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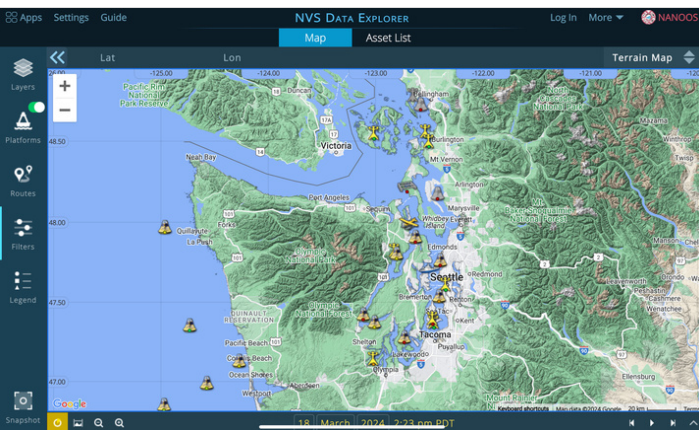
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The Impact of Runoff on pH Levels in the Salish Sea?

AFFILIATIONS

WCC

How does the runoff affect the pH level in the Salish Sea?



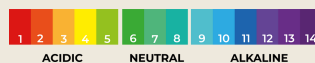
01. Introduction

This research paper aims to investigate how runoff affects the pH level in Salish Sea. Runoff — which can carry pollutants and chemicals from urban and agricultural areas, has the potential to contribute to changes in the pH level of the seawater. Through a review of relevant publications and analysis of water quality data from the Salish Sea, this study will explore the relationship between runoff and pH levels in the marine ecosystem.

03. Methodology

- To investigate the relationship between runoff and pH levels in Puget Sound, water quality data from monitoring stations (Nanos) across the sound will be analyzed.
- These data will include pH levels, nutrient concentrations, and other parameters relevant to water quality.
- The data will be analyzed to identify potential correlations between runoff sources and changes in pH levels.

1. Research
2. Collect data
3. Compare results
4. Present



04. Results/Findings

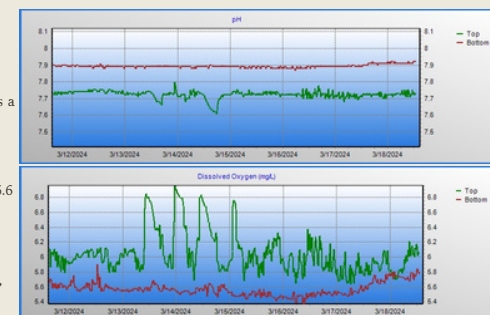
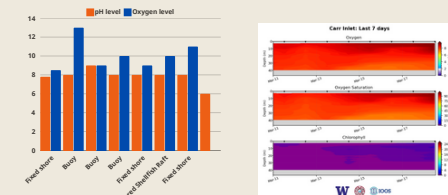
pH Level - Oxygen:

1. The pH level at Elliott Bay is 7.8mg/L, while the oxygen level is 8.5mg/L. (charts below)
2. At Point Williams Buoy, the pH level is 7.9mg/L and the oxygen level is 13mg/L.
3. Port Susan Buoy has a pH level of 8.5mg/L and an oxygen level of 8.6mg/L.
4. Friday Harbor Lab recorded a pH level of 7.9mg/L and an oxygen level of 10mg/L.
5. Bellingham Bay has a pH level of 8.4mg/L and an oxygen level of 9.1mg/L.
6. At Whidbey Island, the pH level is 8.1mg/L and the oxygen level is 10mg/L.
7. The pH level at Vashon Island is 7.7mg/L, with an oxygen level of 11mg/L.
8. Carr Inlet has a pH level of 6.6mg/L.

Runoff impacts:

Based on the pH levels of the various locations we found, it can be seen that there is a range of pH levels observed in the runoff data. The pH levels generally range from slightly acidic to slightly alkaline, with most falling within the range of 7.7 to 8.6 mg/L. There are also some outliers, such as the Carr Inlet which has a lower pH level of 6.6 mg/L. The presence of outliers with lower pH levels may indicate potential contamination or pollutants in the runoff.

75 percent of toxic chemicals entering the Salish Sea come via roads, driveways, rooftops, yards, and other developed land.



02. Hypothesis

The runoff from urban and industrial areas will lead to a decrease in pH levels in the Salish Sea.

=> This is because runoff can introduce pollutants and chemicals that can change the chemistry of the water, causing a decrease in pH

Citations

- NVS Nanos. "NVS Explorer." n.d. <https://nvs.nanoos.org/Explorer>
- RE Sources. "Polluted Runoff." n.d. <https://www.re-sources.org/initiative/polluted-runoff/#:~:text=75%20percent%20of%20toxic%20chemicals,drink%20from%2C%20and%20swim%20n.>
- Washington State Department of Ecology. "Runoff Pollution." n.d. <https://ecology.wa.gov/water-shorelines/water-quality/runoff-pollution>

05. Analysis

• pH and Oxygen level Correlation:

From the data we found in various locations of the Salish Sea, there seems to be a correlation between the pH levels and oxygen content in the water. Higher pH levels correlate with higher oxygen levels, which suggests a healthier marine ecosystem.

• Runoff Impacts based on our data set

The range of pH levels found in the data from 7.7 to 8.6mg/L shows the diverse water quality across different areas. The outlier of pH 6.6mg/L indicates potential pollution issues that could need further attention.

- Normal range of pH in an estuary range from 6.5 to 8.5, but typically stays in the 7.0 to 7.5 area in the fresher sections where the ocean meets freshwater.
- May also range from 8-8.6 in more saline areas, typically found deeper in the ocean than on the surface where it tends to be fresher
- Because fresh water is less dense, it stays on top so it may be challenging to get accurate data.
- Our results were consistent with our hypothesis with some outliers, but mostly showing the relationship between the pH levels and oxygen levels. demonstrating how that affects the health of the Salish Sea.

06. Discussion + Conclusion

- Heavy rainfall can result in a decrease in the pH levels from 6.8 to 7.4, which alters the water's acidity.
- Acidity levels can impact and disrupt the environment of marine life and cause imbalances in the ecosystem.
- Agricultural runoff can contribute to a decrease in pH levels.
- Wastewater discharge can be a factor in the health of the Salish Sea, with several implications.
- It is important to monitor pH levels and monitor runoff to protect the marine ecosystem of the Salish Sea.



Charts

