

2024 Analysis of Chlorophyll in Bed Sediments within Bellingham Bay in Puget Sound, WA

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Chlorophyll is the essential molecule in the process of photosynthesis. Chlorophyll-a is the isomer of chlorophyll that is present in almost all plant life. Due to its ubiquitous presence, chlorophyll-a has been demonstrated to be an accurate reflection of primary production within the water column. This study was to determine baseline chlorophyll concentration within estuarine benthic sediments to correlate with climate change. Thirty samples from pre-selected stations within Bellingham Bay were collected by the Washington Department of Ecology as part of the Puget Sound Environmental Monitoring Program (PSEMP). Samples were collected using a van Veen grabber and placed in a black trash bag within an ice filled cooler. Cells were ruptured by freezing samples for 24 hours, chlorophyll was then extracted from the chloroplast using a 90% acetone solution, extracted chlorophyll concentration was determined using a Turner Trilogy Fluorometer. Sediment particle size was classified using a laser diffractometer. This study found that minimum and maximum concentrations of wet chlorophyll-a were 133.46 µg/L and 218.78 µg/L, respectively. Geospatial analysis of chlorophyll-a concentrations indicates two concentration peaks at stations 35 and 299, with concentrations slowly decrease while approaching Bellingham Bay. This data contributes to the greater body of work regarding productivity trends in the Bellingham Bay basin within Puget Sound. Further investigation into this region is called for in order to assess the effect of climate change over time.