

MĀKAHA AREA DESCRIPTION

Mākaha (transects 0 -83) is located on the west shore of O'ahu. The shoreline is composed of carbonate sand and limestone and basalt rock. The area is exposed to southerly swells in summer months, northerly swells in winter months, and southerly to westerly waves from Kona storms throughout the year but most often in the winter. Large waves may break on or near the shoreline causing temporary erosion as the deep nearshore reef provides little protection in most areas.

Mauna Lahilahi Beach Park (transects 0 - 25) has eroded at a rate of -0.5 ft/yr since 1910 averaged along the length of the beach. The shoreline east of transect 0 is comprised primarily of an exposed limestone shelf. A stone breakwater and small lagoon were constructed east of the beach park between 1996 and 2006.

The shoreline at Papaoneone (Turtle) Beach (transects 26 - 42) has remained approximately stable since 1910 averaged along the length of the beach (0.0 ft/yr). However, the historical shorelines indicate high seasonal variability. Aerial photographs from 1949 to 1988 were taken in fall or winter months and show little or no beach north of transect 42 (limestone outcrops) and relatively wide beach in the south. Southerly swells in summer months likely push sand to the north of the beach. Northerly swells in winter months likely push sand to the south of the beach. Erosion from high seasonal waves may threaten nearshore structures even though the shoreline remains stable over the long term.

Aki's Beach (transects 44 and 45), a pocket beach in a small opening in the limestone shelf, has remained approximately stable since 1928 (0.0 ft/yr).

Historical shorelines at Mākaha Beach Park (transects 46 -83) indicate a seasonal pattern similar to Papaoneone Beach. Aerial photos taken in summer months (July 1999 and June 2006) show little or no beach in the south (south of transect 46) and relatively wide beach in the north (near transects 60 - 75). Aerial photographs taken in fall and winter months (1949 - 1988) typically show a wider beach in the south and a narrower beach in the north. Beach profile surveys taken in summer and winter at Mākaha Beach since 1994 (near transect 60) show that the middle of the beach is, on average, 40 feet narrower in winter months. Over the long term (since 1910), Mākaha Beach has been stable to slightly erosive (-0.2 ft/yr) averaged along the length of the beach.

Previous studies (Hwang, 1981; Sea Engineering, 1988) found variable erosion and accretion to the vegetation and water line at Mauna Lahilahi Beach Park 1949 -1988. At Papaoneone Beach the previous studies found net seaward movement of the vegetation line in the north and south of the beach but little change in the water line. At Mākaha Beach they found net accretion to the south and net erosion to the north of the vegetation line 1949 - 1988. Hwang (1988) also noted high seasonal variability in the shoreline at Papaoneone and Mākaha Beaches.

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

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

² Sea Engineering, Inc. (1988) "O‘ahu shoreline study", City and County of Honolulu, Department of Land Utilization.

Keywords:

O‘ahu; Mauna Lahilahi Beach Park; Papaoneone (Turtle) Beach; Makaha Beach Park;