

STATE OF ALASKA  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF GEOLOGICAL AND GEOPHYSICAL SURVEYS

*John W. Katz — Commissioner*

*Geoffrey Haynes — Deputy Commissioner*

*Ross G. Schaff — State Geologist*

October 1981

This is a preliminary publication of the Alaska Division of Geological and Geophysical Surveys and has not received final editing and review. The author will appreciate candid comments on the accuracy of the data and will welcome suggestions to improve the report.

Alaska Open-file Report 135  
TABULATED GRAVITY FIELD DATA FOR YUKON FLATS  
AND NORTON SOUND COASTAL AREAS

By  
Steve W. Hackett

STATE OF ALASKA  
Department of Natural Resources  
DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

According to Alaska Statute 41, the Alaska Division of Geological and Geophysical Surveys is charged with conducting 'geological and geophysical surveys to determine the potential of Alaska lands for production of metals, minerals, fuels, and geothermal resources; the locations and supplies of ground waters and construction materials; the potential geologic hazards to buildings, roads, bridges, and other installations and structures; and shall conduct other surveys and investigations as will advance knowledge of the geology of Alaska.'

In addition, the Division shall collect, evaluate, and publish data on the underground, surface, and coastal waters of the state. It shall also process and file data from water-well-drilling logs.

DGGS performs numerous functions, all under the direction of the State Geologist---resource investigations (including mineral, petroleum, and water resources), geologic-hazard and geochemical investigations, and information services.

Administrative functions are performed under the direction of the State Geologist, who maintains his office in Anchorage (3001 Porcupine Dr., 99501, ph 274-9681).

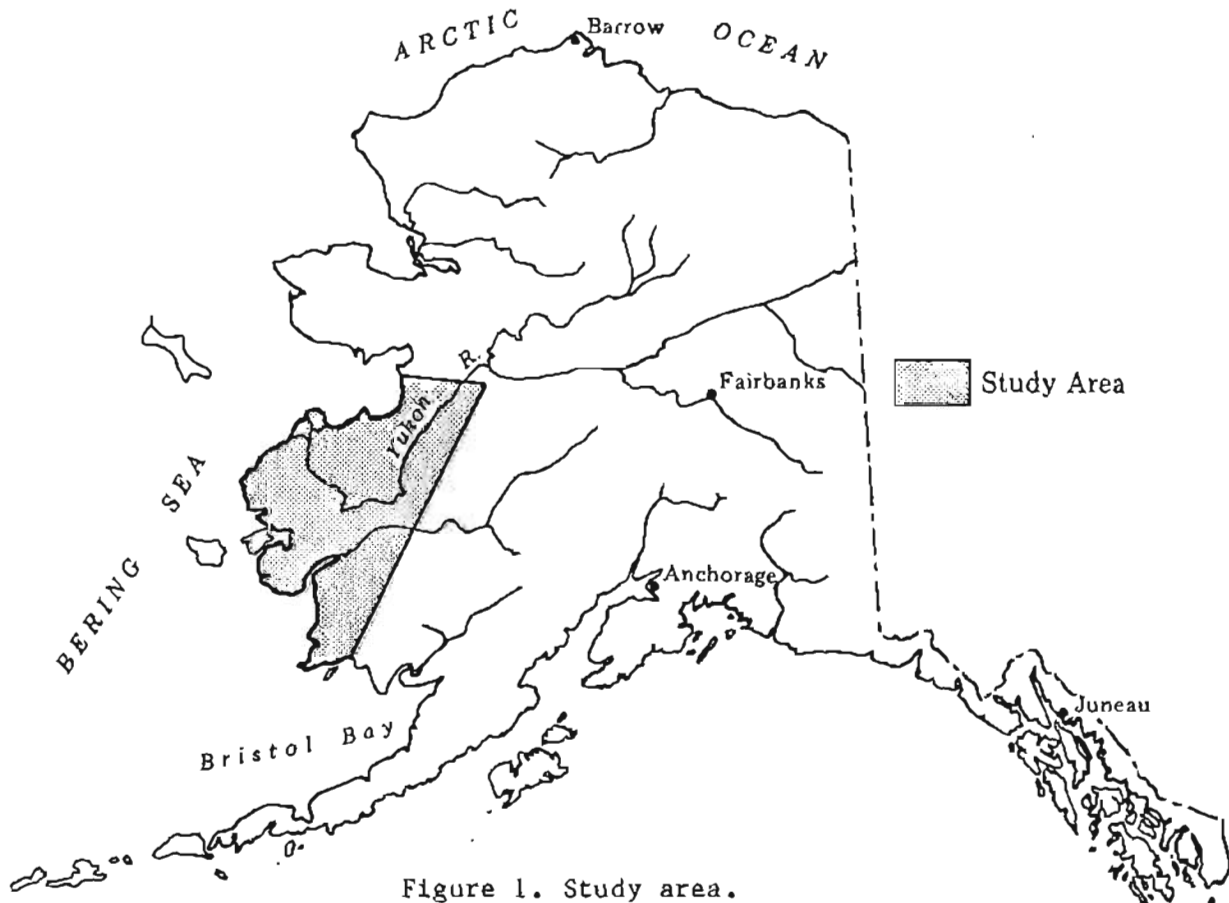
This report is for sale by DGGS for \$1. It may be inspected at any of the four DGGS information offices: University of Alaska Physical Plant Bldg, Fairbanks; 323 E. 4th Ave., Anchorage; 230 So. Franklin St, Juneau; and the State Office Bldg, Ketchikan. Mail orders should be addressed to DGGS, P.O. Box 80007, College, AK 99701.

