



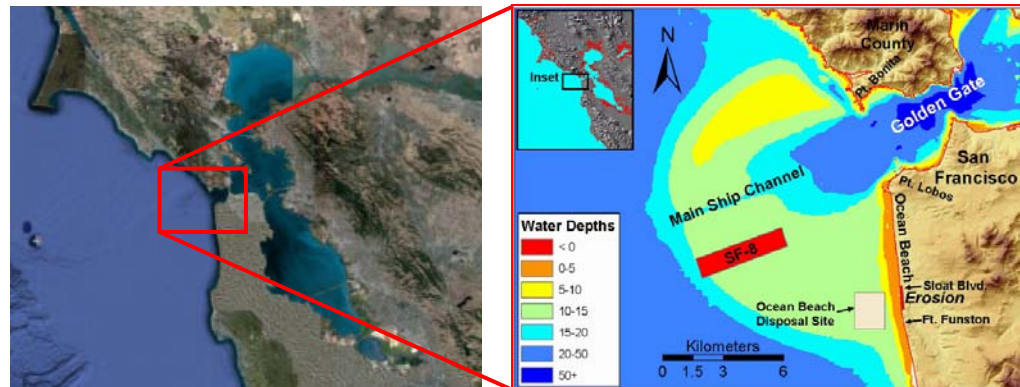
Regional Sediment Management Program

Sediment Transport Model Development and Application for Ocean Beach and San Francisco Bight, CA



Description

Ocean Beach is located on the coast of San Francisco, California, to the south of the Golden Gate, and in the shadow of the San Francisco Ebb Tidal Delta. The study reach, located adjacent to the southern-most lobe of the Ebb Tidal Delta, has been classified as an erosion hotspot threatening coastal infrastructure such as the Great Highway. Regional Sediment Management (RSM) activities have been initiated to develop a calibrated sediment transport model capable of handling the unique coastal, estuarine, and tidal processes that contribute to sediment transport in the study area. The Coastal Modeling System (CMS) is being utilized through the Surface-water Modeling System (SMS) interface to capture the physics of the erosion hotspot. The study will provide an advanced and practical in-house sediment transport modeling technology. The model application to the west coast littoral cells will be available after successful model development, calibration and validation at Ocean Beach.



Location map

Issue/Challenges

Sediment transport at Ocean Beach is complex in nature, accented by high energy waves and human perturbation. Significant human-induced changes include construction of the Upper Great Highway along the Pacific coast, related shore armoring and placement of sediment on the beaches and dunes, dredged material management practices, and possibly dredging to define and maintain the main navigation channel through the San Francisco Delta. Constriction of the Delta, possibly due to reduction in both sediment supply from the Sierras and tidal prism in the San Francisco Bay, has resulted in new wave focusing patterns to and periodic erosion of Ocean Beach over the past few decades, which is threatening the structural integrity of the adjacent highway and ocean outfall pipe. This investigation will further the understanding of the complex coastal processes and extensive erosion along the shoreline, and promote the development of long-term strategies for regional sediment management. In addition, this effort will address a need expressed by USACE engineers and scientists to have a reliable, advanced and practical in-house sediment transport model.



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Expected Products

- Updated 3-D CMS for offshore berm placement and beach nourishment
- Shoreline change and swash zone process formulation and implementation in 3-D CMS
- Technical Note for 3-D CMS applications in onshore transport and beach nourishment
- Conference paper and presentation for Ocean Beach regional sediment budget and long-term prediction
- Quarterly Report for the project progress
- Final Report for project findings and information gained through 3-yr effort for recommended action optimizing use of sediments
- Updated 3-D model technology transferred to US Army Engineers San Francisco District (SPN) and South Pacific Division (SPD) with training

Potential Users

This system will be used by USACE engineers and scientists on the west coast, including the South Pacific Division and San Francisco, Seattle, and Portland Districts, as well as to other local and national agencies.

Projected Benefits

The final product, the operational model, will be used in an effort to support and improve decision making for the RSM, enhance cross-mission benefits and ultimately reduce the project life-cycle costs.

Leveraging Opportunities

Opportunities with City of San Francisco and State of California to address needed action to reduce coastal erosion and create plans for regional sediment management.

Points of Contact

USACE MSC RSM Representative: George W. Domurat, Programs Support Division, SPD, phone: 415-503-6575, e-mail: George.W.Domurat@usace.army.mil

Participating Partners

Principal Investigator: Lihwa Lin, ERDC-Coastal and Hydraulic Laboratory; Phone: 601-634-2704; email: Lihwa.Lin@usace.army.mil

Co-Principal Investigator: Honghai Li, ERDC-Coastal and Hydraulic Laboratory; Phone: 601-634-2840; email: Honghai.Li@usace.army.mil

SPN

Technical Lead: Frank Wu, Water Resources Division, San Francisco District; Phone: 415-503-6902; email: Frank.Wu@usace.army.mil

Lisa C. Andes, Water Resources Division, San Francisco District; Phone: 415-503-6810; email: Lisa.C.Andes@usace.army.mil

James G. Zoulas, Civil Works Technical Branch, Engineering and Construction Division, San Francisco District ; Phone: 415-503-6923; email James.G.Zoulas@usace.army.mil