



Don't forget to check out the Department of Civil and Environmental Engineering Web Site!

www.cee.lsu.edu

- Find out the latest information about the CEE Department
- Contact faculty and staff
- Get information about graduate and undergraduate programs
- Find out the most up-to-date information about student organizations
- and much more!

Contributions to the newsletter are always welcome. If you have news that would be of interest to other CEEs or your classmates, please send it to us so it can be included in a future edition.

Tel: (225) 578-8442 Fax: (225) 578-4945

Please contact Dr. George Z. Voyiadjis for more details.

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Civil and Environmental Engineering

Volume 2 Fall Issue

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LSU HURRICANE CENTER

Addressing Hurricanes and Other Hazards and Their Impacts
on the Natural, Built, and Human Environments

The LSU Hurricane Center is a multidisciplinary Center dedicated to research and education on hurricanes and other hazards and their impacts on the natural, built, and human environments. Faculty from seven colleges and dozens of departments, centers, and institutes across the campus collaborate on large interdisciplinary projects. Collaborating units include the Southern Regional Climate Center, the Coastal Studies Institute, Department of Environmental Studies, and LSU Earth Scan Lab. The Center is physically located in Civil Engineering and more than half of the CEE faculty are actively collaborating with the Center on one or more projects.

Since its inception two and a half years ago, the Center has garnered nearly \$5 million in competitive, externally funded research and education programs. Funding sources include the National Science Foundation, Louisiana Board of Regents, Louisiana Sea Grant, and several state and local government agencies (including matching and pass-through funds from the Federal Emergency Management Agency and Federal Highway Administration). Some of the major projects currently underway in the Center are described below, along with brief biographical sketches of several of the faculty. Additional information is available on the web at www.hurricane.lsu.edu.

A three-year project funded by the National Science Foundation (NSF) will define and create the new discipline of Hurricane Engineering. It addresses planning, analysis, design, response, and recovery of civil engineering systems. Project deliverables include new courses, curricular materials, and a book. Marc Levitan is the Project Director, and is also leading the structural engineering tasks. Brian Wolshon is leading the transportation engineering tasks with Chester Wilmot and John Metcalf. Bill Moe is leading the environmental component, with Dean Adrian, John Sansalone, John Pardue, and Danny Reible (ChemE). Water resources tasks are being led by Vijay Singh, with Joe Subayda, Ivor van Heerden, and Clint Wilson. Geotechnical tasks are being led by Dante Fratta, with Roger Seals.

The LSU Hurricane Center has created a new undergraduate minor in Disaster Science and Management (DSM). This program combines engineering, coastal and environmental sciences, planning, social sciences, and geographic information sciences to bring science and technology to the fields of emergency management and design of sustainable communities. The DSM Minor is housed in the College of Arts and Sciences but available campus-wide. Planning for an interdisciplinary graduate concentration in DSM is well underway. John Pine (Environmental Studies) and Marc Levitan are leading the planning efforts, and Ivor van Heerden is teaching the first DSM course this semester, titled "Hazards, Disasters, and the Environment."

ALUMNI

The Department of Civil and Environmental Engineering wants to know where life has taken you. Who are you working for and what is your title? Have you received any recognition for your work? Are you working on an especially challenging project?

Please complete the following information and attach any additional comments you may have. Space permitting, we would like to use photos of you, your family or your latest project.

Please e-mail your information with attached photos to ceseal@lsu.edu. Or, you may mail your submission to: Civil and Environmental Engineering, LSU, 3418 CEBA Building, Baton Rouge, LA 70803-6405.

CEE ALUMNI INFORMATION

Name: _____ Degree: _____ Year: _____

Home Address: _____

Home Telephone: _____ Email: _____

Position Title: _____

Firm: _____ Business telephone: _____

Business Address: _____

Your News: _____

Alumni Corner

Don Jones, PE, CSP, received the American Society of Safety

Engineers (ASSE) Edgar Monsanto Queeny National Safety Professional of the Year Award. He was also recently elected as vice-president of Practices

and Standards. The ASSE is the oldest and largest safety engineering

organization in the world with over 32,000 members.

CIVIL & ENVIRONMENTAL ENGINEERING DEPARTMENTAL CAMPAIGN

The Department of Civil and Environmental Engineering is continuing a fundraising campaign to enrich and enhance programs in the department. Your donation will support the Departmental Enhancement Fund, financing new initiatives so that we may continue to produce top-quality engineers.

Our goal is to build an endowment of \$400,000 and an annual \$50,000 supplement to support the purchase of new lab equipment, computers and software, support of students, and support of faculty activities at professional meetings and conferences.

