



**CALIFORNIA STATE SCIENCE FAIR  
2017 PROJECT SUMMARY**

<b>Name(s)</b> Elyse G. Wong	<b>Project Number</b> <b>J1134</b>
<b>Project Title</b> <b>Full Steam Ahead, Part II: Solar Powered Water Purification</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The objective of this study is to determine if raising the ambient temperature without any additional energy sources will increase the output of purified water in a solar powered distiller.</p> <p><b>Methods/Materials</b> Parabolic dish, parabolic trough, acrylic cover for the trough, solar vacuum tubes, solar powered CPU cooler, thermometers, simulated seawater (35 parts/thousand). Heated simulated seawater in a solar vacuum tube outdoors using a parabolic dish, an uncovered parabolic trough, and a covered parabolic trough. The steam generated was condensed through a solar powered CPU cooler and the distilled water was collected. Temperature was recorded every hour for three hours and the average temperature was calculated vs. the amount of water purified.</p> <p><b>Results</b> An uncovered or covered parabolic trough produced more purified water than a parabolic dish, even though the surface area of the dish was four times the area of the trough. The covered trough increased the temperature around the vacuum tube about 15 degrees C above ambient temperature and 7 degrees higher than an uncovered trough, but the amount of water produced was nearly equal between the two trough designs.</p> <p><b>Conclusions/Discussion</b> Raising the ambient temperature of simulated seawater in a solar vacuum tube without any additional energy sources did not increase the amount of purified water output in a solar powered distiller. It is concluded that the amount of water production was less dependent on the temperature around the solar vacuum tube but more so on distiller design and amount of available sunlight.</p>	
<b>Summary Statement</b> Increasing purified water output in a solar powered distiller is more dependent on the solar collector design and amount of available sunlight than on raising the ambient temperature.	
<b>Help Received</b> My father and I designed the parabolic trough and performed the trials. I received help from my uncle, a retired engineer to graph the data. I visited the Glasspoint facility in McKittrick, CA and received valuable information from Mr. Lee Foster, site manager.	