Introduction

Recently landowners along the Tongue River in Cavalier, ND have been experiencing severe erosion of the banks. The Red River Basin Riparian Project group has been working with the landowners on an individual basis.

Method

In order to create a surface, Light Detection and Radar (LiDAR) data was collected from the Red River Basin Commission website. This was opened in AutoCAD as shown and an alignment was created. This file could then be exported into Hydrologic Engineering Centers River Analysis System (HEC-RAS). After the LiDAR data was collected, a small condemned railroad dam within the city was replaced with a series of three rock weirs.

Survey data of the weir cross sections as well as several other cross sections within town were entered into HEC-RAS and interpolated to create an estimated bed surface.

It was found to all be silty clay loam and a $d_{50}$ value and gradation were estimated for the preliminary model.

Conclusion

The existing model needs to be refined in order to better represent the Tongue River. In order to do this, a surveying field trip has been planned for the end of March 2012 to collect more cross sections, samples for gradations, and sediment loads. When this is entered into the model, a sediment cross section graph will be created similar to the one shown here.

Once the model is complete, it will be used to analyze and compare the current methods of erosion protection to decide whether a city-wide erosion solution is feasible.

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