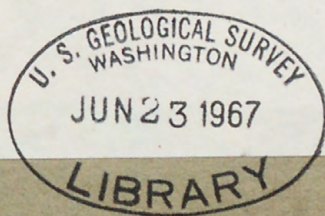


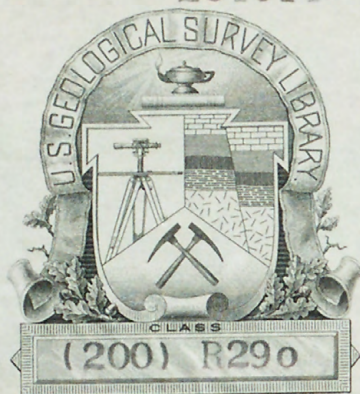
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Gravity survey in
southern Cascade Range, California

by

T. R. LaFehr

1965



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Open-file report

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been edited or reviewed for conformity
with Geological Survey standards or
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Figure 1.--Location map.

2.--East-trending crustal section and Bouguer anomaly across northern California.

Plate A.--Bouguer anomaly gravity map of part of the Southern Cascade Range, California.

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Gravity survey in
southern Cascade Range, California

by

T. R. LaFehr

ABSTRACT

A regional gravity survey in the southern Cascade Range and environs was made during the summers of 1962 and 1963. Twelve hundred gravity stations were established within the area enclosed by lat $41^{\circ}00'N$, lat $42^{\circ}30'N$, long $120^{\circ}00'W$, and long $124^{\circ}00'W$. Most of the stations are concentrated in an area overlapping the axis of the High Cascades in the vicinity of Mount Shasta. An average station density of one station in 7 square miles was obtained. A Bouguer-anomaly gravity map has been made of the area by standard methods.

The major gravity feature is a 100-mgal eastward decrease across the Klamath Mountain-Cascade Range contact. A residual negative anomaly of about 35 mgal is associated with the Cascade volcanic rocks and a residual positive anomaly of about 40 mgal is associated with the Klamath Mountain rocks.

A preliminary interpretation suggests a regionally-compensated crust beneath the Interior Platform (a large volcanic plateau) and a net mass excess in the crust beneath the Klamath Mountains (a region of crustal shortening). Depth estimates suggest that the disturbing masses are, at least in part, relatively shallow in the earth's crust. Under Shasta Valley the top surface of the disturbing mass must be within the upper 10 km.

INTRODUCTION

A regional gravity survey consisting of 750 stations in northern California was made by R. A. Bowers (1957) in 1953 and 1954. The survey showed a general eastward decrease in gravity from the Pacific Coast of California to the volcanic highlands of the Cascade Range, a positive Bouguer anomaly across the Sacramento Valley, and a negative Bouguer anomaly in the vicinity of Lassen Volcanic National Park (Fig. 1).

In 1959, L. C. Pakiser began a U.S. Geological Survey project to obtain better definition of the negative gravity anomaly in the Lassen Park region. Pakiser (1964) established 658 new gravity stations and reduced the data to the complete-Bouguer anomaly. This survey revealed a large gravity low of 70 mgals. It also showed that the Bouguer-anomaly values decrease considerably toward the Lassen Park area from all directions except the northeast. The average gradient is about 5 mgal/mile.

This report is concerned with an extension of the regional gravity coverage from the vicinity of Lassen Park toward the northwest, north, and northeast (Fig. 1). The area of study centers on the southern Cascade Range in the vicinity of Mount Shasta. Bordering areas, including the Klamath Mountains on the west and the Interior Platform on the east, are also a part of this study. Field work was done during the summer months of 1962 and 1963 under the supervision of L. C. Pakiser.

GEOLOGIC BACKGROUND

The northern California-southern Oregon region consists of three major geologic features in addition to the Cascade Range, Klamath Mountains, and Interior Platform mentioned above (Fig. 1). These are the Coast Ranges to the north and south of the Klamath Mountains; the Sacramento Valley immediately south of the Klamath Mountains, and south and west of the southern end of the Cascade Range; and the northern Sierra Nevada Mountains which border the southern Cascade Range and the Interior Platform. Almost all of the gravity stations presented in this report were located between lat $41^{\circ}00'N$ and lat $42^{\circ}30'N$. A few stations were located just south of lat $41^{\circ}00'N$, in the border areas of the southern Cascades, Klamath Mountains, and Sacramento Valley. All of the gravity stations were located between the Pacific Coast and long $120^{\circ}00'W$. The area mapped consists of about 14,000 square miles. A brief description of the three principal regions under consideration follows:

The Cascade Range. The Cascade Range is a narrow belt of lofty peaks and ridges extending from Canada through Washington and Oregon into the area of study. The highest summits of this chain are Quaternary volcanoes built on a foundation of earlier rocks and structures. The Cascade Range represents both a major change in rock type and a major change in mode of extrusion from the pronounced Tertiary volcanism of the Pacific Northwest.

The Columbia Plateau, which lies east of and adjacent to the Cascade Range, consists of uniform tholeiitic basalt, erupted during Miocene and later time. It covers an area of more than 100,000 square miles and has a total thickness exceeding 5,000 feet. These basaltic rocks were erupted

through feeder dikes or long fissures, from which they spread over wide areas. Subsidence of the floor of the Columbia Plateau has apparently caused a general tilting of the rocks toward their eruptive basins. The basin structure of the basalt is dominant, but some folding has taken place and is apparently related to older structures.

The volcanic part of the Cascade Range consists predominantly of basaltic and andesitic lava which was extruded through a line of central vent conduits during most of the Cenozoic era. It also consists of pyroclastic products in larger relative amounts than the bordering volcanic terrains. According to King (1959) "...some special volcanic condition unlike that on either side existed along the axis of the Cascade Range during Tertiary time."

Flanking the High Cascades on the west are the Western Cascade series, a narrow belt of older Tertiary lavas and pyroclastic rocks which attain a thickness of 15,000 feet (Mack, 1963). These flows dip eastward under the High Cascades. They attain a maximum dip of about 15° near the folded Klamath Mountains on the west. The amount of deformation of the Western Cascade series decreases eastward. Toward the south the Western Cascade series terminates between Mount Shasta and the Klamath Mountains. The Western Cascade series widens northward and locally underlies Shasta Valley, a depression between the volcanoes of the High Cascades and the rocks of the Klamath Mountains.

Flows in the High Cascades are made up predominantly of basic, olivine-bearing basalt and basaltic andesite. The fact that the major andesitic volcanoes of the chain tower above the other volcanoes leads to the false

impression that andesite is the dominant rock type. Actually the great andesitic cones make up a small part of the total volume of the High Cascades. The Bedrock series. The Klamath Mountains provide the best exposures of the Bedrock series. They consist of meta-sedimentary, meta-volcanic, ultrabasic, and granitic rocks. The time of intrusion of the ultrabasic and granitic rocks ranges from late Jurassic to Cretaceous. It is noteworthy that fragments of the Bedrock series have not been found in the volcanic ejecta, but it is likely that this Series underlies the Cascade volcanic rocks. These eugeo-synclinal and plutonic rocks occur again in the Blue Mountains in east-central Oregon and across the southern Cascades in the foothills of the Sierra Nevada. The Klamath uplift has apparently been caused by a broad warping.

The Interior Platform. The Cascade lavas merge on the east with the lavas of the broad Interior Platform. This undulating volcanic plateau includes the Modoc lava beds. It is a region of pronounced Cenozoic volcanism. The dominant rock type is basalt, but some silicic rock types are found. Pyroclastic deposits are widespread. The Interior Platform is bordered on the east by the Basin and Range province.

FIELD METHODS

Twelve hundred gravity stations have been established within the survey area (Appendix 1, Appendix 2, and Appendix 3). The average station density for the Shasta region of the southern Cascades is 1 station in 7 square miles, but the station density is not uniform. It is as high as 1 gravity station in 2.8 square miles where the gradient is steepest, and as low as 1 gravity station in 40 square miles along the boundaries of the mapped area.

Horizontal and vertical control was obtained from 7.5-minute and 15-minute U.S. Geological Survey quadrangle maps for all stations except 26 located in the extreme northeastern section. Control for these stations was obtained from the 1:250,000 Army Map Service (AMS) 2-degree sheets. All of the maps used have been published except for a block of 7.5-minute maps east of long 122°00'W and between lat 41°00'N and lat 41°30'N. These maps, which show benchmarks and other elevations, consist of both Before Field Completion and After Field Completion versions of the final maps to be published.

A LaCoste-Romberg gravity meter was used for all field work in the Shasta area. This meter has a nonlinear scale-reading-to-milligal conversion factor of about 0.104 mgal/scale division. The meter has a worldwide range. Instrument drift ranged from 0.1 to 0.7 mgal/month and was periodic in nature. During 1962 the daily observed drift, superimposed on the long-term drift pattern, could almost entirely be explained by tidal variation of the earth's gravity field. During the summer of 1963, however, the daily drift was erratic and could not be explained by tidal variation. Daily instrument drift was a maximum of about 0.01 mgal/hour. Advantage was taken of the meter's low drift characteristics by not repeating base readings more often than every 12 hours. During the first summer it was possible to minimize errors by creating a hypothetical base station in the middle of the day, based on the assumption that all of the daily instrument drift could be explained by the tidal variation. This practice was not worthwhile during the second summer because of the erratic nature of the drift; in general, it was assumed that the instrument drift was linear between base readings.

An examination of the instrumental errors will be taken up in the next section.

The following information was recorded in the field: 1) station number, 2) time of reading, 3) meter reading, 4) elevation of station, and 5) description of station location. The location of each station was plotted on field maps. In the office these data were reduced to observed gravity to keep a continual check on the accuracy of the survey. In addition, the data were reduced to simple-Bouguer gravity and plotted on a map. The simple-Bouguer gravity was computed by standard means, assuming the density to be a constant 2.67 g/cm^3 to sea level. This yields a combined slab and free-air correction of 0.06 mgal/ft . The correction for latitude was based on Nettleton's (1940) tables for values of theoretical gravity from the International Gravity Formula. All calculations were carried out to 0.01 mgal in order to reduce rounding errors.

ACCURACY

Observed gravity. Four of Pakiser's (1964) Lassen base stations were used to establish the first base stations of this survey. New base stations were established by obtaining at least three independent, drift-controlled differences from at least two previously established base stations. The observed-gravity values had to agree to within 0.1 mgal to consider that station a base. Eight bases were established in the Shasta area. The standard deviation for the base stations is 0.04 mgal . This network of base stations was tied to Woollard's (1958) airport station in Medford, Oregon. It has also been tied to the California network of stations established by Roger Chapman (written communication, 1963). These ties indicate that the original base stations of Bowers, upon which Pakiser's

stations were based, disagree with the airport network by -2.8 mgal. Thus, all of the gravity values tabulated in this report should be raised by 2.8 mgal to make the southern Cascade network consistent with the airport network.

Field stations were established using the single-loop method, in which a base station was read before and after a series of field stations. A station previously established in another loop was usually included in the new loop to keep a check on the accuracy of the survey. A check on the assumed linearity of the instrument drift was made by repeating a station within the same loop.

The total number of repeated readings, including those obtained as ties between loops and those obtained as repeated readings within the same loop, was 108, or 9 percent of the total number of new stations. Of these, 98 percent showed a difference with the previous readings of less than 0.20 mgal, 73 percent less than 0.10 mgal, and 46 percent less than 0.05 mgal; all differences were less than 0.25 mgal. The standard deviation for the field stations of this survey is 0.08 mgal.

Bouguer gravity. The relative accuracy of the simple-Bouguer gravity values depends upon the accuracy of the elevation, latitude, and observed gravity of each station. For 98 percent of stations, these quantities are known to within 1 ft, 0.02 minutes of arc, and 0.2 mgal, respectively. The simple-Bouguer gravity is thus accurate to within 0.4 mgal for most of the stations. The remaining 2 percent of the simple-Bouguer gravity values are generally accurate to within 1.0 mgal and should always be accurate to within 3 mgal.

The influence of terrain varies from virtually zero mgal on the Módoc Plateau to 130 mgal for the top of Mount Shasta. The average of the computed terrain corrections (excluding Mount Shasta) is 4.4 mgal. This value is higher than the average terrain effect because of the natural bias of making more corrections in areas of rugged terrain. Most of the 135 corrections, however, were made along profiles which are to be used in the analysis of the gravity anomalies. Terrain corrections are tabulated in Appendix 3. These corrections take into account the variation from an infinite slab of the topography extending to and including zone L of the Hayford-Bowie template. The terrain correction for the station on top of Mount Shasta was applied through zone O. These corrections are reproducible to within about 5 percent of their tabulated values. The reliability of the corrections, however, may be only to within 10 percent of the tabulated values because of the approximating nature of the numerical integration technique. The average error in the terrain corrections, then, is about 0.3 mgal, but for some individual stations it will be higher. For all stations except the one on top of Mount Shasta this error should be below 3 mgal.

The complete-Bouguer anomaly values, relative to each other, are, in general, known to within 1 mgal. For nearly all stations they are known to within 4 mgal. The error in the absolute value of gravity could, of course, be greater than the relative error between Bouguer values because of the original error in the base stations and the error in the density assumption. The latter error will be treated in the analysis of the anomalies. The error between nearby stations is very small when compared to the size of the observed gravity anomalies.

RESULTS

Bouguer-gravity anomaly values are plotted (Plate A) at a contour interval of 5 mgal. Although most of the control for this map is based on stations which do not have terrain corrections, the major anomalies are accurately represented as to their locations, gradients, and amplitudes. This is because 1) for most of the area mapped the effect of terrain is negligible, and 2) the 135 existing corrections are spaced to adequately define the major gravity features with some bias towards areas of rugged terrain. The profiles discussed in this report are entirely controlled by stations reduced to the complete-Bouguer anomaly. Additional terrain corrections must be made, however, in the areas where the local gravity anomalies are to be studied.

Description of the anomalies. The largest gravity relief in this area is an eastward decrease in the Bouguer anomaly of 100 mgal in about 30 km. This gradient occurs along the Klamath Mountain-Cascade Range contact in the vicinity of Mount Shasta. In places, the gradient approaches 8 mgal/km. Northwest of Mount Shasta the gradient averages about 2-to-3 mgal/km.

Two major residual anomalies can be separated from the observed gravity of the area that overlaps the Klamath-Cascade boundary. The first, and most westerly of the two, is an elongated high trending about 10° west of north. This anomaly has an amplitude of about +40 mgal; its crest occurs near the highest peaks of the Eddys, the eastermost uplift of the Klamath Mountains. Nearly all of the anomaly is contained within a width of 25 km; its length is several times greater than the width. The maximum gradient of this anomaly is about 6 mgal/km.

