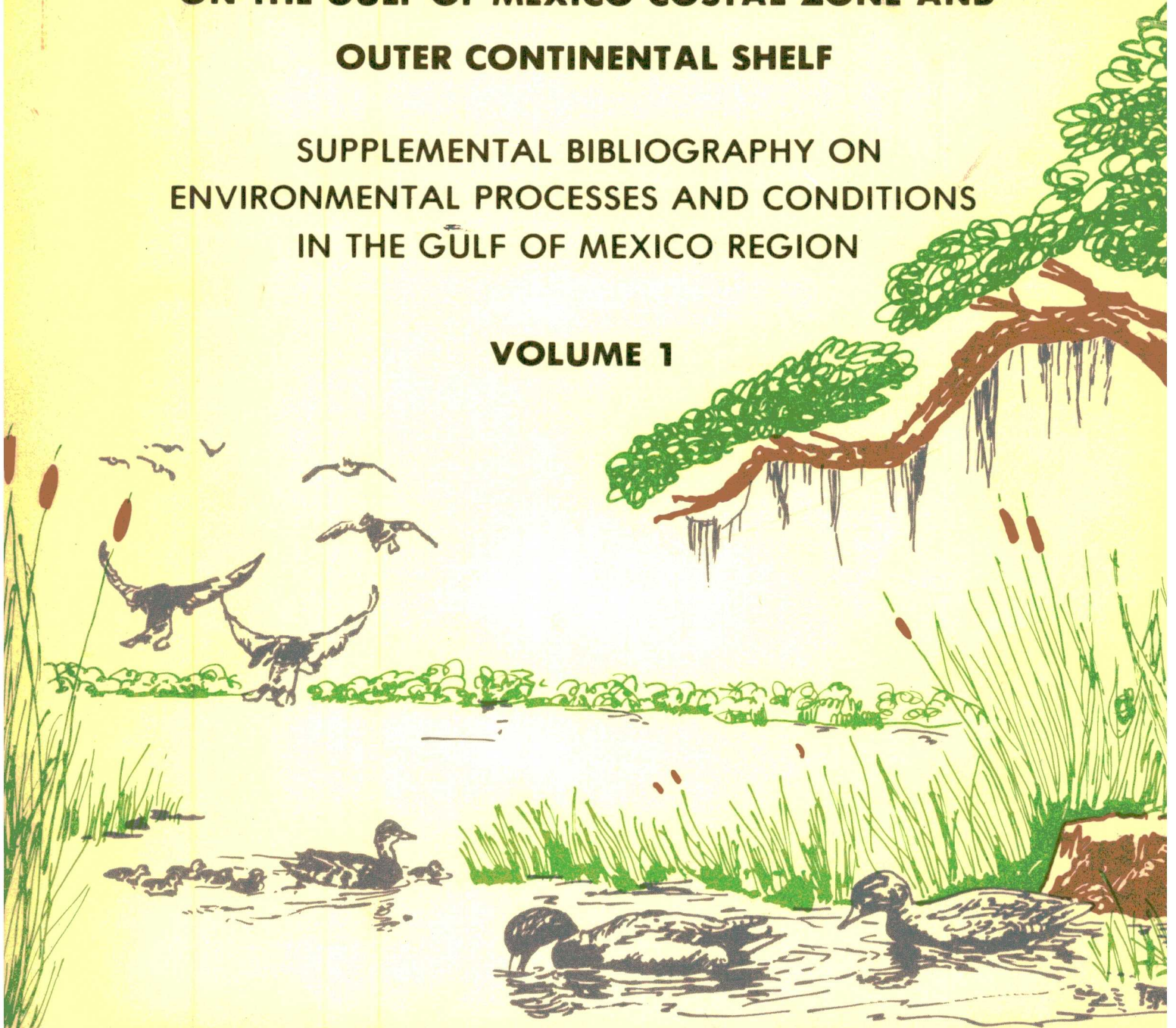


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**ENVIRONMENTAL AND SOCIO ECONOMIC BASELINE
ON THE GULF OF MEXICO COSTAL ZONE AND
OUTER CONTINENTAL SHELF**

**SUPPLEMENTAL BIBLIOGRAPHY ON
ENVIRONMENTAL PROCESSES AND CONDITIONS
IN THE GULF OF MEXICO REGION**

VOLUME 1



**DEPARTMENT OF THE INTERIOR
Bureau of Land Management**

SUPPLEMENTARY BIBLIOGRAPHY
on
ENVIRONMENTAL PROCESSES AND CONDITIONS
in
THE GULF OF MEXICO REGION
VOLUME I of III

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FOREWORD

Heightened interest in offshore oil exploration and development on the Outer Continental Shelf of the Gulf of Mexico has generated the need for current and expanded information on that area. In 1970, the National Oceanographic Data Center published Cooperative Investigations of the Caribbean and Adjacent Regions (CICAR), Bibliography on Meteorology, Climatology, and Physical/Chemical Oceanography, Volume I; Bibliography on Marine Biology, Volume II; and Bibliography on Marine Geology and Geophysics, Volume III.

