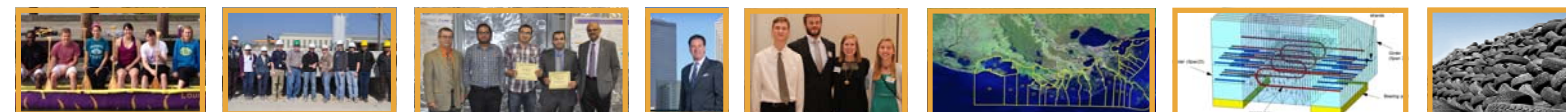
honored him at our annual banquet, as well as recipients of the 2014 faculty awards. These recent inductee brings our Hall of Distinction to 31 outstanding individuals who have made significant contributions to our profession and to the department through their honorable achievements and support.

You will also find information on the latest awards and distinctions of our faculty and students. We also held our 3<sup>rd</sup> CEE Graduate Student Research Conference and presented awards to our top three students. We continue to be proud of their outstanding achievements.

The CEE Department has been actively engaged in hiring four new faculty members starting in August 2014. Three of these faculty in Environmental, Coastal and Geotechnical Engineering have already accepted our offer and we will be highlighting them in the Fall issue of our newsletter.

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

## IN THIS ISSUE



## ASCE STUDENT CHAPTER PARTICIPATES IN DEEP SOUTH REGIONAL CONFERENCE

In March, members of the LSU ASCE Student Chapter participated in the 2014 Deep South Regional Conference hosted by Christian Brothers University. Members of the steel bridge and concrete canoe teams traveled to Memphis, TN to compete against student chapters and clubs from Arkansas, Louisiana, Mississippi, and Tennessee.

The primary goal of the Deep South Conference is "to further technical, professional, and ethical knowledge of these students as it relates to civil engineering." Annual competitions offer students an opportunity to apply principles and concepts they have learned in their undergraduate studies.



The concrete canoe team included members: Sean Moore, Alicia Fortier, Brendan Copley, Emily Weigand, Jabari Landry, Robert Davis, Patrick Stiegman, and Laura Iverson. The team placed third overall. The canoe was improved this year by decreasing the thickness of the sides from over an inch to one-half inch and also by lightening the concrete mix by removing coastal sand and expanding clay. The women placed second in both the 600m slalom and 200m sprint races. The four person co-ed 400m sprint placed third. The men placed second in sprint and third in slalom. The team would like to thank the following sponsors: Modjeski and Masters, CSRS, the Louisiana Transportation Research Center, SJB Group, Forte & Tablada, H. Davis Cole & Associates, Aucoin & Associates, and Ardaman & Associates.



The steel bridge team included members Ryan Jeansonne, Brad Jacobs, Paul Wedig, Josh Kohler, and Blake Villarubia. The LSU purple and gold bridge was made with I-beams to decrease weight and the team was able to decrease their build time to 9:15 minutes (before penalties and deductions) which was one of the best construction times among the nine teams participating at this year's competition. Unfortunately, the bridge failed during loading just after the final weight was added. The team would like to thank the following sponsors: Exxon Mobil, CDI Corporation, CB&I, the American Institute of Steel Construction, and Shread - Kuyrkendall & Associates.

The group also participated and won first place in the mystery event. The team had to create a structure that would withstand a given frequency. Tongue depressors, super glue, and a base was supplied to the team. During testing, LSU's structure withstood through the highest frequency. Ole Miss, University of Memphis, and LSU tied for first place.

Both teams would also like to thank the Department of Civil & Environmental Engineering for their support, along with faculty advisor Dr. Michele Barbato and CEE staff member Dave Robertson for making their participation in the regional competition possible.



## MAKING HISTORY AS NEW CHIEF ENGINEER OF DOTD

LSU civil engineering graduate Janice (Joplin) Williams is making history as the first female chief engineer at the Department of Transportation and Development (DOTD). As the daughter of an LSU civil engineering professor, Williams is following in her

father's footsteps. With two daughters studying here at LSU, one in civil engineering and the other a graduate student, the tradition of educational excellence continues on.

Williams, a 1985 graduate, began her DOTD career immediately after graduating from LSU and has held multiple positions since. As the new chief engineering of DOTD, Williams will now oversee more than 500 engineers, technicians, and support staff.



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# THANK YOU!

FOR HELPING THE LSU COLLEGE OF ENGINEERING  
BREAK NEW GROUND

The LSU College of Engineering is committed to educating the very best engineers, and thanks to your help, it will break ground on the renovation and expansion of the engineering campus this fall. More than 450 individual and corporate donors pledged \$52.5 million in private funds, fulfilling the College's commitment to a \$100 public/private partnership. Please know how much we appreciate your support of the next generation of LSU Engineers.

## CEE FACULTY EARN LSU DISTINGUISHED FACULTY AND TAF AWARDS



**D**r. Steve C.S. Cai, (pictured left) Edwin B. and Norma S. McNeil Distinguished Professor in the Department of Civil & Environmental Engineering, was selected to receive a 2014 University Distinguished Faculty Award, which recognizes faculty accomplishments and showcases superb teaching, research, and service at LSU. Cai, along with four other recipients, was recognized at an awards presentation and reception held on April 29 at the Lod Cook Alumni Center.

