

1.2.2 Toxics TMDLs

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The Clean Water Act (CWA) requires that each state “shall identify those waters within its boundaries for which the effluent limitations are not stringent enough to implement any water quality objective applicable to such waters.” The CWA also requires states to establish a priority ranking and TMDLs (Total Maximum Daily Loads) for these impaired waters. Multiple water bodies within Santa Monica Bay and its watershed are listed as impaired due to various constituents such as trash, bacteria, nutrients, and toxic pollutants in water or sediment. Recent monitoring data and analyses have been conducted that provide an update on the impacts from toxics on Santa Monica Bay seafood contamination and aquatic life. As a result of this information, TMDLs for toxics and metals in sediment and/or water have been established or updated for four water bodies: Santa Monica Bay (offshore), Ballona Creek, Ballona Creek Estuary, and Marina del Rey Harbor. These activities provide an opportunity to evaluate the current impact from toxics and assess recent progress towards improving water and sediment quality.

Santa Monica Bay

Previous assessments of Santa Monica Bay have identified multiple types of impairments due to toxics in sediment. The United States Environmental Protection Agency (EPA) updated its assessment of Santa Monica Bay water quality in the course of establishing a TMDL for Santa Monica Bay in 2012. While the sediments in the Bay contain elevated concentrations of many contaminants as the result of decades of input from urban runoff, wastewater discharge and other sources, recent monitoring data indicates that these toxics are no longer having adverse impacts on aquatic life. This is indicated by healthy benthic communities and a lack of sediment toxicity in most areas. However, contamination of seafood in Santa Monica Bay and other portions of the Southern California Bight continues to be prevalent and a potential health risk to humans.

Fish consumption advisories for multiple species of fish are in effect in most part of Santa Monica Bay. The first ever regional survey of sportfish contamination was conducted by the State Water Resources Control Board (SWRCB) in 2009 and provides perspective on relative contamination levels in Santa Monica Bay (Davis et al. 2010). Contamination of popular sportfish such as kelp bass, mackerel, and white croaker by mercury, PCBs, and DDTs is prevalent throughout southern California, with the greatest potential health risk associated with mercury and PCBs ([Figure 1.2.2-1](#)). Mercury contamination is mostly due to large-scale contamination patterns and not related to specific sources in Santa Monica Bay.

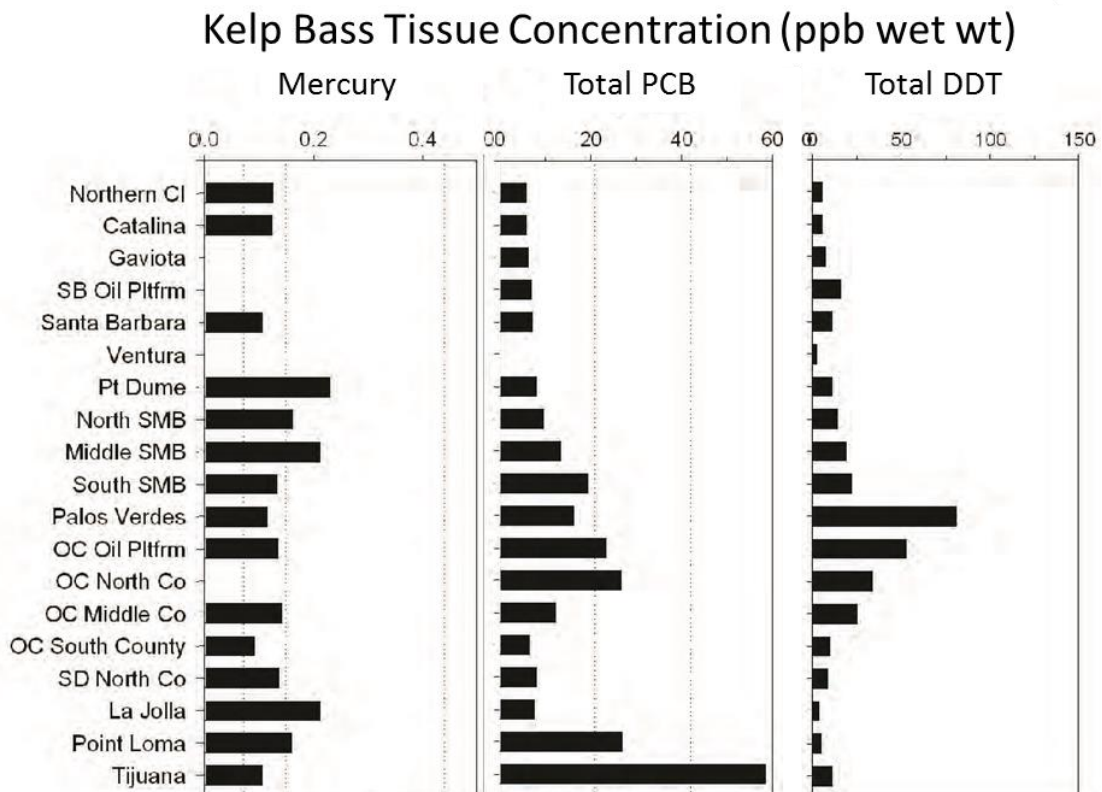
The EPA’s TMDL for Santa Monica Bay is focused on PCB and DDT contamination of fish, and establishes concentration targets for both tissue and sediment that are intended to minimize the health risk of consuming seafood. Ongoing inputs of these legacy contaminants are very