The other major residual anomaly is a broad gravity low located along the axis of the southern Cascade Range and along the western edge of the Interior Platform. This anomaly has an amplitude of about -30 mgal. It has an average width of about 50 km and an average length of about 75 km. The southern end of the anomaly occurs near Mount Shasta. It reaches a maximum in the absolute value of its amplitude and gradient at that place. The gradient approaches 8 mgal/km and the amplitude -35 to -50 mgal, depending on how the background anomaly is selected. On the southern, western, and northern sides of the anomaly the gradient averages about 3 mgal/km, but on the eastern side it is only about 0.7 mgal/km.

Very little gravity relief exists in the area bounded by lat 41°00'N, lat 42°00'N, long 121°00'W, and long 122°00'W, although a few local anomalies were mapped. Negative anomalies are closely associated with Quaternary lake deposits in the areas 15 to 30 km east of Dorris, near the California-Oregon border, and in an area near McArthur at the southern edge of the map. These anomalies have amplitudes ranging between -15 and -25 mgal. Two circular highs were mapped: a +15 mgal anomaly about 15 km northwest of Adin and a +12 mgal anomaly about 25 km southeast of Tulelake. Both highs occur in areas of pronounced Tertiary basaltic volcanism, and both are several times broader than any single volcanic cone.

The regional variation in the Bouguer anomaly is best described with the aid of an east-trending profile across the northern part of California (Fig. 2). This profile extends beyond the areal coverage represented on the map; it extends from the Pacific coast to the Nevada border, crossing the Klamath Mountains, Cascade Range, Interior Platform and into the Basin and

Range province. Near the coast the Bouguer anomaly typically decreases at the rate of about -2.7 mgal/km. The anomaly values level off at an inland distance of about 50 km, and remain at a relatively constant level of -114 mgal for a distance of about 70 kilometers across the western Klamath Mountains. At this point, which is nearly coincident with the highest belt of uplifted Klamath rocks, the Bouguer anomaly rises into the local anomaly described above. It then plunges 100 mgals at the rate of about -3.2 mgal/km into the gravity low associated with the Cascade Range. For a distance of about 130 km, across part of the Cascades and the Interior Platform, the anomaly values are relatively constant at -155 mgal. Finally, as the profile crosses into the Basin and Range province, local anomalies having medium amplitudes, short wave-lengths, and high gradients are observed. These are superimposed on a regional eastward decrease of less than 1 mgal/km. The highest gradient of the local anomalies is -14 mgal/km.

Preliminary interpretation. A detailed analysis of each gravity anomaly is not within the scope of this report. The purpose here is to attempt to extract the essential meaning of the regional gravity anomaly across northern California, particularly as it relates to the Cascade Range. A cursory examination of the results reveals a striking relationship between the gravity anomalies and surface geology. The meta-volcanic and ultrabasic intrusive rocks of the Klamath Mountains apparently cause a large local positive anomaly. Depth estimates, which are described later, confirm a source material very shallow in the earth's crust. The sharply defined anomalies in the Basin and Range province (Fig. 2) clearly result from the large density contrast between the Quaternary lake deposits or alluvial fill

of the basins and the bordering Miocene basalt flows. These and other aspects of the gravity field deserve more attention in terms of both field work and interpretive analysis.

The mass deficiency beneath the Interior Platform is nearly equal to the topographic mass excess. The average free-air anomaly for this region is -0.16 mgal. Because the area is broad and the gravity anomaly is adequately defined, this average is interpreted to be a meaningful estimate of the isostatic state of the Interior Platform. This section of the earth's crust is in nearly complete isostatic equilibrium on a regional basis.

The amount of mass deficiency beneath the Klamath Mountains, on the other hand, is less than the amount of mass excess in the shallow part of the crust. The net mass excess represents about 19 percent of the amount of mass deficiency required for compensation of the topographic load. This calculation is based on the application of Gauss' theorem to the Bouguer anomaly and on the assumption that the regional gravity profile analysed is the same as any other east-trending profile across the region. Local geologic features in the Klamath Mountain region are out of compensation by a larger amount.

Part of the difference between the average Bouguer values over the Klamath Mountains and the Interior Platform can be explained by the existence of different average densities for the near-surface rocks. A geologic correction would diminish the regional amplitude by about 10 mgals.

The most interesting feature of the gravity field is its pronounced eastward decrease all along the western side of the Cascade Range. Some of this gradient could be accounted for by a regional change in crustal thickness. The fact that this general eastward decrease in gravity crosses geologic

boundaries (it occurs on the western side of the Sierra Nevada) supports such a conclusion. However, much of the anomaly cannot be accounted for by changes in crustal thickness because the gradients and amplitudes require a shallow depth for the source.

The negative gravity contribution of the exposed volcanic rocks is not sufficient to explain the entire observed anomaly. A magma chamber consisting of silicic intrusive rocks could provide the needed negative density contrast. If intruded at a mean depth of 6 km, a silicic magma chamber could contrast with country rocks of a more basic type. This concept of a relatively-shallow magma chamber that acts as a temporary holding zone for the ascending magma is widely held among volcanologists (Williams, 1942; Rittman, 1962). There is some geophysical evidence for an even shallower reservoir beneath Kilauea (Eaton and Murata, 1960). Of course the nature of such a chamber cannot be specified on the basis of gravity information alone. The important density contrast can only be surmised in the present case. Although thermal expansion of locally hot rocks could partially account for the gravity anomaly, it is not likely that the magma chamber is still molten (as it may be in part, south of this area, beneath the Lassen volcanic region). Thus, in the Shasta area, the existing density contrast must largely arise from contrasting rock types.

Other geologic interpretations are possible. Crustal thickening beneath the volcanic province could account for a part of the anomaly. Variations in depth or thickness of an intermediate layer could account for an even larger part of the anomaly. Most of the anomaly, however, must be associated with a relatively shallow feature. The fact that the anomaly occurs at the

Klamath-Cascade contact cannot be considered a mere coincidence. The Cascade anomaly could be explained by a maximum thickness of 8 km of material with a density of 0.3 gm/cm^3 less than the surrounding rocks.

The gravity anomaly associated with Mount Shasta has been analysed in detail (LaFehr, in press). The application of Gauss' theorem to the negative gravity anomaly indicates a mass deficiency beneath Mount Shasta that corresponds well with the mass excess of the mountain. This suggests isostatic compensation, a large part of which must be local.

CONCLUSIONS

The northern part of California can be divided into two distinct sections both from the standpoint of geology and from that of the gravity field. The western part is an area of crustal shortening, tectonic uplift, and positive gravity anomalies. The eastern part is an area of pronounced Recent volcanism (largely basaltic) and is in approximate isostatic equilibrium.

The major local gravity anomalies occur close to the Klamath Mountain-Cascade Range contact, and they suggest a large volume of low-density material at a shallow depth beneath the High Cascades. A part of the negative gravity anomalies may be caused by the existence of shallow magma chambers consisting of silicic intrusive rocks. The positive gravity anomalies associated with the Klamath Mountains are consistent with the observation of ultrabasic rocks at the surface.

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APPENDIX I

BASE STATION NETWORK
CASCADE GRAVITY PROJECT
MT. SHASTA AREA

BASE STATION NETWORK
CASCADE GRAVITY PROJECT
MT. SHASTA AREA

STATION	OBSERVED GRAVITY (-979,000.00 milligals)	LOCATION
B1	937.39	Exactly on the "Blue Lake" triangulation marker, BM 3203 on the Burney Quad, about $2\frac{1}{2}$ tenths mile NE from intersection US 299 and Calif. 89, on NW side US 299, about 150 ft from road in clump of bushes.
B2	938.23	Exactly on the "Pilgrim" triangulation marker, BM 3622 on the Bartle SW (7.5') Quad, about 8.2 miles east on Calif. 89 from McCloud, about 30 ft north of the road.
B3	961.10	Exactly on BM R494, BM 3701 on the Weed Quad, about 1.7 miles south on U.S. 99 from Weed, about 0.1 mile NW of Igerna, 30 ft NE of the old road.
B4	905.25	On ground directly below and on west side of BM S602, BM 4408 on the Hackamore Quad, about 30 ft NE of Calif. 139 and about 200 ft NE of the California Entrance Station.
B5	903.56	Exactly on BM 4766, Medicine Lake Quad, at Hdqrs of Lava Beds Nat. Mon., on the edge of the parking lot between Hdqrs building and a lava tube, near the lava tube entrance.
B6	774.65	Exactly on BM S502, BM 6711 on the Medicine Lake Quad, next to the road and in front of the Forest Service Hdqrs at Medicine Lake.
B7	1,081.76	Exactly on BM 2702, Yreka Quad, about 1.2 miles east of Yreka and about 20 ft south of the Yreka-Montague highway.
B8	1,132.28	Exactly on BM 2136, Ashland, Oregon, Quad, about 5 miles southeast of Ashland on Klamath Falls highway, on concrete culvert on southwest side of highway.

APPENDIX II

SIMPLE-BOUGUER GRAVITY DATA

STATION	LATITUDE	LONGITUDE	ELEVATION (feet)	OBSERVED GRAVITY (-979,000.00 milligals)	SIMPLE- BOUGUER GRAVITY (milligals)
1	40°56.46'	121°36.3'	3203	937.38	-134.8
2	40°58.18'	121°37.2'	3009	944.71	-136.8
3	40° 1.96'	121°37.7'	3072	950.09	-138.1
4	41° 4.95'	121°38.3'	3341	945.24	-131.3
5	41° 6.52'	121°38.2'	3809	919.33	-131.4
6	41° 8.76'	121°38.7'	4128	903.45	-131.5
7	41°10.12'	121°41.3'	4008	901.56	-128.3
8	41°11.13'	121°46.3'	4504	889.18	-126.8
9	41°14.59'	121°48.2'	3994	918.05	-133.6
10	41°16.03'	121°53.6'	3824	923.55	-140.5
11	41°15.83'	121°56.0'	3675	939.14	-138.5
12	41°15.58'	121°58.8'	3622	938.27	-137.2
13	41°16.20'	122°11.3'	3981	936.57	-118.3
14	41°15.92'	122°13.5'	4406	913.07	-115.9
15	41°17.31'	122°16.8'	3700	954.66	-118.7
16	41°15.93'	122° 0.7'	3574	942.63	-136.2
17	41°15.88'	122° 2.4'	3392	955.14	-134.6
18	41°15.08'	122° 4.0'	3273	968.88	-126.8
19	41°15.82'	122° 9.7'	3718	951.31	-118.8
20	41°15.78'	122° 8.2'	3328	966.89	-126.5
21	41°16.53'	122° 7.9'	3510	948.22	-135.4
22	41°17.04'	122° 6.7'	3793	925.66	-141.7
23	41°18.60'	122° 4.0'	3951	906.85	-153.4
24	41°19.88'	122° 2.6'	4154	892.02	-158.0
25	41°20.76'	122° 0.4'	4097	894.69	-160.0
26	41°22.11'	122° 1.4'	4536	870.89	-159.5
27	41°23.82'	122° 2.2'	4999	841.78	-163.4
28	41°24.97'	122° 3.9'	5339	819.38	-167.1
29	41°26.42'	122° 4.9'	3815	792.23	-167.8
30	41°27.99'	122° 5.1'	5866	794.45	-164.9
31	41°29.14'	122° 6.4'	5918	794.23	-163.7
32	41°29.55'	122° 8.3'	5996	790.54	-163.3
33	41°30.18'	122° 9.8'	5561	823.93	-157.0
34	41°31.23'	122°18.3'	3468	977.77	-130.3
35	41°29.96'	122°19.7'	3562	969.74	-130.8
36	41°27.10'	122°21.7'	3490	971.77	-128.8
37	41°26.66'	122°26.5'	3036	1010.49	-116.7
38	41°28.72'	122°29.4'	2964	1029.44	-105.1
39	41°25.91'	122°24.6'	3255	989.37	-123.5
40	41°24.08'	122°22.8'	3701	961.07	-122.4
41	41°21.22'	122°21.3'	3915	941.83	-124.5
42	41°17.00'	122°23.8'	3388	975.36	-116.3
43	41°16.24'	122°22.0'	3258	980.53	-117.8
44	41°13.21'	122°16.3'	2337	1043.62	-105.4
45	40°58.55'	122°25.9'	1237	1083.17	-110.0

STATION	LATITUDE	LONGITUDE	ELEVATION (feet)	OBSERVED GRAVITY (-979,000.00 milligals)	SIMPLE- BOUGUER GRAVITY (milligals)
46	41° 5.69'	122° 20.6'	1869	1045.90	-120.0
47	41° 18.69'	122° 19.8'	3483	974.90	-113.5
48	41° 32.29'	122° 32.1'	2750	1053.52	- 99.2
49	41° 34.48'	122° 32.7'	2704	1063.28	- 95.5
50	41° 36.21'	122° 31.3'	2593	1070.15	- 97.8
51	41° 37.53'	122° 31.3'	2567	1076.97	- 94.5
52	41° 39.38'	122° 31.1'	2548	1080.89	- 94.5
53	41° 40.94'	122° 31.8'	2523	1083.52	- 95.8
54	41° 43.66'	122° 33.5'	2453	1089.29	- 98.1
55	41° 44.34'	122° 36.5'	2702	1081.79	- 91.8
56	41° 46.14'	122° 37.8'	2720	1084.71	- 91.5
57	41° 49.94'	122° 35.4'	2039	1107.78	-114.0
58	41° 40.59'	122° 37.3'	2861	1068.37	- 90.1
59	41° 39.40'	122° 39.8'	2155	1079.32	- 83.7
60	41° 30.04'	122° 30.9'	2828	1045.83	- 98.9
61	41° 32.03'	122° 14.8'	3979	946.08	-132.5
62	41° 33.10'	122° 13.2'	4227	922.58	-142.7
63	41° 35.18'	122° 11.7'	4814	887.31	-145.9
64	41° 37.61'	122° 11.8'	5086	872.11	-148.4
65	41° 40.65'	122° 4.1'	4871	877.53	-163.7
66	41° 39.96'	122° 5.6'	4939	869.55	-163.3
67	41° 38.96'	122° 6.5'	5017	861.79	-164.9
68	41° 33.82'	122° 15.8'	3554	977.31	-129.5
69	41° 34.77'	122° 17.1'	3225	1001.26	-126.7
70	41° 35.66'	122° 19.0'	2969	1018.14	-126.5
71	41° 36.82'	122° 22.1'	2747	1036.27	-123.4
72	41° 37.25'	122° 23.8'	2640	1049.85	-117.2
73	41° 39.58'	122° 23.8'	2665	1050.92	-117.8
74	41° 41.53'	122° 25.5'	2666	1062.68	-108.9
75	41° 42.73'	122° 26.2'	2609	1064.50	-112.3
76	41° 45.35'	122° 27.1'	2670	1061.14	-115.9
77	41° 47.64'	122° 27.2'	2660	1068.93	-112.1
78	41° 49.13'	122° 26.3'	2628	1072.58	-112.6
79	41° 50.94'	122° 27.7'	2402	1093.04	-108.6
80	41° 52.55'	122° 25.2'	2611	1074.42	-116.9
81	41° 54.29'	122° 22.7'	2664	1067.53	-123.5
82	41° 56.11'	122° 26.3'	2796	1060.78	-124.8
83	41° 57.27'	122° 19.7'	3142	1041.78	-124.8
84	41° 57.81'	122° 15.8'	2620	1069.95	-128.7
85	41° 58.53'	122° 11.3'	2704	1072.84	-121.9
86	42° 1.00'	122° 4.2'	4212	966.69	-141.2
87	41° 59.62'	122° 2.0'	4300	958.67	-141.9
88	41° 58.00'	121° 59.7'	4245	956.39	-145.1
89	41° 57.13'	121° 56.4'	4238	950.18	-150.4
90	41° 54.63'	121° 57.2'	4237	936.70	-160.2

