

USACE Detroit District (LRE) and USACE Buffalo District (LRB) support continued collection of turbidity monitoring data at Fairport Harbor, OH, on Lake Erie, working in collaboration with ERDC Environmental Laboratory (EL) and ERDC Coastal and Hydraulics Laboratory (CHL)

Impact Statement: Long-term, extensive turbidity monitoring at a Lake Erie harbor in Ohio is ongoing as a result of collaboration between ERDC Environmental Laboratory (EL) and ERDC Coastal and Hydraulics Laboratory (CHL), and USACE Detroit District (LRE) and USACE Buffalo District (LRB) personnel. This effort is generating a comprehensive turbidity data set for the harbor and nearshore which will be crucial in supporting future innovative aquatic Beneficial Use of Dredged Material (BUDM) placements throughout the Great Lakes.

Between 10-20 July 2023, USACE Detroit District (LRE) hydraulic engineers (led by Jonathan Waddell) and USACE Buffalo District (LRB) survey crew members (led by Kevin Lesika) performed various field activities at Fairport Harbor, OH. These activities included performing maintenance on previously deployed sensors (Figures 1 and 2), deployment of an additional turbidity sensor (Figure 3), and completion of a bathymetric survey and an unmanned aerial system (UAS) photographic survey of the sensor array and dredged material placement area (Figure 4). Videos and photographs from the UAS surveys may be [viewed here](#). Seven of the turbidity sensors surrounding the placement area have been in place since April 2023, and initial bathymetric and UAS surveys were completed in May 2023. Nearshore placement of 35,000 cubic yards of dredged sediment occurred during the month of June 2023. ERDC Coastal and Hydraulics laboratory (CHL) researcher Doug Krafft plotted the bathymetric data to show differences in lakebed elevation reflecting dredged material placement (Figure 5), which will support interpretation of turbidity monitoring measurements. Data collected before, during, and after dredged material placement will be used to understand turbidity impacts from the dredged material placement in context with naturally occurring turbidity in the nearshore. Because turbidity is a common concern for aquatic beneficial use placements, the resulting compilation of data are expected to support additional aquatic beneficial use placement projects in the Great Lakes.

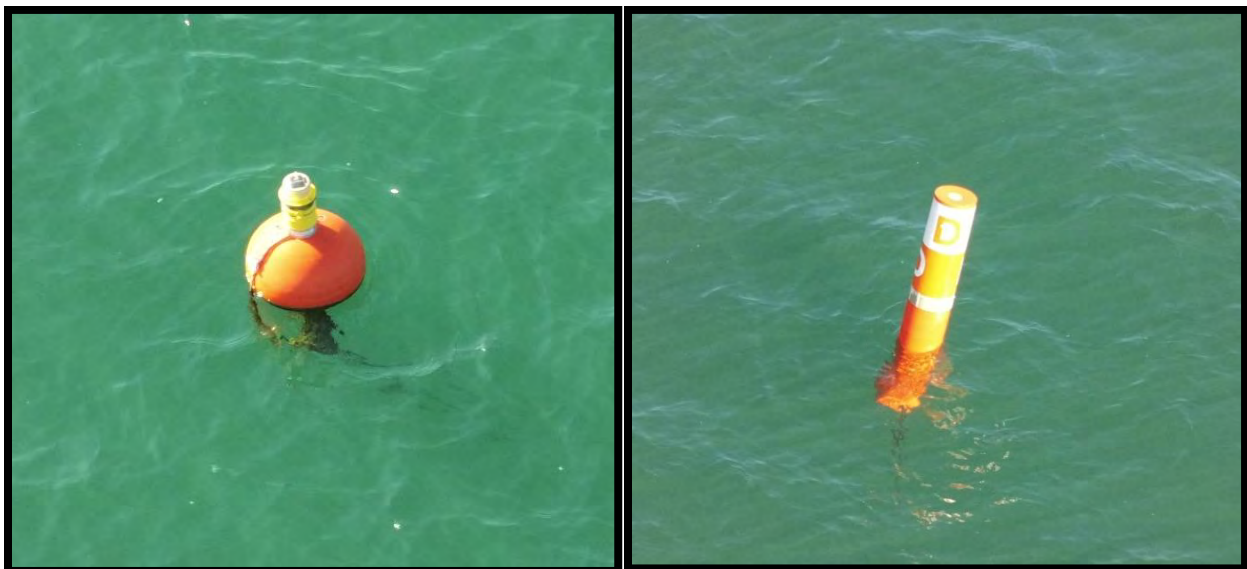


Figure 1. A buoy with turbidity monitor deployed in Lake Erie outside of Fairport Harbor, OH.

