



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

Principal Facts for 408 Gravity Stations in the Vicinity of the Talkeetna Mountains, South-Central Alaska

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INTRODUCTION

Gravity data were collected between 1999 and 2002 along transects in the Talkeetna Mountains of south-central Alaska as part of a geological and geophysical study of the framework geology of the region. The study area lies between 61° 30' and 63° 45' N. latitude and 145° and 151° W. longitude. This data set includes 408 gravity stations. These data, combined with the pre-existing 3,286 stations, brings the total data in this area to 3,694 gravity stations. Principal facts for the 408 new gravity stations and the 15 gravity base stations used for control are listed in this report. Principal facts of previously collected gravity data in Alaska are available at:

<http://wrgis.wr.usgs.gov/docs/gump/morin/alaska/alaska.html>

During the summer of 1999, a gravity survey was conducted in the western Talkeetna Mountains. Measurements at 55 gravity stations were made. One gravity base station was used for control for this survey. This base station, STEP, is located at the Stephan Lake Lodge on Stephan Lake. The observed gravity of this station was calculated based on an indirect tie to base station ANCL in Anchorage. The temporary base used to tie between STEP and ANCL was REGL in Anchorage.

During the summer of 2000, a gravity survey was conducted in the western Talkeetna Mountains. Measurements at 56 gravity stations were made. One gravity base station was used for control for this survey. This base station, GRHS, is located at the Gracious House Lodge on the Denali Highway. The observed gravity of this station was calculated based on multiple ties to base stations D87, and D57 along the Denali Highway.

During the summer of 2001, a gravity survey was conducted in the western Talkeetna Mountains. Measurements at 90 gravity stations were made. One gravity base station was used for control for this survey. This base station, HLML, is located at the High Lake Lodge. The observed gravity of this station was calculated based on multiple ties to base stations ANCU in Anchorage, PALH in Palmer, WASA in Wasilla, and TLKM in Talkeetna.

Also during the summer of 2001, a gravity survey was conducted in the vicinity of Tangle Lakes. Measurements at 86 gravity stations were made. The Tangle Lakes area is located about 25 km west of Paxson and north of the Denali Highway. One gravity base station was used for control for this survey. This base station, TLIN, is located at the Tangle Lakes Inn. The observed gravity of this station was calculated based on multiple ties to base stations ANCU in Anchorage, PALH in Palmer, BD27 in Gulkana, B-07 on the Richardson Highway, and base stations D42, and D57 along the Denali Highway.

During the summer of 2002, measurements at an additional 107 gravity stations were made in the vicinity of Tangle Lakes. Base station TLIN at the Tangle Lakes Inn was again used for control. Additional ties to base stations ANCU and B-07 were made.

GRAVITY REDUCTION

Conversion to milligals are made using factory calibration constants and a calibration factor which varies with each gravity meter and has been determined by multiple gravity readings over the Mt. Hamilton calibration loop east of San Jose, CA (Barnes and others, 1969). Observed gravity values are based on an assumed linear drift between successive base readings. Theoretical gravity at sea level is based on the Geodetic Reference System 1967 (GRS 67) (International Association of Geodesy, 1971, p. 58) for the shape of the spheroid. The datum for the observed gravity is the International Gravity Standardization Net 1971 (IGSN 71) (Morelli, 1974, p. 18). Observed gravities are calculated by adding meter drift and earth-tide corrections to the milligal equivalent meter readings. Free-air anomalies are calculated by subtracting the theoretical gravity from the observed gravity and adding the free-air correction as defined by Swick (1942, p. 65). Simple Bouguer anomalies are calculated by adding the free-air anomaly to the Bouguer correction, which accounts for the attraction of rocks between the station and sea level using a rock density of 2.67 g/cm^3 . Complete Bouguer anomalies are calculated by adding the terrain correction to the simple Bouguer anomaly. Isostatic anomalies are calculated by adding the isostatic correction to the complete Bouguer anomaly.

Horizontal control for data collected in 1999 was made by navigating from U.S. Geological Survey (USGS) 1:63,360 scale topographic maps. Horizontal control for data collected in 2000, 2001, and 2002 is provided by small portable Global Positioning Systems, referred to as GPS. USGS topographic maps at a scale of 1:63,360 are used for vertical control. Total terrain corrections consist of inner and outer terrain corrections. The inner terrain correction typically includes a field terrain correction and a hand terrain correction. Field terrain corrections are made in the field to calculate the effect of the local terrain from the station to a radial distance of 53 m (Hammer zones A through C) (Hammer, 1939). Field terrain corrections were not measured for data collected in 1999. Hand terrain corrections for radial distances between 53 m and 0.39 km from the station are made by estimating average elevations from topographic maps and using tables by Hammer (Hammer, 1939) for Hammer zones D through E (Hammer, 1939). No hand terrain corrections were made for the data in this report. Outer terrain corrections, from a radial distance of 0.39 km (Hammer zone F) (Hammer, 1939) from the station to a radial distance of 166.7 km, were computed with a FORTRAN program (Plouff, 1966, 1977; Godson and Plouff, 1988) and a digital elevation model. These data are processed with an isostatic reduction program (Jachens and Roberts, 1981) to compensate for the effects of crustal roots that buoyantly support topography. The isostatic reduction assumes an Airy-Heiskanen model with the following parameters from the station to 166.7 km: density of topography above sea level, 2.67 g/cm^3 ; crustal thickness at sea level, 25 km; density contrast across the base of the model crust, 0.4 g/cm^3 . From 166.7 km to a point on the opposite side of the Earth, isostatic and terrain corrections were taken off maps by Karki and others (1961). These corrections were added to the output of the isostatic program of Jachens and Roberts (1981) to produce the isostatic anomalies.

