



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Stacey S. Dojiri	Project Number S1707
Project Title The Effects of Ocean Acidification on the Larval Shell Development and Calcification of the Red Abalone	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals This project focuses on the effects of increasing atmospheric CO₂ and decreasing pH on the development and calcification of larval red abalone shells.</p> <p>Methods/Materials Female and male abalone were induced to spawn. Fertilized eggs were then siphoned into a beaker and a homogenous mixture of embryos was pipetted into each experimental bowl. There were 6 bowls per gas chamber. Four gas chambers were used: a control injected with 200 mL of air, one injected with 200 mL of 10% CO₂, another injected with 400 mL of 10% CO₂, and the fourth injected with 600 mL of 10% CO₂. After 48 hours, final water quality measurements were taken. The larvae were transferred into culture flasks and examined under an inverted microscope.</p> <p>Results In the control chamber, 99.67% of the abalone developed normally. In the chamber injected with 200 mL CO₂, 91.17% developed normally. 29.83% of the abalone in the 400 mL CO₂ chamber developed normally, and only 1.33% developed normally in the 600 mL CO₂ chamber.</p> <p>Conclusions/Discussion My hypothesis that increasing levels of CO₂ and decreasing levels of pH would cause the abalone shells to develop abnormally was supported strongly by my results. These results clearly show that ocean acidification is impairing abalone growth and survival. This study is significant because red abalone are endangered, and the decrease in their populations has both environmental and economic effects.</p>	
Summary Statement This project focuses on the effects of increasing atmospheric CO ₂ and decreasing pH on the development and calcification of larval red abalone shells.	
Help Received Rodeline Estiva helped with spawning abalone; Dawn Petschauer taught me how to calibrate pH meters and use the CETIS data analysis program; Masahiro Dojiri oversaw and supervised the project.	