

SWAMP SURVEY OF CONTAMINANTS IN SPORT FISH ON THE CALIFORNIA COAST

What is it?

In 2012 SWAMP released findings from the largest-ever statewide survey of contaminants in sport fish on the California coast. The report, *Contaminants in Sport Fish from the California Coast, 2009-2010*, presents the results from the collection of 3,483 fish representing 46 species from 68 locations.

Sport fish were evaluated because they provide information on human exposure and also the condition of the aquatic food web. Five species were examined at each sampling location. The array of species selected for sampling included those known to accumulate high concentrations of contaminants and therefore serve as informative indicators of potential contamination problems.



Why is it important?

Contaminants that accumulate in the food web (or “bioaccumulate”) and exceed levels of concern in water bodies throughout California pose threats to the health of humans and wildlife that consume contaminated aquatic biota. Bioaccumulation of methylmercury, PCBs, and other contaminants has led to fish consumption advisories, 303(d) listings, and total maximum daily loads (TMDLs) in many locations across the state. Existing information on spatial patterns and temporal trends suggests that other locations that have either not been monitored or monitored less thoroughly may also have similar problems.

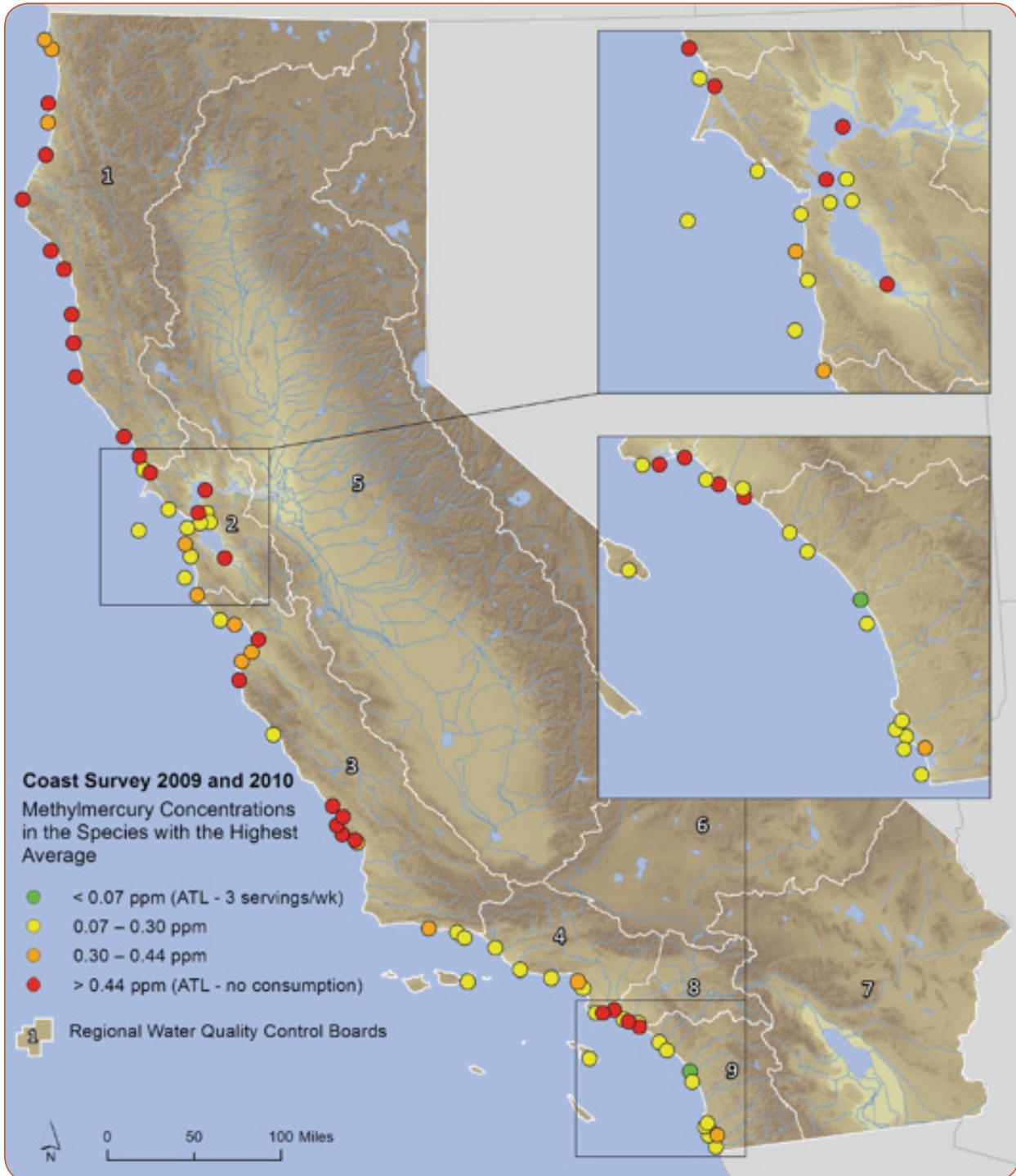
Recreational and commercial fishing are a vibrant part of the economy for California and other Pacific coastal states. In 2009, recreational anglers in coastal California took 4.7 million fishing

