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**MORPHOLOGY AND GEOLOGY**

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GALVESTON BAY  
NATIONAL ESTUARY PROGRAM  
DATA INVENTORY PROJECT

DATA SET REPORT-001

DATA INVENTORY INFORMATION

GBNEP Reference Number: GLO03

PROJECT NAME: County surveys, GLO

OBJECTIVE: Archive original maps and survey notes on Texas counties

DATA USE: survey

PRIORITY PROBLEM:

C1. Regulatory

D1. Subsidence & sea-level rise

D2. Bathymetric/circulation changes

D3. Loss of wetlands

D4. Use of littoral property

KEYWORDS: property, shoreline, beach, dredge-and-fill

SOURCE: General Land Office

CONTACT: Doug Howard (512-463-5218) or Bruce Smith (512-463-5055)  
General Land Office  
1700 N. Congress  
Austin, TX 78701

GENERAL TYPE: Maps and Surveying notes

GEOGRAPHICAL COVERAGE: Galveston Bay and Tributaries

PERIOD OF COVERAGE: 1837-present

MEASUREMENTS: Shoreline positions and physical features

FORMAT: Areal (maps); hand-written (survey notes)

COMMENTS:

GLO maintains in its archive the original county maps dating back to the mid-1800s. Original survey notes upon which the maps were based are kept in the GLO vault. The earliest such survey of Galveston Bay was performed by Stephen F Austin in 1826 at the request of the Mexican authorities. His original report is in the vault, though the "plat" is not, and may be in some historical collection (e.g. the Bexar collection at Barker History Center). The earliest map in the GLO collection is the 1837 Galveston County. The map scales are 1 in = 4000 varas; later (ca. 1900?) the standard scale was changed to 1 in=2000 varas. For about 100 years, the retired maps have been on vellum, but many of these have not seen the light of day in years, and no one knows what condition they are in. Some of the older paper maps are touched as infrequently as possible, since they are in a highly deteriorated state. (About half of the collection has been enclosed in plastic

envelopes.) For many maps, there are mylar positives, which were made photographically, that can be reproduced. The principal value of this map collection is as early authority on land forms and shoreline configuration. About the time of the War for Southern Independence, the Coastal Survey charts would become the authority.

**QUALITY CONTROL/QUALITY ASSURANCE:** No formal QA/QC plan exists, however, great care is exercised in the preservation of these documents. Good surveying practices include redundancy and geometric closure.

GALVESTON BAY  
NATIONAL ESTUARY PROGRAM  
DATA INVENTORY PROJECT

DATA SET REPORT-005

DATA INVENTORY INFORMATION

GBNEP Reference Number: BEG0002

PROJECT NAME: Shoreline changes BEG

OBJECTIVE: Extent of shoreline change from 19th Cent to present

DATA USE: research

PRIORITY PROBLEM:

A1. Loss of habitat

D1. Subsidence & sea-level rise

D2. Bathymetric/circulation changes

D3. Loss of wetlands

D4. Use of littoral property

KEYWORDS: shoreline, erosion, beach, property

SOURCE: Bureau of Economic Geology, University of Texas

CONTACT: Robert Morton  
Bureau of Economic Geology  
Balcones Research Center  
Austin, TX 78712

512-471-1534

GENERAL TYPE: Morphology, hydrography

GEOGRAPHICAL COVERAGE: Galveston Bay & beachfront

PERIOD OF COVERAGE: 1851 to 1982 (bayshore), 1850-1982 (beachfront)

MEASUREMENTS: Rates of shoreline movement based upon survey maps and aerial photographs

FORMAT: Tabular

COMMENTS: Published in:

Morton, R., 1974: Shoreline changes on Galveston Island (Bolivar Roads to San Luis Pass). Geol. Circ. 74-2, BEG, Univ. Texas Austin.

Morton, R., 1975: Shoreline changes between Sabine Pass and Bolivar Roads. Geol. Circ. 75-6, BEG, Univ. Texas Austin.

Shoreline changes BEG

Morton, R. and M. Pieper, 1975: Shoreline changes in the vicinity of the Brazos River delta (San Luis Pass to Brown Cedar Cut). Geol. Circ. 75-4, BEG, Univ. Texas Austin.

Paine, J. and R. Morton, 1986: Historical shoreline changes in Trinity, Galveston, West, and East Bays, Texas Gulf Coast. Geol. Cir. 86-3, BEG, Univ. Texas Austin.

Paine, J. and R. Morton, 1989: Shoreline and vegetation-line movement, Texas Gulf Coast, 1974-1982. Geol. Circ. 89-1, BEG, Univ. Texas Austin.

Shoreline changes in linear distance between various survey/photograph dates and annualized rates computed for points along beachfront at 5000 ft intervals. Similar data for stations around shore of bay spaced at 5000 ft intervals, except in Trinity Bay where 4000 ft interval was used. Morton (1974) et seq. contains data through 1973, which is updated to 1982 in Paine and Morton (1989).

QUALITY ASSURANCE/QUALITY CONTROL: No formal QA/QC plan exists, and no information is available as to QA/QC practices. All vintage maps and photographs are archived at BEG, from which the shoreline computations may be directly verified.

