

THE ROLE OF SUSPENDED PARTICLE LAYERS IN THE BIOGEOCHEMISTRY
OF MONTEREY BAY, CALIFORNIA

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Abstract

Recent evidence suggests that suspended particles may act as anoxic or suboxic (low dissolved molecular oxygen) microzones in oxygenated seawater. In March 2002, the remotely operated vehicle *Ventana* was used to study layers of such suspended particles in Monterey Bay, California. This new method of water column sampling allowed for water collection with minimal disturbance, yielding detailed chemical analyses of the layers and the surrounding seawater. Although elevated levels of methane were discovered in the water column, they did not correlate with particle concentrations. In addition, it appears that, with the exclusion of 5 extraneous points, concentrations of dissolved silica, alkalinity, nitrogen, phosphorus, methane, oxygen, and N₂O showed large changes independent of particle concentration. Comparison of Monterey Bay nutrient data to Pacific open-ocean data indicates possible depletion of particulate C by the time sampled depths in Monterey are reached, thereby limiting the role particles play in the waters. Although this appears to refute the hypothesis that suspended particle layers play an active role in controlling the bulk water column chemistry of the bay, small-scale perturbations may be present but just not discernable from the sampling scale and depths of this research. In September 2001 similar research was done that included methane stable carbon isotope data, indicating future study of this system should include a more detailed look at small-scale changes at, above, and below individual particle layers in addition to mineral analysis of the particles, and methane and N₂O stable isotope data.