DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

PREPARED ON BEHALF OF THE U.S. BUREAU OF LAND MANAGEMENT
STATE TERRITORIAL WATER DATA COLLECTED IN COOPERATION WITH
THE BUREAU OF ECONOMIC GEOLOGY, UNIVERSITY OF TEXAS AT AUSTIN

MISCELLANEOUS INVESTIGATIONS SERIES
MARINE GEOLOGY ATLAS
BEEVILLE QUADRANGLE, TEXAS
MAP I-1288-E

DISCUSSION

This map is one of a set of six environmental geologic maps for the Beeville 1° × 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. 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 Beeville 1° × 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 Beeville 1° × 2° quadrangle that can be used in planning specific site studies as well as more detailed topical investigations.

EXPLANATION

GEOMORPHIC FEATURES OF EMERGED CONTINENTAL SHELF

- Coastal plain—Part of the emerged shelf during the low stand of sea; largely a complex of stream channels and coalesced thin alluvial fan and floodplain deposits
- Ancient stream channel—Indicates approximate outline of the most conspicuous buried stream channels and distributaries
- Buried oyster beds—Indicates approximate extent of acoustical signatures on the seismic profiles interpreted to be accumulations of buried oyster shells
- Delta plain—Southwestern edge of the ancestral Colorado/Brazos River delta that was built outward across the emerged Continental Shelf during the low stand of sea level. The late Pleistocene sedimentary structure is similar to that of the ancestral Rio Grande delta

SUPPLEMENTARY READINGS

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_____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.

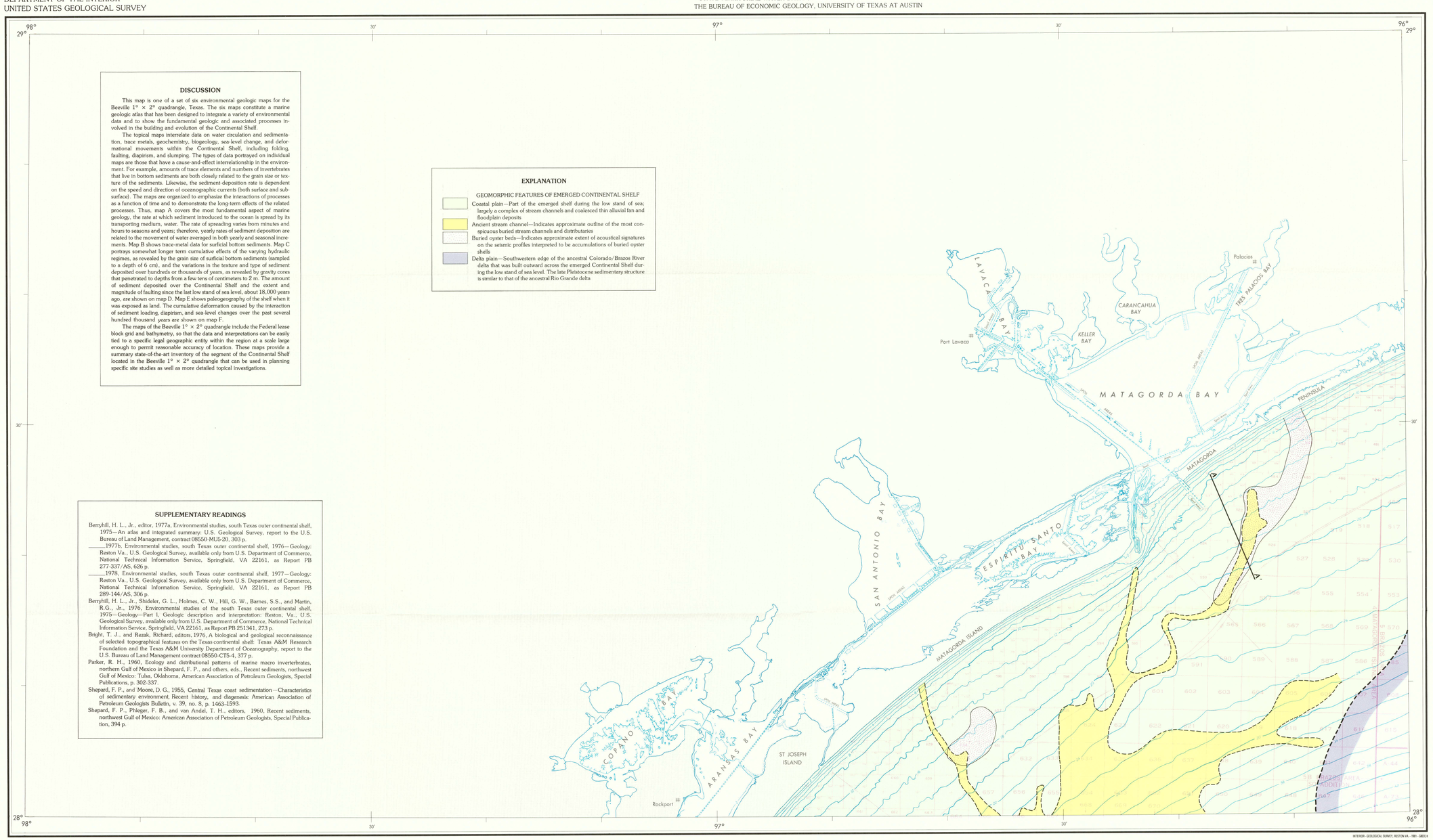
Berryhill, H. L., Jr., Shideler, G. L., Holmes, C. W., Hill, G. W., Barnes, S. S., and Martin, R.G., Jr., 1976, Environmental studies of the south Texas outer continental shelf, 1975—Geology—Part I, Geologic description and interpretation: Reston, Va., U.S. Geological Survey, available only from U.S.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

