

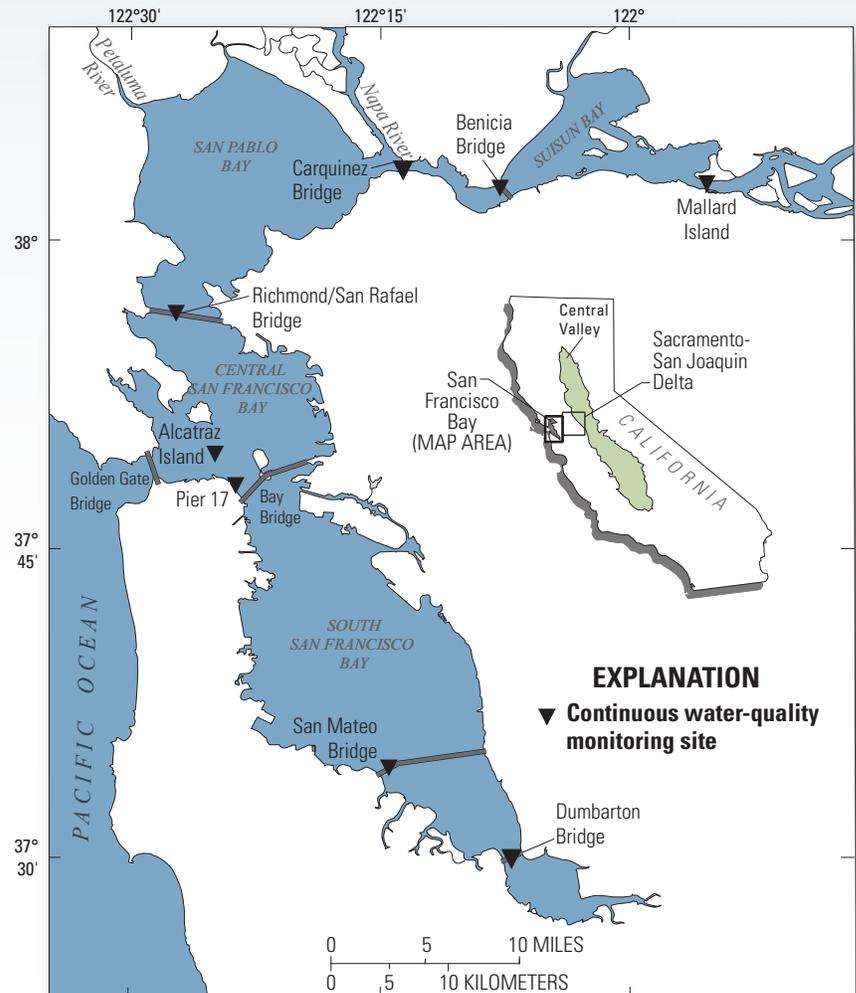
Continuous Water-Quality and Suspended-Sediment Transport Monitoring in the San Francisco Bay, California, Water Years 2016–17

The U.S. Geological Survey (USGS) monitors water quality and suspended-sediment transport in the San Francisco Bay (Bay) as part of a multi-agency effort to address estuary management, water supply, and ecological concerns. The San Francisco Bay area is home to millions of people, and the Bay teems with plants and both resident and migratory wildlife, and fish. Freshwater mixes with salt water in the Bay and is subject to riverine influences (floods, droughts, managed reservoir releases, and freshwater diversions) and marine influences (tides, waves, and effects of salt water). To understand this environment, the USGS along with its cooperators (see “Acknowledgments”), has been monitoring the Bay’s waters continuously since 1988.

Several water-quality characteristics of particular importance to State and Federal resource managers are monitored at key locations throughout the Bay (fig. 1). These water-quality characteristics of interest include salinity, water temperature, and suspended-sediment concentration (SSC). Salinity, which indicates the relative mixing of fresh and ocean waters in the Bay, is derived from specific conductance measurements. Water temperature, along with salinity, affects the density of water, which controls gravity-driven circulation patterns and stratification in the water column. Turbidity, a measure of light scattered from suspended particles in the water, is used to estimate SSC. Suspended sediment affects Bay water quality in multiple ways: it attenuates sunlight in the water column, affecting phytoplankton growth; it can deposit on tidal marsh and intertidal mudflats, which can help restore and sustain these habitats as sea level rises; and it can settle in ports and shipping channels, which can necessitate dredging. In addition, suspended sediment often carries adsorbed contaminants as it is transported in the water column, which affects their distribution and concentration in the environment. Excessive concentrations of sediment-adsorbed contaminants in deposits on the bottom of the Bay can affect ecosystem health.

External factors, such as tidal currents and wind, also can affect water quality in the Bay. Tidal currents in the Bay change direction four times daily, and wind direction and intensity also typically vary on a daily cycle. Consequently, salinity, water temperature, and SSC vary

spatially and temporally throughout the Bay. Therefore, continuous measurements in multiple locations are needed to monitor these changes. Data collected at eight stations are transmitted in near real-time using cellular telemetry. This fact sheet provides information about the USGS San Francisco Bay water-quality monitoring network. Internet links to access the resulting continuous water-quality data collected by the USGS also are provided.



Base modified from U.S. Geological Survey and other Federal and State digital data, various scales; Albers Equal-Area Conic projection, standard parallels are 29° 30' N. and 45° 30' N.; North American Datum of 1983

Figure 1. San Francisco Bay study area, California.