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Seismic-reflection data from R/V FARNELLA cruises FRNL82-7, FRNL85-1, FRNL85-2, and FRNL85-3A in the U.S. Gulf of Mexico EEZ

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During the winter of 1982 and the summer and early fall of 1985, the U.S. Geological Survey (USGS) in cooperation with the Institute of Oceanographic Sciences of the United Kingdom collected approximately 30,508 line kilometers of seismic-reflection data in the U.S. Gulf of Mexico Exclusive Economic Zone (EEZ) as part of a USGS program to map the EEZ. In water depths exceeding 3,000 m, survey line spacing was about 25 km and gradually decreased to about 5 km in 250 m water depths. No areas were surveyed with depths shallower than 250 m. Orientation of the tracklines was in general parallel to the trend of the bathymetric contours (Figs. 1, 2, 3, and 4).

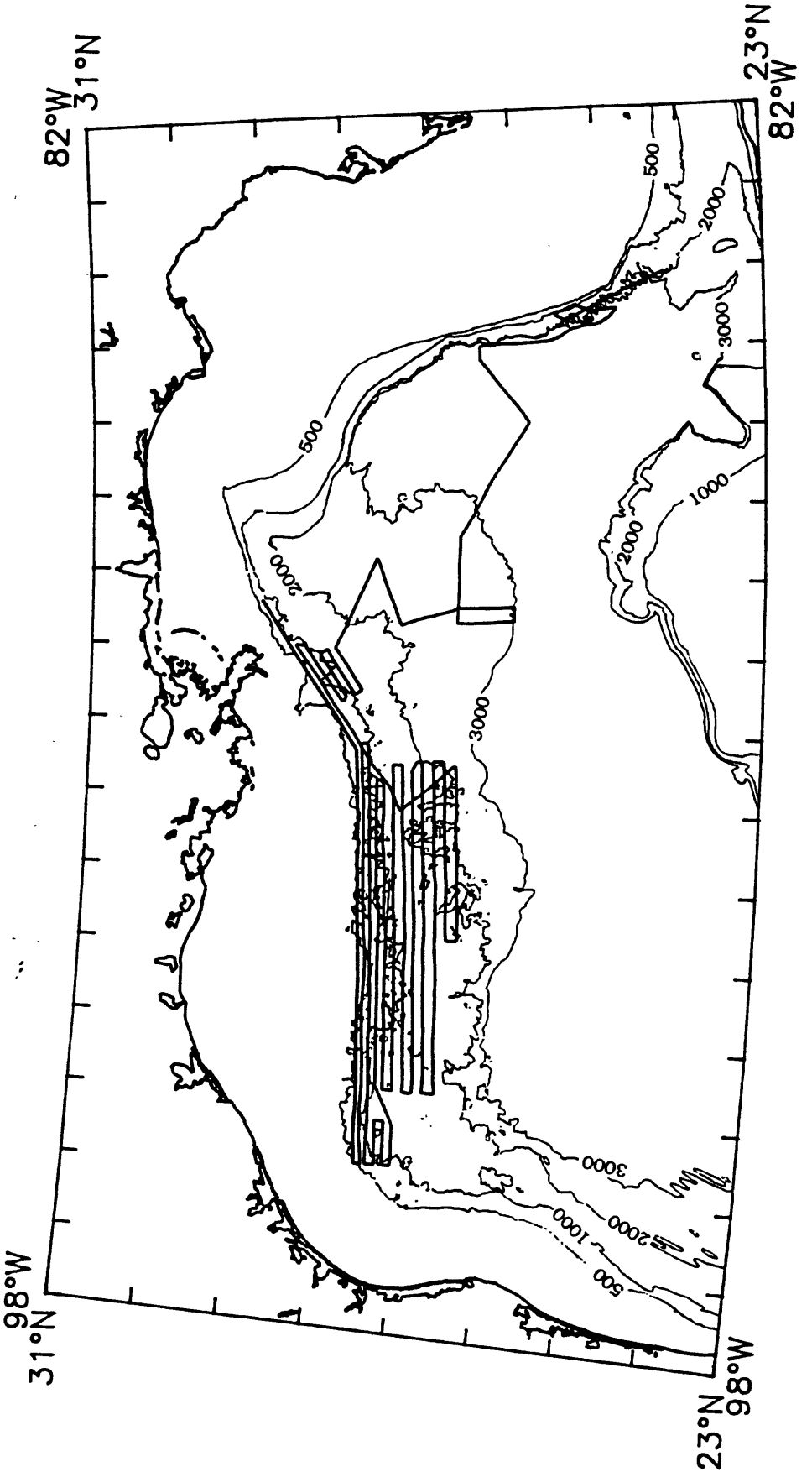
Four cruises were conducted aboard the R/V FARNELLA. The cruise in 1982 (3-23 February) collected approximately 7,725 line kilometers of seismic data, primarily on the continental slope of the western Gulf, although some data were collected in the central and eastern Gulf as well (Fig. 1). Leg 1 of the three cruises in 1985 (7 August-3 September) covered the lower slope and rise in the western Gulf, acquiring 8,195 line kilometers of single-channel seismic-reflection data (Fig. 2). Leg 2 (5-29 September) surveyed the central Gulf, where 8,010 line kilometers of seismic data were collected (Fig. 3). Leg 3A (2-22 October) surveyed the eastern Gulf and acquired 6,578 line kilometers of seismic data (Fig. 4).