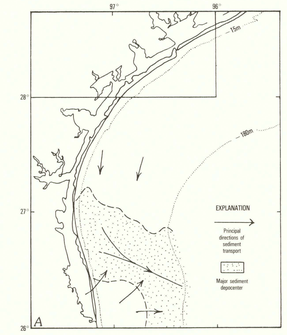
Bright, T. J., and Rezak, Richard, editors, 1976, A biological and geological reconnaissance of selected topographical features on the Texas continental shelf: Texas A&M Research Foundation and the Texas A&M University Department of Oceanography, report to the U.S. Bureau of Land Management contract 08550-CT5-4, 377 p.

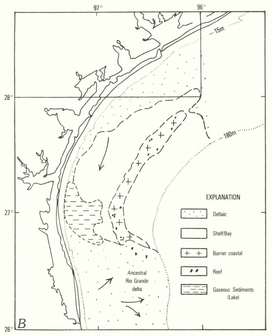
Parker, R. H., 1960, Ecology and distributional patterns of marine macro invertebrates, northern Gulf of Mexico *in* Shepard, F. P., and others, eds., Recent sediments, northwest Gulf of Mexico: Tulsa, Oklahoma, American Association of Petroleum Geologists, Special Publications, p. 302-337.

Shepard, F. P., and Moore, D. G., 1955, Central Texas coast sedimentation—Characteristics of sedimentary environment, Recent history, and diagenesis: American Association of Petroleum Geologists Bulletin, v. 39, no. 8, p. 1463-1593.

Shepard, F. P., Phleger, F. B., and van Andel, T. H., editors, 1960, Recent sediments, northwest Gulf of Mexico: American Association of Petroleum Geologists, Special Publication, 394 p.







Regional summary maps comparing the paleogeographic relationship during the *A*, late Pleistocene and *B*, early Holocene along the south Texas outer Continental Shelf. Outline of Beeville quadrangle shown.

Base from U.S. National Ocean Survey. Base map information including bathymetry, compiled by the U.S. National Ocean Survey from NOS hydrographic surveys supplemented by hydrographic information from other sources. Bathymetric contour intervals: 10 meters to the 200-meter depth, supplemented by 2-meter intervals; thence 50 meters to maximum depth.

Datum MLW.

Universal Transverse Mercator Grid, Zone 14; 10,000-meter ticks (-) are shown on the neatline.