TABULATED GRAVITY FIELD DATA FOR YUKON FLATS AND NORTON SOUND COASTAL AREAS

By  
Steve W. Hackett

In 1978 the Alaska Division of Geological and Geophysical Surveys (DGGs) and the Conservation Division of the U.S. Geological Survey (USGS) initiated a reconnaissance geologic field program to provide new stratigraphic information in the Norton Sound area (Lyle and others, in press). Jeff Morehouse, DGGs field assistant, occupied a limited number of new gravity stations in the Yukon Flats and Norton Sound coastal areas. In 1979, DGGs geologist James Riehle and field assistant Karen Emmel occupied new gravity sites along the Norton Sound coast between Unalakleet and the Stebbins Passage area. We appreciate the preliminary regional gravity data and base-station information provided by the USGS, Branch of Regional Geophysics, Menlo Park, California.

Previously described gravity base stations (Barnes, 1968) and new sites were occupied with a LaCoste Romberg geodetic gravimeter model LCR G108. These gravimeter-counter readings may be converted to uncorrected milligals by referring to table 1. All gravity data were reduced to a common datum (Morelli and others, 1974) and processed with a modified version of a gravity reduction program used by the USGS in presenting previous Alaskan gravity data (Barnes, 1972, 1977). The gravity field data for the 1978 and 1979 surveys are tabulated and listed by latitude and longitude in table 2. The study area is shown in figure 1.



## Interpretation of table 2

There are three basic components of the field data contained in table 2---the heading, or project information (H), the base information (B), and the gravity data itself (D). The 80-column printout format for all three components is described below and in Barnes (1968, 1972).

The format for the header card (project information) leads each block of data and is shown first. The rightmost column contains the code 'H.'

The base cards (B) generally have several columns. The leftmost one is a 12-character block: two digits for the GN-AN, a four-digit station identity code, and a six-character base-1 reading. The second column has 10 digits, four for the base-1 time of the reading and six for the base-2 readout. Column 3 has 12 characters, four for the base-2 time and eight for the gravity base reading or for the altimetry reference. The next column has 13 digits, six for latitude and seven for longitude. The remaining card columns contain 12 spaces, four for elevation and the last for general comments. The rightmost column contains the code 'B' (for base information).

The actual tabular part, or data (D), has seven columns. The first is a 15-character block, with the first four designating the station, the next four the time, and the last eight the gravimeter values. Column 2 contains the altimeter readings; column 3 is gravity base identification. Column 4 contains 19 characters: six for elevation, six for latitude, and seven for longitude. Column 5 denotes the altimeter base identification. The sixth column contains the average air temperature in the first three digits and the WDB (wet bulb depression) in the last two. The last column is the card code 'D' for data (gravity station information).