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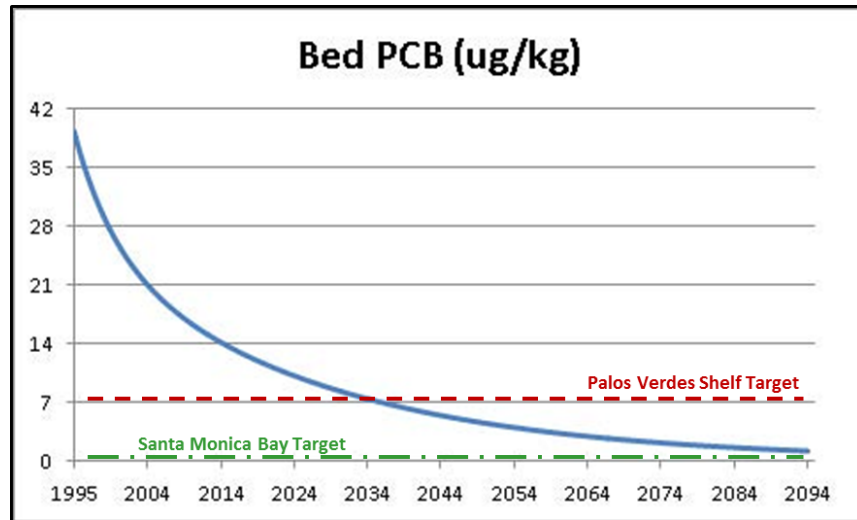
small; most fish contamination is due to existing sediment contamination, a result of legacy discharges of contamination from wastewater outfalls and other sources. Reduction in fish contamination is therefore dependent on natural processes of contaminant degradation and burial by sedimentation, which are predicted to take more than 30 years to achieve TMDL targets ([Figure 1.2.2-2](#)).