STATION	LATITUDE	LONGITUDE	ELEVATION (feet)	OBSERVED GRAVITY (-979,000.00 milligals)	SIMPLE- BOUGUER GRAVITY (milligals)
91	41°53.68'	121°59.7'	4239	936.42	-158.9
92	41°51.96'	121°57.8'	4239	929.83	-162.9
93	41°49.34'	122° 0.7'	4247	921.55	-166.8
94	41°47.60'	122° 2.0'	4258	919.84	-165.3
95	41°46.08'	122° 3.2'	4263	923.02	-159.5
96	41°45.98'	121°59.8'	4266	917.26	-165.0
97	41°44.26'	121°59.5'	4324	914.92	-161.2
98	41°42.47'	121°58.2'	4383	910.45	-159.5
99	41°41.16'	121°57.0'	4442	901.91	-162.5
100	41°38.86'	121°55.2'	4577	890.68	-162.2
101	41°36.32'	121°55.2'	4740	877.20	-162.1
102	41°33.67'	121°54.9'	4948	858.15	-164.7
103	41°25.66'	121°48.3'	4986	848.71	-160.0
104	41°23.55'	121°47.4'	4586	867.56	-162.0
105	41°22.42'	121°46.8'	4572	876.59	-152.1
106	41°20.94'	121°47.2'	4676	870.80	-149.4
107	41°18.32'	121°45.8'	4596	880.45	-140.7
108	41°17.43'	121°46.3'	4598	881.27	-138.4
109	40°58.09'	121°34.2'	3137	938.82	-139.7
110	41° 0.13'	121°30.3'	3224	938.69	-137.7
111	40°59.56'	121°28.3'	3611	911.28	-141.0
112	41° 0.08'	121°26.7'	3360	926.71	-141.4
113	41° 1.77'	121°25.2'	3318	921.91	-151.2
114	41° 3.00'	121°23.8'	3311	923.41	-152.0
115	41° 3.75'	121°21.8'	3314	930.40	-145.9
116	41° 4.38'	121°19.8'	3321	932.73	-144.1
117	41° 5.81'	121°17.8'	3610	920.11	-141.5
118	41° 5.22'	121°15.9'	4060	893.24	-140.8
119	41° 4.02'	121°18.8'	4520	861.44	-142.9
120	41° 5.16'	121°16.7'	4136	881.33	-147.8
121	41° 6.18'	121°15.0'	4116	871.38	-160.5
122	41° 7.29'	121°13.7'	4127	869.47	-163.4
123	41° 8.51'	121°11.3'	4155	874.16	-158.8
124	41° 8.80'	121° 4.6'	4148	870.29	-163.5
125	41° 8.81'	121° 2.2'	4181	871.31	-160.5
126	41° 9.48'	121° 0.7'	4201	870.10	-161.6
127	41°59.92'	121°31.1'	4047	972.14	-144.1
128	41°58.08'	121°29.0'	4036	957.88	-156.2
129	41°56.76'	121°27.6'	4036	953.07	-159.1
130	41°55.55'	121°26.2'	4033	953.01	-157.5
131	41°54.01'	121°23.6'	4036	953.66	-154.4
132	41°53.09'	121°21.7'	4044	954.75	-151.4
133	41°50.50'	121°18.5'	4088	957.23	-142.4
134	41°47.88'	121°18.2'	4164	951.17	-140.0
135	41°45.87'	121°18.1'	4178	947.61	-139.7

STATION	LATITUDE	LONGITUDE	ELEVATION (feet)	OBSERVED GRAVITY (-979,000.00 milligals)	SIMPLE- BOUGUER GRAVITY (milligals)
136	41°42.99'	121°16.9'	4142	945.42	-139.8
137	41°39.16'	121°14.6'	4207	922.45	-153.1
138	41°36.72'	121°12.8'	4408	905.27	-154.6
139	41°34.39'	121°10.9'	4544	892.93	-155.3
140	41°32.14'	121° 8.9'	4662	883.91	-153.9
141	41°31.33'	121° 5.3'	4816	873.91	-153.4
142	41°30.40'	121° 0.5'	4910	857.66	-162.6
143	41° 9.32'	121° 8.1'	4137	876.51	-158.7
144	41°11.08'	121° 8.2'	4136	872.67	-165.3
145	41°12.55'	121° 9.4'	4147	879.18	-160.3
146	41°13.66'	121°11.9'	4203	877.58	-160.2
147	41°14.86'	121°13.3'	4236	882.74	-154.8
148	41°16.60'	121°13.6'	4238	881.70	-158.3
149	41°17.89'	121°16.3'	4249	885.86	-155.3
150	41°18.56'	121°19.1'	4317	894.24	-143.8
151	41°19.06'	121°21.6'	4432	891.27	-140.8
152	41°18.89'	121°23.8'	4406	894.03	-139.3
153	41°20.00'	121°25.2'	4424	894.31	-139.6
154	41°20.36'	121°27.2'	4492	888.62	-141.8
155	41°20.45'	121°29.5'	4374	898.09	-139.5
156	41°20.17'	121°32.6'	3850	936.27	-132.4
157	41°19.90'	121°35.1'	3881	931.59	-135.0
158	41°19.71'	121°37.7'	4062	915.85	-139.4
159	41°20.15'	121°40.1'	4256	905.95	-138.3
160	41°19.95'	121°42.4'	4419	892.09	-142.1
161	41°19.32'	121°44.6'	4588	880.64	-142.4
162	41°38.95'	121°17.8'	4228	926.78	-146.6
163	41°39.87'	121°19.2'	4209	933.96	-141.5
164	41°40.57'	121°21.2'	4224	938.17	-138.5
165	41°40.03'	121°23.3'	4250	935.06	-139.2
166	41°39.95'	121°25.7'	4359	928.99	-138.6
167	41°41.34'	121°26.7'	4290	937.28	-136.6
168	41°42.28'	121°28.6'	4510	917.93	-144.1
169	41°42.83'	121°30.3'	4766	903.47	-144.0
170	41°43.57'	121°31.6'	4733	906.50	-144.1
171	41°45.32'	121°33.2'	4509	922.04	-144.6
172	41°47.03'	121°34.3'	4267	937.57	-146.2
173	41°48.89'	121°35.2'	4250	938.47	-149.1
174	41°50.92'	121°35.3'	4268	940.31	-149.2
175	41°51.91'	121°35.6'	4355	934.69	-151.0
176	41°54.19'	121°35.9'	4312	936.44	-155.3
177	41°55.70'	121°36.1'	4087	953.99	-153.5
178	41°57.86'	121°35.7'	4092	961.70	-148.6
179	41°59.73'	121°35.8'	4156	971.35	-138.0
180	41°59.71'	121°42.6'	4081	954.01	-159.8

STATION	LATITUDE	LONGITUDE	ELEVATION (feet)	OBSERVED GRAVITY (-979,000.00 milligals)	SIMPLE- BOUGUER GRAVITY (milligals)
181	41°59.81'	121°46.7'	4082	946.17	-167.8
182	41°59.41'	121°53.8'	4110	972.12	-139.5
183	41°54.71'	121°48.0'	4098	960.62	-144.7
184	41°52.35'	121°46.0'	4139	938.52	-160.6
185	41°48.37'	121°44.4'	4226	934.50	-153.7
186	41°45.99'	121°44.2'	4337	921.34	-156.6
187	41°43.11'	121°43.0'	4686	893.43	-159.3
188	41°41.35'	121°43.9'	4771	883.29	-161.7
189	41°38.82'	121°44.0'	5047	867.86	-156.8
190	41°34.21'	121°41.5'	6354	787.72	-151.8
191	41°34.78'	121°38.3'	6977	749.36	-153.5
192	41°35.19'	121°36.8'	6711	774.42	-145.0
193	41°33.82'	121°34.4'	6711	769.74	-147.6
194	41°32.67'	121°33.0'	6392	782.91	-151.9
195	41°31.02'	121°30.1'	5509	833.75	-151.5
196	41°28.62'	121°28.7'	4825	873.18	-147.6
197	41°28.38'	121°27.3'	4518	893.47	-145.3
198	41°25.06'	121°27.2'	4478	891.60	-146.7
199	41°22.51'	121°27.3'	4357	897.09	-144.6
200	41°47.00'	121°36.3'	4323	924.16	-156.2
201	41°47.18'	121°39.8'	4501	916.94	-153.0
202	41°45.48'	121°41.0'	4507	905.41	-161.6
203	41°47.36'	121°44.6'	4304	924.18	-157.8
204	41°46.03'	121°45.4'	4445	918.84	-152.7
205	41°46.33'	121°47.8'	4407	919.04	-155.2
206	41°45.50'	121°47.8'	4382	915.81	-158.7
207	41°44.45'	121°46.7'	4382	915.11	-157.9
208	41°43.16'	121°49.0'	4390	905.97	-164.6
209	41°44.51'	121°48.9'	4382	910.91	-163.2
210	41°46.20'	121°49.1'	4385	914.61	-160.8
211	41°48.66'	121°49.4'	4707	909.27	-150.5
212	41°45.96'	121°51.2'	4383	914.73	-160.4
213	41°45.91'	121°53.7'	4380	912.98	-162.3
214	41°46.97'	121°54.9'	4345	919.62	-159.3
215	41°50.22'	121°57.4'	4361	917.49	-165.4
216	41°51.06'	121°54.1'	4238	939.90	-151.6
217	41°51.96'	121°55.1'	4238	938.08	-155.6
218	41°52.38'	121°53.2'	4236	945.49	-148.1
219	41°51.06'	121°52.0'	4370	935.83	-147.7
220	41°53.48'	121°53.3'	4237	944.03	-153.2
221	41°58.49'	121°52.8'	4132	969.92	-139.0
222	41°57.93'	121°50.1'	4086	966.73	-144.1
223	41°57.19'	121°48.2'	4080	969.07	-141.1
224	41°51.74'	121°44.3'	4215	935.00	-158.9
225	41°50.46'	121°45.0'	4156	939.66	-155.8



STATION	LATITUDE	LONGITUDE	DEPTH (feet)	OBSERVED GRAVITY (-979,000.00 milligals)	BOUSSER GRAVITY (milligals)	SIMPLE GRAVITY (milligals)
226	41°49.42'	121°40.71'	4186	919.35	-154.8	-154.8
227	41°53.36'	121°41.81'	4091	931.25	-172.5	-172.5
228	41°41.08'	121°32.51'	5285	861.34	-152.4	-152.4
229	41°40.20'	121°32.21'	5620	841.30	-151.0	-151.0
230	41°40.61'	121°32.11'	5861	820.52	-157.0	-157.0
231	41°41.50'	121°36.41'	5195	863.09	-156.7	-156.7
232	41°41.64'	121°39.41'	5059	870.55	-157.9	-157.9
233	41°43.55'	121°39.31'	4661	891.33	-163.6	-163.6
234	41°40.35'	121°36.11'	5912	817.60	-157.4	-157.4
235	41°39.10'	121°35.81'	6367	793.14	-152.7	-152.7
236	41°37.35'	121°36.81'	6905	761.95	-149.0	-149.0
237	41°35.71'	121°34.41'	6696	778.53	-142.5	-142.5
238	41°34.90'	121°34.11'	6960	754.40	-149.6	-149.6
239	41°34.76'	121°34.11'	6187	780.97	-151.2	-151.2
240	41°34.40'	121°42.81'	5917	815.42	-151.9	-151.9
241	41°36.11'	121°43.11'	5655	831.94	-152.2	-152.2
242	41°36.81'	121°43.81'	5582	836.23	-153.3	-153.3
243	41°37.60'	121°43.91'	5344	851.41	-153.6	-153.6
244	41°37.80'	121°46.31'	5157	858.50	-158.0	-158.0
245	41°37.94'	121°47.81'	4928	869.48	-160.8	-160.8
246	41°38.26'	121°44.81'	4603	887.30	-163.2	-163.2
247	41°38.18'	121°46.41'	4605	889.81	-160.4	-160.4
248	41°36.97'	121°47.71'	4666	882.20	-162.6	-162.6
249	41°35.77'	121°48.41'	4756	873.00	-164.6	-164.6
250	41°36.58'	121°56.71'	4720	878.13	-162.8	-162.8
251	41°38.81'	121°57.01'	4582	891.74	-160.2	-160.2
252	41°43.29'	121°59.41'	4338	912.46	-161.4	-161.4
253	41°45.95'	121°57.51'	4320	917.92	-161.0	-161.0
254	41°44.45'	121°52.91'	4392	904.18	-168.2	-168.2
255	41°44.24'	121°51.71'	4347	906.27	-168.5	-168.5
256	41°42.08'	121°51.21'	4506	892.27	-169.7	-169.7
257	41°41.62'	121°52.31'	4581	887.52	-169.2	-169.2
258	41°39.79'	121°52.21'	4567	891.36	-163.6	-163.6
259	41°40.87'	121°48.61'	4489	900.77	-160.4	-160.4
260	41°42.15'	121°47.61'	4427	906.47	-160.4	-160.4
261	41°43.13'	121°47.11'	4388	911.10	-159.5	-159.5
262	41°41.41'	121°45.21'	4778	883.10	-161.6	-161.6
263	41°40.32'	121°44.11'	4873	877.34	-160.0	-160.0
264	41°39.72'	121°41.81'	5207	859.58	-156.8	-156.8
265	41°40.00'	121°40.61'	5528	842.40	-155.2	-155.2
266	41°40.50'	121°39.41'	5652	833.67	-157.2	-157.2
267	41°49.59'	121°33.21'	4059	952.59	-147.4	-147.4
268	41°49.12'	121°32.61'	4062	950.29	-148.9	-148.9
269	41°49.96'	121°28.41'	4051	953.31	-147.8	-147.8
270	41°59.81'	121°22.71'	4053	919.35	-152.4	-152.4

