



CALIFORNIA STATE SCIENCE FAIR 2017 PROJECT SUMMARY

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Project Title California Tide Pools: Environment in Crisis? What We Can Learn from Algae and Rocks?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals California's local tide pools are home to thousands of species of organisms that are vital to our aquatic ecosystem. Largely due to human impacts, these ecosystems are becoming increasingly threatened. The purpose of this project is to examine how human induced climate change is affecting our local algae populations as a proxy for the overall health of Southern California tide pools through the testing of the following three hypotheses:</p> <ol style="list-style-type: none">1. Populations of Sargassum multicum, an invasive algae species, will have increased over the last four years, impacting tide pool life.2. Healthy populations of coralline algae will have decreased over the last four years due to ocean acidification and warming.3. The distribution of algae is not random but is governed by the rock formations forming the tide pools. Thus, rising sea level may also impact tide pool life. <p>Methods/Materials This project was conducted using 10 m line transects to calculate the percent cover of different species of sessile marine invertebrates. Three to four of these transects were used for each of the two localities. 24 species of algae were identified and normalized to 100 percent.</p> <p>Results Comparison of percent cover data for each of the algae species with data from a 2012 study conducted using the same methods and localities demonstrates that the distribution of algae has changed dramatically since 2012. S. muticum shows a significant decrease at both localities. Coralline algae increased at both localities but 30 to 50 percent of the coralline algae was dead or bleaching. Finally, data showed that species have very strong distribution correlations to types of geologic outcrops.</p> <p>Conclusions/Discussion Major inferences about the current and future health of our local tide pools can be made. S. muticum, previously thought of to be a major problem on our coastline, is not as big of an issue as projected and may actually be declining. Second, although percent cover of Coralline algae has actually increased in the past four years, populations of healthy colonies are in decline and finally, rock formation has a dramatic effect on the species distribution. Furthermore, the strong correlation between some of the most common algae with the tide pool geology is worrisome as current projections suggest rate of sea level rise will be much more rapid than erosion of coastal rock formations which are essential</p>	
Summary Statement Analysis of the impact of human induced climate change on tide pools in California indicates that tide pools have been impacted by environmental factors.	
Help Received	