# VARIABILITY IN SUSPENDED SOLIDS MEASURED AT THE KILO NALU OBSERVATORY, OAHU

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**Abstract**

Variability in suspended solids may have significant impacts both economically and ecologically on the south shore of Oahu, yet the forcing mechanisms behind this variability are poorly understood. This study examined the temporal and spatial variability of echo amplitude, a proxy for suspended solids, and the relationship between various forcing mechanisms and echo amplitude response. A 1200 kHz ADCP, along with other instrumentation incorporated into the Kilo Nalu cabled observatory was utilized to collect data on both the physical environment and suspended solid conditions. Data were examined using EOF analysis, correlation and regression analysis, and spectral analysis, as well as qualitative graphical evaluation. Analytical modeling of the physical environment necessary for suspension demonstrated that the particles measured by the ADCP were likely organic in nature, not purely carbonate sands. To first order, swells have the greatest effect on suspended solids with correlation coefficient values between swell height and depth-averaged echo amplitude greater than 0.9. Observations suggest that nonlinear interactions between forcing mechanisms are influential and difficult to quantify using correlation/regression analysis and spectral methods.