

ERDC Coastal and Hydraulics Laboratory and Environmental Laboratory collaborate with USACE Detroit and Buffalo Districts to Complete Data Collection in the Nearshore Placement Area of Fairport Harbor, OH, on Lake Erie

Impact Statement: Long-term extensive monitoring of changes in turbidity and bathymetry in the nearshore of a Lake Erie harbor in Ohio have been completed. This effort, a collaboration among ERDC Coastal and Hydraulics Laboratory (CHL), ERDC Environmental Laboratory (EL), USACE Detroit District (LRE), and USACE Buffalo District (LRB) personnel generated comprehensive turbidity and bathymetric data sets for the Fairport Harbor and nearshore dredged material placement area, improving our understanding of sediment transport in the nearshore. These data and associated evaluations will be crucial in supporting future innovative aquatic Beneficial Use of Dredged Material (BUDM) placements throughout the Great Lakes.

On 27 March 2024, USACE Buffalo District (LRB) survey crew members (led by Kevin Lesika) completed a fourth bathymetric survey at the nearshore dredged material placement area outside Fairport Harbor, OH (Figure 1). Dredged material placement occurred in the nearshore in June 2023. Other bathymetric surveys were conducted just before, just after, and 3 months post-placement, and used by ERDC Coastal and Hydraulics Laboratory (CHL) team member Doug Krafft to estimate erosion and accretion resulting from sediment transport in the vicinity of the dredged material placement site (Figure 2).

In addition, with support and expertise of USACE Detroit District (LRE) personnel (led by Jonathan Waddell), turbidity measurements were obtained before, during, and for approximately 3 months after placement, via an array of 9 turbidity sensors that were deployed on buoys across the harbor and nearshore placement area last April. Together, these data will be used to understand not only long-term sediment transport following nearshore placement, but also turbidity impacts from the dredged material placement in context with naturally occurring turbidity in the nearshore.

Fate of material placed in the nearshore and turbidity may be concerns for designing aquatic beneficial use placements. The resulting compilation of data are expected to support additional aquatic beneficial use placement projects in the Great Lakes. The research team plans to submit a manuscript describing this study to a special edition of the *Journal of Great Lakes Research* which will focus on coastal processes.

