CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY

Name(s)
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Project Number
J0706

Project Title
The Effect of 0%, 3.5%, 7%, and 20% Salinity Levels on Five Common Rocks

Abstract

Objectives/Goals
My objective was to find out if rocks were affected over time by varying levels of salinity as reflected in a freshwater environment(0% salinity), the average ocean (3.5% salinity), the Baltic Sea (7% salinity), and the Great Salt Lake 20% salinity).

Methods/Materials
Materials: 4 identical tubs, caliper, camera, notebook, pen, salt, water, dietary scale, measuring spoons, tape measure, measuring cup, 4 lbs. of Sedimentary rock, and four of the following rocks; Anthracite, Dolomite, Obsidian, Red Lava, and Slate.
Procedure:
1. Fill 4 tubs each with 1/2" of Sedimentary rock.
2. Put one of each of the following rocks into all 4 environments; Anthracite, Dolomite, Obsidian, Red Lava, and Slate.
3. Add the following amounts of salt and water to each environment.
Environment A. 192 tsp. water/0 tsp. salt, Environment B. 185 tsp. water/7 tsp. salt, Environment C. 178.5 tsp. water/13.5 tsp. salt, Environment D. 143.6 tsp. water/48.4 tsp. salt
4. Every three days observe, measure, and weigh the rocks using a caliper and a dietary scale. Record measurements, weight, and visual notes.
5. Observe the change in rocks size and weight and create graphs to reflect the results.

Results
As the salinity level increased, all of the rocks were affected. Dolomite, Anthracite, and Red Lava decreased in weight, whereas Obsidian and Slate increased in weight. Anthracite, Red Lava, and Obsidian decreased in size whereas Dolomite and Slate increased in size.
I observed signs of cracking in all three Obsidian rocks that were placed in saltwater. The pitting in Red Lava increased over time, in all saltwater environments, increasing its buoyancy. Slate was least affected by the salt.

Conclusions/Discussion
My experiment proved that varying salinity levels over time cause chemical weathering to common rocks. My discoveries could be applied to the preservation and conservation of underwater reefs, landforms, and replications of natural habitats. Preserving natural habitats with natural rocks as opposed to synthetic material such as concrete could eliminate pollution of our oceans. Stronger rocks could be used to secure and fortify foundations located in coastal regions.

Summary Statement
My project measured the effects of varying degrees of salinity over time on five common rocks.

Help Received
Hollister Landscape Inc. donated rocks; Ms. Deich of New Brighton Middle School helped with graphs; my mom helped edit report and measure rocks.