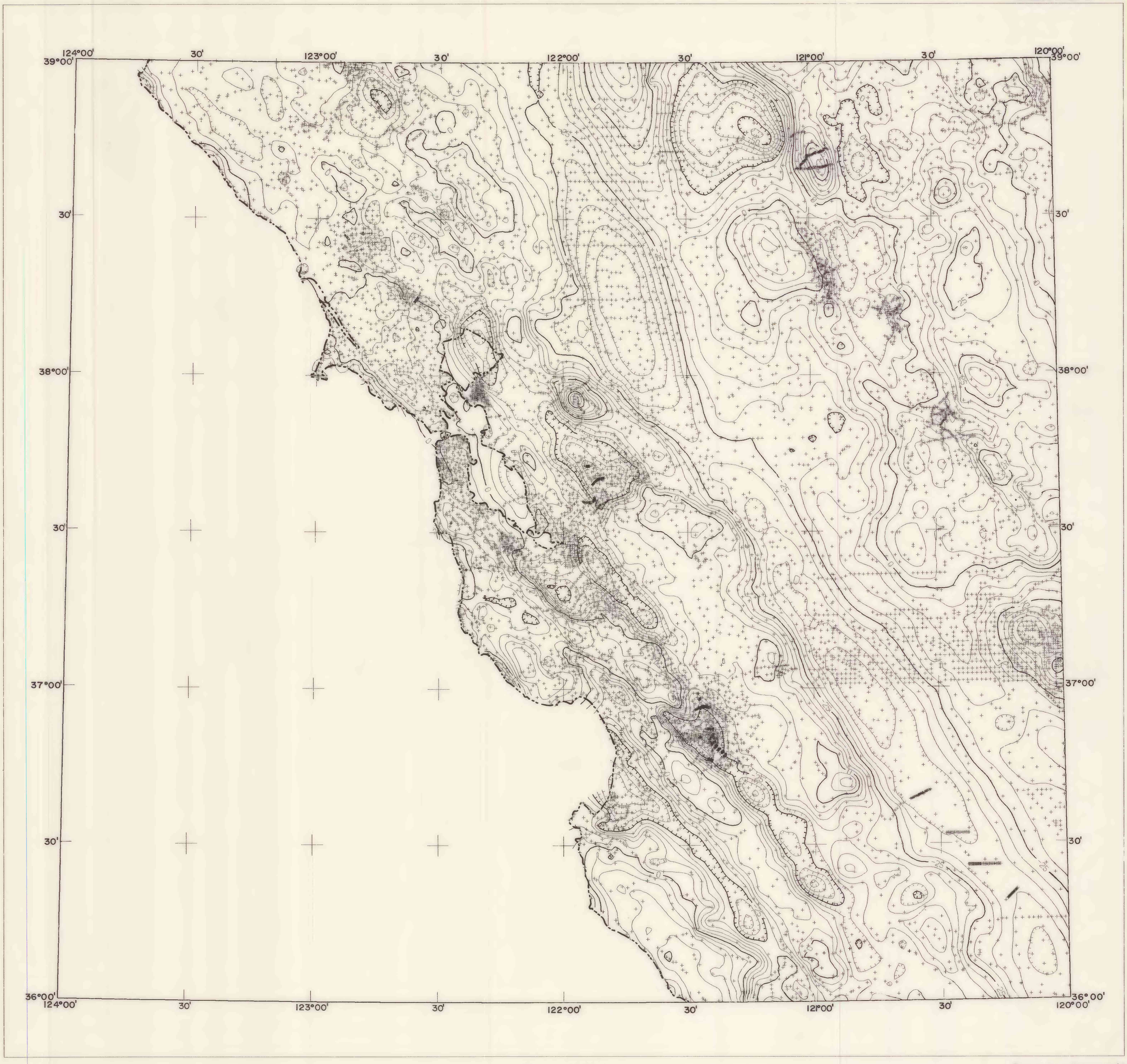
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

OPEN-FILE REPORT
81-573
SHEET 2 OF 5



SCALE 1:750,000

10 0 10 20 30 40 50 Miles

10 0 10 20 30 40 50 60 Kilometers

CONTOUR INTERVAL 5 MILLIGALS

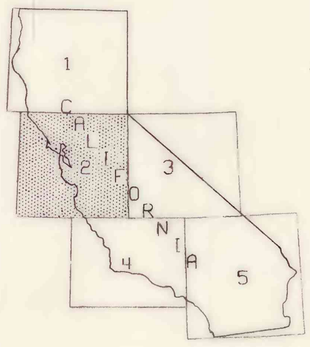
PRELIMINARY ISOSTATIC RESIDUAL GRAVITY MAP OF CALIFORNIA

by

Carter W. Roberts, Robert C. Jachens, and Howard W. Oliver

1981

This map is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards.



SHEET LOCATION

EXPLANATION

+ indicates gravity high
hachures indicate lows

Complete Bouguer anomalies from Oliver and others (1980).

Isostatic corrections calculated assuming complete local compensation by the Airy-Heiskanen system. Calculations performed by computer (Jachens and Roberts, 1981) out to a radius of 166.7 km from each station using formulas of Heiskanen and Vening Meinesz (1956, p. 136 and 182) modified to incorporate station elevations. Crustal thickness calculated from topography averaged over 3x3 minute compartments (Robbins and others, 1973) assuming density of topography, 2.67 g/cm^3, sea level crustal thickness, 25 km, and lower crust-upper mantle density contrast, 0.40 g/cm^3.

For region beyond 166.7 km, combined terrain and isostatic corrections taken from published topographic-isostatic reduction maps (Karki and others, 1961).

Contouring by computer with 1600 m grid size.

References

Heiskanen, W. A., and Vening Meinesz, F. A., 1958, The earth and its gravity field: McGraw-Hill Book Co., Inc., New York, 470 p.

Jachens, Robert C., and Roberts, Carter W., 1981, Documentation of a FORTRAN program, 'isocomp', for computing isostatic residual gravity: U.S. Geological Survey, Open-File Report 81-574.

Karki, P., Kivioja, L., and Heiskanen, W. A., 1961, Topographic-isostatic reduction maps for the world for the Hayford zones 18-1, Airy-Heiskanen system, T=30 km: Isostatic Institute of the International Association of Geodesy, no. 35, 5 p., 20 maps.

Oliver, H. W., Chapman, R. H., Biehler, Shawn., Robbins, S. L., Hanna, W. F., Griscom, Andrew, Beyer, L. A., and Silver, E. A., 1980, Gravity map of California and its continental margin: California Division of Mines and Geology, Geologic Data Map No. 3, scale 1:750,000.

Robbins, S. L., Oliver, H. W., and Plouff, Donald, 1973, Magnetic tape containing average elevations of topography in California and adjacent regions for areas of 1x1 minute and 3x3 minutes in size: U.S. Geological Survey Report, 31 p., tape, available from National Technical Information Service, U.S. Department of Commerce, Springfield, VA, NTIS-PB 219794.