



**CALIFORNIA STATE SCIENCE FAIR  
2014 PROJECT SUMMARY**

<b>Name(s)</b> Jared T. Ellis	<b>Project Number</b>  34558
<b>Project Title</b> Using Kelp as an Indicator of Ocean Pollution	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The objective of this project is to determine if kelp, <i>Macrocystis pyrifera</i>, is an indicator of ocean pollution</p> <p><b>Methods/Materials</b> One Carolina Bacterial Pollution of Water kit, and one Tetra Easy strips water test strips kit were acquired. Then via kayak, kelp from Ocean Beach, Torrey Pines, Solana Beach, and La Jolla was collected and brought back to shore. This was then tested using Tetra water test strips, which included 25 test strips testing for Nitrate, Nitrite, Hardness, Alkalinity and pH, and a Carolina Bacterial pollution of water test kit. This test kit consisted of petri dishes that tested for both normal bacteria and coliform bacteria. The samples used for bacterial testing were then then incubated for two days. The strip testing samples were then homogenized with water and tested.</p> <p><b>Results</b> In Ocean Beach, there were 21 colonies of normal bacteria and 5 colonies of coliform bacteria, and had an alk. Of 100/120, and a pH of 6.8/6.4. Torrey Pines had no normal bacteria colonies, but had two coliform bacteria colonies, and a alk. Of 80/100 and a pH of 6.2/7.2. Solana Beach no normal bacteria colonies, yet had 8 coliform colonies, and a alk. of 120/80 and a pH of 7.2/6.2. La Jolla had 15 colonies of normal bacteria and 6 colonies of coliform bacteria, and had an alk of 100/120, with a pH of 6.2/6.2.</p> <p><b>Conclusions/Discussion</b> This hypothesis was used: Pollution levels in the kelp will vary between beaches by as much as 10 colonies or with pH and alkalinity as much as 20% above or below their averages. It was predicted that this hypothesis would be true because although the individual kelp beds are located in the same body of water topographical differences, land-based runoff, and current characteristics will vary between beaches. This hypothesis was proven incorrect bacterially Ocean beach, which had the highest normal bacteria count at 21 colonies. The hypothesis was also proven incorrect in strip testing by Solana Beach being 30% over average.</p>	
<b>Summary Statement</b> The purpose of this experiment was to find out if kelp is a valid indicator of beach pollution. Although the specific testing used did not yield conclusive results they suggest that kelp is a valid indicator of pollution.	
<b>Help Received</b> Thomas Ellis my Dad, and Julie Ellis, my Mom and Mrs. Gillum.	