



**CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY**

Name(s) Sarah C. Silver	Project Number J0809
Project Title Surfing 24/7 in California: Do California Waves Have a Greater Magnitude at High or Low Tide?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Because of the observations made while playing in and near the ocean, the question arose as to whether normal tidal variation created larger wave heights. The objective was to discover whether tidal patterns influenced wave magnitudes.</p> <p>Methods/Materials A measuring device was designed and employed off the shore of Torrey Pines State Beach in San Diego. It consisted of a six foot length of PVC pipe clearly marked in half foot increments. On several different days, at either high or low tide, this device was placed at a constant fixed distance from the high water shore line and a series of waves were measured. Data was also collected from offshore buoys from the NOAA society to be used as a comparison to close shore data collected. Measurements were taken during twenty high tide and twenty low tide trials. Trials began within five minutes of published tidal extremes.</p> <p>Results Measurements of sets of 10 waves were averaged to determine values for each 15- minute trial. Values for each trial were compared to wave heights taken from NOAA buoy data, which measured deep water mass waves. No significant difference was revealed between waves measured at high vs. low tide. A large data gap was shown between buoy data and shore data because of what kind of wave, a shallow water mass wave or a deep water mass wave, was being measured.</p> <p>Conclusions/Discussion This data does not support the hypothesis that there is a positive correlation between tidal stages and wave heights. Wave magnitude is not significantly effected by shifting of tides. Water height created by the tides does not create a different wave height at different tides.</p>	
Summary Statement Thiss experiment tested wave magnitude at high and low tides and did a comparison between this data and data from NOAA offshore buoys.	
Help Received Thank you to both parents for assisting transport to and from the testing beach, mentors Maryanne Fletcher & Dr . Curtis Long at NASA for aiding research, and teacher Mrs. Gillum for providing encouragement and proofreading documents.	