

Diamond Head, Oahu, Hawaii

AREA DESCRIPTION

Kaalawai, Kuilei Cliffs, Diamond Head, Leahi, and Makalei Beaches are located on the south shore of Oahu at the base of Diamond Head Crater.

Waves are typically small (< 1 ft) along most portions of this shoreline. A shallow fringing reef provides shelter from southern hemisphere swells and tradewind swells, which commonly affect this side of the island.

The shoreline at Kaalawai and Kuilei Cliffs (transects 1-59) is experiencing insignificant erosion at an average rate of -0.02 ± 0.04 ft/yr. The beach between Diamond Head Beach Park and Makalei Beach Park (transects 61-97) is eroding at -0.09 ± 0.07 ft/yr. The beach on the west side of Makalei Beach Park (transects 98-107) is eroding at 0.30 ± 0.18 ft/yr averaged along its length. The beach at transects 103-107 was lost to erosion between 1988 and 2005.

Hwang (1981) found no net change at Kaalawai Beach, net accretion at the eastern end of Kuilei Cliffs Beach, and net erosion at the western end of Kuilei Cliffs Beach for the years 1949-1975. Sea Engineering (1988) found erosion at all beaches in the study area, except Kaalawai from 1975-1988.

For more information see: <http://www.soest.hawaii.edu/asp/coasts/oahu/index.asp>

Hwang, D. (1981), "Beach changes on Oahu as revealed by aerial photographs," State of Hawaii, Department of Planning and Economic Development.

Sea Engineering, Inc. (1988), "Oahu shoreline study," City and County of Honolulu, Department of Land Utilization

SHORELINE CHANGE RATES

- █ Accretion Rate
- █ Erosion Rate

Historical shoreline positions are measured every 66 ft along the shoreline. These sites are denoted by yellow shore-perpendicular transects. Changes in the position of the shorelines through time are used to calculate shoreline change rates (ft/yr) at each transect location.

Annual shoreline change rates are shown on the shore-parallel graph. Red bars on the graph indicate a trend of beach erosion, while blue bars indicate a trend of accretion. Approximately every fifth transect and bar of the graph is numbered. Where necessary, transects have been purposely deleted to maintain consistent along-shore spacing. As a result transect numbering is not consecutive everywhere.

The EX method is used to calculate shoreline change rates for the study area. The rates are smoothed along shore using a 1-3-5-3-1 technique to normalize rate differences on adjacent transects. For more information on erosion rate methods and results see: <http://www.soest.hawaii.edu/asp/coasts/oahu/index.asp>

HISTORICAL SHORELINES

- █ 1927
- █ Feb 1949
- █ Dec 1957
- █ Nov 1970
- █ Jan 1971
- █ Mar 1975
- █ Feb 1988
- █ Dec 2005

- █ Erosion rate measurement locations (shore-normal transects)

Historical beach positions, color coded by year, are determined using orthorectified and georeferenced aerial photographs and National Ocean Survey (NOS) topographic survey charts. The low water mark is used as the historical shoreline, or shoreline change reference feature (SCRF).

Movement of the SCRF along shore-normal transects (spaced every 66 ft) is used to calculate erosion rates.



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UTM coordinates: 825500mE, 1974920mW
 Latitude/Longitude coordinates

