



Shoreline response to environmental forcings: A case study in the Wax Lake Delta, Gulf of Mexico

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River deltas are well-known landforms within both hydrology and geology. However, both their hydrodynamics and morphodynamics are not well understood, in part because of scarcity of historical data that document the growth or retreat of their channel networks, islands and associated shorelines.

Here, we present an analysis of Landsat imagery of the Wax Lake Delta, a young and relatively rapidly prograding delta in the shallow Atchafalaya Basin, Gulf of Mexico. Taking advantage of a recently developed semi-automatic shoreline extraction method [Geleynse et al, 2012], we show how suitably-defined shorelines can be retrieved from satellite imagery. The effect of tides, river floods, storm surges, and vegetation cover on the extracted shoreline of Wax Lake Delta can be quantified as well as the physical relationship between the boundary of the subareal and subaqueous portions of the delta (hydrodynamic shoreline) and the morphodynamic shoreline.