Primary navigation during the cruise in 1982 and the first two legs of the cruises in 1985 was Loran-C. Leg 3A of the 1985 cruise used a combination of Loran-C, transit satellite, and Global Positioning System fixes.

The seismic-reflection data were collected using a single airgun as the seismic source, a two-channel hydrophone receiver with the two channels summed together, and an analog paper recorder for display. The size of the

airgun varied from 40-in^3 to 160-in^3. In 1982, a 40-in^3 airgun was used on the first part of the cruise on the continental slope in the western Gulf. This was replaced by a 80-in^3 airgun for the part of the cruise in the central and eastern Gulf. In 1985, legs 1 and 2 primarily used a 160-in^3 airgun although at times an 80-in^3 airgun was used. Leg 3A primarily used an 80-in^3 airgun source although a 160-in^3 airgun was used in places. The seismic signals were mostly filtered between 20 and 200 Hz on all cruises and were recorded at 2- and 4-second sweep rates in 1982 and 5- and 8-second sweep rates in 1985. The records generally are of good quality for a single-channel system, and subbottom penetration exceeded 2 seconds in the central Gulf of Mexico but was considerably less on the continental slope in the northwestern Gulf and in the shallow water of the easternmost Gulf.

The original seismic records may be examined at the U.S. Geological Survey, Woods Hole, MA 02543. Microfilm copies of these data can be purchased only from the National Geophysical Data Center, 325 Broadway, Boulder, CO 80303, telephone (303) 497-6345.



FARNELLA 1982 GULF OF MEXICO

FIGURE 1 Trackline map for 1982 R/V FARNELLA cruise. Thick lines represent the ship's track along which seismic data were collected. Thin lines are bathymetric contours in meters.

