



**CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY**

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Project Title Enterococcus Bacteria Alert! Which Popular North County San Diego Surf Beaches Are the Safest?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of this project was to determine which popular North County, San Diego Surf Beaches were the safest and most hazardous regarding Enterococcus bacteria. The following beaches were tested: Ponto Jetty, Grandview, 15th Street, Cardiff Reef, Fletcher Cove, Swamis, Beacons, and D Street.</p> <p>Methods/Materials She tested the eight popular North County Surf beaches by using the Index-Quanti Tray method. To do this, she worked along side with the Surfrider Foundation-San Diego Chapter. She tested each beach ten times on ten different Sundays. Materials included the following: Nasco Whirls-Paks, 10ml plastic pipettes, pipette pump, 100ml beaker, distilled water, Enterolert reagent packs, Quanti-trays, Quanti-tray sealer, incubator that can be set to 41'C, lunch size cooler, ice, notebooks, blacklight, rubber boots, Enterococcus charts, thermometer, trash bags, beach water samples, surgical rubber gloves, eye goggles. Disposal: After the Quanti-trays were incubated, any of the Quanti-trays that had a bacteria level over 104 were given to the Surfrider Foundation who took them to an autoclave. All materials and Quanti-trays that had a safe level of Enterococcus bacteria were thrown away in the regular garbage as was instructed by the Surfrider Foundation-San Diego Chapter.</p> <p>Results On days of rain (tests 4,5,6) a lot of the beaches' Enterococcus levels reached extremely high levels, 1520 being the highest. On the days before the rain came (tests 1,2,3) the highest level was only 70. On the days after the rain (tests 7,8,9,10) the highest level was 250.</p> <p>Conclusions/Discussion Note: Enterococcus levels: 0-79=acceptable; 80-104=poop; Over 104=unacceptable When rain came, the researcher got some shocking results from the beaches that had a storm drain (Fletcher Cove and Beacons) or a river mouth (Ponto Jetty and Cardiff Reef). Fletcher Cove reached 570 while Ponto Jetty reached 1520! Beaches that have storm drains or river mouths are extremely dangerous to venture into during rain. The worst beach during rainy weather is Ponto Jetty at an average of 560! The safest during rainy weather is D Street at an average of 30. With no rain and good weather conditions, Cardiff Reef is the worst at an average of 70. The best is Beacons at a mere average of 3! With both of those categories combined, the most hazardous is Cardiff Reef at an average of 183! The safest and most surfer friendly is 15th Street at an average of 17!</p>	
Summary Statement The safest and most hazardous popular North County, San Diego Surf beaches regarding Enterococcus bacteria.	
Help Received Mother and father drove to beaches and helped process samples for incubating; Used lab at Grauer Prep. Academy under supervision of Surfrider Foundation (also provided materials); Dad helped attach chains to board.	