Also recognized at the reception were Drs. Mostafa Elseifi (pictured top right) and Ayman Okeil (pictured bottom right), both recipients of 2014 Tiger Athletic Foundation (TAF) Undergraduate Teaching Awards.

The TAF Undergraduate Teaching Award, a one-time, \$1,000 honor, recognizes full-time faculty members annually for extraordinary classroom teaching. In choosing award recipients, TAF considers nominees' impact on and involvement with students, contributions to the profession of teaching, and a focus on scholarship in teaching and learning.

## HIGHLIGHTS



**Dr. John Pardue**, along with his LSU research group, won the 2014 EBC Ira W. Leighton, Jr. Outstanding Environmental-Energy Technology Application Award, presented by the Environmental Business Council of New England. The award will be presented in Boston on May 21.



**J. Anthony "Tony" Cavell**, PLS, CFedS, from Louisiana was elected vice president of the National Society of Professional Surveyors. Cavell is a research specialist with the LSU Center for Geoinformatics (C4G) within the Department of Civil & Environmental Engineering and a consulting professional land

surveyor. He previously served LSU C4G as Associate Director from 2005 to 2010 during which he saw the development of the LSU network of GNSS reference stations called *C4Gnet*.



The following have been recognized for their years of service to the University:

**Dr. Chester Wilmot** (left), Professor 20 years of service

**Dr. Clinton Willson** (middle), Professor 15 years of service

**Joshua Kent** (right), GIS Manager at the LSU Center for Geoinformatics (C4G) 15 years of service

## CHIEPSILON HAS AN ACTIVE SPRING SEMESTER

**T**he LSU Chi Epsilon Honor Society has had an active Spring semester. At its initiation ceremony held March 24, the chapter welcomed nine new undergraduate and graduate students. Also in March, Pollard Lawson (current associate editor) represented the chapter at the National Conclave in Salt Lake City, Utah where he was able to network with fellow society members.

Dr. Frank Tsai (Associate Professor in civil engineering) continues as the chapter's faculty advisor and the newly elected officers for Fall 2014 academic calendar will be: Chris Rowan (President), John Voelker (Vice President), Laura Iverson (Treasurer/Secretary), Pollard Lawson (Associate Editor), and Justin Richard (Marshal). The chapter would also like to congratulate five chapter members graduating this May: Fabiola Campoblanco (former President), Thomas Bourgeois, Michael Sanders, Philip Goppelt, and Paul Wedig.

Chi Epsilon honors engineering students who have exemplified the principles of scholarship, character, practicality, and sociability in the civil engineering profession. For more information about the society or if a senior Chi Epsilon member is interested in speaking to the group, please contact faculty advisor Dr. Frank Tsai (ftsai@lsu.edu).

## ENVIRONMENTAL ENG STUDENTS PARTICIPATE IN WERC DESIGN CONTEST

**L**SU environmental engineering students, along with faculty advisors Drs. John Pardue and Ron Malone, recently traveled to New Mexico to participate in the 2014 WERC Design Contest. The team won the first annual EPA Pollution Prevention award with their design of a bioretention basin to treat stormwater using recycled materials as the medium. Team members included Aaron Moseley, LeeAnn Fitch, Jess DeVille, Zachary Romaine, Clark Broussard and Alexander Franklin. The award included a \$500 check to help defer costs of attending.

## GEAUX ENGINEERING



## CE4460 VISITS BOYKIN BROTHERS, INC.

**O**n March 19, students enrolled in the capstone project class (CE 4460 Design of Bridges), along with instructor Dr. Ayman Okeil, visited a prestressed concrete production line. The visit was arranged by Mr. Paul Fossier, Louisiana State Bridge Engineer, who also guest lectures the course, and Mr. Sam Greenwood from Boykin Brothers, Inc. in Baton Rouge. The students were able to tour the plant and see production steps of several ongoing projects. Mr. Greenwood explained to the students the ins and outs of precast concrete production. They listened to how forms are prepared, reinforcement is placed and prestressed, and went into the concrete batch plant control room. Field trips such as these provide students an opportunity to see "real world" applications of the engineering principles and practices.



## 3<sup>RD</sup> ANNUAL CEE GRADUATE STUDENT RESEARCH CONFERENCE

On March 21, 2014, the Department of Civil & Environmental Engineering (CEE) held the 3<sup>rd</sup> annual CEE Graduate Student Research Conference to showcase the research work being performed by graduate students in the department. Held in Patrick F. Taylor Hall, participants displayed research posters to conference guests and judges. The conference also featured guest Dr. Kalliat T. Valsaraj, LSU Vice Chancellor of Research and Economic Development.

