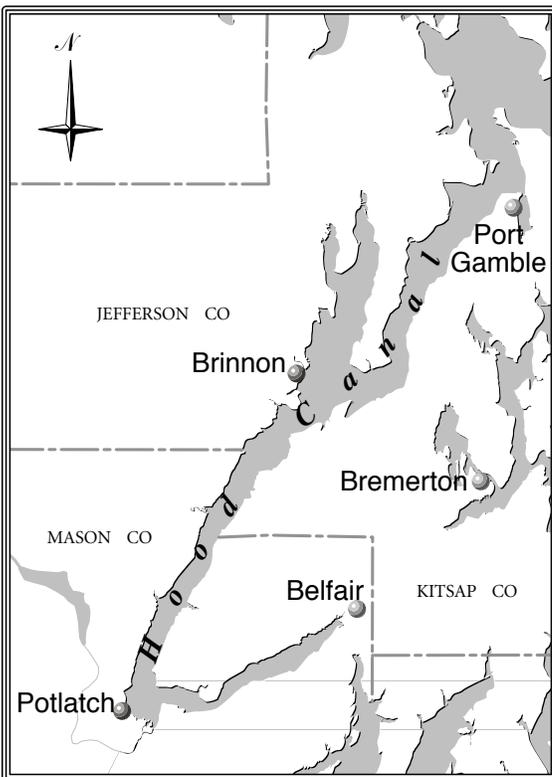


# LOW DISSOLVED OXYGEN LEVELS IN HOOD CANAL

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**F**rom May through September, the deep waters of Hood

Canal may not have enough dissolved oxygen to sustain marine life — a condition known as “hypoxia.” When this happens, very mobile sea life, such as fish and shrimp, move up toward the surface of the water column, where dissolved oxygen levels are higher. However, worms, snails and other less mobile marine animals often cannot escape from the low-oxygen environment.

## Hypoxia in Hood Canal

Hood Canal waters are more likely to have low oxygen levels than other parts of Puget Sound. That’s because the waters at the surface and bottom of the Canal tend to mix less, especially in summer months, when the weather is warm and the breezes are mild. The Skokomish, Hamma Hamma, Duckabush, Dosewallips, Union, Tahuya, Dewatto, Quilcene and other rivers and streams feeding into Hood Canal contribute lighter-weight fresh water, which sits on top of the canal’s denser and heavier salt water — a condition called stratification. Without wind and wave action, this oxygen-rich water does not get mixed into the lower depths.

Plants, especially tiny, free-floating phytoplankton, thrive in the Canal’s warm, stable summer conditions. They feed on the nutrients carried by the numerous

rivers and streams, and contributed by septic systems and other land-based sources. When the plants die, they decompose and sink, gobbling up the dissolved oxygen from the water.

Stratification of Hood Canal is a natural phenomenon. So is the decomposition of dead animals and plants in the aquatic environment. However, excessive nutrients in the water can lead to the abnormal production of plant life. Organic matter running off the land adds to the Canal’s burden. The resulting decay robs Hood Canal’s depths of the oxygen that sea life need to survive.

## How is oxygen produced in Hood Canal?

In the aquatic environment, oxygen is generated by photosynthesis from algae, seaweeds, sea grasses, marsh vegetation and other green plants growing at or near the water’s surface. Oxygen is also mixed into the water from the air at the Canal’s surface. Because of seasonal ocean conditions, water that flows into Hood Canal from other parts of Puget Sound may be relatively high in oxygen. However, as the water stays in the Canal for a period of time, the oxygen may be depleted by fish, shellfish, decaying plant life and other sea life.

## What happens when oxygen levels are low?

All animals need oxygen to live. Some forms of sea life show distress and die at low oxygen levels. Fast-swimming fish and invertebrates such as salmon or octopus are particularly susceptible to hypoxic conditions. As oxygen levels drop, marine animals start to show signs of distress. Fish may surface, flare their gills and gasp for breath. Shellfish might close their shells and stop feeding. Octopus may abandon their eggs, leaving them unprotected from predators. Some animals may acquire parasites or have unusual fungal lesions. Others may become too slow to evade predators.