GALVESTON BAY  
NATIONAL ESTUARY PROGRAM  
DATA INVENTORY PROJECT

DATA SET REPORT-010

DATA INVENTORY INFORMATION

GBNEP Reference Number: RICEU01

PROJECT NAME: Holocene sediments, dating

OBJECTIVE: Determine sedimentology of bay

DATA USE: research

PRIORITY PROBLEM:

A. REDUCTION/ALTERATION OF LIVING RESOURCES

A1. Loss of habitat

A4. Bathymetric/circulation changes

A5. Subsidence & sea-level rise

A7. Increased sediment/turbidity

D3. Loss of wetlands

KEYWORDS: geology, sedimentology, sea-level changes, infilling

SOURCE: Rice University

CONTACT: Library

GENERAL TYPE: Geology, morphology

GEOGRAPHICAL COVERAGE: Galveston Bay

PERIOD OF COVERAGE: not applicable (thousands of years)

MEASUREMENTS: Deep cores, seismic profiling, radiocarbon dating

FORMAT: textual

COMMENTS:

Published in:

Rehkemper, L.J., 1969: Sedimentology of Holocene estuarine deposits, Galveston Bay, Texas. Ph.D. dissertation, Rice University.

QUALITY ASSURANCE/QUALITY CONTROL: No formal QA/QC plan exists, and no information is available as to QA/QC practices.

GALVESTON BAY  
NATIONAL ESTUARY PROGRAM  
DATA INVENTORY PROJECT

DATA SET REPORT-015

DATA INVENTORY INFORMATION GBNEP Reference Number: MEL0001
PROJECT NAME: Jetties 1880-85
OBJECTIVE: Morphology of Galveston inlet and design of jetties
DATA USE: engineering study
PRIORITY PROBLEM:
A4. Bathymetric/circulation changes
C1. Regulatory
D2. Bathymetric/circulation changes
KEYWORDS: jetties, inlets, shoreline, bathymetry

SOURCE: Merrill et al. (1886)

CONTACT:

GENERAL TYPE: Anecdotal, morphological, hydrographic

GEOGRAPHICAL COVERAGE: Galveston entrance, Bolivar Roads

PERIOD OF COVERAGE: 1880-1885

MEASUREMENTS: Bathymetric charts, 1880, 1883, 1885

FORMAT: Areal, textual

COMMENTS: The discussions in this issue (most of which focus on Galveston rather than the putative subject, viz. a paper on the jetties of South Pass of the Mississippi) not only present information of a century ago relating to the form and hydrography of Bolivar Roads, but also yield much insight into the experimental approach to jetty design at Galveston and the factions (and animadversion) involved. These discussions are lengthy and frequently vituperative; the comments about the dubiousness of young H.C. Ripley's analyses are particularly amusing given his later dominant reputation as a coastal engineer. Published in:

Merrill, Col. W.E., et al., 1886: Discussion on the South Pass Jetties. *Trans. ASCE*, 40, pp 223-336.

Jetties 1880-85

Additional discussions, especially relating to the design of the North Jetty, and Ripley's plan for a curved jetty (like that at Port Aransas) may be found in:

Haupt, L.M., 1899: The reaction breakwater as applied to the improvement of ocean bars. *Trans. ASCE*, 42, pp 485-546 (including Discussions).

Wisner, G.Y. et al., 1900: Further discussion of Haupt (1899). *Trans ASCE*, 43, pp. 93-106.

Harts, W.M., 1901: Description of Coos Bay, Oregon, and the improvement of its entrance by the government. *Trans. ASCE*, 46, pp. 482-550 (including Discussions).

QUALITY ASSURANCE/QUALITY CONTROL: No formal QA/QC plan exists, and no information is available as to QA/QC practices.

GALVESTON BAY  
NATIONAL ESTUARY PROGRAM  
DATA INVENTORY PROJECT

DATA SET REPORT-020

DATA INVENTORY INFORMATION	
GBNEP Reference Number: RIP0002	
PROJECT NAME:	Ripley, jetties 1924
OBJECTIVE:	document design of jetties
DATA USE:	engineering study
PRIORITY PROBLEM:	
	A4. Bathymetric/circulation changes
	D2. Bathymetric/circulation changes
KEYWORDS:	inlets, currents, tides, jetties, Bolivar Roads

SOURCE: Ripley (1924)

CONTACT:

GENERAL TYPE: Morphology

GEOGRAPHICAL COVERAGE: Bolivar Roads

PERIOD OF COVERAGE: 1884

MEASUREMENTS: Bathymetry

FORMAT: areal (map)

COMMENTS: Map of bathymetry of entrance to Galveston Bay from survey of 1884 given as Fig. 3. Also in the discussion there is some anecdotal information from Ripley's appointment at Port Bolivar 1878-1880.

Published in:

Ripley, Henry Clay, 1924: The economic location of jetties. *Trans. ASCE*, 87, pp 979-986, 1119-1129.

QUALITY ASSURANCE/QUALITY CONTROL: No formal QA/QC plan exists, and no information is available as to QA/QC practices.

GALVESTON BAY  
NATIONAL ESTUARY PROGRAM  
DATA INVENTORY PROJECT

DATA SET REPORT-025

DATA INVENTORY INFORMATION

GBNEP Reference Number: GERM001

PROJECT NAME: Subsidence - Germiot

OBJECTIVE: summarize status & causes of subsidence

DATA USE: survey

PRIORITY PROBLEM:

A4. Bathymetric/circulation changes

A5. Subsidence & sea-level rise

D1. Subsidence & sea-level rise

D3. Loss of wetlands

KEYWORDS: geology, tides, subsidence, oil & gas, groundwater

SOURCE: Germiot (1988)

CONTACT: Dr. Jack Sharp  
Department of Geology  
University of Texas  
Austin, TX 78712

GENERAL TYPE: Geology, hydrography

GEOGRAPHICAL COVERAGE: Galveston Bay and environs

PERIOD OF COVERAGE: 19th-20th Century historical, current as of 1988

MEASUREMENTS: See comments

FORMAT: Tabular, graphical

COMMENTS: Published as:

Germiot, Steven, 1988: An assessment of future coastal land loss in Galveston, Chambers, and Jefferson Counties, Texas. M.A. Thesis, Department of Geology, University of Texas at Austin.

