



**CALIFORNIA STATE SCIENCE FAIR  
2017 PROJECT SUMMARY**

<b>Name(s)</b> <b>Zoie S. Andre</b>	<b>Project Number</b> <b>J1102</b>
<b>Project Title</b> <b>Living Shorelines to Mitigate Sea Level Rise</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> Living shorelines are a method to protect coastal shorelines while maintaining self-sustaining biological habitat. This project will help to determine which natural material structures can create conditions for the most effective living shorelines. I tested whether willow branch bundles, oyster shell bundles or coir log structures would accumulate the most sediment and organic material.</p> <p><b>Methods/Materials</b> Three of each structure type was installed in the intertidal zone of Humboldt Bay, adjacent to the Arcata wastewater treatment plant. The nine one square meter structures were installed during the winter storm period and allowed to trap material for twenty one days. The volume of organic material and sediment was collected and measured for each structure.</p> <p><b>Results</b> After the measurement of material within the living shoreline structures, the willow bundle structures resulted in the greatest quantity of trapped material. The coir log structures accumulated the least amount of material.</p> <p><b>Conclusions/Discussion</b> The data obtained did not support the hypothesis that the coir log structures would trap the most material. Instead, the willow branch structures accumulated material most effectively. I can conclude that living shorelines are achievable in Humboldt Bay when using the correct natural materials. Natural material type structures that effectively trap sediment and organic material will promote salt marsh growth. Living shorelines will be an essential type of shoreline protection to lessen sea level rise damage and buffer shorelines from coastal erosion while protecting, restoring and enhancing habitats.</p>	
<b>Summary Statement</b> This study compared the effectiveness of natural material structures to develop living shorelines on the coast of Humboldt Bay.	
<b>Help Received</b> Humboldt Bay Oyster provided shells. Used the City of Arcata wastewater lab equipment for turbidity sample with assistance of Dr. Robert Gearheart and Rachel Hernandez. My father purchased supplies and drove me to the project site.	