



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

## ***National Erosion Control Development and Demonstration Program (Section 227)***

# **Sacred Falls Park, Hauula, Hawaii**

### **Description**

Sacred Falls Beach Park, Hauula is located at the south end of Makao Beach on the north-east side of the island of Oahu, Hawaii. The project site is an approximate 113-m (370-ft) reach of undeveloped shoreline. Seawall-protected private residences bound the small publicly accessible beach at both ends. The narrow beach becomes inundated at high tide, and the low-elevation coastal road that services the area is poorly protected with randomly placed boulders and waste concrete piles. In the nearshore, a wide fringing coral reef extends along the coast, with 3.7-m (12-ft) water depth located approximately 750 m (2,500 ft) offshore. The shallow reef has a mean depth of approximately 1 m (3-4 ft) at mean low water (mlw), and is composed of a mixture of coral rubble, sand, and scattered reef blocks over a seabed of hard limestone substrata.



**Shoreline recession along beach**

The Sacred Falls project site is directly exposed to the prevailing trade winds that predominate from April to September. The large winter north swell refracts and diffracts around the island and impacts the project site. Coupled with high winter tides, the shoreline and adjacent coastal highway are occasionally inundated. Tropical storms and hurricanes periodically impact the Hawaiian shores. While these storms produce large surf, the extensive fringing reef at the project site produces a depth-limited breaking wave condition that expends most of the wave energy before impacting the shoreline. However, numerous shore protection structures, many of which show signs of deterioration both north and south of the project site, attest to pervasive yet manageable rates of erosion. The tides are semidiurnal with a mean tide range of 0.6 m (2 ft).

### **Issue**

Continual, yet manageable, erosion of the beach at Sacred Falls Beach Park has reduced beach width to a point that it is almost totally submerged during high tide. Some deterioration of the coast highway is evident. Recreational use of this tourist destination is minimal due to lack of beach width. Shoreline recession must be abated.

### **Technology**

Project design will include at least one pair of low profile breakwaters/groins to abate erosion and retain placed fill material, but may also include other structures. The breakwaters/groins will be designed to allow sufficient sediment to pass over, or around

the feature to maintain the pre-project littoral supply to adjacent beaches. They will also be designed to allow for installation utilizing only manpower and small equipment. The breakwaters/groins and any other structures need to be unobtrusive and cannot interfere with the public's use of the beach. The goal of the system is not to advance the existing shoreline seaward of the adjacent shores, but to stabilize the shore and dune line and retain a placed beach-fill volume.

**Status** The Special Broad Agency Announcement (BAA) for design of the project was awarded in FY 04. Phase 1 of the BAA will be completed by April 2005. Model testing is scheduled to be completed in July 2005.

**Time Line** Concept designs will be physically modeled and final configuration selected by the end of FY05.

**Points of Contact** Stanley J. Boc, CEERD-HF-FF, Fort Shafter, HI 96858-5440; phone, (808) 438-9526; e-mail, [Stanley.J.Boc@erdc.usace.army.mil](mailto:Stanley.J.Boc@erdc.usace.army.mil)

Thomas D. Smith, CEPOH-EC-T, Fort Shafter, HI 96858-5440; phone, (808) 438-0581; e-mail, [Thomas.D.Smith@poh01.usace.army.mil](mailto:Thomas.D.Smith@poh01.usace.army.mil)

**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.erdc.usace.army.mil/section227>.