STATION	LATITUDE	LONGITUDE	ELEVATION (feet)	OBSERVED GRAVITY (-979,000.00 milligals)	SAMPLE- BOUGHER GRAVITY (milligals)
271	41°58.98'	121°20.8'	4062	963.13	-150.7
272	41°58.68'	121°19.0'	4324	952.40	-145.3
273	41°58.34'	121°17.3'	4741	927.78	-144.4
274	41°57.19'	121°15.7'	4755	925.11	-144.5
275	41°57.00'	121°12.1'	4768	913.80	-153.6
276	41°56.91'	121°7.2'	4752	913.66	-155.7
277	41°57.04'	121°24.9'	4040	956.58	-155.7
278	41°57.04'	121°22.2'	4037	955.21	-157.3
279	41°54.44'	121°20.7'	4035	954.33	-154.4
280	41°46.77'	121°18.2'	4182	947.19	-141.2
281	41°44.96'	121°16.1'	4144	948.43	-139.6
282	41°44.11'	121°17.8'	4149	947.29	-139.2
283	41°41.48'	121°17.7'	4163	941.87	-139.8
284	41°41.49'	121°16.3'	4166	936.02	-145.5
285	41°40.52'	121°15.1'	4179	931.08	-148.2
286	41°38.20'	121°13.8'	4254	918.26	-153.0
287	41°37.41'	121°13.2'	4317	912.23	-154.1
288	41°39.61'	121°16.4'	4165	930.92	-147.8
289	41°38.82'	121°20.6'	4274	927.68	-143.4
290	41°38.96'	121°22.7'	4283	930.91	-139.8
291	41°46.70'	121°27.7'	4139	950.19	-140.7
292	41°48.74'	121°27.3'	4114	951.78	-143.7
293	41°53.58'	121°26.4'	4031	947.36	-154.3
294	41°50.99'	121°21.5'	4038	959.53	-143.9
295	41°49.17'	121°21.5'	4035	958.84	-142.0
296	41°44.14'	121°25.2'	4219	943.86	-138.4
297	41°42.46'	121°24.4'	4237	942.91	-135.8
298	41°42.37'	121°21.0'	4206	943.43	-137.0
299	41°41.19'	121°20.3'	4182	940.97	-139.1
300	41°2.10'	121°29.6'	3310	936.13	-138.0
301	41°3.71'	121°29.3'	3312	931.61	-144.8
302	41°5.11'	121°29.7'	3309	928.60	-150.1
303	41°5.68'	121°32.6'	3323	939.76	-138.9
304	41°7.30'	121°31.3'	3338	931.79	-148.4
305	41°9.71'	121°30.8'	3418	936.32	-143.7
306	41°17.14'	121°32.1'	3618	938.00	-128.0
307	41°19.20'	121°32.7'	3676	933.80	-131.8
308	41°19.85'	121°36.4'	3914	927.76	-136.6
309	41°18.24'	121°36.8'	3929	926.01	-135.0
310	41°15.89'	121°36.8'	3610	934.74	-129.9
311	41°13.82'	121°36.3'	3797	931.62	-130.7
312	41°12.37'	121°37.3'	3854	923.54	-133.2
313	41°10.98'	121°38.1'	3698	927.66	-136.4
314	41°10.11'	121°29.7'	3705	922.25	-140.3
315	41°7.90'	121°29.7'	3341	940.62	-140.3

STATION	LATITUDE	LONGITUDE	ELEVATION (Feet)	OBSERVED GRAVITY (-979,000.00 milligals)	SIMPLE- BOUGUER GRAVITY (milligals)
316	41° 8.26'	121° 37.2'	3934	910.03	-135.8
317	41° 1.60'	121° 40.4'	2809	974.07	-129.4
318	41° 1.60'	121° 42.7'	3042	962.22	-127.4
319	41° 3.45'	121° 43.7'	3339	918.40	-127.8
320	41° 4.23'	121° 40.6'	3431	937.56	-132.5
321	41° 5.14'	121° 42.2'	3699	926.89	-128.4
322	41° 8.27'	121° 41.8'	4790	865.47	-129.0
323	41° 7.72'	121° 43.5'	5000	853.26	-129.5
324	41° 9.37'	121° 44.2'	4538	887.73	-123.5
325	41° 11.88'	121° 41.0'	4124	906.63	-133.2
326	41° 14.17'	121° 59.3'	3544	949.00	-129.1
327	41° 17.21'	121° 58.4'	3720	927.39	-144.6
328	41° 18.61'	121° 59.2'	3818	916.28	-152.0
329	41° 19.94'	121° 58.3'	3939	907.00	-156.0
330	41° 20.16'	121° 50.3'	3917	907.87	-156.7
331	41° 18.86'	121° 50.3'	3804	916.38	-153.1
332	41° 17.68'	121° 50.3'	3757	922.84	-147.7
333	41° 13.72'	121° 53.3'	3979	921.84	-129.4
334	41° 11.97'	121° 53.5'	5015	859.04	-127.5
335	41° 10.17'	121° 56.4'	5282	848.48	-119.3
336	41° 10.27'	121° 54.1'	5757	810.75	-130.5
337	41° 21.23'	121° 57.4'	3977	903.71	-158.9
338	41° 22.17'	121° 56.5'	4051	900.18	-159.4
339	41° 22.73'	121° 55.2'	4268	888.76	-158.6
340	41° 23.21'	121° 53.8'	4549	874.04	-157.2
341	41° 23.94'	121° 53.6'	4653	868.72	-157.4
342	41° 24.67'	121° 54.2'	4666	868.06	-158.3
343	41° 24.94'	121° 54.8'	4685	866.59	-159.1
344	41° 25.75'	121° 54.5'	4749	862.80	-160.2
345	41° 26.08'	121° 53.8'	4817	858.64	-160.8
346	41° 26.50'	121° 53.2'	4874	854.89	-161.8
347	41° 27.02'	121° 52.7'	4907	853.63	-161.8
348	41° 27.72'	121° 52.2'	4901	853.58	-163.3
349	41° 29.73'	121° 53.0'	5453	821.22	-165.6
350	41° 29.99'	121° 53.4'	5540	817.14	-164.7
351	41° 31.00'	121° 54.0'	5552	818.31	-164.4
352	41° 31.74'	121° 53.9'	5341	831.35	-165.1
353	41° 32.28'	121° 54.6'	5266	838.18	-163.6
354	41° 34.80'	121° 56.3'	4828	868.40	-163.4
355	41° 37.41'	121° 59.6'	4660	885.36	-160.4
356	41° 33.37'	121° 57.6'	5913	794.87	-169.7
357	41° 34.63'	121° 52.3'	4872	861.56	-167.3
358	41° 34.33'	121° 51.0'	5453	829.14	-164.4
359	41° 33.95'	121° 49.8'	5815	804.94	-166.4
360	41° 34.09'	121° 48.1'	5918	810.10	-155.2

STATION	LATITUDE	LONGITUDE	ELEVATION (feet)	OBSERVED GRAVITY (-979,000.00 milligals)	SIMPLE- BOUGUER GRAVITY (milligals)
361	41°33.53'	121°46.21'	6013	797.68	-161.1
362	41°35.69'	121°46.11'	5501	835.42	-157.3
363	41°32.28'	121°42.44'	5874	809.22	-156.0
364	41°31.55'	121°41.55'	5639	822.41	-155.9
365	41°30.38"	121°42.55'	5337	835.62	-159.0
366	41°29.30'	121°41.05'	5164	844.02	-159.4
367	41°27.42'	121°46.81'	4835	858.90	-161.5
368	41°28.86'	121°46.33'	5161	839.92	-163.0
369	41°30.72'	121°44.44'	5591	818.48	-161.4
370	41°30.75'	121°47.01'	5856	795.30	-168.2
371	41°29.89'	121°49.65'	5483	817.15	-169.0
372	41°27.80'	121°48.81'	5248	832.17	-164.2
373	41°26.55'	121°49.65'	4985	846.06	-164.0
374	41°24.66'	121°50.65'	4901	851.18	-161.1
375	41°23.66'	121°49.71'	5225	831.00	-160.4
376	41°22.98'	121°51.33'	5353	822.59	-160.1
377	41°19.94'	121°48.71'	4840	856.64	-152.3
378	41°18.60'	121°51.55'	5192	895.09	-150.7
379	41°15.97'	121°48.33'	4051	913.33	-137.0
380	41°16.88'	122°10.71'	4254	915.66	-123.8
381	41°18.38'	122°11.33'	4890	867.65	-135.9
382	41°18.76'	122°12.71'	5188	849.83	-136.4
383	41°19.20'	122°9.33'	5578	817.27	-146.2
384	41°18.67'	122°13.65'	5224	850.07	-133.9
385	41°18.55'	122°15.33'	4668	888.32	-128.8
386	41°18.32'	122°16.21'	4273	917.34	-123.2
387	41°17.92'	122°16.95'	3985	937.04	-120.1
388	41°17.99'	122°17.81'	3695	957.72	-117.0
389	41°10.31'	120°59.01'	4211	873.88	-158.4
390	41°14.25'	120°54.81'	4260	875.79	-159.4
391	41°15.77'	120°53.71'	4375	881.86	-149.4
392	41°17.46'	120°53.33'	4576	874.02	-147.0
393	41°20.79'	120°55.33'	5188	844.53	-144.8
394	41°21.40'	120°56.81'	4476	895.23	-137.7
395	41°26.66'	120°52.11'	4312	893.93	-156.7
396	41°27.21'	120°49.01'	4367	895.90	-152.2
397	41°27.70'	120°46.11'	4337	890.75	-159.9
398	41°29.30'	120°40.11'	4416	908.05	-140.3
399	41°29.85'	120°35.71'	4351	900.27	-152.8
400	41°29.40'	120°32.71'	4368	887.95	-163.4
401	41°31.35'	120°28.44'	4416	893.06	-158.3
402	41°30.47'	120°30.11'	4410	886.43	-164.0
403	41°29.46'	120°42.33'	4350	905.09	-147.4
404	41°50.49'	121°55.44'	2140	1016.47	-110.6
405	41°45.70'	122°0.71'	1327	1058.00	-110.7

STATION	LATITUDE	LONGITUDE	ELEVATION (feet)	OBSERVED GRAVITY (-979,000.00 milligals)	SIMPLE- BOUGUER GRAVITY (milligals)
406	40°37.27'	122°18.8'	592	1123.39	- 76.2
407	40°35.12'	122°24.8'	661	1126.64	- 66.3
408	40°38.15'	122°44.1'	3212	927.44	-116.9
409	40°41.85'	122°38.3'	1352	1067.26	- 94.2
410	41°27.68'	122°23.1'	3267	987.49	-127.3
411	41°28.08'	122°24.7'	3016	1003.02	-127.5
412	41°28.09'	122°26.1'	2921	1013.18	-123.0
413	41°29.24'	122°27.3'	2856	1017.69	-124.1
414	41°31.95'	122°28.1'	2673	1032.95	-123.9
415	41°35.21'	122°26.4'	2585	1051.77	-115.5
416	41°35.77'	122°24.2'	2613	1047.75	-118.4
417	41°38.59'	122°29.4'	2521	1074.42	-101.5
418	41°38.32'	122°26.2'	2605	1059.89	-110.5
419	41°33.16'	122°27.8'	2732	1029.63	-125.5
420	41°29.66'	122°22.8'	2966	1005.48	-130.4
421	41°28.31'	122°12.9'	6833	738.41	-163.4
422	41°28.28'	122°17.8'	4462	903.38	-140.1
423	41°19.55'	122°18.3'	3768	948.25	-124.4
424	41°20.93'	122°18.8'	4243	914.13	-132.1
425	41°19.91'	122°14.5'	5679	820.02	-138.5
426	41°20.92'	122°13.8'	6737	746.62	-149.9
427	41°21.82'	122°17.6'	4991	863.21	-139.4
428	41°21.83'	122°19.3'	4320	908.78	-134.2
429	41°12.72'	121°1.7'	4212	887.39	-148.4
430	41°12.95'	121° 6.3'	4161	883.15	-156.1
431	41°15.26'	121° 6.4'	4164	895.14	-146.7
432	41°17.34'	121° 6.3'	4242	908.22	-132.7
433	41°19.30'	121° 8.0'	4250	910.06	-133.3
434	41°21.37'	121° 8.9'	4298	903.31	-140.3
435	41°22.76'	121°11.6'	4512	877.58	-155.2
436	41°25.28'	121°10.3'	4603	884.71	-146.4
437	41°26.84'	121° 9.8'	4714	883.03	-143.7
438	41°28.67'	121° 9.6'	4714	881.97	-147.5
439	41°43.74'	121°16.0'	4231	939.02	-142.0
440	41°44.50'	121°14.1'	4396	928.30	-143.9
441	41°45.86'	121°12.5'	4376	928.17	-147.3
442	41°47.06'	121°11.0'	4461	921.53	-150.6
443	41°47.69'	121° 9.5'	4483	920.98	-150.8
444	41°48.29'	121° 7.4'	4491	921.87	-150.3
445	41°49.56'	121° 5.3'	4524	924.66	-146.4
446	41°47.49'	121° 3.3'	4548	916.86	-150.7
447	41°45.45'	121° 2.4'	4659	905.63	-152.2
448	41°43.97'	121° 1.8'	4704	899.53	-153.4
449	41°39.06'	121° 3.8'	4825	881.81	-156.5
450	41°34.58'	121° 3.2'	4925	868.52	-157.1

STATION	LATITUDE	LONGITUDE	ELEVATION (feet)	OBSERVED GRAVITY (-979,000.00 milligals)	SIMPLE- BOUGUER GRAVITY (milligals)
451	41°35.18'	121° 5.9'	4801	878.14	-155.8
452	41°30.86'	121° 2.8'	4895	866.07	-155.8
453	41°26.30'	121°13.7'	4503	882.56	-156.0
454	41°24.46'	121°16.9'	4406	887.90	-153.8
455	41°26.06'	121°17.0'	4384	890.05	-155.3
456	41°28.30'	121°16.8'	4337	895.51	-156.0
457	41°30.71'	121°19.2'	4255	910.66	-149.4
458	41°33.01'	121°19.0'	4288	912.87	-148.6
459	41°35.17'	121°19.9'	4317	917.11	-145.9
460	41°36.77'	121°20.6'	4338	920.10	-144.0
461	41°52.42'	121°32.6'	4035	947.55	-158.1
462	41°52.43'	121°30.9'	4035	950.40	-155.3
463	41°54.02'	121°29.7'	4035	946.46	-161.6
464	41°56.28'	121°29.7'	4038	949.43	-162.0
465	41°57.23'	121°31.7'	4034	959.74	-153.2
466	41°58.74'	121°32.5'	4039	965.27	-149.6
467	41°58.30'	121°33.8'	4048	973.35	-140.4
468	42° 0.59'	121°37.8'	4095	973.66	-140.7
469	42° 0.60'	121°40.6'	4098	973.40	-140.7
470	42° 2.35'	121°43.7'	4117	971.74	-143.9
471	42° 2.34'	121°47.7'	4084	956.23	-161.4
472	42° 2.33'	121°50.2'	4084	965.23	-152.3
473	42° 2.33'	121°52.3'	4116	976.86	-138.8
474	42° 3.87'	121°51.1'	4084	980.84	-139.0
475	42° 5.99'	121°50.0'	4081	981.44	-141.8
476	42° 7.56'	121°48.7'	4097	983.76	-140.9
477	42° 7.57'	121°46.7'	4095	977.17	-147.6
478	42° 9.99'	121°46.7'	4092	986.23	-142.3
479	42°11.51'	121°49.3'	4177	984.83	-140.2
480	42°10.22'	121°41.8'	4114	972.88	-154.5
481	42° 8.03'	121°41.8'	4087	976.32	-149.6
482	42° 5.69'	121°41.4'	4083	981.49	-141.2
483	42° 4.17'	121°39.8'	4082	979.39	-141.1
484	42° 1.46'	121°31.4'	4068	985.88	-131.4
485	42° 3.87'	121°32.7'	4203	979.55	-133.2
486	42° 3.76'	121°36.7'	4099	979.93	-138.9
487	42°14.09'	121°34.0'	4193	989.96	-138.1
488	42°14.09'	121°30.4'	4127	986.58	-145.4
489	42°12.86'	121°26.4'	4141	987.89	-141.3
490	42°11.32'	121°21.7'	4136	985.80	-141.6
491	42° 9.93'	121°18.8'	4126	980.59	-145.5
492	41° 8.22'	121°16.3'	4132	969.35	-154.2
493	42° 2.52'	121°12.1'	4142	959.94	-154.4
494	42° 5.60'	121°13.2'	4164	957.74	-159.9
495	42° 9.52'	121°11.8'	4407	940.43	-168.5