Any amount will be greatly appreciated; however, donors giving \$200 a year for five or more years or over \$1000 initially will receive special recognition in our departmental newsletter and on the Departmental Enhancement Fund plaque displayed in the department. Company matching funds will also be acknowledged. Please consider the CEE department this year in your annual giving.

DONOR INFORMATION:

(please check) \$10,000 or more \$5,000 to \$9,999 \$1,000 to \$4,999
 \$500 or more \$200 to \$499 Less than \$200

I pledge \$ _____ per year for the next _____ years to the CEE Departmental Enhancement Fund for a total of \$ _____.

Please make your checks payable to the "LSU Foundation" and note "for CEE Enhancement Fund".

NAME: _____

ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

TELEPHONE: _____ BUSINESS _____ HOME _____ FAX _____

GRADUATION DATE: _____ DEGREE: _____

EMPLOYER: _____ E-MAIL: _____

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You will be contacted by our development coordinator to confirm your pledge and support. Thank you.

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ASCE NEWS

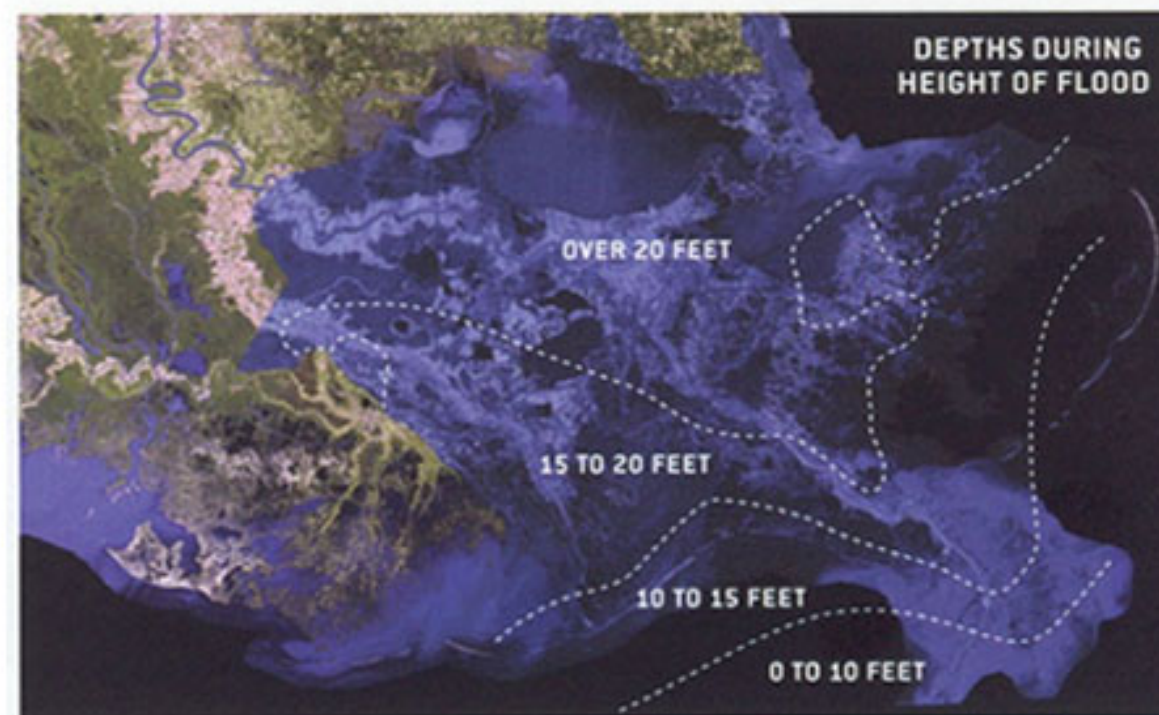
During the fall semester, we are having a tailgate party on October 5 for the ULL game. We are still looking for guest speakers to present at our Thursday night meetings. A field trip to the Sinking Unit is also in the works for this semester. For Thanksgiving we are planning a big Thanksgiving meal and a food drive. We are gearing up for the Concrete Canoe and Steel Bridge Competition at the Deep South Regional Student Conference. This year's conference will be held at Tulane University, in New Orleans, La. We are trying to recruit a surveying team for this year's surveying competition. Like last year, the competition should be a great opportunity for all LSU ASCE members to participate in the competitions and activities.