## What you can do to help

Low oxygen levels in Hood Canal are probably the result of natural phenomena, but there are many

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ways in which human actions can make it worse. We can manage water quality in Hood Canal through a combination of teamwork and individual actions. Each one of us must consider our daily activities and our impact on Hood Canal. Here are a few ways we can help protect the health of Hood Canal:

1. Have your septic system checked on a routine basis, making sure it is working properly. Failing septic systems can release pathogens and excess organic matter and nutrients into Hood Canal. For more information and handy tips, visit the Washington Sea Grant Web site ([wsg.washington.edu/research/ecohealth/septic.html](http://wsg.washington.edu/research/ecohealth/septic.html)).
2. Keep fertilizers and pesticides from entering the water. Follow the directions on the package and use only the amount you need. Even better, consider switching to an organic fertilizer that is less likely to be washed off your property and into the water. If you use moss remover on your roof or sidewalks, consider switching to a less toxic product or removing by hand.
3. Grow shellfish on your beach. By raising and harvesting shellfish, you will help the Canal naturally recycle its nutrient load. You will also

gain an appreciation for the value of good water quality after you've seen your own shellfish thrive. Washington Sea Grant Program offers workshops and guides to help homeowners grow shellfish.

4. Dispose of pet wastes in a certified landfill. It might be easier to spray pet and wildlife feces from your deck or dock into the water; however, it also adds extra organic matter, nutrients and unwanted pathogens to Hood Canal.
5. Keep grass clippings, leaves from gutters and deadheaded flowers out of the Canal. The decay of these materials on the bottom of the Canal removes oxygen from the water.
6. Plant a native vegetative buffer between your bulkhead and the beach to help filter out nutrients, organic matter and other impurities before the water seeps onto the beach.
7. Avoid feeding the seagulls or other wild creatures. These animals should be able to survive on the food they find in nature. By adding excess feed into the environment, we are altering their migration patterns and lifestyles, as well as contributing more nutrients to the water in the form of bird feces.
8. Instead of dumping excess bait at the end of a fishing trip, freeze it and keep it for the next trip.
9. Wash boats, decks and docks with a little "elbow grease" and water, using only a small amount of detergent if needed.
10. If you see abnormal behavior or die-offs of marine life, let someone know. For fish kills, contact Washington State Department of Ecology immediately at 800.OILS 911 and they will mobilize a response. Other unusual sightings should be reported to the Washington Sea Grant Program office in Shelton at 360.432.3054.

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## SOME TERMS THAT DESCRIBE HOOD CANAL WATER

**Anoxia:** a condition in which dissolved oxygen is absent

**Hypoxia:** a condition in which dissolved oxygen levels are low

**Nutrients:** Naturally-occurring chemical forms, such as nitrogen, phosphorus and silica, that are essential building-blocks of plant cells.

**Photosynthesis:** the process by which green plants produce oxygen from water, carbon dioxide and sunlight

**Respiration:** the process by which animals and green plants use oxygen from Hood Canal or other locales to release energy in food

**Phytoplankton:** small plants, or mostly microscopic algae, that grow in the sunlit layer near the surface of fresh and salt water

**Stratification:** a layering of water, with lighter water on top. Water that is fresh (contains little salt) and warm is lighter than cool salt water

Government agencies, university scientists and tribal governments are working to improve the water quality of Hood Canal. You can also play a part, by learning about new ways to process stormwater, sewage and other sources of excess organic matter and nutrients in your community. A team of residents and decision-makers at the local, tribal, state and federal levels can work together to reduce the input of organic matter and nutrients into Hood Canal. We also need to monitor subtle changes in the water quality over time to pick up earlier warning signals of further environmental degradation. To be part of the solution for preventing water pollution, contact Washington Sea Grant Program at 360.432.3054 or [guatemala@u.washington.edu](mailto:guatemala@u.washington.edu).

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