



CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

Name(s) Ayush Ghosh	Project Number J1113
Project Title Reducing Ocean Acidification Using Aquatic Plants	
<p style="text-align: center;">Abstract</p> <p>Objectives Global warming is a significant issue for the earth's environment. The temperatures around the world are rising, causing many challenges such as more intense heat waves, shrinking glaciers and rising sea levels. Another critical impact of global warming is the increase in carbon-dioxide in the ocean water resulting in increased acidity of the water. This phenomenon is called ocean acidification, and it is a major threat to marine ecosystems and animals such as calcareous plankton and deep sea corals. The goal of my project is to reduce the impact of ocean acidification.</p> <p>Methods Experiment 1: 1. Clean all apparatus with distilled water and lab soap. 2. Pour sand into container until it reaches a height of 2 cms. 3. Clean sand by pouring distilled water inside the container. Then, mix it with sand and pour out. Continue until water is transparent. 4. Fill 2.5 liters of sea water in each container. 5. Add a different aquatic plant inside four containers while leaving fifth aside as control with no plants. 6. Place them all next to each other, put air tubes inside each container, close lid and turn on air pump. 7. Turn on fluorescent lamp facing towards containers. 8. Every day for six days, check and record pH of water inside the containers. 9. After trial is done, check final pH of water and record data. 10. Repeat steps 1-9 two more times. The plant which shows the highest increase of pH between the trials is the best plant to reduce ocean acidification.</p> <p>Experiment 2: 1. Follow steps 1-4 from Experiment 1 to prepare 4 containers. 2. Add Chaetomorpha (most impactful plant from Experiment 1) to two of the containers. 3. Use the Fluval Kit to add CO₂ to one container with Chaetomorpha and one with only sea water. Set the CO₂ rate to 1 bubble a second. 4. Follow steps 6-9 from Experiment 1 to measure the pH in each container on a daily basis for 5 days. 5. Observe how the pH differs for containers with and without CO₂ as well as containers with and without the plant.</p>	
Summary Statement I proved that ocean acidification, which is the increase of acidity in earth's oceans due to global warming, can be reduced by adding aquatic plants such as Chaetomorpha Algae to the ocean.	
Help Received My parents helped me by buying all the materials for me and assisting me. Dr. Nyssa Silbiger who teaches at California State University, Northridge, also helped me by giving me necessary information to begin my project.	