The Bureau of Land Management, U. S. Department of the Interior, charged with the responsibility for leasing federally-owned offshore lands for oil exploration and development, perceived the need to supplement the extensive references in these previously published works by addition of more recent publications in the same fields of study and by providing references in several other relevant categories.

This work was prepared by Environment Consultants, Inc., under contract to The Bureau of Land Management, and is Volume I of a three-volume study.

The geographic scope of this study is described as that area falling within a straight line drawn from Brownsville, Texas, to the point 24° N., 81° W., (excluding the Campeche Escarpment) and including all counties and parishes that are adjacent to the coastline or include bay and estuary systems and coastal wetlands of The Gulf of Mexico.

Volume I is an upgraded and updated annotated bibliography on environmental processes and conditions in The Gulf of Mexico. This volume presents some 780 references in the original CICAR categories. The Oceanography and Meteorology sections of CICAR have been updated to include references for the years 1970-1973. The Marine Biology and Marine Geology sections were updated to include references for the years 1972-73. In addition to the above CICAR categories, 2079 references in the following categories are included:

- Archaeological and Historical Sites
- Commercial Activities
- Commercial Fishing
- Commercial Shipping
- Demography
- Land Use
- Marine, general
- Miscellaneous
- Petroleum Industry
- Pollution
- Rare and Endangered Species
- Recreational Sites and Opportunities
- Sport Fishing
- Transport Systems

All entries are presented in the same format as that of the CICAR volumes.

Because of the dynamic nature of socio-economic data, only recent references are considered useful in all of the categories listed above except Rare and Endangered Species and Archaeological and Historical Sites; therefore, the socio-economic categories contain references of relatively recent years only.

Volume II is a report identifying research and studies in progress (at the time of writing) concerning matters related to the CICAR and to the following subjects:

- Archaeological and Historical Sites
- Rare and Endangered Species
- Recreational Sites and Opportunities
- Commercial Fishing
- Sport Fishing
- Land Use, and
- Commercial Shipping

As in Volume I - The Annotated Bibliography - sections on Commercial Activities, Demography, Marine (general), Miscellaneous, Petroleum Industry, Pollution and Transport Systems are also included in Volume II- Current and Recent Research on Environmental Processes and Conditions in The Gulf of Mexico Region.

Volume III is a socio-economic inventory and analysis of the study area, prepared in order to provide both detailed and comprehensive data on social and economic factors as they relate to the environmental processes and resources of The Gulf of Mexico. Many of these factors are presented in five-color distribution maps. It is expected that impact evaluations of resource development projects in this region may be more easily facilitated by information presentation in the above context.

INTRODUCTION

This supplementary annotated bibliography has been compiled through a literature search. Its purpose is to provide the reader with a reasonably comprehensive review of the published literature in the subjects considered of relevance to a study of the Gulf of Mexico, the U. S. Gulf coastal region and the Outer Continental Shelf. References in these subject areas which were not specific to the geographic area were omitted. Although additional literature appropriate to the scope of this bibliography may exist, constraints of time, funds and personnel were the ultimate determinants in the extent of this work.

ACCESSIONS FOR BIBLIOGRAPHY

Bibliographic material has been grouped into the general topics of:

- Archaeologic and Historic Sites
- Commercial Activities
- Commercial Fishing
- Commercial Shipping
- Demography
- Land Use
- Marine Biology
- Marine General
- Marine Geology
- Meteorology
- Miscellaneous
- Oceanography
- Petroleum Industry
- Pollution
- Rare and Endangered Species
- Recreational Sites and Activities
- Sport Fishing
- Transport Systems

Within each general topic, references are presented 1) chronologically by year of publication, and 2) alphabetically by author within each year. The complete reference and abstract (when practicably available to the bibliographers in the course of their investigation and compilation) follow.

All references within a general topic are numbered consecutively without regard to year.

HOW TO USE THE INDICES

Three indices for each general topic have been prepared to assist the user in locating references:

1. Subject Index
2. Geographical Index
3. Author Index

These three indices for each general topic precede the references for that topic. Each reference is numbered, and by its number may be retrieved from each of the indices for that general topic.

Those entries pertinent to more than one general topic will appear in the reference section and in the indices for each relevant general topic.