Judging for the conference was conducted by a panel comprised of faculty and students from each research concentration area. Each was reviewed for technical content, delivery of the poster presentation, and design and clarity. Results were tallied and the following winners were announced:

**1<sup>st</sup> Place: Osama Osman**  
*"Development of a Connectivity Robustness Measure for Connected Vehicles Environments"*  
 Advisor: Dr. Sherif Ishak

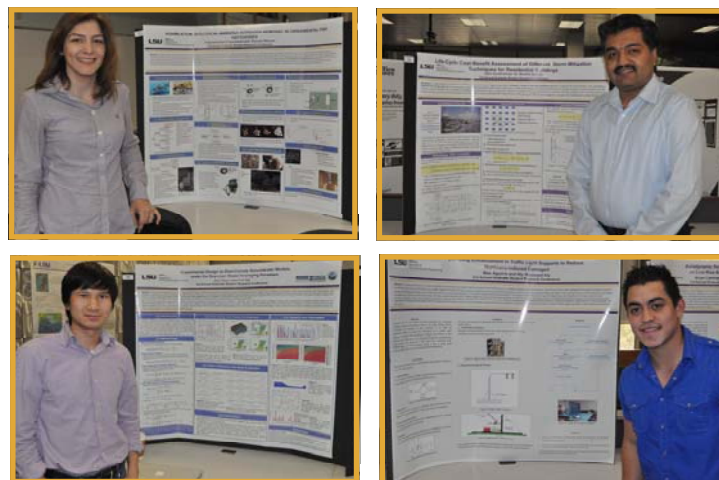
**2<sup>nd</sup> Place: Md. Nafiul Haque**  
*"Evaluating of Set-Up Phenomenon for Fully Instrumented Test Piles in Cohesive Soils"*  
 Advisor: Dr. Murad Abu-Farsakh

**3<sup>rd</sup> Place: Agnimitro Chakrabarti**  
*"Optimizing the Design of Shoreline Protection to Reduce Marsh Edge Erosion for Louisiana Coastal Protection and Restoration"*  
 Advisor: Dr. Q. Jim Chen

**Honorable Mention:**

- Jose Rodriguez (Transportation)
- Getnet Agegnehu (Water/Coastal)
- Jonathan Barnett (Environmental)
- Francisco Grau (Geotech)
- Vipin Unnikrishnan (Structures)

The department would like to thank all participants and attendees, along with the conference committee members and judges.



## NEW RIVER MODEL FACILITY MOVING FORWARD AS PART OF THE BATON ROUGE WATER CAMPUS

Construction is scheduled to begin this summer on LSU's new River Model facility. The \$15M facility, which is being funded by the Louisiana Coastal Protection and Restoration Authority (CPRA), will house the new expanded small-scale physical model (ESSPM), an exhibit/outreach hall, a hydraulics lab and some small conference/workshop space. The River Model facility will be one of the first three buildings on the new Baton Rouge Water Campus, located along the Nicholson Drive corridor, just south of the I-10 Mississippi River bridge. The other two are a building located on Baton Rouge's old Municipal Dock that will be used by the Water Institute of the Gulf and a CPRA headquarters building. Dr. Clint Willson, a professor of Civil & Environmental Engineering at LSU says, "This incredible project would not be possible without the vision, commitment and collaborative spirit of the CPRA, the Baton Rouge Area Foundation and LSU."

The centerpiece of the river model facility will be the ESSPM. The new model domain will cover approximately 140 miles of the lowermost Mississippi River, more than double the old model's domain, at a horizontal scale of 1:6000 and a vertical scale of 1:400. The ESSPM will contain 220, five foot by ten foot panels, each routed individually based on the

latest bathymetric and topographic surveys. As a result of the improved scaling and level of detail and the custom designed automated control and measurement systems, the ESSPM will be able to better simulate the hydraulics and bulk sediment (sand) transport under a variety of flow and sea level conditions, and do so in a more efficient time frame. Willson says "While we haven't done a complete testing of the sediment time scales, we anticipate that one year of Mississippi River time will take on the order of one or two hours in the ESSPM."

The new river model facility will be much more than simply a lab for the ESSPM - it will also be a center for education and outreach, containing a hydraulics lab, a couple of small meeting spaces and an exhibit hall. The hydraulics lab will allow for LSU faculty and students to conduct laboratory experiments at scales that are relevant to the state's coastal issues. The exhibit and outreach space, currently being designed by the LSU Coastal Sustainability Studio, will have interactive, hands-on exhibits and displays that highlight the important restoration and protection work being done by the CPRA, the state's universities, colleges, and private industry.

"The ESSPM will be one more tool in our toolbox as we seek to better understand how to more effectively manage and utilize the Mississippi River and its resources," said Willson. "The work that we do there will be highly complementary to the computational and field studies currently being conducted by researchers at the Water Institute, the state and the U.S. Army Corps of Engineers." Construction of the building is anticipated to be complete by summer 2015. For more information, please contact Clint Willson at 225-578-8672 or cwillson@lsu.edu.



Picture of a section of the guinea pig model, currently being tested at the Vincent A. Forte River and Coastal Hydraulics Laboratory.

## WARM MIX ASPHALT TECHNOLOGIES: MECHANISTIC, ENVIRONMENTAL, AND ECONOMIC ANALYSIS



More than 90 percent of the roads in the United States are surfaced with asphalt. The asphalt industry produces 500 million tons of HMA annually in the USA.

