



**CALIFORNIA STATE SCIENCE FAIR  
2008 PROJECT SUMMARY**

<b>Name(s)</b> Sarah E. Doyel	<b>Project Number</b> <b>S0703</b>
<b>Project Title</b> <b>A Cry for Help! Are the Malibu Beaches Starving for Sand?</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The objective of my project is to determine whether the beaches in the Malibu area are eroding at an unnatural rate due to human development. <b>Methods/Materials</b> I compared beach profile maps of my six selected beaches in the years 1967 and 1969 to 2002 and 2005. Using the Cartesian coordinates of the profiles and the location of the mean high tide line, I determined if there was significant beach retreat from 1967 to 2005. I then compared aerial photographs of the Malibu coastline from 1972 to 2004-2006 to examine possible further photographic evidence of erosion. <b>Results</b> My results showed that four of the six beaches I surveyed have experienced significant erosion since 1967. I couldn't use the profile data for one of the beaches due to lack of modern survey data, but photographic evidence of that beach showed the most dramatic retreat of all. The last beach was relatively stable due to an offshore rock formation that shielded the beach from wave impact and trapped sand onshore. Overall, the evidence supporting the existence of unnatural erosion was overwhelming. <b>Conclusions/Discussion</b> My results clearly show a trend of noticeable retreat - on average, the beaches have receded thirty meters over the last three decades. My results do not support the theory that the missing sand is stored offshore; therefore, I believe that the Malibu beaches are experiencing true retreat. This, I believe, is due to human development. I believe that "armoring" of the coast, which is the construction of sea walls, bulkheads and other artificial structures designed to protect beachfront houses, is the cause of this erosion. The City of Malibu needs to take this beach retreat under serious consideration, as the beaches are the economic, social and recreational hub of the area. The loss of these beaches would mean the loss of tourist dollars, decreased tax revenue due to damaged private property, and the elimination of one of Southern California's most loved amenities.	
<b>Summary Statement</b> My project concerns beach erosion on the Malibu coastline and whether human development is accelerating it to an unnatural rate.	
<b>Help Received</b> Mother helped with obtaining permission to use survey data from consultants, finding research sources and manipulating data into Microsoft Xcel format.	