SUBJECT INDEX

A hierarchical subject index has been compiled using the information found in the citation and/or abstract for each entry. An alphabetical listing of specific topics indented beneath the sub-general topic to which they pertain is the format used in the index. Indented specific topics are given the same weight as the terms under which they appear. Redundancy is eliminated by indexing an entry only under the most specific terms applicable in the hierarchy.

An entry may be found under any number of categories within the Subject Index for a particular general topic. Example:

A publication entitled "Biology, Population Dynamics - Shrimp" is pertinent to both Marine Biology and Commercial Fishing.

The entry (for illustrative purposes numbered 00000) would be classified in the Marine Biology Subject Index under:

Ecology
Population dynamics 00000

Taxa
Crustacea 00000

Under the Commercial Fishing Index as:

Ecology
Population dynamics 00000

Fisheries
Shellfish
Penaied shrimp 00000

GEOGRAPHICAL INDEX

The index is arranged as an alphabetico-classed system, i.e., by major regions ordered in a pattern of indentations indicating geographic subordination. Geographic subordinate heading and their

subordinate geographic units are also arranged alphabetically. To avoid redundancy, an entry is indexed only under the most specific location applicable in the hierarchy. This arrangement enables the user to find all specific geographic references in a broad geographic region. Example:

Entry 00000 describes a reference concerning a report relating to work in Atchafalaya Bay, Louisiana. The entry appears:

```
Gulf/Caribbean
  Gulf Coastal States
    Louisiana
      Bays
        Atchafalaya Bay 00000
        Barataria Bay
      Lakes
        Calcasieu Lake
        Lake Maurepas
      Parishes
        Ascension
        Assumption
    Mississippi
  Gulf of Mexico, general
    Eastern Gulf of Mexico
    Western Gulf of Mexico
```

AUTHOR INDEX

The Author Index is an alphabetical listing of authors. Corporate authors are shown if individual authors were not cited. These corporate authors are ordered in a pattern of indentations indicating divisional or departmental subordination. The major agencies along with their composite divisions are arranged alphabetically. As in both the Subject and Geographical Indices, an entry is indexed only under the most specific term applicable-- here, the agency most directly responsible for the work. Example:

Gulf Coastal Fisheries Center is the author of entry 00000. The entry would be indexed as:

```
U. S. Dept. of Commerce
  Maritime Administration
  National Oceanic and Atmospheric Administration
  National Marine Fisheries Service
    Gulf Coastal Fisheries Center 00000
```

As an additional retrieval device, entries with anonymous or unknown author have been identified by the name of their source-periodical enclosed in brackets.

ARCHAEOLOGICAL AND HISTORICAL SITES
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San Antonio 00259

Coastal 00035 00036 00039 00040 00066 00096
00118 00131 00141 00156 00248 00250

Counties

Aransas 00132
Chambers 00205
Galveston 00127 00187
Kenedy 00239
Kleberg 00239
Nueces 00038

Islands

Padre

00122

00244

00001

Du Pratz, L. M. The history of Louisiana. Reprinted, Pelican Press, Inc., New Orleans, Louisiana. Printed for T. Becket, Corner of the Adelphi in the Strand, 376 p. 1774.

00002

Anonymous. Indian mounds in Louisiana. DeBow's Review. New Orleans, La. 3 (4): 31-352, 1847.

00003

Anonymous. Historical and statistical collections at Louisiana Terrebonne Indian Mounds. DeBow's Review, 11:601-602; 611, 1851.

The article records the presence, but not quantitatively of various scattered mounds in southern Louisiana parishes. There are some short descriptions of some of the mounds.

00004

Brinton, D. G. Notes on the Floridian peninsula; its history, Indian tribes and antiquities. Sabin Philadelphia. 202 p. 1859.

00005

Brinton, D. G. Artificial shell deposits of the United States. Smithsonian Institution Annual Report for 1866.

The author makes observations in the occurrences and distributions of shell mounds in the Manatee River, along the shores of Tampa Bay, one near New Smyrna on the Mosquito Lagoon and on the mouth of the Crystal River on the Gulf. He describes them as sometimes being "regular" in outline and 25 or 30 feet high.

00006

Leidy, J. Remarks, Proceedings of the Academy of Natural Science 109. Philadelphia, 1866.

Discusses possible association between artifacts and fossil mammals at Avery Island.

00007

Simpson, Dr. Remarks upon the shell-mounds of West Florida, particularly those of Tampa Bay. American Naturalist, III: 558-560, December, 1869.

00008

Caines, A. S. and K. M. Cunningham. Shell heaps on Mobile River. Smithsonian Institute Annual Report for 1877. 290-291, 1877.

