

TEMPORAL AND SPATIAL ANALYSIS OF STORM INDUCED
FRESHWATER PLUMES IN SOUTHERN KANEOHE BAY, HAWAI'I

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Abstract

Past research in Kaneohe Bay has shown storm-induced freshwater plumes to be potentially detrimental to the coastal marine ecosystem in terms of drastic salinity reductions, nutrient loading and an introduction of pollutants from urban runoff. Highly episodic rainfall, steep slopes and an increase in urban impervious surfaces are characteristics of the Kaneohe Bay watershed that further exacerbate plume related impacts on the Bay's ecosystem. This study investigated the temporal and spatial evolution of a storm induced freshwater plume in southern Kaneohe Bay in attempt to further understand plume dynamics in this unique embayment system. Salinity profile data gathered from a six-day shipboard survey were compared to wind data gathered from the HIMB weather station and rainfall data from the Luluku rain gage station. South wind averages were correlated to daily measurements of the offshore extent of the plume and a significant relationship was found. The spatial structure of the surface plume is highly influenced by wind forcing in the southern part of Kaneohe Bay.