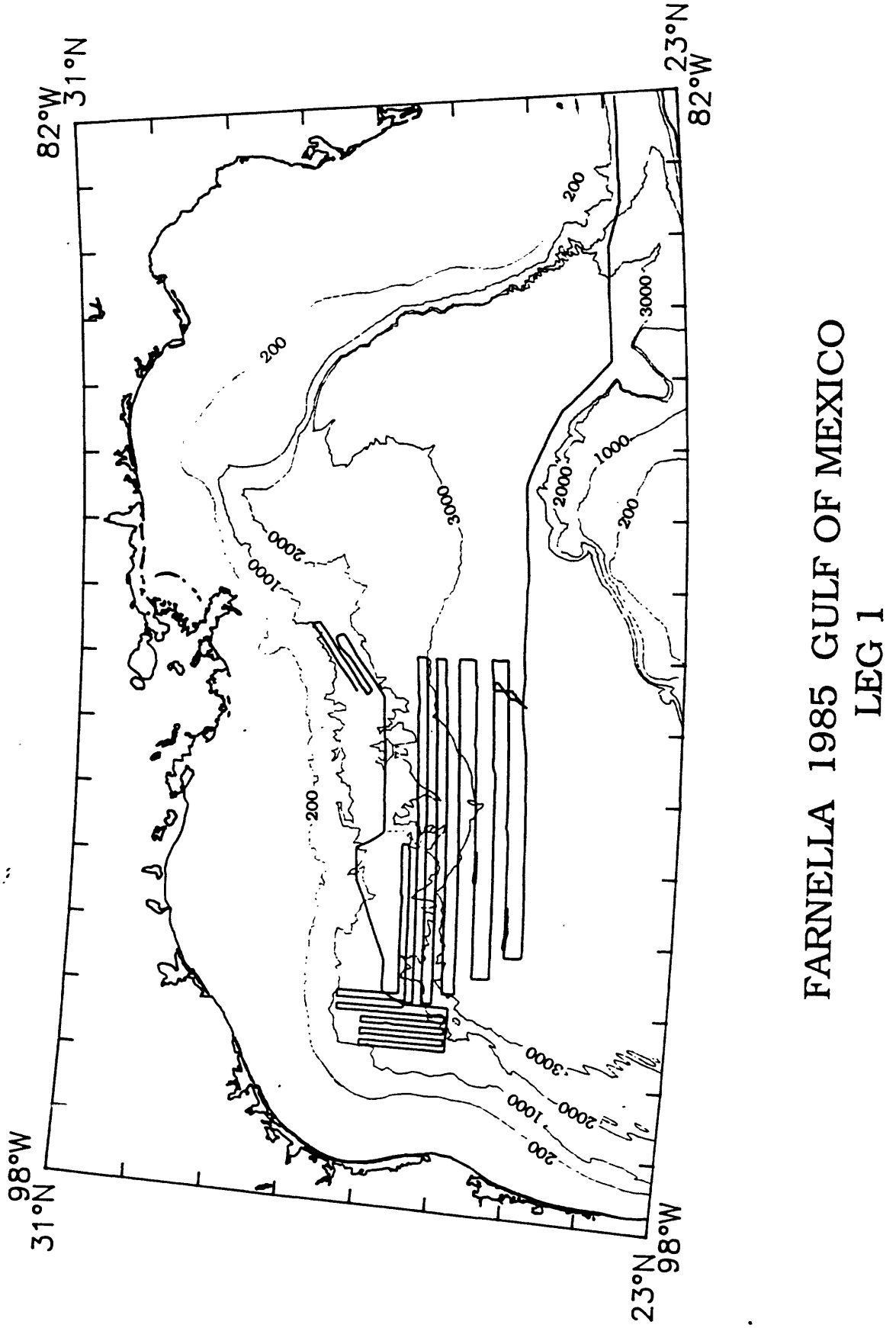


FIGURE 2 Trackline map for R/V FARNELLA cruise FRNL85-1. Thick lines represent the ship's track along which seismic data were collected. Thin lines are bathymetric contours in meters.

