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Principal facts for fifty-six gravity stations near the Diamond Peak Wilderness Area, Oregon

by

Carol Finn

and

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Explanation of the headings of the accompanying table of principal facts are as follows.

STATION IDENTIFICATION — All stations were taken with LaCoste and Romberg[1] gravity meter G-24. For a complete description of the gravity reduction procedures currently in use by the U.S. Geological Survey (USGS) for defining the corrections and anomalies, see Cordell and others (1982).

LATITUDE AND LONGITUDE — Values listed are in degrees and minutes to the nearest one hundredth of a minute. These positions were surveyed in with a laser theodolyte for all stations.

ELEVATION — Elevations are in feet to the nearest tenth. All elevations were surveyed in with a laser theodolyte and are accurate to the nearest tenth of a foot.

OBSERVED GRAVITY — Values are to the nearest hundredth of a milligal. All stations are relative to IGSN-71 (Morelli, 1974) tied to a base at Pearson Airport Washington having observed gravity equal to

[1]Use of tradenames is for descriptive purposes only and does not imply endorsement by the U.S. Geological Survey.

980632.54 mgals (based on Portland, Oregon Customs House value of 980632.64 mgals).

THEORETICAL GRAVITY — Values were calculated using the Geodetic Reference System 1967 (International Association of Geodesy, 1971).

TERRAIN CORRECTIONS — Most of the stations were corrected for terrain by computer from Hammer (1939) zone D to 166.7 km (Richard Godson, unpublished program , U.S. Geological Survey), implementing the procedure of Plouff (1977). Some of the inner zone (Hammer zones D-F, Hammer, 1939) terrain corrections were done by template. The density used in these corrections was 2.2 g/cm^3. This density was obtained by a modified Nettleton profiling technique described in Finn and Williams (1982).

FREE-AIR ANOMALY — Free-air anomaly values are in milligals. The free-air correction was obtained by the following calculation: observed gravity - theoretical gravity - free-air anomaly = free-air correction.

COMPLETE BOUGUER ANOMALY — Complete Bouguer anomaly values are in milligals using densities of 2.2 and 2.43 g/cm^3.

REFERENCES CITED

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Finn, Carol, and Williams, D. L., 1982, Gravity evidence for a shallow intrusion under Medicine Lake Volcano in northern California: Geology, v. 10, p. 503-507.

Hammer, Sigmund, 1939, Terrain corrections for gravimeter stations: Geophysics, v. 4, p. 184-194.

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Morelli, C., ed., 1974, The International Gravity Standardization Net 1971: International Association of Geodesy Special Publication no. 4, 194 p.

Plouff, Donald, 1977, Preliminary documentation for a Fortran program to compute gravity-terrain corrections based on topography digitized on a geographic grid: U.S. Geological Survey Open-File Report 77-535, 45 p.