While containing only derivative data, this is an excellent summary of information concerning subsidence and sea-level rise in Galveston Bay and on the Gulf shorefront. Original analyses included of Pier 21 tide data and correlation with shoreline information compiled by BEG (Morton).

QUALITY ASSURANCE/QUALITY CONTROL: No formal QA/QC plan exists, and no information is available as to QA/QC practices.

GALVESTON BAY  
NATIONAL ESTUARY PROGRAM  
DATA INVENTORY PROJECT

DATA SET REPORT-030

DATA INVENTORY INFORMATION GBNEP Reference Number: RICH001
PROJECT NAME: Riche 1900-20 beach erosion
OBJECTIVE: describe beach changes at Galveston after 1915 hurricane
DATA USE: engineering study
PRIORITY PROBLEM:
A4. Bathymetric/circulation changes
A5. Subsidence & sea-level rise
D1. Subsidence & sea-level rise
D2. Bathymetric/circulation changes
D4. Use of littoral property
KEYWORDS: beach, storm surge, hurricanes, shoreline

SOURCE: Riche (1924)

CONTACT: No way

GENERAL TYPE: Anecdotal

GEOGRAPHICAL COVERAGE: Galveston beachfront

PERIOD OF COVERAGE: 1900-1920

FORMAT: Textual

COMMENTS: Account of loss of Galveston Beach during hurricane of 1915 and subsequent accumulation south of south jetty. Published in:

Riche, C.S., 1924: Discussion of beach erosion. *Trans, ASCE*, 87, pp 605-606.

QUALITY ASSURANCE/QUALITY CONTROL: No formal QA/QC plan exists, and no information is available as to QA/QC practices.

GALVESTON BAY  
NATIONAL ESTUARY PROGRAM  
DATA INVENTORY PROJECT

DATA SET REPORT-035

DATA INVENTORY INFORMATION

GBNEP Reference Number: WAT0001

PROJECT NAME: Jetties 1900

OBJECTIVE: Response of sediment & bathymetry to construction of jetties

DATA USE: engineering study

PRIORITY PROBLEM:

A4. Bathymetric/circulation changes

A7. Increased sediment/turbidity

D2. Bathymetric/circulation changes

KEYWORDS: jetties, inlets, sand, sediment, bathymetry, shoreline

SOURCE: Watt (1905)

CONTACT:

GENERAL TYPE: Hydrographic, Anecdotal

GEOGRAPHICAL COVERAGE: Galveston Bay, Bolivar Roads

PERIOD OF COVERAGE: 1886-1902

MEASUREMENTS: Bathymetry, response of sediment to construction of jetties

FORMAT: Textual, graphical. Excellent bathymetric maps of Bolivar inlet during period of jetty construction and shortly thereafter.

COMMENTS: Published as:

Watt, D.A., 1905: Notes on the improvement of river and harbor outlets in the United States. *Trans. ASCE*, pp 288-321.

QUALITY ASSURANCE/QUALITY CONTROL: No formal QA/QC plan exists, and no information is available as to QA/QC practices.

GALVESTON BAY  
NATIONAL ESTUARY PROGRAM  
DATA INVENTORY PROJECT

DATA SET REPORT-040

DATA INVENTORY INFORMATION GBNEP Reference Number: WASH001
PROJECT NAME: Galveston Beach 1938
OBJECTIVE: History of structural changes to shoreface
DATA USE: survey
PRIORITY PROBLEM:
D1. Subsidence & sea-level rise
D2. Bathymetric/circulation changes
D4. Use of littoral property
KEYWORDS: shoreline, beach, groins, jetties

SOURCE: Washington (1938)

CONTACT:

GENERAL TYPE: Morphological, anecdotal

GEOGRAPHICAL COVERAGE: Galveston Beach and shoreface

PERIOD OF COVERAGE: 1838-1938

MEASUREMENTS: Notes on beach dimensions, erosion and accretion

FORMAT: Textual

COMMENTS: A brief history of structural changes to Galveston shoreface that have affected the beach, especially a history of the groin construction experiments. Washington was the County surveyor and Engineer, and expresses the opinion, " If such a system or similar system of groins had been built at the time of the building of the seawall protection, there can be little doubt that the entire beach existing at that time could have been saved."

Published as :

Washington, C. C. , 1938: Galveston Island shoreline and the protection of Galveston Beach. *Shore and Beach*, July , 1938, 105-108.

QUALITY ASSURANCE/QUALITY CONTROL: No formal QA/QC plan exists, and no information is available as to QA/QC practices.

