STATISTICAL AND STABILITY ANALYSIS OF ECOSYSTEM DYNAMICS

IN SOUTHERN KANEOHE BAY

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ABSTRACT

A statistical analysis of water quality parameters in the Coastal Intensive Site Network (CISNet) dataset for southern Kaneohe Bay, Hawaii, found poor rank correlations due to phase differences, as well as the relatively long sampling interval of the CISNet program that made it difficult to detect nutrient cycling processes in the dataset. The results of the statistical tests are summarized in a 'pennants diagram.' To understand more fully ecosystem dynamics in southern Kaneohe Bay, the Kaneohe Bay ECOsystem Model (KECOM) was developed. This model is a nine-compartment nitrogen cycle biogeochemical box model that reproduced the trends of changes in water quality parameters in response to a storm perturbation. Moderate damping of the perturbation suggests that the bay is probably never at steady state in nature. The stability analysis of KECOM using a community matrix approach indicates that the instability of the benthic autotrophic biomass is caused by low fish grazing and/or high nutrient uptake due to high irradiance.