Highway construction consumes a great amount of material (aggregates and asphalt) and energy (production and transportation). The energy consumption required to produce HMA mixtures can be reduced through the use of warm mix asphalt technologies that allow asphalt mixtures to be produced and placed at lower temperatures as compared to hot mix asphalt (HMA). WMA technologies also offer improvements in workability,

cost, and environmental sustainability such as reduced fuel usage, greenhouse gas emissions, and wear and tear at plants, while enhancing worker health and safety conditions. Dr. Mohammad's research characterized and compared the structural performance of plant-produced WMA and HMA mixtures. The results of the research showed that the reduction in production and placement temperatures had no negative performances when compared to conventional mixtures. In addition, reduced energy consumption associated with producing WMA resulted in fuel savings of 12-14% and an average energy savings of \$1.61 per ton of mixture compared to that of HMA.



Department of Civil & Environmental Engineering Professor Dr. Brian Wolshon is the Director of The Gulf Coast Research Center for Evacuation and Transportation Resiliency. The center is a collaborative effort between the LSU Department of Civil and Environmental Engineering and the University of New Orleans' Department of Planning and Urban Studies. The theme of the LSU-UNO Center is focused on Evacuation and Transportation Resiliency in an effort to address the multitude of issues that impact transportation processes under emergency conditions such as evacuation and other types of major events. This area of research also addresses the need to develop and maintain the ability of transportation systems to economically, efficiently, and safely respond to the changing demands that may be placed upon them.

The NEC is teaming with the Journal of Emergency Management to publish a special edition highlighting research featured at this year's conference. Wolshon is serving as a guest editor for this special edition of the Journal.

For more information about the center, visit [www.evaccenter.lsu.edu](http://www.evaccenter.lsu.edu)

For more information about the conference, visit [www.nationalevacuationconference.org](http://www.nationalevacuationconference.org)

## 2014 NATIONAL EVACUATION CONFERENCE

The Gulf Coast Center for Evacuation and Transportation Resiliency, along with co-sponsors at the University of New Orleans and LSU's Stephenson Disaster Management Institute, held the 2014 National Evacuation Conference (NEC) January 7-10 at the New Orleans Ernest N. Morial Convention Center. The conference, the fifth since its inception, focused on uniting the fields of transportation and emergency management to further advance and improve evacuation planning to accommodate the needs of all people before, during and after a major disaster.

The biennial conference brings together public and nonprofit professionals from around the world to address policy, lessons learned, best practices and forward thinking, resulting in the mitigation of loss of life and property when catastrophic events occur. This year's conference was designed to foster an interdisciplinary exchange of ideas surrounding a broad range of issues, particularly mass evacuations prompted by disasters.

## 2014 UNDERGRADUATE SCHOLARSHIP AWARD RECIPIENTS

Please join the department in congratulating the following 2014 undergraduate scholarship recipients. The award committee selected students who have demonstrated academic excellence and meet the criteria specific to each award.

### Chevron Texaco Scholarship in Civil Engineering

Amy Olson Luke Evan  
Rebecca LaPorte Kelsey Schmaltz  
Maris Fanguy Laura Iverson

### Chevron Texaco Scholarship in Environmental Engineering

Matthew Louque Sarah Belanger

### Erin Krielow Lahr Memorial Scholarship Fund

Amy Olson

### Uniroyal Chemical Company, Inc. Environmental Engineering Scholarship

Annelise Zeltmann Kaitlin Arceneaux

### Stanley M & Hilma Cothren Scholarship

Patrick Duffy Patrick Stiegman  
Kimberly Koehl John Voelker

### Joseph W. Carmena, Sr. Memorial Scholarship

Robert Davis Jabari Landry

### L. Ralph & Jacqueline L. Datrez Scholarship

Kelsey Schmaltz Alicia Fortier

### A.W. Nolan Jr. Scholarship

Rachel Markowitz Brendan Copley

### Environmental Technical Sales (ETEC) Scholarship

Evan Luke Rebecca LaPorte  
Sean Moore Mark Holman

### McDermott Scholarship

Jabari Landry

### James A. Nugent Scholarship

Timothy Patterson Dane Lecoq  
Thomas Everett

### William Crawford Scholarship

Kristin Kendrick

### Michael A. Clause Scholarship

Chris Rowan Pollard Lawson

## CIVIL ENGINEERING STUDENTS RECEIVE THE LOUISIANA ASPHALT TECHNOLOGY SCHOLARSHIPS

Eight civil engineering students: Kimberly Koehl, Alyse Aldridge, Lane Hargroder, Michael Sanders Jr., Brittany Day, Theodore Reynolds, Regina Viviano, and Andres Gonzales, were recently named as recipients of the Louisiana Asphalt Technology Scholarships that are funded by the NAPA Research and Education Foundation and the Louisiana Asphalt Pavement Association. Member companies that sponsored these scholarships include Barriere Construction Company,

New Orleans, R. E. Heidt Construction Company, Lake Charles, Coastal Bridge Company, Baton Rouge, and Asphalt Products Unlimited, Baton Rouge. This scholarship program was developed in an effort to encourage young men and women to choose asphalt technology courses as a part of their curriculum. "An example of partnership among academia, government and industry, this scholarship is intended to not only benefit the asphalt industry by providing a trained workforce in asphalt technology, highway construction and rehabilitation, but also benefit the individuals who choose careers in the public sector at the federal, state, or municipal level," said Dr. Mohammad, LSU Professor of Civil Engineering and Director of the Engineering Materials Characterization Research Facility at LTRC. The scholarships, each \$2000, are presented annually to college sophomores, juniors or seniors who are U. S. citizens and already enrolled in a full time civil engineering curriculum.

