

## **Civil Engineering is Regional and National Leader in Coastal Engineering Research and Education**

USA's Civil Engineering Department is a regional and national leader in civil engineering in the coastal environment. CE students and faculty are involved in a range of research activities related to improving society's resilience to coastal storms including storm surge and wave modeling, wave loads on bridge decks, beach erosion solutions and the design tools for "living shorelines."

The CE department's Wave Basin facility, with its ability to make waves and measure both impacts of the waves on structures, as well as the impacts of structures on waves, makes it a unique facility in the state of Alabama and this part of the country.

There are over a 1,000 visitors per year to the CE department's Wave Basin for demonstrations on wave mechanics and beach erosion. Many of these visitors are middle school girls with an interest in science and engineering.

Highway engineers in states throughout the country (and even in Australia) use USA's research and education products today. USA has developed the FHWA manual on *Highways in the Coastal Environment* as well as 3-day short course for highway engineers taught under the auspices of the FHWA's National Highway Institute.

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## **USA Research Facility Contributes to the Design of an Award-Winning Engineering Project**

USA Civil Engineering's Wave Basin played an important role in the design of an award-winning engineering project. The project is the "Little Bay Restoration Project" south of Bayou LaBatre, Alabama in Mississippi Sound where a new, large, man-made wetland was built in 2010 to create new wetland habitat and protect thousands of acres of existing wetlands. The American Council of Engineering Companies (ACEC) of Alabama has announced that the project has won its 2011 Engineering Excellence Awards Competition Grand Award. The state's Grand Award-winning project is "recognized for its engineering achievement that demonstrates the highest degree of innovative design, engineering merit and ingenuity." It has also been announced that the project will receive an honorable mention award at the national ACEC meeting to be held in Washington, DC in April.

Scale model laboratory tests of alternative breakwater configurations were tested in USA's wave basin to quantify the level of wave transmission through the structures – which are rows of individual concrete units called "Wave Attenuation Devices." The testing led to the use of larger units in a tightly-spaced configuration of two rows in order to reduce the Mississippi Sound waves to a level that wetland grasses can typically tolerate. The laboratory study was funded by the project owner, the State of Alabama Department of Conservation and Natural Resources, as part of the engineering design because the wave attenuation properties of the breakwaters were previously unknown. The design engineer of record for the project was Volkert, Inc. of Mobile with coastal engineering by South Coast Engineers.



Engineering student in Wave Basin with scale model of the I-10 bridge



Some of the 1000 visitors/year in the CE Wave Basin



Students on scale models ready to be tested in the Wave Basin