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The Chemistry and Bioaccumulation of Copper and Other Heavy Metals by Phytoplankton in the Water Column of San Diego Harbor and their Relationship to Ecological Assessment and Water Quality

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LONG-TERM GOAL

My long term goal is to determine the ecological importance of specific toxic metals (copper and zinc) in harbors, through an understanding of their chemistry and biological effects at the base of marine food chains. The major focus is on obtaining quantitative answers to research questions in this area, to establish what concentrations of these elements are acceptable when they are derived from anthropogenic sources.

OBJECTIVES

The specific objective is to determine the relationship between heavy metal chemistry and the accumulation of these metals in living cells. Such accumulation influences the toxicity of these metals to small grazers, which are the basis of EPA regulatory criteria and toxicity testing which EPA requires of many navy facilities.

APPROACH

The approach is to combine our traditional speciation methodologies (electrochemical and in situ probes) with measurements of metals I phytoplankton biomass using flow cytometry. Also, given the right student, we would like to explore molecular biological probes for metal uptake, in collaboration with Brian Palenik at Scripps.

WORK COMPLETED

No work has been performed on the project because we were unable to recruit a student in 1997. However, the project is now supporting an excellent student, who is well qualified and interested in an applied environmental thesis topic.

RESULTS

None