

## **GRAVITY CONSTRAINTS ON BASIN GEOMETRY AND FAULT LOCATIONS IN SOUTHERN CADIZ VALLEY, EASTERN CALIFORNIA SHEAR ZONE**

David M. Carpenter and Phillip A. Armstrong

Geological Sciences, California State University Fullerton, 800 N. State College Blvd, Fullerton, CA 92834, [dcarpenter4@csu.fullerton.edu](mailto:dcarpenter4@csu.fullerton.edu)

The southern Mojave Desert is a tectonically complex area that is largely affected by deformation associated with the Eastern California Shear Zone. Cadiz Valley is a NW-SE – oriented valley located east of the Sheephole Mountains that is bound by the Iron Mountains on the east and Calumet Mountains on the west. Basement rocks include the Cretaceous Iron Mountain and Coxcomb Mountain Intrusive Suites, which are mostly comprised of granodiorite and granite. Although southern Cadiz Valley is located east of the main Eastern California Shear Zone fault exposures, a poorly constrained NW-SE - striking fault is mapped in the valley below Holocene alluvial deposits; the presence and location of this fault is presumably based on projection of basement exposures. In order to analyze basin geometry and evaluate possible fault locations, a gravity survey was performed across southern Cadiz Valley. From the west side of the valley, adjacent to the Calumet Mountains, Bouguer anomalies (non-terrain corrected) decrease approximately 10 mGals to the center of the valley. Eastward, Bouguer anomalies increase rapidly 14 mGal across a distance of 3.4 km (~4 mGal/km). At ~2 km from the Iron Mountains range front, a prominent inflection point in anomaly values occurs and Bouguer gravity anomalies decrease 0.4 mGal across a distance of 0.5 km. Farther east, Bouguer gravity again increases at approximately the same rate as that west of the anomaly inflection. Preliminary evaluation of this Bouguer anomaly inflection suggests that the Cadiz Valley fault is located on the eastern side of the southernmost Cadiz Valley near the Iron Mountains range front. Additional gravity data collected farther north across Cadiz Valley, in combination with density measurements of surrounding bedrock and detailed gravity modeling, will be used to further constrain basin geometry and fault location(s).