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U.S. Geological Survey Open-File Report 82-842*
HIGH-RESOLUTION SEISMIC DATA AND BATHYMETRIC, GRAVIMETRIC, AND MAGNETIC
DATA FROM THE NORTHERN GULF OF MEXICO COLLECTED DURING
R/V GYRE CRUISE G-81-6

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High-resolution, single-channel seismic and bathymetric surveys were conducted in two study areas in the northern Gulf of Mexico during R/V GYRE cruise G-81-6 in April 1981 by the U.S. Geological Survey. The study areas include parts of the Louisiana-Mississippi Outer Continental Shelf, Mississippi Trough, adjacent Texas-Louisiana Slope, and upper Mississippi Fan (Fig. 1). Furthermore, gravimetric, magnetic, and high-resolution seismic studies were conducted over seven banks on the Louisiana Outer Continental Shelf (Fig. 1). The data from the Outer Continental Shelf (OCS) of eastern Louisiana and Mississippi were obtained as part of a geological hazard study for the U.S. Bureau of Land Management. The survey grid (Fig. 2) consisted of lines, parallel and perpendicular to the shelf break, at 5-km spacings. The collection of 2,500 km of seismic-survey track lines (Table 1) included the following systems: (1) 400-joule minisparker, (2) 3.5-kHz subbottom profiler, (3) 40-in³ and 5-in³ airguns, and (4) 12-kHz precision depth recorder (PDR). Resolution of the analog records was enhanced by use of seismic-signal amplifiers and band-pass filters. Navigation was accomplished with an integrated navigation system.

During the gravimetric, magnetic, and high-resolution seismic studies conducted over seven banks on the OCS off central Louisiana, each of the banks was "crossed" by two gravimeter and magnetometer survey track lines (N-S, E-W). Coordinates of each bank are given in Table 2. The survey was augmented with high-resolution records from a 3.4-kHz subbottom profiler and a 12-kHz bathymetric profiler. The survey track lines totaled 416 km, including mileage between the study areas (Table 3).

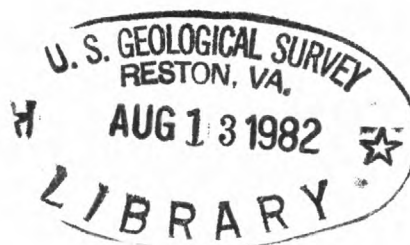
*This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards.

The high-resolution seismic and bathymetric surveys over the Mississippi Trough, the adjacent Texas-Louisiana Slope, and the upper Mississippi Fan (Fig. 3) were the first half of a study conducted to support drill-site selection for a proposed Deep Sea Drilling Project program (Stelting and Kindinger, 1982). The seven survey track lines totaled 475 km. The survey utilized the same seismic systems used during the Louisiana-Mississippi OCS survey except that the power of the minisparker was increased to 800 joules (Table 4). An inventory of the seismic lines on microfilm is listed in Table 5.

The original data may be seen at the U.S. Geological Survey offices at 6300 Ocean Drive, Corpus Christi, Texas. Copies of the data on 35-mm microfilm may be purchased only from the National Geophysical and Solar-Terrestrial Data Center, NOAA/EDIS/NGSDC, 325 Broadway, Boulder, Colorado, 80303 (303-497-6338).

References Cited

- Moore, G. T., Starke, G. W., Bonham, L. C., and Woodbury, H. O., 1978, Mississippi Fan, Gulf of Mexico--physiography, stratigraphy, and sedimentation patterns, in A. H. Bouma, G. T. Moore, and J. M. Coleman, eds., Framework, facies, and oil-trapping characteristics of upper continental margin: American Association of Petroleum Geologists, Studies in Geology No. 7, p. 155-191.
- Stelting, C. E., and Kindinger, J. L., 1982, High-resolution seismic data and bathymetric data from the central region of the Mississippi Fan, Gulf of Mexico: U.S. Geological Survey Open-File Report 82-605, 7 p.



