



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Alisa Smith	Project Number S0834
Project Title How Do Culverts and Rainfall Intensity Affect Erosion?	
Abstract Objectives/Goals The goal of this project was to see how rainfall intensity and culverts affect erosion on an 18 degree slope. Methods/Materials In this project, I built a model hill slope to test erosion produced from runoff. I simulated rain at the top of the hill, and collected the run off at the bottom in a bucket. Then, I weighed the bucket with water and eroded soil and compared it to the weight of the bucket containing only water to determine the mass of eroded soil. Each trial used them same amount of water, but I varied the intensity of the "rain" (rate of water flow from a hose into a pipe with holes drilled in it). Half the trials used this process on a "barren hill" while the other half were done to a hill with an added model culvert. Materials: Shovel, Saw, Level, Tape Measurer, Hose, Rake, Wheelbarrow, Scale, Sandy Loam Soil, Screws, Staples, Screw Gun, PVC Piping, Water, Lumber, Plywood, Inclinometer, 20 lb weight, Half Inch Screen, 18 Liter Bucket, 4 Liter Bucket, 1 Liter Measuring Cup, Timer, Metal Flashing, Duct Tape. Results After testing, I found that "light rain" on a hill without a culvert produced, on average, .22 kg of eroded soil. "Medium rain" on a hill without a culvert produced an average of .70 kg of eroded soil, and "heavy rain" eroded an average of 1.19 kg of soil. With a culvert, "light rain" produced an average .22 kg of soil, "medium rain" produced an average of .45 kg of soil, and "heavy rain" produced an average of 1.95 kg. Conclusions/Discussion My results supported the hypothesis that runoff from heavier rain would produce more erosion than that from lighter rain. However, my hypothesis that culverts cause more erosion wasn't really confirmed. I think that more trials are necessary to fully prove my hypothesis correct or incorrect.	
Summary Statement My project involved building a model hill slope in order to test if culverts and rainfall intensity have an affect on erosion produced from runoff.	
Help Received Grandfather helped me build and set up parts for the experiment	