ISOSTATIC GRAVITY DATA

Figure 1 shows the location of the gravity data collected from 1999 through 2002 as well as earlier data. The data points are plotted on a topographic base generated from a digital elevation model (DEM). A colored isostatic gravity grid of the combined data sets is shown in figure 2. Table 1 lists the principal facts of the gravity stations collected in 1999, 2000, 2001, and 2002. More detailed information about the individual data sets are found in table 2. Table 3 is an explanation of the data.

Table 2 gives detailed information on individual data sets. Data set codes from table 1 are unique for each day of data. The following two fields list the project name under which the data were collected and a traverse name, that best describes the geographic area in which the data were collected. The fourth field provides the date that the data were collected. Following the date field is the field listing the meter name and type. A type 1 meter is one that only has a single meter factor, supplied from the manufacturer, that is applied to each reading. A type 0 meter has a table of calibration constants, which vary with the range of the dial reading, supplied from the manufacturer. A type 2 meter is one that has a table of calibration constants supplied from the manufacturer plus an additional factor determined by multiple gravity readings over the Mt. Hamilton calibration loop east of San Jose, CA (Barnes and others, 1969). The next field is the meter factor followed by the hours west of Greenwich Mean Time where the data were collected. Then the project chief and the party members are listed in the far right column.

Table 3 provides an explanation to the columns of data and codes in table 1. Inner terrain corrections generally include field terrain corrections, as explained earlier, and hand terrain corrections, which are made by calculating the effect of the terrain beyond the field correction to a radial distance of 0.39 km. None of the data in this report, however, include hand terrain corrections.

ACKNOWLEDGMENTS

We would like to thank Dolores Kulik, Steve Nelson, and Peter Bittenbender for their assistance in collecting data during the 1999, 2000, and 2001 field seasons, respectively. We are grateful to the Bureau of Land Management for their financial and logistical support in the gravity data collection in the Tangle Lakes area (01DM and 02DM stations). We also thank Elizabeth Sanger and Frank Chuang for reviewing this paper.

