Abstract:

Marine water in South Puget Sound has been the focus of ongoing water quality concerns. Concentrated, frequent, vast algal bloom and jellyfish aggregations in all finger inlets of South Sound during 2011 and currently in 2012. These features align with a 13-year increase in macronutrients in surface waters. In 2012 the water column was unusually cold and significantly fresher. As a result oxygen levels at depth noticeably recovered. Our observations illustrate the importance of climate variability and distant oceanic influences for the South Puget Sound oxygen budget.

Conclusion

Following Puget Sound-wide trends, South Sound has seen a decline in phytoplankton biomass in the water column since 1999. During the same time, nutrient concentrations have steadily increased and nutrient ratios have shifted. The conditions give smaller opportunistic algal species ideal growth conditions. Starting in 2011 we have documented large and lasting blooms at the surface. A recent coordination with the Squaxin Tribe and the SoundToxins Program confirmed the high abundance of marine dinoflagellates. Often red-brown blooms are accompanied by extensive jellyfish aggregations.

Historic trends (1999 - 2011)

Two years in review (2011 and 2012)

Colder

Fresher

More Oxygen

Marine Flights

Moorings

Cold spell

We use a float plane as a cost-effective means to collect marine samples monthly throughout Washington's extensive marine waters. We lower a CTD package carrying 4 Niskin bottles and 9 in situ sensors to full depth.

We deployed a mooring package off the Carlyon Beach dock floating at 3.3 m depth. The mooring package (model SBE 16+ and SBE 43) measures temperature, conductivity, density, salinity, and dissolved oxygen. (Deomrsoned 3/1/12)

During the week of January 14-21, 2012 water temperature dropped rapidly (-1.0°C), salinity values temporarily increased (retention of frozen water on land), and dissolved oxygen concentration decreased (0.4 mg/L). Arrow shows the period of the cold snap followed by snow melt.

Cold spell affects Puget Sound water! A monster Pacific Northwest storm coated Washington with freezing rain on Thursday January 19th, 2012 and brought much of Washington State to a standstill. [USA Today]