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

Authors' list: Simon Shipp and Julie Masura

Phytoplankton synthesizes chlorophyll to generate energy through photosynthesis, so measuring the concentration gives insight into the productivity, thus the health of ecosystems. This project measured the chlorophyll concentration of sediment collected from nineteen locations in Bellingham Bay in 2024 by partners from the Puget Sound Ecosystem Monitoring Program. As part of a summer research experience course, seven samples were prepared in triplicate by mixing a subsample of sediment with acetone to solubilize the cells and release the chlorophyll. The supernatant was analyzed using a Trilogy Laboratory Fluorometer by Turner Designs to measure the concentration of chlorophyll-a and pheophytin. The average chlorophyll-a was 17555.66079 mg of chlorophyll per liter of solution, and the range was from 10550.39869 mg/L to 24135.70773 ug/L. The concentrations were compared to two sediment properties, total organic content (TOC) and the median grain-size. TOC is created in a productive environment, and grain-size indicates energy in a system. There was a moderate negative correlation between the chlorophyll concentration and the total organic content, with an R^2 of 0.5967. There was also a poor correlation between the median grain size and the chlorophyll concentration, with an R^2=0.4341. This work contributes to understanding the relationship between ecological productivity and environmental factors. NOTE: The low number of samples analyzed was due to the inability to access the lab for part of the summer.