GALVESTON BAY  
NATIONAL ESTUARY PROGRAM  
DATA INVENTORY PROJECT

DATA SET REPORT-045

DATA INVENTORY INFORMATION  
GBNEP Reference Number: GEOL01

PROJECT NAME: Bullard 42 beach sand

OBJECTIVE: Determine composition and origin of beach sands

DATA USE: research

PRIORITY PROBLEM:

A5. Subsidence & sea-level rise

D1. Subsidence & sea-level rise

D2. Bathymetric/circulation changes

D4. Use of littoral property

KEYWORDS: Littoral, sand, beach, texture, swash

SOURCE: Bullard (1942), Dept. Geology, Univ. of Texas

CONTACT: Department of Geology  
University of Texas  
Austin, TX 78712

GENERAL TYPE: Mineralogical and grain-size analysis of beach sand

GEOGRAPHICAL COVERAGE: Galveston Island shorefront

PERIOD OF COVERAGE: 1939-41

MEASUREMENTS: Three samples per station from low tide level, normal water level, and dune area, though only the normal water level samples are presented in Bullard (1942). Bromoform separation of light & heavy minerals, from 1/16 mm diameter fraction, microscopic grain size counts in different mineralogical categories.

FORMAT: Graphical

COMMENTS: Five grain-size pans used. Graphical presentation of basaltic hornblende and pyroxene, green hornblende, a suite of less resistant minerals, and a suite of more durable minerals. Three stations on Galveston Island: the South Jetty, mid-way down island, and near San Luis Pass, roughly: (29° 20, 94° 40), (29° 10, 94° 50), (29° 05, 95° 05)

Published in:

Bullard, F.M., 1942: Source of beach and river sands on Gulf coast of Texas. *Bull. Geol. Soc. Amer.* 53, 1021-1044.

QUALITY ASSURANCE/QUALITY CONTROL: No formal QA/QC plan exists, and no information is available as to QA/QC practices.

GALVESTON BAY  
NATIONAL ESTUARY PROGRAM  
DATA INVENTORY PROJECT

DATA SET REPORT-050

DATA INVENTORY INFORMATION

GBNEP Reference Number: DGUT001

PROJECT NAME: Bullard 47-48 Beach processes

OBJECTIVE: Determine properties of beach sands

DATA USE: research

PRIORITY PROBLEM:

A5. Subsidence & sea-level rise

D1. Subsidence & sea-level rise

D2. Bathymetric/circulation changes

D4. Use of littoral property

KEYWORDS: beach, swash, sand, texture

SOURCE: Dept. Geology, Univ. of Texas

CONTACT: Department of Geology  
University of Texas  
Austin, TX 78712

GENERAL TYPE: Mineralogical and grain-size analysis of beach sand, bathymetric and geological maps

GEOGRAPHICAL COVERAGE: Galveston Island and Bolivar Peninsula

PERIOD OF COVERAGE: 1947-48

MEASUREMENTS: Three samples per station from low tide level, normal water level, and dune area, though only the normal water level samples are presented in Bullard (1942). Bromoform separation of light & heavy minerals, from 1/16 mm diameter fraction, microscopic grain size counts in different mineralogical categories.

FORMAT: Graphical and tabular

COMMENTS:

Published in a series of three theses:

Richardson, Raymond M., 1948: Sedimentation and shore processes at Bolivar Peninsula, Galveston County, Texas. M.A. Thesis, University of Texas at Austin.

Slingluff, Frank P., 1948: Sedimentation and shore processes of southwestern Galveston Island, Galveston City, Texas. M.A. Thesis, University of Texas at Austin.

Stern, Thomas W., 1948: Sedimentation and shore processes on the northeastern portion of Galveston Island, Texas. M.A. Thesis, University of Texas at Austin.

Beach and backshore areas sampled for sands and analyzed for grain-size and heavy mineral suites. 20 stations sampled at strand line (or identifiable horizons) by Stern, 18 by Richardson and 15 by Slingluff for a total of 53. Screening and pipette analyses, bromoform separation of heavy and light minerals for microscopic analysis. Similarity of dune and Galveston fine sand suggests a common cause. Photographs of shorefront and beach. Stern (1948) contains a summary of erosion, erosion controls and historical beach profiles. Also photographs and status of sea wall, and a 1944 aerial mosaic of Galveston Island. Richardson (1948) contains a 1930 1 in = 1 mi full-color soils map of Galveston County, produced by the USDA Bureau of Chemistry and Soils, now the SCS, which displays the dunes, swales and interior lakes of the island.

QUALITY ASSURANCE/QUALITY CONTROL: No formal QA/QC plan exists, and no information is available as to QA/QC practices.

GALVESTON BAY  
NATIONAL ESTUARY PROGRAM  
DATA INVENTORY PROJECT

DATA SET REPORT-055

DATA INVENTORY INFORMATION  
GBNEP Reference Number: SSOC001

PROJECT NAME: Oyster reefs 1954-58

OBJECTIVE: Map live and buried reefs throughout bay

DATA USE: survey

PRIORITY PROBLEM:

A1. Loss of habitat

A5. Subsidence & sea-level rise

C2. Fisheries depletion

D1. Subsidence & sea-level rise

KEYWORDS: Oysters, shell mining, geology, stratigraphy, infilling, sedimentation

SOURCE: Shell Survey and Oyster Conservation Association

CONTACT:

GENERAL TYPE: Geological, biological

GEOGRAPHICAL COVERAGE: Galveston Bay

PERIOD OF COVERAGE: 1954-58

MEASUREMENTS: depth to shell, nature of buried or exposed shell

FORMAT: graphical?

COMMENTS:

This was an extensive survey of the entirety of Galveston Bay conducted by J.G. Turney, and reported as "Shell survey for the Shell Survey and Oyster Conservation Association." No copy of this work has yet been located. However, two figures from the survey are presented in Lankford and Rogers (1969), showing plan maps of the bay with distribution of oyster reefs (exposed, buried, and dredged) and greatest depth at which shell was encountered.

