

## The State of Estuary Water Quality: 2015 and 2065

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The state of Estuary water quality was evaluated as part of the 2015 State of the Estuary Report. The Report examined whether Estuary waters are clean enough to be safe for fishing, for swimming, and to provide healthy habitat for aquatic life.

The status for fishing is fair and there has been no indication of improvement since 1994. Limited consumption of most popular Estuary fish species is advised due to contamination from two legacy pollutants (mercury and PCBs).

Water quality is generally good for swimming. Conditions are excellent at most Bay beaches. However, conditions are poor at 7% of beaches in summer and 27% in wet weather.

The quality of Estuary habitat with regard to chemical contamination is fair. Hundreds of chemicals have been measured and are below thresholds for concern. Mercury, invasive species, and trash are persistent problems. Recent improvement has been achieved for PBDEs and copper and is expected for invasive species, trash, and PFOS. Many potentially harmful chemicals have yet to be assessed.

The Estuary is also a safe source of drinking water for over two-thirds of Californians. A quantitative assessment of drinking water quality was beyond the scope of the Report.

In 2065, it can be expected that sources of pollutants of concern will be under robust control and that major hotspots will have been cleaned up. Other changes that can be expected include significant reductions in water flows and contaminant loads as wastewater and stormwater are increasingly conserved and used as a water supply; alterations in flows into the Estuary, the spatial extent of the Estuary, water movement, and water chemistry due to climate change; and changes due to new technologies including enhancements in water quality monitoring but also threats posed by new materials used in energy generation, transportation, and other sectors.

**Keywords:** water quality, fishing, swimming, habitat, mercury, PCBs, PBDEs, trash

**Session Title:** Water Quality in the Bay-Delta Estuary: Now and in the Future

**Speaker Biography:** Dr. Davis grew up near the PCB-contaminated aquatic food web of Lake Michigan. He has worked on contaminant issues in San Francisco Bay since 1986. He received his Ph.D. in Ecology at the University of California, Davis in 1997. Dr. Davis is lead scientist of the Regional Monitoring Program for Water Quality in San Francisco Bay, a comprehensive water quality monitoring program for San Francisco Bay. He is also lead scientist for bioaccumulation element of the California State Water Resource Control Board's Surface Water Ambient Monitoring Program, which conducts statewide surveys of contaminants in aquatic food webs. Dr. Davis is also the co-lead of SFEI's Clean Water Program. His primary research interests are monitoring the accumulation of persistent contaminants in aquatic food webs of the Bay, its watershed, and aquatic ecosystems in California, and the work of John Lillison, England's greatest one-armed poet.

## Emerging Contaminants: Tackling Tomorrow's Problems, Today

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Emerging contaminants are broadly defined as chemicals that are not regulated or commonly monitored, but have the potential to contaminate the environment and harm ecological or human health. The Regional Monitoring Program for Water Quality in San Francisco Bay (Bay RMP) has developed an emerging contaminants strategy that guides decisions on monitoring and management. Early identification of problem pollutants and quick action to prevent their spread is an optimal and cost-effective strategy for protecting water quality. This is especially true in an ecosystem like the Bay, which can act as a long-term trap for persistent contaminants, with recovery taking decades or centuries when contamination is extensive.

Monitoring of flame retardants like PBDEs (polybrominated diphenyl ethers) and stain repellants like PFOS (perfluorooctane sulfonate) illustrate the critical role the Bay RMP plays in providing policymakers with data needed to protect this vital urban ecosystem. Recent monitoring of PBDEs and PFOS suggests that levels have been high enough to affect Bay wildlife, though they are now declining due to state and federal policies, some informed by Bay RMP data. However, a common theme that our studies highlight is that policy actions designed to limit use of one chemical of concern can lead to increased use of replacement chemicals that may also threaten water quality. The Bay RMP emerging contaminants strategy allows scientists and managers to stay ahead of the curve, by identifying problem pollutants *before* they can harm wildlife.

**Keywords:** Contaminants of emerging concern, CECs, monitoring, flame retardants, stain repellants

**Session Title:** Water Quality in the Bay-Delta Estuary: Now and in the Future

**Speaker Biography:** Dr. Rebecca Sutton joined SFEI-ASC in 2013 as a Senior Scientist for the Regional Monitoring Program for Water Quality in San Francisco (Bay RMP), where she conducts investigations of contaminants of emerging concern. She manages SFEI-ASC's Green Chemistry focus area, leading studies to inform policies designed to prevent pollution through reduced use of toxic chemicals. Dr. Sutton has been appointed to California's Green Ribbon Science Panel to aid in the implementation of the state's Safer Consumer Products Regulations. Dr. Sutton received her B.S. in Environmental Resource Science from the University of California, Davis and her Ph.D. in Environmental Chemistry from the University of California, Berkeley. Prior to joining SFEI-ASC, Dr. Sutton was a senior scientist with research and advocacy non-profit Environmental Working Group, where she conducted research on chemicals of concern in air, water, soil, consumer goods, and people.

## Green Infrastructure in San Mateo: A Vision of the Future

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Green infrastructure – natural systems that use vegetation, soils, and natural processes to manage water and create healthier urban environments – is increasingly seen as a “magic bullet” solution that can simultaneously provide habitat, flood protection, cleaner air, and cleaner water. These systems capture and treat stormwater runoff, allowing it to filter through plants and soil and replenish underground supplies. Although green infrastructure is being implemented throughout the Bay Area as new and redevelopment projects comply with regional mandates to incorporate on-site stormwater management systems, local agencies are challenged to meet increasing regulatory demands for green infrastructure within the public realm, primarily due to obstacles unique to stormwater in obtaining funding. Municipalities are facing requirements to develop Green Infrastructure Plans intended to gradually transform storm drainage infrastructure from the traditional “gray” to “green.” These Plans, when implemented over the coming decades, are expected to help achieve long-term load reductions for mercury and PCBs in urban runoff. Municipalities are struggling to generate the necessary revenue to develop and implement such plans, and are looking for cost-effective approaches for integrating landscape-based stormwater management with other planned investments. In the past five years, agencies in San Mateo County have gradually increased the number of public green infrastructure projects and shifted from opportunistic demonstration projects to integrated multi-benefit projects capitalizing on the region’s focus on building Complete Streets – roadways that safely accommodate bikes, pedestrians, and transit, as well as cars – as a means of driving down the cost of green infrastructure implementation and meeting water quality requirements. The presentation will focus on regional requirements related to green infrastructure, funding challenges and opportunities, integration with climate change and transportation investments, and project examples from San Mateo County.

**Keywords:** stormwater, green infrastructure, complete streets, low impact development, green streets

**Session Title:** Water Quality in the Bay-Delta Estuary: Now and in the Future

**Speaker Biography:** Matthew Fabry serves as Program Manager for the San Mateo Countywide Water Pollution Prevention Program, a program of the City/County Association of Governments of San Mateo County, which assists the 21 San Mateo municipalities with stormwater compliance issues. He sits on the Boards of Directors for both the Bay Area Stormwater Management Agencies Association and the California Stormwater Quality Association and has over 20 years of experience in water quality and stormwater management. Matthew has worked in municipal, regulatory, and consultant capacities, holds degrees in environmental engineering and music, and is a registered civil engineer in the State of California.