Plankton & pH

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Research Question & Background

We desired to study how ocean acidification affects the growth and productivity of algae in Whatcom County, Washington. Phytoplankton (algae) are primary producers that serve as the starting point of marine food chains by converting sunlight and nutrients into organic matter via photosynthesis (NOAA 2023). Ocean acidification is a major concern for marine ecosystems (Thomas 2021). The Salish Sea is vulnerable to pH changes due to ocean acidification caused by increased CO2 absorption. We wished to better understand the effects of pH in productivity and growth of phytoplankton and zooplankton in Whatcom County, Washington.

Phytoplankton are plants and zooplankton are animals. Acidic conditions resulting from lower pH levels can affect zooplanktons survival, development, and reproduction. For phytoplankton, acidic conditions can inhibit their growth and photosynthetic activity, potentially leading to a decline in their populations. This reduction in phytoplankton abundance can disrupt the entire marine food web, impacting organisms at higher trophic levels.

Methods

To conduct this research, we decided to collect our data at Bellingham Bay, Larrabee Beach, and Birch Bay. We took three samples onshore measuring out the pH levels of each location. To catch plankton, we used a plankton net. Afterwards, we then took the samples to the lab to identify the type of plankton with three drops of water from each container using a microscope. We did three different trials with each of our water samples and decided to base our data on the numbers and variety of organisms we were finding.

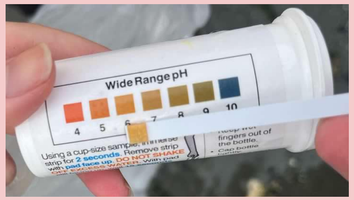

Figure 1. pH level result in Bellingham Bay

Figure 2. pH level result in Larrabee Beach

Figure 3. pH level result in Birch Bay

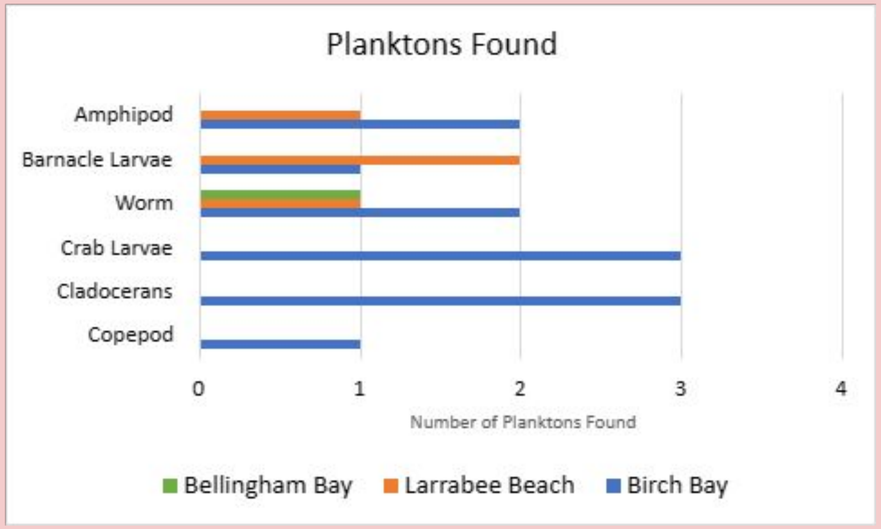

Table 1. Planktons found in Birch Bay, Larabee Beach, and Bellingham Bay.

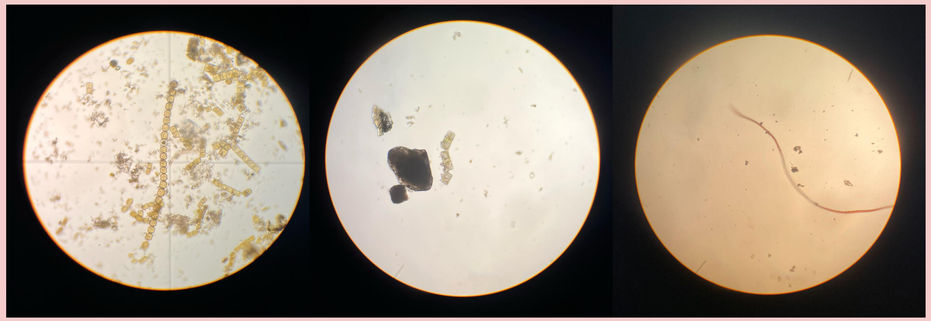

Figure 4. Actual photo of planktons found in microscopes. (1. Diatom in Birch Bay; 2. Diatom in Larrabee; 3. Worm in Bellingham Bay)

Figure 5. Amphipod

Figure 6. Copepod

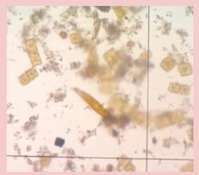

Figure 8. Worm

Figure 7. Copepod

QR code for the video of "Planktons in Birch Bay"

Interpretations and Limitations

Based on our data we might be able conclude that there's less algae growth in areas with lower acidification. However, our data is not conducive to this as we were fairly limited. Since we couldn't get samples from deeper water for comparison, all of it was shoreline. The phytoplankton we found were mainly diatoms. This could be because they require sunlight for photosynthesis so with the lack of sunlight in the days coming up to us collecting samples, there's a good chance the phytoplankton were lacking. The majority of our findings were zooplankton. While we were at Birch Bay we lost the net in the water. It sat for a while before we retrieved it so this could be why Birch Bay had far more organisms than Larrabee or Bellingham Bay. In all the samples we found diatoms. In Bellingham and Larrabee we found an average of 3-4 diatoms. Birch Bay had a ton of diatoms scattered around. Our pH levels are very close to each other and it challenges us to make an interpretation about the effects of ocean acidification in planktons in Whatcom County. More information from other local beaches would be needed to answer our question.

Location	pH Level
Birch Bay	7.2
Larabee Beach	6.5
Bellingham Bay	6.5

Acknowledgements

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Work Cited

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