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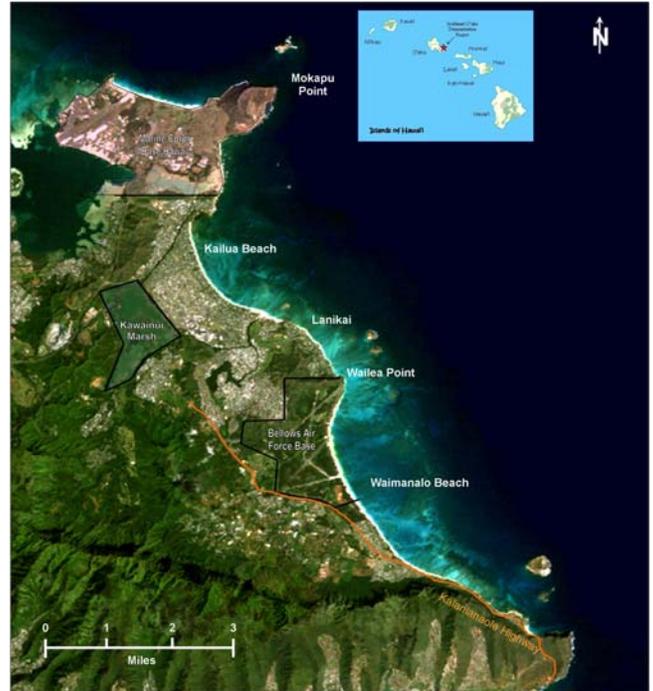
Southeast Oahu Regional Sediment Management

Description

CHL, in support of the Honolulu District (POH), is developing a nearshore circulation model for southeast Oahu and providing user training. This will enable POH to analyze the impact of long-term variations of atmospheric forcing on nearshore circulation and sediment transport within the Southeast Oahu study area. Of specific interest is the decadal variation of prevailing trade wind direction.

Issue

The circulation and sediment transport along Kailua and Waimanalo Bays has led to erosion at Lanikai Beach and Bellows Air Force Station, excess sediment at Ka'elepulu Stream, and erosion threatening a portion of Kalaniana'ole Highway. The modeling tools developed can be applied to evaluate alternative courses of action to alleviate these issues.



Products

1. A calibrated nearshore circulation modeling suite for southeast Oahu including grids, model input files, and documentation of methodologies and procedures. The model was calibrated to field measurements of wave, water levels and currents collected in August and September 2005. 2. Training and consultation in simulation execution and analysis of results will also be provided.

Supporting Technology

ADCIRC, a two-dimensional depth-integrated hydrodynamic model, predicts the water surface elevation and current distribution resulting from the prevailing trade winds and waves. STWAVE is a spectral wave transformation model capable of representing wave-current interaction and wave transformation over coral reefs. The Hydrodynamic Steering Module of the Surface-water Modeling System (SMS) allows ADCIRC and STWAVE models to share information, so that the combined effects of waves and currents are simulated.

Benefits

Provides POH the capability (a modeling system) to evaluate alternatives for alleviating sediment management issues. Provides hydrodynamic inputs for future modeling of sediment transport and long-term sediment budgets.

Sponsors

This project is sponsored by the US Army Engineer District, Honolulu through the Regional Sediment Management Demonstration Program.

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