Corey Van Dyk
October 29, 2013
CE 394
Project Progress Report

<u>Geographic, Hydrologic, and Hydrodynamic Analysis of Louisiana's Wax Lake Delta</u>

For this project, I desired to analyze different physical aspects of the Wax Lake Delta. The first thing I did was to obtain bathymetric data from post-doc Man Liang. These data consisted of 2,310 data points arranged in nine transects. These data each have an easting and northing given in the NAD83 UTM Zone 15N projected coordinate system, in addition to depth. I altered the symbology of the dataset using a graduated color ramp with natural breaks in order to depict the depth along each transect. The data, overlaid on a topographic basemap, are shown in Figure 1.
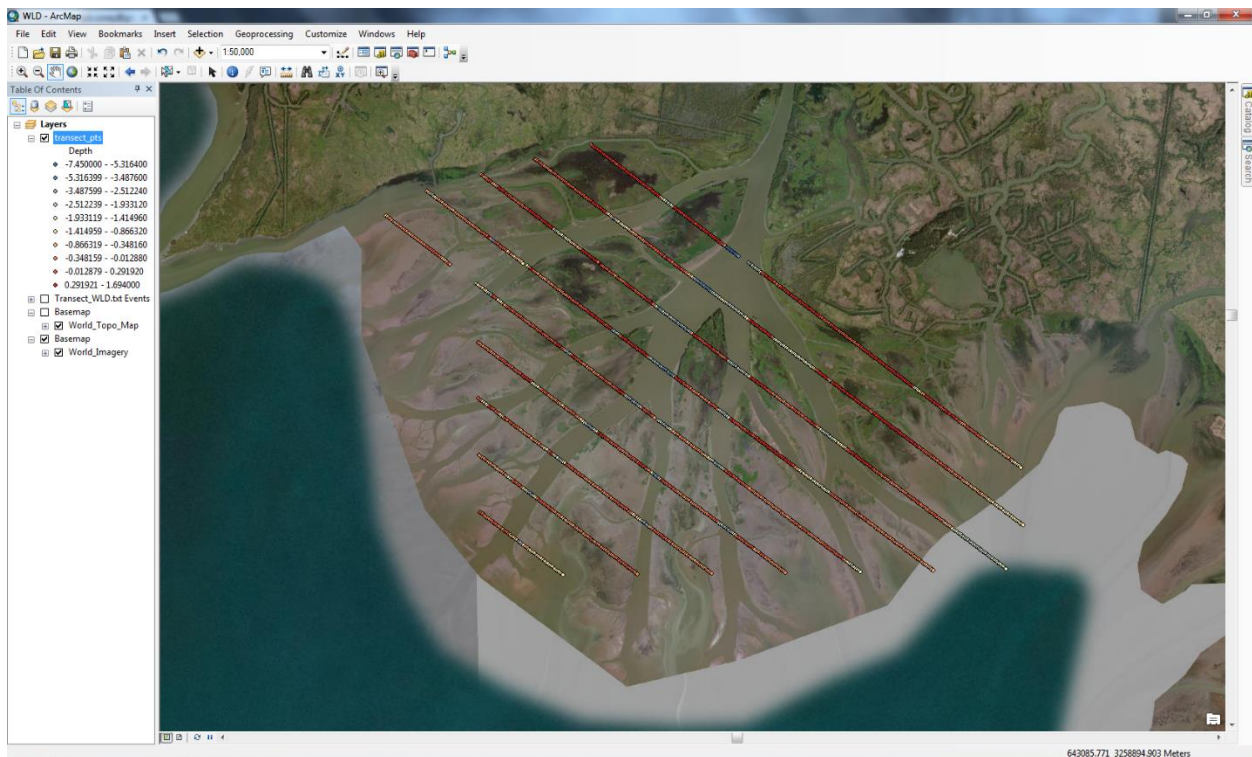

Figure 1: Depth along transects of Wax Lake Delta

It is easily seen that the data has a basic correspondence to the topographic basemap, with bluer points (greater depths) in the delta channels and redder points (surface elevation above water) on the islands of the delta.

