

UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Digital shipboard gravity and magnetic data collected
in 1982 on the Bering Sea shelf

by

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

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1985

During 1982, the U.S. Geological Survey collected about 5000 km of digital gravity and magnetic data across the Bering Sea shelf (St. George and Bristol Bay and Navarin basins, Figs. 1 and 2) aboard the USGS research vessel S.P. LEE (cruise L9-82-BS). Preliminary results of the cruise are described by Cooper and Marlow (1983). Other magnetic traverses of the area (Cooper et al., 1985), a magnetic map of the adjoining Umnak Plateau region (Childs et al., 1981) and gravity maps of the Bering sea (Childs et al, 1985a,b,c) are also available.

MAGNETIC DATA

Total field magnetic data were sampled with a Geometrics proton precession magnetometer and recorded every 4 seconds. The magnetometer was towed 183 meters behind the ship at a depth of between 18 and 31 meters. Reduction of the magnetic data included removal of the 1975 IGRF regional field (IAGA,1976), corrected to 1982, to obtain a total field anomaly. The location of each magnetic reading is not corrected for the 183 meter tow distance of the magnetometer behind the ship. Temporal magnetic variations have not been removed from the data.

GRAVITY DATA

Shipboard gravity data were recorded at 20 second intervals with a 2-axis, stable-platform, LaCoste-Romberg seagravimeter (meter S-53). Eotvos corrections, based on the final smoothed navigation, and adjustments for the 1967 reference ellipsoid (International Association of Geodesy, 1971) were applied to the field data to obtain free-air anomalies. A correction for gravity meter drift was also applied using base-station ties at the start (Dutch Harbor, AK) and end (Nome, AK) of the cruise.

NAVIGATION DATA

Navigational control of the survey was by satellite fixes integrated with Loran C (Rho-Rho) and doppler-sonar bottom-track navigation. Course and speed values between navigational fixes were subsequently smoothed for the gravity data to remove large changes in eotvos corrections.

DIGITAL DATA

In the final stage of the data reduction, the gravity and magnetic data were merged with the navigation data at 1 minute intervals and stored on magnetic tape. The information contained on the tape includes:

Year	Observed gravity	Observed magnetics
Julian Day	Theoretical gravity	IGRF regional field
Hour	Eotvos correction	Total field anomaly
Minute	Free-air anomaly	Latitude/Longitude

Copies of the data are available through the National Geophysical Data Center, NOAA/EDIS/NGDC, Code D64, 325 Broadway, Boulder, CO 80303. Telephone (303) 497-6338.

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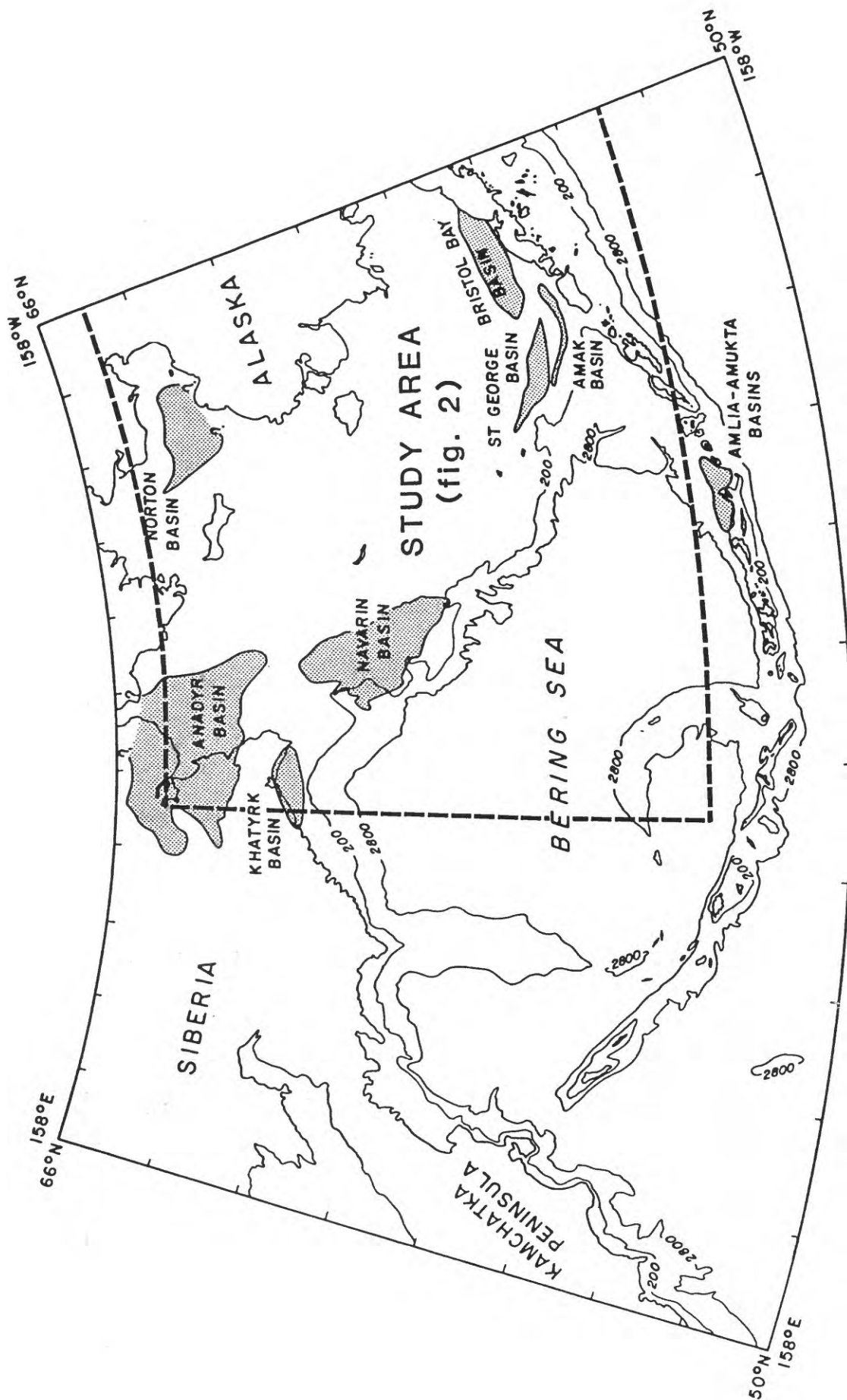


