



**CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY**

Name(s) Madelyn R. Goley	Project Number J1110
Project Title Do Sea Lion Carcasses on the Surface Affect the Amount of Bacteria in the Soil?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The goal of my project was to determine how the presence of a sea lion carcass on the beach affected the number of bacteria in the soil below. I predicted there would be more bacteria under the carcass than under a control at two depths (2 inches and 12 inches).</p> <p>Methods/Materials I collected soil samples from 2 and 12 inches under the sea lion carcass and under the control using sterile collecting supplies. I isolated the bacteria from the samples and plated dilutions of the samples on nutrient agar plates before counting the number of bacterial colonies.</p> <p>Results I found that the bacteria were 220 times more abundant in the shallow soil sample under the sea lion than under the shallow control (447.3 vs. 2.03 million colonies/ml). Bacteria were 33 times more abundant at depth under the sea lion than under the deep control (15.7 vs. 0.48 million colonies/ml).</p> <p>Conclusions/Discussion In conclusion, my hypothesis was supported. My findings are important because there is currently a large sea lion die-off along the coast of California due to the current El Niño event. Over 1,500 California sea lions have died on California beaches this year (NOAA). If these bacteria are harmful they could affect people and animals that come into contact with them. If these bacteria are beneficial, they may help to decompose the animal quickly and recycle important nutrients deep into the environment. This would be similar to the role that bacteria play in decomposing whales (whale fall) in the deep ocean.</p>	
Summary Statement I showed that there were significantly more bacteria under a sea lion carcass than under a control plot which is important due to the large numbers of sea lions dying along the coast of California due to the ongoing El Niño event.	
Help Received Dr. Mark Wilson at Humboldt State University trained me in microbial culture techniques which included diluting samples I collected on the beach, preparing spread plates of samples, counting bacterial colonies and calculating bacterial concentrations.	