



# CALIFORNIA STATE SCIENCE FAIR 2006 PROJECT SUMMARY

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<b>Project Title</b> <b>Back to Ballona: A Two Year Analysis of Ballona Creek</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The objective of this project is to measure water properties, such as salinity, at various points along Ballona Creek at high and low tide. Samples were also tested for turbidity. The creek water temperature was monitored.</p> <p><b>Methods/Materials</b> Water samples were taken at various points along Ballona Creek at high and low tide. Density, electrical resistance, pH, and non-volatile residue (NVR) tests were used to evaluate the amount of salt in the water samples. The residue determined in the NVR testing was calculated in parts per thousand (ppt). The samples were tested for turbidity using a homemade turbidimeter. The temperature of the creek was monitored using iButtons. The results were graphed versus the distance inland from the ocean. Bottled freshwater, rainwater, and saltwater taken from the ocean were used as control samples. As a control for the turbidity testing, controlled amounts of milk and water were used to determine the turbidity of different samples. Plant and animal life was observed along the creek giving clues to the presence of salt in the water.</p> <p><b>Results</b> At low and high tide, the water at the ocean outlet of the creek tested comparable to the saltwater control sample. As the samples progressed inland, the salinity level decreased. At low tide, samples which were taken 2,700 feet and more inland from the ocean end of the creek tested similar to the freshwater control samples. At high tide samples had to be taken much further inland to reach freshwater. The presence of bay mussels and California sea mussels at various points along the creek, gave evidence of the salinity of that section of the creek. Turbidity testing showed that the water at high tide was more turbid than the low tide water samples. The turbidity testing at low tide at the end of the jetty gave the same results as clear, tap water. The temperatures of the creek rose and fell with the air temperature and the tide.</p> <p><b>Conclusions/Discussion</b> My conclusion is that the salinity level of Ballona Creek varies depending upon the tide. At high tide, the saltwater reaches much further inland than at low tide. The turbidity was lowest both furthest inland from the jetty and closest to the outlet. The creek temperature varied with the air temperature. I found that the conditions of Ballona Creek are hard to control and monitor due to the pollution of the creek, the number of uncontrolled inlets, and other factors.</p>	
<b>Summary Statement</b> Water samples were taken along Ballona Creek, a watershed for all west Los Angeles county, as it enters the ocean to see the changes of the salinity levels, turbidity, temperature, and other physical and chemical properties of the water.	
<b>Help Received</b> Ken Edmondson of Maxim Dallas Semiconductor donated four Maxim iButtons, an iButton fob, and an iButton adapter. My mom and dad drove me to Ballona Creek to collect water samples. My dad bought me the materials to make the turbidimeter, and he assisted me in the assembly of the turbidimeter.	