



**CALIFORNIA STATE SCIENCE FAIR  
2012 PROJECT SUMMARY**

<b>Name(s)</b> <b>Mauricio Wulfovich</b>	<b>Project Number</b> <b>J1026</b>
<b>Project Title</b> <b>Powerless Desalination</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> Every year more than 3.5 million people die from unsafe drinking water, yet many of these people live right next to an ocean. The objective of my project is to try to create a portable parabolic desalination system. Based on my research, I think a parabola's focal point can raise water to sufficient temperature to desalinate it at a rate of half a liter per hour.</p> <p><b>Methods/Materials</b> Build a parabolic reflector with a sheet of highly reflective stainless steel and build a base with PVC. Erect a copper tube at the focal point with a system to collect all the steam that would be evaporated, and a tie a rope in such a way so the parabola can be tilted according to the position of the sun in the sky. Later, create ocean water by adding 35 grams of sodium chloride (salt) to a liter of water to use as input. Set the dripper rate and return every 15 minutes to measure the temperature and tilt the parabola to achieve maximum efficiency. Collect the residual and the desalinated water to test the salinity levels and total dissolved solids.</p> <p><b>Results</b> After running the experiment five times and collecting more than 40 samples of water, it was seen that a parabolic reflector can heat up the focal point to almost twice the temperature of the outside weather in less than 15 minutes. The water produced has 80% less salt than before and 78% less dissolved solids. While this project did not follow the second part of hypothesis it achieved a great feat by providing true portable solar powered desalination.</p> <p><b>Conclusions/Discussion</b> Referring back to my hypothesis, it is easy to see that while I had the right research and ideas, a small parabolic reflector can still not generate enough heat to evaporate half a liter of water per hour. Overall, however, we are finally one step closer to helping people in natural disasters near home all the way to people in third world countries be able to survive.</p>	
<b>Summary Statement</b> The purpose of my project is to create a portable system using a parabola's focal point to raise water to sufficient temperature to desalinate it.	
<b>Help Received</b> Father helped me with power tools; Mrs. Armour helped me organize my data and taught me how to use the lab equipment; Mrs. Rines taught me a lot about the science behind my project.	