

**Proposal for Cleanup and Abatement Account
San Diego Regional Water Quality Control Board
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**Sediment Contamination and Eutrophication in Coastal Wetlands
in the San Diego region
March 13, 2008**

Introduction

Toxic pollutants and nutrients are introduced into coastal wetlands through wet and dry weather runoff from developed watersheds, municipal and industrial wastewater treatment plants, atmospheric deposition, and from the nearshore environment through tides. These pollutants can negatively affect the biological communities in the coastal wetlands. Coastal wetlands serve as buffers between land and ocean, and are important habitats for wildlife and fish. A limited dataset from a regional assessment in 2003 (Bight '03) shows that out of all marine habitats, most of the sediment contamination was found in embayment areas. There is also indication that eutrophication (increased primary production) is a major problem in coastal wetlands in Southern California according to the NOAA's National Estuarine Eutrophication Assessment Report. Almost no data are available on the eutrophication of coastal wetlands in Southern California.

Based on these results, a special wetlands group was formed for the regional assessment in 2008 (Bight '08) to address eutrophication and sediment contamination in the coastal wetlands in the Southern California Bight with special focus in the San Diego region.

The results of this study can be used in different ways to clean up and abate sources of pollutants to coastal wetlands:

1. Identify the coastal wetlands that are possibly impacted.
2. Identify the severity of the possible impacts.
3. Identify which pollutants that are causing the possible impacts.
4. Identify the sources that are causing the possible impacts (water column versus sediment pollutants).
5. Develop tools to most effectively clean up and abate the sources.
 - a. Dose-Response Curves, and Numeric Models:
Based on data of this study, dose-response-curves and numeric models can be developed for toxic pollutants and nutrients and for different types of coastal wetlands. These dose-response-curves and numeric models can then accurately describe the load reductions that are needed for protecting the beneficial uses.
 - b. Nutrient Numeric Endpoints
The results will provide a regional assessment of eutrophication across different coastal wetland types. The State Water Resources Control Board is currently developing numeric endpoints for the effects of nutrient

overenrichment in estuaries. This ambient survey will provide key data that are needed to develop scientifically-supported criteria and tools to link these criteria to targeted nutrient load allocations. Thus these data provide the scientific foundation for the clean up and abatement of nutrient sources to estuaries.

c. Sediment Quality Objectives for Coastal Wetlands

In addition, data from this study will contribute to the development of sediment quality objectives for coastal wetlands. Currently, sediment quality objectives are only available for coastal embayments. Sediment quality objectives are needed for coastal wetlands to better assess these ecosystems, and eventually abate sources of pollution if systems are impaired.

Sampling Design

The proposed study will sample the following estuarine classes in the San Diego region: (1) protected embayments and harbors; (2) perennially tidal lagoons; (3) seasonally tidal lagoons; and (4) nontidal lagoons.

Sediment contamination will be assessed using a triad of indicators as prescribed in the State's recently adopted Sediment Quality Objectives. The triad approach includes measurement of sediment chemistry (for presence of potentially toxic pollutants), sediment toxicity (as a direct effect of sediment contamination on biological communities), and benthic infauna (as the third leg of the triad because they are sensitive to chemical contamination of the sediments and integrate over time). Increased nutrient loads from the watersheds can affect the growth of primary producers in estuaries. An increased biomass of primary producers can then lead to low oxygen levels which in turn can affect the biological communities. Therefore, eutrophication will be assessed through the following indicators: (1) sediment nutrients; (2) primary producers (phytoplankton, harmful algal blooms, macroalgae, and submerged aquatic vegetation); (3) dissolved oxygen, and (4) harmful algal bloom toxins such as domoic acid and microcystin.

Budget and Current Funding

The San Diego Regional Water Quality Control Board is asking for \$ 525,000 from Clean Up and Abatement (CAA) Funds to fund part of this study. We are planning to spend \$ 215,000 for the sediment contamination study of this project, and \$ 310,000 for the eutrophication study of this project. There are 22 coastal wetlands in the San Diego region. For the sediment contamination study, the costs are approximately \$ 8,500 per site. For the eutrophication study, the cost per site is approximately \$ 30,000. These cost estimates include field sampling, and analyses. With CAA funds, we would be able to cover most of the sampling and analyses costs for the proposed project. Additional money for the proposed project will be covered under existing grants awarded to SCCWRP, contributions from existing monitoring programs and resources from the San Diego County Stormwater Copermittees.