Citation:

Lankford, R. R. and J. Rogers (Eds.), 1969: *Holocene Geology of the Galveston Bay Area*. Houston Geological Society.

QUALITY ASSURANCE/QUALITY CONTROL: No formal QA/QC plan exists, and no information is available as to QA/QC practices.

GALVESTON BAY  
NATIONAL ESTUARY PROGRAM  
DATA INVENTORY PROJECT

DATA SET REPORT-060

DATA INVENTORY INFORMATION	
GBNEP Reference Number: TAMU0019	
PROJECT NAME:	Shoreline morphology West Bay
OBJECTIVE:	Determine nature of shoreline-like features
DATA USE:	research
PRIORITY PROBLEM:	
A. REDUCTION/ALTERATION OF LIVING RESOURCES	
A5. Subsidence & sea-level rise	
D1. Subsidence & sea-level rise	
D3. Loss of wetlands	
KEYWORDS:	sea-level change, shorelines, geology

SOURCE: Texas A&M University

CONTACT: Library

GENERAL TYPE: Morphology, geology

GEOGRAPHICAL COVERAGE: West Bay

PERIOD OF COVERAGE:

MEASUREMENTS: Morphological observations of shoreline-like features

FORMAT: textual, graphical

COMMENTS:

Published in:

Henry, V., 1955: Investigation of quaternary eustatic shorelines in the Galveston Bay region. M.S. Thesis, TAMU.

QUALITY ASSURANCE/QUALITY CONTROL: No formal QA/QC plan exists, and no information is available as to QA/QC practices.

GALVESTON BAY  
NATIONAL ESTUARY PROGRAM  
DATA INVENTORY PROJECT

DATA SET REPORT-065

DATA INVENTORY INFORMATION

GBNEP Reference Number: UTMA001

PROJECT NAME: Bolivar beach sands

OBJECTIVE: determine textural characteristics of beach sediments

DATA USE: research

PRIORITY PROBLEM:

D1. Subsidence & sea-level rise

D4. Use of littoral property

KEYWORDS: morphology, geology, erosion, shoreface, beach

SOURCE: University of Texas, Geology

CONTACT: Library

GENERAL TYPE: Geology, morphology

GEOGRAPHICAL COVERAGE: Bolivar Peninsula

PERIOD OF COVERAGE: ca. 1955

MEASUREMENTS: Beach and dune sediment samples, analyzed for grain-size distribution, roundness and light minerals, from 39 stations from Sabine Pass to the north jetty.

FORMAT: graphical, tabular

COMMENTS:

Published as:

Bridges, W. E., 1959: Beach sediments of Galveston, Chambers and Jefferson counties, Texas. M.A. Thesis, University of Texas

QUALITY ASSURANCE/QUALITY CONTROL: No formal QA/QC plan exists, and no information is available as to QA/QC practices.

GALVESTON BAY  
NATIONAL ESTUARY PROGRAM  
DATA INVENTORY PROJECT

DATA SET REPORT-070

DATA INVENTORY INFORMATION	
GBNEP Reference Number: LAR0001	
PROJECT NAME:	Geology survey (HGS, 1969)
OBJECTIVE:	summarize sedimentology of bay emphasizing Trinity River
DATA USE:	research, monitoring, compliance, engineering study, survey
PRIORITY PROBLEM:	
	A1. Loss of habitat
	A7. Increased sediment/turbidity
	D1. Subsidence & sea-level rise
	D2. Bathymetric/circulation changes
	D3. Loss of wetlands
KEYWORDS:	Geology, delta, sediment, infilling, stratigraphy

SOURCE: Lankford and Rogers (1969)

CONTACT: Houston Geological Society

GENERAL TYPE: Geology, sedimentology, biology

GEOGRAPHICAL COVERAGE: Galveston Bay and surrounding area

PERIOD OF COVERAGE: mid-1960s for current information

MEASUREMENTS: sedimentological

FORMAT: tabular, graphical

COMMENTS:

Published as:

Lankford, R. R. and J. W. Rogers (Eds.), 1969: *Holocene geology of the Galveston Bay area*. Houston Geological Society.

Excellent summary of sedimentology and morphology of Galveston Bay with emphasis on the Trinity River. Includes data on sediment load, infilling, deltaic structure and accretion, and related topics.

QUALITY ASSURANCE/QUALITY CONTROL: No formal QA/QC plan exists, and no information is available as to QA/QC practices.

GALVESTON BAY  
NATIONAL ESTUARY PROGRAM  
DATA INVENTORY PROJECT

DATA SET REPORT-075

DATA INVENTORY INFORMATION  
GBNEP Reference Number: TAMU0016

PROJECT NAME: Soil & vegetation East Bay  
OBJECTIVE: Determine effect of soil chemistry on growth of marsh plants  
DATA USE: research  
PRIORITY PROBLEM:  
    A1. Loss of habitat  
    A2. Alteration of salinity  
    D3. Loss of wetlands  
KEYWORDS: marshes, cordgrass, Spartina, soil quality, soil chemistry

SOURCE: Dept. of Range Science, Texas Agricultural Experiment Station, Texas A&M University

GENERAL TYPE: Morphology, biology: water and soil quality - appropriate plants for prevention of soil erosion

GEOGRAPHICAL COVERAGE: East Bay - shoreline of Anahuac National Wildlife Refuge in Chambers County

