

**PHYSICAL AND BIOGEOCHEMICAL PROPERTIES OF ENCHANTED LAKE**

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## ABSTRACT

Confronted by important water quality issues in the Ka'elepulu subwatershed region, this project aims to understand more fully the watershed and the water quality problems associated with it. An investigation of the lake's physical and biogeochemical properties was therefore undertaken to examine whether storm runoff is a major nutrient source in the Enchanted Lake estuary and whether the lake is a source or sink of atmospheric CO<sub>2</sub> during the period of this research effort. Some general findings of the project are summarized below.

Enchanted Lake is a small but dynamic estuarine system, and can be classified as a blind estuary (Day 1981a, b). The contemporary water quality issues stem from urban storm runoff bringing excess nutrient loading into an already stagnant body of water inside this closed estuarine basin. Much of the precipitation flushes through the storm drains into the lake rather than percolating down to form groundwater since about 60% of the surface area of Ka'elepulu subwatershed is impervious. During storm events, significant amounts of nutrients and particulate matter enter the lake and result in an increase in organic productivity after storms. At most locations in the lake, the Pco<sub>2</sub> of the surface waters is much higher than atmospheric, indicating that the lake is a source of CO<sub>2</sub> to the atmosphere, probably a result of net heterotrophy of the system. Although storm events, are only a transient phenomena, they should receive increased attention in any attempt to manage the lake's water quality.