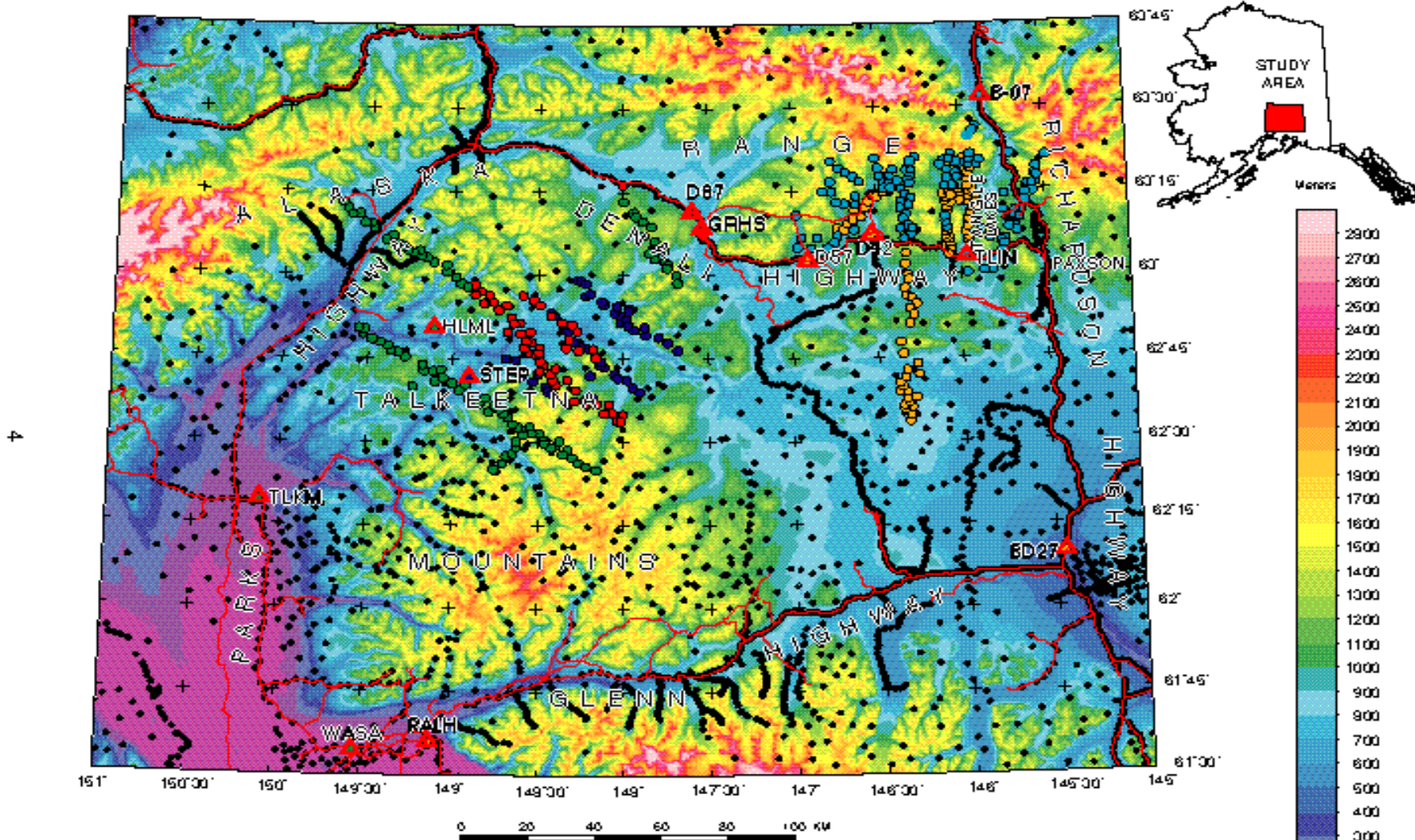


Figure 1. Topographic index map of study area showing gravity station locations. Black circles, previous gravity stations; dark blue circles, 1999 data; red circles, 2000 data; green and orange circles, 2001 data; light blue circles, 2002 data. Red triangles, base stations in study area. Red lines show road locations. Major highways are labeled.

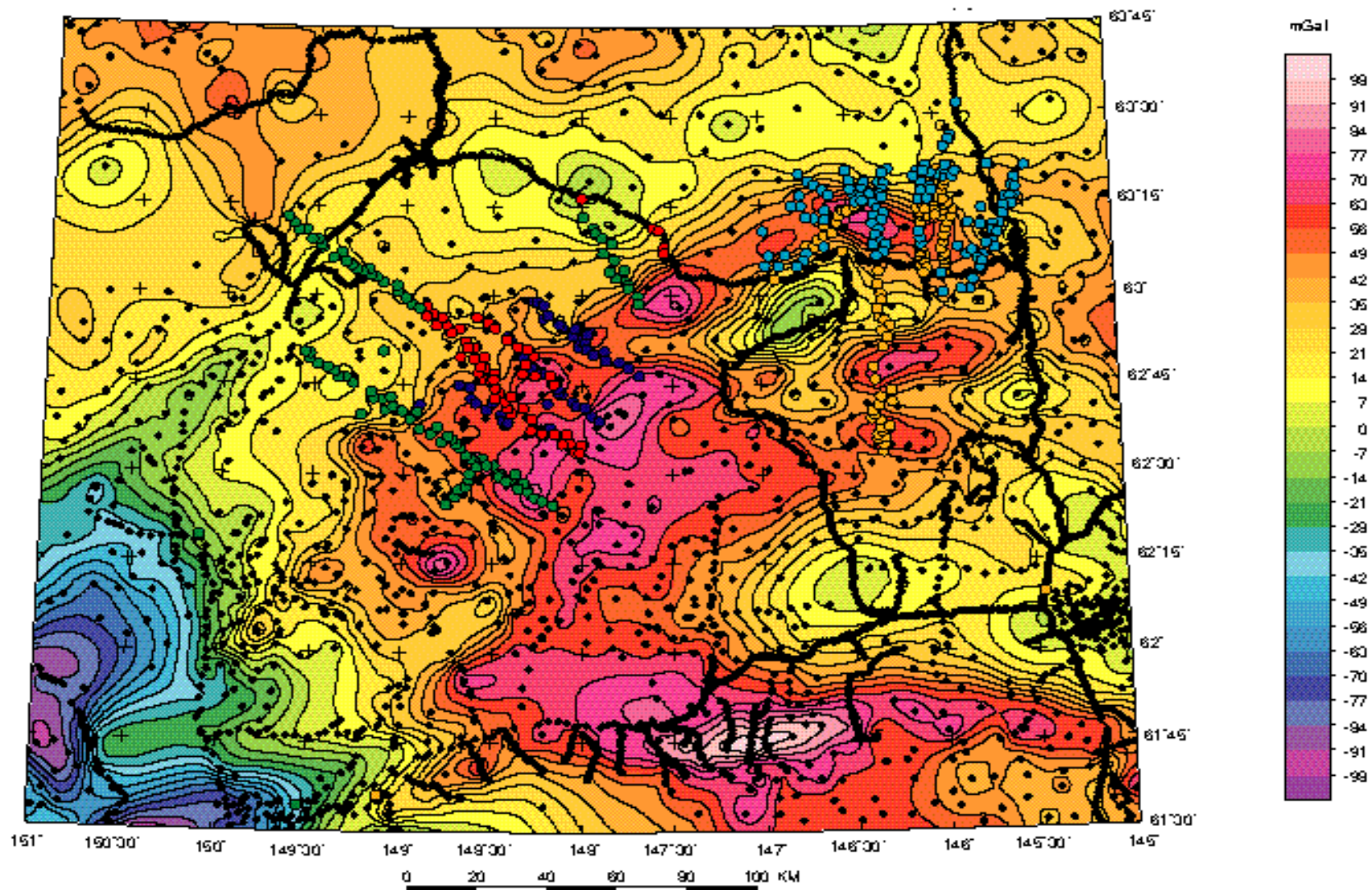


Figure 2. Isostatic gravity map of study area, contour interval 7 mGal. Data gridded at 1 x 1 km interval. Black circles, previous gravity stations; dark blue circles, 1999 data; red circles, 2000 data; green and orange circles, 2001 data; light blue circles, 2002 data.