BOUGUER GRAVITY DATA

diamond peak gravity
collected summer 1982
Meter ID: g-24 Date: 12/02/82

STATION IDENTIFICATION proj	sta-id	LOCATION LATITUDE deg	min	LONGITUDE deg	min	ELE (in ft)	ST	GRAVITY OBSERVED	THEORETICAL	CORRECTIONS TERRAIN	BOUGUER	CURV	SPECIAL	ANOMALIES FREE AIR	COMPLETE-BOUGUER d1=2.20	d2=2.43	SPEC FIELDS
di	:di0	43	33.02	-121	57.77	4790.0	wa	980061.35	980487.91	1.28	-134.61	-1.14	0.00	23.79	-110.69	-124.75	
di	:di01	43	32.88	-121	57.83	4836.0	wa	980058.44	980487.70	1.30	-135.91	-1.15	0.00	25.41	-110.34	-124.54	
di	:di02	43	32.32	-121	56.81	4793.0	wa	980059.64	980486.85	1.10	-134.70	-1.14	0.00	23.41	-111.33	-125.42	
di	:di03	43	31.13	-121	57.43	4728.0	wa	980059.53	980485.06	1.16	-132.87	-1.13	0.00	18.98	-113.86	-127.75	
di	:di04	43	30.07	-121	58.35	4853.0	wa	980049.61	980483.47	1.23	-136.38	-1.15	0.00	22.41	-113.90	-128.15	
di	:di05	43	28.67	-122	0.90	4853.0	wa	980049.09	980481.36	1.90	-136.38	-1.15	0.00	24.00	-111.64	-125.82	
di	:di06	43	27.69	-122	1.64	4853.0	wa	980048.02	980479.88	1.95	-136.38	-1.15	0.00	24.41	-111.17	-125.35	
di	:di07	43	28.67	-122	12.83	3660.0	wa	980115.02	980481.36	4.24	-102.86	-0.98	0.00	-22.20	-121.81	-132.22	
di	:di08	43	30.90	-122	14.15	6106.0	wa	979954.89	980484.72	14.76	-171.60	-1.24	0.00	44.19	-113.89	-130.41	
di	:di09	43	31.07	-122	12.90	6082.0	wa	979962.64	980484.97	12.15	-170.92	-1.24	0.00	49.43	-110.58	-127.30	
di	:di10	43	30.49	-122	7.50	6579.4	wa	979934.11	980484.10	4.90	-184.90	-1.25	0.00	68.51	-112.74	-131.69	
di	:di11	43	29.74	-122	7.70	6257.0	wa	979953.96	980482.97	3.93	-175.84	-1.24	0.00	59.20	-113.96	-132.06	
di	:di12	43	30.85	-122	8.26	7112.0	wa	979896.98	980484.64	9.68	-199.87	-1.25	0.00	80.89	-110.55	-130.56	
di	:di13	43	31.29	-122	7.98	7108.6	wa	979900.97	980485.30	8.92	-199.77	-1.25	0.00	83.89	-108.21	-128.29	
di	:di14	43	31.56	-122	8.22	7717.3	wa	979855.67	980485.71	13.27	-216.88	-1.23	0.00	95.37	-109.46	-130.88	
di	:di15	43	31.78	-122	7.58	7163.1	wa	979897.71	980486.04	9.93	-201.31	-1.25	0.00	85.01	-107.61	-127.75	
di	:di16	43	31.60	-122	7.52	7747.7	wa	979849.46	980485.77	17.19	-217.74	-1.23	0.00	91.96	-109.82	-130.91	
di	:di17	43	31.77	-122	8.23	8381.7	wa	979798.33	980486.02	24.66	-235.55	-1.18	0.00	100.13	-111.95	-134.12	
di	:di18	43	31.72	-122	8.52	8375.3	wa	979802.18	980485.95	22.89	-235.37	-1.18	0.00	103.45	-110.21	-132.55	
di	:di19	43	31.46	-122	8.72	8450.5	wa	979793.66	980485.56	24.80	-237.49	-1.18	0.00	102.39	-111.47	-133.83	
di	:di20	43	31.42	-122	9.25	8296.2	wa	979802.51	980485.50	27.13	-233.15	-1.19	0.00	96.80	-110.40	-132.07	
di	:di21	43	31.97	-122	10.16	7235.7	wa	979886.26	980486.33	14.24	-203.35	-1.24	0.00	80.09	-110.26	-130.16	
di	:di22	43	29.79	-122	7.02	6712.5	wa	979920.77	980483.05	6.34	-188.64	-1.25	0.00	68.74	-114.81	-134.00	
di	:di23	43	30.67	-122	1.71	6947.1	wa	979900.61	980484.37	12.36	-195.24	-1.25	0.00	69.29	-114.84	-134.08	
di	:di24	43	31.44	-122	3.93	5781.3	wa	979995.55	980485.53	2.20	-162.47	-1.22	0.00	53.52	-107.97	-124.86	
di	:di25	43	30.76	-122	5.44	6113.2	wa	979970.57	980484.51	2.85	-171.80	-1.24	0.00	60.76	-109.43	-127.22	
di	:di26	43	31.26	-122	4.94	5959.6	wa	979983.47	980485.26	2.51	-167.48	-1.23	0.00	58.47	-107.73	-125.10	
di	:di27	43	30.43	-122	5.97	6192.5	wa	979963.47	980484.01	3.10	-174.03	-1.24	0.00	61.61	-110.56	-128.56	
di	:di28	43	29.71	-122	5.37	5930.0	wa	979981.34	980482.92	2.63	-166.65	-1.23	0.00	55.90	-109.35	-126.63	
di	:di29	43	28.78	-122	4.36	5522.5	wa	980007.07	980481.52	2.10	-155.20	-1.21	0.00	44.73	-109.57	-125.70	
di	:di30	43	29.33	-122	7.58	6107.5	wa	979963.82	980482.35	3.46	-171.64	-1.24	0.00	55.63	-113.79	-131.50	
di	:di31	43	30.22	-122	8.02	6466.1	wa	979939.72	980483.69	5.08	-181.72	-1.25	0.00	63.88	-114.01	-132.60	
di	:di32	43	30.94	-122	9.55	6996.8	wa	979900.20	980484.77	11.44	-196.63	-1.25	0.00	73.14	-113.30	-132.79	
di	:di33	43	30.36	-122	10.81	5668.0	wa	979988.45	980483.90	6.08	-159.29	-1.22	0.00	37.41	-117.01	-133.16	
di	:di34	43	31.78	-122	10.62	6844.0	wa	979914.75	980486.04	11.87	-192.34	-1.25	0.00	72.07	-109.64	-128.64	
di	:di35	43	32.04	-122	9.62	6840.1	wa	979919.97	980486.43	9.06	-192.23	-1.25	0.00	76.53	-107.88	-127.16	
di	:di36	43	31.65	-122	9.02	7659.3	wa	979859.27	980485.84	14.56	-215.25	-1.23	0.00	93.39	-108.53	-129.64	
di	:di37	43	31.24	-122	8.86	8744.0	wa	979782.55	980485.23	36.58	-245.73	-1.15	0.00	99.18	-111.12	-133.11	
di	:di38	43	32.16	-122	8.38	7857.0	wa	979844.04	980486.62	15.53	-220.81	-1.22	0.00	95.96	-110.54	-132.12	
di	:di39	43	32.49	-122	8.29	7478.0	wa	979875.86	980487.11	11.96	-210.16	-1.24	0.00	91.68	-107.76	-128.61	

