CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)
Jillian E. Avila

Project Number
J1104

Project Title
The Removal of Microplastics in Ocean Water Using Homemade Filters

Abstract

Objectives/Goals
Create inexpensive filters from materials in your home to effectively filter out microplastics found in Ocean water.

Methods/Materials
Constructed a screen from a hardware store to dip into the first 6 inches of ocean water and collect surface samples. First filter materials were: plastic and glass water bottles, gravel, activated and crushed charcoal and clean sand. Second filter materials were: turkey baster, activated and crushed charcoal, and coffee filter. Using a microfiltration rig supplied by my advisor, I was able to compare the controlled sample to the two types of homemade filters.

Results
The result of using my filters demonstrated that they were effective in removing 97% of microplastics from the ocean water sampled. The average number of plastics counted in the control group was 86 particles. The filtered water average was 2 particles.

Conclusions/Discussion
The result of a homemade filter was effective in removing microplastics. Over 5 trillion pieces of plastic are currently polluting our oceans. 8 million tons of plastic is dumped into our oceans each year. Education and prevention would be the optimal solution. Knowing a simple filter can remove such a high percentage of plastics could be useful in industrial uses such as retrofitting ocean liners and fishing boats.

Summary Statement
I created homemade filters that effectively removed microplastics from ocean water.

Help Received
My advisor and mentor Dr. Craig Carlson gave me the use of his lab and advised me on how to compare a control group to my samples. I found samples of the filters online and cited the creators in my project.