STATION	LATITUDE	LONGITUDE	ELEVATION (feet)	OBSERVED GRAVITY (-979,000.00 milligals)	SIMPLE- BOUGUER GRAVITY (milligals)
496	42°12.18'	121° 8.5'	4935	915.15	-165.9
497	42° 8.26'	121°32.1'	4118	978.68	-145.7
498	42° 6.24'	121°28.4'	4144	982.16	-137.7
499	42° 3.41'	121°27.3'	4188	981.63	-131.3
500	42°2.56'	121°24.2'	4118	975.28	-140.6
501	42° 1.03'	121°21.6'	4098	969.20	-145.6
502	42° 1.88'	121°26.7'	4065	975.67	-141.6
503	42° 1.88'	121°26.7'	4065	979.06	-139.0
504	41°59.28'	121°27.9'	4041	965.41	-150.2
505	41°39.23'	121°27.5'	5048	879.86	-145.4
506	41°38.17'	121°29.2'	5848	824.57	-151.0
507	41°37.47'	121°25.5'	4667	901.82	-143.6
508	41°35.83'	121°25.7'	4778	894.04	-142.3
509	41°34.23'	121°24.8'	4673	897.36	-142.9
510	41°31.10'	121°24.2'	4333	910.99	-145.0
511	41°29.32'	121°24.4'	4283	910.74	-145.6
512	41°30.92'	121°21.2'	4250	912.40	-148.3
513	41° 7.02'	121°19.8'	3537	928.09	-139.7
514	41° 9.07'	121°21.2'	3482	938.60	-135.6
515	41°10.20'	121°21.6'	3481	941.75	-134.5
516	41°11.54'	121°22.3'	3484	944.56	-133.2
517	41°12.65'	121°22.3'	3654	938.28	-130.9
518	41°12.50'	121°20.4'	4658	875.08	-133.7
519	41°12.10'	121°18.6'	4772	867.13	-134.2
520	41°13.87'	121°26.3'	3561	945.63	-131.0
521	41°16.19'	121°24.5'	4435	889.96	-137.7
522	41°18.57'	121°27.2'	4387	897.52	-136.5
523	41°21.93'	121°29.3'	4341	889.90	-141.9
524	41°23.28'	121°28.7'	4363	898.08	-144.4
525	41°25.00'	121°29.6'	4593	881.63	-149.6
526	41°26.83'	121°29.2'	4680	879.90	-148.9
527	41°26.82'	121°27.7'	4616	887.55	-145.1
528	41°25.64'	121°25.1'	4465	896.44	-143.5
529	41°27.47'	121°24.2'	4342	904.34	-145.7
530	41°24.52'	121°22.8'	4437	892.54	-147.4
531	41°23.74'	121°21.0'	4375	895.32	-147.2
532	41°25.74'	121°22.3'	4466	892.09	-147.9
533	41°28.04'	121°21.5'	4390	897.64	-150.3
534	41°21.44'	121°20.9'	4325	898.39	-143.7
535	41°20.12'	121°20.8'	4342	895.65	-143.4
536	41°17.11'	121°19.5'	4325	895.52	-140.1
537	41°16.09'	121°15.6'	4270	886.39	-151.0
538	41°17.97'	121°13.6'	4233	887.13	-155.2
539	41°20.18'	121°13.5'	4349	885.84	-152.9
540	41°20.10'	121°15.3'	4265	887.29	-156.4

STATION	LATITUDE	LONGITUDE	ELEVATION (feet)	OBSERVED GRAVITY (-979,000.00 milligals)	SIMPLE- BOUGUER GRAVITY (milligals)
541	41°21.79'	121°16.2'	4255	891.94	-156.8
542	41°23.13'	121°16.6'	4393	889.11	-151.4
543	41°23.62'	121°13.3'	4436	882.24	-156.4
544	41°18.59'	121° 8.2'	4182	914.53	-131.8
545	41°17.51'	121° 8.0'	4230	904.56	-137.3
546	41°16.65'	121° 8.5'	4165	903.84	-140.7
547	41°15.90'	121° 8.7'	4201	893.79	-147.4
548	41°17.59'	121° 7.3'	4186	907.89	-136.7
549	41°16.55'	121° 6.3'	4240	903.66	-136.2
550	41°14.47'	121° 6.3'	4163	892.60	-148.8
551	41° 2.97'	121°34.8'	3805	911.84	-133.9
552	41° 3.39'	121°32.8'	3552	928.05	-133.5
553	41° 3.05'	121°26.9'	3314	920.65	-154.6
554	41° 4.94'	121°24.7'	3306	921.22	-157.4
555	41° 2.22'	121°21.9'	3320	931.04	-142.6
556	41° 1.36'	121°19.2'	3326	928.27	-144.1
557	41° 0.01'	121°17.2'	3331	929.05	-140.7
558	41° 3.60'	121°17.7'	3642	912.61	-143.8
559	41° 2.57'	121°13.7'	4448	862.95	-143.6
560	41° 1.91'	121°11.8'	4275	871.62	-144.3
561	41° 0.99'	121°11.2'	4226	872.04	-145.5
562	41° 0.87'	121° 9.8'	4202	872.24	-146.5
563	41° 4.71'	121° 8.7'	4113	867.83	-162.0
564	41° 6.62'	121° 6.3'	4138	868.66	-162.5
565	41° 4.87'	121° 6.2'	4132	865.83	-159.9
566	41° 2.70'	121° 6.7'	4132	875.70	-150.0
567	41° 4.09'	121° 3.6'	4281	864.17	-154.6
568	41° 2.95'	121° 2.7'	4570	848.57	-151.2
569	41° 2.56'	121° 4.8'	4216	872.37	-148.1
570	41° 7.29'	121° 0.4'	4224	871.51	-155.5
571	41°18.05'	122° 5.0'	3901	914.46	-148.0
572	41°20.84'	122° 3.9'	4682	859.31	-160.4
573	41°23.19'	122° 4.0'	5219	827.57	-163.4
574	41°24.10'	122° 2.2'	4944	844.39	-164.5
575	41°24.80'	122° 1.8'	4903	847.63	-164.7
576	41°25.94'	122° 6.4'	6360	753.25	-173.6
577	41°27.09'	122° 5.2'	5910	788.28	-167.1
578	41°28.60'	122° 5.7'	5879	794.52	-165.0
579	41°22.25'	122° 0.2'	4209	888.01	-162.2
580	41°23.48'	121°59.7'	4200	891.28	-161.3
581	41°25.61'	121°57.8'	5126	837.60	-162.6
582	41°24.10'	121°57.6'	4533	871.92	-161.6
583	41°22.56'	121°57.3'	4056	899.56	-160.3
584	41°19.52'	122° 0.5'	3910	906.71	-157.4
585	41°18.77'	122° 1.2'	3813	914.40	-154.4

STATION	LATITUDE	LONGITUDE	ELEVATION (feet)	OBSERVED GRAVITY (979,000.00 milligals)	SIMPLE- BOUGUER GRAVITY (milligals)
586	41°18.11'	122° 2.6'	3698	924.55	-150.1
587	41°17.01'	122° 3.0'	3506	937.68	-146.9
588	41°11.99'	122° 4.2'	3034	982.38	-123.0
589	41°12.51'	122° 5.3'	3060	979.46	-125.2
590	41°13.74'	122° 6.7'	3088	981.55	-123.2
591	41°13.63'	122° 8.6'	3032	985.70	-122.3
592	41°12.85'	122° 9.0'	2916	994.36	-119.4
593	41°11.96'	122° 8.8'	2849	997.82	-118.7
594	41°14.04'	122° 9.1'	3151	980.48	-120.5
595	41°13.73'	122°10.8'	3522	967.44	-111.3
596	41°12.85'	122°12.8'	2975	1004.14	-106.1
597	41°31.44'	122°17.1'	3740	960.02	-132.0
598	41°32.39'	122°13.8'	4168	928.50	-139.3
599	41°31.62'	122°11.2'	4901	869.69	-153.0
600	41°30.92'	122°10.8'	5181	848.78	-156.0
601	41°28.53'	122°10.3'	6570	751.54	-166.4
602	41°36.41'	122°12.0'	4855	892.11	-140.5
603	41°38.43'	122°10.6'	5058	864.85	-158.6
604	41°38.80'	122° 7.6'	5070	858.94	-164.3
605	41°38.44'	122° 8.7'	5098	859.24	-161.8
606	41°38.41'	122° 9.8'	5063	863.91	-159.2
607	41°37 32'	122° 9.8'	5532	834.50	-158.8
608	41°35 32'	122° 8.2'	5904	804.58	-163.4
609	41°34.25'	122° 8.1'	5745	810.60	-165.4
610	41°34.79'	122° 6.5'	5544	825.91	-162.9
611	41°36.70'	122° 5.4'	5296	843.25	-163.3
612	41°37.02'	122° 4.4'	4924	869.35	-160.0
613	41°38.72'	122° 2.9'	4758	881.14	-160.7
614	41°38.55'	122° 1.1'	4694	883.37	-162.1
615	41°39.84'	122° 3.3'	4820	879.65	-160.2
616	41°41.79'	122° 2.4'	5202	852.97	-166.8
617	41°44 71'	122° 3.9'	4469	905.94	-162.2
618	41°44.52'	122° 2.3'	4291	914.92	-163.6
619	41°46.13'	122° 1.3'	4266	918.11	-164.3
620	41°47.62'	122° 3.8'	4254	923.84	-161.5
621	41°49.34'	122° 3.2'	4237	924.00	-165.0
622	41°49.35'	122° 4.8'	4256	934.02	-153.8
623	41°50.21'	122° 6.5'	4246	942.46	-147.3
624	41°55.13'	121°59.7'	4240	940.81	-156.6
625	41°57.13'	121°58.5'	4240	949.94	-150.5
626	41°58.87'	121°57.4'	4259	962.04	-139.9
627	41°57.99'	122° 1.2'	4246	957.00	-144.4
628	41°55.87'	122° 1.3'	4247	950.37	-147.8
629	41°54.11'	122° 2.8'	4238	944.16	-151.9
630	41°54.11'	122° 1.7'	4238	941.09	-155.0

STATION	LATITUDE	LONGITUDE	ELEVATION (feet)	OBSERVED GRAVITY (979,000.00 milligals)	SIMPLE- BOUGUER GRAVITY (milligals)
631	41°53.67'	122° 4.4'	4236	941.33	-154.2
632	41°57.11'	122° 6.0'	4279	953.95	-144.1
633	41°55.43'	122° 6.0'	4246	952.38	-145.2
634	41°54.29'	122° 6.9'	4260	947.69	-147.3
635	41°53.33'	122° 8.2'	4565	933.73	-141.5
636	41°53.10'	122°10.3'	5048	903.38	-142.5
637	41°53.41'	122°11.7'	5580	868.49	-146.0
638	41°54.20'	122°13.2'	5865	854.75	-143.8
639	41°52.07'	122°13.4'	6263	826.57	-144.9
640	41°51.10'	122°14.2'	6104	840.27	-142.4
641	41°49.73'	122°12.0'	6111	837.48	-139.6
642	41°48.18'	122°12.0'	6210	825.23	-143.6
643	41°47.74'	122°14.3'	7780	698.80	-175.2
644	41°45.18'	122° 5.9'	5688	835.75	-160.0
645	41°44.73'	122° 9.1'	5324	862.89	-154.0
646	41°43.11'	122° 6.3'	5126	871.13	-155.2
647	41°41.94'	122° 7.6'	5336	848.11	-163.9
648	41°40.15'	122° 9.5'	5281	847.96	-164.6
649	41°39.63'	122°10.6'	5064	861.89	-163.0
650	41°40.92'	122°12.6'	5883	813.34	-164.3
651	41°40.14'	122°17.1'	5191	878.95	-139.0
652	41°37.87'	122°20.4'	2925	1023.01	-127.5
653	41°39.73'	122°22.3'	2760	1040.39	-122.8
654	41°41.05'	122°22.2'	2738	1042.82	-123.7
655	41°41.34'	122°20.5'	2915	1023.37	-133.0
656	41°42.70'	122°23.3'	2705	1048.11	-122.9
657	41°43.58'	122°22.2'	2801	1038.15	-128.4
658	41°45.23'	122°18.5'	3196	1010.46	-134.8
659	41°46.25'	122°23.3'	3364	1014.56	-122.2
660	41°48.09'	122°19.3'	3692	994.91	-124.9
661	41°49.80'	122°21.5'	3196	1029.41	-122.7
662	41°50.66'	122°24.3'	2884	1055.55	-116.6
663	41°48.28'	122°29.9'	2801	1073.54	-100.0
664	41°46.27'	122°31.4'	2711	1074.34	-101.6
665	40°52.34'	121°53.8'	2976	960.76	-118.9
666	40°53.19'	121°54.2'	2894	968.34	-117.5
667	40°54.86'	121°54.6'	2699	987.63	-112.4
668	40°55.60'	121°55.9'	2825	980.34	-113.2
669	40°56.03'	121°56.8'	2701	990.34	-111.3
670	40°58.82'	121°56.1'	3103	974.10	-107.5
671	40°59.72'	121°55.3'	2432	1015.43	-107.8
672	41° 0.86'	121°54.6'	1798	1050.95	-112.0
673	41° 1.84'	121°55.3'	1857	1054.11	-106.8
674	41° 3.36'	121°58.2'	2810	991.41	-114.6
675	41° 5.08'	121°58.0'	3314	960.37	-118.0

