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Analyses of Recent Upper St. Clair River Bathymetric Changes

The U.S. Army Corps of Engineers, Detroit District has collected updated data in the upper St. Clair River to better characterize any changes that may have occurred in the bottom profile of the river. In 2002 and 2005, the Corps collected bathymetric data for a two-mile stretch at the head of the river near Port Huron, Michigan. The Corps collected these data using a conventional survey vessel and the latest technology multi-beam sounder. These two multi-beam surveys each provided a grid of data points at a spacing of 2 meters, resulting in a more comprehensive, total bottom coverage of the river. Previous single-beam surveys of the river provided fewer river bottom elevation points collected along cross-sections spaced about 100 hundred meters apart.

Comparison of older river bathymetry, using a single-beam survey with cross-sections spaced 100 meters apart, with a denser multi-beam survey can give misleading conclusions. When using the single-beam profile data, the computer has to assume, or interpolate, the depth at many additional locations to fill in the voids where data were not collected. The 2002 and 2005 multi-beam data created a much more detailed terrain model based on the fact that it had so much more actual data to work with. The best way to capture changes to the river bottom over time is to compare surveys collected using the same technology and method.

The Corps has analyzed the data from the 2002 and 2005 data sets that were collected using the same technology and method. The two data sets were used to create computer-generated terrain models, showing a detailed three-dimensional river bottom. Comparisons of these two data sets show that over this three-year period, some areas in the upper river have become deeper, while some have become shallower (see attached figure). This is consistent with characteristics of a dynamic river system such as the St. Clair River. Overall, when comparing the two data sets, the volume of the upper river that became deeper is roughly in balance with the volume of the upper river that became shallower over this two-mile river segment, within the accuracy of the survey equipment and methods. Therefore, this analysis shows that over the time period from 2002 to 2005, while some areas got deeper and others shallower in the upper St. Clair River, the net overall effect on the total cross-sectional area of this section of the river is essentially unchanged. Because there has been no net change in the area of river flow, the Corps concludes that these river bottom changes would not likely lead to increased river flows. The Corps plans to continue to conduct detailed surveys of the upper St. Clair River in future years to monitor any ongoing changes to the river bottom.

The Detroit District point of contact for these issues is Scott Thieme, Chief of the Great Lakes Hydraulics and Hydrology Office. He can be reached at 313-226-6440 or by email at Scott.J.Thieme@usace.army.mil

St. Clair River Depth Change 2002 - 2005

Legend

Feet Shallower

- > than 5
- 3 - 5
- 2 - 3
- 1 - 2
- 0 - 1

Feet Deeper

- 0 - 1
- 1 - 2
- 2 - 3
- 3 - 5
- > than 5

0 500 1,000 2,000 Feet