Figure 1.2.2-1. Average concentration of contaminants measured in parts per billion (ppb) in kelp bass fillets in 2009 by fishing zone in Southern California. Vertical lines indicate OEHHA fish consumption advisory thresholds. *Data Source: Davis et al. 2010.*



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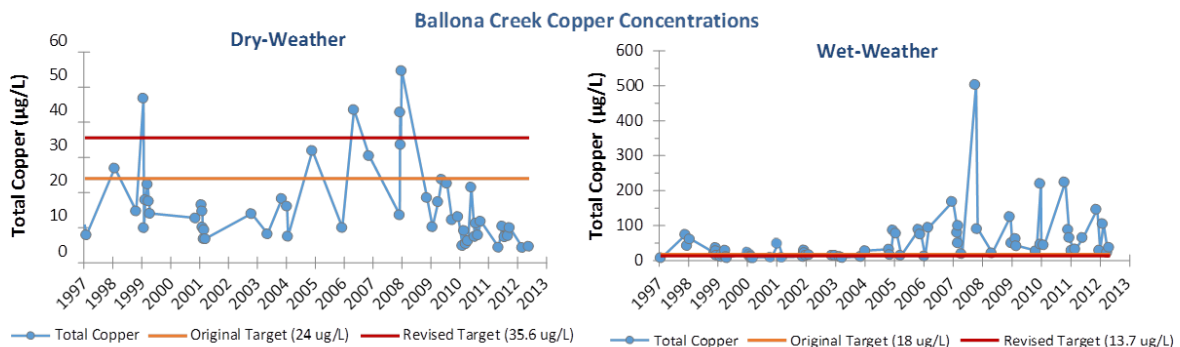
Figure 1.2.2-2. Projected change in sediment PCB concentrations in Santa Monica Bay due to natural processes measured in micrograms per kilogram ($\mu\text{g}/\text{kg}$). Reference lines indicate TMDL sediment targets for the Palos Verdes Shelf and other portions of Santa Monica Bay. Data Source: EPA 2012.



Ballona Creek

The TMDL for metals in the Ballona Creek water column was updated in 2013 to include revised compliance targets and load allocations for copper, lead, and zinc. The revised targets and allocations took improved data on flows, water hardness, and partitioning between total and dissolved metals into account. Monitoring data indicates reductions in dry weather metal loadings have occurred since 2009, and concentrations now rarely exceed the TMDL targets ([Figure 1.2.2-3](#)). This progress is likely due to a combination of factors, including lower runoff volumes due to weather patterns and the effectiveness of BMPs installed in the watershed. Ballona Creek wet weather metal loads have not shown similar declines, and achieving water quality standards in wet weather will continue to be a challenge.

Figure 1.2.2-3. TMDL monitoring results for Ballona Creek water column copper measured in micrograms per liter ($\mu\text{g}/\text{L}$). Reference lines indicate TMDL compliance targets. Data Source: SWRCB 2014.



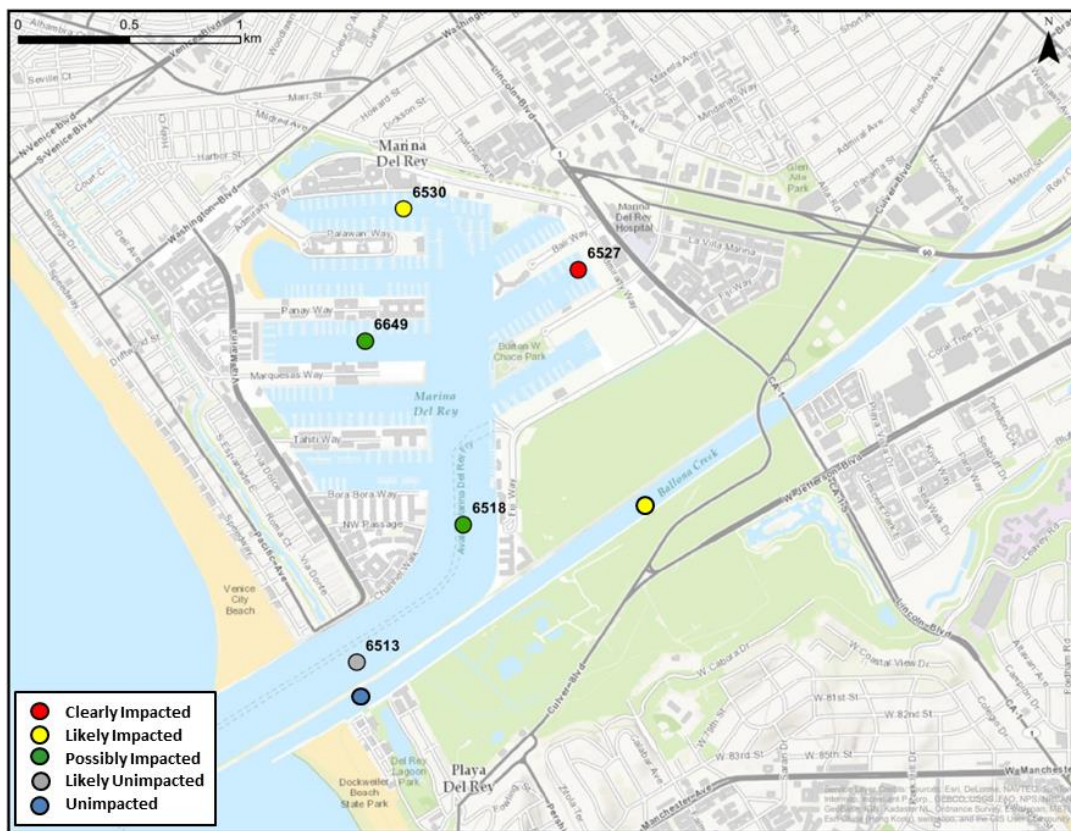
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Ballona Creek Estuary

