



Colorado Science and Engineering Fair

2024 Individual Project Abstract Form

Please print 2 copies of the completed form. Sign both copies, keep 1 for your notebook and submit 1 copy to your Regional Fair Director with your other paperwork.

Title of Project: The Effects of Recycled Calcium Hydroxide on the Growth and Mortality of an Ecosystem Affected by Simulated Ocean Acidification

Finalist's Name: Hannah McClintock

School and City: Strasburg Highschool, Strasburg

Sponsor's Name: John Leisge

Category: Earth & Environmental Sciences (EAEV)

Division: Senior (9th - 12th grades)

Abstract (250 words or less):

Ocean acidification causes both an increase in acidity and a decrease in calcium carbonate concentrations, due to increased carbon dioxide emissions. While it's impossible to stop ocean acidification entirely, it's theoretically possible to stunt its effects. My goal is to find a disruption towards the effects of ocean acidification that not only decreases its impact on the environment, but doesn't administer anything foreign or potentially harmful. The increased acidity caused by ocean acidification can interfere with the size and sensory of eggs/larvae, causing a decrease in their survival rate. A decrease in calcium carbonate concentrations also pose a serious threat to organisms like echinoderms, mollusks, and corals who depend on the extraction of calcium carbonate to develop their outer shells, which they use for protection. With underdeveloped shells, their survival rate will also see a decrease.

Using shells that have washed up onto shore, I can turn them into calcium oxide, which will turn to calcium hydroxide upon making contact with water. The calcium hydroxide will act as a base to lower the acidity while also contributing to an increase in calcium carbonate concentration. I will then keep track of the growth of macroalgae (using a scale), the growth/mortality rate of brine shrimp (using a microscope), and the growth/mortality of astrea snails (using a soft ruler). While I already know that recycled calcium hydroxide is an effective buffer towards ocean acidification, it's important to know how the marine ecosystem will react to this stunt as well.

I hereby certify that the above statements are correct and the information provided in the Abstract is the result of one year's research. I also attest that the above properly reflects my own work.

Finalist's Signature:

Date:

In addition, all students must complete the ISEF Student Checklist (1A), Research Plan, Approval Form (1B), and Checklist for Adult Sponsor (1), and any other ISEF forms required for this type of project. See the International Rules and Guidelines for form requirements. Return COPIES of all of these forms to your Regional Fair Director with you Finalist Verification/Permission Form. A signed copy of this form must be included in your notebook.