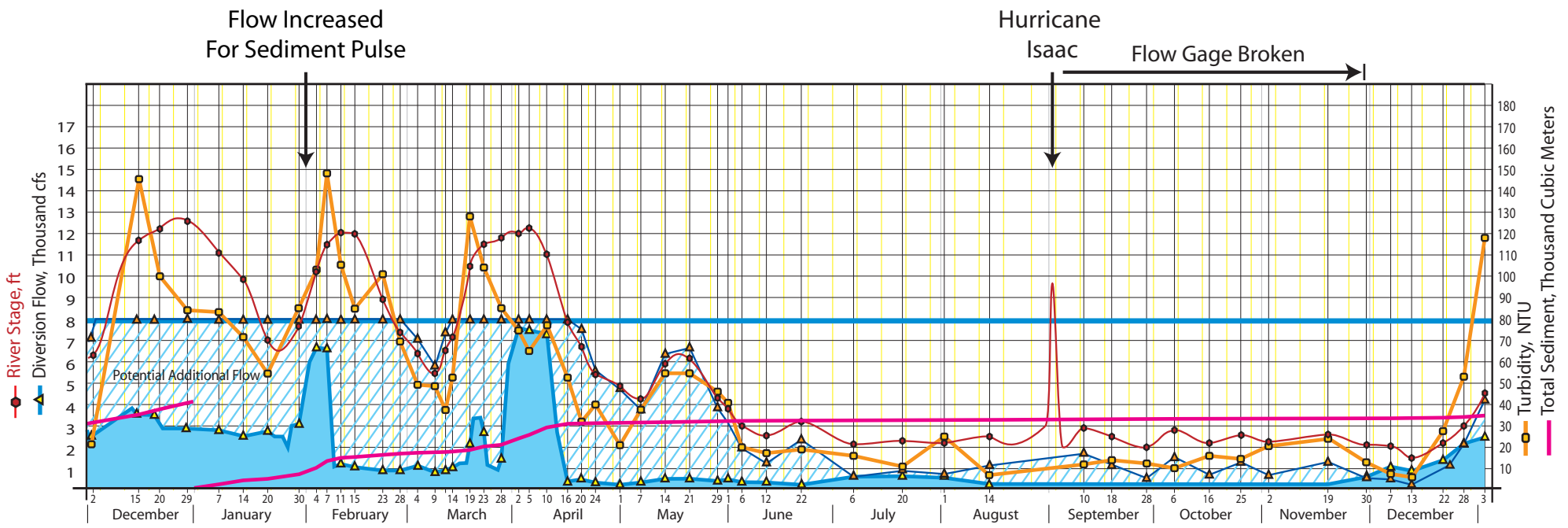
Caernarvon Diversion Turbidity Sampling 12/2011 - 12/2012

A Project of the Lake Pontchartrain Basin Foundation



This graph shows the results of water sampling at the Caernarvon diversion in St. Bernard Parish, Louisiana.

The orange line shows the measured turbidity (cloudiness), which tells how much sediment is suspended in the water. The red line shows the river stage (height above sea level). The solid blue area indicates the actual discharge of water from the diversion in cubic feet per second (cfs). The magenta line is an estimate of the sediment delivered by the diversion. The blue hatched area shows the water that could physically have flowed through the diversion, but was not allowed to. The diversion structure can deliver more water as the river stage increases, up to its design limit of 8,000 cfs (thick blue line).

There were 3 moderate rises in the river from December 2011 to March 2012, a long dry summer with record low water, and the beginning of a rise in late December. There was a spike in turbidity on the leading edge of each river rise. It may be that rising energy mobilizes sediment from the river bed, which is swept downstream and diluted by the peak flow.

LEGEND

- Turbidity of Diversion Discharge (Suspended Sediment)
- Actual Diversion Flow
- River Stage (at Carrolton)
- Potential Diversion Flow (Calculated from river stage)
- Diversion Operational Limit
- Total Delivered Sediment

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For the first time, diversion managers used LPBF's turbidity information to open the gates at the peak of sediment load in early February. Calculations show that the 1-week increase delivered about 4,000 more cubic meters of sediment (magenta line). About 35,000 cubic meters of sediment flowed through the diversion in 2012.

Turbidity is directly related to sediment concentration, so a gallon of water with 150 NTU has three times more clay, silt and sand in it than one with 50 NTU. Using turbidity data to time the peak water flow will help diversions deliver the most sediment. The river's behavior is complex and hard to predict, though it sometimes follows patterns. More research is needed to track and capture pulses of sediment moving down the river so that they can be used as resources for coastal restoration.