BOUGUER GRAVITY DATA

diamond peak gravity
collected summer 1982
Meter ID: a-24 Date: 12/02/82

STATION IDENTIFICATION proj	sta-id	LOCATIONS LATITUDE deg	min	LONGITUDE deg	min	ELE (in ft)	ST	GRAVITY OBSERVED	THEORETICAL	CORRECTIONS TERRAIN	BOUGUER	CURV	SPECIAL	ANOMALIES FREE AIR	COMPLETE-BOUGUER d1=2.20	d2=2.43	SPEC FIELDS
dl	:dl40	43	33.74	-122	7.38	6750.0	wa	979929.21	980488.99	10.25	-189.70	-1.25	0.00	74.75	-105.95	-124.84	
dl	:dl41	43	33.11	-122	6.74	6200.0	wa	979971.50	980488.05	3.89	-174.24	-1.24	0.00	66.31	-105.29	-123.22	
dl	:dl42	43	32.73	-122	6.21	6232.0	wa	979966.93	980487.47	3.77	-175.14	-1.24	0.00	65.31	-107.29	-125.34	
dl	:dl43	43	33.00	-122	7.59	6600.0	wa	979942.29	980487.88	5.50	-185.48	-1.25	0.00	74.85	-106.38	-125.33	
dl	:dl44	43	32.14	-122	7.79	7175.0	wa	979898.31	980486.59	9.17	-201.64	-1.25	0.00	86.19	-107.53	-127.78	
dl	:dl45	43	32.33	-122	6.94	6632.0	wa	979938.23	980486.87	5.42	-186.38	-1.25	0.00	74.81	-107.40	-126.45	
dl	:dl46	43	31.91	-122	5.67	6169.0	wa	979969.29	980486.23	3.19	-173.37	-1.24	0.00	62.99	-108.43	-126.35	
dl	:dl47	43	31.84	-122	7.43	7136.0	wa	979900.61	980486.13	8.60	-200.54	-1.25	0.00	85.27	-107.92	-128.11	
dl	:dl48	43	31.90	-122	7.93	7692.0	wa	979857.20	980486.22	13.18	-216.17	-1.23	0.00	94.01	-110.21	-131.56	
dl	:dl49	43	32.74	-122	8.08	7034.0	wa	979910.94	980487.48	8.04	-197.68	-1.25	0.00	84.66	-106.22	-126.18	
dl	:dl50	43	32.27	-122	9.12	7037.0	wa	979907.22	980486.78	10.06	-197.76	-1.25	0.00	81.94	-107.01	-126.77	
dl	:dl52	43	33.99	-122	10.20	5672.0	wa	980009.13	980489.37	3.89	-159.40	-1.22	0.00	53.00	-103.73	-120.12	
dl	:dl53	43	33.07	-122	9.68	6253.0	wa	979964.46	980487.98	6.39	-175.73	-1.24	0.00	64.31	-106.28	-124.11	
dl	:dl54	43	33.12	-122	10.99	5267.0	wa	980032.19	980488.06	4.00	-148.02	-1.19	0.00	39.30	-105.90	-121.08	
dl	:dl55	43	32.76	-122	8.95	7145.0	wa	979899.10	980487.52	11.98	-200.80	-1.25	0.00	83.23	-106.84	-126.71	