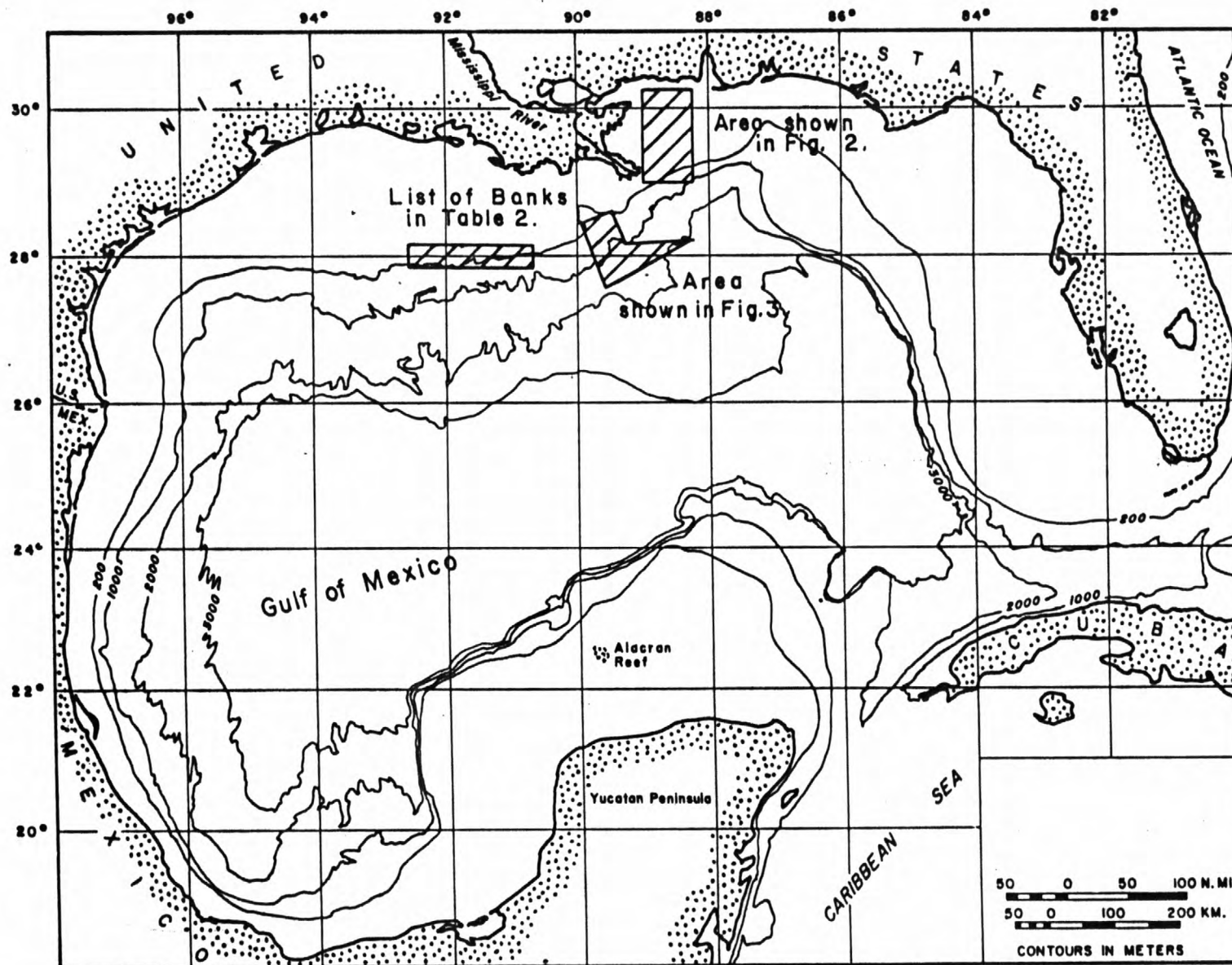


Figure 1. Location of study areas, R/V GYRE cruise G - 81 - 6.

