

Monitoring Monday – Let’s look at fecal contamination.

Join us each Monday as the Clean Water Team shares some resources on a water quality monitoring topic. Today is Swimmable California Day and we are looking at fecal contamination.\



Is There Danger Lurking in The Water at Your Favorite Beach or Swimming Hole?

Although less physically intimidating than a shark, harmful microbes invisible to the human eye might be “swimming” around in the water “looking for you”. If these microbes get into your body, you may come down with a digestive illness, respiratory illness, infection, or skin rash. Those aren’t as scary as a shark bite, but water-borne illnesses are much more common and require substantial health care resources.

How Do Harmful Microbes Get in The Water?

Microbes are tiny living organisms that can be found all over. The most common types are bacteria, viruses, and fungi. Protozoa, prions, and archaea are other types of microbes. They live in water, soil, the air and within larger living organisms. Some microbes like bacteria, viruses, and fungi can make people sick. These harmful microbes can live in the digestive systems of humans and other warm-blooded animals like dogs and birds. When these animals defecate the microbes are carried out of the body on the fecal matter. Sewage spills, sewage overflows, and contaminated stormwater send microbe-containing fecal matter into rivers, lakes, and storm drains which eventually flow into the ocean. Therefore, all bodies of water (fresh and salt) can be impacted by this sickness-inducing pollution.

How is Fecal Contamination Measured?

Looking for harmful microbes in the water where people recreate is not easy. The microbes are tiny and cannot be seen with the naked eye. They are also very few in number and hard to detect. That is why fecal contamination is measured with an indicator. Fecal Indicator Bacteria (FIB) such as E. coli (Escherichia coli), enterococcus bacteria or total fecal coliform bacteria are used.

These indicator bacteria indicate the presence of harmful microbes and are not harmful themselves. Water quality samples are collected at a recreational water (beach, swimming hole...). A water quality sample could be tested for the FIB, E. coli. This microbe, E. coli, can live in the lower intestine of warm-blooded animals. If the counts of E. coli are high, the water is likely contaminated with fecal pollution. This contaminated water is likely to expose people to harmful microbes.

Why not test for the harmful pathogens themselves?

Although virus monitoring is incredibly useful in identifying sources of fecal pollution, there are a number of drawbacks to available virus measurement methods. There have been tremendous breakthroughs in the use of DNA to analyze water samples for virus or human pathogenic bacteria, but these techniques are still relatively expensive, and do not accurately measure the quantity of pathogens.

How Do We Know If It's Safe To Go In The Water?

After it rains, FIB densities often far exceed state health criteria for recreational water use. Health officials and community organizations like Heal the Bay recommend that beach users never swim within 100 yards on either side of a flowing storm drain, creek, or river in any body of water during a rainstorm. It is recommended that people stay out of the water for at least three days after a storm has ended.

Government agencies, tribal agencies, nonprofit organizations, and community science groups measure water quality regularly. The frequency of testing varies depending on where you live, and many beaches or bodies of water may not get sampled.

In California, water quality samples are collected by the appropriate health agency at a minimum of once a week from April through October as required under the California Beach Bathing Water Quality Standards (AB411), and as recommended by EPA's National Beach Guidance and Performance Criteria for Recreational Waters (EPA's BEACH program). The results of those water quality samples are compared against the appropriate State Water Resources Control Board statewide bacteria water quality. A beach or water hole that fails to meet these objectives should be posted with a warning to the public that the bacteria levels in the water may cause illness, and local health officers are recommending that the public stay out of the water in areas where the signs are visible.

A number of programs in California address existing water quality problems to improve swimming safety. Through the [Clean Beaches Initiative Grant Projects](#), California has invested \$100 million to fund local projects that reduce bacterial contamination along the coast. The State has

also funded research to develop more rapid detection methods for knowing when to post beaches, tracking the sources of contamination, and studies to better understand the relationship between bacterial indicators and incidence of disease. The state has also implemented Total Maximum Daily Loads (TMDLs), to improve water quality for every impaired water body on the 303(d) list to bring the water body back into compliance with water quality standards. Some of these [listed waters cannot support safe water contact recreation](#).

To learn if a certain beach or swimming hole's water quality is safe for recreation and other water contact activities you can visit these websites:

- **My Water Quality Safe to Swim Interactive Map**
https://mywaterquality.ca.gov/safe_to_swim/interactive_map/
- **Beach Report Card**
<https://beachreportcard.org/>
- **Beach Surveys – Warnings, Closures, and Rain Advisories**
www.waterboards.ca.gov/water_issues/programs/beaches/beach_surveys/index.html

California Beach Water Quality Information Page

www.waterboards.ca.gov/water_issues/programs/beaches/beach_water_quality/

Educator and Student Resources

https://mywaterquality.ca.gov/safe_to_swim/educator_student/

Fecal Contamination Fact Sheet for Recreational Waters

Used for this email, this document was created by the Safe to Swim Network – Outreach and Education Committee.

https://www.waterboards.ca.gov/water_issues/programs/swamp/docs/cwt/guidance/340.pdf

Fecal pollution and water quality

www.who.int/water_sanitation_health/bathing/srwe1-chap4.pdf

LEARN: Beach Basics

www.epa.gov/beaches/learn-beach-basics

LEARN: EPA's Role in Protecting Beaches

www.epa.gov/beaches/learn-epas-role-protecting-beaches

Part 3 of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California — Bacteria Provisions and a Water Quality Standards Variance Policy

www.waterboards.ca.gov/bacterialobjectives/docs/bacteria.pdf

Swimmable California Webinar Series 2017 – 2018

www.youtube.com/playlist?list=PLvTjRb8VCkp5xsM7UgA6769YzPIYeiA0r

Get involved by joining the [Safe to Swim Network](#) and any of its Beach Water Quality Workgroups ([Coastal Beach Monitoring Workgroups](#), [Inland Beach Monitoring Workgroup](#)).

Add FIB monitoring to your citizen monitoring or community science program. [Contact](#) the [Clean Water Team](#) to learn more.

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