STATION	LATITUDE	LONGITUDE	ELEVATION (feet)	OBSERVED GRAVITY (979,000.00 milligals)	SIMPLE- BOUGUER GRAVITY (milligals)
676	41° 5.90'	121°57.7'	4077	914.47	-119.3
677	41° 2.07'	121°53.4'	2236	1027.93	-110.6
678	41° 5.74'	121°51.7'	2885	988.02	-116.9
679	41° 5.04'	121°50.2'	4001	919.02	-118.0
680	41° 6.51'	121°49.4'	4098	915.48	-117.9
681	41° 5.43'	121°47.9'	5403	828.15	-125.2
682	41° 6.80'	121°46.8'	5140	845.61	-125.7
683	41° 9.83'	121°46.6'	5278	842.37	-125.2
684	41°10.90'	121°47.0'	5575	817.75	-133.6
685	41°10.72'	121°48.5'	4777	875.57	-123.6
686	41°10.45'	121°51.2'	6224	777.42	-134.3
687	41°14.98'	121°38.8'	3954	919.21	-135.5
688	41°22.15'	121°42.5'	4525	880.74	-150.4
689	41°22.76'	121°43.7'	4571	877.11	-152.1
690	41°25.19'	121°42.8'	4641	871.53	-157.1
691	41°26.21'	121°41.1'	4609	875.51	-156.6
692	41°12.65'	122°10.1'	3509	961.45	-116.4
693	41°11.75'	122°11.6'	3988	937.06	-110.8
694	41°10.68'	122°12.0'	3585	960.34	-110.1
695	41°10.09'	122°12.3'	4570	897.91	-112.5
696	41° 9.13'	122°13.4'	4697	887.00	-114.4
697	41° 7.72'	122°16.7'	4809	877.07	-115.5
698	41° 9.37'	122°21.7'	2341	1015.43	-127.7
699	41° 9.14'	122°28.1'	5323	845.53	-118.3
700	41° 8.34'	122°30.7'	5392	835.40	-123.1
701	41° 9.46'	122°31.2'	4874	873.14	-118.1
702	41° 8.33'	122°32.5'	4740	879.44	-118.2
703	41° 8.29'	122°34.3'	3720	943.07	-115.7
704	41° 8.35'	122°36.0'	5089	871.54	-105.2
705	41° 8.64'	122°38.9'	2991	985.34	-117.7
706	41° 8.60'	122°37.6'	3717	947.36	-112.0
707	41° 9.82'	122°26.5'	5468	837.02	-119.1
708	41° 9.81'	122°24.9'	3948	922.65	-124.6
709	41° 9.29'	122°23.3'	3172	967.06	-126.1
710	41° 8.89'	122°19.6'	2083	1041.41	-116.4
711	41°25.15'	122°21.4'	3725	954.43	-129.1
712	41°24.45'	122°20.7'	4037	931.94	-131.9
713	41°24.51'	122°18.4'	5153	853.43	-143.5
714	41°16.89'	122°22.2'	3488	975.25	-110.2
715	41°21.81'	122°22.6'	3801	953.78	-120.3
716	41°22.93'	122°23.3'	3944	950.06	-117.1
717	41°22.16'	122°26.3'	4310	941.61	-102.4
718	41°24.48'	122°25.9'	3279	996.20	-113.1
719	41°32.30'	122°33.1'	2844	1056.20	- 90.9
720	41°32.42'	122°35.2'	3013	1055.04	- 82.1

STATION	LATITUDE	LONGITUDE	ELEVATION (feet)	OBSERVED GRAVITY (979,000.00 milligals)	SIMPLE- BOUGUER GRAVITY (milligals)
721	41°34.06'	122°41.1'	3440	1024.35	- 89.6
722	41°35.24'	122°43.2'	3326	1028.18	- 94.4
723	41°35.41'	122°46.0'	2962	1037.15	-107.5
724	41°34.31'	122°47.4'	2825	1040.86	-110.4
725	41°33.55'	122°49.7'	2740	1046.78	-108.4
726	41°32.34'	122°49.8'	2750	1044.02	-108.8
727	41°31.16'	122°51.5'	2744	1045.71	-105.7
728	41°30.79'	122°53.3'	2775	1040.88	-108.1
729	41°32.21'	122°54.4'	2810	1032.56	-116.4
730	41°33.96'	122°55.5'	2824	1034.81	-116.0
731	41°34.39'	122°57.1'	2934	1037.34	-107.5
732	41°36.02'	122°58.6'	2828	1047.59	-106.0
733	41°37.45'	122°57.7'	2695	1051.51	-112.2
734	41°38.55'	122°55.5'	2732	1045.97	-117.2
735	41°37.79'	122°53.3'	2715	1048.20	-114.8
736	41°37.39'	122°48.6'	2807	1042.68	-114.2
737	41°43.87'	122°34.6'	2505	1089.29	- 95.4
738	41°43.70'	122°31.8'	2535	1080.34	-102.3
739	41°43.64'	122°29.6'	2621	1068.67	-108.8
740	41°43.50'	122°27.4'	2614	1065.84	-111.8
741	41°45.38'	122°29.6'	2594	1070.80	-110.8
742	41°48.27'	122°24.9'	2739	1060.02	-117.2
743	41°51.97'	122°26.7'	2488	1085.84	-112.0
744	41°53.37'	122°23.9'	2598	1073.90	-119.4
745	41°56.52'	122°18.5'	3383	1020.84	-130.1
746	41°56.03'	122°18.5'	3535	1010.19	-130.9
747	41°55.17'	122°18.1'	4377	954.51	-134.8
748	41°54.40'	122°15.4'	6015	846.85	-143.0
749	41°53.86'	122°16.2'	5998	846.74	-143.3
750	41°53.23'	122°18.4'	4746	929.40	-134.8
751	41°53.12'	122°16.4'	6022	843.61	-143.9
752	41°54.86'	122°16.6'	5412	886.68	-140.0
753	41°57.92'	122°20.7'	3075	1048.92	-122.6
754	41°58.81'	122°21.8'	2460	1087.75	-122.0
755	41°53.88'	122°32.5'	2110	1123.99	- 99.4
756	41°38.40'	112°34.4'	2797	1074.76	- 84.3
757	41°36.01'	122°34.6'	3260	1041.26	- 86.4
758	41°29.85'	122°33.0'	2953	1055.44	- 81.5
759	41°27.45'	122°37.8'	3640	1011.75	- 79.8
760	41°25.95'	122°38.4'	4921	930.36	- 82.6
761	41°24.15'	122°38.7'	4218	965.41	- 87.1
762	41°22.63'	122°41.6'	3835	973.26	-100.0
763	41°21.96'	122°43.0'	3731	974.32	-104.1
764	41°21.15'	122°43.9'	3783	963.96	-110.2
765	41°19.17'	122°44.8'	3353	978.89	-118.1

STATION	LATITUDE	LONGITUDE	ELEVATION (feet)	OBSERVED GRAVITY (979,000.00 milligals)	SIMPLE- BOUGUER GRAVITY (milligals)
766	41°18.69'	122°45.8'	3244	978.90	-123.9
767	41°18.24'	122°46.6'	3136	988.62	-120.0
768	41°27.43'	122°53.7'	2928	1032.99	-101.8
769	41°25.70'	122°56.5'	3609	966.16	-125.2
770	41°25.36'	122°57.7'	4206	933.37	-121.7
771	41°24.03'	122°59.3'	5492	876.60	- 99.3
772	41°22.61'	123° 0.4'	4783	911.80	-104.5
773	41°19.36'	123° 3.7'	2572	1034.16	-110.0
774	41°17.83'	123° 7.2'	2263	1050.26	-110.1
775	41°18.71'	123°10.1"	2020	1066.99	-109.3
776	41°17.75'	123°13.8'	1716	1071.53	-121.5
777	41°15.49'	123°19.4'	1243	1106.46	-111.6
778	41°17.22'	123°21.8'	1149	1114.17	-112.1
779	41°20.24'	123°24.3'	805	1136.11	-115.3
780	41°22.55'	123°26.9'	670	1143.70	-119.3
781	41°18.17'	123°32.3'	400	1157.09	-115.6
782	41°16.63'	123°36.4'	815	1136.75	-108.7
783	41°14.19'	123°39.4'	382	1157.85	-110.0
784	41°11.19'	123°42.3'	321	1165.95	-101.1
785	41°12.02'	123°47.5'	2827	1033.11	- 84.8
786	41° 8.80'	123°53.2'	2694	1050.47	- 70.6
787	41°11.17'	123°56.3'	2333	1082.56	- 63.7
788	41°14.95'	123°59.0'	1985	1115.51	- 57.3
789	41°17.29'	124° 3.5'	34	1252.81	- 40.5
790	41°50.72'	122°39.8'	1923	1125.31	-104.6
791	41°51.99'	122°47.9'	1775	1126.10	-114.6
792	41°50.08'	122°51.8'	1724	1112.06	-128.8
793	42°12.64'	122°42.0'	1812	1165.06	-104.3
794	42° 9.28'	122°37.7'	2136	1132.21	-112.7
795	42° 3.20'	122°36.3'	4458	974.39	-122.1
796	41° 2.77'	120°51.9'	4720	826.54	-164.0
797	41° 5.05'	120°54.0'	4464	853.30	-156.0
798	41° 6.42'	120°55.1'	4484	854.95	-155.2
799	41° 7.14'	120°56.7'	4331	864.82	-155.5
800	41°27.59'	120°54.3'	4356	889.31	-160.0
801	41°28.75'	120°57.5'	4613	875.54	-160.1
802	41°18.18'	122°18.7'	3488	970.55	-116.8
803	41°14.00'	122°26.6'	4746	898.86	-106.8
804	41°14.53'	122°25.6'	4658	907.93	-103.8
805	41°12.98'	122°29.9'	5827	824.55	-114.7
806	41°14.41'	122°30.9'	7070	745.94	-120.9
807	41°13.63'	122°22.6'	6246	797.07	-118.1
808	41°13.25'	122°21.5'	5430	852.31	-111.2
809	41°14.04'	122°20.5'	5781	828.33	-115.3
810	41°13.32'	122°18.5'	5556	839.64	-116.4

STATION	LATITUDE	LONGITUDE	ELEVATION (feet)	OBSERVED GRAVITY (979,000.00 milligals)	SIMPLE- BOUGUER GRAVITY (milligals)
811	41° 1.92'	122°25.0'	2440	1001.48	-124.6
812	41° 2.28'	122°27.3'	5525	813.90	-127.6
813	41° 4.54'	122°28.5'	6326	771.12	-125.7
814	41° 5.00'	122°31.2'	6020	797.61	-108.2
815	41°26.50'	122°30.7'	7904	719.94	-106.2
816	41°18.84'	122°35.9'	7366	753.37	-102.3
817	41°26.28'	122°32.9'	6546	827.52	- 88.6
818	41°26.63'	122°31.7'	5866	866.85	- 90.5
819	41°24.83'	122°30.6'	4097	963.46	- 97.3
820	41°22.68'	122°34.5'	8542	689.74	-101.3
821	41°20.36'	122°43.1'	3591	969.10	-115.4
822	41°21.01'	122°41.3'	4471	897.52	-135.1
823	41°19.12'	122°42.8'	4173	925.62	-122.1
824	41°17.33'	122°43.9'	4412	910.32	-120.4
825	41°16.55'	122°41.8'	5403	855.43	-114.6
826	41°15.56'	122°40.2'	4515	900.77	-121.1
827	41°14.09'	122°39.1'	3296	970.62	-122.2
828	41°12.05'	122°39.1'	3016	988.52	-118.1
829	41°10.17'	122°39.8'	2837	984.03	-130.5
830	41° 8.43'	122°41.4'	2698	990.03	-130.2
831	41° 6.47'	122°42.6'	2559	994.38	-131.3
832	41° 3.93'	122°42.3'	2413	1002.03	-128.6
833	41°33.22'	122°36.8'	3886	1006.52	- 79.4
834	41°31.73'	122°38.0'	5156	923.40	- 84.1
835	41°32.68'	122°38.5'	5209	920.92	- 84.8
836	41°30.64'	122°38.4'	6093	858.23	- 91.4
837	41°34.49'	122°38.4'	5414	907.59	- 88.6
838	41°37.28'	122°39.6'	5260	914.06	- 95.5
839	41°37.69'	122°41.3'	5512	891.42	-103.6
840	41°46.11'	122°33.2'	2683	1078.45	- 98.9
841	41°48.03'	122°39.0'	4721	953.74	-104.2
842	41°46.92'	122°39.4'	3622	1028.37	- 93.9
843	41°45.55'	122°41.2'	4432	976.19	- 95.4
844	41°47.63'	122°41.6'	2381	1097.55	-100.2
845	41°49.00'	122°40.8'	2154	1111.10	-102.3
846	41°49.32'	122°57.7'	1663	1100.82	-142.6
847	41°45.97'	122°53.8'	4210	956.97	-128.6
848	41°44.71'	122°50.1'	5233	909.47	-112.8
849	41°43.59'	122°51.4'	4285	962.66	-114.8
850	41°41.76'	122°51.6'	3207	1024.21	-115.2
851	41°40.83'	122°49.7'	3008	1039.37	-110.6
852	41°42.53'	122°48.9'	3214	1029.53	-110.6
853	41°43.18'	122°46.2'	3806	1003.06	-102.6
854	41°43.73'	122°44.1'	4016	992.86	-100.8
855	41°43.97'	122°38.2'	2600	1084.15	- 95.0

