

ENVIRONMENTAL INDICATOR

AQUATIC LIFE

WATERBODY TYPE: COASTAL BAYS & ESTUARIES

MEASURE: SEDIMENT QUALITY

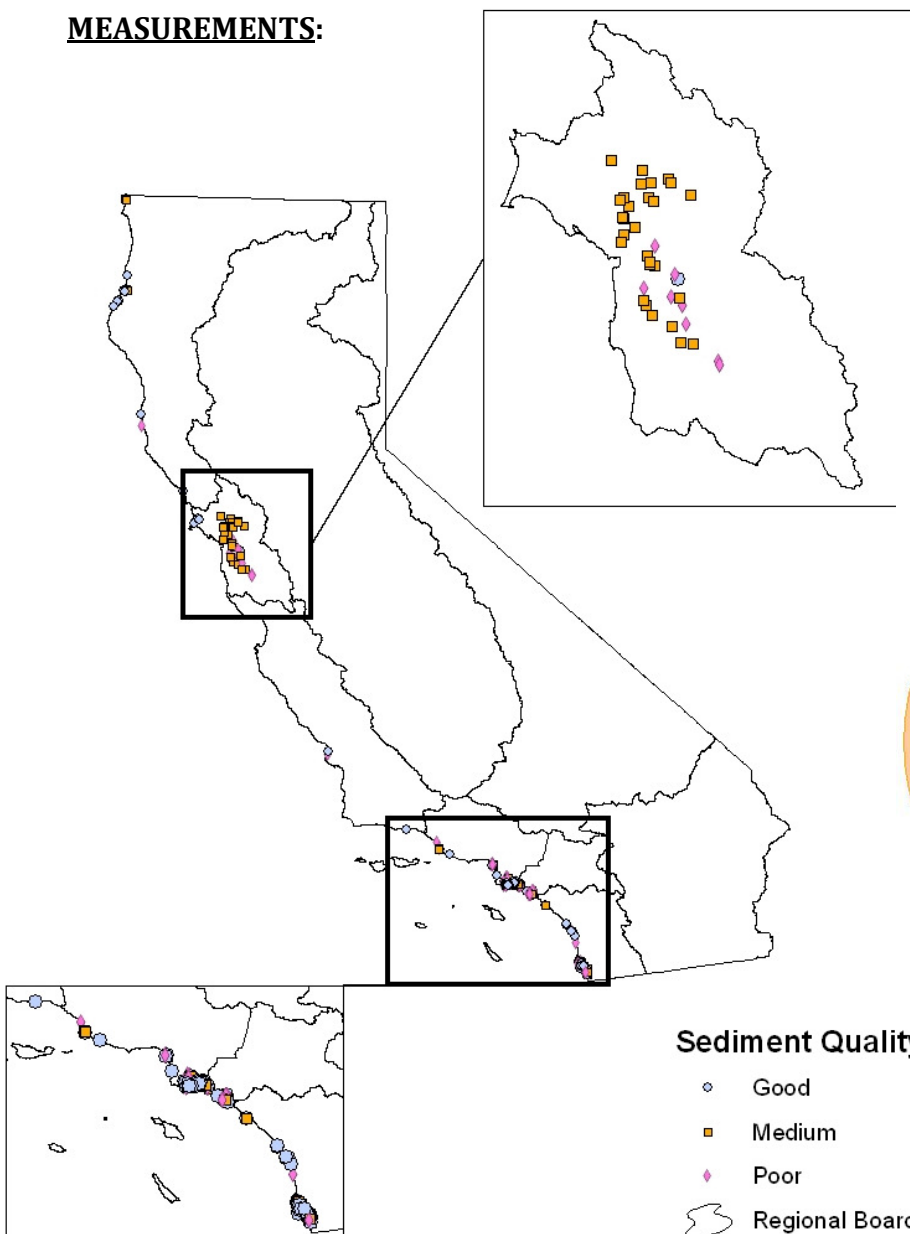
MESSAGE: *Only 17% of the sediment in California's bays and estuaries have "clean" sediment.*

