State of California
The Resources Agency
Department of Water Resources
Division of Environmental Services

Water Quality Conditions in the Sacramento-San Joaquin Delta and Suisun and San Pablo Bays during 2001-2002

Report to the State Water Resources Control Board
in accordance with Water Right Decision 1641.

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Executive Summary, 2001-2002

This report summarizes the results of water quality monitoring and special studies conducted by the Department of Water Resources (DWR) and the U.S. Bureau of Reclamation (USBR) within the Sacramento-San Joaquin Delta and the Suisun and San Pablo bays (the upper San Francisco Estuary) from 2001 through 2002. This monitoring is mandated by Water Right Decision 1641(D-1641) of December 1999. This report is being submitted to fulfill the reporting requirements of this decision.

DWR and USBR monitored water quality using a revised protocol implemented in 1996. Under this monitoring protocol, eleven sampling sites representing eight regions of the upper San Francisco Estuary (Estuary) were monitored for a variety of physical and chemical water quality parameters. The results gathered from the sampling of 14 parameters are described in this report. Parameters such as water temperature, Secchi disk depth, dissolved oxygen concentration, specific conductance, dissolved inorganic nitrogen, orthophosphate, and volatile suspended solids were within their historical range. Measured parameters often exhibited seasonal and inter-annual variation, as well as changes in response to significant rainfall events, and/or changes in flow rates. No major discernable long-term trends were seen in these data.

In addition to monitoring physical and chemical water quality parameters, biological sampling was conducted to monitor productivity and community composition of phytoplankton and benthic communities. Samples for chlorophyll *a* and pheophytin *a* were taken at 15 sampling sites in the Estuary. Chlorophyll *a* concentrations showed seasonal patterns. The highest chlorophyll *a* concentrations occurred during the spring for most stations, with a second increase usually occurring during the late summer or early fall. Pheophytin *a* concentrations remained fairly constant and did not show apparent seasonal patterns. Chlorophyll *a* and pheophytin *a* concentrations for 2001-2002 were generally below 10 µg/L for most regions. Concentrations generally ranged between 0.5 µg/L and 15 µg/L throughout the Estuary.

Monthly zooplankton monitoring throughout the Estuary showed that mean monthly densities of most taxa remained relatively stable throughout 2001 and 2002. However, changes in the relative abundance of mysids and calanoid copepods in the upper Estuary were evident. Generally, native species were less abundant in 2002, relative to introduced species, than in 2001.

Benthic monitoring was conducted at ten representative stations throughout the Estuary to document substrate composition and the distribution, diversity and abundance of benthic organisms within the Estuary. The benthic community was determined to be a diverse assemblage of organisms including annelids (worms), crustaceans, aquatic insects and mollusks (clams and snails). Of the eight phyla identified, Annelida, Arthropoda, and Mollusca constituted 99.4% of the organisms collected during the study period.

DWR also conducted a series of special studies to monitor dissolved oxygen (DO) levels within the Stockton Ship Channel (Channel) during the late summer and early the fall of calendar years 2001 and 2002. The studies were conducted to determine if DO levels dropped below State (5.0 mg/L) and regional (6.0 mg/L) water quality objectives established for the Channel. Monitoring was typically conducted biweekly from August through November from Prisoner's Point in the central Delta to the Stockton Turning Basin at the eastern terminus of the Channel. Monitoring results showed DO concentrations in the Channel consistently fell below both the 5.0 mg/L and 6.0 mg/L objectives in both 2001 and 2002 due, in part, to relatively low net flows in the San Joaquin River past Stockton and warm water temperatures.

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