STATION	LATITUDE	LONGITUDE	ELEVATION (feet)	OBSERVED GRAVITY (979,000.00 milligals)	SIMPLE- BOUGUER GRAVITY (milligals)
856	41°41.74'	122°33.8'	2594	1084.90	- 91.3
857	41°40.73'	122°36.0'	3378	1038.72	- 88.9
858	41°41.75'	122°39.1'	2767	1076.21	- 89.6
859	41°41.22'	122°39.9'	2830	1072.63	- 88.6
860	41°40.54'	122°41.7'	3202	1038.75	- 99.2
861	41°40.56'	122°43.7'	4147	978.35	-102.9
862	41°39.07'	122°44.5'	3362	1028.22	- 97.9
863	41°38.09'	122°44.8'	2947	1052.30	- 97.3
864	41°37.72'	122°42.8'	3155	1041.96	- 94.6
865	41°36.73'	122°43.4'	3250	1035.24	- 94.1
866	41°33.01'	122°41.0'	3523	1019.92	- 87.5
867	41°31.75'	122°41.3'	3627	1013.46	- 85.8
868	41°33.12'	122°44.5'	3558	1007.64	- 97.8
869	41°32.37'	122°44.8'	3700	997.45	- 98.4
870	41°31.62'	122°43.5'	6039	839.26	-115.1
871	41°30.54'	122°50.4'	2753	1040.64	-109.3
872	41°29.98'	122°49.6'	2810	1030.66	-113.5
873	41°29.12'	122°47.2'	2981	1027.49	-106.6
874	41°27.46'	122°51.0'	2780	1031.50	-112.2
875	41°28.90'	122°54.0'	2858	1030.52	-110.7
876	41°32.48'	122°55.8'	2919	1024.60	-118.3
877	41°35.05'	122°54.7'	2777	1039.78	-115.4
878	41°35.98'	122°53.6'	2784	1040.12	-116.1
879	41°33.37'	122°58.3'	3059	1028.24	-107.5
880	41°34.91'	122°58.6'	2898	1041.01	-106.7
881	41°38.31'	122°59.2'	2663	1051.71	-115.2
882	41°39.84'	122°53.6'	3373	1011.29	-115.3
883	41°37.46'	122°52.0'	2723	1045.89	-116.2
884	41°36.60'	122°51.4'	2737	1040.76	-119.2
885	41°39.38'	122°50.3'	2882	1043.90	-111.5
886	41°38.19'	122°49.8'	2800	1044.70	-113.8
887	41°35.07'	122°50.3'	2752	1040.24	-116.5
888	41°34.85'	122°52.5'	2806	1033.02	-119.6
889	41°32.48'	122°51.4'	2732	1047.23	-106.8
890	41°30.71'	122°55.9'	3085	1007.64	-122.6
891	41°29.68'	122°51.7'	2751	1038.54	-110.2
892	41°26.37'	122°50.7'	2797	1027.84	-113.2
893	41°24.72'	122°50.1'	2853	1023.62	-111.6
894	41°23.64'	122°52.3'	2923	1019.31	-110.1
895	41°24.82'	122°51.6'	2857	1022.99	-112.2
896	41°23.75'	122°50.5'	2864	1021.42	-111.7
897	41°23.74'	122°49.4'	2869	1024.67	-108.1
898	41°22.47'	122°49.3'	2960	1017.41	-108.1
899	41°20.33'	122°49.0'	3087	1002.39	-112.3
900	41°10.51'	122° 8.6'	2751	1003.29	-116.3

STATION	LATITUDE	LONGITUDE	ELEVATION (feet)	OBSERVED GRAVITY (979,000.00 milligals)	SIMPLE- BOUGUER GRAVITY (milligals)
901	41° 9.37'	122°10.2'	2824	1000.71	-113.4
902	41° 8.20'	122°10.9'	3052	987.20	-111.5
903	41° 6.83'	122°11.2'	2106	1035.22	-118.2
904	41° 5.81'	122°11.7'	1932	1044.05	-118.3
905	41° 4.52'	122°12.1'	1770	1051.02	-119.1
906	41° 2.98'	122°11.9'	1607	1059.08	-118.5
907	41°32.30'	122° 2.7'	5114	847.74	-163.1
908	41°33.48'	122° 4.3'	5015	854.88	-163.7
909	41°31.26'	122° 5.8'	5867	802.03	-162.1
910	41°35.05'	122° 4.1'	4954	863.67	-160.9
911	41°22.05'	121°35.4'	4014	920.88	-140.7
912	41°22.93'	121°36.8'	4182	906.55	-146.3
913	41°23.37'	121°35.0'	4113	909.03	-148.6
914	41°25.12'	121°33.3'	4590	884.11	-147.5
915	41°26.52'	121°35.1'	4739	869.60	-155.2
916	41°27.52'	121°31.7'	4955	856.42	-156.9
917	41°14.08'	121°58.3'	4552	871.29	-146.2
918	41° 6.20'	121° 2.5'	6392	754.43	-155.8
919	41°18.07'	121° 1.7'	4754	875.87	-135.4
920	41°26.63'	120°57.7'	4894	859.10	-156.5
921	41°37.04'	121° 3.3'	4858	870.46	-162.9
922	41°36.05'	121° 4.2'	4795	876.07	-159.6
923	41°36.40'	121° 7.3'	4776	881.26	-156.0
924	41°33.00'	121° 3.7'	4761	882.60	-150.5
925	41°33.01'	120°25.6'	4798	887.35	-143.6
926	41°33.78'	120°23.3'	5009	880.07	-139.3
927	41°33.46'	120°21.9'	5243	866.08	-138.8
928	41°33.58'	120°19.0'	5533	833.81	-153.8
929	41°33.70'	120°16.2'	6371	776.39	-161.2
930	41°32.13'	120°13.5'	5311	840.28	-158.5
931	41°31.84'	120°11.7'	4854	867.82	-158.0
932	41°31.78'	120° 9.1'	4654	866.93	-176.80
933	41°31.78'	120° 7.8'	4470	859.52	-189.20
934	41°32.21'	120° 6.3'	4473	858.84	-190.4
935	41°32.60'	120° 3.8'	4515	865.08	-182.2
936	41°33.02'	120° 1.4'	4558	863.47	-181.8
937	41°33.46'	119°59.8'	4863	845.55	-182.1
938	41°31.77'	120° 8.6'	4514	864.21	-181.9
939	41°31.78'	120°10.1'	4630	870.88	-168.3
940	41°33.29'	120°20.2'	5399	844.27	-151.0
941	41°54.93'	120°19.7'	4812	896.99	-165.8
942	42°11.38'	120°21.0'	4787	931.89	-157.1
943	42°15.66'	120°43.2'	4965	912.38	-172.2
944	42°26.52'	121°16.3'	4359	982.79	-154.8
945	42°25.03'	121°19.8'	4324	992.57	-145.0

STATION	LATITUDE	LONGITUDE	ELEVATION (feet)	OBSERVED GRAVITY (979,000.00 milligals)	SIMPLE- BOUGUER GRAVITY (milligals)
946	42°23.51'	121°22.2'	4379	990.29	-141.8
947	42°20.10'	121°23.8'	4908	956.77	-138.8
948	42°18.43'	121°25.3'	4453	980.99	-129.5
949	42°17.02'	121°27.8'	4170	994.23	-140.1
950	42° 4.35'	121°53.2'	4169	977.67	-137.8
951	42° 6.09'	121°54.8'	4089	981.61	-141.3
952	42° 7.67'	121°55.8'	4094	982.91	-142.1
953	42° 8.60'	121°52.4'	4086	985.67	-141.2
954	42°13.15'	121°47.5'	4094	993.61	-139.6
955	42°21.28'	121°48.1'	4149	996.17	-146.6
956	42°27.22'	121°52.7'	4152	996.54	-154.4
957	41°29.19'	121°54.7'	4145	993.02	-161.2
958	42°23.95'	121°49.3'	4151	994.25	-152.2
959	42°17.66'	121°48.8'	4149	994.94	-141.7
960	42°15.98'	121°47.6'	4207	985.90	-144.7
961	42°12.27'	121°42.6'	4181	975.19	-151.5
962	42°10.79'	121°38.6'	4171	970.49	-154.5
963	42°15.56'	121°38.2'	4205	986.56	-143.5
964	42°17.75'	121°40.0'	4189	981.48	-152.9
965	42°19.61'	121°40.1'	4187	989.14	-148.1
966	42°21.12'	121°40.7'	4209	997.04	-141.9
967	42°25.34'	121°41.6'	7016	815.05	-161.4
968	42°28.36'	121°30.7'	4296	994.98	-149.0
969	42°26.51'	121°26.2'	4337	997.34	-141.6
970	42°25.64'	121°22.3'	4316	992.27	-146.6
971	42°26.45'	122° 5.6'	4150	1007.84	-142.2
972	42°24.23'	122° 2.9'	4148	1001.57	-145.4
973	42°23.21'	122° 1.0'	4185	997.25	-146.1
974	42°20.57'	122° 0.0'	4384	986.08	-141.6
975	42°19.31'	121°58.7'	4563	970.62	-143.6
976	42°17.78'	121°57.2'	4801	950.60	-147.0
977	42°16.65'	121°54.2'	4230	988.51	-141.7
978	42°15.11'	121°51.1'	4161	990.26	-141.8
979	42° 7.76'	121°57.7'	4264	971.62	-143.2
980	42° 8.44'	121°59.9'	4083	986.56	-140.3
981	42° 8.39'	122° 2.2'	3788	1002.88	-141.5
982	42° 6.95'	122° 4.6'	4372	960.16	-147.1
983	42° 6.92'	122° 8.8'	4589	944.65	-149.5
984	42° 7.26'	122°11.3'	4332	963.45	-146.6
985	42° 7.30'	122°12.7'	4095	980.53	-143.8
986	42° 5.20'	122°14.4'	4053	983.49	-140.5
987	42°10.77'	122°14.4'	3970	999.79	-137.3
988	42°11.68'	122° 6.3'	4455	968.71	-140.6
989	41°51.49'	122°34.3'	2080	1131.91	- 89.7
990	41°54.16'	122°33.8'	2264	1117.98	- 96.6

STATION	LATITUDE	LONGITUDE	ELEVATION (feet)	OBSERVED GRAVITY (979,000.00 milligals)	SIMPLE- BOUGUER GRAVITY (milligals)
991	41°56.50'	122°34.8'	2409	1107.57	-101.8
992	41°58.37'	122°36.1'	2936	1074.27	-106.3
993	42° 0.24'	122°38.5'	2863	1074.96	-112.7
994	42° 1.86'	122°38.2'	3131	1056.74	-117.3
995	42° 4.41'	122°36.3'	4129	1004.72	-113.3
996	42° 6.13'	122°36.7'	3640	1036.52	-113.4
997	42°11.12'	122°40.7'	2001	1147.44	-108.3
998	42° 8.07'	122°32.2'	3027	1072.44	-117.1
999	42° 7.42'	122°30.6'	3936	1008.16	-125.9
1000	41°24.62'	122°11.6'	14161	126.00	-330.7
1001	42° 7.43'	122°27.9'	4525	969.83	-128.9
1002	42° 6.56'	122°24.0'	3685	1015.83	-132.0
1003	42° 7.06'	122°22.1'	3368	1038.12	-129.5
1004	42° 7.78'	122°18.6'	4030	995.27	-133.7
1005	42° 7.66'	122°16.2'	4362	968.35	-140.5
1006	42° 5.63'	122°20.6'	3667	1017.85	-129.7
1007	42° 3.15'	122°20.3'	3545	1023.00	-128.1
1008	42° 1.34'	122°20.1'	3326	1037.77	-123.8
1009	42° 0.06'	122°21.2'	3271	1040.22	-122.7
1010	42°22.17'	122°52.5'	1318	1233.46	- 80.4
1011	42°28.76'	122°47.3'	1325	1228.45	- 94.3
1012	42°28.11'	122°43.0'	1426	1214.37	-101.4
1013	42°27.08'	122°40.6'	1503	1208.53	-101.2
1014	42°24.94'	122°37.2'	1703	1180.86	-113.8
1015	42°24.42'	122°33.8'	2118	1146.65	-122.4
1016	42°23.55'	122°26.0'	3547	1052.14	-130.0
1017	42°21.37'	122°21.6'	4696	967.07	-143.0
1018	42°23.74'	122°17.2'	5024	952.03	-141.7
1019	42°20.45'	122°18.0'	4974	953.63	-138.5
1020	42°17.53'	122°18.5'	4998	948.18	-137.3
1021	42°17.16'	122°22.2'	4638	973.60	-132.9
1022	42°15.95'	122°26.8'	4535	980.56	-130.3
1023	42°14.22'	122°26.6'	5020	949.96	-126.3
1024	42°14.64'	122°30.7'	5091	953.67	-121.9
1025	42°14.33'	122°34.3'	3236	1073.37	-111.0
1026	42°49.92'	122°39.2'	2067	1118.18	-101.9
1027	42°51.17'	122°50.2'	1735	1120.42	-121.4
1028	42°53.85'	122°52.1'	4129	977.29	-124.9
1029	42°54.47'	122°56.6'	6775	809.69	-134.7
1030	42°58.32'	122°56.1'	6143	864.34	-123.7
1031	42°59.40'	122°54.6'	5839	889.20	-118.7
1032	42° 1.77'	122°52.6'	7061	828.87	-109.2
1033	42° 3.01'	122°50.7'	6496	873.20	-100.7
1034	42° 3.03'	122°48.2'	5879	910.51	-100.4
1035	42° 1.66'	122°46.7'	4660	984.20	- 97.8

STATION	LATITUDE	LONGITUDE	ELEVATION (feet)	OBSERVED GRAVITY (979,000.00 milligals)	SIMPLE- BOUGUER GRAVITY (milligals)
1036	42° 2.21'	122° 44.3'	4338	994.00	-108.1
1037	42° 2.58'	122° 42.7'	4609	975.52	-110.9
1038	42° 3.44'	122° 41.7'	4419	985.35	-113.8
1039	42° 3.96'	122° 38.0'	3923	1013.84	-115.8
1040	40° 49.22'	122° 0.7'	1657	1040.93	-113.5
1041	40° 50.37'	122° 1.1'	1141	1068.84	-117.9
1042	40° 51.34'	122° 2.3'	1332	1060.12	-116.6
1043	40° 52.89'	122° 2.7'	1502	1047.97	-120.9
1044	40° 54.72'	122° 4.3'	2433	996.56	-119.2
1045	40° 55.26'	122° 5.8'	1442	1053.71	-122.3
1046	40° 54.96'	122° 6.6'	1394	1056.44	-122.0
1047	40° 53.18'	122° 6.6'	1306	1058.82	-122.3
1048	40° 52.42'	122° 8.0'	1568	1047.52	-116.7
1049	40° 54.07'	122° 9.8'	2299	1009.40	-113.4
1050	40° 54.62'	122° 12.5'	1157	1077.93	-114.2
1051	40° 56.18'	122° 15.1'	1259	1077.29	-111.1
1052	40° 57.73'	122° 16.6'	3157	965.18	-111.6
1053	40° 57.84'	122° 18.3'	2397	1012.44	-110.1
1054	40° 56.98'	122° 20.5'	1411	1072.84	-107.6
1055	40° 56.80'	122° 22.2'	2189	1030.07	-103.4
1056	40° 56.94'	122° 23.8'	1650	1062.30	-103.7
1057	40° 56.73'	122° 25.7'	1137	1093.13	-103.4
1058	41° 15.56'	122° 16.5'	3154	987.82	-115.7
1059	41° 14.04'	122° 16.6'	2430	1037.87	-106.8
1060	40° 54.65'	122° 23.2'	1218	1090.28	- 98.3
1061	40° 53.00'	122° 23.0'	1102	1097.47	- 95.6
1062	40° 51.06'	122° 20.6'	1120	1094.81	- 94.3
1063	40° 49.11'	122° 19.4'	1287	1085.46	- 93.7
1064	40° 46.07'	122° 18.9'	1169	1089.23	- 89.5
1065	40° 38.12'	122° 21.8'	633	1130.31	- 68.7
1066	40° 40.01'	122° 21.3'	747	1124.94	- 70.1
1067	40° 43.05'	122° 19.8'	886	1111.86	- 79.3
1068	41° 0.25'	122° 24.5'	1356	1071.13	-117.5
1069	41° 4.11'	122° 21.5'	1675	1049.56	-125.6
1070	41° 7.65'	122° 19.3'	1879	1057.62	-110.6
1071	41° 9.61'	122° 17.7'	2077	1049.62	-109.7
1072	41° 11.00'	122° 17.1'	2169	1048.53	-107.3
1073	41° 26.78'	122° 25.5'	3056	1002.17	-124.1
1074	41° 28.86'	122° 27.3'	2930	1018.22	-118.6
1075	41° 28.25'	122° 26.8'	2945	1018.69	-116.3
1076	41° 27.53'	122° 26.2'	2943	1013.81	-120.2
1077	41° 26.62'	122° 22.3'	3554	967.93	-126.1
1078	41° 23.74'	122° 21.6'	3895	943.34	-127.9
1079	41° 19.53'	122° 19.3'	3597	961.07	-121.8
1080	40° 51.80'	122° 15.2'	1053	987.75	-102.3

