# MĀʻILI BEACH DESCRIPTION

Māʻili (transects 0 - 140) is located on the west coast of Oʻahu. The shoreline is composed of carbonate sand and limestone rock. The area is exposed to southerly swells in summer months, northerly swells in winter months and southerly waves from winter Kona storms.

Māʻili Point (transects 0 - 34) is eroding at a rate of -0.1 ft/yr, averaged along its length. The northern half of the point (transects 0 -19) has remained approximately stable since 1928, likely due to protection from the shallow reef offshore and limestone outcrops along the shoreline. The southern half of the point (transects 20 – 40), with less protection from the reef, has experienced erosion up to -0.5 ft/yr. Widening of the Māʻili Channel mouth in the early 1960's has also contributed to erosion on the north side of the point.

The shoreline at Māʻili Beach (transects 36 - 140) is highly variable with outcrops of limestone intermittently buried and exposed along the shore by shifting sand. The shallow fringing reef disappears north of Māʻili Point and waves typically break directly on the shore. Beach surveys at the north end of Māʻili Beach show that the shoreline is highly variable due to changes in seasonal wave directions. The shoreline in the north typically erodes 60 feet landward in winter and recovers in summer.

Removal of beach sand by mining operations at Māʻili Beach has resulted in a landward shift of the shoreline of over 300 feet in some areas over the last century. Mining operations are visible in air photos from 1949 and 1967. The effect of sand mining is apparent in the landward shift of historical shorelines from 1928 to 1949. Sand mining also contributes to the high long-term erosion rates calculated for Māʻili Beach (-1.2 ft/yr) averaged along the length of the beach and up to -3.4 ft/yr in the north of the beach. Inspection of the time series of shoreline positions indicates that erosion has slowed over the last few decades since mining ceased. Limestone out¬crops exposed by erosion may be helping to stabilize the remaining beach.

Previous studies found seaward movement of the vegetation line in the middle of Māʻili Beach and chronic erosion at either end from 1949 -1988. Results from these studies likely reflected recovery of the shoreline since sand mining operations ceased in the second half of the century and cultivation of the vegetation line along Māʻili Beach Park. The effects of sand mining could not be removed by omitting early shorelines because the shortened time series, in combination with large seasonal beach movements, resulted in unstable shoreline change rates.

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

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

[2] Sea Engineering, Inc. (1988) “Oʻahu shoreline study”, City and County of Honolulu, Department of Land Utilization.

Keywords:

O‘ahu; Mā‘ili Beach; Mā‘ili Point