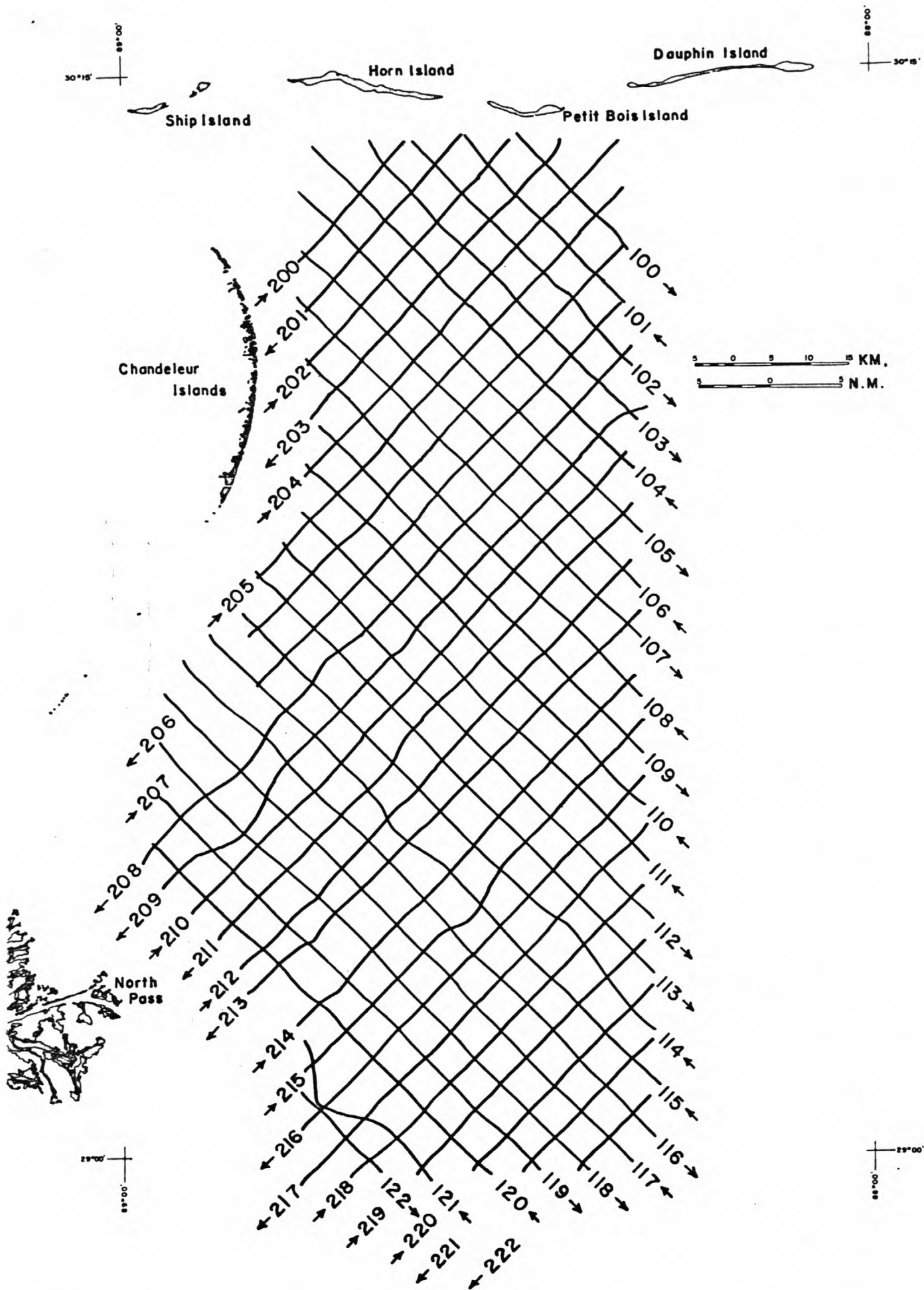


Figure 2. Seismic survey grid of the Louisiana-Mississippi OCS area.