The Ballona Estuary TMDL was established in 2006 to address impairments due to toxins in the sediment. This TMDL was revised in 2014 to incorporate new information pertaining to sediment quality objectives, monitoring results and special studies. The state's Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (EB&E Plan) was adopted in 2009 and established narrative sediment quality objectives (SQOs) to protect aquatic life (benthic communities) and human consumers of seafood. This plan also established a new method for assessing toxic impacts on sediment quality based on multiple lines of evidence. The Ballona Creek Estuary TMDL was revised to include fish tissue and bioaccumulation-based sediment targets for PCBs, DDTs, and Chlordane, as well as alternative compliance targets for sediment condition based on SQO assessment categories (LARWQCB 2013a). Sediment quality in the Ballona Creek Estuary and other bays and estuaries are now being assessed using the new SQO framework, and the results show evidence of continuing impairment in both the estuary and adjacent Marina del Rey Harbor ([Figure 1.2.2-4](#)). The dominant cause of sediment quality impacts in the estuary has been shown to be pyrethroid pesticides discharged in urban runoff, with minor contributions from the other toxins listed in the TMDL (Greenstein et al. 2014). TMDL monitoring of sediment quality using the SQO framework is continuing, and additional data are needed in order to determine whether or not conditions are improving over time.

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Figure 1.2.2-4. Sediment quality monitoring results for Marina del Rey Harbor and Ballona Creek Estuary in 2008 using the SQO assessment framework.