To raise extra money for the club, we have designed a Civil Engineering Polo Shirt. The design, shown below, is available on a white, pale yellow, or purple collared shirt. The cost is \$25. If you are interested in purchasing one, contact us at lsuasce@hotmail.com and we will send you an order form.



More information about ASCE activities and officer contact information is located on our web page at www.ce.lsu.edu/~ASCE. Employers can also check the website for student resumes or send us information about job openings.

The Disaster: A Worst-Case Scenario



COMPUTER MODELS by researchers at Louisiana State University predict that the counter-clockwise winds of a slow-moving, Category 4 hurricane (characterized by winds of up to 155 mph with storm surges) crossing the Gulf of Mexico from the southwest would drive a sea surge 30 miles inland, right to New Orleans's back door. Surging water would also fill Lake Pontchartrain, which would then overflow its western bank and pour into the city. At the height of the flood, the downtown would be under more than 20 feet of water only about 33 hours after the first storm winds touched the southern barrier islands.

Continued on Page 4

The Center was recently awarded \$3.7M by the Board of Regents for "Assessment and Remediation of Public Health Threats Due to Hurricanes and Major Flooding Events." This multidisciplinary proposal includes over 20 faculty from the main campus and the LSU Medical Center in New Orleans. The Project Director is Ivor van Heerden. Participating CEE faculty include John Pardue, Vijay Singh, Brian Wolshon, Marc Levitan, and Joe Suhayda.

Ivor van Heerden is also leading a team of dozen researchers to develop a 'worst case scenario' for a catastrophic hurricane strike on the city of New Orleans. This is the first phase of a larger study to develop a comprehensive response/recovery plan for the city. CEE team members include Joe Suhayda, Vibhas Aravamathan, Marc Levitan, Brian Wolshon, and Chester Wilmot.

Jefferson Parish (western half of New Orleans metro area) has contracted with the LSU Hurricane Center to study the survivability of parish hospital facilities and their suitability for use as hurricane shelters for special needs patients who can't evacuate. This project includes wind tunnel testing and structural analysis of the facilities, along with hurricane flood and wind modeling. Investigators are Marc Levitan, Dimitris Nikitopoulos (Mechanical Eng), Ivor van Heerden, Joe Suhayda, and Vibhas Aravamathan. Louisiana Sea Grant recently funded a \$147 thousand project to investigate use of satellite-based remote sensing data to measure extent of flooding and estimate flood depths and damage (LB Wang, Marc Levitan, and John Sansalone). The Hurricane Center was also awarded a \$52 thousand Board of Regents Enhancement Grant to acquire field equipment for disaster assessment teams (Ivor van Heerden, Marc Levitan, and John Pardue). Brian Wolshon, Chester Wilmot, Sherif Ishak, Steve Cai and Marc Levitan have several hurricane evacuation-related proposals pending with the Louisiana Transportation Research Center, Federal Highway Administration, NSF, and the American Red Cross to study evacuation issues facing southeastern Louisiana.

Marc L. Levitan, Director, LSU Hurricane Center, Associate Professor of Civil and Environmental Engineering, and Charles P. Siess Jr. Professor. Dr. Levitan's expertise is in wind effects on buildings and structures, including such aspects as assessment and design of hurricane shelters, damage investigations, full scale and wind tunnel testing, and wind loads on industrial and petrochemical facilities.

Ivor van Heerden, Deputy Director, LSU Hurricane Center and Associate Professor (Research), CEE. He has expertise in geology, marine sciences, and coastal land loss and restoration issues. Dr. van Heerden spent two years heading the Coastal Restoration program for the Louisiana Department of Natural Resources, and has worked with coastal communities to develop resource management plans.

Brian Wolshon, Assistant Professor of Civil and Environmental Engineering. Dr. Wolshon is rapidly becoming one of the leading authorities in the country on transportation engineering issues surrounding hurricane evacuations, such as design and operation of contraflow (reverse laning) strategies and application of ITS to evacuations. The Federal Highway Administration recently ordered 1000 copies of his state-of-the-practice report and distributed them to DOT and emergency management agencies all along the hurricane coast.

Joe Suhayda, Director, Louisiana Water Resources Research Institute and Associate Professor of Civil and Environmental Engineering. When questions arise about storm surge flooding in South Louisiana, Dr. Suhayda is the one everybody approaches for answers. He has done storm surge modeling for federal, state and local agencies for the past 20 years. His work was recently featured in the October Issue of Scientific American Magazine, in an article entitled "Drowning New Orleans."