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Table 1. Principal facts of gravity stations.

[DEG, degrees; MIN minutes; ELEV, elevation; FT, feet; MGAL, milligals; ACC, accuracy; FAA, free-air anomaly; SBA, simple Bouguer anomaly; CBA, complete Bouguer anomaly]

GRAVITY STATION NAME	LATITUDE	LONGITUDE	ELEV	OBSERVED	ACC	FAA	SBA	TERRAIN	CORRECTION	CBA	ISOSTATIC	DATA	SECONDARY	ISO-
	(DEG MIN)	(DEG MIN)	(FT)	(MGAL)	CODES	(MGAL)	(MGAL)	INNER	OUTER	(MGAL)	ANOMALY	SET	ELEVATION	AND
									(MGAL)		(MGAL)	CODES	ANOMALY	STATIC
ANCL	61	9	33	7										
ANCU	61	9	33	7										
B-07	31	11	1	2										
BD27	31	11	1	2										
DD2	31	11	1	2										
DD7	31	11	1	2										
DD7	31	11	1	2										
GRHS	1	1	4	1										
HMLM	1	1	4	1										
PALH	1	1	4	1										
REGL	1	1	4	1										
STEP	1	1	4	1										
TLIN	1	1	4	1										
TLKM	1	1	4	1										
WASA	1	1	4	1										
99TM00	1	1	4	1										
99TM0001	1	1	4	1										
99TM0002	1	1	4	1										
99TM0003	1	1	4	1										
99TM0004	1	1	4	1										
99TM0005	1	1	4	1										
99TM0006	1	1	4	1										
99TM0007	1	1	4	1										
99TM0008	1	1	4	1										
99TM010	1	1	4	1										
99TM011	1	1	4	1										
99TM012	1	1	4	1										
99TM013	1	1	4	1										
99TM014	1	1	4	1										
99TM015	1	1	4	1										
99TM016	1	1	4	1										
99TM017	1	1	4	1										
99TM018	1	1	4	1										
99TM019	1	1	4	1										
99TM020	1	1	4	1										
99TM021	1	1	4	1										
99TM022	1	1	4	1										
99TM023	1	1	4	1										
99TM024	1	1	4	1										
99TM025	1	1	4	1										
99TM026	1	1	4	1										
99TM027	1	1	4	1										
99TM028	1	1	4	1										
99TM029	1	1	4	1										
99TM030	1	1	4	1										
99TM031	1	1	4	1										
99TM032	1	1	4	1										
99TM033	1	1	4	1										
99TM034	1	1	4	1										
99TM035	1	1	4	1										
99TM036	1	1	4	1										
99TM037	1	1	4	1										
99TM038	1	1	4	1										
99TM039	1	1	4	1										
99TM040	1	1	4	1										

Table 1. Principal facts of gravity stations. -- Continued

GRAVITY STATION NAME	LATITUDE (DEG MIN)	LONGITUDE (DEG MIN)	ELEV (FT)	OBSERVED GRAVITY (MGAL)	ACC CODES	FAA (MGAL)	SBA (MGAL)	TERRAIN INNER	CORRECTION OUTER	CBA (MGAL)	ISOSTATIC ANOMALY (MGAL)	DATA SET CODES	SECONDARY ELEVATION ANOMALY	ISO- AND STATIC CODE
99TM039	6	52.7	148	25		ADN7								ISOW
99TM040	6	52.7	148	25		ADN7								ISOW
99TM041	6	52.7	148	25		ADN7								ISOW
99TM042	6	52.7	148	25		ADN7								ISOW
99TM043	6	52.7	148	25		ADN7								ISOW
99TM044	6	52.7	148	25		ADN7								ISOW
99TM045	6	52.7	148	25		ADN7								ISOW
99TM046	6	52.7	148	25		ADN7								ISOW
99TM047	6	52.7	148	25		ADN7								ISOW
99TM048	6	52.7	148	25		ADN7								ISOW
99TM049	6	52.7	148	25		ADN7								ISOW
99TM050	6	52.7	148	25		ADN7								ISOW
99TM051	6	52.7	148	25		ADN7								ISOW
99TM052	6	52.7	148	25		ADN7								ISOW
99TM053	6	52.7	148	25		ADN7								ISOW
99TM054	6	52.7	148	25		ADN7								ISOW
99TM055	6	52.7	148	25		ADN7								ISOW
99TM056	6	52.7	148	25		ADN7								ISOW
99TM057	6	52.7	148	25		ADN7								ISOW
99TM058	6	52.7	148	25		ADN7								ISOW
99TM059	6	52.7	148	25		ADN7								ISOW
99TM060	6	52.7	148	25		ADN7								ISOW
99TM061	6	52.7	148	25		ADN7								ISOW
99TM062	6	52.7	148	25		ADN7								ISOW
99TM063	6	52.7	148	25		ADN7								ISOW
99TM064	6	52.7	148	25		ADN7								ISOW
99TM065	6	52.7	148	25		ADN7								ISOW
99TM066	6	52.7	148	25		ADN7								ISOW
99TM067	6	52.7	148	25		ADN7								ISOW
99TM068	6	52.7	148	25		ADN7								ISOW
99TM069	6	52.7	148	25		ADN7								ISOW
99TM070	6	52.7	148	25		ADN7								ISOW
99TM071	6	52.7	148	25		ADN7								ISOW
99TM072	6	52.7	148	25		ADN7								ISOW
99TM073	6	52.7	148	25		ADN7								ISOW
99TM074	6	52.7	148	25		ADN7								ISOW
99TM075	6	52.7	148	25		ADN7								ISOW
99TM076	6	52.7	148	25		ADN7								ISOW
99TM077	6	52.7	148	25		ADN7								ISOW
99TM078	6	52.7	148	25		ADN7								ISOW
99TM079	6	52.7	148	25		ADN7								ISOW
99TM080	6	52.7	148	25		ADN7								ISOW
99TM081	6	52.7	148	25		ADN7								ISOW
99TM082	6	52.7	148	25		ADN7								ISOW
99TM083	6	52.7	148	25		ADN7								ISOW
99TM084	6	52.7	148	25		ADN7								ISOW
99TM085	6	52.7	148	25		ADN7								ISOW
99TM086	6	52.7	148	25		ADN7								ISOW
99TM087	6	52.7	148	25		ADN7								ISOW
99TM088	6	52.7	148	25		ADN7								ISOW
99TM089	6	52.7	148	25		ADN7								ISOW
99TM090	6	52.7	148	25		ADN7								ISOW
99TM091	6	52.7	148	25		ADN7								ISOW
99TM092	6	52.7	148	25		ADN7								ISOW
99TM093	6	52.7	148	25		ADN7								ISOW
99TM094	6	52.7	148	25		ADN7								ISOW
99TM095	6	52.7	148	25		ADN7								ISOW
99TM096	6	52.7	148	25		ADN7								ISOW
99TM097	6	52.7	148	25		ADN7								ISOW
99TM098	6	52.7	148	25		ADN7								ISOW
99TM099	6	52.7	148	25		ADN7								ISOW
99TM100	6	52.7	148	25		ADN7								ISOW

