



**CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY**

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| Name(s) Brian Zhang | Project Number S1120 |
| Project Title Analyzing a Method to Measure the Health and Stability of the Salt Marsh by Various Biotic and Abiotic Factors | |
| Abstract Objectives/Goals Salt marshes are an important ecosystem, providing services to many species, but are declining due to factors such as global warming and pollution. This investigation attempts to formulate a method to measure the salt marsh health. Methods/Materials First, 3 125mL samples were removed from the salt marsh by use of a plankton net. 10 drops of acetone was spread across a paper filter by use of a glass pipette, and the first 125mL sample was ran through the filter, where the acetone extracted the chlorophyll. Chlorophyll absorbance was found by using a spectrophotometer. Plankton density was found by counting the number of plankton in a certain volume and dividing the number of plankton by volume. The number of algae was counted by use of the hemocytometer. Results From analyzing the data, an increase in one of the variables was matched by an increase in the others. Total numbers of birds were higher when the densities and numbers of the other factors such as plankton density were higher. Over time, the average number of birds dropped due to winter migration, but relative rises and increases were still possible to observe. Conclusions/Discussion The conclusions of this investigation demonstrated a number of concepts. Salt marsh health relies upon stability, so health cannot be measured by the success of just one organism. High tide results in an influx of organisms due to water gain, attracting higher numbers of birds, while low tide reduces productivity because producer organisms are lost with the water draining back to the ocean. Overall, salt marsh health is evaluated by multiple factors. | |
| Summary Statement The project is determining an accurate method to measure the health of the salt marsh so government measures that are being taken can be proved successful and continued and those that do not can be stopped, conserving time and resources. | |
| Help Received Lab supplied equipment, project developed and conducted independently of facility, parents helped drive | |