

**GRAVITY AND MAGNETIC ANALYSIS OF THE LITHOSPHERIC
STRUCTURE OF THE SOUTHERN SIERRA NEVADA AND SURROUNDING
REGIONS, CALIFORNIA AND NEVADA**

(Geography, Geology and Planning)

Missouri State University, February 2010

(Master of Science)

(Uranbaigal Purevsuren)

ABSTRACT

The general crustal structure of the southern Sierra Nevada and surrounding area was examined through the analysis of gravity and magnetic data. A series of relief Bouguer gravity, low-pass and band-pass wavelength filtered gravity and reduced to the pole total magnetic intensity maps were produced to delineate the general tectonic features of the region. Two regional gravity models were utilized for determining the general crustal structure of the region and the location of the denser upper mantle body under the Great Valley and the Sierra Nevada region. Mountains generally have a thick crust underneath them. The lack of a thick crustal root beneath the Sierra Nevada reported by previous geophysical studies still needs to be resolved. This gravity analysis study provides additional information to help explain these previous findings. This study found that the Moho is 30-33 km deep under the Basin and Range province and 35-40 km beneath Sierra Nevada, and also showed delamination of the mantle lithosphere beneath the high topography of the Sierra Nevada. In general, the gravity and magnetic analysis and gravity models were consistent with the previous seismic studies and gave an improved image of the removal of the crustal lithosphere.

KEYWORDS: (Sierra Nevada, lithospheric removal, delamination, root foundering, lack of crustal root)

This abstract is approved as to form and content

(Kevin Mickus, Ph.D.)
Chairperson, Advisory Committee
Missouri State University