



**US Army Corps
of Engineers®**
Engineer Research and
Development Center

National Erosion Control Development and Demonstration Program (Section 227)

Chesapeake Bay Breakwaters

Background

This project has identified 37 nearshore segmented breakwater study sites, located along the Maryland and Virginia shorelines of the Chesapeake Bay. The long-term goal of this demonstration project is to document breakwater system performance around the Chesapeake Bay, develop an index/database of existing site data, monitor select sites, and using this data, develop design guidelines for future use of nearshore, segmented breakwaters in cohesive, sand-limited, and fetch-limited systems (i.e., estuaries, reservoirs, lakes, and bays).

Problem

The use of breakwaters for shore protection in the Chesapeake Bay has increased over the past 15 years. The primary goal of these breakwater systems is long-term erosion control. As these sites age and go through more storms, they appear to become more resilient. Pocket beaches form and provide shore protection during storm events. Often, beach fills, wetland planting, and habitat enhancement accompany and enhance these breakwater system projects. As a method of evaluating these systems, the beach morphology and how it evolved is a prime research interest. Yet, many of the sites have received little or no monitoring, assessment or evaluation. Although design guidance has been developed for open coast breakwater application, its applicability to the short-fetched, shallow-water environments of the Chesapeake Bay and similar estuaries has not been established.



**Willoughby Spit, southern shore of Chesapeake Bay,
Norfolk, Virginia**

Status

This project has completed the monitoring stage and an ACCESS database has been developed. The final year of monitoring data is being evaluated and entered in to the database. One additional year is planned for data analysis and the development of design guidance. Out years may include workshops and database sharing. The database has been created for 37 breakwater sites in the Chesapeake Bay. Post-construction data collected for the breakwater and surrounding area include elevations surveys, vegetation surveys, hydrodynamic analysis, and photographs. In Fiscal Year 2003, six sites around the bay were chosen for detailed analysis. These surveys were conducted during the months of August

and September. Shortly after these surveys were completed, Category 2 Hurricane Isabel hit the area on September 19. Post-hurricane surveys were immediately conducted at four of these six sites, and the data sets were included in the database. Analysis of these data sets indicates the breakwaters provided significant protection to land in the lee of the breakwaters and that the structures experienced little or no damaged. Additionally, the sand introduced to the sediment budget as a result of the storm cutting into the banks of adjacent unprotected properties may have enhanced the breakwater systems by accelerating the equilibrium beach building process. Other types of structures and in the area and the shores they protected sustained much greater damage than the sites in this study. Surveys were conducted in the August and September of 2004 on six different sites and information is being analyzed and entered into the database.

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Available Documentation Watch the Web site for upcoming publication information on the Hurricane Isabel Report.

Program Authorization Water Resources and Development Act of 1996 (Public Law 104-303, 110 Stat. 3658) dated October 12, 1996.

Additional information can be found at <http://chl.ercd.usace.army.mil/section227>.