

## **LAMINATED SEASONAL AUTHIGENIC SEDIMENTATION AND CLIMATE HISTORY WITHIN IN A BRACKISH COASTAL HAWAIIAN POND**

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Ordy Pond is a 5m deep, closed basin on the leeward coastal plain of Oahu, Hawaii, containing a 9000-year record of authigenic aquatic sedimentation. Alternations of inorganic carbonate-, diatomaceous-, and organic-rich sediment laminae reflect past variations in water column chemistry. Thus, these sediments contain a history of local land character and climate, perhaps including ENSO and Pacific Decadal Oscillation events.

The pond is highly eutrophic, nearly entirely anoxic, and is dominated by both microbial sulfate reduction and methanogenesis. Preliminary time series analyses of the water chemistry indicate that, While the pond is consistently oversaturated with respect to calcium Carbonate ( $IAP/K = \sim 15x$ ), inorganic precipitation from the water Column is seasonal. Profiles of dissolved calcium, magnesium, and carbon indicate calcium carbonate precipitates in the warmer summer months.

Modern water chemistry and authigenic sediment production are consistent with the geochemistry of the sediment record. Throughout the sediment record, sulfur/organic carbon ratios indicate that the pond has been consistently anoxic over time. Stable isotopic data indicate that historic carbonate mineral precipitation has consistently been promoted by organic matter oxidation and enhanced during evaporatively warm climate periods. The alternation of carbonate mineralogy between aragonite and calcite intervals appear to correspond to such global climatic events as the mid-Holocene sea level highstand, the Medieval warm period, and the Little Ice Age. Using digitized images of the sediment cores, spectral analysis of laminae color and frequency should help reveal the historic strength, duration, and frequency of such climate phenomena in the northern equatorial Pacific.