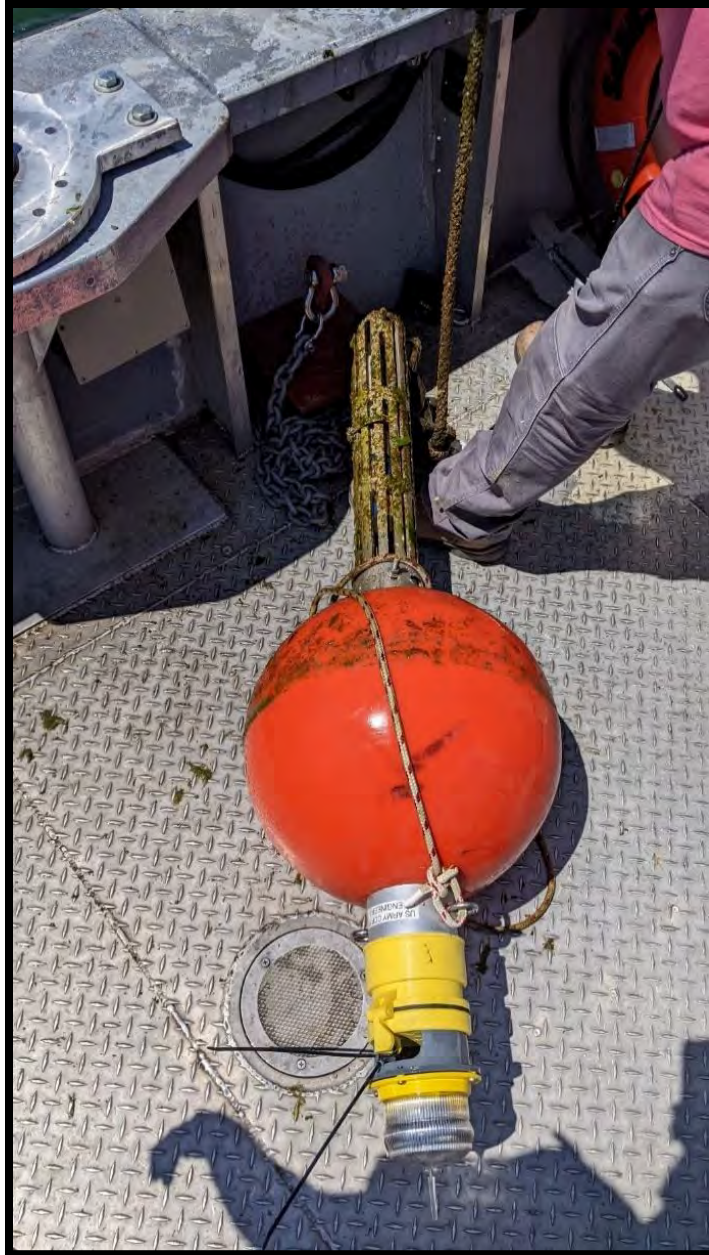


Figure 2. Retrieval of one of the buoys and turbidity monitors to remove biofouling which can interfere with sensing turbidity and transmittal of the measurements. The sensor was redeployed in the nearshore of Lake Erie after cleaning.



Figure 3. Placement of the eighth buoy and turbidity sensor outside the Coast Guard station at the mouth of Fairport Harbor, OH.

