

Appendix E

Potential Field Data - Gravity Surveys

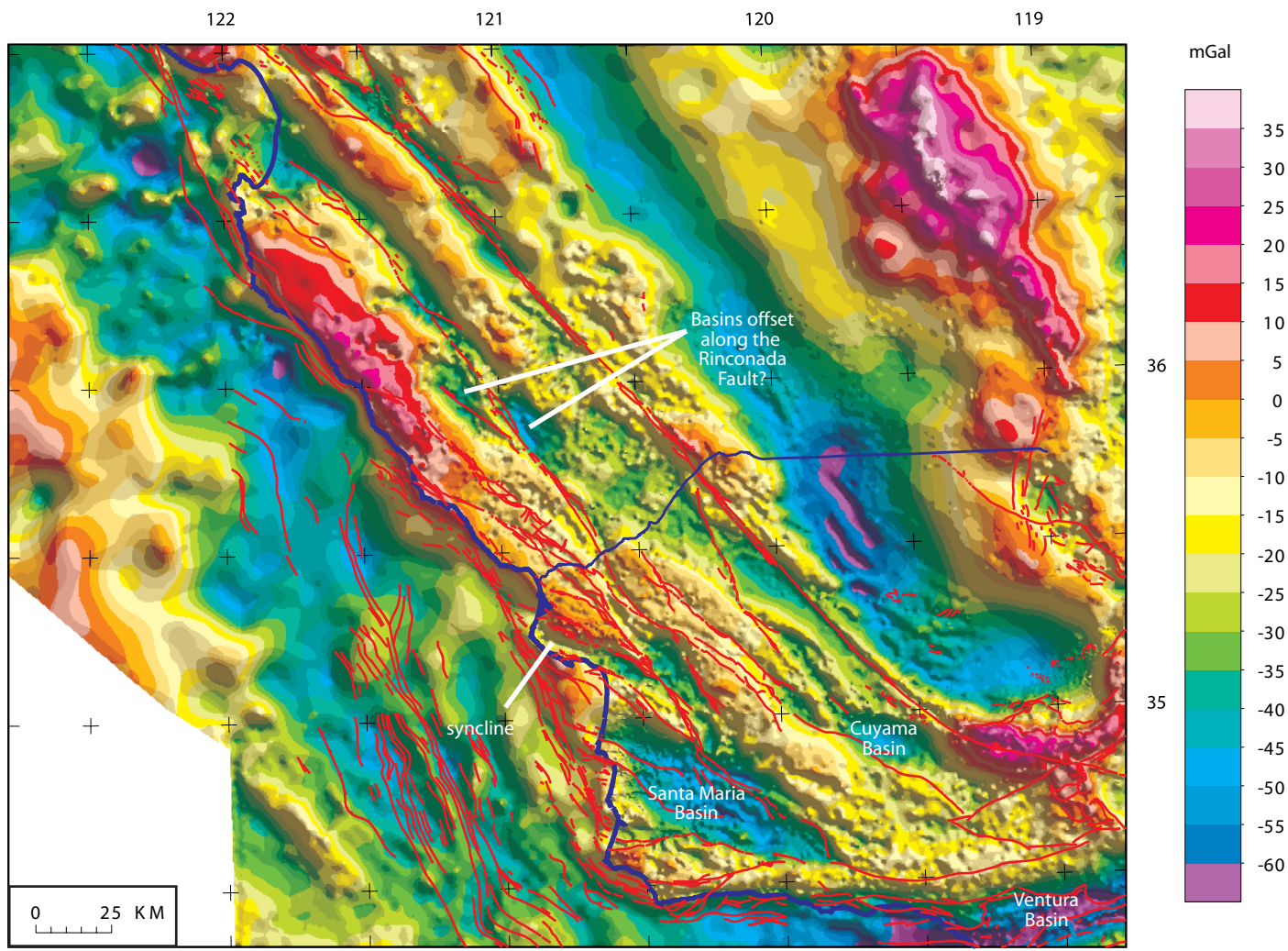
Introduction

The USGS has compiled, edited and reprocessed nearly 30,000 gravity measurements to produce an isostatic residual gravity map for the region, spanning Monterey Bay on the north to the Santa Barbara channel on the south (Figure E-1). Isostatic gravity is calculated by subtracting an idealized isostatic compensation for the regional elevation from the Bouguer gravity. Result is a high pass filter that removes regional, long wavelength crustal scale features (wavelengths > 50 to 100 km) while preserving anomalies that have a shallower source and smaller lateral extent (sedimentary basins, lithologic variations in the crust, etc.). Data includes the PG&E LTSP offshore data base as well as data collected at ~ 1 mile spacing by NIMA (formerly the Defense Mapping Agency) for the area south of 36°15'N near Vandenberg Air Force Base. Terrain corrections were applied using 30 m DEMs to create a roughly 2km grid over the LTSP Update study area. (Langenheim et al., 2008). The USGS also collected about 180 new gravity measurements in the Pt-Buchon/Los Osos area and the Santa Maria basin in 2009 (Watt, written communication 2009). Several older measurement sites were reoccupied to aid in editing the old data. The reoccupations have highlighted the inaccuracy of the older data. Figure E-2 shows an overlay of the isostatic gravity map for the Shoreline fault zone study area with the actual gravity stations used to produce the map. The map emphasizes the steep gravity gradients along the boundaries of the Pismo syncline as well as the near vertical dips of the West Huasna and Hosgri faults in this area.