Table 1. Principal facts of gravity stations. -- Continued

GRAVITY STATION NAME	LATITUDE (DEG MIN)	LONGITUDE (DEG MIN)	ELEV (FT)	OBSERVED GRAVITY (MGAL)	ACC CODES	FAA (MGAL)	SBA (MGAL)	TERRAIN INNER	CORRECTION OUTER	CBA (MGAL)	ISOSTATIC ANOMALY (MGAL)	DATA SET CODES	SECONDARY ELEVATION ANOMALY	ISO- AND STATIC CODE
00TK04432														
00TK04433														
00TK04434														
00TK04435														
00TK04436														
00TK04437														
00TK04438														
00TK04439														
00TK04440														
00TK04441														
00TK04442														
00TK04443														
00TK04444														
00TK04445														
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00TK04536														
00TK04537														
00TK04538														
00TK04539														
00TK04540														
00TK04541														
00TK04542														

Table 1. Principal facts of gravity stations. -- Continued

GRAVITY STATION NAME	LATITUDE (DEG MIN)	LONGITUDE (DEG MIN)	ELEV (FT)	OBSERVED GRAVITY (MGAL)	ACC CODES	FAA (MGAL)	SBA (MGAL)	TERRAIN INNER	CORRECTION OUTER	CBA (MGAL)	ISOSTATIC ANOMALY (MGAL)	DATA SET CODES	SECONDARY ELEVATION ANOMALY	ISO-AND STATIC CODE
01DM0443														
01DM0444														
01DM0445														
01DM0446														
01DM0447														
01DM0448														
01DM0449														
01DM0450														
01DM0451														
01DM0452														
01DM0453														
01DM0454														
01DM0455														
01DM0456														
01DM0457														
01DM0458														
01DM0459														
01DM0460														
01DM0461														
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01DM0471														
01DM0472														
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01DM0480														
01DM0481														
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01DM0488														
01DM0489														
01DM0490														
01TK0001														
01TK0002														
01TK0003														
01TK0004														
01TK0005														
01TK0006														
01TK0007														
01TK0008														
01TK0009														
01TK0010														
01TK0011														
01TK0012														
01TK0013														

Table 1. Principal facts of gravity stations. -- Continued

GRAVITY STATION NAME	LATITUDE (DEG MIN)	LONGITUDE (DEG MIN)	ELEV (FT)	OBSERVED GRAVITY (MGAL)	ACC CODES	FAA (MGAL)	SBA (MGAL)	TERRAIN INNER	CORRECTION OUTER	CBA (MGAL)	ISOSTATIC (MGAL)	DATA SET CODES	SECONDARY ELEVATION AND STATIC ANOMALY	ISO-CODE
01TK0114														
01TK0111														
01TK0117														
01TK0119														
01TK0220														
01TK0221														
01TK0222														
01TK0223														
01TK0224														
01TK0225														
01TK0226														
01TK0227														
01TK0228														
01TK0229														
01TK0230														
01TK0231														
01TK0232														
01TK0233														
01TK0234														
01TK0235														
01TK0236														
01TK0237														
01TK0238														
01TK0239														
01TK0240														
01TK0241														
01TK0242														
01TK0243														
01TK0244														
01TK0245														
01TK0246														
01TK0247														
01TK0248														
01TK0249														
01TK0250														
01TK0251														
01TK0252														
01TK0253														
01TK0254														
01TK0255														
01TK0256														
01TK0257														
01TK0258														
01TK0259														
01TK0260														
01TK0261														
01TK0262														
01TK0263														
01TK0264														
01TK0265														
01TK0266														
01TK0267														
01TK0268														
01TK0269														

