CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY

Name(s)
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Project Number
S0313

Project Title
Comparing the Efficiency of Two Wave Energy Converter Designs and Their Potential for the Santa Monica Bay

Abstract

Objectives/Goals
The objective of my experiment was to explore the possibility of wave energy for the Santa Monica Bay. The voltage output and efficiency of two specific wave energy converter designs was analyzed.

Methods/Materials
Two designs that worked on different mechanics were tested: the attenuator and point absorber. The attenuator was designed to lie parallel to the predominant wave direction and 'ride' the waves, and the point absorber was designed with small dimensions to absorber shorter wavelengths. The point absorber was constructed from two segments of PVC pipe interconnected with flexible joints.The point absorber was composed of a small wood apparatus connected with a hinge. A air pouch was attached to the lower segment to act as a float. The same enameled copper wire and n54 magnets were used in both designs.

Results
The attenuator had the highest averaged voltage output. The point absorber performed best in small conditions but was quickly outmatched in larger wave conditions.

Conclusions/Discussion
The lack of refraction and consistency of the wave direction leads me to believe that the attenuator has the greatest potential for the Santa Monica Bay area. With our electricity needs only growing, the ocean offers an excellent solution to many of our energy problems.

Summary Statement
My project was conducted to test the efficiency of two wave energy converter designs and evaluate their potential for the Santa Monica Bay.

Help Received
My dad assisted me in cutting out a few pieces of my projet with eletric power tools.