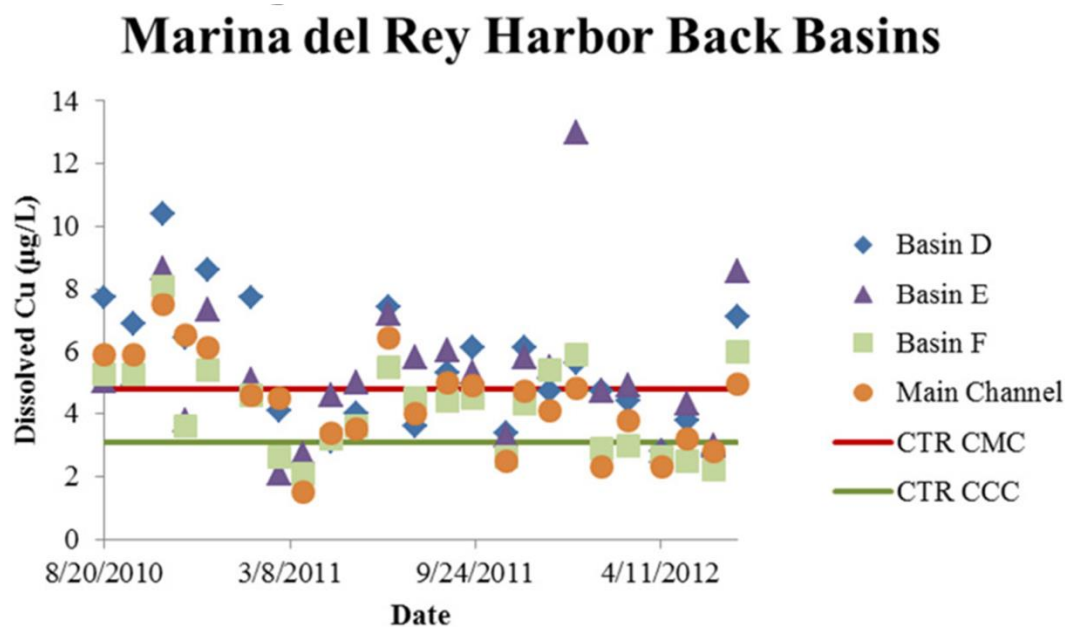
Marina del Rey Harbor

Similar to the Ballona Creek Estuary, the sediments of Marina del Rey Harbor are impacted due to sediment toxins. The original TMDL identified impairments in the back basins of the harbor from multiple metals and trace organics. Results from recent TMDL monitoring and special studies were used as a basis for several significant TMDL revisions in 2014. First, the extent of the TMDL was expanded to include the entire harbor, as the studies identified widespread sediment impairments based on SQO assessments. Second, additional impairments and TMDL targets were added for PCBs, DDTs, and Chlordane associated with fish tissue contamination. Finally, special studies and monitoring identified frequent and widespread exceedances of the water quality objective (California Toxics Rule) for water column copper ([Figure 1.2.2-5](#); LARWQCB 2013b). Attaining the current TMDL targets for the sediment and water column in Marina del Rey Harbor is likely to have substantial economic and recreational impacts. Much of the water column copper contamination is from antifouling paints on the 4,700 boats in the harbor; most of these boats will need to be repainted with alternative coatings in order to achieve the TMDL-required load reductions, an expensive task that may be beyond the existing capability of harbor boatyards.

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Restoring the sediment quality of the harbor is also a major challenge that could require extensive dredging of sediments. Two special studies are planned in the coming years that will help regulatory agencies and responsible parties develop the most effective management plans to improve conditions in Marina del Rey Harbor. First, an extensive study of copper toxicity and bioavailability in harbor waters will be conducted. This study will determine whether there is a scientific basis for developing a more accurate site-specific copper water quality objective for the harbor, potentially resulting in a revised objective that will protect aquatic life while requiring less drastic reductions in copper loads. The second special study will conduct toxicity identification evaluations in order to identify the specific contaminants responsible for sediment quality impacts. The results of this study are expected to produce a more accurate determination of the sediment contamination targets needed to support good sediment quality in the harbor, which in turn will help determine the most effective and technically feasible sediment management alternatives for Marina del Rey Harbor.

Figure 1.2.2-5. Water column monitoring results for copper in Marina del Rey Harbor. Most samples exceed the TMDL target, which is based on the California Toxics Rule chronic toxicity water quality objective. Data Source: CTR CCC.



These recent TMDL revisions and planned special studies illustrate a substantial evolution of the approaches for dealing with toxins in Santa Monica Bay over the last decade. Initial listings of impairments and TMDLs were relatively broad in scope, a reflection of data gaps and limited scientific understanding of toxicological relationships. The revised TMDLs use improved monitoring data and technological advances to develop programs with a better focus and greater potential for success. Of course, continued efforts are needed to implement these best management practices in order to reduce the impact of toxins on Santa Monica Bay habitats.

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References

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