

Fact Sheet

Pilot Study Monitoring Results Suggest Most California Coastal Bays and Estuaries in “Fair” to “Good” Condition Based on Selected Indicators

Overview

Waterbody Type: Coastal Bays and Estuaries | Beneficial Use: Aquatic Life

One of the first steps in managing our environmental resources is to determine their current condition by answering the key question, “What is the overall condition of California’s surface waters?” Often-raised questions relating to the condition of our waters include, “Is the water safe to drink?” “Are the waters safe to swim?” “Are the fish safe to eat?” and “Is aquatic life healthy?” The assessments summarized in this fact sheet focus on the last question “Is aquatic life healthy?” in our coastal bays and estuaries.

California’s coastal waters, which include estuaries, bays and coastal shoreline, provide an important link between land and sea, as well as between freshwater and saline environments. These waters provide unique and critical habitats for fish, birds and other wildlife. Coastal waters also support commercial and recreational activities that are vital to our economy.

The findings¹ represent the state’s initial attempt to make broad statistical estimates of the conditions of coastal bays and estuaries and establish a baseline against which future assessments can be compared. The assessments focus on one beneficial use—aquatic life use—and are based on a limited suite of key water and sediment quality data collected in California as part of U.S. Environmental Protection Agency’s Environmental Monitoring and Assessment Program-Western Pilot study (EMAP) from 1999 through 2000. The survey design that was used generates statistically defensible, unbiased condition assessments. As such, it did not specifically focus on areas of high impact. Other sampling, which has targeted such areas, has shown toxicity and elevated chemical levels in some areas. In this study, the water quality indicators included dissolved oxygen, nutrients (nitrogen and phosphorus), chlorophyll *a* and water clarity. The sediment quality indicators included total organic carbon, sediment chemical contamination, toxicity and richness of bottom-dwelling species.

Statewide Assessment of Water and Sediment Quality

Indicator Type	Condition Category		
	High Quality (% area)	Moderate Quality (% area)	Low Quality (% area)
Water Quality Indicators			
Dissolved Oxygen	98	2	0
Nitrogen	87	12	1
Phosphorus	52	46	2
Chlorophyll <i>a</i>	87	13	0
Water Clarity	65	11	24
Sediment Quality Indicators			
Total Organic Carbon	96	3	1
Sediment Contamination	36	57	7
Amphipod Toxicity	>99	-	<1
Species Richness	78	15	7

1. *Water Quality Assessment of the Condition of California Coastal Waters and Wadeable Streams*. State Water Resources Control Board. 2006.



Findings

Most of the state's coastal waters appear to be in "fair" to "good" condition based on the water and sediment quality indicators used. The few high nitrogen levels were observed at Alviso Slough (South San Francisco Bay), Pajaro River (Central California) and Santa Ynez River (Central California). The higher phosphorus values were observed in much of San Francisco Bay and in a few coastal estuaries: Santa Ynez River, Los Angeles Harbor, Santa Margarita River and San Diego Bay. Although no sediments from San Francisco Bay were found to be toxic to the test organism *Ampelisca*, sediment toxicity tests using other test organisms indicated that some sediments from San Francisco Bay were toxic, suggesting that other test organisms, such as *Eohaustorius estaurius*, may be more representative test species for California. Less than 10 percent of the state's coastal waters are in "poor" quality condition based on sediment contaminant concentration; those areas tend to be in Southern California ports. This estimate may change based on the results of a more comprehensive evaluation of statewide sediment quality condition that is being done as part of the development of sediment quality objectives in California.