KEY STATISTICS

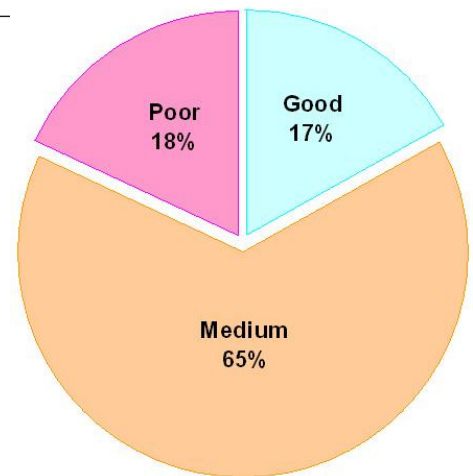
NUMBER OF SITES SAMPLED: 381

COASTAL BAY & ESTUARY AREA REPRESENTED (acres): 320,000

MEASUREMENTS:

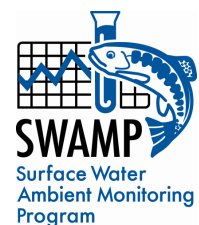


Statewide Coastal & Estuary Sediment Quality



Sediment Quality

- Good
- Medium
- Poor
- Regional Boards



WHAT IS THE MEASURE SHOWING?

The measure shows how much area of California's coastal bays and estuaries have contaminated sediments. The sediment quality was evaluated using a multiple lines of evidence assessment framework. This means that three separate indicators are used to determine contamination. Chemical concentrations, toxicity, and aquatic community data were used to assess the condition of the sediment. Only 17% of the bay and estuary area had "clean" (Good) sediment, while 65% had moderate adverse impacts (Medium), and the remaining 18% of the area had severe impacts (Poor).

WHY IS THIS MEASURE IMPORTANT?

Sediment quality has an important influence on the overall condition of a water body. Sediments can store contaminants, which can then be released into the water by physical disturbance such as dredging, wave action, and biological activities. Also, sediments are a primary source of contaminant exposure for sediment-dwelling organisms and animals that feed on the bottom, such as crabs and flatfishes.

WHAT FACTORS INFLUENCE THE MEASURE?

Contaminants in sediment are difficult to track. It is also difficult to quantify the magnitude of contaminants that reach the organisms in the water or sediment. Chemical analysis does not measure how much of the contaminants are tightly bound to sediment versus how much the organisms are exposed to. There are multiple ways that the organisms in water could be exposed to contaminants. The organisms can take up the pollutant from the water, ingest it directly from sediment, or bioaccumulate it through the food web. For this reason, multiple indicators have to be used to determine the impact of contaminants on marine animals, which makes the analysis complex.

TECHNICAL CONSIDERATIONS:

- Data source: Southern California Bight (1998), Regional Monitoring Program (2003), Western Environmental Monitoring and Assessment Program (1999, 2000, and 2005), and Huntington Harbor and Anaheim Bay Survey (2001) were used.
- Unit of Measure: An integrated data set of chemical, toxicity, and benthic community data were used. For chemical data two sediment contamination indices were used: the California Regression Model (CA LRM) and Chemical Score Indicator (CSI). For toxicity the 10-day amphipod survival test using *Eohaustorius estuarius* was used to determine the magnitude of sediment toxicity. For the benthic community four indices of benthic community were used: Benthic Response Index (BRI), Index of Benthic Biotic Integrity (IBI), Relative Benthic Index (RBI) and, River Invertebrate Prediction and Classification System (RIVPACS).

- Because these results are integrated assessment of sediment quality, the specific contaminants responsible for impacts cannot be determined without additional study.
- The public report is available at:
http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/sedimentquality_baysestuararies.pdf

GLOSSARY:**Bay**

A body of water that is partly enclosed by land usually smaller than a gulf.

Estuary

Coastal water body where ocean tides and river water merge.

Bioaccumulate

The accumulation of substances, such as pesticides, or other organic chemicals in an organism either through absorption from surrounding water or through ingestion of other contaminated organisms.

Amphipod

Small, shrimp-like crustaceans.

Benthic

Pertaining to the bottom (bed) of a water body. Benthic organisms dwell on or in the sediment at the bottom of a water body.