



**CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY**

Name(s) Joshua J. Compton	Project Number J0806
Project Title The Effects of Large Woody Debris on Sediment Transport	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The recent series of storms in December 2002 caused severe flooding in Freshwater Creek. One of the causes of flooding is soil erosion, which results in the transport of sediment downstream. Transported sediment is deposited into the flatter portions of the creek. The upper portions of Freshwater Creek and its tributaries contain significant amounts of large woody debris (LWD). The objective of this experiment is to determine the effects of LWD on the flow of water and the amount of sediment transported downstream.</p> <p>Methods/Materials A model watercourse was constructed, containing two separate channels. An equal amount of soil and rock was placed in each watercourse. Various size limbs and twigs were placed in one watercourse to simulate LWD. The other watercourse was the control. Water was allowed to run down the watercourses at 1.92 oz/sec until 2 gallons of sediment and water were collected. Sediment was separated from the water, dried, and weighed. This process was repeated 5 times.</p> <p>Results In all experiments, the LWD watercourse transported approximately one-fourth to one-half less sediment than the control watercourse. The water pushed and trapped sediment against the LWD and caused water to flow around and over the LWD. In both watercourses, there was scouring which created different channels. In the LWD watercourse, the water channel created was narrow and deep. In the control watercourse, the water channel created was wider and more shallow than the LWD watercourse. In the control watercourse, the channel wall was undercut by the flow of water, causing a portion of the wall to collapse into the watercourse and be transported downstream as sediment.</p> <p>Conclusions/Discussion The results of this experiment may benefit watershed management. This experiment shows that large woody debris reduces sediment transport, and may reduce undercutting in stream banks. Large woody debris can be placed into watersheds where it is lacking. Introducing large woody debris in areas where it is lacking may also benefit Freshwater Creek. There would be less sediment transported downstream, and may help the flooding problem.</p>	
Summary Statement This project attempts to simulate the natural conditions of Freshwater Creek, to determine the effects of large woody debris on water flow and sediment transport.	
Help Received My father helped construct the watercourse and stand.	