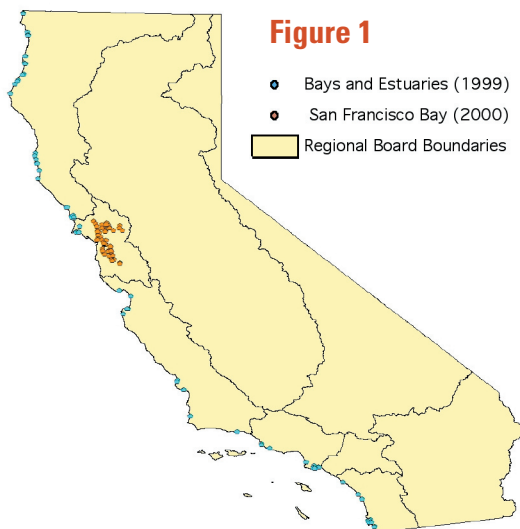


Table 1: Indicators and Threshold Values Used for Assessment

Indicator Type	Condition Category		
	High Quality Condition	Moderate Quality Condition	Low Quality Condition
Water Quality Indicators			
Dissolved Oxygen	> 5 mg/l	2-5 mg/l	< 2 mg/l
Nitrogen	< 0.5 mg/l	0.5-1.0 mg/l	> 1.0 mg/l
Phosphorus	< 0.01 mg/l	0.01-0.1 mg/l	> 0.1 mg/l
Chlorophyll <i>a</i>	< 5.0 µg/l	5.0-20 µg/l	> 20 µg/l
Water Clarity	>20%	10-20%	<10%
Sediment Quality Indicators			
Total Organic Carbon	< 2 %	2 – 5 %	> 5 %
Sediment Contamination	<5 contaminants exceed Effects Range Low	5 or more contaminants exceed Effects Range Low (none exceed ERM)	1 or more contaminants exceed Effects Range Median
Amphipod Toxicity	≥ 80% survival	-	<80% survival
% of expected species richness normalized for salinity	> 90%	75 – 90%	< 75%

Frequently Asked Questions

What data were used for the assessment?

From 1999 through 2000, field crews sampled more than 130 California sites, including small California estuaries, river-dominated estuaries in northern California and San Francisco Bay, as part of the Environmental Monitoring and Assessment Program. Sampling sites were intended to be representative of all estuarine waters of the state and were selected using a statistical design in which every element of the population has a known probability of being selected. Standardized field methods and laboratory protocols were used to ensure comparability. Sampling occurred in the summer and the fall. The sampling sites are shown in Figure 1.

What assessment thresholds were used to evaluate the data?

The threshold values used are from the national coastal condition assessment (see Table 1)². Although these thresholds were intended for comparison among states and do not necessarily reflect water quality standards for California, they are used because specific thresholds have not been established for these indicators in California.

What are the results of national and major regional assessments of this waterbody type?

The results for California are comparable to West Coastal and national results. The West Coastal study area extended from the Washington-Canada border to the Mexican border. The national assessment applies to 28 coastal states and Puerto Rico. The California results are shown in Table 2 with the West Coastal and national results from the U.S. Environmental Protection Agency's (U.S. EPA) 2004 *National Coastal Condition Report*, available at [www.epa.gov/owow/oceans/nccr]. For ease of presentation, Table 2 shows only the percent values for low quality condition.



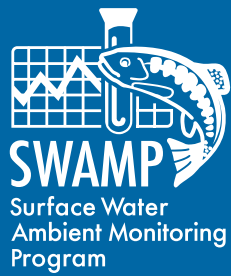
Table 2: California, West Coastal and National Assessment Results Summary

Indicator Type	Region and Condition		
	California	West Coastal	National
Water Quality Indicators	% area in Low Quality Condition	% area in Low Quality Condition	% area in Low Quality Condition
Dissolved Oxygen	0	1	4
Nitrogen	1	<1	5
Phosphorus	2	10	9
Chlorophyll <i>a</i>	0	<1	8
Water Clarity	24	36	25
Sediment Quality Indicators			
Total Organic Carbon	1	0	3
Sediment Contamination	7	3	7
Amphipod Toxicity	<1	17	6
Species Richness	7	13	17

How will California continue to provide statewide assessments of this type of waterbody?

The state has joined with the U.S. EPA, the Southern California Coastal Waters Research Program and Moss Landing Marine Laboratories in the EMAP-Coastal Waters Program. Bays and estuaries, intertidal wetlands and offshore coastal waters have been, or are slated to be, monitored from 2002 through 2006. National Coastal Assessments will occur at five-year intervals and will be integrated with large-scale regional monitoring programs such as the San Francisco Estuary Regional Monitoring Program and the Southern California Bight Project. Statewide assessments that include data from these and other programs will be done every two years. Future assessments will include evaluations of other beneficial uses including the safety of swimming in coastal waters and of eating fish caught in these waterbodies.

2. *National Coastal Condition Report II*. U.S. Environmental Protection Agency, Office of Research and Development and Office of Water. Document EPA-620/R-03/002. Washington, D.C., 2004. Posted at [www.epa.gov/owow/oceans/nccr].



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