

**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 geology 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-MUS-20, 303 p.

1977b, Environmental studies, south Texas outer continental shelf, 1976—Geology—Reason 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—Reason 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., Stalder, 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, Reason, 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.

Bright, T. J., Rezak, Richard, editors, 1976, A biological and geological reconnaissance of selected topographic features on the Texas continental shelf, Texas A&M Research Foundation and the Texas A&M University Department of Oceanography, report to the U.S. Bureau of Land Management contract 08550-CTS-4, 377 p.

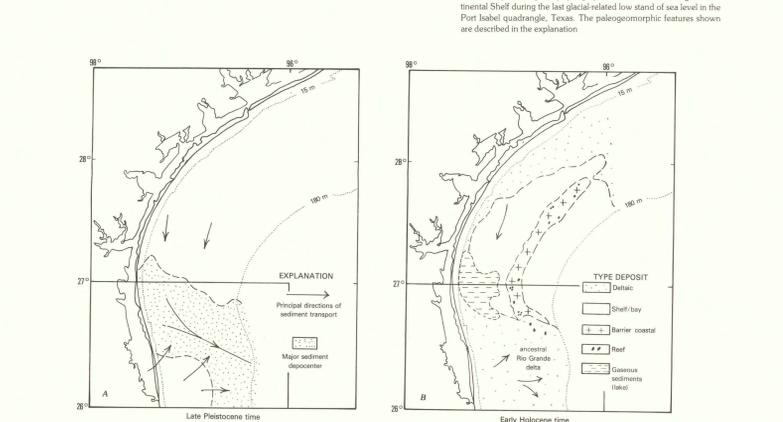
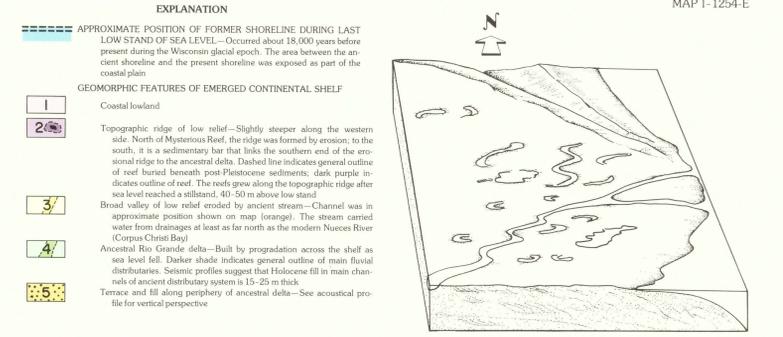
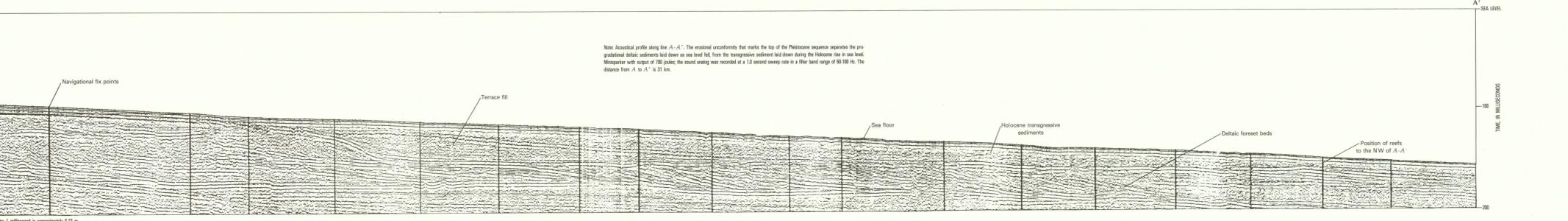
Shepard, F. P., Philiger, F. B., and van Andel, T. H., editors, 1960, Recent sediments, north-west Gulf of Mexico, American Association of Petroleum Geologists, Special Publication, 394 p.

**UNITED STATES MEXICO**

Base map information including bathymetry, compiled by the National Ocean Survey from NOS hydrographic surveys supplemented by hydrographic information from other sources.  
Bathymetric contour interval: 10 meters to the 200 meter depth, then 50 meters to maximum depth. Datum M.W.

Universal Transverse Mercator Grid, Zone 16, 10,000 meter ticks (1) are shown on the map.

⚠ Lack of sufficient data in portions of the map require the use of generalized form lines to infer probable shapes for conical or elliptical shaped features that would otherwise appear truncated. The form lines are not at the prescribed contour interval.



**EVALUATION OF BATHYMETRIC SURVEY ACCURACY**

SURVEY NUMBER	SURVEY DATE	SCALE	SURVEY LINE SPACING (NAUT. MILES)	HORIZONTAL POSITIONING (METERS)
H-4007	1928	1:20,000	06.17	20.45
H-4003	1928	1:40,000	41.171	30.100
H-4005	1928	1:80,000	10.20	40.700
H-4087	1929	1:20,000	06.23	20.40
H-4490	1929	1:20,000	06.13	20.40
H-4491	1929	1:20,000	03.14	29.40
H-4493	1929	1:10,000	02.06	15.30
H-4474	1929	1:40,000	08.24	30.100
H-4492	1929	1:40,000	15.100	30.100
H-4496	1929	1:40,000	12.28	30.100
H-4497	1929	1:40,000	35.210	40.200
H-4498	1928-39	1:40,000	36.170	40.200
H-4499a	1929	1:240,000	50.1530	600.1500

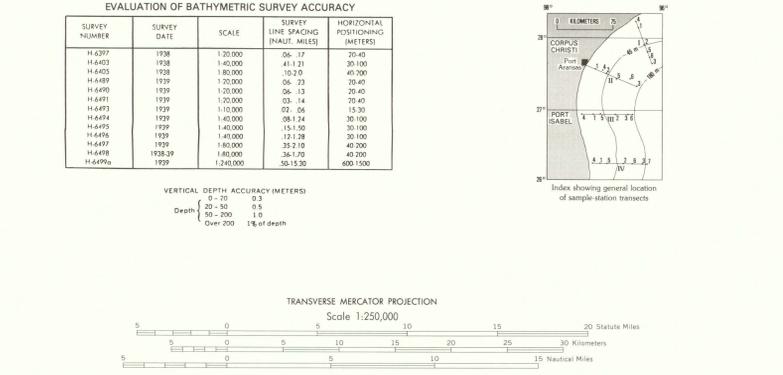
**VERTICAL DEPTH ACCURACY (METERS)**

Depth 0-20 0.3

20-50 0.5

50-200 1.0

Over 200 1% of depth



**MAP SHOWING PALEOGEOGRAPHY OF THE CONTINENTAL SHELF DURING THE LOW STAND OF SEA LEVEL, WISCONSIN GLACIAL EPOCH, PORT ISABEL 1° x 2° QUADRANGLE, TEXAS**

By  
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1980

For sale by Branch of Distribution, U.S. Geological Survey, Box 2426, Federal Center, Denver, CO 80225