



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 Measurement of Expelled Zooxanthellae Using Sensor and Data Fusion to Predict the Effect of Heat Waves

Finalist's Name: Kyra Jordan

School and City: Golden High School, Golden

Sponsor's Name: Jesse Swift

Category: Micro & Molecular Biology (MCRO)

Division: Senior (9th - 12th grades)

Abstract (250 words or less):

In the last half century the area coral reefs cover has fallen nearly to 50 percent. Due to the warming oceans, changes in the halocline, runoff, oil spills, these essential reefs are slowly dying. Our current data collection methods and monitoring of these reefs are expensive, outdated, and often don't provide detailed enough information about individual reefs. In this project, the idea was to create a network of devices attached to the bottom of the ocean over an area of reef to more accurately and efficiently pinpoint higher levels of expelled zooxanthellae. Zooxanthellae live in coral cells and provide coral with food, when it gets stressed it releases it into water changing the coral from its natural bright colors to white. Warning scientists about the very early stages of coral bleaching, by measuring the small changes in algae in the surrounding water, I built a device that measures turbidity and temperature stored in a waterproof housing. The methods used to test this product, was through the use of simulation in a plain salt water tank of a heat wave and cooling period.

Methods:

- Securing device to bottom of tank, stirring every minute
- Add warmed(2 degrees above main tank temperature) diluted Zooxanthellae
- $\frac{2}{3}$ of the time period later add 2 degrees cooler water

My project will provide more information about the changes occurring in the reefs, by predicting the effect of heat waves and identifying environmental hazards before they become disasters. This will help scientists prepare and protect these reefs.

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.