



CALIFORNIA STATE SCIENCE FAIR 2002 PROJECT SUMMARY

Name(s) Connor L. Mosley	Project Number 22904
Project Title Taming Tidal Waves	
Objectives/Goals My objective was to test man-made methods to reduce tidal wave run-up of a tsunami generated by an underwater landslide. I used the possibility of an earthquake induced underwater landslide occurring off the coast of Santa Barbara as a "conceptual model" and basis for my experiment. Abstract Methods/Materials I built a "doe-boy style" pool 5m x 1.2m x .6m from wood/plastic sheathing, with plywood at opposing ends, one at a 60* angle to simulate the "slide zone" and one at 15* angle simulating the "beach". I released a 27kg pea-gravel bag just underwater simulating the slide, and recorded max wave heights at the beach. After establishing my control, I tested 3 methods of reducing wave run-up: 1)"Filling" the area at the base of the slide zone (extra plywood @ 30* angle to simulate land fill) to reduce the slide angle; 2)"Obstructing" the slide path(16p nails in the slide zone to simulate surplus objects like oil derricks, bridge girders/trestles, ships, railcars, airplanes) to break up slide speed and energy; 3)create an "Opposing" force between slide zone and beach (width wise nylon bladder, inflated by rubber tube-attached exterior "air-rocket footstomper" to simulate explosive charges that would ring the slide zone and be auto-activated by zone sensors during a slide) to defuse tidal energy. All methods were tested 50 times each and results averaged. Results The averaged wave heights (in mm)were: the control 37; the "Fill" method-29; the "Obstruct" method-21; the "Oppose" method-34. In comparing the variable method wave heights with the control, all 3 methods showed a height reduction: "Obstruct" - 47.2%; "Fill" - 22.6%; "Oppose" - 8.6%. Conclusions/Discussion The "Obstruction" method was the most effective way of reducing wave run-up, but also had the largest fluctuation in recorded results. I believe this was due to the difficulty in consistantly "modeling" the landslide. The model I built was not intended to duplicate any actual topographical location, or simulate any actual scale, but rather to generate results for these 3 methods strictly for comparison with each other. I gave no consideration to any "real-life" cost, safety, environmental, or engineering impacts or problems that any of these methods might involve, and I can not claim that the scale or accuracy of any of these methods would result in a "real-life" solution. All of these factors would have to be considered in order to explore any real solutions.	
Summary Statement Exploring man-made methods of reducing tidal wave run-up for tsunamis generated by underwater landslides.	
Help Received My father helped with the building of the wave pool, and "air stomper" mechanism.	