Concentration of Chlorophyll in 2018 Bed Sediments from the Salish Sea

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Chlorophyll, the green pigment found in plants, algae, and cyanobacteria, plays a critical role in photosynthesis by capturing light energy and converting it to chemical energy. This process drives primary productivity, which is the foundation of most marine food webs. In marine environments, such as the Salish Sea, chlorophyll-a concentrations can serve as indicators of ecosystem productivity and biological responses to environmental changes. In partnership with the Washington State Department of Ecology (DOE), this project analyzed chlorophyll-a and pheophytin concentrations in bed sediments collected during the 2018 Puget Sound Ecological Monitoring Program (PSEMP) Sediment Survey. Sediment samples were analyzed using fluorescence, involving solvent extraction and fluorometric quantification. Focusing on bed sediments allows for an understanding of the long-term accumulation of chlorophyll, offering a historical examination of primary productivity and ecosystem changes. Preliminary results show chlorophyll-a concentrations ranging from 42.34 µg/mL to 152.71 µg/mL, with an average of 89.57 µg/mL. This work can be used to correlate relevant evidence that periodic heat waves have impacted the concentration of chlorophyll measured in sediments. The outcomes of this project will be used to connect how climate-related factors may affect habitat health through monitoring chlorophyll-a concentration in bed sediments. Future investigations will include connecting results to a time series from 2014 to the present of known warming anomalies in the Salish Sea.