

**EXPLANATION**

— 30 — SEDIMENT THICKNESS LINE IN MILLISECONDS OF TWO-WAY TRAVEL TIME— Dashed where approximately located. Contour interval 10 milliseconds. Thickness contours indicate sediments deposited over Continental Shelf during approximately the last 18,000 years, or since the last low stand of sea level during Wisconsin time. Thickness based on acoustical properties of the sediments and interpreted from sound analog profiles. Acoustical survey based on two sound systems: (1) Acousti-pulse<sup>®</sup> with an output of 1000-1500 joules; and (2) miniparker with an output of 800 joules. One millisecond approximately equal to 0.73 m.

— FAULTS THAT OFFSET POST-WISCONSIN SEDIMENTS—Dots indicate offset of at least 50 milliseconds at a subsurface depth of about 250 milliseconds; open diamonds indicate fault intersects sea-floor surface. Short line indicates fault shown by acoustical profile but spacing of profiles too wide to indicate trend; hachure indicates downthrown side.

AREA IN WHICH THICKNESS OF POST-WISCONSIN SEDIMENTS EXCEEDS 40 MILLISECOND—Stippled indicates sediments characterized by poor acoustical return. Attenuation of sound by sediments within stippled area suggests either high organic content or relatively high gas content at shallow depth.

CARBONATE REEF OF PLEISTOCENE AGE—Dashed line indicates general outline of reef buried beneath post-Pleistocene sediments; black indicates outcrop of reef.

The use of brand names is for descriptive purposes only and does not necessarily constitute endorsement by the U.S. Geological Survey.

**DISCUSSION**

This map is one of a set of six environmental geologic maps for the Port Isabel 1° x 2° quadrangle, Texas. The six maps constitute a marine geologic atlas that has been designed to integrate a variety of environmental data and to show the fundamental geologic and associated processes involved in the building and evolution of the Continental Shelf.

The topical maps interrelate data on water circulation and sedimentation, trace metals, geochemistry, biogeology, sea-level change, and deformational movements within the Continental Shelf, including folding, faulting, diapirism, and slumping. The types of data portrayed on individual maps are those that have a cause-and-effect interrelationship in the environment. For example, amounts of trace elements and numbers of invertebrates that live in bottom sediments are both closely related to the grain size or texture of the sediments. Likewise, the sediment-deposition rate is dependent on the speed and direction of oceanographic currents (both surface and subsurface). The maps are organized to emphasize the interactions of processes as a function of time and to demonstrate the long-term effects of the related processes. Thus, map A covers the most fundamental aspect of marine geology, the rate at which sediment introduced to the ocean is spread by its transporting medium, water. The rate of spreading varies from minutes and hours to seasons and years; therefore, yearly rates of sediment deposition are related to the movement of water averaged in both yearly and seasonal increments. Map B shows trace-metal data for surficial bottom sediments. Map C portrays somewhat longer term cumulative effects of the varying hydraulic regimes, as revealed by the grain size of surficial bottom sediments (sampled to a depth of 6 cm), and the variations in the texture and type of sediment deposited over hundreds or thousands of years, as revealed by gravity cores that penetrated to depths from a few tens of centimeters to 2 m. The amount of sediment deposited over the Continental Shelf and the extent and magnitude of faulting since the last low stand of sea level, about 18,000 years ago, are shown on map D. Map E shows paleogeography of the shelf when it was exposed as land and the sedimentary facies of the ancestral Rio Grande delta that was built across the shelf as sea level fell prior to 18,000 years ago. The cumulative deformation caused by the interaction of sediment loading, diapirism, and sea-level changes over the past several hundred thousand years are shown on map F.

The maps of the Port Isabel 1° x 2° quadrangle include the Federal lease block grid and bathymetry, so that the data and interpretations can be easily tied to a specific legal geographic entity within the region at a scale large enough to permit reasonable accuracy of location. These maps provide a summary state-of-the-art inventory of the segment of the Continental Shelf located in the Port Isabel 1° x 2° quadrangle that can be used in planning specific site studies as well as more detailed topical investigations.

**SUPPLEMENTARY READINGS**

Berryhill, H. L., Jr., editor, 1977a, Environmental studies, south Texas outer continental shelf, 1975—An atlas and integrated summary, U.S. Geological Survey report to the U.S. Bureau of Land Management, contract 08550-MU5-20, 303 p.

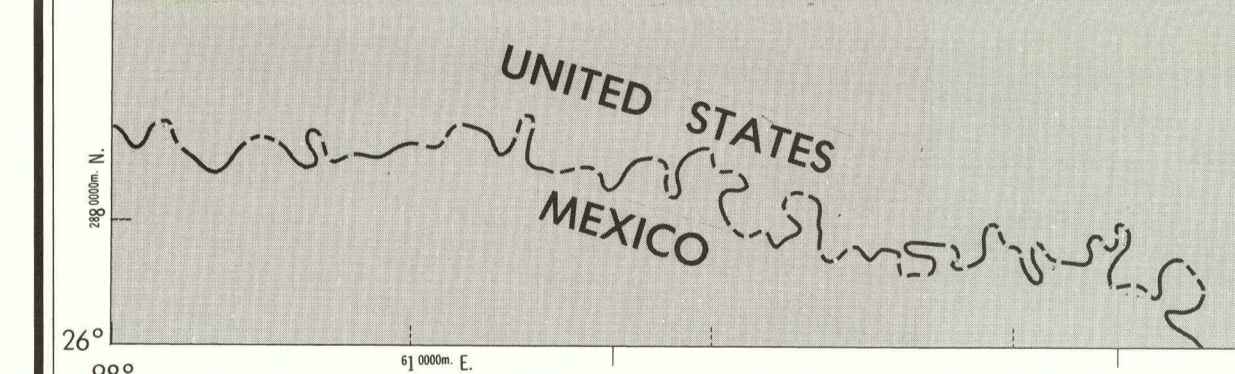
1977b, Environmental studies, south Texas outer continental shelf, 1976—Geology, Reston, Va., U.S. Geological Survey, available only from U.S. Department of Commerce, National Technical Information Service, Springfield, VA 22161, as Report PB 277-337/AS, 626 p.

