



**US Army Corps
of Engineers**

Cleveland Harbor Green Breakwater: Cleveland, OH



Project Location: The project is located on the inner end of the East Arrowhead Breakwater in Cleveland Harbor, Cleveland, Ohio. The breakwater is directly adjacent to the Cuyahoga River Area of Concern and the Cuyahoga River riparian corridor where regional stakeholders have indicated that aquatic habitat improvements would be beneficial. The breakwater is located on the east side of the main entrance to the harbor, 2000 ft off of the Lake Erie shoreline.

Project Description: This is a pilot project to demonstrate the potential to economically incorporate aquatic habitat features into the O&M repairs of Federal Navigation Structures. O&M repairs of the Cleveland East Arrowhead Breakwater were performed in 2012, 2013, and 2014. Repairs were accomplished by rebuilding 272 linear ft of the upper structure beginning at an elevation about 4 ft below lake level using massive precast concrete block units. This project consists of the incorporation of a variety textures, cavities, shelves, and other physical surface modulations into the design of the concrete block that will be installed below the water surface. This will provide opportunity to support an increase in the abundance and diversity of periphyton, aquatic macrophytes, and macroinvertebrates on the breakwater, and ultimately provide improved spawning, nursery, and foraging habitat for a variety of target local fish species.

Project Authorities: Study, monitoring, and the incremental construction cost of incorporating the habitat features are being done under ERDC Demonstration Project Authority and paid for with EPA funding provided through the Great lakes Restoration Initiative. The larger breakwater repair project is authorized and funded under the Cleveland Harbor O&M authority.

Non-Federal Partner: No cost share sponsor is required for this demonstration project. The project team collaborated with the Ohio EPA in selecting the habitat features that were incorporated into the blocks.

EWN Application: In the past, breakwater repairs were constructed with featureless concrete block which provided little in the way of aquatic habitat. The demonstration project will document the cost and effectiveness of incorporating habitat features into the submerged blocks.

ERDC Participation: Anthony Friona helped lead conceptual project development. Study design and preparation of technical publications are being performed by Thomas Fredette and Burton Suedel.

Project Status: Construction is complete. Monitoring, data analysis, and publication of results are ongoing.



Estimated Project Costs	
Federal	\$50,000
Non-Federal	\$0
Total	\$50,000

Project Milestones	
Purchase Habitat Block	FEB 2012 (A)
Start Construction	MAY 2012(A)
Complete Construction	JUN 2014(A)

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