

Seafood Safety in Puget Sound

Why is seafood safety an issue?

The Pacific Northwest and Puget Sound is blessed with an abundance and variety of seafood almost unparalleled throughout the world. Prior to recent history, our native populations have both honored and enjoyed these riches. With this context, why do we ask the question: "Seafood: It's Healthy, But Is It Safe to Eat?"

Puget Sound has been home to manufacturing and industry since the 1850's. Industrial chemicals, oil from vehicles, and pesticides from farms and lawns have polluted Puget Sound and its rivers. Chemicals collect in water and sediment and break down slowly.



Algae and plankton take up contaminants and are eaten by small fish, which are eaten by larger fish. Toxicants move up the food chain in a process called bioaccumulation. Large fish and fish that are long-lived collect the most toxicants. We humans are at the top of the food chain and can be exposed to these toxicants when we eat seafood.

What are the contaminants?

Persistent bioaccumulative toxic chemicals (PBTs) accumulate in fish tissue and animal fat and are harmful to animals and humans. PBTs that contaminate the Puget Sound ecosystem include polychlorinated biphenyls (PCBs); polycyclic aromatic hydrocarbons (PAHs); polybrominated diphenyl ethers (PBDEs); and suspected hormone-disrupting chemicals such as bisphenol A (BPA). PBTs are present throughout the waters of Puget Sound. In the Duwamish River, fish and shellfish are so contaminated with PCBs that the Washington State Department of Health (DOH) advises people not to eat any resident fish, crab, or shellfish from the Duwamish River. The warning does not include salmon because salmon are migratory and can spend much of their lives in the ocean.

Mercury is the contaminant of greatest concern in Bellingham Bay, the location of multiple cleanup sites. The sediment contains mercury left behind by pulp and paper mills that once operated there. Mercury pollution comes from burning

coal, household and industrial waste, products thrown in the garbage and washed down the drain, and industrial paper production. All fish worldwide are contaminated to some degree with environmental toxicants.

What seafood is affected?

All species of Puget Sound fish and shellfish are affected to some degree, but some waterways are more contaminated. The WA State DOH has developed fish consumption guidelines that take into account differences between species, nutritional benefits, sustainability, wild versus farmed fish, and local or non-local sourcing.

Who is most at risk?

People who eat the most seafood, including tribal members and subsistence fishers, have a higher risk of adverse health effects, as do those who eat seafood from more contaminated waters. Others who are especially vulnerable are pregnant and nursing mothers, women of childbearing age, and growing children.

What can be done to make seafood safer?

Seafood will be safer after toxicants are removed from water and sediment. Prevention and cleanup are two strategies to create a cleaner environment for our seafood.

New contaminants can be kept out of waterways by preventing runoff and point source pollution. Stormwater treatment, emission controls, and educating the public about behavior changes to reduce pollution help keep toxicants from entering Puget Sound.

Cleanup of industrial pollutants in sediment helps reduce the amount of these chemicals marine animals are exposed to. Contaminated sediment can be treated or disposed of, sequestered under a cap of sand or gravel, or monitored while toxicants break down naturally over many years.

What agencies are involved?

The US Environmental Protection Agency (EPA) ensures that policies are in place to protect the environment, and that federal laws are enforced fairly and effectively. Washington, Oregon, Idaho, Alaska, and 267 Indian tribes make up EPA Region 10.

The WA State Dept of Ecology protects, preserves and enhances the environment and promotes wise management of Washington's natural resources for the benefit of current and future generations.

The WA State Dept. of Health (DOH) provides leadership to develop and promote policies to protect and improve the public's health.

What are these agencies doing to improve seafood safety?

The EPA enforces the Clean Water Act for water quality standards and carries out the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) by identifying and supervising the cleanup of particularly contaminated sites, known as “Superfund” sites. The map below shows where some of the Superfund sites that affect Puget Sound waters are located.



The Department of Ecology is re-evaluating the WA fish consumption rate (FCR). Currently WA has 2 FCR's. The water quality standard assumes the average WA resident eats 1/4 oz of seafood/day. The sediment cleanup standard assumes 2 oz/day. Ecology believes these FCRs are outdated and inaccurate.

DOH fish consumption advisories warn the public when contamination is too high in fish or shellfish in a local waterway. DOH has also developed the Healthy Fish Guide to help people choose less contaminated seafood. To decrease exposure to toxicants, DOH recommends grilling, broiling, or baking fish and eating only the fillet, not the fatty skin, organs, or eggs. To avoid exposure to mercury, DOH recommends eating fish low in mercury.

Should we stop eating seafood?

No! If we don't eat seafood, we'll miss out on the nutritional benefits it offers. Fish is high in protein, rich in unsaturated omega-3 fatty acids, and contains B-vitamins, Vitamin D, and essential trace minerals. The American Heart Association recommends eating at least 2 meals of fish per week. And chemicals are all around us, so the foods we eat instead of eating seafood are likely to have some level of contamination too.

A complex issue

Eating fish and shellfish provides health benefits, yet higher consumption can mean greater exposure to toxic chemicals. Overfishing threatens sustainability of the world's fisheries, and aquaculture (fish farming) may have negative ecological impacts. Finally, consumer choice affects not only the individual but could have an economic impact on the fishing industry as a whole. Given these competing interests and concerns, seafood safety is a complex and emotional issue for many people.

Food for thought

- Because of toxicants in fish and shellfish and a decline in fish populations, NW Coast natives eat less seafood than their ancestors and less than they would like to. Many tribes have higher than average rates of obesity and diabetes, perhaps as a result of lack of access to healthy, traditional foods. What ethical issues does this raise? What solutions are possible?
- EPA has identified several Superfund sites around Puget Sound. How much should be done to clean up 160 years of industrial contamination? Think broadly about who is responsible and who should be held accountable for the cleanup.
- What can be done to prevent more toxicants from entering our waterways? Who is responsible for prevention?
- How many seafood meals do you eat each week? Do you make decisions based on advice from experts?



Where to go to learn more

WA State Department of Ecology www.ecy.wa.gov/

US Environmental Protection Agency www.epa.gov/

WA State Department of Health Fish Consumption and Healthy Fish Guide www.doh.wa.gov/CommunityandEnvironment/Food/Fish.aspx

Lower Duwamish Waterway Superfund Site Fact Sheet www.doh.wa.gov/Portals/1/Documents/Pubs/334-139.pdf

Which Fish Should I Eat? Perspectives Influencing Fish Consumption Choices <http://ehp03.niehs.nih.gov/article/info:doi/10.1289/ehp.1104500>

Mercury: From Source to Seafood. 10 min video shows a family deciding how much fish to eat, with comments from researchers about seafood safety <http://www.dartmouth.edu/~toxmetal/program-resources/research-translation/mercurymovie.html>

The Ecogenetix Blog www.ecogenetix.org

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