

Cross-system comparison of factors influencing chlorophyll-*a* concentration in Oregon estuaries.

Caitlin L. White, Cheryl A. Brown & T Chris Mochon Collura

Water column chlorophyll-*a* (chl*a*) is a proxy for phytoplankton biomass and is often used as a biological response indicator of eutrophication. Although watershed nutrient loading may influence chl*a* concentration in estuaries, factors such as freshwater inflow, residence time, and import from the coastal ocean can also play a role. Despite the importance of chl*a* as an indicator for ecosystem management, there is a paucity of published data for estuarine systems in the Pacific Northwest. We performed a cross-system comparison of 15 Oregon estuaries using two decades of chl*a*, nutrient, and freshwater flow data obtained from state, federal, and tribal sources to determine principal drivers of chl*a* in those systems. Dry season (May – October) median and 90th percentile concentrations of chl*a* were assessed. Chlorophyll *a* in all 15 estuaries was low compared to other systems in the U.S., with median concentrations less than 3 µg/L in nearly all systems. This difference is likely due to higher freshwater flows and strong tidal flushing; however, import of chl*a* from the coastal ocean can lead to elevated concentrations near the mouth of some systems. Chlorophyll *a* levels in Oregon estuaries typically fall well below the state of Oregon's chl*a* standard (15 µg/L).

Keywords: chlorophyll-*a*, estuaries, nutrients, water quality standard.