ENVIRONMENTAL INDICATOR: FISHABLE

WATERBODY TYPE: COAST	**MEASURE:** CONTAMINATION IN SPORT FISH

MESSAGE:

100% of California's coast has fish that are contaminated to some degree

KEY STATISTICS	
Number of sites sampled:	*68*
California Coastal Zones Sampled :	*100%*

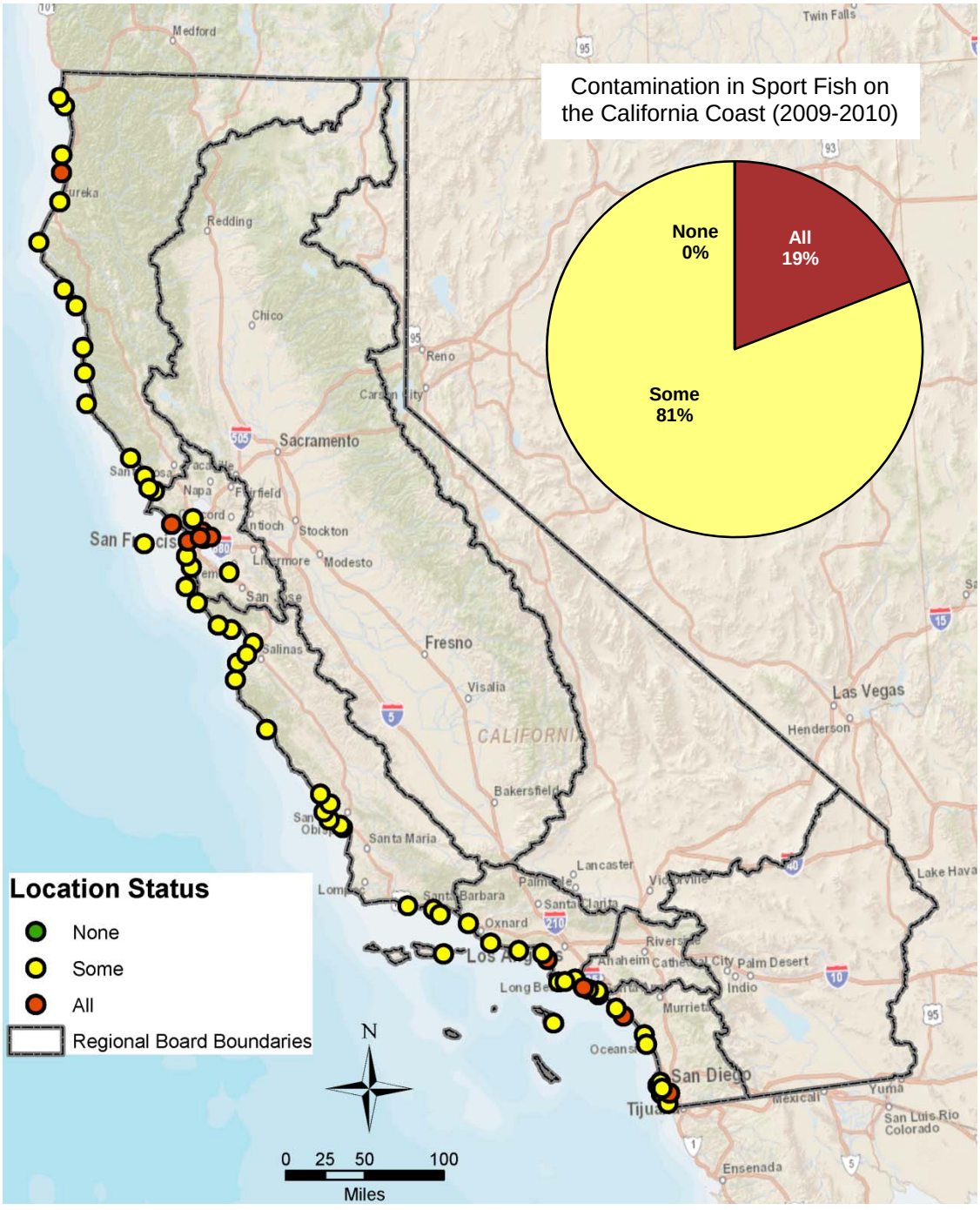

Figure 1. The Status of Contamination Above Any of the Known Human Health Thresholds Caught at Each Coastal Location in California, 2009-2010.

green = none of the fish samples had contamination above any applicable human health thresholds

yellow = some of the fish samples had contamination above some human health thresholds

red = all of the fish samples had contamination above human health thresholds

WHAT IS THE MEASURE SHOWING?

