

THE USE OF THE STABLE NITROGEN ISOTOPIC COMPOSITION OF
SUSPENDED PARTICULATE MATTER AS A TRACER TO DISTINGUISH THE
EFFECTS OF SEWAGE AND STREAM RUNOFF ON MAMALA BAY

MASTER OF SCIENCE
IN
OCEANOGRAPHY (CHEMICAL)

MAY 1996

By

Deborah E. Schulman

Thesis Committee:

Edward Laws, Chairperson

Brian Popp

Bob Bidigare

ABSTRACT

Recent concern over sewage discharge into Mamala Bay, Oahu, Hawaii prompted an intensive study to identify the major sources of pollutants into the bay and their effects on water quality. Chemical characteristics of the water, including nutrient concentrations, salinities, particulate carbon and nitrogen concentrations and isotopic ratios of ^{15}N to ^{14}N , were used to distinguish between water impacted by sewage, stream runoff, and groundwater seepage. The study elucidated the relative contribution of those sources and the impacts they had at ten locations along the bay using the nitrogen isotopic composition of particulate organic matter. It also demonstrated the utility of using natural abundances of nitrogen isotopes found in suspended particulate organic matter (SPOM) to trace sewage impacts and fates.