Figure 1: Index map of the Bering Sea showing location of trackline map in figure 2.

176°E

L9-82-BS

158°W

65°N

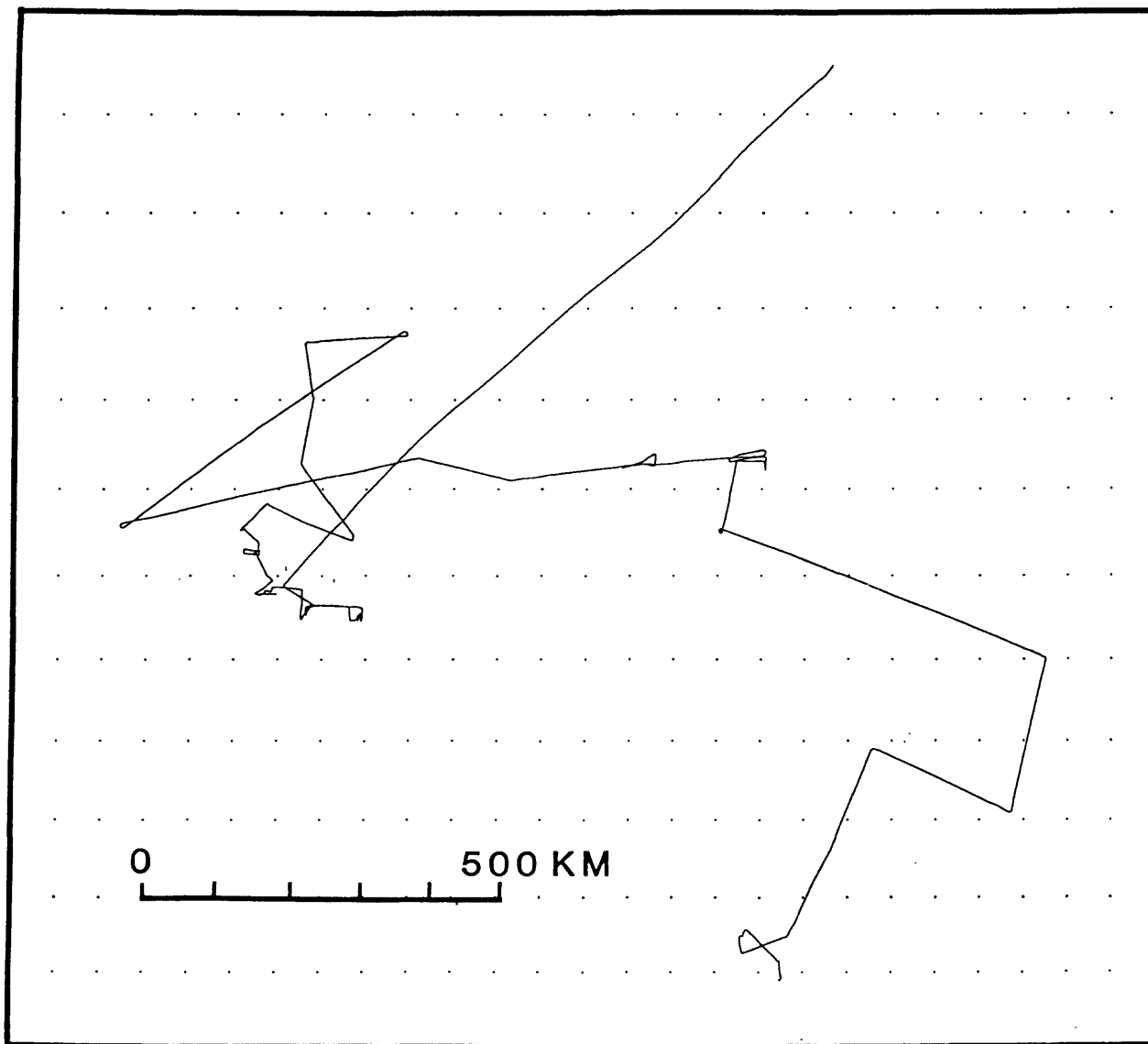


Figure 2: Map showing location of ship tracklines for USGS cruise L9-82-BS. Gravity and magnetic data were collected along most, but not all segments of these tracklines. See figure 1 for location.