STATION	LATITUDE	LONGITUDE	ELEVATION (feet)	OBSERVED GRAVITY (979,000.00 milligals)	SIMPLE- BOUGUER GRAVITY (milligals)
1081	40°45.33'	122°21.3'	1050	1001.17	- 79.5
1082	40°46.80'	122°22.5'	1051	998.56	- 84.2
1083	40°48.32'	122°23.2'	1051	997.11	- 87.9
1084	40°50.47'	122°24.7'	1049	998.52	- 89.8
1085	40°50.86'	122°22.6'	1050	996.10	- 92.8
1086	40°49.10'	122°21.3'	1051	996.03	- 90.2
1087	40°45.42'	122°23.3'	1050	1002.07	- 78.7
1088	40°46.61'	122°25.3'	1051	997.14	- 85.4
1089	40°47.86'	122°25.5'	1050	996.72	- 87.7
1090	40°44.96'	122°25.1'	1049	1000.66	- 79.5
1091	40°45.72'	122°15.3'	1049	987.67	- 93.6
1092	40°46.50'	122°13.2'	1050	986.22	- 96.2
1093	40°47.54'	122°11.2'	1051	981.56	-102.3
1094	40°48.98'	122° 9.1'	1050	977.82	-108.3
1095	40°	122°13.3'	1049	988.33	
1096	40°48.16'	122°17.8'	1050	993.36	- 91.5
1097	40°48.89'	122°16.2'	1052	987.28	- 98.5
1098	42°15.35'	120°21.5'	4917	922.81	-164.24
1099	42°15.03'	120°19.0'	5290	900.37	-163.81
1100	42°14.00'	120°17.3'	5842	860.75	-168.79
1101	42°13.24'	120° 8.9'	5516	875.64	-172.33
1102	42°10.69'	119°53.8'	4542	921.06	-181.55
1103	42°10.46'	119°52.1'	4494	920.51	-184.63
1104	42°10.51'	119°50.2'	4487	925.14	-180.50
1105	42°10.45'	119°48.2'	4492	926.96	-178.29
1106	42° 9.76'	119°47.7'	4496	925.91	-178.27
1107	42° 8.14'	119°46.9'	4534	920.47	-178.79
1108	42° 7.32'	119°46.5'	4563	917.68	-178.62
1109	42° 6.64'	119°45.6'	4621	914.58	-177.22
1110	42° 6.30'	119°44.3'	4814	907.44	-172.27
1111	42° 6.02'	119°42.7'	5455	864.57	-176.26
1112	42° 5.55'	119°41.4'	5698	849.46	-176.10
1113	42° 5.73'	119°39.6'	6122	817.15	-182.87
1114	42° 1.13'	119°28.7'	6240	797.19	-194.23
1115	42° 0.17'	119°21.4'	6114	805.65	-186.88
1116	42° 4.12'	119°31.8'	5150	862.33	-193.97
1117	42° 3.44'	119°29.3'	5100	865.90	-192.37

APPENDIX III

TERRAIN CORRECTIONS

CASCADE GRAVITY PROJECT

TERRAIN CORRECTIONS

CASCADE GRAVITY PROJECT

Station	Terrain Correction	Station	Terrain Correction	Station	Terrain Correction
15	2.9	60	2.1	386	3.8
20	2.3	64	2.1	387	3.8
21	2.2	65	0.6	417	0.3
22	2.1	67	0.8	418	0.6
23	1.9	68	2.5	421	11.1
24	1.7	69	2.3	425	6.6
26	1.8	70	1.9	426	9.4
29	4.6	71	1.2	427	5.1
30	2.2	72	0.9	428	3.3
31	3.3	74	0.7	450	0.0
32	4.4	77	0.6	507	1.2
33	4.1	83	1.8	571	2.1
40	2.5	94	0.2	576	4.3
41	3.5	100	0.5	578	2.8
42	2.9	138	0.1	579	1.4
46	9.2	229	1.7	580	2.3
48	1.4	235	2.2	581	2.5
50	0.8	236	2.9	594	2.9
52	1.1	243	0.8	595	1.2
53	0.7	245	1.1	598	2.8

Station	Terrain Correction	Station	Terrain Correction	Station	Terrain Correction
57	8.6	247	0.6	599	3.9
58	1.4	251	0.3	603	1.3
59	1.3	383	6.3	604	0.8
605	1.2	692	2.2	766	8.5
613	0.7	693	2.9	804	6.8
614	0.5	695	6.8	806	10.7
620	0.6	696	9.9	815	17.0
622	1.5	697	17.2	816	13.3
623	2.2	698	9.4	817	13.5
635	1.0	704	3.5	818	12.3
636	2.1	712	3.7	819	12.3
637	4.1	713	6.2	820	31.3
641	2.9	714	4.9	822	5.9
643	19.4	715	3.1	823	6.1
645	1.9	716	2.6	831	12.4
646	1.6	717	6.7	834	9.8
647	1.0	734	2.9	836	16.3
650	2.8	735	1.6	870	25.7
651	6.0	746	2.7	918	11.1
653	1.3	747	4.0	1000	130.5
654	1.3	748	5.4		
655	2.4	752	5.5		
658	4.0	753	1.7		
659	1.4	754	3.7		

Station	Terrain Correction	Station	Terrain Correction	Station	Terrain Correction
663	0.6	758	3.6		
686	13.0	759	6.5		
		761	1.7		

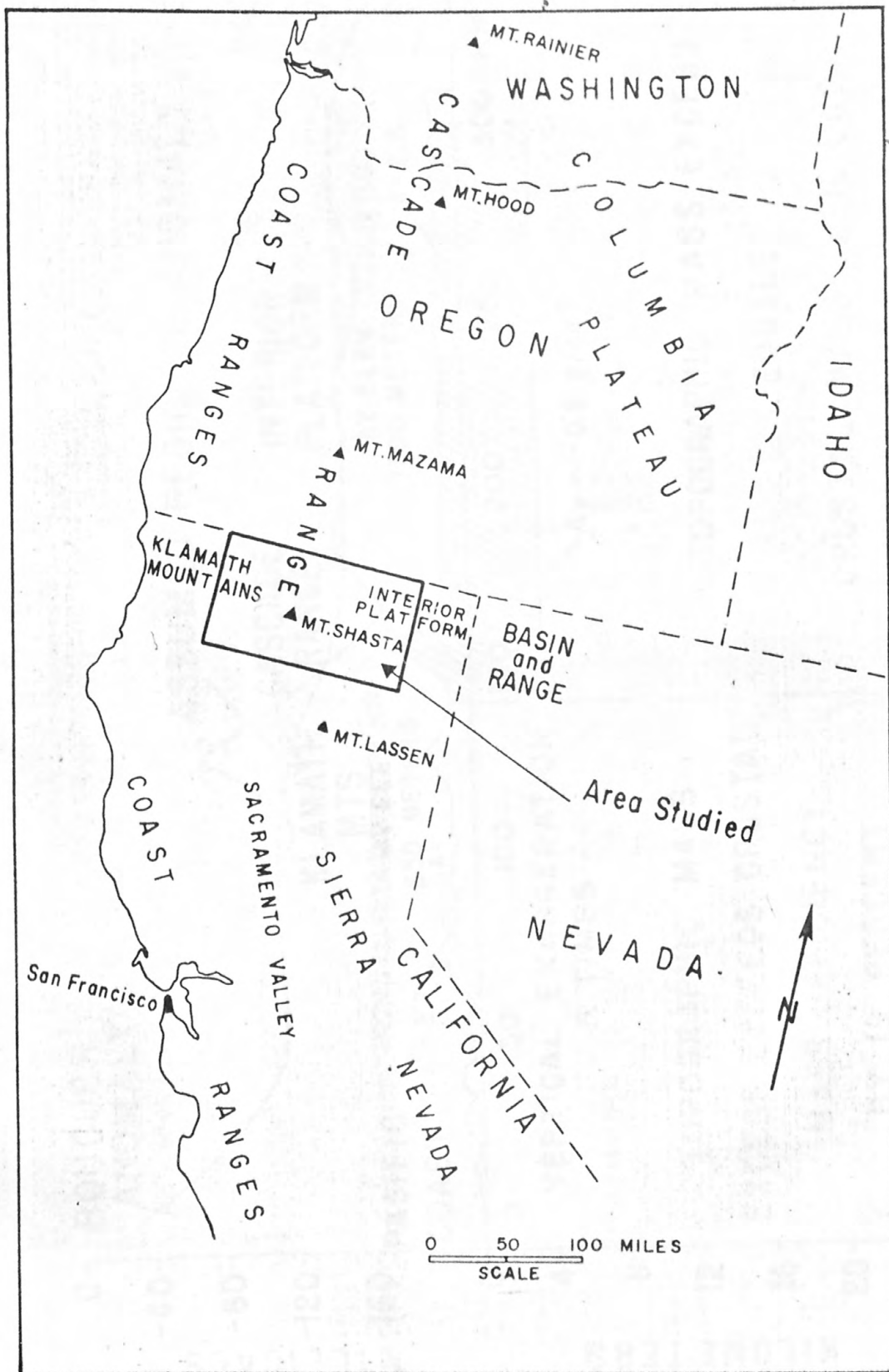


Figure 1.--Location map

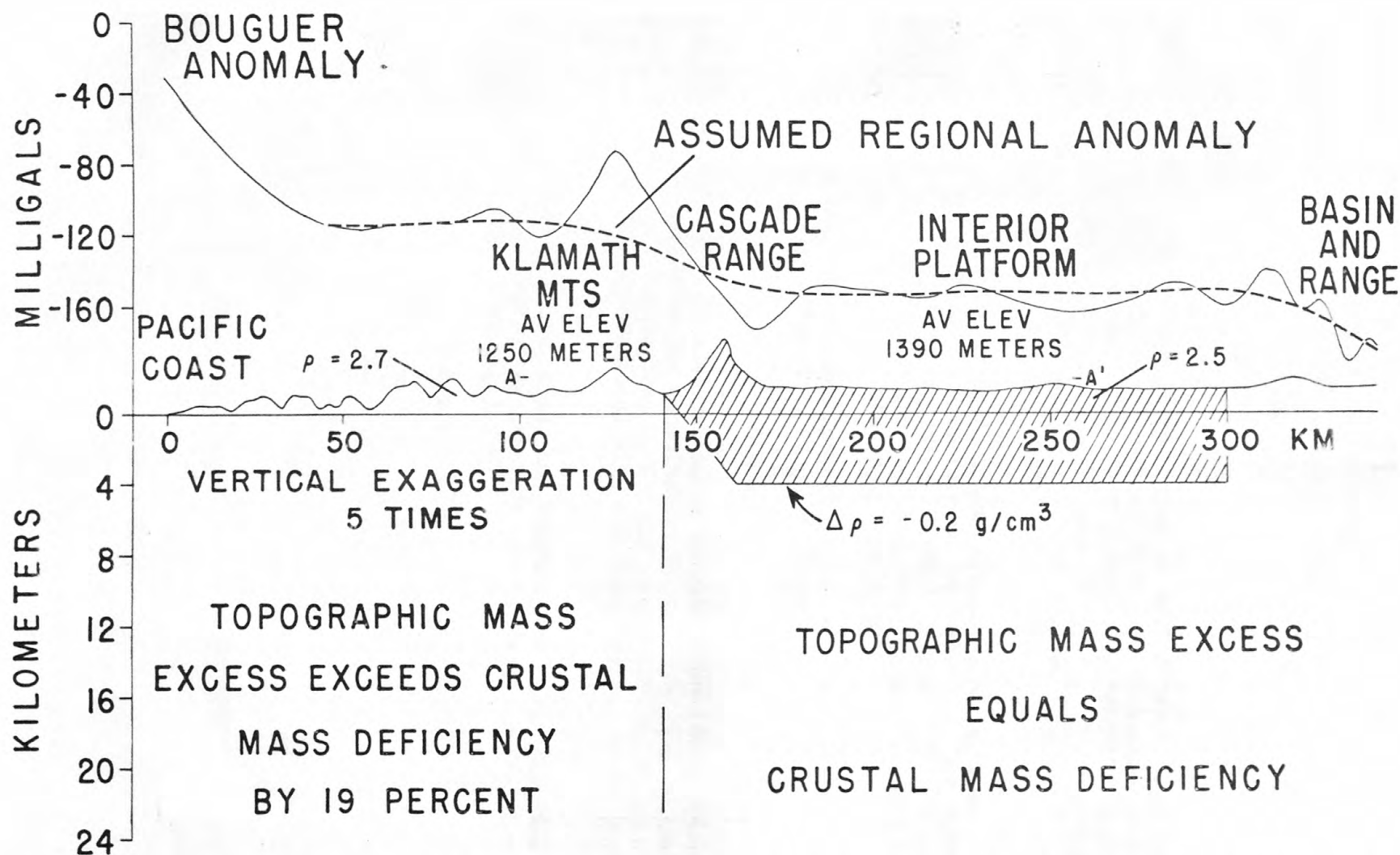


FIGURE 2.- EAST-TRENDING CRUSTAL SECTION AND BOUGUER ANOMALY ACROSS NORTHERN CALIFORNIA

Weld - Int. 2905

GEOLOGIC DIVISION
U. S. GEOLOGICAL SURVEY
Washington, D. C.
20242

For release SEPTEMBER 20, 1965

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1. Approximate location of fault traces and historic surface ruptures within the Hayward fault zone between San Pablo and Warm Springs, California, by Dorothy H. Radbruch. Map with text, scale, 1:62,500 (one sheet). Copy from which reproduction can be made at private expense is available in the San Francisco office shown above.

2. Gravity survey in southern Cascade Range, California, by T. R. LaFehr. 21 p., plus 48 p. appendix, 1 pl., 2 figs.

* * * * *

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3. Investigation of brick, tile, and "mortar" and their possible raw materials from archeological excavations, Fort Raleigh, North Carolina, by Sam H. Patterson. 12 p., 1 fig.

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