

# Research demonstrates relationship of Texas coastal prairie-pothole wetlands to Galveston Bay

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New research reveals vast tracts of wetlands along the upper Gulf Coast are more hydrologically connected to Galveston Bay and other waters of the U.S. than previously thought, suggesting immediate implications for how they are preserved, managed and regulated, according to Texas AgriLife scientists.

"Loss of wetlands closer to traditional navigable waters must be mitigated under the Clean Water Act by creating new wetlands, or preferably by protecting and restoring similar existing wetlands," said Dr. John Jacob, Texas AgriLife Extension Service environmental quality specialist. "This ensures that the aquatic integrity of state and federal waters is maintained, because wetlands provide critical ecological services such as pollution removal, among others."

The study's findings appear in the journal *Wetlands*. Jacob said the study suggests that wetlands farther up in the watershed are just as critical to the aquatic integrity of state and federal waters as those that are immediately adjacent to these waters.

"The coastal 'prairie pothole' wetlands studied were considered to be hydrologically isolated from traditional navigable waters by the U.S. Army Corps of Engineers, that they are, in effect, essentially closed depressions that contribute little or no water downstream," Jacob said.

The findings quantify "anecdotal observations" by professionals in the field over many years of substantial runoff coming from the wetlands, said Dr. Brad Wilcox, Texas AgriLife Research rangeland scientist.

"(Our research) suggests surface runoff occurred regularly and accounted for at least 17 percent of watershed precipitation during the 45-month long study," Wilcox said. "Runoff events averaged 17 days."

The results of this study have national implications. The difficulty of determining just how far Clean Water Act regulations should extend up into the watersheds above traditional navigable waters has resulted in many lawsuits and a long series of Supreme Court decisions, according to Jacob.

"The most recent decision in 2006 (Rapanos) reinstated the long-standing doctrine of the "significant nexus," declaring that if such a nexus between wetlands and traditional navigable waters could be quantified, then those wetlands should fall under the jurisdiction of the [Clean Water Act](#)," Jacob said.

"The research we've reported here is the first in the country, after Rapanos, to address the nexus issue for a class of wetlands – in this case, coastal prairie potholes on the upper Texas Gulf Coast."

He said in the anatomy of ecosystems "forests are the lungs and wetlands are the kidneys. But headwater wetlands, like the prairie pothole wetlands we studied, are perhaps more like lymph nodes, acting to filter pollutants in the furthest reaches of the watershed. Given that at least one third of the water in Galveston Bay is derived from runoff which courses through these wetlands, it is critical that we do not lose so many of these wetlands that we can no longer maintain a healthy aquatic ecosystem."

Jacob said with all the new development and potential loss of wetlands coming to the lower Galveston Bay watershed in the next few decades, there's a threat of "losing the defenses we need."

"The quantitative demonstration of a significant hydrological connection between headwater prairie pothole wetlands and Galveston Bay does not mean that development and fill of these wetlands will not take place," he said. "It does mean, however, that the loss of any of these headwater wetlands should be mitigated, just as is done now for development of wetlands adjacent to Galveston Bay and other waters.

"The mitigation process can be used to protect and restore critical headwater wetlands, which have already largely been identified," says Jacob. "Prairie pothole wetlands are precisely the [wetlands](#) most impacted by development in the greater Houston area. That none of this loss is mitigated puts the health of our waters at grave risk. We now have enough information to know that this loss must be mitigated without delay."

Jacob also suggests that perhaps not all the loss can be mitigated. Some prairie pothole complexes are so large and unique that their loss cannot really be mitigated.

"You can lose one kidney, but not both," he said

Provided by Texas A&M AgriLife Communications

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