Table 1. Principal facts of gravity stations. -- Continued

GRAVITY STATION NAME	LATITUDE (DEG MIN)	LONGITUDE (DEG MIN)	ELEV (FT)	OBSERVED GRAVITY (MGAL)	ACC CODES	FAA (MGAL)	SBA (MGAL)	TERRAIN INNER (MGAL)	CORRECTION OUTER (MGAL)	CBA (MGAL)	ISOSTATIC ANOMALY (MGAL)	DATA SET CODES	SECONDARY ELEVATION ANOMALY	ISO AND STATIC CODE
01TK0770														
01TK0771														
01TK0772														
01TK0773														
01TK0774														
01TK0775														
01TK0776														
01TK0777														
01TK0778														
01TK0779														
01TK0800														
01TK0801														
01TK0802														
01TK0803														
01TK0804														
01TK0805														
01TK0806														
01TK0807														
01TK0808														
01TK0809														
01TK0810														
01TK0811														
01TK0812														
01TK0813														
01TK0814														
01TK0815														
01TK0816														
01TK0817														
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01TK0839														
01TK0840														
01TK0841														
01TK0842														
01TK0843														
01TK0844														
01TK0845														
01TK0846														
01TK0847														
01TK0848														
01TK0849														
01TK0850														
01TK0851														
01TK0852														
01TK0853														
01TK0854														
01TK0855														
01TK0856														
01TK0857														
01TK0858														
01TK0859														
01TK0860														
01TK0861														
01TK0862														
01TK0863														
01TK0864														
01TK0865														
01TK0866														
01TK0867														
01TK0868														
01TK0869														
01TK0870														
01TK0871														
01TK0872														
01TK0873														
01TK0874														
01TK0875														
01TK0876														
01TK0877														
01TK0878														
01TK0879														
01TK0880														
01TK0881														
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01TK0885														
01TK0886														
01TK0887														
01TK0888														
01TK0889														
01TK0890														
01TK0891														
01TK0892														
01TK0893														
01TK0894														
01TK0895														
01TK0896														
01TK0897														
01TK0898														
01TK0899														
01TK0900														

Table 1. Principal facts of gravity stations. -- Continued

GRAVITY STATION NAME	LATITUDE (DEG MIN)	LONGITUDE (DEG MIN)	ELEV (FT)	OBSERVED GRAVITY (MGAL)	ACC CODES	FAA (MGAL)	SBA (MGAL)	TERRAIN INNER	CORRECTION OUTER	CBA (MGAL)	ISOSTATIC ANOMALY (MGAL)	DATA SET CODES	SECONDARY ELEVATION ANOMALY	ISO-STATIC AND CODE
02DM095	17.65	146	472	81780	ACG7	85	-75	0	0	-68	47	CA47	0	ISOW
02DM096	20.77	146	566	81773	ACN7	9	-101	0	0	-95	24	CA47	0	ISOW
02DM097	20.22	146	667	81655	ACG7	4	-95	0	0	-95	20	CA47	0	ISOW
02DM098	17.47	146	667	81677	ACG7	4	-95	0	0	-64	50	CA47	0	ISOW
02DM099	16.47	146	667	81733	ACG7	3	-77	0	0	-70	49	CA47	0	ISOW
02DM100	17.33	146	667	81775	ACN7	3	-77	0	0	-70	49	CA47	0	ISOW
02DM101	17.33	146	667	81775	ACN7	3	-77	0	0	-70	49	CA47	0	ISOW
02DM102	19.33	146	667	81770	ACG7	3	-77	0	0	-70	49	CA47	0	ISOW
02DM103	21.33	146	667	81770	ACG7	3	-77	0	0	-70	49	CA47	0	ISOW
02DM104	19.52	146	462	81782	ACG7	7	-104	0	0	-97	13	CA47	0	ISOW
02DM105	20.52	146	407	81822	ACG7	7	-104	0	0	-97	13	CA47	0	ISOW
02DM106	20.45	146	374	81847	ACN7	6	-98	0	0	-89	26	CA47	0	ISOW

Table 2. Data set information

[W, Worden gravity meter; G, LaCoste and Romberg gravity meter; GMT, Greenwich mean time]

