2024 Analysis of *Alexandrium* Cysts in Bed Sediments of Bellingham Bay in Puget Sound, WA

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Alexandrium catenella, a toxic dinoflagellate, produces saxitoxin that can bioaccumulate in shellfish with the potential to cause paralytic shellfish poisoning (PSP) when consumed by mammals. To determine the probability of future harmful algal blooms (HABs), *Alexandrium catenella* abundance is monitored in its resting cyst form within sea floor sediments. Since 2005, Bellingham Bay, WA, has been a known seedbed for cysts and has continually been noted as a bay with high potential for recurring HABs. In June 2024, sediment samples were collected from Bellingham Bay at Washington State Department of Ecology stations at sediment depths of 2–5 cm using a 0.1 m² stainless steel van Veen grab sampler. Samples were stained with Primulin, and cysts were counted under epifluorescence. Surface sediment properties, including total organic content (TOC) and median grain size, were also analyzed for possible correlations with redox conditions and sedimentary structures. The average cyst counts across all stations were 61 cysts/cc (wet) and 178 cysts/cc (dry). The highest cyst count (183 cysts/cc (wet) and 567 cysts/cc (dry)) was found near the middle of the bay. No cysts were found in 2 stations. There was no correlation found between cysts, TOC, or median grain size within Bellingham Bay surface sediments in 2024. Thus, mechanisms affecting cyst abundances in surface sediments need to be further investigated. This is particularly true in Bellingham Bay, where cyst concentrations are consistently high, indicating the need for continued monitoring to inform stakeholders of potential human and ecosystem health risks.