



CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

Name(s) Gavin Peters	Project Number S0919
Project Title Phytoplankton Assemblage Composition at White Point Hydrothermal Vent	
<p style="text-align: center;">Abstract</p> <p>Objectives It is the primary objective of this research to develop a better understanding of the ecophysiological conditions leading to toxic algal blooms. Through water analysis and phytoplankton composition comparisons from three locations in the shallow waters off White Point, CA, this project was designed to discover if nutrients from vent effluence, specifically nitrates and phosphates, as well as increased temperature contributions would create an ideal environment for harmful phytoplankton to proliferate. The hypothesis was a unique signature of phytoplankton would be present in association with an active hydrothermal vent site.</p> <p>Methods The California Department of Public Health (CDPH) Marine Biototoxin Monitoring Program supplies volunteers with a 20 µm mesh phytoplankton net, data spread sheets, and microscope observation protocols. Using an OMAX digital compound LED microscope, plankton samples were averaged to obtain an accurate representation of relative abundance for each organism observed. The tallied data and water samples were sent to Richmond, California for verification by CDPH Environmental Management Branch experts. Twelve samples were examined during a week in November and abundance compositions were compared between three locations.</p> <p>Results Patterns were highlighted using data spreadsheets to uncover which organisms were prevalent at each sample location at White Point Beach. The Cyanobacteria produced in association with the active hydrothermal vent site were over three times greater than the other two locations. Navicula, Cylindrotheca, and Licmophora were also observed consistently across samples taken above the hydrothermal vent.</p> <p>Conclusions The hypothesis that a unique signature of phytoplankton could be found associated with an active hydrothermal vent site was supported by the results. This indicates the importance for further research to address the knowledge gap among toxin-producing phytoplankton in connection to its ecophysiological niche.</p>	
Summary Statement I investigated a novel association between the organisms that cause harmful algal blooms and hydrothermal vents.	
Help Received Dr. Elizabeth Trembath-Reichert, at Woods Hole Oceanographic Institution, suggested that I investigate the hydrothermal vents at White Point. My project design was reviewed by Carl Carranza at the Cabrillo Marine Aquarium.	