### References cited

- Barnes, D.F., 1968, Alaska gravity base station network, 1968: U.S. Geological Survey Open-file Report 68-7.
- \_\_\_\_\_, 1972, Notes on the processing and presentation of U.S. Geological Survey Alaskan gravity data: U.S. Geological Survey Open-file report, 25 p.
- \_\_\_\_\_, 1977, Bouguer gravity map of Alaska: U.S. Geological Survey Geophysical Investigations Map GP-913.
- Lyle, W.M., Palmer, I.F., Jr., Bolm, J.G., and Flett, T.O., 1981, Hydrocarbon reservoir and source rock characteristics from selected areas of southwestern Alaska (in press).
- Morelli, Carlo, Gantar, C., Honkasala, Tauno, McConnell, R.K., Tanner, J.G., Szabo, Bela, Motila, U.A., and Whalen, G.T., 1974, The international gravity standardization net 1971 (I.G.S.N.71): Paris, Bureau Central del Association Internationale de Geodesie Special Publication 4, 194 p.
- Riehle, J.R., Emmel, K.S., and Bolm, J.G., 1981, Reconnaissance report on surficial geology of coastal area from Tolstoi Point to Cape Nome, Norton Sound, Alaska: Alaska Division of Geological and Geophysical Surveys Open-file Report 125, 24 p.

Table 1. Milligal values for LaCoste & Romberg, Inc.  
Model G Gravity Meter 108

<u>Counter reading*</u>	<u>Value in milligals</u>	<u>Factor for interval</u>	<u>Counter reading*</u>	<u>Value in milligals</u>	<u>Factor for interval</u>
000	000	1.04480			
100	104.48	1.04475	3600	3762.43	1.04645
200	208.96	1.04470	3700	3867.08	1.04650
300	313.43	1.04465	3800	3971.73	1.04655
400	417.89	1.04460	3900	4076.39	1.04665
500	522.35	1.04455	4000	4181.05	1.04670
600	626.81	1.04455	4100	4285.72	1.04675
700	731.27	1.04450	4200	4390.40	1.04680
800	835.72	1.04450	4300	4495.07	1.04680
900	940.17	1.04450	4400	4599.75	1.04685
1000	1044.62	1.04450	4500	4704.44	1.04685
1100	1149.07	1.04455	4600	4809.12	1.04685
1200	1253.53	1.04460	4700	4913.81	1.04685
1300	1357.99	1.04465	4800	5018.49	1.04680
1400	1462.45	1.04470	4900	5123.17	1.04680
1500	1566.92	1.04475	5000	5227.85	1.04675
1600	1671.39	1.04480	5100	5332.53	1.04675
1700	1775.87	1.04485	5200	5437.21	1.04670
1800	1880.36	1.04490	5300	5541.87	1.04660
1900	1984.85	1.04500	5400	5646.54	1.04655
2000	2089.34	1.04505	5500	5751.19	1.04645
2100	2193.85	1.04515	5600	5855.84	1.04630
2200	2298.36	1.04520	5700	5960.47	1.04620
2300	2402.89	1.04530	5800	6065.09	1.04605
2400	2507.42	1.04535	5900	6169.69	1.04590
2500	2611.95	1.04545	6000	6274.28	1.04575
2600	2716.49	1.04550	6100	6378.86	1.04555
2700	2821.04	1.04560	6200	6483.41	1.04535
2800	2925.60	1.04570	6300	6587.95	1.04510
2900	3030.17	1.04580	6400	6692.46	1.04485
3000	3134.75	1.04590	6500	6796.94	1.04455
3100	3239.34	1.04600	6600	6901.40	1.04425
3200	3343.94	1.04610	6700	7005.82	1.04395
3300	3448.55	1.04620	6800	7110.22	1.04365
3400	3553.17	1.04625	6900	7214.58	1.04335
3500	3657.80	1.04635	7000	7318.92	

\*Note: Right wheel on counter indicates approximately 0.1 milligal.

12-15-65

LH





Table 2 (cont.)