This measure shows the percent of California coastal waters in which sport fish are contaminated with methylmercury or other contaminants. In 81% percent of the California coastal areas measured, one or more fish samples exceeded a human health threshold ("Some" category), while in 19% percent of the areas all of the fish samples exceeded a health threshold ("All" category). All of the zones sampled had some samples above thresholds, therefore none of the zones were in the "None" category.

The objective of this two-year screening survey was to identify popular coastal fishing areas where sport fish are contaminated. Five popular species were sampled at each 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. This measure shows widespread contamination throughout the coastal regions sampled, although clean species can be found at most locations.

WHY IS THIS MEASURE IMPORTANT?

Sport fish were evaluated because they provide information on human exposure and also the condition of the aquatic food web. Contaminants such as methylmercury and PCBs can reach levels that pose a risk to human health. Methylmercury exposure can cause brain damage and other neurological problems, particularly in fetuses and small children. PCBs may cause cancer; damage the liver, digestive tract, and nerves; and affect development, reproduction, and the immune system. The information from this study can be used to prioritize which coastal areas need follow-up studies and cleanup plans, and to inform the public so they can lower their exposure to contaminants by focusing on cleaner species.

WHAT FACTORS INFLUENCE THE MEASURE?

Methylmercury is the most problematic contaminant, reaching concentrations that pose potential health risks to consumers of fish caught from California's coastal areas. Methylmercury tends to accumulate in sport fish species like rockfish and sharks that are long-lived and at the top of the food chain. This mercury is derived from a variety of sources, including global emissions to the atmosphere; historic mercury, gold, and silver mining; urban and industrial wastewater and stormwater; and upwelling of organic matter from the deep ocean. The ubiquitous methylmercury contamination observed in this survey suggests that atmospheric deposition of mercury from global sources may be a significant contributor to methylmercury in California coastal food webs.

PCBs were second to methylmercury in reaching concentrations that pose potential health risks for consumers of fish caught in California's coastal waters. PCBs are organic chemicals, once used in electrical equipment and other industrial products, that accumulate in the fatty tissue of sport fish. Fish in urban areas and that have high percentages of fat in their fillets tend to have the highest PCB concentrations. PCBs tend to occur in areas of historic use or maintenance of electrical equipment such as largely populated areas with high amounts of industrial activity, areas where electrical equipment or other PCB-containing equipment was used, and hydroelectric facilities.

TECHNICAL CONSIDERATIONS:

- Data source: Statewide SWAMP study of contaminants in fish from the California Coast. http://www.waterboards.ca.gov/water_issues/programs/swamp/coast_study.shtml
- Also available in interactive map on the "My Water Quality" portal: http://www.waterboards.ca.gov/mywaterquality/safe_to_eat/
- Unit of Measure: Concentrations of mercury and PCBs in fish tissue.
- Not all fish species found in the urban coastal areas were sampled. The survey targeted a range of species, including predator species, to evaluate accumulation of methylmercury at the top of the food chain, and fish with high fat content because they accumulate organic contaminants like PCBs.
- For fish consumption advice (Safe Eating Guidelines) and information on the health effects of methylmercury and PCBs please visit the Office of Environmental Health Hazard Assessment (OEHHA) website: http://www.oehha.ca.gov/fish/so_cal/index.html

GLOSSARY

Polychlorinated biphenyls (PCBs)
A class of organic compounds manufactured primarily for use as electrical insulating fluids in transformers and capacitors. Use of these chemicals was banned in the 1970s, but due to their persistence, they are still found in the environment.

Atmospheric deposition
Air pollution deposited directly into water or onto land and then washed into water.

Sport fish
Fish typically targeted by recreational and subsistence anglers.

(Updated 11/8/2012)