PERIOD OF COVERAGE: 1974 (Salinity samples, bi-weekly)

MEASUREMENTS: Water salinity (from conductivity using wheatstone bridge), soil characteristics - texture, salinity, pH, extractable cations

- Water samples collected biweekly ten feet from shore
- Soil samples taken Feb. 9 and May 24 at different depths and zones; samples were oven dried and filtered (2 mm screen)
- Soil texture analyses followed:  
    Bouyoucos, G.J., "Hydrometer Method Improved for Making Particle Size Analyses of Soils," *Agronomy Journal*, Vol. 54, No. 5, Sept.-Oct. 1962, pp. 464-465.
- Textural classification used the textural triangle diagrammed by Jacobs, H.S., et al., *Soils Laboratory Exercise Source Book*, American Society of Agronomy, Madison, Wisconsin, 1971.
- Soil salinity determined by electrical conductivity of saturation extract
- Sample preparation and collection of extract followed procedures outlined in U.S. Salinity Laboratory, "Diagnosis and Improvement of Saline and Alkali Soils," *Agricultural Handbook 60*, U.S. Department of Agriculture, Washington, D.C., Feb. 1954.
- Extractable cations: calcium, potassium, and sodium measured by flame spectrophotometry; magnesium by atomic absorption  
    Due to high concentrations, aliquots of the extract were diluted

FORMAT: Tabular

COMMENTS:

Published in:

Dodd, J.D. and J.W. Webb, 1975: Establishment of Vegetation for Shoreline Stabilization in Galveston Bay. Miscellaneous Paper No. 6-75, Coastal Engineering Research Center.

Water samples for salinity taken from four stations in Anahuac Refuge, ten feet from shore.

BAY SAMPLING SITES:

<i>Description</i>	<i>Latitude</i>		<i>Longitude</i>	
	<i>Deg</i>	<i>Min</i>	<i>Deg</i>	<i>Min</i>
Block I	29	33.24	94	28.91
Block II	29	32.47	94	30.90
Block III	29	33.30	94	31.73
Block IV	29	34.43	94	33.22

QUALITY ASSURANCE/QUALITY CONTROL: No formal QA/QC plan exists, and no information is available as to QA/QC practices.

GALVESTON BAY  
NATIONAL ESTUARY PROGRAM  
DATA INVENTORY PROJECT

DATA SET REPORT-080

DATA INVENTORY INFORMATION

GBNEP Reference Number: TAMU0020

PROJECT NAME: Jetty sediments

OBJECTIVE: Survey sediments and bathymetry near jetties

DATA USE: research

PRIORITY PROBLEM:

A4. Bathymetric/circulation changes

A7. Increased sediment/turbidity

D1. Subsidence & sea-level rise

D2. Bathymetric/circulation changes

KEYWORDS: jetties, Galveston Harbor, nearshore, beachfront, geology

SOURCE: Texas A&M University

CONTACT: Library

GENERAL TYPE: Geology, morphology

GEOGRAPHICAL COVERAGE: Galveston Harbor, jetties, nearshore

PERIOD OF COVERAGE: ca. 1975

MEASUREMENTS: bathymetry, sediment sampling, minerology, textures

FORMAT: tabular, graphical

COMMENTS:

Published in:

Coulthard, D. 1976: Nearshore sediments off Galveston island and Jetty system, Texas. M.S. Thesis, TAMU.

QUALITY ASSURANCE/QUALITY CONTROL: No formal QA/QC plan exists, and no information is available as to QA/QC practices.

GALVESTON BAY  
NATIONAL ESTUARY PROGRAM  
DATA INVENTORY PROJECT

DATA SET REPORT-085

<b>DATA INVENTORY INFORMATION</b> GBNEP Reference Number: CERC003
<b>PROJECT NAME:</b> CERC Sand Resources
<b>OBJECTIVE:</b> Prospect Galveston coast for useful sand reserves
<b>DATA USE:</b> engineering study
<b>PRIORITY PROBLEM:</b>
D1. Subsidence & sea-level rise
D2. Bathymetric/circulation changes
D4. Use of littoral property
<b>KEYWORDS:</b> geology, stratigraphy, beach erosion, nourishment, sand

**SOURCE:** Coastal Engineering Research Center

**CONTACT:** CERC, Waterways Experiment Station  
3909 Halls Ferry Road  
Vicksburg, Mississippi 39180-6199  
601-634-3111

**GENERAL TYPE:** Geological, Sedimentary

**GEOGRAPHICAL COVERAGE:** Galveston Island Beachfront from San Luis Pass to High Island

**PERIOD OF COVERAGE:** 1976-77

**MEASUREMENTS:** Seismic reflectivity, deep coring with vibracore, and grain-size analyses on cores and surficial sediments

**FORMAT:** Tabular, digital

**COMMENTS:** Objective was to survey Galveston Island area for possible deposits of sand of sufficient quality to use in beach nourishment. In process, CERC performed an excellent stratigraphic survey of the area. The raw data are presented in a table at the end of the report (see below) but the digital record is now lost. Published in:

Williams, S., D. Prins, & E. Meisburger, 1979: Sediment distribution, sand resources, and geologic character of the inner continental shelf off Galveston County, Texas. Rep. MR 79-4, CERC, Kingman Bldg, Fort Belvoir, VA.

**QUALITY ASSURANCE/QUALITY CONTROL:** No formal QA/QC plan exists, and no information is available as to QA/QC practices.