ST MICHAEL ONE	AK	06/28/79	G108	12240RIEHLE	EMMEL	NS79H
G10101557357	0745557381	193598221733				D
A10101000090	0745000089	1935 00013				R
0101074555735701300090	G1	0000006353021604748	A1	04802		D
0102110555482301000089	G1	0000006333421610336	A1	05303		D
0103124555484700400087	G1	0000006334361610224	A1	05804		D
0104133055587100400086	G1	0000006336541605900	A1	05802		D
01051420555471917500103	G1	0000006336421605930	A1	05809		D
0106152555586400300087	G1	0000006337061605812	A1	06102		D
0107155555623000000087	G1	0000006340061605336	A1	05606		D
0108193555738101300089	010161	0000006353021604748	A1	05105		D
ST MICHAEL TWO	AK	06/29/79	G108	12240RIEHLE	EMMEL	NS79H
G20202553841	1345553808	2250				R
A20202000098	1345000101	2250 00020				R
0201074555736701300093	010162	0000006353021604748	A2	05407		D
0202134555384102500098	G2	0000006328421620218	A2	05806		D
0203165055482401000098	010262	0000006333421610336	A2	05406		D
0204174555495900300099	G2	0000006333121610548	A2	05606		D
0205181555480600000099	G2	0000006331361610748	A2	05806		D
0206190555456900000099	G2	0000006328241611748	A2	05402		D
0207194055470000000099	G2	0000006328181612124	A2	05403		D
0208203055454300000099	G2	0000006327301612600	A2	05002		D
0209204055452300000099	G2	0000006327301612712	A2	04903		D
0210211055445101000100	G2	0000006328121612812	A2	05004		D
0211214055437601000100	G2	0000006327511613048	A2	04803		D
021225055380802500101	020262	0000006328421620218	A2	04602		D
ST MICHAEL THREE	AK	06/30/79	G108	12240RIEHLE	EMMEL	NS79H
G30301553852	1350553838	2330				R
A30301000111	1350000098	2330 00020				R
0301135055385202500111	020263	0000006328421620218	A3	06711		D
0302153555275800300109	G3	0000006327061615330	A3	07014		D
0303161055299200000108	G3	0000006327181614542	A3	07215		D
030416355532700300108	G3	0000006327241614318	A3	07313		D
03051720552990300300106	G3	0000006326481614742	A3	07216		D
0306174055286100500105	G3	0000006326301614912	A3	06812		D
030718105527200500105	G3	0000006326481615106	A3	06611		D
030818355527300300104	030263	0000006327061615330	A3	06410		D
0309190055303400300103	G3	0000006326481615736	A3	06412		D
0310202055587700000102	G3	0000006332181621824	A3	05806		D
0311205055588900000101	G3	0000006332181621600	A3	05605		D



0312214055546800000099		G3	0000006331281621212	A3	05203	D
0313222555511100000098		G3	0000006330481620448	A3	05203	D
0314233055383802500098	0301G3		0000006328421620218	A3	05403	D
ST MICHAEL FOUR						
G40401553844	AK 07/01/79	G108	12240RIEHLE	EMMEL		NS79H
A40401000076	1330553857	1900	00020			B
0401133055384402500076	0202G4		0000006328421620218	A4	05203	D
04021425554091000	G4		0000006329301620254		05203	D
04031450554024000	G4		0000006329241620248		05203	D
04041510554014000	G4		0000006329241620242		05203	D
04051515553977000	G4		0000006329211620224		05203	D
04061520553955000	G4		0000006329181620218		05404	D
04071530553930000	G4		0000006329181620212		05404	D
04081540553887000	G4		0000006329151620200		05404	D
04091550553867000	G4		0000006329121620148		05404	D
04101600553802000	G4		0000006329151620124		05303	D
04111610553741000	G4		0000006329121620112		05303	D
04121620553709000	G4		0000006329121620106		05404	D
04131815553261035	G4		0000006329121620048		05203	D
0414190055385702500074	AK 07/02/79	G108	12240RIEHLE	EMMEL		NS79H
ST MICHAEL FIVE						
0501092555379102500093	0202		0000006328421620218		05804	R
0502113555737601300091	0101		0000006353021604748		06004	R