



**CALIFORNIA STATE SCIENCE FAIR  
2016 PROJECT SUMMARY**

<b>Name(s)</b> Cristofer Lortz	<b>Project Number</b>  36418
<b>Project Title</b> Oceanic Power: Oscillating Water Column Generator	
<b>Abstract</b> <b>Objectives/Goals</b> My hypothesis was that we can use the ocean's powerful tidal and wave action to produce renewable electricity to power homes, businesses and cars. <b>Methods/Materials</b> I began my research at the library and online for background information. I got my initial design idea from Science Buddies (website). I choose to build an Oscillating Water Column (OWC) Generator to prove my hypothesis. My dad helped me with the design, modifications and construction. Most of the materials were from our garage and back yard.  The methodology for the experiment was to plunge the OWC generator down into the pool water (Independent Variable), which will force water to flow into the inlet hole at the bottom of the generator. The incoming water will begin to fill the volume/area inside of the pipe (Control/Constant Variable), displacing the ambient air inside the pipe (Dependent Variable). The exhaust air will spin the fan and generator producing electricity to light 4 LEDs and measured with a multimeter. <b>Results</b> I had great results in both testing phases of this experiment.  Design Test Phase: I was able to modify the original Science Buddies design and make it much more efficient. This test phase also allowed my testing team to develop a rythmic plunging method for final test phase consistency.  Final Test Phase: I was able to produce increasing (progressively) voltages and amperages during the 4', 5', and 6' plunges. The OWC Generator what was tested as the 10.5' model. All LEDs were illuminated and the electricity was measured with a multimeter. <b>Conclusions/Discussion</b> I concluded that my hypthotesis was valid. We moved the OWC generator in an up/down oscillating motion in the pool, the water displaced the air from inside the tube, forced it out through the exhaust holes, spun the fan/motor. The electricity produced lit the LEDs and was read on a digital multimeter. Each of the three experiments were successful in making electricity.	
<b>Summary Statement</b> The power and motion of the ocean can be harnessed to produce renewable and clean energy.	
<b>Help Received</b> The people who helped me were my Fleming STEM teacher: Oscar Espinoza, my dad: John Lortz and my family.	