trips, including 3.6 million trips by shore-based anglers, 676,000 trips in private boats, and 385,000 trips by for-hire boats. Together with sales of durable equipment, these trips generated 13,567 full and part-time jobs, and over \$2 billion in sales (NMFS 2009). In spite of the importance of coastal fisheries to the economy and as a source of food for Californians, no systematic statewide monitoring of contaminants in coastal fish has yet been performed. This report summarizes results from a two-year statewide screening survey of contaminants in recreational sport fish species from California coastal waters. The report represents a major advance in understanding the extent of contamination in sport fish on the California coast.

The survey results indicate that methylmercury accumulation in sport fish is of high concern along much of the California coast, especially in the North and Central coast regions (see Figure). Many locations, 25 of the 68 sampled (37%), were in the high contamination category, with an average for the most contaminated species exceeding 0.44 ppm. Methylmercury can affect the developing nervous system in children and adolescents, potentially leading to learning disabilities. Overall, the survey results indicate that the supply of mercury to coastal waters appears sufficient to lead to significant food web contamination and risks to humans wherever long-lived predator fish are caught and consumed. Multiple sources are likely to contribute to methylmercury contamination of California coastal waters, including global emissions to the atmosphere; upwelling from ocean sediments; historic mercury, gold, and silver mining; and urban and industrial wastewater and stormwater. The relative importance of these different sources is not well understood.

PCBs also reached levels of moderate concern, and were the only other contaminant with problematic concentrations. PCBs may cause cancer; damage the liver, digestive tract, and nerves; and affect development, reproduction, and the immune system. Five of the 68 locations (7%) were in the high contamination category, with an average for the most contaminated species exceeding 120 ppb. San Francisco Bay and San Diego Bay stood out as having elevated concentrations.

Although species with high or moderate concentrations of methylmercury and PCBs were observed at many locations, they were usually accompanied by species with low concentrations. For example, 26 of the 68 locations (38%) had at least one species with low concentrations of both methylmercury and PCBs, and eight locations (12%) had more than one species with low concentrations for both contaminants.



Other contaminants, including dieldrin, DDT, chlordanes, and selenium, were also analyzed, but were found at low levels.

How will this information be used?

Results from the Coast Survey will be used by the State and Regional Water Boards in prioritizing coastal areas in need of cleanup plans or further monitoring. The Office of Environmental Health Hazard Assessment (OEHHA) is using results from the Coast Survey to develop advisories. In 2011, OEHHA merged results from the Coast Survey and the San Francisco Bay Regional Monitoring Program to develop a comprehensive advisory for ten species in San Francisco Bay. OEHHA plans to merge data from the Coast Survey with additional data from other studies to develop an advisory for San Diego Bay. The study has provided information that the public can access through the My Water Quality web portal to be better informed about the degree of contamination of popular fishing spots.

For more information:

- Visit the [My Water Quality Web Portal](#), "[Safe to Eat](#)" web page.
- Visit the [Bioaccumulation Oversight Group](#) web page.
- Contact Dr. Jay Davis (jay@sfei.org).