Anatomy of a Fish Kill: Hood Canal August 2026

We understand the dynamics of southern Hood Canal fish kills in general, thanks in part to the HCDOP program and its fish kill observations. We learned that if oxygen is low enough (below hypoxia), when southerly winds blow, the surface layer of the Canal can be pushed away and the deeper low oxygen waters move upwards quickly, leaving fish with no escape but to perish. For the August 2026 fish kill event that affected resident sea life (flounders, ratfish, lingcod, shrimp, octopi), while these factors happened, the question is why was the oxygen so very low, basically anoxic (confirmed with water samples at 0.2 mg/L), this year, the lowest we have recorded for an ORCA buoy?

Some observations that may be critical to understanding the answer are that for all of Puget Sound, not just Hood Canal:

- Seawater temperature has been warmer than average in general during 2025 and 2026. Temperature is important to the oxygen story because it can increase respiration of organisms (consumption of oxygen).
- Dissolved oxygen has been lower than typical. While warmer water holds less oxygen due to changes in solubility, the decrease in oxygen observed greatly exceeds the reduction that can be attributed to a change in solubility alone.

Of all of Puget Sound, due to its depth and slow circulation, Hood Canal is most susceptible to hypoxic conditions. Given the normal tendency for hypoxia, it is apparent that something pushed it even more extreme this year. But this is happening all over Puget Sound, it's just that we don't see fish kills because the typical oxygen in other basins is not that low, so that threshold isn't being crossed.

What could cause the widescale warmer temperatures and lower oxygen throughout Puget Sound and lead to the extreme conditions in lower Hood Canal?

Hypothesized possibilities, which may all be contributing are:

1) Solar heating and retention. We had a warmer than average winter in 2025-6. The heat fluxes in late 2025 showed very high shortwave radiation, indicating sunnier than average heating during fall, with much higher longwave radiation in winter, indicating clouds acting as insulation, trapping the heat, during winter.

2) Increased rate of respiration. Higher temperatures will cause organisms to respire faster. That will contribute to the oxygen deficit. Data show that the decrease in oxygen levels was faster this year than normal.

3) Change in source waters. Puget Sound and Hood Canal receive oceanic waters via the Strait of Juan de Fuca. But we know that oceanic conditions are not constant. Some of the

increased temperature and oxygen here locally could be contributed by ocean waters with higher temperatures and rates of respiration, or oxygen consumption by organisms.

4) Drought and less flushing. Persistent drought conditions led to higher seawater salinity. The oceanographic flushing of estuaries is driven by changes in seawater density, and salinity is a major determinant. The flushing of Puget Sound and Hood Canal is still happening, but it is possible that it is less efficient, meaning that the residence time of the waters is longer, accumulating more biological respiration, which consumes oxygen.

We do see that the seasonal oceanic intrusion this year is presently happening in Hood Canal and is bringing in higher oxygen waters at depth, visible now at Hoodsport. We hope that this will mix away the lower Hood Canal anoxia. But we also know that the anoxic waters in lower Hood Canal may 'squirt' northwards and bathe the mainstem. How this plays out is not certain and depends on so many factors.

Real-time and monthly data useful to this story can be found at a variety of sources below.

- Access to ORCA buoy data operated by UW for NANOOS and WOAC can be found here: https://nwem.apl.uw.edu/index.shtml
- Access to oxygen data for Washington and Oregon coastal and other Puget Sound sites can be found here at NANOOS: https://www.nanoos.org/documents/misc/NANOOS_Hypoxia_Watch_2026_09_04.pdf
- Marine water column data are available via Ecology's Environmental Information Management database and can be found here: https://apps.ecology.wa.gov/eim/search/SMP/MarineAmbientSearch.aspx?StudyMonitoringProgramUserId=MarineAmbient&StudyMonitoringProgramUserIdSearchType=Equals