



CALIFORNIA STATE SCIENCE FAIR 2011 PROJECT SUMMARY

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Project Title Santa Monica Beach Pollution: High School Designed and Implemented Water Quality Monitoring Program	
Abstract Objectives/Goals Our objective was to test the water quality in terms of the number of colony forming units(cfu) of Enterococcus bacteria per 100 milliliters of seawater at three different sites within the Santa Monica Bay area and to inform the public of potentially poor water quality. Specifically we tested two null hypotheses: (1) There is no significant difference in water quality during dry and rainy weather, (2) There is no difference among our three sites (two with a storm drain and one without a storm drain) in terms of water quality. Methods/Materials We followed the standard Idexx protocol in testing for Enterococcus bacteria, with the exception that we took three replicates per site as opposed to one replicate per site so as to evaluate inter-replicate variability. Specifically we collected three ocean samples per site, processed and incubated the samples in a lab, and after 24 hours we determined the number of cfu/100mL by counting the number of Quanti-tray wells that fluoresced under UV light. Results Based on the results from our Two Proportion Z and Chi Squared tests we found significantly poorer water quality during the wet seasons, and that the site without a storm drain was not significantly cleaner than the sites with a storm drain. Conclusions/Discussion In conclusion, during the wet seasons we observed a large amount of runoff water entering the ocean which appears to be the direct cause of poor water quality. This large volume of runoff in the ocean combined with currents appear to affect other non-storm drain beaches down the coastline. Based on the high inter-replicate variability seen in our data, our results suggest other researchers who take only one sample have a 37.5% chance of reporting a false negative.	
Summary Statement Our main focus is to monitor the ocean water for fecal indicator bacteria and inform the public of our results to raise awareness.	
Help Received	