

Undergraduate Research Symposium May 17, 2013 Mary Gates Hall

Online Proceedings

POSTER SESSION 4

Balcony, Easel 107

4:15 PM to 5:45 PM

Seasonal Effects on Dissolved Oxygen and Temperature in Possession Sound

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Mentor: Ardi Kveven, Ocean Research College Academy, Everett Community College

Mentor: Robin Araniva, Life Sciences, Everett Community College

Possession Sound is a complex estuary system branching off of NE Puget Sound. It is home to an abundance of organisms, primarily birds and mammals, and a multitude of environmental factors which influence them constantly, including the Snohomish River, tides, and anthropogenic factors. Buoy, the station we studied, is one of four stations in Possession Sound used by Ocean Research College Academy (ORCA) students to collect data on the state of Possession Sound. Its position in the Sound, at the mouth of the Snohomish River, allowed us to analyze data that is more diversified than the information from other stations. We compared dissolved oxygen (DO) and temperature trends from past years at the Buoy station. We found that in the winter of 2012, in comparison to 2010 winter data, the range was less extreme, with DO ranging from 7.58 mg/L at 8 meters and 11.02 mg/L at sea level, while winter data from 2012 showed DO being 11.47 mg/L at 0 meters and 6.91 at 7 meters. Based on our findings at Buoy we can infer that there has been a change in the seasonal conditions affecting DO and temperature between 2010 and 2012, resulting in increasingly extreme ranges of data in the water column. This suggests that DO and temperature trends could develop wider ranges of data in the future if the factors contributing to the increase in variability of the ranges of these two parameters remain prevalent.

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Stratification and Seasonal Trends of Fecal Coliform and Other Bacteria in the Water Column

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Possession Sound is a smaller estuary within the northeast arm of Puget Sound, with influence from the Snohomish River. As a result of the watershed runoff into the Snohomish River, fecal coliform and other bacteria are present in the Possession Sound water column. We hypothesized that the most fecal coliform and other bacteria would be found at the surface and halocline (the zone of rapid increase in salinity) of the water column. The density difference would therefore trap the bacteria in or above the halocline. Low salinity surface water from the Snohomish River is the vector of fecal coliform due to warm-blooded animals. To determine the distribution of fecal coliform and other bacteria we referenced historical data from past State of Possession Sound (SOPS) cruises collected by Ocean Research College Academy (ORCA) students at the research station Buoy. The location Buoy is near the Snohomish River and therefore has a strong influence from the river discharge. We tested for fecal coliform at North Jetty (NJ) another location near the river. Using a sediment grab we collected samples of sediment and tested them for fecal as well. River discharge and watershed runoff change seasonally, affecting the depth and strength of the halocline so we categorized the data by season in order to find any correlation. The data shows during times of strong stratification, only a single fecal coliform at the surface, whereas an average of twenty other bacteria colonies were found at the surface. At the halocline there were no fecal coliform, but on average four other bacteria. In the deep layer there were no fecal coliform and on average two other bacteria found. The seasonal analysis of the same data demonstrates that fall months had the highest concentration of other bacteria and winter contained the most fecal.