## 2014 CEE HALL OF DISTINCTION BANQUET

**O**n May 1, 2014 at the LSU Lod Cook Alumni Center, the Department of Civil & Environmental Engineering held their annual Hall of Distinction and Faculty Awards Banquet. Past inductees and department faculty and staff joined to honor the 2014 inductee William Rushing. It is our great pleasure to welcome this outstanding gentleman to our Hall of Distinction which is now comprised of 31 members. Candidates are carefully selected based on distinguished professional achievement and service to the LSU Department of Civil & Environmental Engineering. Inductees have made substantial impact in their field and/or to the department.



**2014 INDUCTEE**  
**William E. Rushing, Jr.**  
 Vice President  
 Waldemar S. Nelson & Co., Inc

The department also honored two faculty members and a staff member. Drs. Louay Mohammad, Irma-Louise Rush Stewart Professor, and Brian Wolshon, Edward A. and Karen Wax Schmitt Distinguished Professor, were awarded 2014 Research Achievement Awards. Staff member Julie Mueller was presented with a Career Service Award for her continued contributions to the department, especially with the graduate program.

In addition, six undergraduate students were recognized with various awards for academic excellence and leadership. Some recipients were selected by a faculty committee and others were voted for by their peers. Philip Goppelt, Emily Weigand, Nelida Herrera, Allyson Lutz, Conor Whetsel, and Russell Bayham are all exceptional students who undoubtedly will represent the department well in their future endeavors.

For a full list including bios of the CEE Hall of Distinction inductees, please visit online at [www.cee.lsu.edu](http://www.cee.lsu.edu) and click on "Alumni."

## FACULTY AWARDS



**Dr. Louay Mohammad**  
**2014 Research Achievement Award**  
*(pictured above, left to right: Drs. Wolshon, Mohammad and Voyiadjis)*



**Dr. Brian Wolshon**  
**2014 Research Achievement Award**  
*(pictured above, left to right: Drs. Wolshon, Willson and Voyiadjis)*

## Research Highlights



### SUSTAINABLE DEVELOPMENT: THE USE OF SUSTAINABLE PAVEMENT MATERIALS AND TECHNOLOGIES IN INFRASTRUCTURE

**D**r. Louay Mohammad is Professor of Civil & Environmental Engineering and holder of the Irma Louise Rush Stewart Distinguished Professor in the Department of Civil and Environmental Engineering at LSU and Director of the Engineering Materials Characterization Research Facility of LTRC. He teaches and conducts research in the area of Highway Construction Materials, Pavement Engineering, Accelerated Pavement Testing, Advanced Materials Characterization and Modeling, and Infrastructure Sustainability. Mohammad has focused on conducting research into the concepts of sustainable material development and how it can be applied to the practice of pavement design, engineering, and construction. Mohammad and his research group developed mechanical test devices along with their standard test methods for fracture characterization of asphalt mixtures as well as the characterization of interface bonding in flexible pavements. He has actively contributed in setting asphalt-related specifications in Louisiana and the nation by leading five NCHRP research projects in critical topics as identified by AASHTO and state highway agencies.

significant potential to enhance pavement performance while satisfying current market needs with respect to supporting the recycling of waste tires. Specifications for the use of CR in asphalt mixtures were developed and implemented in the Louisiana Standard Specifications for Roads and Bridges. As the use of this material in asphalt gains popularity in the state and is paved into more roads, Louisiana was able to save thousands of dollars, improve roads, and above all, promote sustainability by drastically reducing the amount of waste into landfills.

### SULPHUR ENHANCEMENT FOR ASPHALT MIXTURES – SHELL THIOPAVE



Many highway agencies experienced a significant increase in construction costs. One major reason for this sharp increase is the rise in energy costs and the price of liquid asphalt cement, a petroleum product. Mohammad

evaluated a new generation of sulfur-based additive, an industrial waste extenders known as Thiopave®. The sulfur modifier has the potential to replace a large percentage of the asphalt cement currently used to produce asphalt mixtures for roads. The goal is to be able to produce mix at lower cost, without compromising performance by using innovative material selection, mixture, and pavement structural design. Thiopave has the potential to save Louisiana money and improve roads' performance by lowering the cost of necessary materials since Thiopave can replace up to 40 percent of the asphalt cement, which is more expensive and rises in cost parallel to crude oil. The overall mix strength may increase by replacing a portion of the asphalt cement in the asphalt mix with Thiopave, resulting in an improved load-bearing capacity of finished roads and, therefore, exceeding service life.

### THE USE OF WASTE TIRES

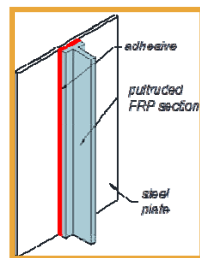


Approximately 850 million to 3 billion waste tires are disposed of in landfills, stockpiled, or illegally dumped around the US, a number that increases by 250 million tires every year.

