CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)
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Project Number
J0214

Project Title
SwellSpark Turns Ocean Swells into Electric Energy

Abstract

Objectives/Goals
The goal of this project was to create a buoy that can convert ocean swells into clean, efficient electric energy without polluting or harming the environment.

Methods/Materials
First I envisioned a fog buoy that uses the ocean swells to make sound, and I wondered if there was a way to make electrical energy from swell through a similar process. After sketching ideas, I constructed a buoy with a generator inside that attached to a spool with line wrapped around it that would reach down to an anchor on the seafloor. When the buoy goes up and down because of the swell, the tension of the string changes, causing the string to pull on the spool, making the generator spin, and creating electric energy. The data collected from the SwellSpark buoy was gathered by first measuring the amplitude of the swell using noaa.com's buoys data to determine what the amplitude of the swell was. Then after measuring the voltage output of my buoy with a volt monitor, both amplitude and volt output were correlated to see how much volt output the SwellSpark could produce using only ocean swells.

Results
The SwellSpark creates up to twenty volts using ocean swells as a power source. A pattern I noticed when testing the SwellSpark buoy is that the larger the amplitude of the wave the more volts are produced by it.

Conclusions/Discussion
The goal of this project has been successfully accomplished, although the SwellSpark could use even more development because there are numerous possibilities for it. This buoy can produce an average of eighteen volts from ocean swells which fulfills my goal.

This is just the beginning of the SwellSpark. Some exciting future possibilities for it are:
- Provide power for fishermen and their boats.
- Provide power for people on islands with no electricity.
- Provide power for the Bajau people that live in huts on the ocean with no electricity.
- Build buoy farms to power large cities.
- It's possible that the SwellSpark could be a part of a hybrid boat in the future.

Summary Statement
I developed the SwellSpark, which is a buoy that is capable of harnessing ocean swells and converting them into clean efficient electric energy.

Help Received
My mother and father both supported me in this project by getting the supplies for this project and driving me to places I needed to go for this project such as the ocean. Also my teachers supported me in this project.