CALIFORNIA SCIENCE & ENGINEERING FAIR
2019 PROJECT SUMMARY

Name(s)

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Project Number

J0918

Project Title

Which Beach Has More Toxic Phytoplankton?

Abstract

Objectives

Thousands of marine mammals have been killed by paralytic shellfish poisoning (PSP), caused by consuming toxic shellfish. How did the shellfish get toxic? Research shows that it starts with toxic phytoplankton. In order to reduce such deaths, including damage done to humans who consume toxic shellfish, the location of toxic phytoplankton is vital to research. Here in San Diego, which beach has the most toxic phytoplankton, Oceanside or Pacific Beach? The hypothesis is that Oceanside Beach will have more because it is closer to the northern California coast, where large concentrations of toxic phytoplankton have been found.

Procedure: Phytoplankton was collected from Pacific Beach Pier and Oceanside Beach Pier weekly for four weeks using a phytoplankton net. While at the piers, water temperature was observed. The specimen collected was then brought back to the student s home to test salinity and identify phytoplankton.

Results: There were more toxic phytoplankton found in Pacific Beach. The most toxic phytoplankton sampled was Alexandrium, found at both piers, but slightly higher in Pacific Beach (4 to 3). Other toxic phytoplankton such as Pseudo-nitzschia, were equal in both beaches. Nitzschia was slightly higher in Pacific Beach at 2 to 1. The most frequent phytoplankton sampled was Ceratium Fusus. The least frequent were Cerataulina, Ditylum, Isthmia, Licmorpha, Lingulodinium, Nocticula, Pleurosigma, Rhizosolenia, and Scrippsiella. The average number of phytoplankton is 1.7 in Pacific Beach Pier and 1.5 in Oceanside Pier.

Conclusion: In the hypothesis, it was predicted that there would be more toxic phytoplankton found in Oceanside Beach Pier. Based on the results, the hypothesis was incorrect. The amount of phytoplankton found was more concentrated in Pacific Beach as well as more toxic phytoplankton found there as well. This shows that research should be done along the San Diego coastline, not solely in the northern part of the county.

Methods

Materials:
large phytoplankton sampling net
50 foot marine rope
Large testing tubes (2)
Microscope
Microscope slides & covers
Thermometer

Summary Statement

I tested the water at two different beaches to investigate which one had more toxic phytoplankton that can impact the health of human & marine ecosystems.

Help Received

The California Department of Public Health provided me with the catching net and the microscope. I collected the water by myself, but got help when the net was heavy and I tested for the phytoplankton my self.