



**CALIFORNIA STATE SCIENCE FAIR  
2011 PROJECT SUMMARY**

<b>Name(s)</b> <b>Jessica W. Luo</b>	<b>Project Number</b> <b>S1509</b>
<b>Project Title</b> <b>The Effect of Ocean Acidification on Ocean Productivity</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The purpose of my investigation is to study the influence of ocean acidification on growth rates of phytoplankton in Santa Monica seawater through in-situ incubation. <b>Methods/Materials</b> To carry out the investigation, I took five seawater samples from Will Rogers State Beach in Los Angeles, added phosphate and nitrate as nutrients to enhance phytoplankton growth, then adjusted the seawater pH to a range between 6.15 to 8.4 using hydrochloric acid and sodium hydroxide. Then, I incubated the five samples in a swimming pool for 2 weeks. During the two weeks, I collected particulate phytoplankton from water samples every other day, at approximately the same time, using a fiber glass filter. The amount of total organic carbon in the particulate material was analyzed by a TOC analyzer. pH in the water samples were monitored using a pH meter. <b>Results</b> After analysis, my hypothesis is proved to be correct. Phytoplankton growth is slower in acidic samples (initial pH of 6.15 and 6.63) than that of the neutral and basic samples (initial pH: 7.09, 8.13, and 8.4). The TOC change during the two weeks in acidic samples is 0.4 mg/kg and -0.35 mg/kg (pH 6.15 and 6.63, respectively). As for the non-acidic samples, TOC change is 1.3 mg/kg, 2.26 mg/kg, 2.97 mg/kg (pH 7.09, pH 8.13, and pH 8.4, respectively). <b>Conclusions/Discussion</b> Seeing that acidity had drastically slowed growth rates of phytoplankton in the ocean, I conclude that ocean acidification caused by anthropogenic carbon dioxide released to the atmosphere does, in fact, adversely affect the growth of phytoplankton in the surface ocean.	
<b>Summary Statement</b> The study of the influence of ocean acidification on growth rates of phytoplankton in Santa Monica seawater through in-situ incubation.	
<b>Help Received</b> Father helped analyze samples for carbon at his university.	