

BATHYMETRIC MAP OF THE WESTERN GULF OF ALASKA

by

J.M. Dunlavey, J.R. Childs and R.E. von Huene

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EXPLANATION

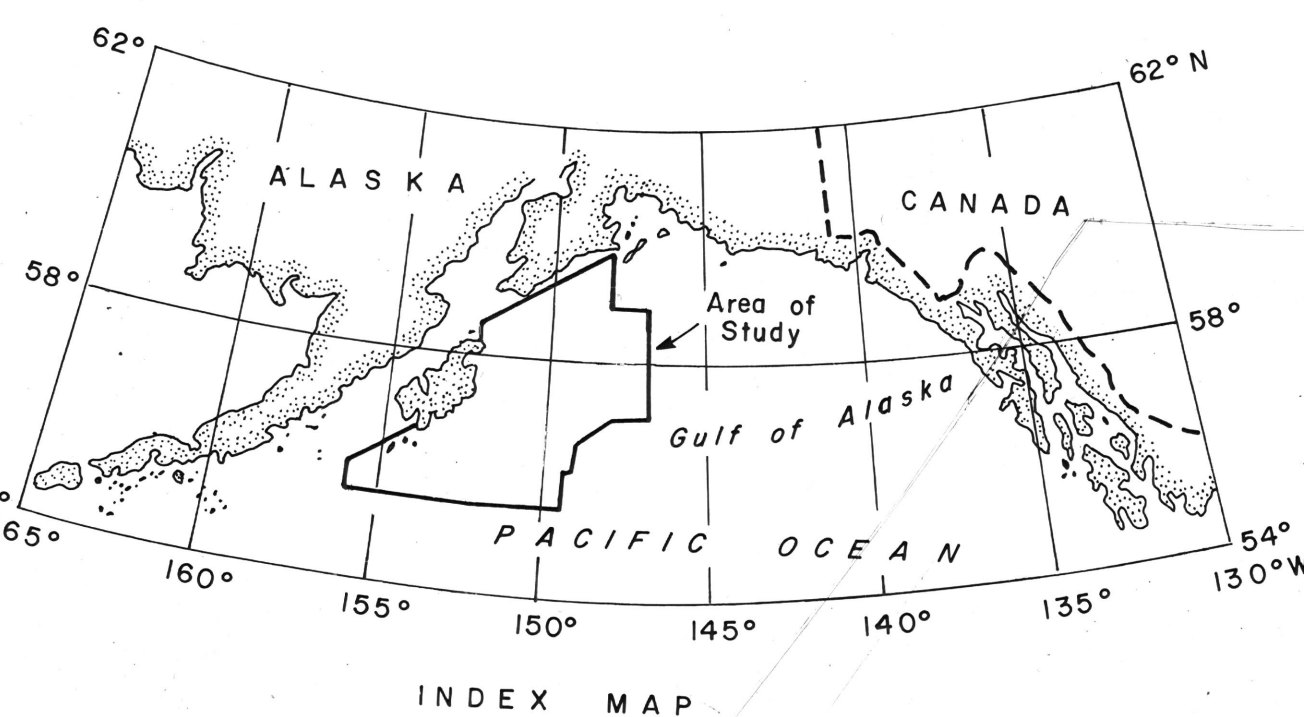
Contour interval 10 meters on continental shelf. A 20 or 25 meter intervals used where space does not permit a 10 meter interval. 100 or 500 meter intervals are used below the 300 meter level depending on the density of data. Dashed lines indicate where data is sparse. Features pointing inward indicate enclosed depressions in the topography and and features pointing outward indicate isolated high areas.

land areas

post 1970 cruises

1930's C. & G.S. cruises

1930's C. & G.S. cruises where tracklines are too closely spaced to delineate



DISCUSSION

These maps are a compilation of bathymetric surveys of the continental shelf and slope southeast of Kotlik Island and the Kenai Peninsula. The cruises from which data were derived are: 1) U.S. Geological Survey ship R/V *Sigsbee*, 1976 (1500 km) and 1977 (1576 km); 2) U.S. Geological Survey ship R/V *Edmond*, 1976 (1576 km), 1977 (1576 km), and 1978 (1500 km); 3) Petty-Ray Corporation, R/V *Sixty*, 1976-77 (9000 km); 4) National Oceanic and Atmospheric Administration ship R/V *Swan*, 1972 (1600 km); 5) Hydrographic Survey cruises conducted by the U.S. Coast and Geodetic Survey (U.S.C. & G.S.) during the years 1931-33.