In hot and wet climates such as Louisiana, the poor management of waste tires also provides a suitable environment for mosquito borne diseases such as the West Nile Virus. Mohammad's research on developing methodologies and specifications that advance the use of waste tires in asphalt mixtures used in construction of flexible pavements has demonstrated that the use of crumb rubber (CR) is a promising technology that has

## LSU RESEARCH ADDRESSES NATIONS ACHING INFRASTRUCTURE ASSETS

The recent ASCE Report Card gave a grade of D+ for US infrastructure. Bridges were slightly better with a C+ grade. Considering that the average age of the nation's 607,380 bridges is currently 42 years and 24.9% of these bridges are classified as either structurally deficient or functionally obsolete, this should not come as a surprise. At LSU, several research activities are focused on infrastructure problems and seeking to help enhance their performance, extend their service life, and mitigate natural and man-made hazards.



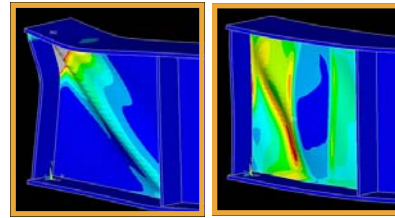
Dr. Ayman Okeil, Associate Professor in LSU Department of Civil & Environmental Engineering, is currently directing several infrastructure related research projects. A grant from the National Science Foundation is funding experimental and analytical work that

aims to develop a novel strengthening technique for thin-walled steel structures such as built-up bridge girders. To mitigate local buckling of thin plates forming a built-up section, a cheap, light, and corrosion resistant pultruded stiffener is glued to the vulnerable plate instead of welding a steel stiffener with all the issues that arise from on-site welding. The new technique, *Strengthening-By-Stiffening or SBS*, is unique in the sense that it uses the out-of-plane stiffness of the pultruded section rather than the in-plane strength that is often used in composite strengthening. Almost 20 steel beams were tested to study the efficiency of SBS and the effect of several key parameters on its performance, such as adhesive type, panel dimensions, bond area, weathering and others. It was found that SBS can increase the shear strength of deficient girders by up to 56% and the initiation of buckling by up to 70%. This is the result of the FRP stiffener reducing the slenderness of the vulnerable plate in the critical shear panel.



(Left) Bare shear panel, (Right) with SBS

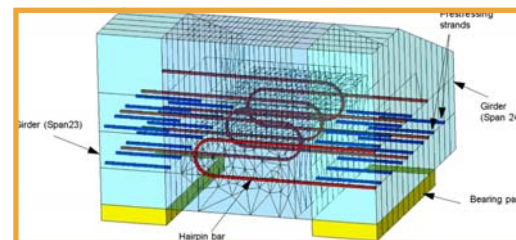
Numerical models are currently being developed to assist in understanding the behavior of SBS. The results will then be used to establish simplified analysis methods that can be used by engineers in a design environment.



Structural Health Monitoring (SHM) and Nondestructive Testing (NDT) have become essential tools that assist engineers in their daily work. Okeil utilized SHM to evaluate a continuity detail utilized in the construction of the John James Audubon Bridge Project, which crosses the Mississippi River between the cities of St. Francisville and New Roads. Prestressed concrete spans were connected via a continuity diaphragm that was

recommended in a National Cooperative Highway Research Program (NCHRP) report. Six different types of sensors were installed as part of a project sponsored by the Louisiana Transportation Research Center and data was recorded for a period of almost five years in the casting yard and at the bridge site while in service. Numerical and analytical models were also developed to help understand the behavior of the used detail. The findings from this project are currently being disseminated to the bridge community to emphasize the effect of thermal gradients which turned out to be the major factor in the development of long-term positive moments.

Okeil also serves as an investigator on other projects sponsored by the National Aeronautics and Space Administration (NASA), the Nuclear Regulatory Commission (NRC), the Florida Department of Transportation, and the LA Board of Regents. These projects cover a wide range of infrastructure related research activities including bridge deck design, friction stir welding, and phased array ultrasonic testing.



