

Progress Report

Title of the project: Magnitude and extension of copper pollution effects on benthic faunal communities in San Diego Bay

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Progress report on activity from June 16, 2008 to Sept 16, 2008

Summary of the whole activity

Main results

Basically this period has been focused on the determination of copper concentration in water samples collected on June 10, 2008 and on evaluation of sediment properties. From the collected water samples (surface, bottom and porewater), an aliquot was separated (5-10 ml) unfiltered to measure ionic copper (Cu^{++}) as pCu with an ion selective electrode (ISE). The pCu unit is a measure of the activity of the $\text{Cu}(\text{II})$ ion and is defined as the negative log of the Cu^{++} ion concentration ($\text{pCu} = -\log_{10} [\text{Cu}^{++}]$). The remaining water samples were filtered and acidified to further determine concentration of total dissolved copper (DCu).

A fraction of the sediment was used for grain size analysis (mud/sand content) and determination of total organic matter. An additional fraction was freeze-dried and homogenized for copper in sediment (solid phase). Sediment collected for pigments were weighed wet, freeze-dried and reweighed prior to determination of chlorophyll and phaeopigments.

Additional surface and bottom water samples were collected in selected sites for measuring the complexation capacity (CuCC) of the system. Cu-binding ligands can be released by microalgae into seawater, and when the sequestering capacity of these ligands is exceeded, Cu can exert acute toxic effects. In coastal areas, high concentrations of CuCC generally reduce metal toxicity, however, we do not know what concentrations of CuCC occur in Harbor Island and American's Cup Basin (Commercial Basin). All these analyses are in progress or will be carried out in the coming weeks depending on instrumentation availability.

Macrofauna. To characterize the macrofaunal composition and abundances at Harbor Island and Commercial Basin, sediment cores (top 5 cm) were collected from each station and sieved on a 0.3 mm mesh screen. Faunal samples are currently being sorted and identified.

For each activity line:

Activity carried out:

- Field: exploratory sample collection in Harbor Island (west and east) and American's Cup Basin (Commercial Basin) already done.

Laboratory: Total organic matter, grain size, chl a done, data to be analyzed. Fauna identification and counting.

Sediment copper prepared to be analyzed with an ICP-OES. Ion selective electrode and system to measure CuCC set up, work in progress.

desk : Literature search to obtain historical record. Working on maps, entering data into worksheet for further analysis.

Table of activity - percentage carried out

Activity	Field	Laboratory	Desk
	Previous/this period	Previous/this period	Previous/this period
Exploratory	%100 / 100%	%50 / 50%	%20 / 20%

Activity in progress:

- field:
- laboratory:

Pigment analysis in progress

Sediment weighed for further determination of bioavailable copper. Setting system for measuring CuCC.

Measuring of ion Cu^{++} using an ion selective electrode in collaboration with Dr. Alberto Zirino.

- desk : search and revision of literature

Deliverables

Report produced

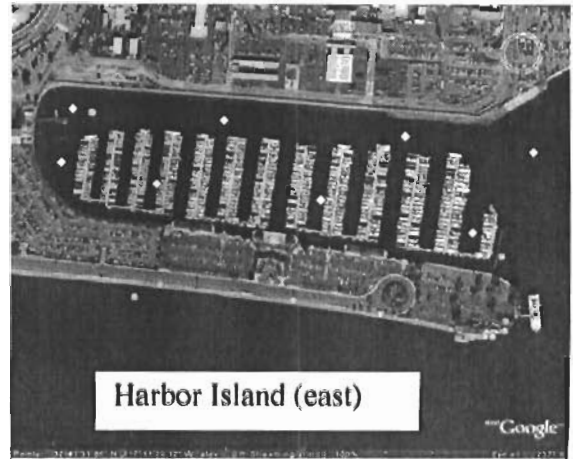


Fig. 1. Exploratory sampling sites (diamond symbol) in San Diego Bay