



Fact Sheet

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Monitoring Study of Aguadilla Harbor, Puerto Rico

Purpose: To describe monitoring activates being conducted at Aguadilla Harbor, Aguadilla, Puerto Rico, as part of the Corps of Engineers' Monitoring Completed Navigation Projects (MCNP) Program.

Background: Since its construction in 1995, the Aguadilla small boat harbor, located on the northwest coast of Puerto Rico, has suffered from shoaling by littoral sediment moving through the more porous sections of the breakwater and around the southern tip of the structure. In essence the harbor is trapping sediment during storm events. The City of Aguadilla does not have the resources necessary to keep the harbor free of sediment through regular dredging. In 2001 the Coastal and Hydraulics Laboratory began a four-year monitoring program to assess the performance and functionality of the harbor and breakwater project relative to its design goals.



Facts: The original monitoring plan included components to examine sand transport through the porous breakwater into the harbor, but throughout the time period of monitoring, the harbor has been substantially shoaled making this task unfeasible. The four remaining monitoring tasks are the following: (1) investigate the physical mechanisms that result in harbor shoaling; (2) determine the local sediment pathways that are active during storms; (3) confirm the structural stability of the breakwater; and (4) assess whether southward moving littoral sediment continues to be impounded by the breakwater. The monitoring plan includes several activities that contribute to one or more of the above monitoring tasks. Aerial shoreline photography was obtained simultaneously with detailed bathymetry acquired by the SHOALS airborne lidar bathymeter. Directional wave data were acquired offshore of the breakwater by a bottom-mounted, internally-recording wave gauge. A geophysical survey of the region offshore of the harbor provided maps showing composition of the bottom (rock or sand) and depth of sand deposits. Over 250 sand samples collected over a grid offshore of the breakwater were used to develop likely sediment pathways based on the Sediment Trend Analysis® technique. The abundance of beach-sized sand observed offshore, combined with projected sediment pathways indicates that much of the sand shoaling the harbor comes from offshore. Previously acquired beach profiles were analyzed along with profiles acquired during the monitoring to assess changes that have occurred north of the breakwater. Finally, breakwater structural integrity was assessed using traditional survey techniques augmented by diver visual inspection of the seaward breakwater toe. Monitoring will conclude in 2004 with production of the final monitoring report.

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