



FISHING AND SHELLFISH

HARVESTING ARE KEY BENEFICIAL USES OF WATER

Recreational and subsistence fishing and shellfish harvesting are *key beneficial uses* because of their importance to people. Key beneficial uses are the uses of water most critical to human well-being and environmental health. As an initial assessment, this status sheet summarizes some data collected by federal, state, and local agencies having to do with:

- (1) chemical contaminants in fish and mussel tissue,
- (2) biotoxins in mussel tissue, and
- (3) fecal indicator bacteria in water where shellfish may be harvested by the public.

The intent of this assessment is to help to educate the public and prioritize efforts for achieving healthy waters in the San Diego Region.

COASTAL SHORELINES AND PIERS ARE KEY AREAS

The places most important to a key beneficial use are *key areas*. In the San Diego Region, key areas for coastal fishing and shellfish harvesting include ocean and bay shorelines and structures such as piers, jetties, docks, and breakwaters accessible to the public for fishing.

SOME HEALTH RISKS ARE ASSOCIATED WITH EATING LOCALLY-COLLECTED FISH AND SHELLFISH

Fish and shellfish are nutritious and good for you to eat, but some can contain toxic chemical contaminants at levels that pose a health risk to those who eat them. Some age groups are more at risk than others. Children and developing fetuses, for example, are the group most at risk to the harmful effects of mercury. In addition to chemical contaminants, shellfish can concentrate biotoxins to levels of concern for human health, as well as pathogens if exposed to sewage-contaminated water.

ASSESSING KEY BENEFICIAL USES IN KEY AREAS
 The San Diego Water Board strives to focus efforts on what is most important for protecting and restoring the health of regional waters. To support its [Practical Vision](#) (2013), the Board identified key beneficial uses of the region's waters and the key areas for those uses ([Resolution R9-2017-0030](#)).

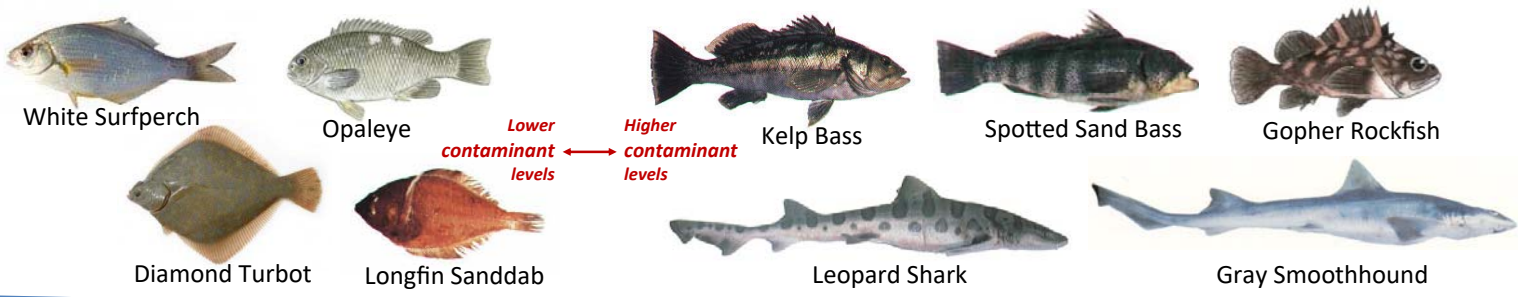
This status sheet represents an initial assessment of conditions for one of the key uses. Focused assessments on key uses of waters will help the Board set regionwide priorities and measurable goals for protecting and restoring the integrity of waters through regulatory and collaborative efforts.

CHEMICAL CONTAMINANTS
 Mercury, in the form found in fish (methylmercury), can harm the brain and nervous system of people, especially unborn babies and children, decreasing learning ability, attention, or memory. PCBs and DDTs can cause a variety of health problems, including effects on the nervous system and cancer, and DDTs can affect reproduction.

BIOTOXINS Paralytic Shellfish Poisoning (PSP) toxin and Domoic Acid (DA) are the two biotoxins of concern in California coastal waters. PSP toxin and DA are produced by certain types of phytoplankton. Both can bioaccumulate in bivalve shellfish and, when ingested, can cause severe neurological effects, including death.

PATHOGENS Shellfish from areas with high levels of bacteria may not be safe to eat. Mussels, oysters, and clams exposed to sewage-contaminated water may contain microorganisms that can make people sick. Pathogenic viruses (Norovirus, Adenovirus, Enterovirus, Hepatitis A), bacteria (*Vibrio*, *Campylobacter*), and parasites (*Giardia*, *Cryptosporidium*) can cause gastroenteritis, respiratory infection, conjunctivitis, and other illnesses.

Some fish species tend to have higher levels of chemical contaminants



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MERCURY AND PCBs ARE THE MAIN CONTAMINANTS OF CONCERN

CHEMICAL CONTAMINANTS

Contaminant levels in three data sets were compared to thresholds at which the Office of Environmental Health Hazard Assessment (OEHHA) advises consumption be limited to two or fewer servings per week. Levels above those thresholds represent potential health risk. For PCBs the threshold was >21 ppb and for mercury >70 ppb. For mercury, this threshold is for the most sensitive population.

FISH: A statewide survey conducted in 2009-2010 tested fish tissue from ten coastal sites in the San Diego Region (530 fish of 18 species). **Mercury and PCBs** were above the thresholds in at least one sample at all ten sites. Elevated risk was not found for the pesticides DDT, chlordane, or dieldrin.

