CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY

Name(s)
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Project Number
J1411

Project Title
Harvesting Atmospheric Water

Abstract

Objectives/Goals
The objective of this project was to test various materials to determine which ones collect the most atmospheric water when exposed to the same environmental factors. I also observed the effect of weather conditions and a material's surface area and hydrophilicity on atmospheric water collection.

Methods/Materials
Equally sized tiles of glass, plastic, ribbed plastic, aluminum, ribbed aluminum, steel and wax paper, scale, thermometer, humidity meter, and a wind meter. The tiles were set outside next to each each night. Temperature, humidity and wind speed were recorded at the onset of each trial. The next morning, I calculated the amount of water collected by weighing each tile. I also recorded the weather conditions at the end of each trial. This experiment was repeated twelve times.

Results
Ribbed and flat plastic collected more water than any other material. Wax paper and glass both collected the second highest amount of water. The metal tiles harvested far less water than the other materials. More water was collected on colder nights with higher humidity levels and lower wind speeds.

Conclusions/Discussion
Repeated trials demonstrated that hydrophobic materials collect more water than hydrophilic materials. This may be because hydrophobic materials repel water, causing atmospheric water to bead up and condense in clusters. This allows more room for condensation and greater efficiency in water collection. Although increasing the surface area appeared to cause more water collection with the plastic materials, the ribbed aluminum collected less water on average than the flat aluminum. This was likely because the ribbed aluminum was thinner and more susceptible to movement caused by wind which may have led to water loss.

Summary Statement
I examined the efficiency of different materials in collecting atmospheric water through condensation.

Help Received
I designed and conducted the experiment myself. My mentor reviewed my work and offered helpful advice.