My next step was to use different methods to interpolate these points into a reasonable raster dataset. This has proved more difficult than I anticipated, probably due to the arrangement

of the depth data. For example, the Kriging method gave a result that didn't give a very clear idea of how the depth varies through the delta. I plan on experimenting with the parameters of the Kriging tool in order to get various results. Other interpolation methods have proved more successful. The nearest neighbor tool (using a default cell size of about 30.6 meters) gave a result from which the channels and islands of the delta can be seen. Figure 2 displays this result.
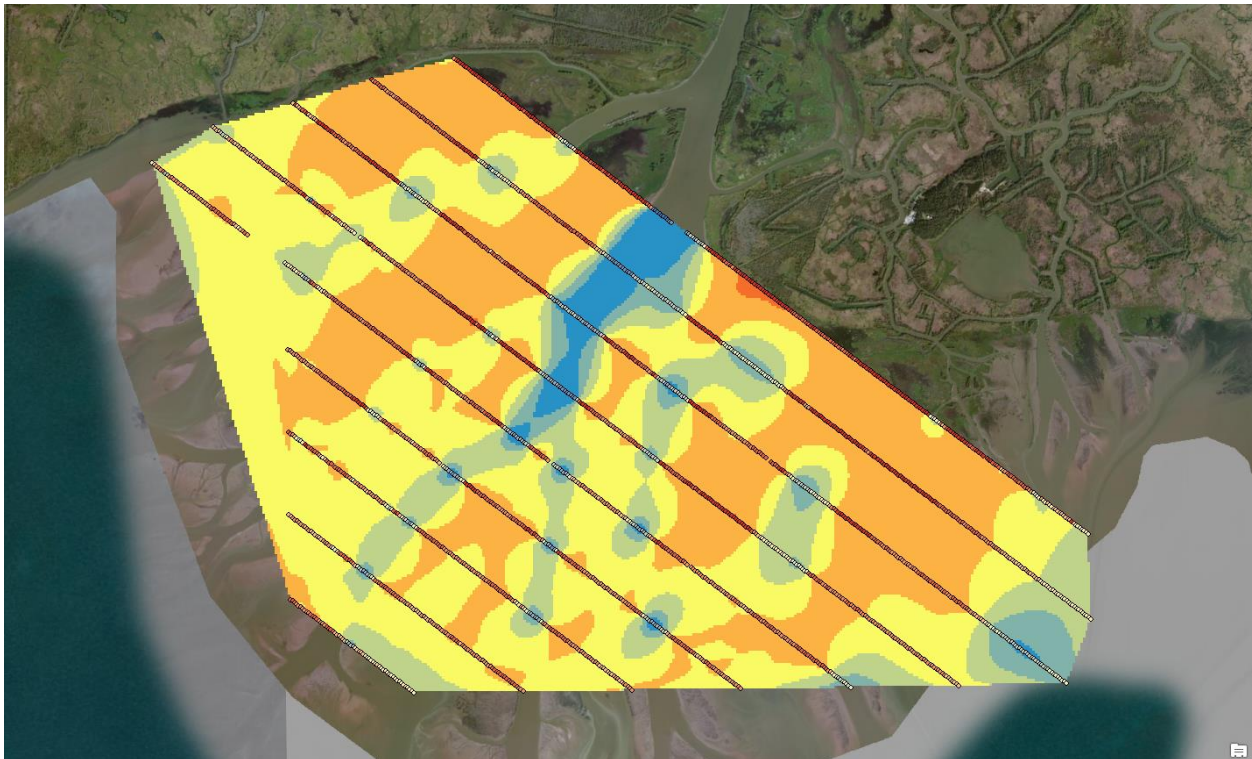
Figure 2: Nearest neighbor interpolation of transects

My next step will be, after interpolating the transect data using several methods, to use Man Liang's numerical model to predict the flow field through the delta. The numerical model will be run for each distinct interpolation. After this, I will map the various flow field results in GIS, as well as use Spatial Analysis tools to analyze geographical data, such as island size, channel width, and channel curvature.