

Notes

1. Value derived from \$34 billion value of containerized goods at Port of Oakland (this is 99 percent of the Bay Area total). This is certainly a conservative estimate of the value of maritime commerce.
2. San Francisco Bay Restoration Authority Poll conducted by FM3 Associates, August 2010.
3. Fonseca, A. and P. Prange. May 2008. *The History of the San Jose/Santa Clara Water Pollution Control Plant: Celebrating over 50 Years of Service*. City of San José, Environmental Services.
4. CCMP. 1993. Frontpiece.
5. Estuary Partnership *State of the Estuary* report, 1993, p. 233.
6. These programs include the Regional Monitoring Program, the California Department of Fish and Game San Francisco Bay Study, and ongoing monitoring of San Francisco Bay water quality by the U.S. Geological Survey. See [technical appendix](#) for description of indicator screening process.
7. This step also identified indicators that would be valuable to analyze, but for which we presently do not have available data (see What's Next? (last section of report)).
8. The method by which indices are derived from their component indicators is described in the [Technical Appendix](#).
9. The California Office of Environmental Health Hazard Assessment (OEHHA) is the agency responsible for establishing safe eating guidelines for wild fish caught from California water bodies, including San Francisco Bay. OEHHA has developed thresholds called advisory tissue levels (ATLs) that are one component of their complex process of data evaluation and interpretation in the development of safe eating guidelines. Other factors are also considered in this process, such as omega-3 fatty acid concentrations in a given species in a water body, and risk communication needs. The San Francisco Bay Regional Water Quality Control Board has also used the exposure of people to pollutants in sport fish as a driver for establishing regulations regarding pollutant discharges to the Bay. More information on how numeric guidelines from these agencies were used is available in the [Technical Appendix](#). Safe eating guidelines for San Francisco Bay, issued by OEHHA in 2011, represent the definitive guidance for the public on the safety of consuming Bay fish.
 10. http://www.swrcb.ca.gov/rwqcb2/water_issues/programs/stormwater/mrp.shtml
 11. For more information on the indicators and the Freshwater Inflow Index, see [Technical Appendix](#).
 12. SWRCB (2010) Development of Flow Criteria for the Sacramento–San Joaquin Delta Ecosystem. State Water Resources Control Board report prepared pursuant to the Sacramento–San Joaquin Delta Reform Act of 2009, August 3, 2010. While the State Board report was used as the basis for the Freshwater Inflow indicator, it is important to note the limitations of the State Water Board approach to the setting of these criteria as expressed in the Executive Summary of the SWRCB report where it states [in part] “When setting flow objectives with regulatory effect, the State Water Board reviews and considers all the effects of the flow objectives through a broad inquiry into all public trust and public interest concerns. For example, the State Water Board would consider other public trust resources potentially affected by Delta outflow requirements and impose measures for the protection of those resources, such as requiring sufficient water for cold water pool in reservoirs to maintain temperatures in Delta tributaries. The State Water Board would also consider a broad range of public interest matters, including economics, power resources (such as habitat for terrestrial species). The limited process adopted for this proceeding does not include this comprehensive review.” Available at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/final_rpt.shtml.
 13. X2 is measured as the location of the 2 parts per thousand salinity in kilometers upstream from the Golden Gate. When inflows are high, brackish water habitat shifts downstream and X2 is low, for example 55 kilometers. When inflows are low, brackish water habitat shift upstream and X2 is high, for example 75 kilometers.
 14. Another basis for setting a goal is the federal anti-degradation policy provided in Section 303(d) of the 1972 federal Clean Water Act, which says in part that activities by people should not degrade the existing uses of waters of the United States, which includes tidal flats. This suggests that the amount of tidal flat existing in 1972 is the minimum acceptable amount. Of these two possible goals, the one for 1993 seems most appropriate because there is an accurate map of tidal flats for that time period, which is the same map used to set the acreage goal for tidal marsh. For the purposes of this

report, the amount of tidal flat that existed in 1993 is selected as the tidal flat acreage goal.

15. For the purposes of this report, an individual tidal marsh is defined as an area of the intertidal zone that supports at least 5 percent cover of vegetation and, during low tide, is completely separated from other areas of the same kind by uplands or open water at least 100 meters wide. This definition of a tidal marsh reflects what is known about the maximum widths of uplands and open water that resident marsh wildlife readily cross. It is also consistent with the discreet intertidal areas referred to by name as marshes, such as Whale Tail Marsh, Triangle Marsh, Arrowhead Marsh, and Petaluma Marsh. The maps of tidal marshes used to set the overall acreage goal for tidal marshes are based on this definition.
16. The 1993 California Wetlands Conservation Policy could be the basis for a goal. However, the marshes were already fragmented by 1993, and therefore might not represent the marsh sizes needed in the future.
17. The goals for larger marshes might be emphasized because of their assumed greater importance for wildlife protection. Given the range of marsh sizes in each size class, and the unknown marsh size requirements for many of the resident species of marsh wildlife, a 25 percent departure from the goals for small and medium size marshes might be acceptable.
18. Although the importance of Bay tidal flats as habitat is broadly recognized, the data and information about Bay tidal flat conditions are not adequate to establish benchmarks for assessing their condition. Hence, the discussion focuses just on tidal marsh.
19. The benchmark should reflect the precision of the attribute scores, which is about 10 points. Given that the mean score for Bay marshes is 53 (± 10), and that the mean score for North Coast marshes is 84 (± 10), the present condition of the Bay marshes is about 65 percent of their condition goal (\pm about 20 percent).
20. Catchment, catchment area, catchment basin, drainage basin, and drainage area are watershed synonyms.
21. It should be emphasized that this approach is only for the purposes of this report.
22. During the 1980s and most of the 1990s, the Pacific Decadal Oscillation (PDO) was in a “warm” phase, with relatively lower productivity in local coastal waters. In the late 1990s, the PDO shifted to a “cool phase,” improving conditions for many species like Dungeness crab that reproduce and feed in these ocean habitats.
23. Longfin smelt (CA threatened), Delta smelt (US threatened, CA endangered, Chinook salmon—winter run (CA and US endangered) Chinook salmon—spring run (CA and US threatened), Green sturgeon (US threatened), Central Valley steelhead (US threatened).
24. Counts were natural log-transformed for comparison with the reference period, 1989 to 1993. For dabbling ducks, benchmark values (expressed as mean log counts) varied from 1.04 (in Suisun Bay) to 6.65 (in South San Francisco Bay); for diving ducks, benchmark values varied from 4.74 (in Suisun Bay) to 6.93 (in the North Bay).
25. This indicator does not include the very small but growing effort by residents and businesses to recycle greywater on-site to meet irrigation and plumbing needs.
26. The PDO is a long-lived El Niño-like pattern of Pacific climate variability.