THE WATER INSTITUTE OF THE GULF™

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For Immediate Release

New publication looks at options to maximize land building from diversions

WAX LAKE OUTLET MAY NOT BE BEST MODEL FOR WHAT A DIVERSION CAN DO

BATON ROUGE, La. (July 12, 2017) – Although many studies have looked at the need to capture the Mississippi River sand through diversions, analysis of an old crevasse along Bayou Lafourche indicates that mud, the most plentiful sediment type carried by the river, is a powerful tool in building land.

In the new publication, "Efficient retention of mud drives land building on the Mississippi Delta plain," researchers from Tulane University, Coastal Carolina University, and The Water Institute of the Gulf find that retention of river diversion sediment in wetlands could be increased to more than 75 percent, if the outflow area is protected from the impacts of marine waves and tides.

"This is dramatically higher than rates observed in growing coastal delta lobes, which retain only 5 to 30 percent of incoming sediment," said Zhixiong Shen, assistant professor of Marine Science at Coastal Carolina University.

By examining an old crevasse along Bayou Lafourche, formed back when this waterway shared flow of water and sediment with the Mississippi River, researchers found that mud can build enough land to keep up with sea level rise if the diversion flows into existing vegetated areas protected from marine forces. This crevasse splay, located near Napoleonville, La., is mostly made of mud deposits that have remained stable enough over the centuries to currently support farming even more than five miles from the Bayou Lafourche channel.

"Crevasse splays like this one are extremely common in the Mississippi River Delta and all of them consist mainly of mud," said Torbjörn Törnqvist, Vokes Geology Professor at Tulane University.

Using information from 132 sediment cores, and defining the soil characteristics for 53 samples, the researchers determined the nature of the sediment carried by Bayou Lafourche 1,200 to 600 years ago that made it into the adjacent wetlands. What they found is that the crevasse splay – the area that receives water and sediment from a break in the natural levee system – only contained about 5 percent sand. From this, they were able to calculate how much of the total sediment that entered the crevasse splay was trapped in this swampy environment.

In total, these calculations revealed a very high retention of mud in the crevasse splay which calls into question using growing delta areas, like Wax Lake Delta, as models of what can be achieved through diversions. Instead, land building can be maximized beyond what these open-water delta areas demonstrate by gearing the diversions toward sections of the vegetated delta plain instead of near the open coast.

“These issues are not unique to the Mississippi River Delta, but the political and economic ability to build these large-scale river management projects has not yet developed in other major delta areas,” said report co-author Christopher Esposito, a research scientist at The Water Institute of the Gulf who undertook this study as part of his Ph.D. dissertation at Tulane University. “We expect this to change as the sea encroaches on major population centers worldwide.”

The full publication can be viewed here.

About The Water Institute of the Gulf
The Water Institute of the Gulf is a not-for-profit, independent research institute dedicated to advancing the understanding of coastal, deltaic, river and water resource systems, both within the Gulf Coast and around the world. This mission supports the practical application of innovative science and engineering, providing solutions that benefit society. For more information, visit www.thewaterinstitute.org.

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