How Size and PH Affects Creatures Under Rocks

Theodore Kenyon, and Amariah Raga
Oceanography

Research Question

How does the size of rocks and PH of rocks affect the creatures underneath?

Background

In our background research there was a clear indication that PH changes has decreased the number of organisms found in our beaches. They took tests of the oceans PH and did a similar experiment to us and found that lowering PH had less organisms that could thrive. Which matched with our data. (Crummet, 2020)

We also found that climate change is also changing the organisms found in the Salish Sea. They took data from previous years and went and tested the area now to find that there was a significant decrease in the organisms than previous data recorded. (Simon, Adamczyk, Basman, 2022)

Methods

Materials

The materials we used for this project were: Our hands to lift rocks, pen and paper to record, phone to take pictures of everything to be able to double check our data, and PH strips to test the PH of the water under rocks against the ocean.

Procedure

Our procedure:

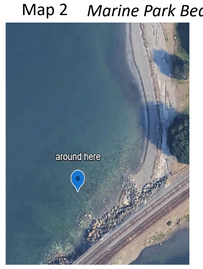
1. Test PH of ocean and under different rocks at different areas
2. Lift up 25 small rocks and count creatures that are underneath
3. Repeat with 25 Big rocks
4. And record the data in a notebook

Figure 1. This was a picture under one of the big rocks that had a crab

Locations

Map 1. Birch bay state park

Map 2 *Marine Park Beach*



Map 3 *Locust Beach off of Locust Avenue*

Table 1. A brief description of what this title illustrates, include the types of methods, the titles and appropriate units

Descriptive Title for your Figure

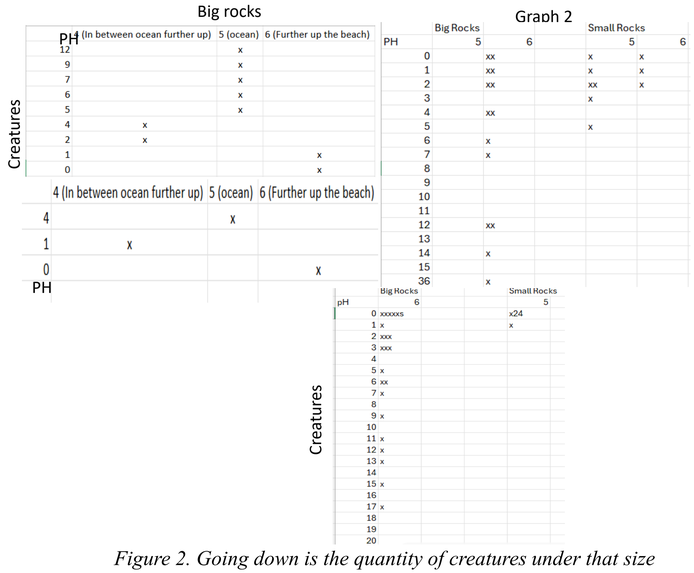


Figure 2. Going down is the quantity of creatures under that size rock and going across is what pH they were found in. As you can see there is a large increase in the number of creatures under big rocks with a higher pH

Discussion (or separated into: Interpretations, Implications & Limitations)

We initially thought that bigger rocks with a higher pH would have higher concentrations of creatures. Our data suggests our hypothesis was correct. The highest concentration under small rocks with a pH of 5 was 4 of any one type of creature. The highest number of organisms under a big rock was 35 organisms. (Specifically, 34 sea snails and one crab.)

We think that more creatures swarmed under bigger rocks with higher pH is because it was closer to a neutral pH, therefore less damaging to their membranes and shells. It was hard to be exact as our study group was rather small, only turned 150 rocks and took 15 pH tests. We also were unable to bring the more accurate pH probe to the beach.

If we were to re attempt this study, with any tool at our disposal, we would test the pH, with the most accurate probe, and count the quantity of creatures under a minimum of 1000 rocks. It would be done in the height of summer to ensure maximum creatures are present. We believe this study implies that creature's avoidance of low pH is due to its more harmful effects.

Acknowledgements

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Works Cited

Crummett, Lisa T. (28 Oct. 2020) "Acidification decreases microbial community diversity in the Salish Sea, a region with naturally high pCO2." *PloS one* vol. 15,10 e0241183. 28 Oct. 2020, doi:10.1371/journal.pone.0241183

Liliana. (Undated.)"How Change in pH Levels is Effecting the Ocean in the Pacific Northwest. Whatcom Community College. Student paper.

Simon, Andrew D F et al. (10 Mar. 2022). "Toward an atlas of Salish Sea biodiversity: the flora and fauna of Galiano Island, British Columbia, Canada. Part I. Marine zoology." Biodiversity data journal vol. 10 e76050. doi:10.3897/BDJ.10.e76050