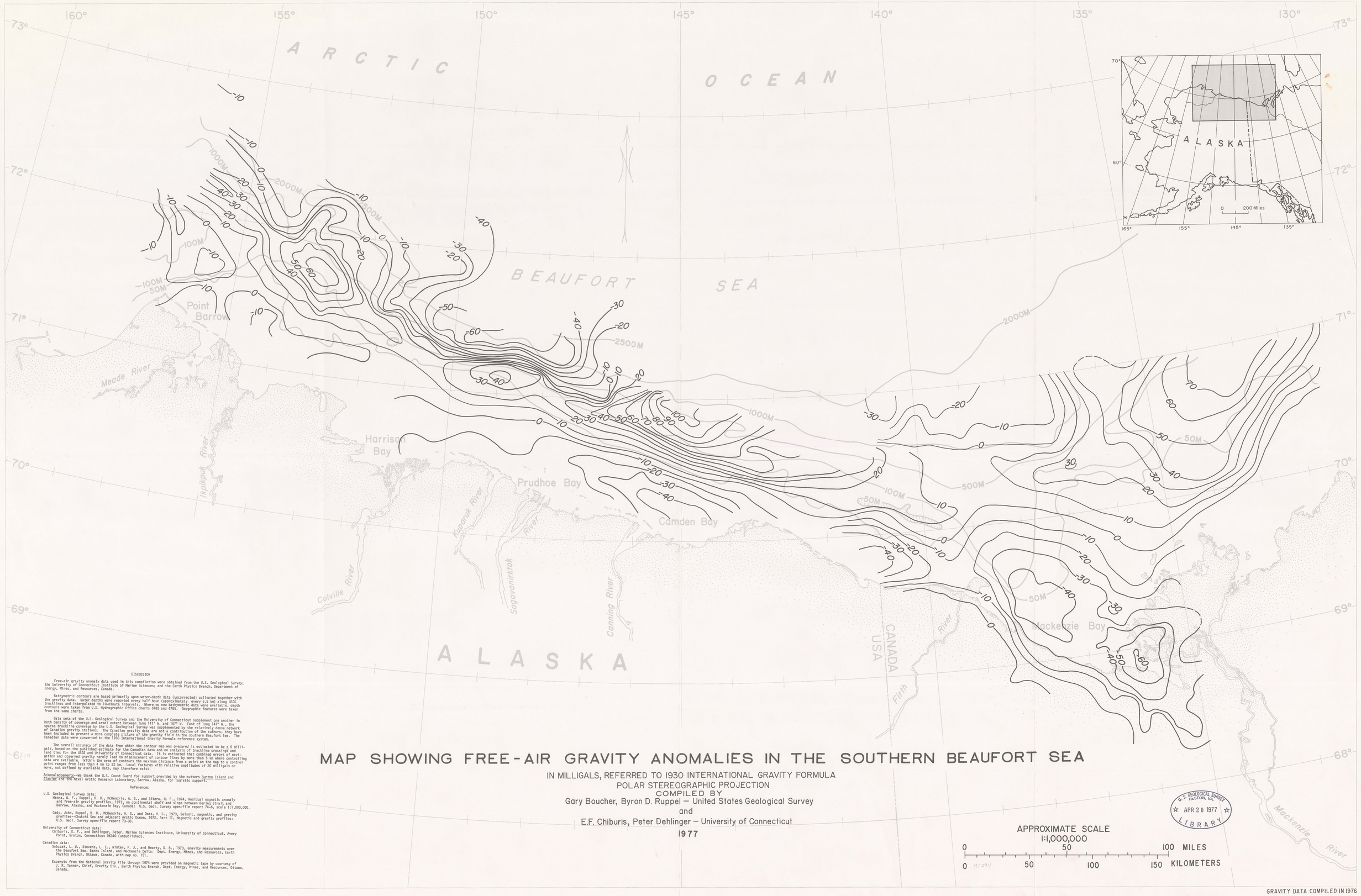
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

MISCELLANEOUS FIELD STUDIES
MAP MF-851
BOUCHER, OTHERS-FREE-AIR
GRAVITY ANOMALIES, BEAUFORT SEA



MAP SHOWING FREE-AIR GRAVITY ANOMALIES IN THE SOUTHERN BEAUFORT SEA

IN MILLIGALS, REFERRED TO 1930 INTERNATIONAL GRAVITY FORMULA
POLAR STEREOGRAPHIC PROJECTION

COMPILED BY
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1977

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DISCUSSION

Free-air gravity anomaly data used in this compilation were obtained from the U.S. Geological Survey; the University of Connecticut Institute of Marine Sciences; and the Earth Physics Branch, Department of Energy, Mines, and Resources, Canada.

Bathymetric contours are based primarily upon water-depth data (uncorrected) collected together with the gravity data. Water depths were reported every half hour (approximately every 5.5 km) along USGS tracklines and interpolated to 10-minute intervals. Where no new bathymetric data were available, depth contours were taken from U.S. Hydrographic Office charts 0782 and 0785. Geographic features were taken from the same charts.

Data sets of the U.S. Geological Survey and the University of Connecticut supplement one another in both density of coverage and areal extent between long 141° W. and 157° W. East of long 141° W., the sparse trackline coverage by the U.S. Geological Survey was supplemented by the relatively dense network of Canadian gravity stations. The Canadian gravity data are not a contribution of the authors; they have been included to present a more complete picture of the gravity field in the southern Beaufort Sea. The Canadian data were converted to the 1930 International Gravity Formula reference system.

The overall accuracy of the data from which the contour map was prepared is estimated to be ± 5 milligals, based on the published estimate for the Canadian data and on analysis of trackline crossings and land ties for the USGS and University of Connecticut data. It is estimated that combined errors of navigation and observed gravity rarely lead to misplacement of contour lines by more than 5 km where controlling data are available. Within the area of contours the maximum distance from a point on the map to a control point ranges from less than 4 km to 22 km. Local features with relative amplitudes of 20 milligals or more, not defined by available data, may therefore exist.

Acknowledgements--We thank the U.S. Coast Guard for support provided by the cutters Burton Island and Staten and the Naval Arctic Research Laboratory, Barrow, Alaska, for logistic support.

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Cady, John, Ruppel, B. D., McHendrie, A. G., and Deas, H. S., 1973, Seismic, magnetic, and gravity profiles--Chukchi Sea and adjacent Arctic Ocean, 1972, Part II, Magnetic and gravity profiles: U.S. Geol. Survey open-file report 73-38.

University of Connecticut data:
Chiburis, E. F., and Dehlinger, Peter, Marine Sciences Institute, University of Connecticut, Avery Point, Groton, Connecticut 06340 (unpublished).

Canadian data:
Sobczak, L. W., Stevens, L. E., Winter, P. J., and Hearty, D. B., 1973, Gravity measurements over the Beaufort Sea, Banks Island, and Mackenzie Delta: Dept. Energy, Mines, and Resources, Earth Physics Branch, Ottawa, Canada, with map no. 151.

Excerpts from the National Gravity File through 1974 were provided on magnetic tape by courtesy of J. R. Tanner, Chief, Gravity Div., Earth Physics Branch, Dept. Energy, Mines, and Resources, Ottawa, Canada.

GRAVITY DATA COMPILED IN 1976

~~Arctic Ocean (Beaufort Sea). Gravity. 1:1,000,000. 1977.~~
~~map~~

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