Project Abstract

Variations in surface topography must be associated with variations in supporting stress in the underlying crust. Here, we assume that the crust behaves as a linear elastic half space to model the behavior of the associated stress. Understanding this stress can help with the study of faults that are close to or beneath major mountain ranges. One method for calculating the stress on a fault underneath this topography is to use the Boussinesq solution for stress due to a point load. By convolving this solution with observed topography, it is possible to find the stress for every point on nearby faults. This study focuses on the San Andreas fault in the area of Southern California where it passes the San Gabriel Mountains. The model assumed the San Andreas Fault to be a strong fault, so it did not shed the stress induced up on it from regional topography. The compressive stress varies along the strike of the fault, from -2MPa to -5Mpa. However the shear stress caused by the topography is uniform along the chosen segment of the fault at about .5MPa in the right lateral direction. Areas for future research include examining the stress created on dipping faults, such as the Sierra Madre fault, how the stress is distributed if the faults are assumed to be relatively weak, and the affects of non-elastic half-space models of the crust.