Scientists Warn of Louisiana Coastal Erosion

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(PhysOrg.com) -- A team of researchers, including three from Boston University, have released findings suggesting that current plans to introduce fresh water to inland marshes around the Louisiana Gulf Coast may weaken protective coastal barriers, leaving inland regions more vulnerable to hurricanes. The relative weakness of freshwater marshes compared to salty wetlands, they said, may help explain coastal erosion patterns after Hurricanes Katrina and Rita.

“Some of the very same marshes that were ravaged by Hurricanes Katrina and Rita in 2005 are now being inundated with oil five years later,” says College of Arts & Sciences Professor of Earth Science Duncan FitzGerald. “It is a testimony to the resiliency of wetlands that they are able to survive these environmental disasters.”

To compare resistance of fresh and salt water wetlands against hurricane-force waves, the researchers tested the shear strength of soil in situ and in core samples retrieved from high- and low-salinity marshes along the Gulf Coast. They identified a weak zone in freshwater wetland cores that coincided with the base of plant rooting.

Soils from high salinity wetlands demonstrated no such zone, and contained deeper rooting. The strength of soil in this weak zone fell below the calculated shear force of waves generated by Hurricane Katrina, the researchers said, potentially explaining the greater failure rate of low-salinity marshes compared to salt water marshes during the storm.

The team, whose paper has been accepted for publication in the Proceedings of the National Academy of Sciences, also included Boston University post-doc Zoe Hughes, and graduate student Nick Howes; Ioannis Georgiou, Mark Kulp, and Michael Miner of the University of New Orleans; and Jane Smith and John Barras of the U.S. Army Engineer Research and Development Center.

FitzGerald, who has been conducting research along the Louisiana coast for more than 20 years, has been using his expertise to help plan boom operations, determine oil burial on beaches, and provide expert opinion on the controversial berm construction strategy. He has been working in the Gulf since May 5th, documenting daily the oil encroachment on the Louisiana shoreline.

Provided by Boston University