The navigation systems used on the post-1970 U.S.C. & G.S. cruises were computerized integrations of dead reckoning, satellite Loran C, and doppler sound positioning was accurate to ± 100 m. The Petty-Ray Corporation cruises used a combination of Miniranger, Raydist, and Loran C; the R/V *Swan* used Hifix and acoustic navigation systems. Position for the cruises conducted by the U.S.C. & G.S. during the 1930's was calculated by celestial navigation and triangulation.

Bathymetric instruments used on the R/V *Sigsbee* and the R/V *Sea Sounder* were hull-mounted 3-beam and 12-beam profilers. The R/V *Edmond* acquired bathymetric data through a hull-mounted precision depth recorder (1968). Petty-Ray Corporation obtained data with a 100-m-beam profiler and a 3-beam profiler. Turner and others (1979) present a detailed explanation of depth determination for the Petty-Ray Survey. Average velocities for sound in sea water were determined for the post-1970 cruises; no corrections were made for tidal fluctuations. The U.S.C. & G.S. bathymetric data were collected with a continuously recording echo sounder and leadline corrections were made for variations in tidal height and sound velocity in water.

The solid tracklines (sheet 1 of 4) show the locations of the U.S.C. & G.S. surveys conducted during the 1930's. Thick, dashed tracklines (sheet 1 of 4) show areas of the post-1970 surveys. These two data sets pre-date and post-date, respectively, the May 27, 1964 Great Alaska earthquake, a major seismic event that resulted in many minor changes in bathymetry. A preliminary study of the tidal variation in the study area indicated a range between 0 and 12 feet with an average of 9 feet. Accuracy of bathymetric data of each cruise was determined by comparing recorded depths at line intersections and was found to be nearly uniform at ± 2 meters. The effects caused by the 1964 earthquake were examined in the study area by comparing the U.S.C. & G.S. data with a bathymetric section of the Petty-Ray data. Preliminary results indicate that deformation affected the overall depth by approximately ± 2 meters (Dunlavey, 1978, unpublished data). Thus, the magnitude of error due to tidal fluctuation, recording system error, or earthquake deformation is less than one-half of the 10-meter contour interval. This information supplements the work of Turner, Thatcher, Shaker, and Holden (1979) by combining additional surveys and extending the boundaries of detailed contouring both landward and seaward.

The Albers conic equal-area projection uses straight line meridians and curved line parallels; great circle spacing preserves equivalence of area. The linear scale is accurate on the standard parallels. Although distance and directional measurements are poor, these maps are not intended to be used for navigation.

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REFERENCES

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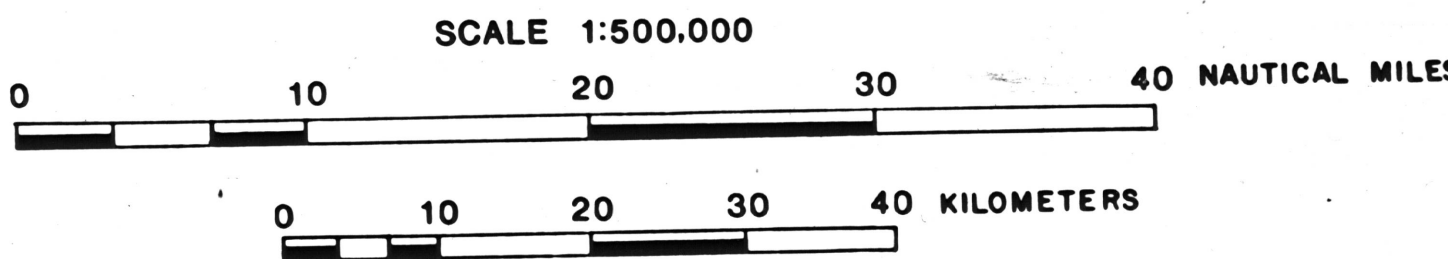
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BATHYMETRIC SURVEYS IN THE WESTERN GULF OF ALASKA

Ship	Organization	Year	Navigation System
Numerous vessels	United States Coast and Geodetic Survey	1931-33	Celestial and triangulation
R/V <i>Swan</i>	National Oceanic and Atmospheric Administration	1972	Hifix and Sea-Fix
R/V <i>Sixty</i>	Petty-Ray Corporation	1976-77	Miniranger, Raydist, and Loran C
R/V <i>Sigsbee</i>	United States Geological	1976-78	Satellite and Loran C
R/V <i>Sea Sounder</i>	United States Geological	1976-78	Satellite and Loran C



Offshore contour interval 10 m, 25 m, and 100 m
Onshore contour interval 200 ft with 100 ft contours represented by dotted lines

Albers Conic Equal-Area Projection
Based on parallels 55° N. and 65° N.