DATA SET CODE	PROJECT NAME	TRAVERSE NAME	DATA SET DATE	METER AND TYPE	METER FACTOR	GMT	PROJECT CHIEF	OBSERVERS
CA01.BAL	TALK MNTS	STEPHAN LAKE	07/07/1999	W177	1	0.49100	8	MORIN KULIK
CA02.BAL	TALK MNTS	STEPHAN LAKE	07/09/1999	W177	1	0.49100	8	MORIN KULIK
CA03.BAL	TALK MNTS	STEPHAN LAKE	07/10/1999	W177	1	0.49100	8	MORIN KULIK
CA05.BAL	TALK MNTS	BASE TIES	10/15/1999	W177	1	0.49100	8	MORIN KULIK
CA10.BAL	TALK MTNS	BASE TIES	06/15/2000	G614	2	1.00038	8	GLEN
CA11.BAL	TALK MTNS	BASE TIES	06/16/2000	G614	2	1.00038	8	GLEN
CA12.BAL	TALK MTNS	KOSINA TO TSISI	06/17/2000	G614	2	1.00038	8	GLEN
CA13.BAL	TALK MTNS	TSISI TO FOG	06/18/2000	G614	2	1.00038	8	GLEN
CA14.BAL	TALK MTNS	FOG TO DEVIL	06/19/2000	G614	2	1.00038	8	GLEN
CA15.BAL	TALK MTNS	FOG TO TSUSENA	06/20/2000	G614	2	1.00038	8	GLEN
CA20.BAL	TALK MTNS	BASE TIES	06/17/2001	G614	2	1.00038	8	GLEN
CA21.BAL	TALK MTNS	BASE TIES	06/18/2001	G614	2	1.00038	8	GLEN
CA22.BAL	TALK MTNS	BASE TIES	06/26/2001	G614	2	1.00038	8	GLEN
CA23.BAL	TALK MTNS	JAINA TO GREBE	06/19/2001	G614	2	1.00038	8	GLEN
CA24.BAL	TALK MTNS	GREBE 2 CHUNILNA	06/20/2001	G614	2	1.00038	8	GLEN
CA25.BAL	TALK MTNS	DEVIL TO BROAD	06/21/2001	G614	2	1.00038	8	GLEN
CA26.BAL	TALK MTNS	CHUNILNA 2 MIAMI	06/22/2001	G614	2	1.00038	8	GLEN
CA27.BAL	TALK MTNS	BROAD 2 LOOKOUT	06/23/2001	G614	2	1.00038	8	GLEN
CA28.BAL	TALK MTNS	REMUS TO KOSINA	06/24/2001	G614	2	1.00038	8	GLEN
CA29.BAL	TALK MTNS	MONAHAN 2 WATANA	06/25/2001	G614	2	1.00038	8	GLEN
CA30.BAL	TALK MTNS	BASE TIES	08/13/2001	G614	2	1.00038	8	GLEN GLEN
CA31.BAL	TALK MTNS	BASE TIES	08/14/2001	G614	2	1.00038	8	GLEN GLEN
CA32.BAL	TALK MTNS	BASE, LONG TANGLE	08/15/2001	G614	2	1.00038	8	GLEN GLEN
CA33.BAL	TALK MTNS	OSAR L, EUREKA CR	08/16/2001	G614	2	1.00038	8	GLEN GLEN
CA34.BAL	TALK MTNS	MACLAREN, LANDMAR	08/17/2001	G614	2	1.00038	8	GLEN GLEN
CA35.BAL	TALK MTNS	WEST F, WILDHORSE	08/15/2001	G614	2	1.00038	8	GLEN GLEN
CA36.BAL	TALK MTNS	BASE TIES	08/19/2001	G614	2	1.00038	8	GLEN GLEN
CA40.BAL	TALK MTNS	BASE TIES	06/27/2002	G17C	2	1.00078	8	GLEN GLEN
CA41.BAL	TALK MTNS	BASE TIES	06/28/2002	G17C	2	1.00078	8	GLEN GLEN
CA42.BAL	TALK MTNS	EUREKA GLACIER	06/29/2002	G17C	2	1.00078	8	GLEN GLEN
CA43.BAL	TALK MTNS	EUREKA2 17M LAKE	06/30/2002	G17C	2	1.00078	8	GLEN GLEN
CA44.BAL	TALK MTNS	RAINY-MCCALLUM	07/01/2002	G17C	2	1.00078	8	GLEN GLEN
CA45.BAL	TALK MTNS	FIELDING LAKE	07/02/2002	G17C	2	1.00078	8	GLEN GLEN
CA46.BAL	TALK MTNS	CLEARWATER MTNS	07/03/2002	G17C	2	1.00078	8	GLEN GLEN
CA47.BAL	TALK MTNS	CLEARW 2 CANWELL	07/04/2002	G17C	2	1.00078	8	GLEN GLEN

Table 3. Explanation of data

Column	Fortran Format	Contents
1-4	a4	Station name
5-8	a4	Auxiliary station name, descriptor, or addition to station name
9	lx	Blank
10-11	f2.0	Latitude of station in degrees
12	lx	Blank
13-17	f5.2	Minutes of latitude to 0.01 minute
18	lx	Blank
19-21	f3.0	Longitude in degrees
22	lx	Blank
23-27	f5.2	Minutes of longitude to 0.01 minute
28	lx	Blank
29-35	f7.1	Elevation in feet to 0.1 feet
36	lx	Blank
37-45	f9.2	Observed gravity to 0.01 milligal
46	lx	Blank
47	a1	Location source code
48	a1	Gravity source code
49	a1	Elevation source code
50	a1	Simple Bouguer anomaly accuracy code
51	lx	Blank
52-58	f7.2	Free air anomaly to 0.01 milligal
59	lx	Blank
60-66	f7.2	Simple Bouguer anomaly to 0.01 milligal
67	lx	Blank
68-73	f6.2	Inner-zone terrain correction from station to 0.39 km to 0.01 milligal
74	lx	Blank
75-80	f6.2	Terrain correction from 0.39 km to 166.7 km to 0.01 milligal
81-83	3x	Blank
84-90	f7.2	Complete Bouguer anomaly to 0.01 milligal
91	lx	Blank
92-98	f7.2	Isostatic anomaly to 0.01 milligal
99	lx	Blank
100-103	a4	Data set code
104	lx	Blank
105	a1	Datum code
106	lx	Blank
107-112	f6.0	Second elevation in whole feet
113	lx	Blank
114	a1	Second elevation source code
115	lx	Blank
116-121	f6.1	Simple Bouguer anomaly based on second elevation to 0.1 milligal
122	lx	Blank
123-126	a4	Isostatic anomaly code

Table 3. Continued.

