STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES
Brian Boyle, Commissioner of Public Lands
Art Stearns, Supervisor

DIVISION OF GEOLOGY AND EARTH RESOURCES
Raymond Lasmanis, State Geologist

GEOPHYSICAL MAP GM-27

COMPLETE BOUGUER GRAVITY ANOMALY MAP, CASCADE MOUNTAINS, WASHINGTON

By

Z.F. DANEŠ AND W.M. PHILLIPS

Prepared in cooperation with
U.S. Department of Energy
Contract DE-AC03-79ET27014

1983

For sale by the Department of Natural Resources
Price $ 3.25

WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES
BRIAN J. BOYLE, Commissioner of Public Lands
ART STEARNS, Supervisor

DIVISION OF GEOLOGY AND EARTH RESOURCES
RAYMOND LASMANIS, State Geologist

Topographic base map from portions of the Hoquiam, The Dalles, Vancouver, and Yakima 1:250,000 USGS map series

LEGEND

Estimated maximum uncertainty of gravity measurements 5 mgals

Theoretical gravity IGF (1967)

Bouguer reduction density 2.67 g/cc

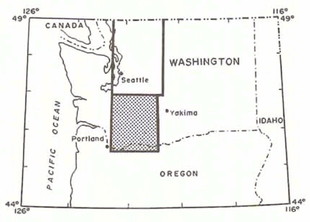
Potsdam correction: Gravity base stations adjusted by -13.00 mgals relative to old international gravity base station at Potsdam.

Terrain corrections: Near terrain corrections (Hammer Zone A-D) determined via use of graphs based on geometry of topography in immediate vicinity of observation points. Distant terrain corrections calculated using the computer program of Plouff (1977)

Principal gravity facts and discussion of terrain corrections available in Daneš and Phillips (1983)

Note: The companion map to this work, Complete Bouguer Gravity Anomaly Map, Northern Cascade Mountains, Washington (sheet 1), uses a terrain correction method (Daneš, 1982) that differs from the one employed here. Therefore, contour lines on the two maps are not continuous across the 47° N. latitude boundary

MAP LOCATION



SOURCE OF GRAVITY DATA

Goman (1967); Konîček (1974, 1975); Rowley (1982); Stricklin (1975); Stuart (1965); all other data collected by Z. F. Daneš. Gravity data tied into the Washington gravity base station network (Nilsen, 1976)

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N

Scale 1:250,000

5 0 5 10 15 20 Statute Miles

5 0 5 10 15 20 25 30 Kilometers

Topographic contour interval 200 feet with supplementary contours at 100-foot intervals
Transverse Mercator Projection

Gravity contour interval 5 mgals
Gravity contours dashed where uncertain
Hachured contour indicates low gravity
Location of gravity stations shown by dots

REFERENCES CITED

Daneš, Z. F.; Phillips, W. M., 1983, Principal facts and a discussion of terrain correction methods for the complete Bouguer gravity anomaly map of the Cascade Mountains, Washington: Washington Division of Geology and Earth Resources Open-File Report 83-1, 15 p., 145 gravity data sheets.

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Goman, T., 1967, Gravity survey of Mount St. Helens, Washington: University of Puget Sound Undergraduate Research Project.

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ACKNOWLEDGMENTS

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NORTHERN CASCADES, WASHINGTON

DIVISION OF GEOLOGY AND EARTH RESOURCES
RAYMOND LASMANIS, State Geologist

Topographic base map from portions of the Concrete, Seattle, Victoria, and Wenatchee 1:250,000 USGS map series

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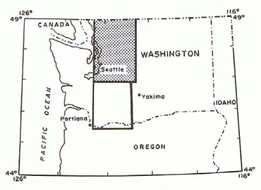
Note: The companion map to this work, Complete Bouguer Gravity Anomaly Map, Southern Cascade Mountains, Washington (sheet 2), uses a terrain correction method (Plouff, 1977) that differs from the one employed here. Therefore, contour lines on the two maps are not continuous across the 47° N. latitude boundary

MAP LOCATION



SOURCE OF GRAVITY DATA

Aiken (1970); Campbell and Johnson (1982); Lepp (1978); Stuart (1965); all other data collected by Z. F. Daneš. Gravity data tied into the Washington gravity base station network (Nilsen, 1976)

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Aiken, C. L., 1970, Gravimetric profiles across northern Cascades employing minimum assumptions as to subsurface density distribution: University of Washington M.S. thesis, 134 p.

Campbell, D. S.; Johnson, D. J., 1982, Bouguer gravity study of Enumclaw/Pinnacle Peak, Washington: Northwest Science, v. 56, no. 2, p. 90-100.

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Lepp, L. R., 1978, Geophysical investigation of southeastern Puget Sound lowland, Washington, USA: University of Puget Sound B.S. thesis, 11 p.

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