THE WATER INSTITUTE OF THE GULF™

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For Immediate Release

New paper finds connection between higher salinity and reduced ability of Louisiana wetlands to keep up with sea level rise

SHORT-TERM CARBON ACCUMULATION RATES SUFFER AS SALINITY GETS HIGHER

BATON ROUGE, La. (January 11, 2017) – Many of Louisiana's coastal wetlands depend upon the annual cycle of birth and death of plant material to help build up soil height as a way of trying to stay ahead of relative sea level rise caused by the combination of sinking land and rising waters.

A new paper published in "Wetlands," shows that although researchers found relatively little difference in the rates of this short-term accumulation across marsh types, as salinity in wetlands rises, the amount of organic carbon in soil that can accumulate as a buffer against relative sea level rise decreases. That also means freshening of certain wetlands with coastal restoration project such as sediment diversions being planned for the Mississippi River or even additional rainfall, can help wetlands regain some of this organic storage ability and perhaps give these areas a buffer against succumbing as quickly to higher water levels.

"Evaluating all marsh types, from fresh to saline, for these kinds of impacts is essential to understanding how Louisiana's marshes respond to changing conditions," said Melissa Baustian Ph.D., researcher with The Water Institute of the Gulf and lead author of the article. Other authors of the report include researchers from the U.S. Geological Survey, Gulf South Research Corporation, Coalition to Restore Coastal Louisiana and the Department of Earth & Environmental Sciences at Tulane University.

The study – "Relationships Between Salinity and Short-Term Soil Carbon Accumulation Rates from Marsh Types Across a Landscape in the Mississippi River Delta," – involved looking at accumulation of organic plant material at 24 marsh sites in southeast Louisiana across four marsh types – fresh, intermediate, brackish, and saline. Soil cores were collected and used to look at bulk density, total carbon, and accretion of the site which were compared to annual surface water salinity data from 2000 to 2015.

Researchers found was that although the average total accumulation rates of live and dead vegetation – soil carbon accumulation – weren't that much different among the marsh types, differences were seen when compared to salinity values. Using regression analysis – a way to look at cause and effect of one variable against another – the study, indicated that the higher the average yearly salinity became, the lower the short-term total carbon accumulation rates.

That means changing salinities, whether saltier because of relative sea level rise or fresher because of increased diversion of fresh water from the Mississippi River, increased rainfall or flooding, could change short-term carbon accumulation rates in Louisiana's wetlands soils into the future.

"Our coast is going to continue to change whether due to climate change or restoration efforts. Results of this study add to the knowledge base in preparing for that future," Baustian said.

Louisiana's coastal marshes accumulate an estimated 5.9 billion pounds of short-term organic carbon, the weight of nearly eight Empire State Buildings, every year which is a notable fraction of the world's yearly total.

Link to full report 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.

Cutline: Melissa Baustian, coastal ecologist with The Water Institute of the Gulf, does field work for a new paper in "Wetlands" looking at salinity and short-term soil carbon accumulation.

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