

DISCUSSION

Free-air gravity data shown on this map are compiled from an earlier map by Burkhard and others (1980) and from previously unpublished data. The part of Burkhard and others' map that shows the area east of 150°W is incorporated here with only minor revision. See the text of their map for the description of data collection and processing that pertains to that part of our map. We have modified the part of the earlier map that shows the area west of 150°W, on the basis of new data.

These new data were collected during cruises aboard the R/V S.P. Lee (57-77-WG and 57-81-WG) and the R/V Sea Sounder (59-79-WG), and we used data from cruise 59-75-WG that lie outside of the area shown in Burkhard and others (1980). Furthermore, we reprocessed gravity data from cruise 54-76-WG, as Burkhard and others reported that line intersection errors from this cruise were greater than 7 mgal. Reprocessing reduced these errors to between 0 and 4 mgal (Table 1).

Gravity data from cruises 57-77-WG, 59-79-WG, and 57-81-WG were collected using La Cote and Romberg marine gravity meters on two-axis platforms. The navigation system for the 57 cruises integrated a satellite navigation system with doppler sonar to calculate the ship's position; whereas the system used during the 59 cruise was primarily a satellite navigation system. The gravity data were corrected for meter drift by measuring gravity before and after each cruise at a base station at Kodiak. Free-air gravity values were calculated from digitized spring-tension data and correction terms. All data were reduced to the 1958/1971 ellipsoid. Burkhard and others (1980) reduced their data to the 1930 datum, and then they subtracted a constant 7 mgal from their values to correct for the difference between the 1930 and 1971 datums. Despite these different methods of reduction to datum, data from their map and ours compare well.

Absolute values of discrepancies at line intersections from all five cruises have a mean value of 2.4 mgal and a standard deviation of 2.2 mgal (Fig. 1). The mean and standard-deviation values for individual cruises are shown in Table 1.

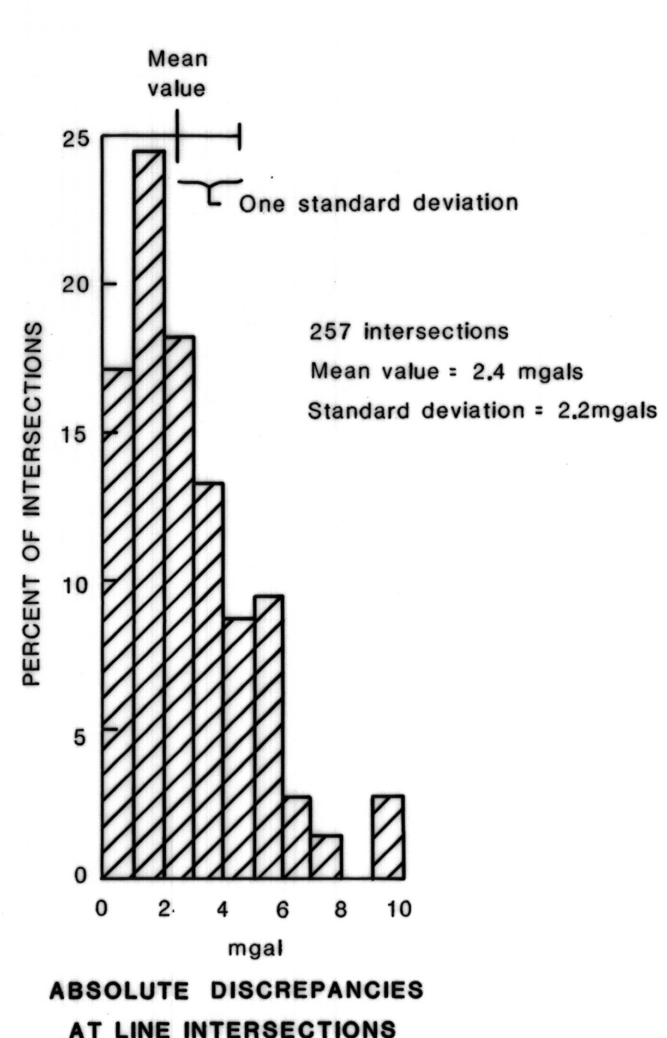
REFERENCE

Burkhard, R., von Huene, R., McHendrie, G., Ruppel, B., and Bruns, T., 1980, Free-air gravity anomaly map, western Gulf of Alaska: U.S. Geological Survey Miscellaneous Field Studies Map MF-1173, 1 sheet, scale 1:500,000.

