



**CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY**

Name(s) Travis J. Killmer	Project Number S0611
Project Title Characteristics of Water Flow in Sherwood Valley Soils	
Abstract Objectives/Goals The goals of my project are to determine the composition, diffusion, permeability and porosity of the soils located around the Sherwood Valley. My project is also designed to determine which soil types are most likely to erode under severe weather conditions and which soils are prone to flooding. Methods/Materials Eight different soil samples (2 fields, 2 forests, 2 hills and 2 streams) were collected. The composition of the samples was determined by conducting sedimentation tests. To conduct the sedimentation test ½ cup of soil, 3 ½ cups of water and 5 tablespoons of Calgon solution were placed in a jar, shaken for five minutes and the settled soil was measured after 40 seconds, 30 minutes and 24 hours. The soil depth after each time interval was divided by the total depth to determine the percentage of clay, sand and silt in each soil sample. The diffusion of the soil was calculated by filling a beaker with 350 ml of soil, adding 5 ml of food coloring and water and measuring its spread in centimeters. The permeability of the soil was determined by filling a gallon bucket with soil, pouring 500 ml of water into it, timing how long it took to permeate and dividing 500 by the time it took for the water to permeate. The porosity of the soil was determined by filling a beaker with 350 ml of soil, pouring water into the soil until it reaches the top of the soil and dividing the amount of water used by 350 to calculate the percent pore space. Results The soils with the highest porosities in descending order are field 2, forest 1, field 1, hill 1, forest 2, stream 2, hill 2 and stream 1. The soils with the highest permeabilities in descending order are hill 1, forest 1, hill 2, stream 2, forest 2, stream 1, field 2 and field 1. The soils with the highest diffusion in descending order are forest 1, forest 2, hill 2, stream 1, field 2, stream 2, field 1 and hill 1. Conclusions/Discussion My conclusion is that the soils of the Sherwood Valley are, for the most part, very high in sand. The high proportion of sand in the soils means that nutrients need to be added to the soil so that croplands can be more productive. In addition, high proportions of sand mean the soil is easier to work and flooding is not a problem in the Sherwood area. The erosion factor in the Sherwood Valley has the potential to be a problem if local road crews and engineers don't cut slopes and grades at appropriate angles.	
Summary Statement The goal of my project is to determine the characteristics of water flow in Sherwood Valley soils by testing for soil composition, diffusion rates, permeability and porosity.	
Help Received Father took pictures; Sister sewed project header; school loaned triple beam balance; Clint Smith helped with data analysis.	