1978, Environmental studies, south Texas outer continental shelf, 1977—Geology, Reston, Va., U.S. Geological Survey, available only from U.S. Department of Commerce, National Technical Information Service, Springfield, VA 22161, as Report PB 289-144/AS, 306 p.

Berryhill, H. L., Jr., Stidler, G. L., Holmes, C. W., Hill, G. W., Barnes, S. S., and Martin, R. G., Jr., 1976, Environmental studies of the south Texas outer continental shelf, 1975—Geology—Part I, Geologic description and interpretation: Reston, Va., U.S. Geological Survey, available only from U.S. Department of Commerce, National Technical Information Service, Springfield, VA 22161, as Report PB 251341, 273 p.

Poag, C. W., 1973, Late Quaternary sea levels in the Gulf of Mexico: Gulf Coast Association of Geological Societies, 23rd Annual Convention, Houston, Texas, 1973, Transactions, v. 23, p. 394-400.

Poag, C. W., and Valentine, P. C., 1976, Biostratigraphy and ecostatigraphy of the Pleistocene basin, Texas-Louisiana continental shelf: Gulf Coast Association of Geological Societies, 26th Annual Meeting, Shreveport, Louisiana, 1976, Transactions, v. 26, p. 185-256.

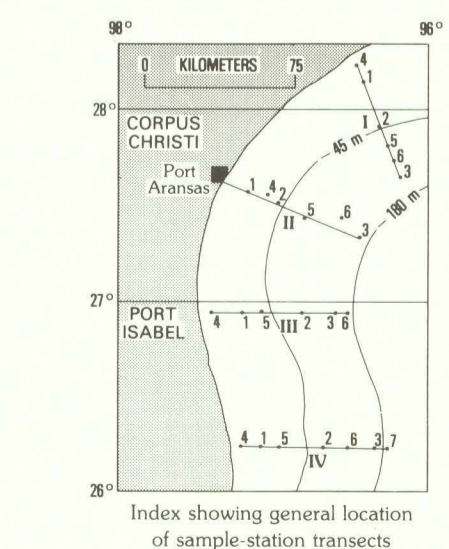
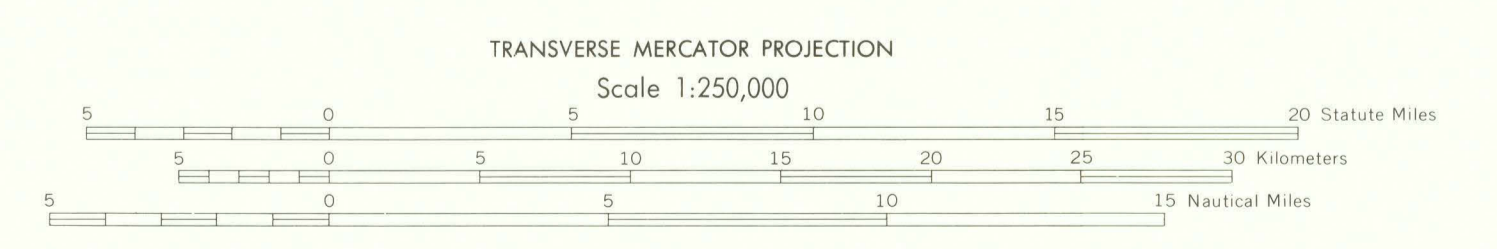


**EVALUATION OF BATHYMETRIC SURVEY ACCURACY**

SURVEY NUMBER	SURVEY DATE	SCALE	SURVEY LINE SPACING (NAUT. MILES)	HORIZONTAL POSITIONING (METERS)
H-6397	1938	1:20,000	06-17	20-40
H-6403	1938	1:40,000	41-17	30-100
H-6405	1938	1:80,000	10-20	40-700
H-6489	1939	1:20,000	06-23	20-40
H-6490	1939	1:20,000	06-13	20-40
H-6491	1939	1:20,000	03-14	20-40
H-6493	1939	1:10,000	02-04	15-30
H-6494	1939	1:40,000	08-24	30-100
H-6495	1939	1:40,000	15-30	30-100
H-6496	1939	1:40,000	12-28	30-100
H-6497	1939	1:80,000	10-20	40-200
H-6498	1938-39	1:80,000	06-17	40-200
H-6499a	1939	1:240,000	30-1530	600-1500

**VERTICAL DEPTH ACCURACY (METERS)**

Depth	Accuracy
0-20	± 2.3
20-50	± 0.5
50-200	± 1.0
Over 200	1% of depth



INTERIOR GEOLOGICAL SURVEY, RESTON, VA—1980-080102  
Compiled by H. L. Berryhill, Jr. and A. R. Trippet, in 1978.  
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**MAP SHOWING POST-WISCONSIN SEDIMENTATION PATTERNS AND FAULTING IN THE PORT ISABEL 1° x 2° QUADRANGLE, TEXAS**

Compiled by  
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