



**CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY**

Name(s) Danny T. Luu	Project Number S1119
Project Title The Effects of Stormwater Runoff on Salvia leucantha and Anna's Hummingbirds Interactions	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this project was to determine if storm-water runoff would effect the Salvia leucantha (Santa Barbara Mexican Bush Sage) and its main pollinator the Anna's Hummingbird. The goal was to determine if there was a change of color in leaves, number of flowers, height of plants, numbers of interactions, and duration of interactions by storm-water fed Salvia leucantha compared to a distilled water fed Salvia leucantha perennial plant.</p> <p>Methods/Materials To simulate storm-water runoff, ten different paved locations (gas station, parking lot, etc.) around the Santa Maria Valley were poured with one liter of distilled water. Then vacuumed up to be transferred into ten, ten milliliter graduated cylinder and froze in a freezer to obtain the amount of motor oil in one liter of storm-water runoff. After the average amount of motor oil from the ten locations were obtained, I started to calibrate the plants by trimming the heights, trimming the flowers, and having the same soil moisture levels for both plants. One day a week for four weeks, I would pour the average amount of motor oil with one liter of water into the experimental plant and one liter of distilled water into the control plant. From 8am to 12pm everyday for four weeks, I would record the plants by having an equidistant area of footage. Everyday after the recording, I would watch the footage on my video editing software with fast forward mode, then chart down the number of visits and durations of the hummingbird interactions for each plant.</p> <p>Results The results were that the experimental plant lost 64 percent of its flowers, decreased in height, and went from green to wilted color leaves while the control plant gained 18 percent more flowers, increased in height, and brought bright green leaves showing that storm-water runoff has an dramatic effect on the Salvia leucantha. Not only is the Salvia leucantha being affected by the storm-water runoff, but also the Anna's Hummingbirds by a decrease in interactions and durations compared to the control plant.</p> <p>Conclusions/Discussion My conclusion is that storm-water runoff does effect the Salvia luecantha plant and Anna's Hummingbirds interactions with the plants. The decrease in flower, height, and color intensity of leaves show the effects of what storm-water runoff could do to plants similar to the Salvia leucantha, also a decrease in Anna's Hummingbird visits and their durations with the plants.</p>	
Summary Statement To determine if storm-water runoff could effect Salvia leucantha phenotypes and Anna's Hummingbirds visits/durations compared to a regularly watered Salvia leucantha plant.	
Help Received Ms. Gutiérrez helped give tips on how to present orally; Mr. Avila helped research articles relating to hummingbirds; Mr. Magni answered questions I needed to know about the science fair criteria.	