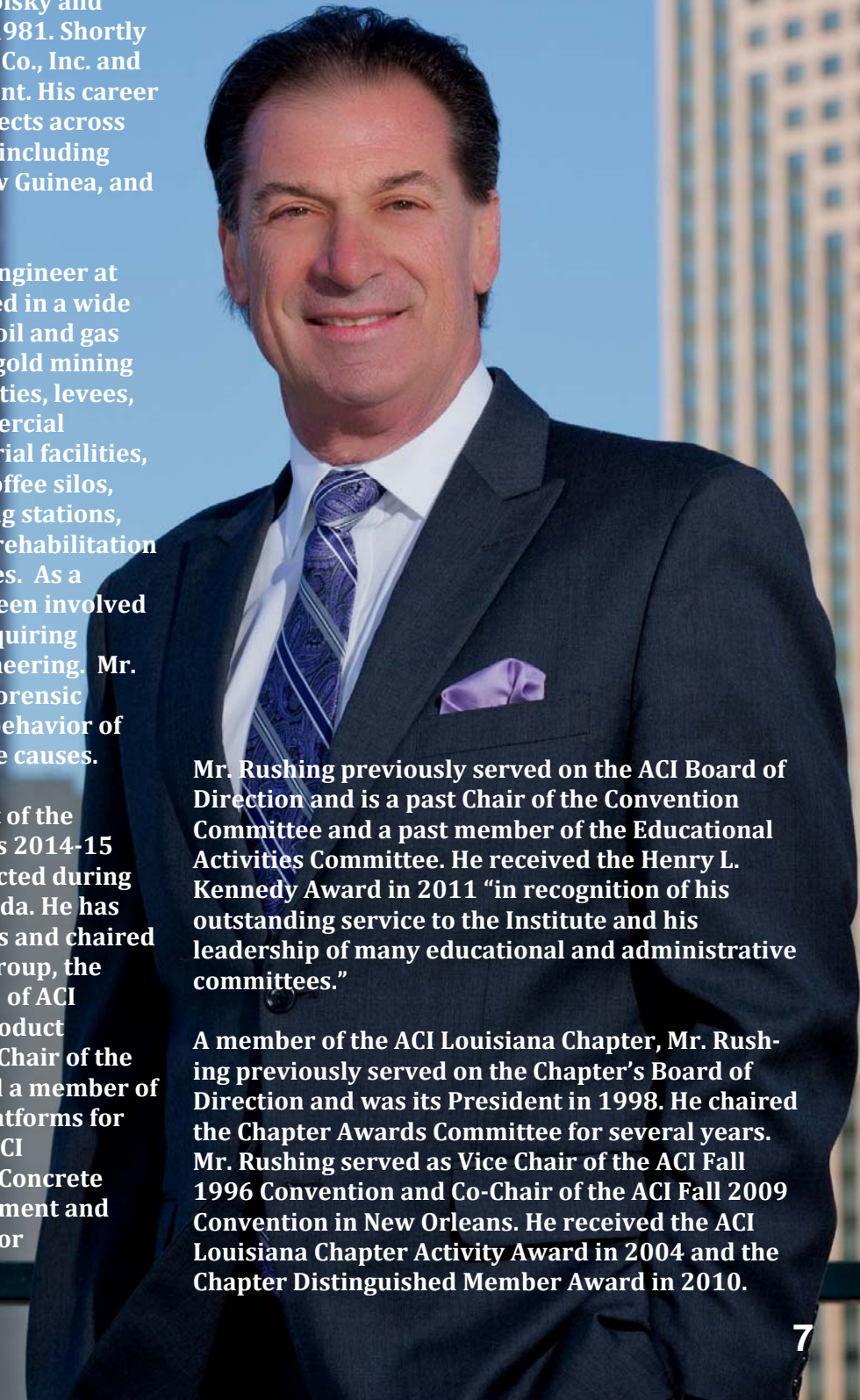
## WILLIAME. RUSHING, JR. Vice President Waldemar S. Nelson & Co., Inc

After receiving a Bachelor of Science in Civil Engineering from Louisiana State University, William Rushing joined Morphy, Makofsky and Masson in New Orleans in January of 1981. Shortly after, he joined Waldemar S. Nelson & Co., Inc. and now holds the position of Vice President. His career includes over 33 years in various projects across the United States and internationally, including projects in Italy, Indonesia, Papua New Guinea, and Australia.

As a Project Manager and Structural Engineer at NELSON, Mr. Rushing has been involved in a wide variety of projects including offshore oil and gas jackets, topside facilities, copper and gold mining structures, liquefied natural gas facilities, levees, flood walls, pipelines, wharves, commercial buildings, high rise structures, industrial facilities, refineries, gas compressor stations, coffee silos, container terminals, drainage pumping stations, and extensive work in the repair and rehabilitation of steel, concrete and timber structures. As a Project Manager for NELSON, he has been involved in many multi-disciplined projects requiring coordination of all disciplines of engineering. Mr. Rushing has served as an expert and forensic witness in cases involving structural behavior of various structures, identifying damage causes.

Mr. Rushing is currently the President of the American Concrete Institute (ACI). His 2014-15 president term started after being elected during ACI's Spring Convention in Reno, Nevada. He has been a fellow of the ACI for many years and chaired the ACI Strategic Plan Drafting Task Group, the Task Group on Managing Translations of ACI Products and Services, and the ETC Product Development Committee. He is a Past Chair of the ACI Financial Advisory Committee and a member of the Task Group on Communication Platforms for Delivery of Services & Products, and ACI Committees 314, Simplified Design of Concrete Buildings; 351, Foundations for Equipment and Machinery; 376, Concrete Structures for

Refrigerated Liquefied Gas Containment; E702, Designing Concrete Structures; and S801, Student Activities. He also serves on the ACI Foundation and is a Director for Creative Association Management (CAM). In addition, he serves on Subcommittees 314-B, Preliminary Design and Economic Impact; 314-D, Design Aids; 314 Task Group to Update IPS-1; 351-D, Design Provisions for Heavy Industrial Concrete Structures Including Turbine Pedestals; and 376-B, Materials.



Mr. Rushing previously served on the ACI Board of Direction and is a past Chair of the Convention Committee and a past member of the Educational Activities Committee. He received the Henry L. Kennedy Award in 2011 "in recognition of his outstanding service to the Institute and his leadership of many educational and administrative committees."

A member of the ACI Louisiana Chapter, Mr. Rushing previously served on the Chapter's Board of Direction and was its President in 1998. He chaired the Chapter Awards Committee for several years. Mr. Rushing served as Vice Chair of the ACI Fall 1996 Convention and Co-Chair of the ACI Fall 2009 Convention in New Orleans. He received the ACI Louisiana Chapter Activity Award in 2004 and the Chapter Distinguished Member Award in 2010.