FISH: The City of San Diego tests fish tissue from four offshore sites, two near ocean outfalls (Point Loma, South Bay) and two 10-15 km away. In 2015 and 2016, 24 samples were tested. **Mercury** was above the threshold in at least one sample at all sites (13 of 24 samples). Elevated risk was not found for PCBs, DDT, chlordane, or dieldrin.

SHELLFISH: The nationwide NOAA Mussel Watch tests shellfish tissue from 12 sites in the San Diego Region. From 2005 to 2012, 30 samples were tested. **PCBs** were above the threshold in at least one sample at two sites in San Diego Bay (6 of 30 samples). Elevated risk was not found for PCBs at other sites, or for mercury, DDT, chlordane, or dieldrin.

BIOTOXINS

The statewide California Department of Public Health (CDPH) tests mussel or oyster tissue from three sites in the San Diego Region. From Jan 2014 to Oct 2017, PSP toxin was not detected in any of 375 samples. During the same period, Domoic Acid was detected in only three of more than 130 samples, and each detection was below the human health threshold of 20 µg/g.

PATHOGENS

From among many coastal locations monitored for bacteria, 13 were selected for their proximity to key areas for shellfish harvesting. From 2012 to 2017, bacteria levels above that considered safe for consumption of shellfish were found in San Diego Bay and Imperial Beach.

Waters in the vicinity of:	Fish			Shellfish					KEY
	Chemical Contaminants			Chemical Contaminants			Biotoxins	Pathogens	
	Mercury	PCBs	Pesticides	Mercury	PCBs	Pesticides	PSP, DA	Bacteria	
Dana Point	Green	Green	Green	Green	Green	Green	Green	Green	No health risk; all samples were below threshold
San Onofre - Crystal Cove	Green	Green	Green	Green	Green	Green	Green	Green	Possible health risk; at least one sample was above threshold (in "limit consumption" category)
Oceanside	Green	Green	Green	Green	Green	Green	Green	Green	
Aqua Hedionda Lagoon	Green	Green	Green	Green	Green	Green	Green	Green	Possible health risk; at least one sample was above threshold (in "do not eat" category)
La Jolla - San Onofre	Green	Green	Green	Green	Green	Green	Green	Green	
Mission Bay	Green	Green	Green	Green	Green	Green	Green	Green	Possible health risk; at least one sample was above threshold (in "do not eat" category)
Pt Loma - La Jolla	Green	Green	Green	Green	Green	Green	Green	Green	
San Diego Bay	Green	Red	Green	Green	Red	Green	Green	Yellow	Possible health risk; at least one sample was above threshold (in "do not eat" category)
Tijuana - N. Island/Coronado	Green	Green	Green	Green	Green	Green	Green	Yellow	
Offshore S. San Diego County	Green	Green	Green	Green	Green	Green	Green	Green	No data

CHOOSE THE SAFEST FISH TO EAT

If you fish along the coast and want to eat what you catch, you can protect your health by following the fish consumption advisories issued by the Office of Environmental Health Hazard Assessment (OEHHA). The easy-to-read advisories show the number of servings per week considered safe for different types of fish, taking into account levels of mercury and PCB. Each advisory has two sets of guidelines—one for those most sensitive to the effects of mercury (children 1-17 and women 18 to 45) and one for those less sensitive (women over 45 and men 18 and older). One advisory applies to the entire **California coastline** and, in the San Diego Region, there are specific advisories for **San Diego Bay, Mission Bay, and the coastline north of San Mateo Point**. Together, these provide consumption advice for more than 60 species of fish.

Fish Consumption Advisories
<https://oehha.ca.gov/fish/advisories>



HARVEST AT THE SAFEST TIME OF YEAR



The safest time to collect mussels to eat is Nov through April. Mussels should not be collected to eat May through Oct. An **annual quarantine** on sport-harvested mussels is issued by the CDPH for the entire California coastline for May through Oct to protect people from exposure to biotoxins during months that biotoxin-producing phytoplankton are most abundant.

FOR MORE INFORMATION...

- SWAMP Statewide Survey of Contaminants in Sport Fish
https://www.waterboards.ca.gov/water_issues/programs/swamp/coast_study.shtml
- Statewide Fish Contamination Interactive Map
<https://step.sfei.org/>
- City of San Diego Ocean Monitoring Reports
<https://www.sandiego.gov/mwwd/environment/oceanmonitor/reports>
- NOAA National Status and Trends, includes Mussel Watch
<https://products.coastalscience.noaa.gov/collections/ltmonitoring/nsandt/default.aspx>
- CDPH Biotxin Monitoring Program
<https://www.cdph.ca.gov/Programs/CEH/DRSEM/Pages/EMB/Shellfish/Marine-Biotxin-Monitoring-Program.aspx>
- CDPH Annual Mussel Quarantine
<https://www.cdph.ca.gov/Programs/CEH/DRSEM/Pages/EMB/Shellfish/Annual-Mussel-Quarantine.aspx>
- State Water Board Portal for "My Water Quality"
<http://www.mwaterquality.ca.gov/index.html>
- Status Sheet about Fish and Shellfish Consumption in San Diego Bay
https://www.waterboards.ca.gov/sandiego/water_issues/programs/swamp/docs/