



# CALIFORNIA STATE SCIENCE FAIR 2010 PROJECT SUMMARY

<b>Name(s)</b> <b>Sabrina L. Houston</b>	<b>Project Number</b> <b>J1211</b>
<b>Project Title</b> <b>Triple A: Algae, Additives, and Affects</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> My goal is to examine how different types of runoffs from different fertilizers and manure commonly used will effect the levels of dissolved oxygen, nitrite and nitrate in a body of water supporting algal growth; simulating the algal issues in the Sacramento-San Joaquin River Delta. I hypothesized that all the trials would exhibit a constant unchanged dissolved oxygen level throughout the experiment due to the different levels of potassium and phosphorus in the additives which are fast reacting in water, and could adhere to the algae; thus killing the algae before absorption of the dissolved oxygen. Comparatively, the algae treated with the garden fertilizer and manure would reveal a high reading of nitrite and nitrate because of the high levels of nitrogen, and lower levels of potassium and phosphorus contained.</p> <p><b>Methods/Materials</b> Algae samples were obtained from a pond, and divided into twenty one liter jars. The jars were divided into four groups of five; the manure, lawn and garden care fertilizers additive groups and a control group which received no additives. The initial dissolved oxygen, nitrite and nitrate tests were performed using aquarium test kits. Then the samples received their initial half teaspoon fertilizer or manure additive. For 14 days, the water chemistry was evaluated, and the trials received further half teaspoon doses of additives every other day following.</p> <p><b>Results</b> After 14 days, all the trials demonstrated similar oxygen levels collectively; only having a 7 parts per million difference between the averages overall. The nitrite and nitrate levels throughout the experiment barely rose above 1 mg/L. The exception was the group of algae exposed to the garden fertilizer; which increased to an end total of 3 mg/L of nitrite and 30 mg/L of nitrate on the final day.</p> <p><b>Conclusions/Discussion</b> My results partially support my hypothesis. The oxygen levels showed little change throughout the experiment, as expected. However the nitrite and nitrate levels of the algae exposed to the manure did not spike with the fertilizer introduction, as hypothesized. If the results were applied to the Sacramento-San Joaquin River Delta, the delta's fresh water, which serves mainly Southern California, could become tainted. The most significant results came from the group exposed to the garden fertilizer; which resulted in three times the California EPA standard for drinking water.</p>	
<b>Summary Statement</b> The purpose of my experiment was to conclude if adding commercial and organic fertilizers to algae would effect the dissolved oxygen, nitrite and nitrate levels of the surrounding water.	
<b>Help Received</b> Brett Mills helped me to gain basic knowledge about the algae. Samuel Houston drove me to the pond and helped me gather the algae from the pond. Ms. Christina Fisher went over how to format my folder and board. Mrs. Elena Diaz went over how to properly format the research report and annotated bibliography.	