Project Scope

Wax Lake Delta is a river-domiated ditributary network located in southern Louisiana 100 km west of the Mississippi Delta birdsfoot. The Wax Lake Delta is currently the subject of the newly-formed Delta Dynamics Collaboratory to study the geomorphologic, hydraulic, and ecologic dynamics of a healthy distributary network and to develop sophisticated modeling techniques of delta dynamics.

Understanding the current topologic and hydrologic characteristics of the Wax Lake Delta is an essential tool in being able to advance the technology of predictive models. For this study, I will investigate the current status of the Wax Lake Delta by analyzing high-resolution satellite imagery and digital elevation models (DEMs) to determine the current geometry of the study area. In my search, I have found an adequate of availability of satellite imagery from both the USGS and NASA for public use. The search for DEMs (30m, 10m, & 1m LIDAR) has yielded less promising results. All resolutions are readily available for the area, but only extend halfway down the delta landscape, possibly due to the dynamics of the delta landscape. I am looking into the Louisiana Atlas LIDAR data for the entire state made available by Louisiana State University. However, I have yet to see if this information is any different from the LIDAR available from the USGS. The delta landscape is very flat and the elevation data may not even prove useful.

Outcomes

The goal of this project is to establish a background knowledge of the Wax Lake Delta system. The study will result in the following deliverables…

- Layouts displaying the Wax Lake Delta using high-resolution satellite imagery, ArcGIS 10 Basemaps, and aerial photography.
- The channel network, landforms, and shoreline digitized into ArcGIS (using the satellite imagery as a guide) and analyzed for various topologic and geometric parameters (distribution of land size, nearest-edge distance, channel lengths and bifurications) as discussed in Edmonds *et. al* (2011).
- A study of the topologic aspects of the river delta based on the guidelines developed by Smart & Moruzzi (1972) and Morisawa (1985). This includes networks analysis, comparison to the random connection model developed by Smart & Moruzzi (1972), determination of the recombination factor, and a summary of the implications of the findings.
- A summary of the flows entering the delta through the Atchafalaya River channel diversion.
- An aerial photography progression through time showing the evolution of the delta (the delta has grown over an observable time period due the a channel built by the Army Corp. of Engineers).