CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY

Name(s)
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Project Number
22292

Project Title
Salinity, Buoyancy, and Drag

Abstract

Objectives/Goals
Our objective was the measure the effect the change in salinity has on the buoyancy and drag of the boat.

Methods/Materials
We constructed a modek boat and tank out of masonite and pine wood. Two pumps were used to maintain a constant flow of water through the tank. The boat was placed in the tank and a pully system and spring gauge were used to measure the drag of the boat. We added 1L of salt to the water, then measured the drag after the salt dissolved. Procedures were repeated with an increase of 1L of salt for each event.

Results
The first event of our enperiment, which has no salt measured a drag of .75 newtons. As we continued the events, adding 1 liter of salt each time, the results were, .65 newtons for 1L of salt, .55 newtons for 2L of salt, .55 newtons for 3L of salt, .45 newtons for 4L of salt, .45 newtons for 5L of salt, .40 newtons for 6L of salt, .35 newtons for 7L of salt, .30 newtons for 8L of salt, and .30 newtons for 9L of salt. These results showed that as the amount of salt increased, the drag decreased.

Conclusions/Discussion
Our conclusion was that the increase in salt causes the density of the water to increase, which reduces the volume of water displaced by the mass of the boat. It reduces the hull surface in contact with the water, which reduces the drag. For change in salinity of 9% we recorded a 40% reduction in drag.

Summary Statement
For our project, we measured the effect the change in salinity has on the buoyancy and drag of a boat.

Help Received
My father helped us in building the tank and the boat.