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[Archived News](#)**LSU storm surge monitoring accounts for wetlands, coastal geometry**(Source: [Fondirect Environmental](#))

When powerful storms hit the Louisiana Gulf Coast, monitoring technology from a Louisiana State University research group is there to measure how the storm packs its punch and how wetlands take the hit.

Q. Jim Chen, an LSU coastal engineering professor, and his research team dynamically measure storm surge. They take wave action and coastal geometry into account, as well as water levels. Their study seeks to quench a drought of data on how wetlands mitigate storm surge.

Wetland plants create a frictional force that slows water washing onto shore during storm events.

"Certainly, we see significant wave reductions from the wetlands," Chen said.

However, he said, little field data has been collected to support anecdotes.

Most storm surge monitoring programs, including the U.S. Geological Survey's, look solely at water level rise using gauges that measure water pressure differences, and interpret it as increases and decreases in water levels.

While Chen's team uses water level sensors they also use SonTek ADV wave sensors to measure wave height and currents at a frequency of 10 Hertz. Chen said studying waves requires much higher sampling frequencies than studying water levels.

The method also takes coastal geometry into account. He collaborates with a local engineering firm to survey coastal topography for his studies.

Chen said continental shelves with a narrow gradual slope and shallow estuaries, like those of New York and Louisiana, have a much higher susceptibility for flooding because high winds can more easily push shallow water ashore. Texas' western Gulf Coast, in comparison, has a wider steeper continental shelf with much greater depth near the shore, making it much less prone to wind-induced flooding.

Hurricane Sandy's devastating flooding on the New York and New Jersey coast is a prime example. "When you have a geometry and topography like Louisiana and New York, then it's a different storm," Chen said.

Chen said one of the most important takeaways for the public from storm surge research is that history cannot be forgotten, nor can science be ignored as powerful storms move toward shore. That's where coastal engineering plays an important role.

"We realize that a lot of damage to infrastructure, loss of property and loss of life can be avoided if we have good education and resources in coastal engineering," Chen said.

The LSU research team deployed gauges in Louisiana wetlands bordering the Gulf of Mexico during three storm events. Starting in 2009, the team monitored Tropical Storm Ida, Tropical Storm Lee and Hurricane Isaac.

Research from Tropical Storm Ida and Tropical Storm Lee helped the team to establish numerical relationships between wetland vegetation drag and wave action from storms. Data from last September's Hurricane Isaac is still being analyzed. So far, the LSU team verified their modelling closely matched data collected by sensors.

LSU graduate students Kyle Parker, Ranjit Jadhav, Ke Liu and Ling Zhu all participated in the research. Post-doctoral researchers Arash Karimpour and Kelin Hu measured and modeled wave and surge events.

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