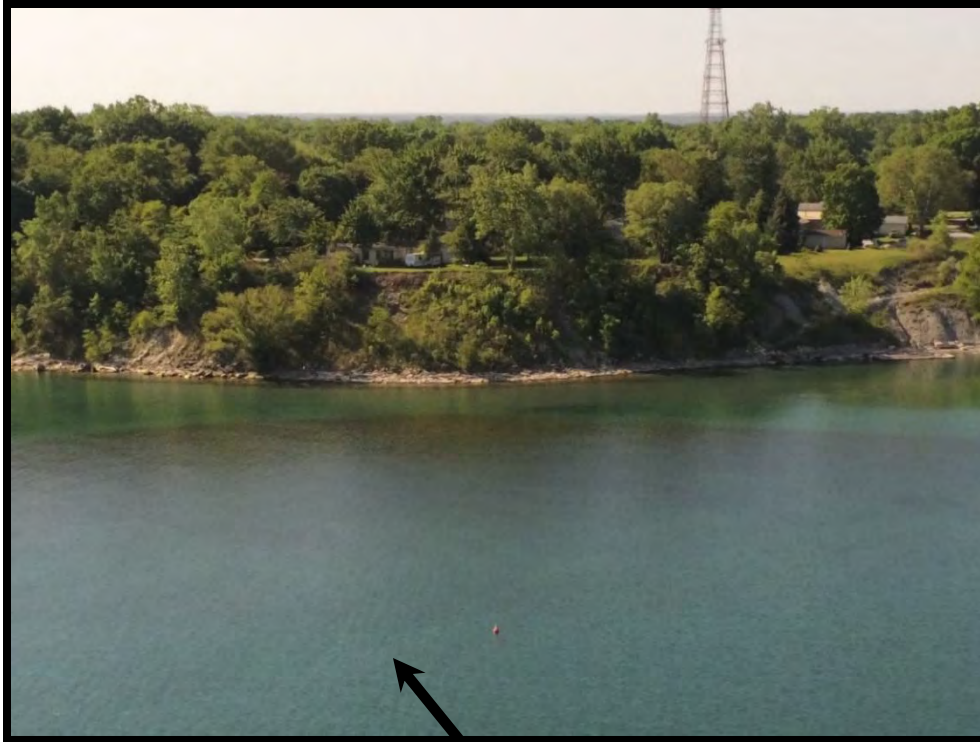


Figure 4. Aerial image showing buoy with turbidity sensor in Lake Erie outside of Fairport Harbor, OH.

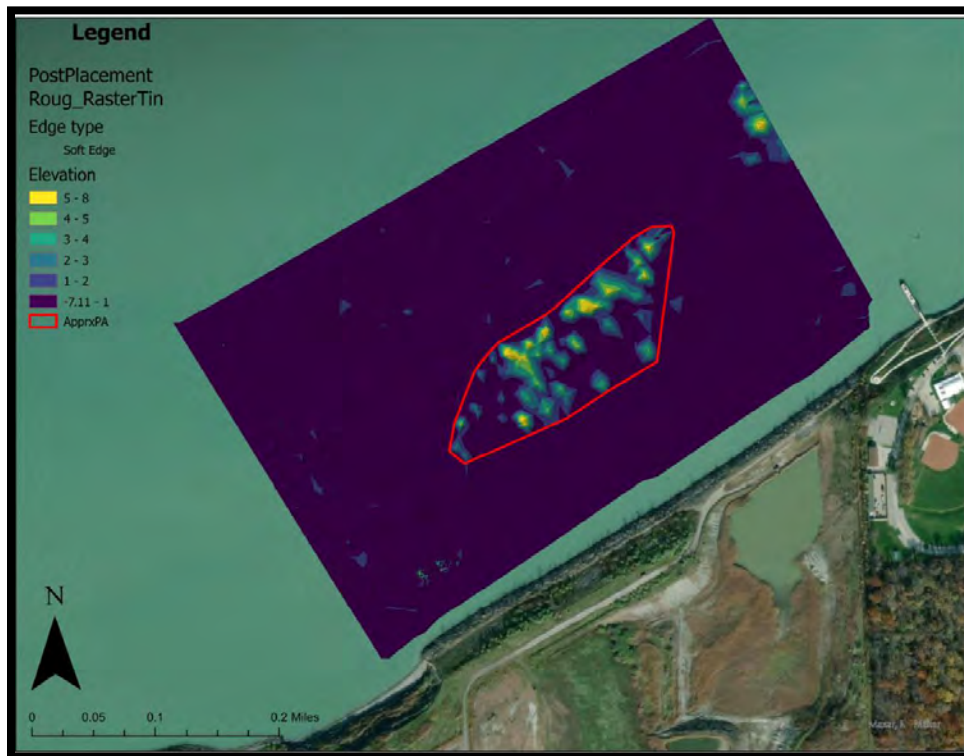


Figure 5. Plot showing difference in bathymetry at nearshore placement site outside of Fairport Harbor, OH, Lake Erie, before and after dredged material placement.

Funding for this turbidity monitoring is provided by the USACE Dredging Operations and Environmental Research (DOER) Program of the Sediment and Dredging Processes Focus Area.

This research addresses Statement of Need (SON) 1726: Nearshore Nourishment Best Management Practices.

POC: Karen Keil Karen.G.Keil@usace.army.mil, ERDC Environmental Laboratory (EL)