The gravity field offshore of DCPD is dominated by a large NNW trending gravity high that is coincident with mapped Franciscan rocks that are truncated to the SW by the Hosgri fault. The northern boundary of this offshore gravity high is coincident with the western edge of the Pismo syncline, and is well defined based on 2009 measurements. Note the absence of gravity measurements immediately offshore DCPD between Point Buchon and Point San Luis in Figure E-2. We are planning to collect new data in this area as part of the LTSP Update in 2011.

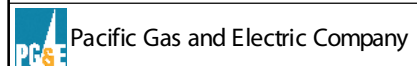
Reference

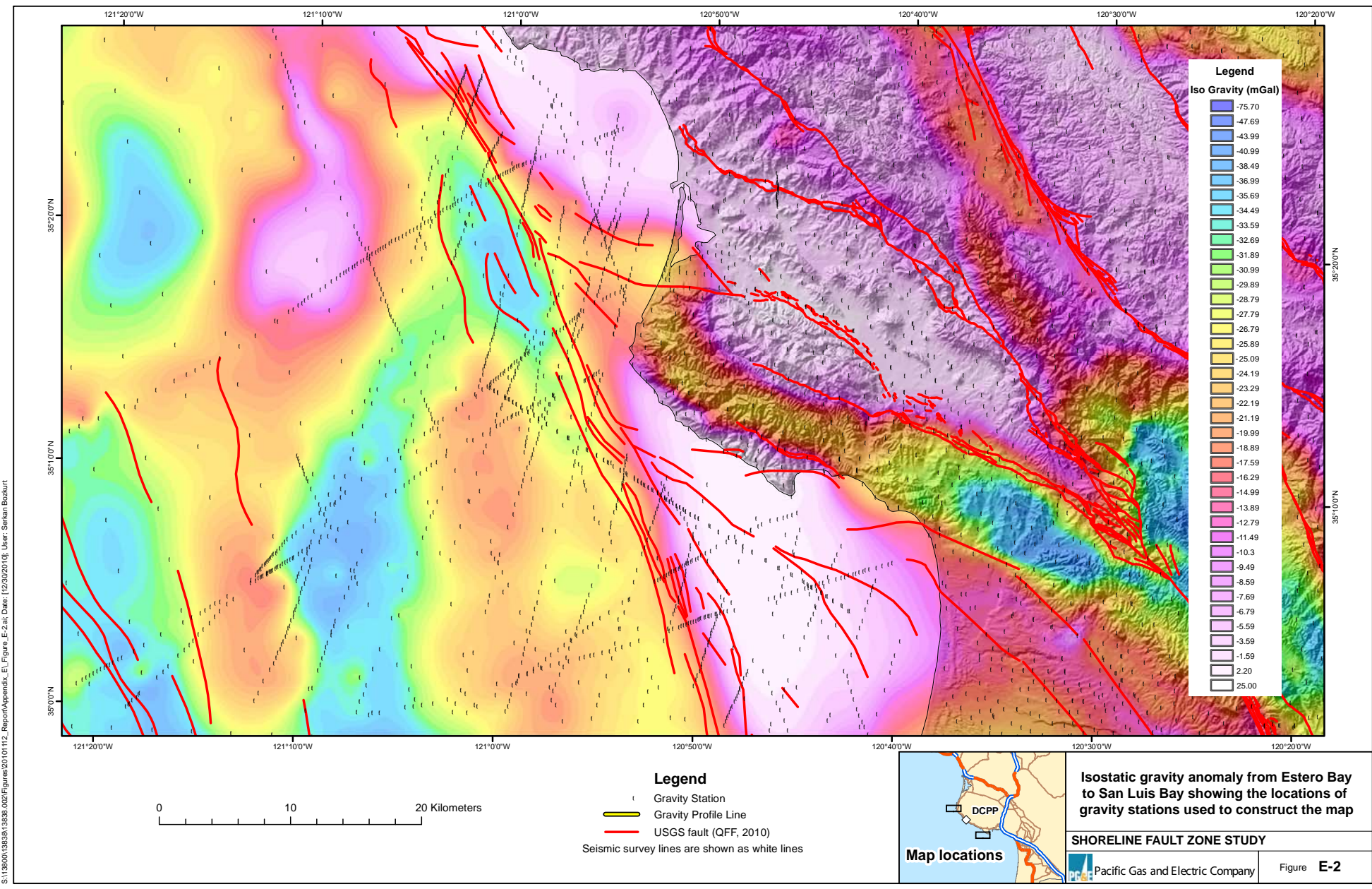
Langenheim, V.E., Jachens, R.C., Graymer, R.W. and Wentworth, C.M., 2008, Implications for fault and basin geometry in the central California Coast Ranges from preliminary gravity and magnetic data, EOS (Abs. AGU), Fall Meeting 2008, abstract #GP43B-0811.



Isostatic gravity map of coastal central California (Langenheim et al., 2008)

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Isostatic gravity anomaly from Estero Bay to San Luis Bay showing the locations of gravity stations used to construct the map

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