



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2018 PROJECT SUMMARY

|   |                                |
|---|--------------------------------|
| <b>Name(s)</b><br>Charlotte E. Myers  | <b>Project Number</b><br>38459 |
| <b>Project Title</b><br>The Effects of Petroleum-Based Fuel Oils on Aquatic Bryophytes  |                                |
| <b>Abstract</b><br><b>Objectives/Goals</b><br>The objective of this experiment was to determine the petroleum-based fuel oil that has the most negative effect on the growth of aquatic bryophytes.<br><b>Methods/Materials</b><br>The materials used in this experiment include gasoline, butane, kerosene, twelve 10-centimeter sprigs of hornwort, two agriculture lights, plastic containers, and a ruler. To perform my experiment, I measured and compared the growth rates of sprigs of aquatic plants submersed in different varieties of fuel oil over a period of ten days.<br><b>Results</b><br>The results of this experiment clearly showed that kerosene stunted the process of photosynthesis in aquatic bryophytes most severely. I found that the natural growth rate of nonvascular hornwort is approximately one millimeter per day. However, plants submersed in kerosene decreased in height dramatically due to partial detachment of the central stem caused by an inability to photosynthesize. The plants affected by gasoline and butane also showed signs of minimized photosynthesis, including a reduction of chlorophyll and leaf loss, but were more pronounced in the plants impaired by kerosene.<br><b>Conclusions/Discussion</b><br>My results allowed me to attain my objective, as I discovered that kerosene is the most dangerous fuel oil to aquatic bryophytes. This experiment provides a better idea of the impacts of oil spills on marine environments. Scientists may be able to more accurately assess the urgency and danger of an oil spill. Standards and regulations regarding the safe transportation of oil across the ocean can be improved and data about the environmental impacts of these oils can be updated with the research from my experiment. |                                |
| <b>Summary Statement</b><br>By measuring and comparing the growth rates of aquatic bryophytes submersed in different varieties of petroleum-based fuel oil, I determined that kerosene most severely inhibits photosynthesis in aquatic plants.   |                                |
| <b>Help Received</b><br>I designed and performed my experiment independently, but I received assistance from my parents in obtaining my materials and from my biology teacher in explaining the scientific method. I also discussed aquatic bryophytes with employees at an aquatic plant retailer.   |                                |