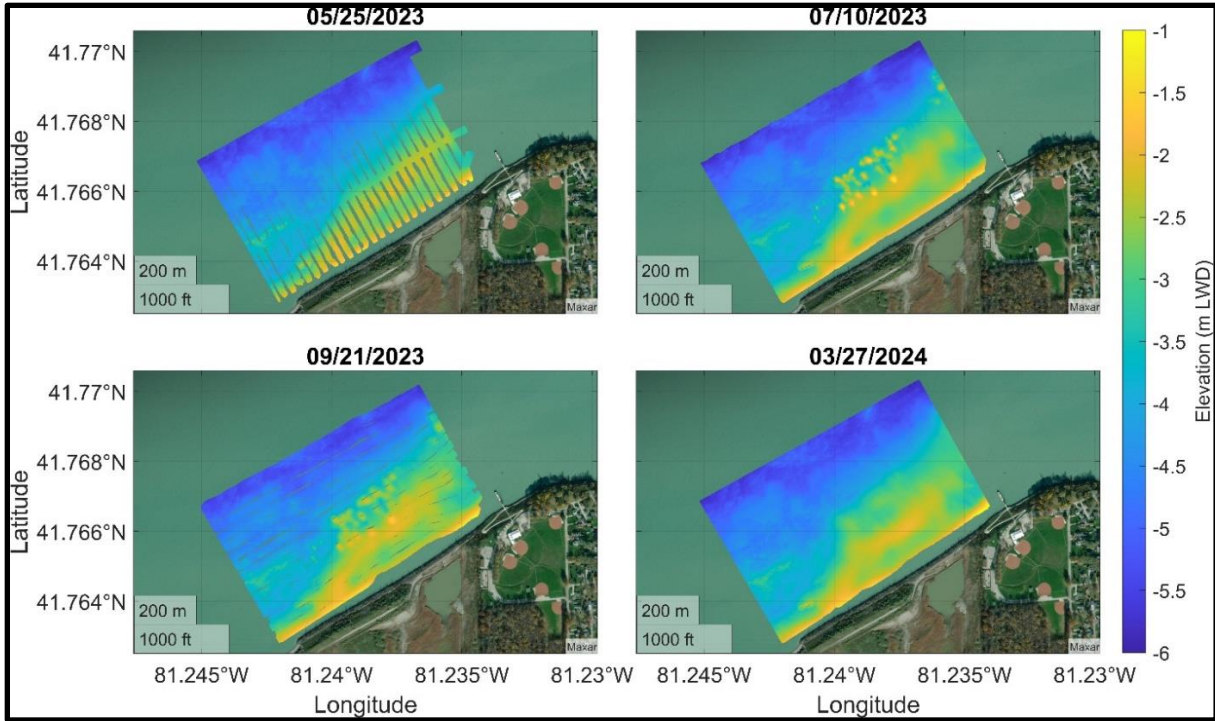


Figure 1. Elevation data measured on 05/25/2023 (upper left), 07/10/2023 (upper right), 09/21/2023 (lower left), and 03/27/2024 (lower right). Dredged material was placed in this area in June 2023.

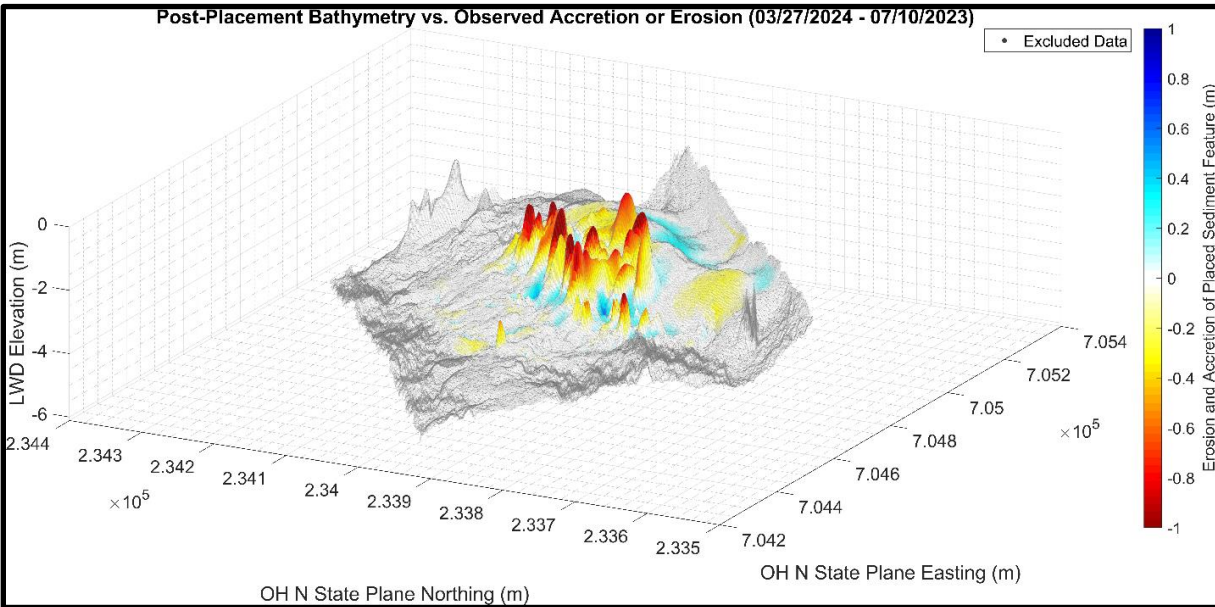


Figure 2. Elevation data from the 07/10/2023 survey, with colors representing filtered bathymetry change from 07/10 to 09/21/2023. Elevations measured on 07/10 that are outside of the 477 m by 370 m analysis area are presented in dark gray. Observable erosion is predominantly at the tallest placed sediment feature peaks, and accretion is immediately adjacent and along the landward edge of the pre-existing sandbar.

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