



California Science Center
CALIFORNIA STATE SCIENCE FAIR
2001 PROJECT SUMMARY

<p>Your Name (List all student names if multiple authors.) Hannah L. Gray</p>	<p>Science Fair Use Only</p>
<p>Project Title (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9) Investigation of the Biofiltration Potential of the Pacific Oyster to Decrease Fecal Coliform Bacterial Levels</p>	<p>S1815</p>
<p>Preferred Category (See page 5 for descriptions.) 18 - Zoology</p>	<p>Division _ Junior (6-8) <u>X</u> Senior (9-12)</p>
<p>Abstract (Include Objective, Methods, Results, Conclusion. See samples on page 14.) Use no attachments. Only text inside these boxes will be used for category assignment or given to your judges.</p> <p>Objective: To investigate the biofiltration potential of the Pacific Oyster (<i>Crassostrea gigas</i>) to decrease fecal coliform bacterial levels in controlled environments with conditions similar to those found in Morro Bay.</p> <p>Methods: Two circular tanks were used. The experimental tank was stocked with 50 oysters; the control tank with none. A known amount of <i>Escherichia coli</i> was added to both tanks and bacterial concentration decline rates were measured. Two initial experiments were done at an average temperature with only sterile water, oysters, and <i>E. coli</i> to determine simply if oysters could filter out a significant and measurable amount of bacteria. A series of six additional experiments were conducted to investigate how temperature changes and turbidity affected filtration rates.</p> <p>Results: In the two initial trials, the oyster tank bacteria levels dropped 50% in the first three hours; compared to 30% drop in the control tanks. Additional trials revealed that the oysters filtered more efficiently in warmer water than colder water. Experiments involving turbidity are not yet complete. A positive correlation was observed between filtration rates in relation to original bacterial concentrations.</p> <p>Conclusion: <i>Crassostrea gigas</i> can filter fecal coliforms out of the water column. Data specifically showed that the oysters filtered more efficiently in warmer water and when bacterial concentrations were higher. Results of this study substantiate the need and viability of further exploration into the possible use of <i>C. gigas</i> as a biofilter for fecal coliform contaminants in Morro Bay and possibly other bays, estuaries, and beaches with a history of high bacterial pollution. A recently obtained grant from the Morro Bay National Estuary Program will make continued research (conducted by the author, as an independent researcher) possible.</p>	
<p>Summary Statement (In one sentence, state what your project is about.) My project explores the biofiltration potential of the Pacific Oyster (<i>Crassostrea gigas</i>) to decrease fecal coliform bacterial levels.</p>	
<p>Help Received in Doing Project (e.g. Mother helped type report; Neighbor helped wire board; Used lab equipment at university X under the supervision of Dr. Y; Participant in NSF Young Scholars Program) See Display Regulation #8 on page 4. Idexx Laboratories donated chemicals and loaned equipment. Roger Philips at the Monterey Bay Aquarium showed me the aquarium's method of measuring bacterial concentrations. Local businesses offered discounts on supplies. Faylla Chapman at Morro Bay High provided bacteria cultures. My dad helped build the tanks and my mom construct the display board.</p>	