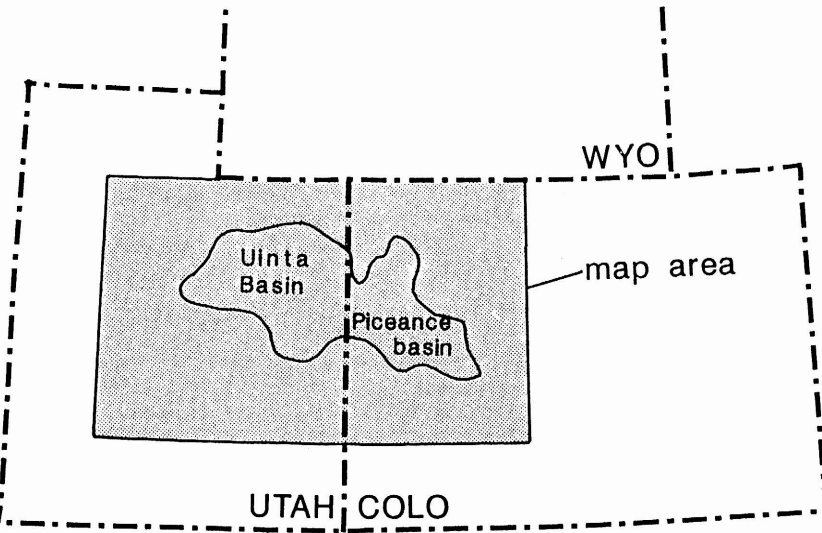


Base from U.S. Geological Survey
Colorado, 1968, Utah, 1958

SCALE 1:500,000
10 0 10 20 30 40 50 MILES
10 0 10 20 30 40 50 KILOMETERS
CONTOUR INTERVAL 500 FEET
NATIONAL GEODESIC VERTICAL DATUM OF 1929

Manuscript approved for publication, September 13, 1989



This map is part of a folio of maps and cross sections of the Uinta and Piceance basin area, bounded by 38°-41° N. lat. and 106°30'-113° W. long., prepared for the Evolution of Sedimentary Basins Program. Other maps in this folio showing various geologic and hydrologic aspects of the same area will be published as U.S. Geological Survey Miscellaneous Field Studies Maps bearing this same serial number but with different letter suffixes (MF-2008-A, -B, and -C).

INTRODUCTION

The purpose of this map is to contribute to the understanding of the evolution of the Uinta and Piceance sedimentary basins. The map was made from a large data set consisting of gravity stations throughout the basin and surrounding areas. The map can be used to help interpret concealed lithology and structures and complement geologic mapping.

The complete Bouguer gravity anomaly map shows variations in the gravitational field. Gravity stations are shown on the map to show the spacing of the data. All of the gravity features on the map are derived from horizontal variations in the density of the subsurface rocks.

DATA COMPILATION

The gravity data for this study consist of 29,259 gravity stations and were acquired from G.L. Keller (University of Texas at El Paso, written commun.), Abrams and Grou (1987), Cook and others (1988), D.L. Campbell (USGS, written commun.), D.W. Hollis (USGS, written commun.), A.E. McCafferty (USGS, written commun.), Soulliere and others (1988), and the U.S. Defense Mapping Agency (1974) available from National Geophysical and Solar-Terrestrial Data Center, National Oceanic and Atmospheric Administration, Boulder, Colorado). The data shown on the complete Bouguer gravity anomaly map were calculated using standard equations (Cordell and others, 1982, and International Association of Geodesy and Geophysics, 1971) using a reduction density of 2.67 g/cm³. Terrain corrections were computed from each gravity station to a radial distance of 167 km using the method of Plouff (1977). The data were projected using the Lambert conformal conic system, with a central meridian of 109° 30' and a base latitude of 39°, then gridded to an interval of 1 km using a minimum curvature algorithm (Briggs, 1974, and Wehring, 1981). The spacing of the grid has a large effect on the nature of the resulting map; calculations made with a smaller grid spacing emphasize smaller details and those with a larger grid spacing tend to suppress smaller features and emphasize broader ones. The data density exerts a strong influence on the size of features that can be identified. The data set represents approximately one station per 7 km²; however, the density of coverage varies

widely from one station per 0.5 km² along roads to greater than one station per 50 km² in more remote areas. Very sparse data may cause considerable loss of important detail for smaller features. Some of the isolated anomalies (i.e., one-station anomalies) may be artifacts of the data reduction procedure and may not represent true density variations. Because of the large uncertainties of the acquisition of these various data sets and the wide range in the spacing of the data, the map was contoured (Gordon and Wehring, 1982) at a 5-mgal interval. Where the spacing between data points was more than 8 km the MNC program (Wehring, 1981) did not extrapolate the data and no contour lines were plotted in those areas. The Bouguer gravity values range from a low of -339 mgal to a high of -131 mgal, with the values generally increasing from east to west.

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EXPLANATION

Gravity contour—Contour interval 5 mgal; hachured contours enclose areas of lower gravity

Gravity station

COMPLETE BOUGUER GRAVITY ANOMALY MAP OF THE UINTA AND PICEANCE BASINS AND VICINITY, UTAH AND COLORADO

By
Gerda A. Abrams, V.J.S. Grauch, and Viki Bankey
1990