Latitudes and longitudes are on the North American Datum of 1927 (NAD27).
 Elevations are on the National Geodetic Vertical Datum of 1929 (NGVD29).
 Theoretical gravity at sea level is based on the Geodetic Reference System 1967 (GRS67).
 Observed gravity is on the IGSN71 datum.
 Terrain corrections are calculated from 0.39 km to 166.7 km by computer program.
 Inaccuracies in station elevations can generate large inner zone corrections between the station and 0.39 km.
 Values shown in the inner zone column are usually field corrections, which are field estimates from the station to a radial distance of 53 m
 The isostatic reduction assumes an Airy-Heiskanen model with the following parameters from the station to 166.7 km:
 density of topography above sea level, 2.67 g/cc
 crustal thickness at sea level, 25 km
 density contrast across the base of the model crust, 0.4 g/cc
 From 166.7 km to a point on the opposite side of the Earth, isostatic and terrain corrections were taken off maps by Karki.

Location source code, column 47
 [NGS, National Geodetic Survey]

Map used for field work or for reading latitudes and longitudes or which controlled location position	good location	poor location	transfer from photo	transfer from smaller scale field map
Modern published maps, scale 1:63,360	A	B	C	D
Old or unpublished maps, scale 1:63,360	F	G	H	I
Modern 1:250,000 scale maps	K	L	M	N
Reconnaissance 1:250,000 scale maps	P	Q	R	S
NGS or special maps	U	V	W	X
Data from other agencies.....Y				
Location from special survey....Z				
No location.....?				
Estimated or assumed location...#				
Near a bench mark.....@				
Location from differential GPS..\$				
Location from GPS.....%				

Gravity source code, column 48

Type of meter	3 ties	other	ties or drift loops lasting			
	within 0.1 mGal	multiple ties	<6 hours	6-24 hours	1-4 days	>4 days
LaCoste & Romberg Geodetic meters	A	B	C	D	E	F
Worden or (loop drift control)	G	H	I	J	K	L
World-Wide (other drift control) meters (no drift control)	M	N	O	P	Q	R
Old LaCoste & Romberg or other thermostated meters	S	T	U			
	V	W	X			
Data from other agencies...Y						
Reasons to expect errors...Z						

Table 3. Continued.

Elevation source code, column 49					
[USWB, U.S. Weather Bureau; FAA, Federal Aviation Administration; Wisc, University of Wisconsin]					
	bench marks	highway & railway surveys	sea Level	special surveys	USWB FAA Wisc
	A	B	C	D	E
	black	brown	blue	unpublished maps	
Map elevations	F	G	H	I	
	Contour interval				
	0-50 ft	100 ft	200 ft		
River gradient interpolation	J	K	L		
Good contour interpolation	M	N	O		
Poor contour interpolation	P	P	Q		
Altimetry	Base Distance				
	<15 miles	15-70 miles	>70 miles		
Good repeated readings	R	S	-		
Alticorder or other good base control	T	U	-		
Poor control	V	W	X		
Altimetry involving special adjustments.....Y					
No data.....?					
Elevation from nearby bench marks.....@					

Table 3. Continued.

Simple Bouguer anomaly accuracy code, column 50		
Code	Gravity Anomaly Accuracy, milligals	Typical gravity or elevation types
1	0.01	Local surveys with special gravity meters and leveling
2	0.02	Multiple readings with LaCoste & Romberg meters on hard, surveyed surfaces
3	0.05	Average LaCoste & Romberg data at stable bench marks
4	0.10	Average LaCoste & Romberg or Worden data at sea level or frost-affected bench marks
5	0.2	Worden or LaCoste & Romberg data with poor drift or closure errors, or average data at vertical angle bench marks
6	0.5	Data from loops with closure errors this large, or good data using river gradients, good photogrammetric elevations or well controlled altimetry
7	1.0	Most surveys based on reasonable altimetry
8	2.0	Data using moderate-distance altimetry in variable weather or spot elevations on 100-ft contour interval maps
9	5.0	Data using long-range altimetry in bad weather or contour interpolation on 200-ft contour interval maps
0	>5.0	Data from surveys using long-distance altimetry or altimetry with control failures or errors or some 500-ft contour interval reconnaissance maps
Data set code, columns 100-103		
<p>This is a unique code for each data set of USGS Alaska gravity data. This code refers to the original field data which include the project name, traverse, date collected, identity of gravity meter used, gravity and altimeter bases, observed gravity of gravity base, time of each reading, meter reading, altimeter reading, reference elevation, base altimeter, and wet and dry bulb temperatures</p>		
Datum code, column 105		
<p>N or blank.....1967 ellipsoid and conversion of Barnes Alaska datum to IGSN-71 datum</p>		
Isostatic anomaly code, columns 123-126		
ISO	Indicates isostatic correction made from station to 166.7 km.	
ISOW	Indicates isostatic correction made for the whole earth	