GALVESTON BAY  
NATIONAL ESTUARY PROGRAM  
DATA INVENTORY PROJECT

DATA SET REPORT-090

DATA INVENTORY INFORMATION

GBNEP Reference Number: GLO0001

PROJECT NAME: Digitized maps, GLO

OBJECTIVE: display in digital format physical and cultural features

DATA USE: monitoring

PRIORITY PROBLEM:

A1. Loss of habitat

D1. Subsidence & sea-level rise

D2. Bathymetric/circulation changes

D3. Loss of wetlands

D4. Use of littoral property

KEYWORDS: property, pipelines, dredging, filling, cabins, beach, shoreline

SOURCE: General Land Office

CONTACT: Jay Crewes or Bruce Smith (512-463-5055)

General Land Office

1700 N. Congress

Austin, TX 78701

GENERAL TYPE: Digital files of mapped physical features

GEOGRAPHICAL COVERAGE: Galveston Bay and nearshore

PERIOD OF COVERAGE: current USGS

MEASUREMENTS: Shoreline positions, and physical and cultural features

FORMAT: Digitized Arc-Info files, mainframe, Hewlett-Packard

COMMENTS: GLO has underway an intensive effort to computerize its operations, including information retrieval and display. This includes development and extension of COMPAS, digital storing of pipeline and well data, digital delineations of coastal channels and disposal areas, and digital maps. Because this does not constitute primary data, it really lies beyond the ambit of this project, but the program is of potential importance to many researchers, so some record is warranted. The products include:

Maps at 1:100,000 (Arc-Info)

State tract boundaries (Arc-Info)

Pipelines for which GLO issues easements (i.e., those pipelines that cross a tract boundary)

Permits, easements and GLO instruments, by tract and name of waterbody  
(database and mainframe)  
Digitized maps at 1:24000 (7.5-min quads) showing channels and disposal  
areas  
Maps showing cabin locations and bird rookeries  
Digital file of aerial photography flown on cabin program, by quad sheets,  
showing coverage, mission and historical photography which GLO had on  
hand.  
Digitized reef boundaries (as mapped by TPWD in Bay) and private leases of  
TPWD, including state tract, and acreage.

The mapping of channels and disposal areas should be noted. This was done very carefully in cooperation with USCE, based upon the positioning used in dredge contracts, with USCE authority in reconciling any discrepancies (and there were some). Unfortunately, this data file is written in some obscure Hewlett-Packard convention, which cannot be translated into any other mode, so for now the generated maps have to be considered as analog.

QUALITY ASSURANCE/QUALITY CONTROL: No formal QA/QC plan exists, and no information is available as to QA/QC practices. Great reliance was placed on sound surveying field practices.

GALVESTON BAY  
NATIONAL ESTUARY PROGRAM  
DATA INVENTORY PROJECT

DATA SET REPORT-095

DATA INVENTORY INFORMATION  
GBNEP Reference Number: SCS0001

PROJECT NAME: SCS Soil Surveys  
OBJECTIVE: characterize soil types by county  
DATA USE: survey  
PRIORITY PROBLEM:  
    A1. Loss of habitat  
    A7. Increased sediment/turbidity  
    D3. Loss of wetlands  
KEYWORDS: soils, wetlands, vegetation

SOURCE: Soil Conservation Service, Temple, TX

CONTACT: Pat Weber, 817-774-1261

GENERAL TYPE: areal soil and landform data

GEOGRAPHICAL COVERAGE: Published by county: Galveston , Chambers, Harris, Liberty, Fort Bend, Brazoria

PERIOD OF COVERAGE: Soil survey data ca. 1980

MEASUREMENTS: Soil characterization, engineering properties, such as gross grain-size partitioning, texture, Unified soil classification, liquid limit, plasticity, etc., permeability, pH, salinity, shrink-swell potential, organic matter and erosion factors. In addition, there are qualitative properties, such as suitability for various plants and structures, exposure to flooding and subsidence, present landuse.

FORMAT: Tabular data, soil types indicated on aerial photographs and generalized maps.

COMMENTS: There should be substantial historical data from the Galveston area extant at SCS or its archive, but no information was provided concerning older information.

QUALITY ASSURANCE/QUALITY CONTROL: No formal QA/QC plan exists, and no information is available as to QA/QC practices.

GALVESTON BAY  
NATIONAL ESTUARY PROGRAM  
DATA INVENTORY PROJECT

DATA SET REPORT-100

DATA INVENTORY INFORMATION	
GBNEP Reference Number: BEG0001	
PROJECT NAME:	Alicia effects BEG
OBJECTIVE:	effects of hurricane on Galveston Island morphology
DATA USE:	research
PRIORITY PROBLEM:	
	D2. Bathymetric/circulation changes
	D3. Loss of wetlands
	D4. Use of littoral property
KEYWORDS:	hurricanes, storm surge, beach, shoreline, property

SOURCE: Bureau of Economic Geology, University of Texas

CONTACT: Robert Morton  
BEG, Balcones Research Center  
Austin, TX 78712  
512-471-1534

GENERAL TYPE: Morphology, hydrography

GEOGRAPHICAL COVERAGE: Galveston Island beachfront

PERIOD OF COVERAGE: February 1980 - August 1985

MEASUREMENTS: Rates of shoreline movement based upon aerial photographs and beach-shoreface profiles

FORMAT: Tabular and graphical

COMMENTS: Published in:

Morton, R. and J. Paine, 1985: Beach and vegetation-line changes at Galveston Island, Texas: Erosion, deposition and recovery from Hurricane Alicia. Geol Cir. 85-5, BEG, University of Texas at Austin.

