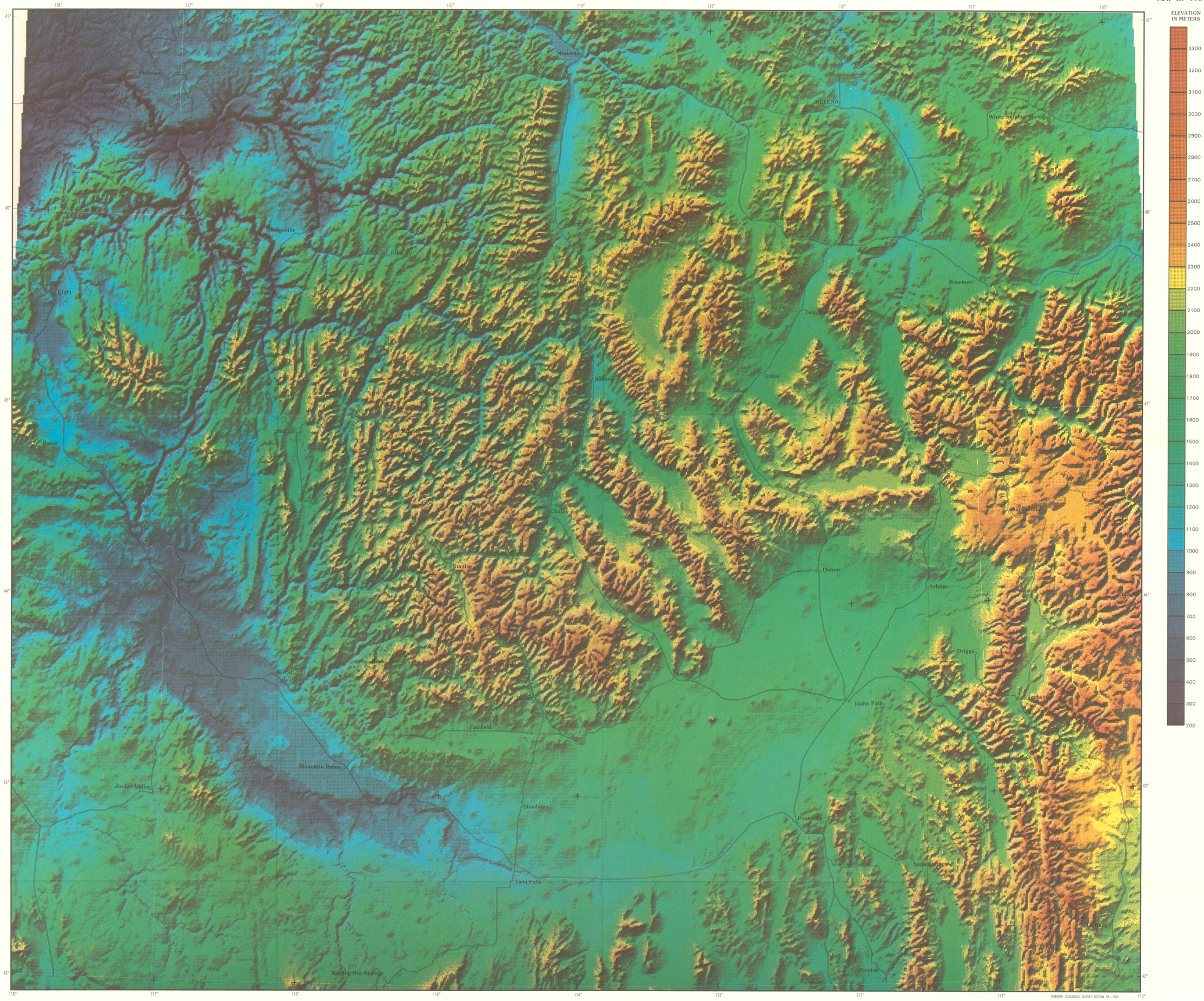
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

GEOPHYSICAL INVESTIGATIONS
MAP GP-996



Base modified from
U.S. Geological Survey
Idaho, 1988; Montana, 1967;
Oregon, 1986; Washington, 1968;
and Wyoming, 1967

SCALE 1:1 000 000

25 0 25 50 75 100 MILES

25 0 25 50 75 100 KILOMETERS

INTERIOR—GEOLOGICAL SURVEY, RESTON, VA—1992

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Graphic Design by William Sowers
Cartography by Henry Williams