2002 Transportation Engineering Conference Pronounced a Success

More than 1,300 transportation professionals converged on Baton Rouge to attend the 2002 Louisiana Transportation Engineering Conference. Attendees from throughout Louisiana, 24 other states, and two Canadian provinces represented the public, private, and academic sectors of the transportation industry. The fifth meeting since its initiation as a biennial event in 1993, this year's two and a half-day conference was the largest and most successful conference yet.

The conference represents a premier tech transfer opportunity for the Louisiana Transportation Research Center which is charged with the accountability for planning, coordinating, and managing the conference. LTRC's Director, Joe Baker, credits the conference's success to the enormous partnering effort between LADOTD, LTRC staff, and friends in the entire transportation community.

"I can think of no other tech transfer activity having as great an impact on the entire industry as this conference," said Baker.

The conference provided a forum for transportation professionals to relate innovative technologies and to discuss transportation policy, practice, and problems. The program focused on a full complement of technical sessions which facilitated the exchange of new information and innovative technologies in the transportation industry, research results and techniques, or strategies developed. The 43 technical sessions offered areas of interest such as ITS, intermodal issues, highway materials, law and the engineer, changes to the LADOTD Standard Specifications, construction issues, and new design concepts. Attendees to the sessions could earn up to 15 professional development hours, which was attractive to engineering attendees.

The conference was well attended by university civil engineering staff and students who comprised about 4 percent of the attendees. There were 26 technical presentations made by 26 LTRC personnel or contract researchers for activities supported by LTRC: 221 Dr. Louay Mohammad, "The Influence of Asphalt Tack Coat Materials on Interface Shear Strength" and "The Application of Minicone Penetration Technology in Pavement Design," Brian Wolshon, "Hurricane Evacuation Planning," Chester Wilmot, "Outsourcing," Murad Abufarsakh, "Predicting Embankment Settlement with CPT," Amitava Roy, "Stabilization of a Reactive Aggregate Base by Blended Portland and Slag Cement," and Richard Avent, "Heat Straightening."

One of the conference highlights included a trade show which showcased new and innovative materials, equipment, and services presented by over 60 transportation-related consultants and vendors. The occasion also provided an opportunity for participants to network and discuss transportation issues and solutions.

With the success of each conference, the number of participants has steadily risen from nearly 700 in 1993 to over 1,400 attendees this year. This continued rate of growth represents a challenge for conference administrators in the planning and conducting this event in the future.

Baker expressed his appreciation for the leadership role that Kirt Clement, conference administrator, and other members of the transportation community played in this conference.

Faculty News

Dr. JB Metcalf visited the Federal University of Rio Grande do Sul, Porto Alegre, Brasil, where he gave a short course on Construction Quality Control to industry and university delegates. He also presented seminars on Low Volume Roads and on Soil stabilization at the University. He addressed civil engineering students about graduate study at LSU.

Dr. Marc Levitan (CEE and LSU Hurricane Center) was invited to serve on the Scientific Advisory Committee for the 4th European and African Conference on Wind Engineering (4EACWE), to be held in Prague during July, 2005.

Dr. Vijay Singh was invited to chair three sessions at the International Conference on Water Resources Planning and Management in Arid Regions held March 23-27, 2002, in Kuwait. The sessions were: Stochastic Modeling, Surface Water and Ground Water Interactions, and Environmental Hydrology. He also chaired a panel discussion on preparing a Water Statement for the Government of Kuwait. The conference was organized by Kuwait Institute of Scientific Research and was sponsored by a number of international organizations.

Dr. Vijay Singh has been selected by the Environmental & Water Resources Institute as the recipient of the 2002 Arid Lands Hydraulic Engineering Award. The award reads, "In recognition of leadership, with exceptional research contributions related to hydrodynamic modeling of watershed runoff, erosion and sediment transport in upland watersheds, analysis and modeling of surface and subsurface water transport in semi arid and arid environments."

Research Grants

Trautwein, S. (PI), Alshibli, K. (Co-PI), and Fratta, D. (Co-PI), "Rapid Determination of Field Density and Moisture Content", Department of Defense, SBIR Program, \$110,000.

Alshibli, K. (PI), "Microfocus Real-Time Radiography: A Potential Technology to Study Micro-Structure of Geomaterials", Louisiana DOTD: Transportation Innovation for Research Exploration (TIRE) Program, \$30,000.

