



CALIFORNIA STATE SCIENCE FAIR

2015 PROJECT SUMMARY

Name(s) Anna T. Rioux	Project Number J1019
Project Title Farming for Water: A Solar Desalination Solution for the Water Crisis Facing California's Farmers	
<div>Objectives/Goals<p>In the past four years California's drought has been getting worse, this year is on pace to be the worse yet. California's economy depends on the farmers, and the farmers depend on water. Solar desalination can be a solution to this problem. The purpose of this experiment is to determine what material, PVC pipe, plastic sink pipe or foam insulation tubing desalinators, will produce the greatest amount and best (pH closest to 7) freshwater. It is my hypothesis that the PVC will produce the best fresh water.</p></div> <div>Abstract<p></p></div> <div>Methods/Materials<p>In the experiment I designed a solar desalinators using various materials; including three 30 cm pieces, 1 1/2 inch width PVC pipe, plastic sink tubing, and foam insulation pipe. Plexi-glass, plastic wrap and aluminum foil were also used in the assembly of the desalinators, and food coloring was added to the water to act as a contaminant. In multiple trials ocean water from the San Francisco Bay was used (120 ml for each test), and the desalinators were placed outdoors in a sunlight area and left for 48 hours allowing the water cycle to purify the water. As a control bottled water was used in the same way as the ocean water was tested.</p></div> <div>Results<p>The results of the desalinator tests included the pH level of the recycled water, the amount of recycled water produced and the color of the recycled water. The PVC pipe produced an average of 28.75 ml, and a pH of 7.85 with a light blue, almost clear color. The plastic sink pipe produced an average of 8.5 ml, and a pH of 7.34, with a clear color. The foam pipe produced an average of 2.5 ml, and a pH of 6.59, with an almost clear color. Control: The PVC tubing produced 12.5 ml, with a pH of 6.78, with an almost clear color. The plastic sink tubing had 32.5 ml with a pH of 8.40, with an almost clear color. The foam insulation tubing had 12.5 ml with a pH of 8.08, and a blueish tint.</p></div> <div>Conclusions/Discussion<p>I found that the results somewhat supported my hypothesis because the PVC produced the most recycled/freshwater when using ocean water. However, in the control the plastic sink pipe produced a greater amount of recycled/freshwater. When considering the pH level the PVC desalinator performed better when both the control and the ocean water tests are compared. The average pH was 7.3 which is reasonably close to 7.0.</p></div>	
Summary Statement <p>The purpose of this experiment was to design and test homemade solar desalinators to find which will produce the greatest freshwater to be used in agriculture settings.</p>	
Help Received <p>My mom helped me by revising and editing my typed work, she also took pictures and provided me with the money needed to buy the supplies. My dad helped me using power tools to cut the tubing and the notches in the tubing.</p>	