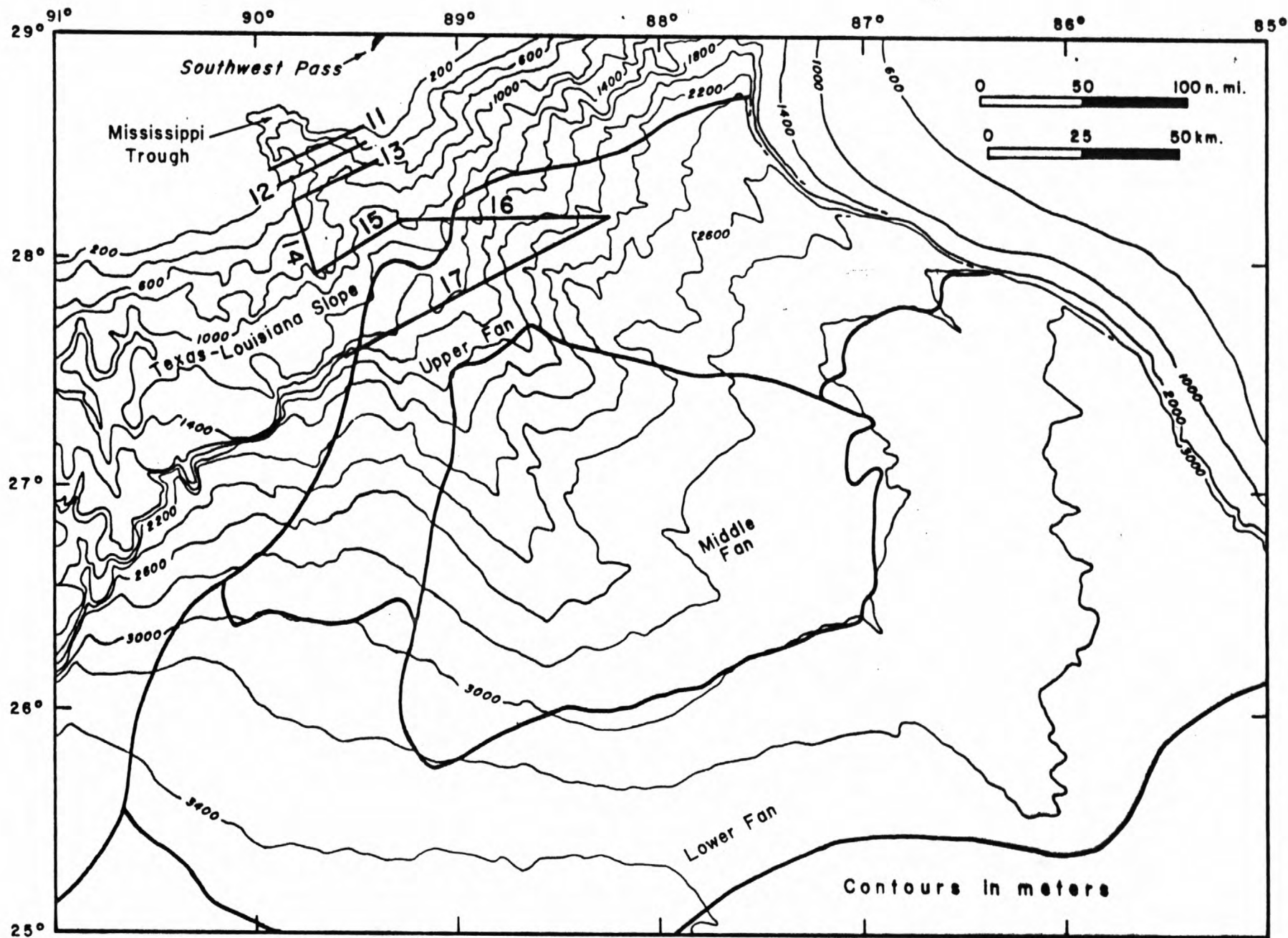


Figure 3. Seismic lines across Mississippi Trough, Texas-Louisiana slope, and upper Mississippi Fan, R/V GYRE cruise G - 81 - 6. Physiographic units of the Mississippi Fan modified from Moore et al. (1978).

TABLE 1. Louisiana-Mississippi OCS area: Inventory of seismic lines on microfilm. (The numbered seismic lines are shown in Figure 2.)

| LINE NO. | TYPE OF PROFILE | LINE NO. | TYPE OF PROFILE |
|----------|-------------------------------------|----------|-----------------|
| 100 | Minisparker, 12 kHz, and 3.5 kHz | 101 | Airguns |
| 101 | " | 102 | " |
| 102 | " | 107 | " |
| 103 | " | 108 | " |
| 104 | " | 110 | " |
| 105 | " | 111 | " |
| 106 | " | 112 | " |
| 107 | " | 113 | " |
| 108 | " | 114 | " |
| 109 | " | 115 | " |
| 110 | " | 116 | " |
| 111 | " | 117 | " |
| 112 | " | 118 | " |
| 113 | " | 119 | " |
| 114 | " | 120 | " |
| 115 | " | 121 | " |
| 116 | " | 122 | " |
| 117 | " | 204 | " |
| 118 | " | 208 | " |
| 119 | " | 209 | " |
| 120 | " | 210 | " |
| 121 | " | 211 | " |
| 122 | " | 212 | " |
| 200 | " | 213 | " |
| 201 | " | 214 | " |
| 202 | " | 214 | " |
| 203 | " | 215 | " |
| 204 | " | 216 | " |
| 205 | " | 217 | " |
| 206 | " | 218 | " |
| 207 | " | 219 | " |
| 208 | " | 220 | " |
| 209 | " | 221 | " |
| 210 | " | 222 | " |
| 211 | " | | |
| 212 | " | | |
| 213 | " | | |
| 214 | " | | |
| 215 | " | | |
| 216 | " | | |
| 217 | " | | |
| 218 | " | | |
| 219 | " | | |
| 220 | " | | |
| 221 | " | | |
| 222 | " | | |

