



Fact Sheet

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Monitoring of Entrance Channel Navigation Improvements at Morro Bay Harbor, California

Purpose: To determine if nonstructural modifications at the harbor entrance are performing as predicted (relative to wave conditions and sedimentation) and validate physical and numerical models used as design tools to develop these modifications.

Background: Morro Bay Harbor is located on the central coast of California about midway between Los Angeles and San Francisco. It is protected from the effects of the open ocean by two rubble-mound breakwaters, an inner harbor groin, and a stone revetment. Prior to the latest channel improvements, the harbor was known as one of the most dangerous in the United States because of steep and breaking waves in the entrance. Improvements in 1995 consisted of a deepened, expanded entrance channel, and a sand trap within the harbor entrance structures. Modifications were expected to allow passage of most larger waves through the entrance into the harbor without steeping and/or breaking, and creating hazardous navigation conditions.



Structural alternatives at the site lacked economic justification. To optimize project design performance, numerical and physical model investigations as well as a limited field investigation were conducted at the harbor entrance. Both hydrodynamic and sedimentation conditions were studied.

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Facts: As part of the Monitoring Completed Navigation Projects program of the Headquarters, U.S. Corps of Engineers, the Morro Bay Harbor entrance was monitored to determine if nonstructural modifications at the harbor entrance were performing as predicted. Evaluation of hydrodynamic conditions and sedimentation rates in the entrance as well as validation of models used as design tools were performed. Wave data (both inside and outside the entrance), tidal elevations and currents, and bathymetry surveys were obtained to determine design effectiveness of the harbor entrance alternative. Limited ground surveys and photogrammetric surveys were obtained for the south breakwater to determine if any detrimental impacts had occurred as a result of the dredging operations. It was concluded that improvements constructed at the harbor entrance resulted in improved navigation conditions and had no negative impact on the existing structures. It was also determined that model investigations used in the design of the project accurately quantified wave conditions and correctly defined sediment patterns and deposition areas. Data results may be used to study similar problems at other site-specific locations as well as for research and development studies.

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