CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY

Name(s)	Project Number
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	35447

Project Title

Project Double Tsunami Walls

Abstract

Objectives/Goals

The purpose of this project is to test retractable tsunami walls that stop the negative tsunami(the drawback before the initial wave) and the positive tsunami(the initial wave). These walls lie on the floor when not in use and rise using the force of the tsunami waves and then lock into place using sliding locks. This project tested flat and curved walls while testing each barrier solitarily and together ten times each. It was hypothesized that the curved walls would be the most efficient walls because it would repel the wave and that stopping the negative wave would reduce the force of the positive wave.

Methods/Materials

Build a box structure from wood and stransparent material(5"by1") with a wave generator at one end(comprised of a wooden board,bungee cords, and hinges) and a wooden "shore" at the other. Build the walls from two polycarbonate sheets(12"by14" and 12"by12"). Attach wood strips to the top of the walls so that they could catch the water and rise. Use hinges to attach them to the bottom of the structre 7" away from the shore facing opposite directions with 1" between them. Pull the generator out and release to generate tsunamis. Video tape trials to input into tracker software, which calculates speed, height and distance travled by wave in the video. To curve walls, bend them to a curve depth of 1/2 an inch.

Results

Stopping the negative tsunami wave decreased the force of the positive tsunami wave by 20% and decreased the height by 40%. Both types of walls were able to rise and fully protect the shore from both tsunamis, however, the curved tsunami walls came up faster than the not curved tsunami walls and were able to repel the wave back more efficiently. This is because the curved structre stops the trough(bottom) of the wave before the rest of it resulting in a withdrawl of the wave and more stable stuctures.

Conclusions/Discussion

After testing each retractable wall, it became apparent that both hypotheses were true. The curved wall structures were able to rise faster therefore decreasing overall damage. The curved structure was able to catch the water like wind in a sail. The walls were also able to repel the wave backwards, thereby, making the walls more stable. Also, stopping the negative tsunami was able to reduce the overall force of the positive wave greatly so the positive tsunami was easily stopped by the positive tsunami wall.

Summary Statement

To test retractable tsunami walls that stop both the drawback before the initial tsunami and the initial tsunami and rise utilizing the force of the of the two tsunami waves.

Help Received

Father helped with supplying equipment needed for testing structure. Coach or mentor helped find software to measure speed, height, and how far the tsunami waves travelled up the shore throuout the videos taken of each trial.