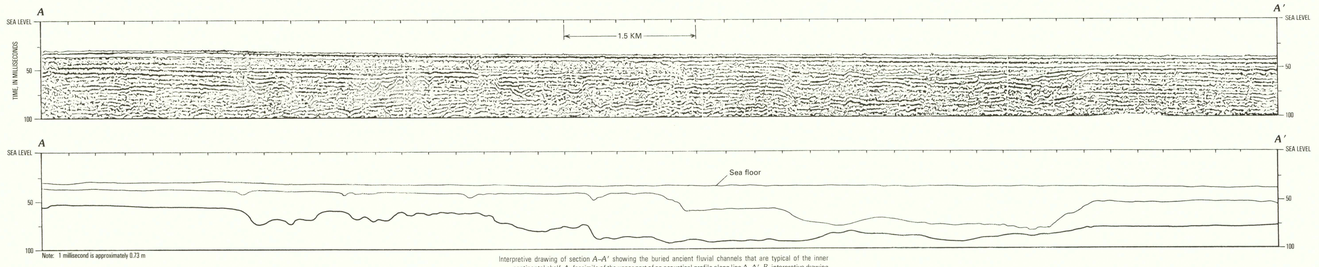
Lack of sufficient data on portions of this map requires the use of generalized form lines to infer probable shape for conical or elliptical shaped features that would otherwise appear truncated. The form lines are not at the prescribed contour interval.

EVALUATION OF BATHYMETRIC SURVEY ACCURACY

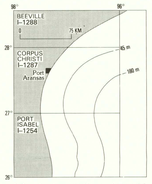
SURVEY NUMBER	SURVEY DATE	SCALE	SURVEY LINE SPACING (NAUT. MILES)	HORIZONTAL LINE SPACING (METERS)
H-5693	1934-35	1:20,000	.03-.12	20-40
H-5813	1935	1:20,000	.03-.12	20-40
H-5857	1935	1:20,000	.05-.10	20-40
H-5864	1935	1:10,000	.03-.25	15-30
H-5865	1935	1:20,000	.03-.10	20-40
H-5866	1935	1:20,000	.04-.25	20-40
H-5875	1935	1:20,000	.03-.10	20-40
H-5877	1935	1:20,000	.04-.16	20-40
H-5916	1935	1:20,000	.05-.15	20-40
H-6389	1938	1:20,000	.05-.20	20-40
H-6390	1938	1:20,000	.10-.18	20-50
H-6391	1938	1:20,000	.10-.20	20-50
H-6392	1938	1:20,000	.04-.23	20-50
H-6393	1938	1:20,000	.07-.19	20-40
H-6401	1938	1:40,000	.07-.19	20-40
H-6402	1938	1:40,000	.19-.73	20-100
H-6403	1938	1:40,000	.22-.80	30-100
H-6404	1938	1:80,000	.10-2.1	40-200
H-6405	1938	1:80,000	.10-2.0	40-200

TRANSVERSE MERCATOR PROJECTION
Scale 1:250,000

5 0 5 10 15 20 Statute Miles
5 0 5 10 15 20 25 30 Kilometers
5 0 5 10 15 Nautical Miles



Interpretive drawing of section *A*–*A'* showing the buried ancient fluvial channels that are typical of the inner continental shelf. *A*, facsimile of the upper part of an acoustical profile along line *A*–*A'*. *B*, interpretive drawing showing two sequences of ancient buried fluvial channels: the younger channels, filled by sediments during the transgressive rise of sea level during the past ~18,000 years, were cut during the Wisconsin glacial epoch; the older channels and sediments above represent a previous cycle of sea-level fall and subsequent rise. Other older sequences of channels underlie those shown.



Index showing adjoining environmental geologic maps

MAP SHOWING PALEOGEOGRAPHY OF THE CONTINENTAL SHELF DURING THE LOW STAND OF SEA LEVEL, WISCONSIN GLACIAL EPOCH, BEEVILLE 1° × 2° QUADRANGLE, TEXAS

By
Henry L. Berryhill, Jr.

1981

INTERIOR—GEOLOGICAL SURVEY, RESTON VA.—1981—G80124

Compiled from data by H. L. Berryhill, Jr. in 1978

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