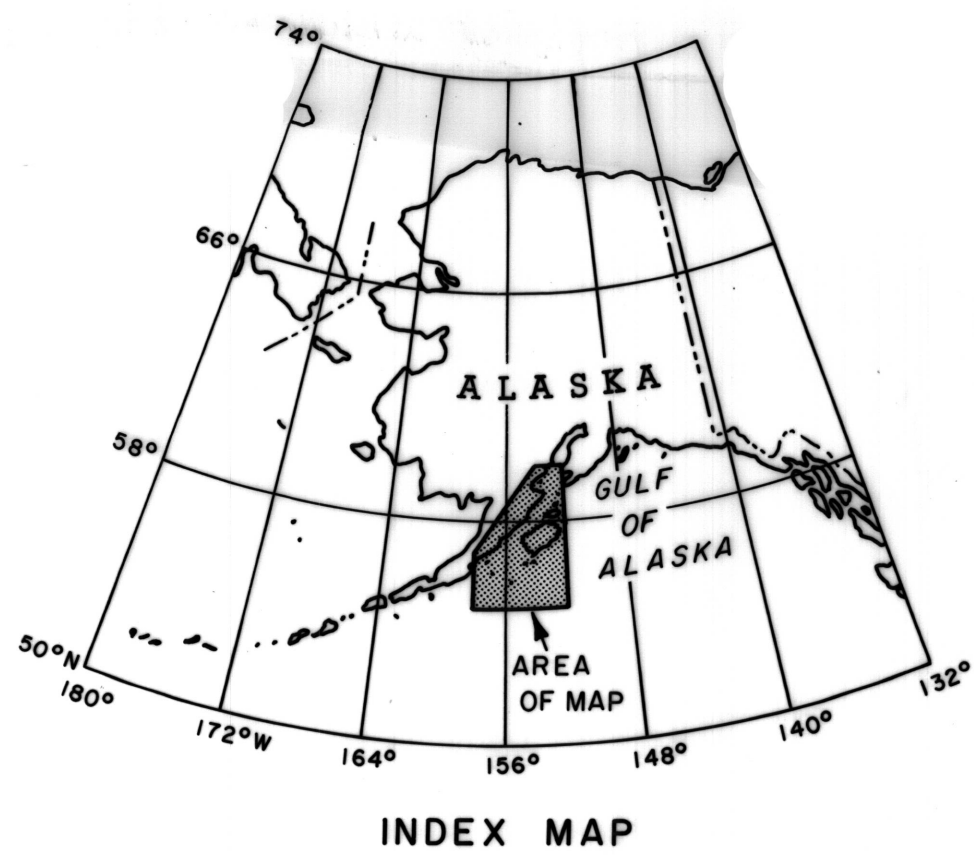
TABLE 1. DISCREPANCIES AT LINE INTERSECTIONS

Cruise	57 81 WG	59 79 WG	54 76 WG	57 77 WG	59 75 WG
57 81 WG (20)	2.4 ± 3.1				
59 79 WG (4)	-2.0 ± 4.5	I.D.			
54 76 WG (21)	-1.0 ± 2.6	(11) -0.5 ± 5.1	(53) 2.0 ± 1.6		
57 77 WG (20)	0.0 ± 4.1	(35) -0.2 ± 4.1	(30) 0.0 ± 2.5	(19) 2.0 ± 1.4	
59 75 WG	I.D.	(9) -0.4 ± 2.3	(20) -2.3 ± 2.8	(9) -1.7 ± 3.2	(7) 0.9 ± 0.9

