CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY

Name(s)
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Project Number
22268

Project Title
Buoyancy in the Bermuda Triangle

Abstract

Objectives/Goals
The objective of my project is to find out whether the release of methane gas from vents on the oceax floor will have an effect on a ship's buoyancy. Does this loss of buoyancy cause ships to sink? Myx hypothesis is that underwater gases will affect the buoyancy of boats or a ship because a mixture of gases and seawater will not support weight as well as seawater normally does.

Methods/Materials
My procedure was to build a test tank using a fish tank, a small propane cylinder, tubing, a 10 CFH flow meter, a manifold to simulate the sea floor vents, and fittings. I then injected propane gas at 2, 4, 6, 8, and 10 CFH (cubic feet per hour) from the bottom of the tank of salt water. The buoyancy of several modx ships and boats were measured with and without injection of propane gas. The height of the model ships was measured to determine the height relative to the surface of the water at the different flow rates. The data was collected and recorded and used to prove my hypothesis correct or incorrect.

Results
The test results show that the buoyancy of the test models was affected. Test number one was for a model tugboat. The maximum buoyancy drop from release of gas at 10 CFH was .125 inches. Test number two was for the model Titanic, which dropped at a maximum of .375 inches at 10 CFH. This translates to x 26.47 feet drop in the ocean at full scale. In addition, when the gas valve was initially opened, the flow exceeded the meter scale, which resulted in drops as much as .750 inches or 52.94 feet at full scale.

Conclusions/Discussion
In conclusion, I have proved that my hypothesis is correct because the propane gas had an effect on the buoyancy of multiple model ships within the experimental tank. I think that the propane gas displacx some of the water around the ship, which reduced the volume of the water that was under each model ship. By reducing the volume of the water, it lowered the ships position in the seawater. Therefore, the ships positive buoyancy was reduced making it sink lower into the water.

Summary Statement
Multiple experiments to learn if the release of underwater gases effects the buoyancy of ships or boats in sea water.

Help Received
Father helped type my information into a report, supervised the handling of flamable gases, and helped identify correct materials for tests.