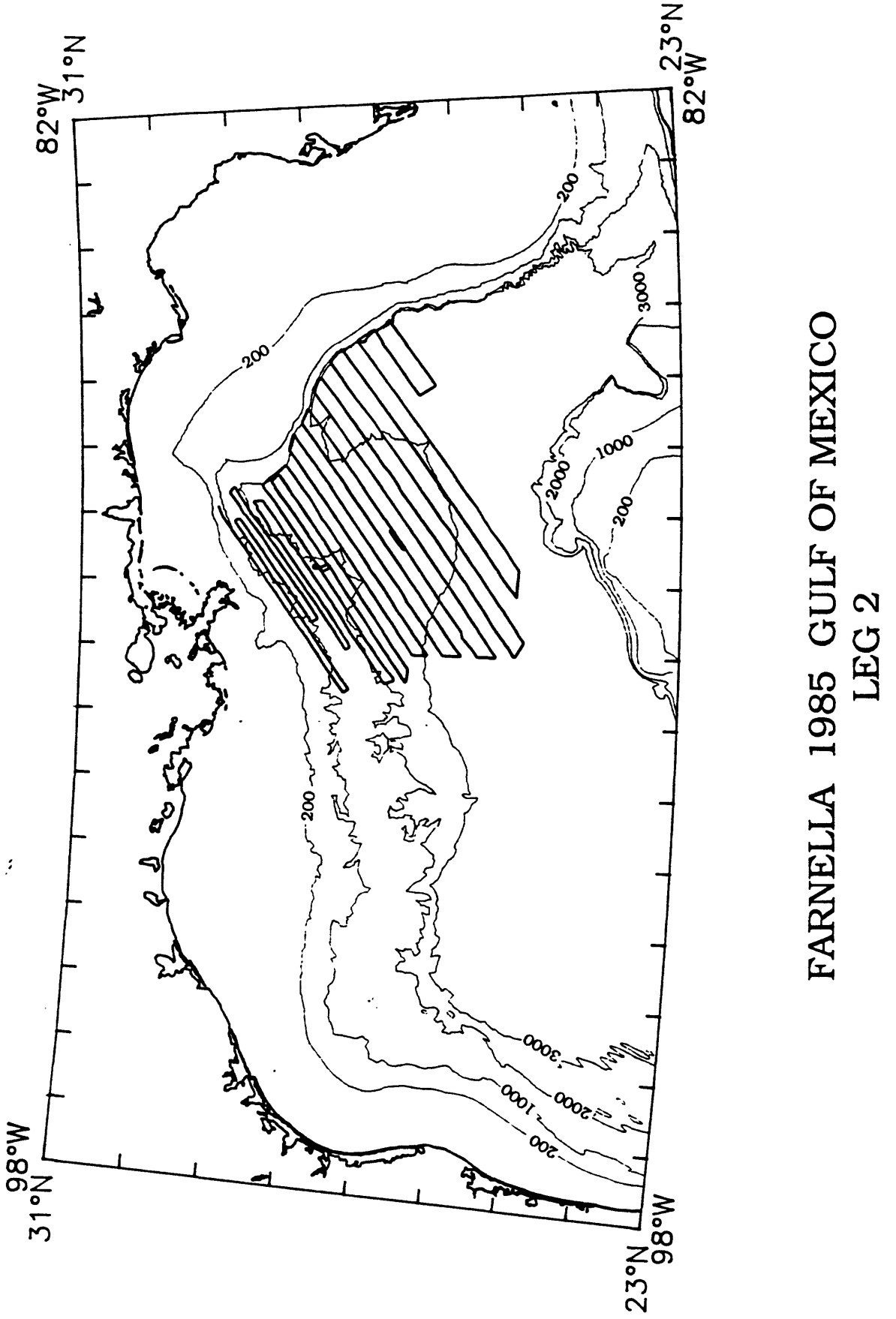


FIGURE 3 Trackline map for R/V FARNELLA cruise FRNL85-2. Thick lines represent the ship's track along which seismic data were collected. Thin lines are bathymetric contours in meters.

