



Description

The SPN will develop a comprehensive physical and ecological monitoring program to document shoreline morphology before, during, and after the construction of a backshore sand dune in front of an eroding coastal bluff adjacent to an SPN-constructed breakwater. An integral part of the monitoring program will be the use of the Coastal Modeling System model developed during a Continuing Authorities Program Section 111

feasibility study of the effect of that breakwater on the adjacent bluff and beach. The results will both meet requirements of permitting agencies and gather additional data that could be used in designing ongoing opportunistic beach nourishment programs throughout the region. Such programs will be valuable when federal, state, and communities develop regional sediment management projects on the central California coast, an area under the jurisdiction of the Monterey Bay National Marine Sanctuary.



Issue/Challenge To Address

Pillar Point Harbor occupies the northern end of Half Moon Bay, an arcuate, open-coast embayment that is approximately 25 miles south of San Francisco, CA. As built, the Pillar Point Harbor project consists of two rubble-mound breakwaters. Construction of the East Breakwater – April 1959 to June 1961 – disrupted the equilibrium wave pattern and focused wave energy at the beach and coastal bluff south of the breakwater. After breakwater construction, the rate of bluff retreat rapidly increased from ~3 inches per year to ~80 inches per year, resulting in a county road being destroyed, an arterial state highway being threatened, and notable harbor shoaling occurring adjacent to the East Breakwater. To mitigate for the loss of beach, bluff retreat, and harbor shoaling, the Section 111 Project Delivery Team’s preferred alternative was a one-time dredging of approximately 140,000 to 150,000 yd³ of shoaled sand and placing that sand in front of a 3,100-foot long section of the bluff south of the East Breakwater. Although federal action was not justified because of a lack of benefits, the San Mateo County Harbor District plans to construct a scaled-down alternative (the Surfer’s Beach Sand Replenishment Pilot Project) using 75,000 yd³.

The eastern end of Pillar Point Harbor showing accretion on the harbor side of the East Breakwater and the proposed placement site along the eroding coastal bluff.

A major challenge to construction is that the Monterey Bay National Marine Sanctuary Rules and Regulations make it difficult to practice regional sediment management along a 276-mile stretch of the Central California Coast that includes Pillar Point Harbor. In essence, the Sanctuary prohibits the placement of dredged material within its boundaries regardless of its appropriateness for beneficial use. Because of increasing concerns by the State of California, the Coastal Sediment



Monitoring of Sand Placement near Pillar Point Harbor, Half
Moon Bay, CA

Management Workgroup, and local jurisdictions that Sanctuary policy greatly impedes effective coastal zone management, the Sanctuary has agreed to allow the project to move forward as a pilot study. One Sanctuary stipulation, however, is that a monitoring program be implemented to determine whether the beneficial impacts of sand placement warrant a change in its rules and regulations.

**Successes
Lessons Learned**

Lessons learned will be compiled during this study.

Expected Products

- Monitoring-Plan Development
- Refinement of an existing Coastal Modeling System Grid
- Final Report and Presentation

Stakeholders/Users

Stakeholders include the San Mateo County Harbor District, Monterey Bay National Marine Sanctuary, local jurisdictions along the Half Moon Bay coast.

**Projected Benefits
Value Added**

This project will have a major positive impact on the SPN navigation program if the results are such that the Monterey Bay National Marine Sanctuary permits the beneficial use of dredged sand within its waters. For example, the sanctuary includes all of Monterey Bay and abuts four harbors with an SPN presence – Pillar Point, Santa Cruz, Moss Landing, and Monterey – meaning that the sanctuary prohibition limits beneficial-use opportunities for sand dredged from those harbors. The re-evaluation of the Sanctuary’s restrictions should provide opportunities for good RSM practices including nearshore and beach sand placement to address the considerable challenges with shoreline erosion along the Sanctuary’s 276-mile shoreline.

Leveraging Opportunities

This project represents a key early step in the Surfer’s Beach Sand Replenishment Pilot Project, which will utilize a recently awarded \$800,000 grant from the State of California Division of Boating and Waterways (DBW) for design, construction, and long-term monitoring of the placed sand. The San Mateo County Harbor District received a notification of award of the grant on June 29, 2017 and is now in its design phase.

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Participating Partners

San Mateo County Harbor District, US Geological Survey, Monterey Bay National Marine Sanctuary