**STUDENT AWARDS**

**Philip Goppelt**  
Civil Engineering Academic Award  
*Awarded for academic excellence (4.0 GPA)*

**Emily Weigand**  
Civil Engineering Leadership Award  
*Awarded for leadership and for service*

**Nelida Herrera**  
Civil Engineering Faculty Award  
for Leadership  
*Awarded by the faculty for academic  
excellence (3.95 GPA) and for leadership*

**Allyson Lutz**  
Environmental Engineering Academic Award  
*Awarded to the senior with the highest GPA in  
the program*

**Conor Whetsel**  
Environmental Engineering Faculty  
Leadership Award  
*Awarded by the faculty to the senior who has  
excelled in both academics and leadership*

**Russell Bayham**  
Environmental Engineering Student Award  
*Awarded to the senior who has excelled in the  
program, voted by the environmental  
engineering students*

**2014 CEE HALL OF  
DISTINCTION BANQUET (CONT.)**



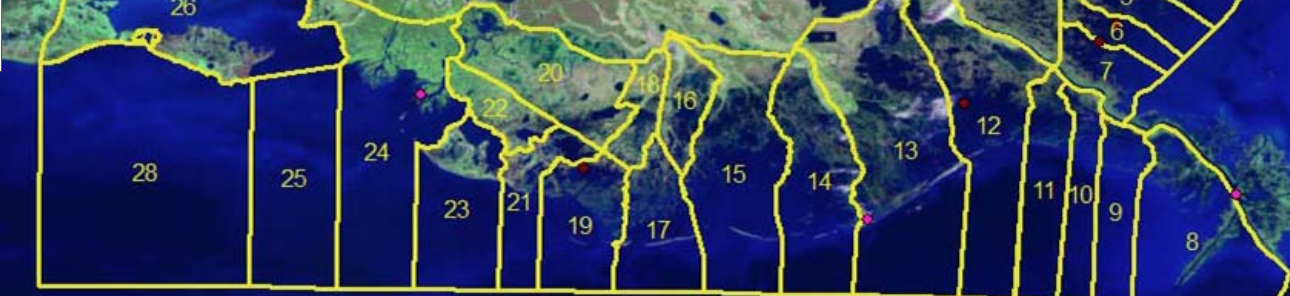
Rushing received his BS in Civil Engineering from Louisiana State University in 1981. He is a licensed professional engineer in Louisiana, Mississippi, Alabama, Arkansas, and Arizona. He is also a member of the American Society of Civil Engineers (ASCE) and a member of the Executive Committee of the New Orleans Branch of the Structural Engineers Institute (SEI).



Rushing is married to Sheila Noote Rushing and they have one daughter, Shelby and one son, Christopher (family pictured above). They currently live in New Orleans, LA.



**USING NASA DATA: DR. ZHIQIANG DENG  
FIRST TO PREDICT OYSTER NOROVIRUS  
OUTBREAK**



*Map showing 30 Louisiana oyster growing areas extending from LAMS border to LATX border*

***By linking his model to NASA data, Deng is helping oyster harvesters prevent seafood contamination.***

**D**r. Zhiqiang Deng, associate professor of water resources and coastal engineering at Louisiana State University’s College of Engineering, became the first scientist in the world to accurately predict an oyster norovirus outbreak when he forecasted an outbreak in the Cameron Parish oyster harvesting area 30 weeks before it occurred. Norovirus, a highly contagious virus that causes severe abdominal and intestinal inflammation, is the leading cause of acute gastroenteritis.

Deng’s work is funded by a \$225,000 grant from NASA, and he used data gathered by NASA satellites to monitor environmental conditions along the Louisiana coast.

Collaborating with the Louisiana Department of Health and Hospitals, Deng predicted the area would become contaminated with the virus more than two weeks before the LDHH closed it on December 28, 2012. Closures of highly productive oyster growing areas causes significant damages to the oyster industry, making it all the more important to determine outbreaks in advance.

“Norovirus outbreaks often occur 10 – 14 days after extremely low tide events during winter months or cold weather, when levels of fecal coliform, a bacterium

that originates in feces, are high,” Deng said. Outbreaks of norovirus have been a significant problem for the oyster farming industry. According to the Center for Disease Control (CDC), norovirus causes about 21 million illnesses annually. The virus typically spreads through contaminated water or food, including seafood, but can also transfer from human to human.

“If your friend eats an infected oyster and gets infected by the norovirus, then you may also get sick,” Deng said. “That is why it is important to prevent the norovirus outbreak in the first place.”

Deng and his research group have contributed to oyster norovirus contamination research by developing a proactive model for predicting oyster norovirus outbreaks that curtails both the health and economic costs of oyster norovirus outbreaks. The model involves prediction of future water quality conditions and bacteria levels.

Deng’s next project is creating an online database where oyster producers, government officials and public users can access real-time data about the environmental predictors of oyster norovirus growth using existing data repositories from around the country. He is also seeking funding to test his model in other oyster producing regions in the United States and abroad.

*Article by Liz Lebron, LSU College of Engineering communications graduate assistant. For more information, contact Mimi LaValle, mlavall@lsu.edu, 225-578-5706.*