

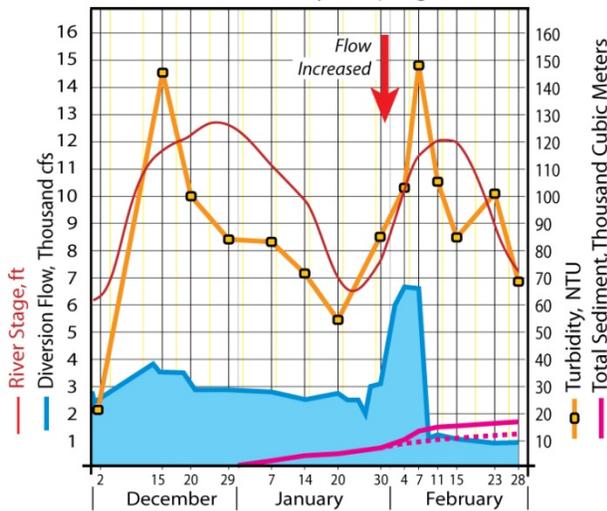
LAKE PONTCHARTRAIN BASIN FOUNDATION

SAVE OUR COAST SAVE OUR LAKE

March 2012

For two years, the Lake Pontchartrain Basin Foundation (LPBF) has been testing the turbidity of the water flowing through the Caernarvon diversion, 15 miles downriver from New Orleans. Turbidity (cloudiness) is a measure of how much sediment is suspended in the water. Recently, the diversion managers at the Louisiana OCPD used turbidity data for the first time to briefly increase flow through the diversion while sediment levels were high. This adaptive management decision resulted in approximately 4,000 m³ of extra sediment being delivered to the upper Breton Sound marsh (see graph below). Though the coastal restoration impact was relatively small, it has large implications for how diversions can be managed in the future.

Caernarvon Diversion Turbidity Sampling 12/2011 - 2/2012



The orange line shows the measured turbidity (cloudiness), which tells how much sediment is suspended in the water. On Feb. 2, the diversion operators increased flow based on turbidity measurements for the first time, resulting in ~4,000 cubic meters more sediment delivered to the marsh (magenta line). [LAKE PONTCHARTRAIN BASIN FOUNDATION](#) [SAVE OUR COAST](#) [SAVE OUR LAKE](#)

Since one of the purposes of diverting water from the river is to build land by depositing sediment, LPBF scientists wanted to investigate how measurements of sediment concentration could be used to manage diversions more effectively. Other research has shown that sediment levels in the Mississippi River vary greatly in time and space, with very complex dynamics. At Caernarvon, LPBF has found that high turbidity often comes in pulses that last 2 to 6 weeks, where sediment levels are 10 to 20 times higher than their lowest levels. These sediment pulses often occur at the beginning of a rise in the river level, though upstream flooding and other factors can cause spikes as well. (To see data for 2010 and 2011, click on the links below).

The recently released [Comprehensive Master Plan for a Sustainable Coast](#) calls for a system of eight diversions on the Mississippi River, with the long-

term goal of delivering sediment to rebuild coastal wetlands. The impact and effectiveness of these diversions will largely depend on how they are operated. As more diversions are built, they will have to be managed as a system. Even at flood stage, the Mississippi River has finite resources of water, sediment and energy. Large diversions remove these resources from the river and affect conditions upstream and downstream. Knowing the concentration of sediment in the river will be a key to making scientific, system-level management choices.

As has been seen at Caernarvon, introducing large volumes of fresh water into coastal marshes has positive and negative effects. By regulating flow based in part on how much sediment the river is

carrying, diversion managers can maximize land building while minimizing the negative effects of freshwater on brackish and saline marshes.

LPBF hopes that the state will eventually establish a network of turbidity monitoring stations to provide real-time data for diversion management. Until then, the modest research efforts of local nonprofits will provide data to environmental managers and public.

<http://saveourlake.org/coastal-resources.php>

<http://saveourlake.org/PDF-documents/our-coast/Caernarvon/Turbidity-Dec09-Oct10.pdf>

<http://saveourlake.org/PDF-documents/our-coast/Caernarvon/Turbidity-Feb-Dec11.pdf>