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CONVERSION FACTORS

Multiply	By	To obtain
centimeters (cm)	0.3937	inches (in)
meters (m)	3.281	feet (ft)
kilometers (km)	0.6214	miles (mi)

INTRODUCTION

This map shows digital topographic data displayed in color-shaded relief for most of Idaho and adjoining portions of Montana, Wyoming, Oregon, and Washington. It is part of a series of maps created by the U.S. Geological Survey for a multidisciplinary evaluation of the mineral resources of National Forest wilderness study areas in Idaho. Other maps in this series are gravity and aeromagnetic maps, and apparent-density and magnetic-susceptibility maps derived therefrom (Bankey, 1992, and McCafferty, 1992). The maps represent part of a regional digital data base that can be used for geophysical and geological interpretations beyond the scope of the initial mineral-resource assessment of the wilderness study areas.

TOPOGRAPHIC DATA

Digital topographic data used to create this map are 1:250,000-scale digital elevation model (DEM) data described by Elassal and Caruso (1983) as follows: "The 1:250,000-scale DEM data are produced by interpolating elevations at intervals of 3 arc-seconds from contours, ridgelines, and drains digitized from 1:250,000-scale topographic maps. Three seconds of arc represent approximately 90 m in the north-south axis and a variable dimension (approximately 90 m at the equator to 60 m at 50° latitude) in the east-west axis due to convergence of the meridians... The accuracy of 1:250,000-scale DEM's is consistent with the accuracy of the contours (50 ft in flat terrain, 100 ft in moderate terrain, and 200 ft in steep terrain) on the 1:250,000-scale topographic maps used to produce the data."

The 3-second data were averaged to produce 15-second means. The means were gridded at a 500-m interval using the MINC computer program (Webring, 1981). The grid and map have a Lambert conformal projection with standard parallels of 33° N.and 45° N. central meridian of 114° W., and base latitude of 0°. The color-shaded relief map was produced on an Applicon color plotter using the CSRELIEF computer program (M.W. Webring, unpublished data, 1987).

The shaded-relief technique simulates a three-dimensional topographic model illuminated from the northwest (N. 35° W.) by a "sun" 40 degrees above the horizon. The illumination direction was chosen to suppress northwest-trending basin-and-range structures. Shadows emphasize northeast-trending features such as structures associated with the Idaho suture zone (located near long 116° W.) and Pleistocene lake shores (located between latitudes 43° N. and 44° N., and longitudes 112° W. and 113° W.).

CONCLUSION

Uses for the map include structural and geomorphic interpretation and evaluation of the effects of topography upon the gravity and magnetic fields shown on the companion maps (Bankey, 1992, and McCafferty, 1992). The digital data from which the map was created can be used for quantitative manipulation and interpretation in conjunction with digital gravity and magnetic data sets. The topographic data gridded at an interval of 0.5 km are available from the EROS Data Center, U.S. Geological Survey, Sioux Falls, SD, 57198.

REFERENCES CITED

Bankey, Viki, 1992, Complete Bouguer gravity, isostatic residual gravity, and related geophysical maps centered on the Idaho batholith and Challis volcanic field, northwestern United States: U.S. Geological Survey Geophysical Investigations Map GP-995, scale 1:1,000,000.

Elassal, A.A., and Caruso, V.M., 1983, Digital elevation models, USGS digital cartographic data standards: U.S. Geological Survey Circular 895–B, 40 p.

McCafferty, A.E., 1992, Aeromagnetic map and terrace magnetization map centered on the Idaho batholith and Challis volcanic field, northwestern United States: U.S. Geological Survey Geophysical Investigations Map GP-994, scale 1:1,000,000.

Webring, M.W., 1981, MINC—A gridding program based on minimum curvature: U.S. Geological Survey Open-File Report 81–1224, 41 p.

Index map showing location of study area

DIGITAL TOPOGRAPHIC MAP CENTERED ON THE IDAHO BATHOLITH AND CHALLIS VOLCANIC FIELD, NORTHWESTERN UNITED STATES

By
John W. Cady

1992

For sale by U.S. Geological Survey Map Distribution
Box 25286, Federal Center, Denver, CO 80225