



# CALIFORNIA STATE SCIENCE FAIR 2010 PROJECT SUMMARY

<b>Name(s)</b> <b>Annemarie R. Kelleghan</b>	<b>Project Number</b> <b>S0818</b>
<b>Project Title</b> <b>An Analysis of Coliform Bacteria Levels in Ballona Creek</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> This project determines whether or not Ballona Creek has high levels of bacterial contamination. I will also determine if the Del Rey Lagoon impacts the contamination of the creek. Samples were taken during dry weather and after rainfall to see how increase freshwater and other inputs affect the creek. This study is a continuation and extension of work that I have been doing at Ballona Creek since 2005.</p> <p><b>Methods/Materials</b> Water samples were collected at seven points along the creek, one point in the lagoon, and one site at the beach during dry and wet weather. Ten milliliters of water was sampled at each site. Water samples were placed on petri dishes and incubated. The conductivity of the samples was also measured using a conductivity meter, and the salinity was calculated using the conductivity measurements, based on the conductivity of a seawater sample of a known salinity. The density was measured using a hydrometer, and the pH was measured using test kits.</p> <p><b>Results</b> In this project E. coli was used as an indicator bacterium. During dry weather, the bacterial level at the ocean outlet was zero colonies per 100 milliliters and increased to 80 colonies at 10,600 feet inland from the ocean outlet. During dry weather, the lagoon had more bacteria than the creek testing locations closest to the lagoon. During rainfall, the creek had greater concentrations of bacteria than it did during dry weather. During rainfall, the storm drains along the creek permit high concentrations of bacteria to enter the creek. The rainfall serves only to dilute the bacterial content of the lagoon. These results show that the lagoon water does not drastically impact the water quality of the creek. The density over the last five years has ranged from 0.0998 to 1.029. This variation has not been great and no significant trends were noted; the average standard deviation of all density over the five years was 0.005. The salinity of the creek decreased significantly during rainfall, but the water in the lagoon and beach was not as affected by the rainfall.</p> <p><b>Conclusions/Discussion</b> Bacterial contamination in the creek increased during rainfall, but the lagoon was not a source of contamination for Ballona Creek. I have determined that the flow of water from the Del Rey Lagoon has little effect on the water in the creek. In my comparison of dry weather sampling over the past five years, the water properties have not changed significantly.</p>	
<b>Summary Statement</b> E.coli bacteria was used as an indicator to determine whether the Del Rey Lagoon is a source of bacteria in Ballona Creek, and the creek's salinity, density, and pH were measured to identify changes throughout the five year study period.	
<b>Help Received</b> The Southern California Academy of Science provided some financial support through their research training program, and Professor Doug Hammond allowed me to use his equipment in Radium Lab in the Geochemistry Department at the University of Southern California.	