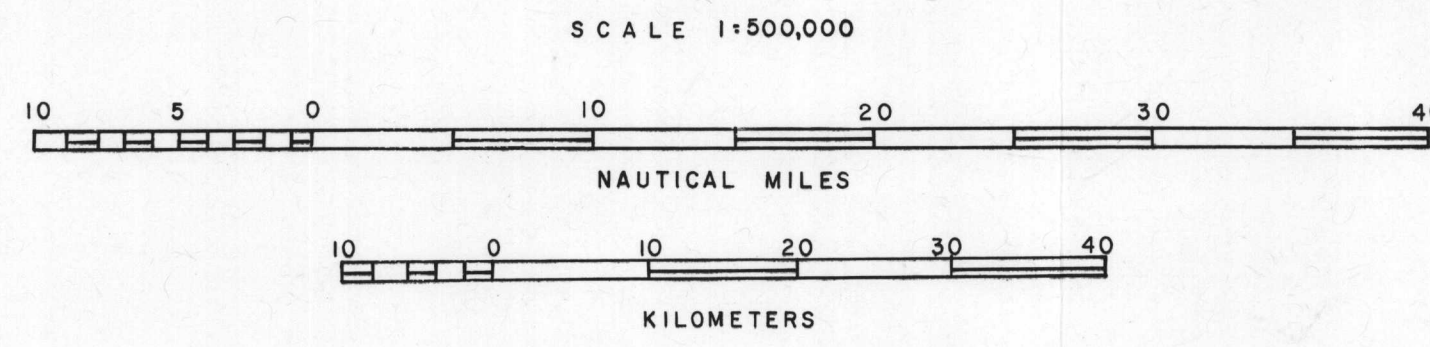


Bathymetry from unpublished maps and bathymetric data, T.R. Chase, P.R. Carlson, and B.F. Molina, 1977



Bathymetric contour interval 500 meters; long dashed where occasional 100 meters contour interval used

ALBERS EQUAL AREA PROJECTION

FREE-AIR GRAVITY ANOMALY MAP, EASTERN GULF OF ALASKA

By
Nardia Burkhard, Terry Bruns, Graig McHendrie and Byron Ruppel

1980

MARINE GRAVITY SURVEYS

Ship	Year	Organization	Navigation System	Gravity Meter
M/V SURVEYOR	1972	NOAA	Satellite Loran C	Lacoste & Romberg with stabilized platform 2 axis
M/V C.H. GREEN	1975	USGS	Satellite Loran C Sonic Doppler	Lacoste & Romberg with stabilized platform 2 axis

NOAA: National Oceanic and Atmospheric Administration
USGS: United States Geological Survey

COMPILED NOTES
Gravity data from the surveys listed above were merged to prepare this free-air gravity map. The gravity data were computer plotted at a scale of 1:250,000 using the Albers equal-area projection. The data from the cruises were merged and contoured. The gravity and bathymetric maps were photographically reduced to a scale of 1:500,000 and mosaicked to a base map for publication.

Data Reduction
Observed gravity data were adjusted for instrumental drift, based on factor gravity station ties, and Eötvös effect, calculated from ship speed and heading. Absolute gravity values were obtained by tying factor gravity stations to absolute gravity base stations. Free-air gravity was calculated using the 1980 International Gravity Formula (I.G.F.), (Cassinis, 1950). A constant was applied to these data to approximate the effect of the 1967 I.G.F. (Capputo, 1968). The formula used for the conversion is

Free-air gravity (1950) + 3.2 - 13.6(sin ϕ)² = free-air gravity (1967) where ϕ is latitude. The conversion factor changes slightly with latitude, from +6.16 mgal at 55°N to -7.1 mgal at 65°N. A value of 7 mgal was selected as a representative value for the entire area. Prior to contouring, -7 mgal was added to all free-air gravity data.

Interaction Difference Evaluation
Line crossing differences for individual cruises have been summarized in the table shown below. Interaction differences were resolved by profiling gravity data near intersecting lines and evaluating irregularities in the data. Interaction errors between lines from different cruises were found to be small, reflecting the general good quality of the data. Overall error is estimated to be ± 2 mgal in most areas.

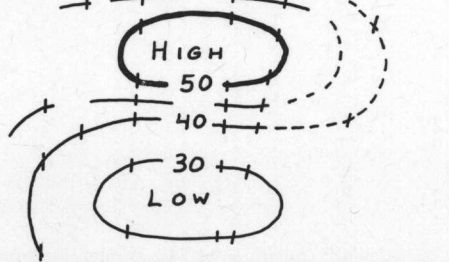
Cruise	Number of line crossings
M/V SURVEYOR	64 89 44 46 19 11 14 9 12
M/V C.H. GREEN	23 23 11 0 1 2 0 0 1
Milligal difference	0 1 2 3 4 5 6 7 7

Albers Equal-Area Projection
The Albers equal-area projection represents areas more accurately than other types of map projections for a region of this size. Edge-joint errors between adjacent maps are minimized by this map projection. Standard parallels of 55°N and 65°N were used for the construction of the Albers equal-area projection, the same parallels as used in the National Atlas of the United States, (U.S. Geological Survey, 1975).

ACKNOWLEDGMENTS
The authors are indebted to several people whose assistance was essential in the preparation of this map. Rebecca Larson, Bruce Langford, and Arthur Council helped reduce and plot navigation and gravity data. Bathymetric charts were provided by R.S. Chase, P.R. Carlson, R. Adams and Lisa Selig. T. R. Alpha and Marybeth Oertel were most helpful in providing base maps and information regarding the Albers equal-area map projection. Technical advice and comments were solicited from L. A. Meyer and Thom McMillan.

REFERENCES
Cassinis, Silvio, 1950, Sur l'adoption d'une formule internationale pour la pesanteur normale. Bulletin Géodésique, Paris, France, no. 26, p. 40-49.
Capputo, Michele, and Hart, L., 1968, The normal gravity formula and the polar flattening according to geostatic reference system 1967. Annali di Geofisica, Rome, Italy, v. 21, no. 7, p. 127-149.
U.S. Geological Survey, 1975, The National Atlas of the United States of America: Washington, D.C., U.S. Geological Survey, 417 p.

EXPLANATION



FREE-AIR GRAVITY CONTOURS - Contour interval 10 milligals; long dashed 5 milligal contours in areas of low gradient; short dashed for widely spaced or uncertain data. Numbers indicate alignment line crossing gravity contours.