



# CALIFORNIA STATE SCIENCE FAIR 2015 PROJECT SUMMARY

<b>Name(s)</b> Perrin J.G. Turney	<b>Project Number</b> <b>S2122</b>
<b>Project Title</b> <b>Death by Salt: An Experiment to Test the Salinity Tolerance of Microorganisms at the Arcata Marsh</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The objective of this project was to determine the salinity tolerance of microorganisms at the Arcata Marsh.</p> <p><b>Methods/Materials</b> Water, including substrate and floating plants, was collected from the Arcata Marsh. 100 mLs of sample were placed in each of 14 clean beakers to make 2 groups of 7 salinity concentrations. Sea salt was measured out at 0.1 gram increments from 0.1 grams to 0.7 grams and was placed in each 100 mL of sample until a range of salinity concentrations from 0.1% to 0.7% were obtained. The remaining sample water was used as the control. I observed the samples every 2 hours for the first 6 hours, then twice daily for a week, noting any changes in populations and health of Daphnia, Cyclops, Coleps, Euglena, diatoms, green algae, amoeba, green algal colony and Rotifers. After one week, I brought the samples back to freshwater concentrations by adding spring water. I observed them twice daily for an another week to determine if any protozoans had become dormant cysts under harsh environmental conditions and became active once freshwater was available again.</p> <p><b>Results</b> Nearly all microorganisms died by the end of one week, even in a 0.1% salinity. Daphnia and Cyclops were relatively tolerant at lower concentrations, but beyond 0.3% died within the first day. Protozoans, Euglena and Coleps, were the most salt tolerant of the protozoans and green algae also survived for several days in up to 0.4% salinity. Diatoms were the most susceptible to salinity change. None of the microorganisms' populations replenished when returned to freshwater.</p> <p><b>Conclusions/Discussion</b> My hypothesis was incorrect because I had thought the microorganisms would be tolerant to 0.6% salinity. In California's current drought, microorganisms, which play in integral role in water health, are at risk. The loss of microorganisms due to drought greatly affects the ecology by influencing food chains, bacterial populations, and the decomposition of waste material in water. I would like to continue this project by increasing salinity slowly, over a longer period of time, to make the change more like that of a natural drought.</p>	
<b>Summary Statement</b> This experiment tests the salinity tolerance of freshwater microorganisms in the Arcata Marsh.	
<b>Help Received</b> Mother trained me how to use a microscope and helped me glue down my backboard.	