

EXPERIMENTAL OBSERVATIONS AND MODELING OF THE
SOUTHERN KĀNE'ŌHE WATERSHED AND BAY: IMPLICATIONS OF
CLIMATE CHANGE ON NUTRIENT EXPORT

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Abstract

Climate change driven impacts on nutrient export of inorganic nitrogen and phosphorous were evaluated in the Southern Kāneʻohe Watershed and Bay, Oahu, Hawaii. Statistical analysis of precipitation, discharge, and suspended sediment and experimental results analyzing nutrient release associated with runoff were synthesized in the formation of a predictive biogeochemical model that analyzed the impacts of climate change on nutrient export. Anticipated changes for the study region were applied as perturbations to the model that analyzed export through the year 2100. These changes include decreasing precipitation, increasing temperature, and rising sea level. Model results suggest that phosphate and nitrate + nitrite export to Southern Kāneʻohe Bay will decrease by 3-13% from year 2015 to 2100, while ammonia export is projected to increase 3-11%. Nutrient limitation or reduction may decrease primary production in the Bay, ultimately limiting its potential for carbon sequestration.