

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 integrate 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 oriented to emphasize the interactions of processes as a function of time and to demonstrate the long-term effects of the related processes. Thus, maps A through F cover 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 hydrologic 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 sediments 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 loading 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 segment of the Continental Shelf 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 base 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.

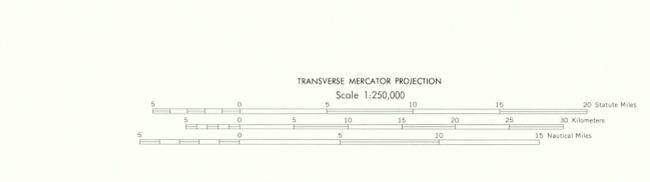
SUPPLEMENTARY READINGS
Berryhill, H. L., Jr., editor, 1977a. Environmental studies, south Texas outer continental shelf, 1975—An atlas and integrated summary. U.S. Geological Survey, report to the U.S. Bureau of Land Management, contract 08550-MU5-20, 303 p.
1977b. Environmental studies, south Texas 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, 629 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., Shideler, 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.
Crooner, R. D., editor, 1977. Environmental studies, south Texas outer Continental Shelf, biology and chemistry. University of Texas, Texas A&M University, and Rice University, report to the U.S. Bureau of Land Management, contract 08550-C16-17, 1216 p.
Gunter, Gordon, 1950. Seasonal population changes and distributions as related to salinity, of certain invertebrates of the Texas coast, including the commercial shrimp. Port Aransas, Texas, Publications of the Institute of Marine Science, v. 1, no. 2, p. 7-51.
Hedgpeth, J. W., 1953. An introduction to the zoogeography of the northwestern Gulf of Mexico with reference to the invertebrate fauna. Port Aransas, Texas, Publications of the Institute of Marine Science, v. 3, no. 1, p. 107-224.
Parker, P. L., editor, 1976. Environmental studies, south Texas outer continental shelf, 1975—Biology and chemistry. University of Texas, Texas A&M University, and Rice University, report to the U.S. Bureau of Land Management, contract 08550-C15-17, 598 p.
Parker, P. L., 1961. Ecology and distributional patterns of marine macro-invertebrates, northern Gulf of Mexico, in Shepard, F. P., Pflieger, F. B., and van Andel, T. H., eds., Recent sediments, northwest Gulf of Mexico. American Association of Petroleum Geologists Special Publication, p. 302-337.
Parker, R. H., and Curry, J. R., 1956. Fauna and bathymetry of banks on continental shelf, northwest Gulf of Mexico. American Association of Petroleum Geologists Bulletin, v. 40, no. 10, p. 2628-2639.

EVALUATION OF BATHYMETRIC SURVEY ACCURACY

SURVEY NUMBER	SURVEY DATE	SCALE	SURVEY LINE SPACING (NAUTICAL MILES)	HORIZONTAL POSITIONING (METERS)
H-4397	1938	1:20,000	06.37	20.40
H-4403	1938	1:40,000	41.31	30.100
H-4405	1938	1:80,000	10.20	40.200
H-4489	1939	1:20,000	06.33	20.40
H-4495	1939	1:20,000	06.33	20.40
H-4491	1939	1:20,000	03.34	20.40
H-4493	1939	1:100,000	02.06	15.30
H-4494	1939	1:40,000	08.74	30.100
H-4495	1939	1:40,000	15.40	30.100
H-4496	1939	1:40,000	12.12	30.100
H-4497	1939	1:80,000	35.210	40.200
H-4498	1938-39	1:80,000	34.170	40.200
H-4499a	1939	1:240,000	55.150	600.100

VERTICAL DEPTH ACCURACY (METERS)

Depth	±	% of depth
0 - 20	0.3	
20 - 50	0.5	
50 - 200	1.0	
Over 200	1.0	



MAP SHOWING NATURE OF SHALLOW SUBSURFACE SEDIMENTS AND BIOGEOLOGY IN THE PORT ISABEL 1° x 2° QUADRANGLE, TEXAS

Compiled by
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1980

INTERIOR GEOLOGICAL SURVEY, RESTON, VA 20192-0001
Correlated by H. L. Berryhill, Jr. and A. R. Trippet in 1978. Scientific contributions in collaboration with G. W. Hill, K. A. Roberts, J. L. Kridgier, G. N. Wiley, H. L. Berryhill, Jr., G. L. Shideler, and C. E. Doney of the U.S. Geological Survey and U.S. School of the University of Texas Marine Science Institute at Port Aransas.

Figure 3.—Columnar sections from gravity cores showing characteristics of shallow subsurface sediments.