Table 2. Coordinates of banks surveyed

| Bank | Coordinates of Banks | |
|------------|-------------------------|---------|
| Bouma | 28°03' | 35.73"N |
| | 92°27' | 51.47"W |
| Parker | 27°56' | 49.10"N |
| | 92°00' | 40.08"W |
| Alderliche | 28°04' | 36"N |
| | 91°59' | 36.5"W |
| Jackula | 27°58' | 56.63"N |
| | 91°39' | 15.84"W |
| Ewing | 28°05' | 43.87"N |
| | 90°59' | 41.37"W |
| Diaphus | 28°05' | 18.62"N |
| | 90°42' | 25.92"W |
| Sackett | 28°38' | 0.89"N |
| | 89°33' | 21.56"W |

TABLE 3. Seven Banks on the northern Gulf of
Mexico outer continental shelf
(Inventory of Seismic Lines on Microfilm)

| Line No. | 3.5 kHz | Line No. | 12 kHz |
|----------|---------|----------|--------|
| 10 | " | 11 | " |
| 11 | " | 12 | " |
| 12 | " | 18 | " |
| 18 | " | 19 | " |
| 19 | " | 20 | " |
| 20 | " | 22 | " |
| 21 | " | 23 | " |
| 22 | " | 1 | " |
| 23 | " | 2 | " |
| 1 | " | 3 | " |
| 2 | " | 4 | " |
| 3 | " | 5 | " |
| 4 | " | 6 | " |
| 5 | " | 7 | " |
| 6 | " | 8 | " |
| 7 | " | 9 | " |
| 8 | " | 10 | " |
| 9 | " | | |

TABLE 4. Mississippi Trough, Texas-Louisiana Slope, and upper Mississippi Fan: Location and type of seismic coverage (Locations of seismic lines are shown in Figure 3.).

| Survey line | Degrees-decimal minutes | | Number of shot points | Distance | | Instruments Used | | | |
|-------------|-------------------------|------------------------|-----------------------|------------|----------------|------------------|--------|--------------|---------|
| | Start of line | End of line | | Kilometers | Nautical miles | 12kHz | 3.5kHz | Mini-sparker | Air-gun |
| 11 | 28-36.09N 89-27.66W | 28-24.36N 89-55.56W | 169 | 51 | 27 | X | X | X | X |
| 12 | 28-19.91N 89-53.53W | 28-31.18N 89-27.27W | 160 | 48 | 26 | X | X | X | X |
| 13 | 28-27.02N 89-23.65W | 28-15.85N 89-48.70W | 154 | 46 | 25 | X | X | X | X |
| 14 | 28-15.57N 89-48.84W | 27-56.28N 89-41.10W | 127 | 38 | 21 | X | X | X | X |
| 15 | 27-56.18N 89-40.82W | 28-10.94N 89-16.13W | 164 | 49 | 27 | X | X | X | X |
| 16 | 28-11.14N 89-16.00W | 28-12.12N 88-15.90W | 329 | 99 | 53 | X | X | X | X |
| 17 | 28-11.93N 88-15.97W | 27-34.97N 89-33.04W | 480 | 144 | 78 | X | X | X | X |

TABLE 5. Mississippi Trough, Texas-Louisiana Slope, and
upper Mississippi Fan

Inventory of seismic lines on microfilm
(Locations of seismic lines are shown in Figure 3).

| Lines | 3.5 kHz, minisparker, 12 kHz, and airguns |
|-------|--|
| 11 | " |
| 12 | " |
| 13 | " |
| 14 | " |
| 15 | " |
| 16 | " |
| 17 | " |