ERDC Technical Report published: "Improving Aquatic Placement Practices for Beneficial Use of Dredged Material in the Great Lakes"

Impact Statement: This project could increase the Beneficial Use of Dredged Material (BUDM) in the Great Lakes by opening up nearshore placement options at dozens of additional Great Lakes harbors, and help restore coastal wetlands along the Lake Erie shoreline in Ohio.

The Great Lakes Navigation System is an economically critical waterway. To maintain safe and navigable waterways, approximately 3–5 million yd^3 (2.3–3.8 million m^3) of sediments are dredged annually. USACE and others now recognize that beneficial use of these sediments can achieve positive economic, environmental, and social outcomes. However, historically less than 25% of dredged sediments have been beneficially used in the nearshore environment. Improvements are needed in dredged material management practices in the Great Lakes to achieve the goal of using 70% of dredged sediments beneficially by 2030. Therefore, to overcome these challenges, this report reviews Beneficial Use of Dredged Material (BUDM) projects with the goal of improving and increasing beneficial-use-placement practices in the Great Lakes.

This technical report seeks to accomplish two main goals which correspond to the different impediments to, and typical goals of, beneficially using dredged material in the upper versus the lower Great Lakes. First, this technical report seeks to identify harbors where sediments greater than 10% fine sediments (measured in situ) have been used for beach nourishment and to 3 understand the transport and disposition of the fine and sandy sediments associated with these placement operations. Those case studies will inform monitoring, modeling, and design concepts that will be incorporated into later phases of this research effort and would especially benefit placement practices in the upper Great Lakes where dredged sediments tend to be sandier. Second, this technical report seeks to document innovative placement techniques or engineered features that use fine-grained sediments. This documentation includes consideration of dynamic structures with non-traditional project life spans (that is, projects not designed with a 50-year life) that provide aquatic habitat benefits or support littoral processes. Fine-grained sediment is more common in the lower Great Lakes, particularly along the southern shore of Lake Erie in Ohio; several projects and plans were reviewed to inform the design concepts for innovative nearshore structures engineered from dredged sediments relocated from nearby navigation channels.

For both conditions (coarser- and finer-grained materials), the specific objectives are to (1) identify and describe existing nearshore engineered and natural and nature-based feature (NNBF) projects that have been designed or built via placement of dredged material and other features, and to (2) identify data gaps, opportunities, and limitations of the projects and approaches. The expected outcome is to identify potential demonstration projects for future implementation and monitoring to document the benefits of different beneficial use methods and alternatives. This report will be shared with dredged material management stakeholders around the Great Lakes, including with USACE Great Lakes Districts (Buffalo [LRB], Chicago [LRC[, and Detroit [LRD]). Personnel from Buffalo and Detroit Districts collaborated with ERDC on this report, and projects from all 3 Great Lakes Districts are showcased in the report.

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