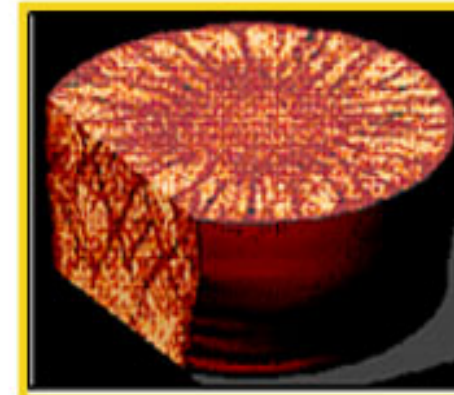
Alshibli, K. (PI), "Computed Tomography: A Potential Technology to Understand Friction Properties of Granular Materials", NASA/ Marshall Space Flight Center: Graduate Student Researchers Program (GSRP), \$24,000.

Dr. Ivor van Heerden "Petro-Chemical Hazards in a Major Hurricane Flood Within the Levee System of New Orleans - GIS Analysis of Oil Spill and Public Health Concerns", Louisiana Oil Spill Research and Development Program, \$40,943.

Dr. Marc Levitan, Dr. Linking Wang, and Dr. John Sansalone, "Satellite-based Remote Sensing of Flood Impacts for Improved Emergency Response and Recovery", Louisiana Sea Grant, \$147,077.

Testing Soils in Space

Dr. Khalid Alshibli of CEE is serving as the project scientist for a Microgravity experiment called Mechanics of Granular Materials (MGM) sponsored by NASA/ Marshall Space Flight Center. The project includes conducting a series of triaxial experiments on silica sand under very low effective stresses aboard the NASA Space Shuttle. MGM is a collaborative effort with Professor Stein Sture of the University of Colorado at Boulder. The team had two successful missions in 1996 and 1998 and planning for another mission in May of 2002. MGM was selected by NASA Headquarters as one of its top three achievements in the Microgravity program in 1999. You can learn more about MGM by visiting (<http://bechtel.colorado.edu/~batiste/>).



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- 1) A cross section of a sand specimen analyzed using computed tomography.
- 2) NASA Astronaut Jay Apt prepares MGM specimen for testing aboard the Space Shuttle during the STS-79 mission.

Graduate Student gets NASA Fellowship

NASA/ Marshall Space Flight Center (MSFC) has selected Brenda Novoa as a 2002 Graduate Student Researchers Program (GSRP) Fellow. Brenda is a graduate student in the Geotechnical Engineering Program under the supervision of Dr. Alshibli. She will conduct most of her thesis research at MSFC utilizing the new Computed Tomography (CT) system to study the shear and instability phenomena in Granular materials.



LWRRI New Directors

Dr. John H. Pardue, Elizabeth Howell Stewart Endowed Professor, associate chair for research and associate professor, has been named director of Louisiana Water Resources Research Institute (LWRRI).

The Louisiana Land and Exploration Company College of Engineering Endowed Professor and associate professor, Dr. John J. Sansalone, has been appointed associate director of LWRRI. Pardue is replacing Joseph N. Suhayda, former director LWRRI, who retired in June 2002. LWRRI is a multidisciplinary center which is federally mandated to perform a statewide function of promoting research, education and serviced in water resources.

The Civil and Environmental Engineering Department congratulates Drs. Pardue and Sansalone for their new position.

NSF Research Awards

Dr. R. Richard Avent, Mr. and Mrs. C. W. Armstrong Jr. Professor of Engineering Dr. Aravamudan Raman (ME), professor and Dr. Lingbing Wang (CEE), assistant professor, in collaboration with Dr. David J. Mukai (formerly with LSU), University of Wyoming, have participated in collaborative research to receive an NSF Research Award of \$211,448 for their work titled, "Fracture Properties of Heat Straightened Steel Duration."

Dr. Sheriff Ishak, assistant professor, received a \$100,000 NSF Research Award: Information and Communication Systems for Surface Transportation. The title of his research is Exploring New Traffic Characteristics and Performance Measures Using Feature Extraction and texture Characterization of Spatiotemporal Traffic Contour Maps."

Dr. Clinton S. Willson, assistant professor, received an NSF Research Award: Hydrological Sciences, totaling \$87,590. His research is titled "Collaborative Research: Measurement and Modeling of Pore-Scale Flows." Willson submitted a collaborative proposal with Markus Hilpert, Department of Geography and Environmental Engineering, Johns Hopkins University.

Dr. Clinton S. Willson, assistant professor, and co-principal investigators Richard Kurtz (Physics) and Kyungmin Ham (CAMD), have been awarded the NSF Instrumentation for Materials Research Program Award entitled "Acquisition of a Multilayer Monochromator for a Synchrotron X-ray Microtomography Station and Education." Their award totaled \$130,000.