

River diversions can build new, storm-resistant land

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Tulane researchers take you to the mouth of the Mississippi to see new land built by the Cubit's Gap Subdelta. Video by Carolyn Scofield.

Restoring the flow of fresh water and sediment from the Mississippi River can rebuild the state's protective wetlands, making them more resilient to looming threats from storms, according to a new Tulane University [study](#).

The [research](#) answers questions posed after Hurricane Katrina caused significant wetland loss near the Caernarvon Freshwater Diversion. Some thought freshwater marshes created by river diversions were less structurally stable than salt marshes.

Researchers in Tulane's Department of Earth and Environmental Sciences looked at land building and erosion in the Cubit's Gap Subdelta south of Venice, which carries about 50,000 to 100,000 cubic feet of water per second. The system is comparable to the Mid-Barataria Sediment Diversion called for in the state's Master Plan.

The team used more than a decade's worth of satellite data to see the rate at which land was built and eroded near the delta. They also measured the strength of the soil in the marshes. They found that marshes closest to the river were often immune to erosion and, in some cases, were actively building. These marshes also had the strongest soils, the most mineral sediment and the lowest salinity. The marshes farthest from the river were the most erosion-prone. These marshes had the most organic sediments (largely decaying roots) with relatively salty and weaker soil.

"Large river diversions will likely build stable land because they can carry a large amount of river sediment," says study author Alex Kolker, adjunct professor in the Department of Earth and Environmental Sciences. "Our findings suggest the problem with the Caernarvon marshes wasn't so much that they were fresh, it was more that they were sediment-poor. The Caernarvon diversion, at least in years leading up to Hurricane Katrina, was carrying too little sediment to build land, as it is relatively small and was rarely operated to capacity.

"Having sediment-rich wetlands is critical to having wetlands that can withstand the forces of hurricanes and rising seas," Kolker says. "As Louisiana looks to the future, it's good to know that as far as large diversions are concerned, the Master Plan is working with the right toolkit."