Shoreline changes in linear distance and total volume between various survey/photograph dates computed for points along beachfront at 1250 ft intervals. Includes cumulative vegetation line changes for other hurricanes dating back to 1961 (Carla).

QUALITY ASSURANCE/QUALITY CONTROL: No formal QA/QC plan exists, and no information is available as to QA/QC practices. All vintage maps and photography are archived at BEG.

GALVESTON BAY  
NATIONAL ESTUARY PROGRAM  
DATA INVENTORY PROJECT

DATA SET REPORT-105

DATA INVENTORY INFORMATION

GBNEP Reference Number: CSU001

PROJECT NAME: San Luis Sedimentology

OBJECTIVE: coring to establish lithology & stratigraphy

DATA USE: research

PRIORITY PROBLEM:

A4. Bathymetric/circulation changes

C1. Regulatory

D1. Subsidence & sea-level rise

D2. Bathymetric/circulation changes

D4. Use of littoral property

KEYWORDS: inlets, sand transport, erosion, shoreline

SOURCE: Colorado State University, Department of Geology

CONTACT: Dr. Frank Ethridge

GENERAL TYPE: Geology

GEOGRAPHICAL COVERAGE: San Luis Pass

PERIOD OF COVERAGE: ca. 1985

MEASUREMENTS: Vibracore and gravity core stations throughout inlet and bars, texture, mineralogy, lithology. Analysis of depositional environments.

FORMAT: Tabular, photographic, graphical

COMMENTS:

Published in:

Israel, A., F. Ethridge & Ernest Estes, 1987: A sedimentologic description of a microtidal, flood-tidal delta, San Luis Pass, Texas. *J. Sedim. Petr.* 57 (2), pp. 288-300.

QUALITY ASSURANCE/QUALITY CONTROL: No formal QA/QC plan exists, and no information is available as to QA/QC practices.

GALVESTON BAY  
NATIONAL ESTUARY PROGRAM  
DATA INVENTORY PROJECT

DATA SET REPORT-110

DATA INVENTORY INFORMATION	
GBNEP Reference Number: TAMU0010	
PROJECT NAME:	Galveston beach processes 85
OBJECTIVE:	Impact of beach nourishment near San Luis Pass
DATA USE:	research
PRIORITY PROBLEM:	
	C1. Regulatory
	D2. Bathymetric/circulation changes
	D4. Use of littoral property
KEYWORDS:	erosion, beach, inlets

SOURCE: Texas A&M University, Departments of Geology & Geography

CONTACT: John R. Giardino

GENERAL TYPE: Geology, beach processes, sand transport

GEOGRAPHICAL COVERAGE: Galveston shoreface

PERIOD OF COVERAGE: 1985-86

MEASUREMENTS: Beach profiles, anecdotal

FORMAT: tabular

COMMENTS:

Published in:

Giardino, J., R. Bednarz & J. Bryant, 1987: Nourishment of San Luis Beach, Galveston Island, TX: An assessment of the impact. *Coastal Sediments '87*, ASCE, pp 1145-1157.

Summary of a small-scale beach nourishment project along the Galveston shoreface within the groin field, associated transport processes. Identified the aeolian component as a significant loss of sand from the shoreface.

QUALITY ASSURANCE/QUALITY CONTROL: No formal QA/QC plan exists, and no information is available as to QA/QC practices.

GALVESTON BAY  
NATIONAL ESTUARY PROGRAM  
DATA INVENTORY PROJECT

DATA SET REPORT-115

DATA INVENTORY INFORMATION

GBNEP Reference Number: TGLO001

PROJECT NAME: State tracts, GLO  
OBJECTIVE: Boundaries of all coastal state tracts, map form  
DATA USE: survey  
PRIORITY PROBLEM:  
D1. Subsidence & sea-level rise  
D2. Bathymetric/circulation changes  
D3. Loss of wetlands  
D4. Use of littoral property  
KEYWORDS: state tracts, property

SOURCE: Texas General Land Office

CONTACT: Bruce Smith  
General Land Office  
1700 N. Congress  
Austin, TX 78701

(512)-463-5055

GENERAL TYPE: maps

GEOGRAPHICAL COVERAGE: All state waters in Galveston Bay area

PERIOD OF COVERAGE: current

MEASUREMENTS: Boundaries of state tracts in coastal waters

FORMAT: Published as "State-Owned Submerged Lands of the Texas Gulf Coast".

COMMENTS: A book of reduced USGS 7.5-min quadrangles with state tract boundaries overprinted, including Texas Plane Coordinate System, tract numbers and ancillary data.

QUALITY ASSURANCE/QUALITY CONTROL: No formal QA/QC plan exists, and no information is available as to QA/QC practices.

**CROSS-REFERENCE  
MORPHOLOGY & GEOLOGY**

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**Data sets with additional or ancillary information:**

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Data Set Report-120	Data Set Report -125
Data Set Report-130	Data Set Report-135
Data Set Report-140	Data Set Report-155
Data Set Report-180	Data Set Report-215
Data Set Report-245	Data Set Report-345
Data Set Report-350	Data Set Report-355
Data Set Report-370	Data Set Report-375
Data Set Report-395	Data Set Report-405
Data Set Report-430	Data Set Report-515
Data Set Report-525	Data Set Report-575
Data Set Report-640	Data Set Report-750
Data Set Report-790	Data Set Report-800

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