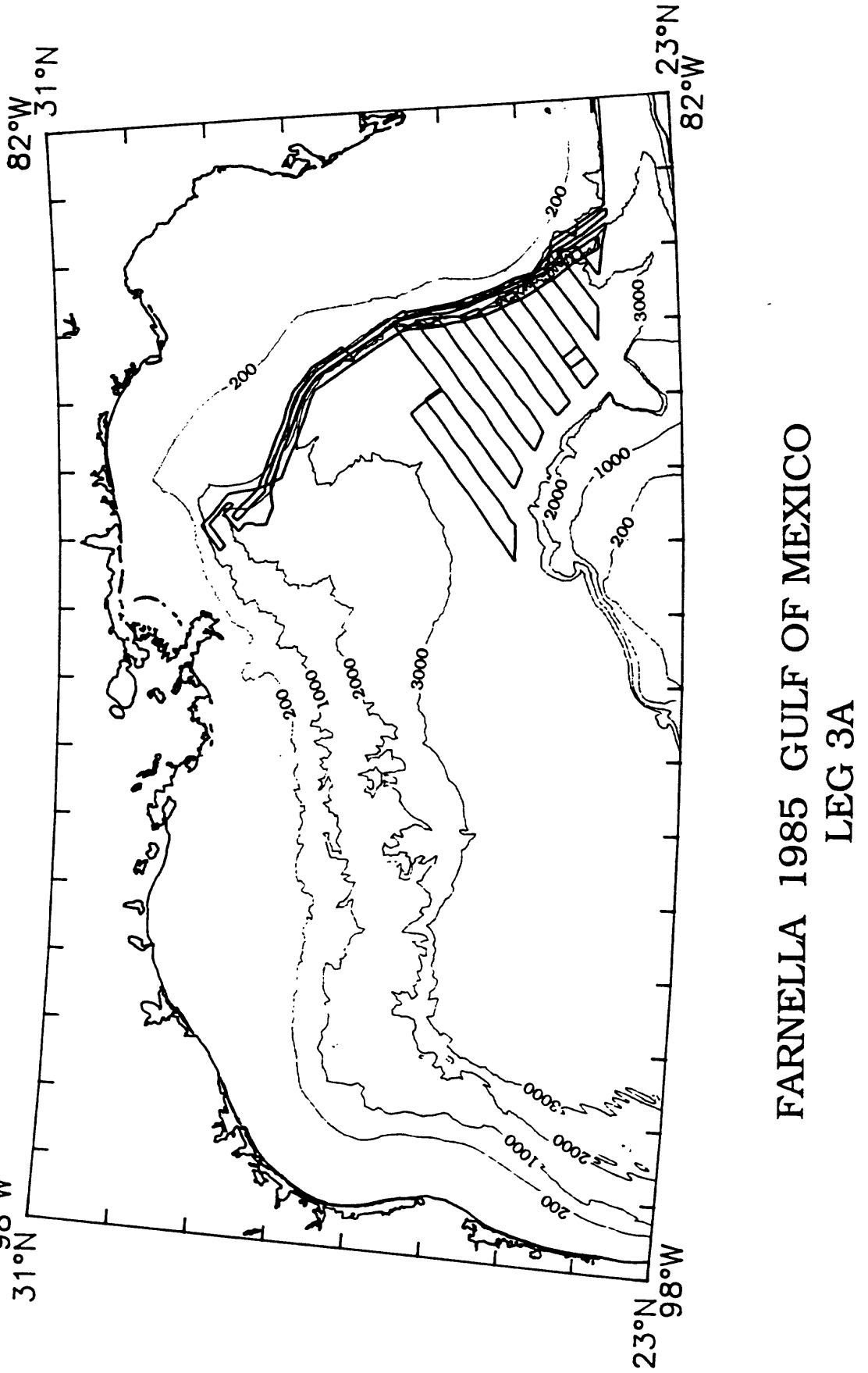


FIGURE 4 Trackline map for R/V FARNELLA cruise FRNL85-3A. Thick lines represent the ship's track along which seismic data were collected. Thin lines are bathymetric contours in meters.