I.D.: Insufficient data
Number in parentheses is number of intersections



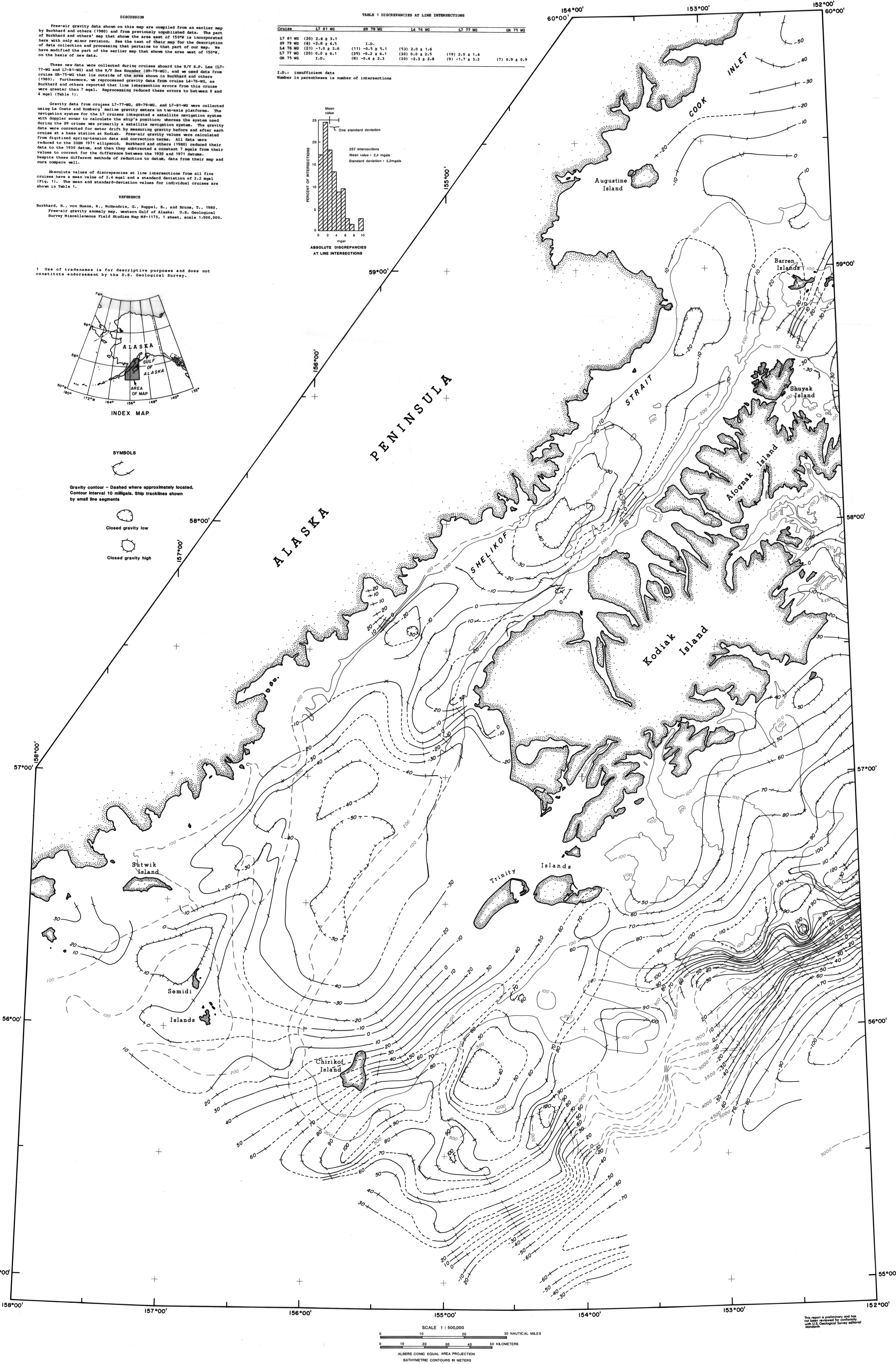
1 Use of tradenames is for descriptive purposes and does not constitute endorsement by the U.S. Geological Survey.



SYMBOLS

Gravity contour - Dashed where approximately located.
Contour interval 10 milligals. Ship tracklines shown by small line segments

- Closed gravity low
- Closed gravity high



SCALE 1:500,000
0 10 20 30 NAUTICAL MILES
0 10 20 30 40 50 KILOMETERS
ALBERS CONIC EQUAL AREA PROJECTION
BATHYMETRIC CONTOURS IN METERS

This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards.

MARINE FREE-AIR GRAVITY MAP OF THE WESTERN GULF OF ALASKA, LOWER COOK INLET, AND SHELIKOF STRAIT, ALASKA

By

Michael A. Fisher, Roland von Huene, and William C. Steele

1983