CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY

Name(s)
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Project Number
J0904

Project Title
Wind Energy on Sand Dune Formation: The Effect of Desertification on Human and Plant Life

Abstract

Objectives/Goals
I intended to investigate the effect of wind on dune formation. I also wanted to figure out the harmful effects of desertification, or the gradual covering over of an area by sand, on human and plant life and the remedies people of the world can do to not contribute to this process.

Methods/Materials
20 liters of sand, Large Aquarium Tank (measuring 760 mm width, 460 mm height and 310 mm length), Hair Blower with high power and diffuser, Cross-Section Layout bond paper, Metric Ruler, Stopwatch, 3 tropical plants, 4 rock simulated styrofoam shapes (measuring 45x45x100)

My Methodology started by pouring the sand in the tank. Then using the metric ruler, I measured the measurements of height, length, width, and length of slope and recorded it in my logbook. Next, I drew my overhead and side view contour drawings of the outline appearance of the sand before the wind has affected the sand. Then I blew the sand, horizontally, for three minutes, using the stopwatch. Then I measured the various measurements of change and drew contour drawings of after wind has affected the sand. I repeated this five more times, totaling in six trials total for this test (sand alone test). For my second test (sand with vegetation), I put the plants in the sand and in the third test (sand with the rock simulations) I put the 4 rock simulations in the sand. I repeated each test group five more times totaling in six trials for each test group.

Results
I observed that after wind affected the sand, the measurements were clearly differentiated in each test group. I also observed that after the wind affected the sand for the second and third test group, there appeared to be a blowout, or a gap, around each object. Lastly, based on my observations of excess sand remaining on the leaves of the plants in the second test, I inferred that vegetation and the environment are affected by the process of dune formation.

Conclusions/Discussion
Based on my research on dune formation, a dune is formed when wind blows sand up against a rock or bush. I conclude that desertification has many harmful affects on the environment, societies and cultures such as loss of animal and plant species and severe population reductions. Although we cannot stop this natural process completely, remedies for reducing contributions to desertification include; planting of windbreaks, reforestation of denuded areas, and dams to control erosion.

Summary Statement
My project is in regard to the effect of wind energy on the formation of sand dunes as well as how desertification affects human and plant life.

Help Received
Mother helped acquire materials, father helped me set up the necessary apparatus, sister helped take pictures of me performing experiment, teacher guided me throughout the year.