



**CALIFORNIA STATE SCIENCE FAIR  
2009 PROJECT SUMMARY**

<b>Name(s)</b> <b>Ken H. Farris</b>	<b>Project Number</b> <b>S0899</b>
<b>Project Title</b> <b>Overpowering Oysters: The Effect of pH on the Bending Moment of Oyster Shells</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The purpose of my experiment is to systematically investigate how pH influences the breaking strength of oyster shells in terms of a bending moment. I hypothesize that the lower the pH, the weaker the oyster shells become. With this research my goal is to understand what might happen to marine life in extreme oceanic pH changes. <b>Methods/Materials</b> The oyster shells with different thicknesses were soaked in eight different pH solutions for three days. Then, I measured the breaking force for each shell using a modified hydraulic press and computed the result in bending moment at fracture. <b>Results</b> The results show both acids and bases weaken oyster shells; however, the acidic pH#s weaken the shells drastically. In fact, at either pH extreme, there is less force required to break or puncture a shell. <b>Conclusions/Discussion</b> As declared in my initial hypothesis, lower pH#s reduce the bending moment to fracture. However, I expected the base to make the oyster stronger or not affect the shell#s breaking strength, because a shell is calcium carbonate, which is a base. My observations show that the base also decreases the strength of the shell, indicating that the strength of the shell is not entirely dependent on the toughness of the calcium carbonate.	
<b>Summary Statement</b> The purpose of my project is to systematically investigate how pH influences the bending moment of oyster shells.	
<b>Help Received</b> Mr. Neilson guided me through experimental preparations and analyses. My chemistry teacher, Mr. McLaughlin, provided me with experimental supplies.	