



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Dorothy L. Silverman	Project Number S0709
Project Title Influence of Site Effects on Peak Ground Acceleration in the Northridge and Whittier Narrows Earthquakes	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The normal intuition is that increased distance from an epicenter results in a decrease in amplitude and therefore a decrease in intensity. This line of thought is called attenuation of a wave. However, site effects can make attenuation an incorrect parameter for the prediction of strong motion/intensity. The main purpose of this study was to determine how and to what extent site effects can account for peak ground acceleration (PGA). Soil type and distance were employed as site effects. Data was only taken from seismic stations that recorded for both the Northridge and Whittier earthquakes to determine whether site effect estimates from one earthquake will apply to those of another.</p> <p>Methods/Materials Acceleration files for the Northridge and Whittier Narrows earthquakes were collected from USGS shakemaps. From these catalogues, seismic station names, the stations' coordinates, distances from the two epicenters to the stations, and PGA for the two earthquakes were recorded for further analysis. Soil types of each seismic station were located using a geologic map. The map used was a Geologic Map of California Los Angeles Sheet, with a scale of 1:250,000. A technique was developed to pinpoint the locations of each station on the map, thus finding its corresponding soil type.</p> <p>Results PGA records from the two earthquakes did not match up perfectly, due to the greater magnitude of the Northridge earthquake. All recordings clearly showed a negative correlation between increasing distance and PGA. All young soils from the Quaternary Period of the Cenozoic Era responded very similarly to one another's the average PGA.</p> <p>Conclusions/Discussion Distance is still the dominating component of earthquake intensity and will normally override other site effects. The study did confirm a correlation between increased PGA and younger soils. Many other site effects such as basin effects and soil thickness may have influenced the data. It is important to acknowledge these additional factors and incorporate them into future studies. A greater pool of data and Graphic Imaging System will further sharpen these results.</p>	
Summary Statement The main focus of this project was to find the degree of impact site effects have on Peak Ground Acceleration.	
Help Received Uncle gave background information on site effects; Dr. Yong at USGS provided some advice.	