The report of a collection received that came from Simpson Island at the mouth of the Mobile River. Gaines reports that shell mounds are common in the area at the time (1877), especially on Simpson Island and the area of the delta from the Mobile to the Tanasas. Various human remains, bone implements, and numerous amounts of pottery were discovered.

00009

Walker, S. T. Preliminary reports among the Indian Mounds in Southern Florida. Smithsonian Institution Annual Report for 1879. 392-413, 1879.

Several mounds along the Achaskote River are located and described: Hernando County, Florida; Anclote River mounds; Dunedin at Saint Joseph's Bay; mounds at Point Pinellas, Hillsborough County; at Long Key near Boca Ciega; Pine Key mounds; Maximo Point and several mounds around Tampa Bay. The results of some test excavations are presented.

00010

Walker, S. T. Report on the shell heaps of Tampa Bay, Florida. Smithsonian Institution Annual Report for 1879, 413-422 p. 1879.

Numerous shell mounds around Tampa Bay, Florida, are located and described. Many mounds no longer exist due to construction of roads, houses and other similar projects which alter the landscape. Some have been excavated, and these results are described.

00011

Gold, silver and other ornaments found in Florida. Annual report Smithsonian Institution for 1882, p. 791-793, 1882.

00012

Gatsche, A. S. The Shetimasha Indians of St. Mary's Parish, Southern Louisiana. Transactions of the Anthropological Society of Washington, 2: 148-158, 1883.

00013

Walker, S. T. Mounds and shell heaps on the west coast of Florida. Annual report of the Smithsonian Institution for 1883, 854-868 p. 1885.

The continuation of Walker's work of 1879 locates and describes several more areas of mound concentration along the Florida Coast. There are mounds at the Pensacola Bay along the East Bay and Escambia areas but are smaller and less numerous than around Tampa Bay. Escriband Point in the area also has a number of small mounds. Santa Rosa Sound is not known to have any mounds, but there are some on the south bank of Choctawatchee Bay. Mound building appears to have been practiced to a lesser degree here, than elsewhere and the mounds were built slowly with gradual accretions of materials.

00014

Leidy, J. Notice of some mammalian remains from the salt mines of Petite Anse, Louisiana Transactions of the Wagner Free Institute of Science, 2: 33-40, 1889.

Gives careful measurements and descriptions of fossil mammal remains from Avery Island which were recovered in the sinking of an air shaft to the mine. The depths of materials found is recorded, including pottery fragments at 10 to 14 feet below the surface.

00015

Douglas, A. E. Mounds in Florida, American Antiquarian, 12: 105-107, 1890.

Douglas generally describes the mounds of Florida, in terms of shape and size, and possible construction. He does not give any really useful archaeological information.

00016

Scaife, Walter Bell. America: its geographical history, 1492-1892. Six lectures delivered to graduate students of the John Hopkins University; with a supplement entitled: Was the Rio Del Espiritu Santo of the Spanish Geographers the Mississippi? The John Hopkins Press, Baltimore, 176 p. 1892.

00017

Mercer, H. C. The antiquity of man on Petit Anse (Avery's Island), Louisiana. American Naturalist, 29: 393-394, 1895.

00018

The Mounds of Louisiana, Publications of the Louisiana Historical Society, 1 (4): 12-32, 1896.

Records the locations of some mounds in Louisiana. Tends to be general in some areas and not give exact locations.

00019

Hamilton, Peter J. 1897. Colonial Mobile. Riverside Press, Cambridge: 446 p. 1897.

00020

Holmes, William H. Aboriginal pottery of the eastern United States. Twentieth Annual Report of the Bureau of American Ethnology, 1898-1899: 1-201, 1903.

Holmes describes general types of ceramic forms found in the eastern United States, forms, colouration, materials, etc. are discussed. Useful only for a generalized introduction.

00021

Dienst, Alex. The Navy of the Republic of Texas. The Quarterly of the Texas State Historical Association, 12 (3): 165-203, 1909.

00022

Halbert, H. S. The archaeology of the Gulf region east of the Mississippi River, read Aug. 24, 1909 before Alabama Anthropol. Society, Amer. Anthropologist, 11: 495-496, 1909.

Halbert postulates five ideas that he thinks existed in the Gulf Coast region - and in some cases, elsewhere - based on the evidence then available about the aboriginal occupants of the area and their culture. No concrete evidence is given as it presents only an outline of the major points of his talk as presented at the meeting.

00023

Bolton, Herbert E. Spanish activities on the Lower Trinity River 1746-1771. The Southwestern Historical Quarterly 16 (4): 339-377, 1913.

Article explains Spanish and French relationships in this area during the mid 18th century. The building of the Presidio, San Agustin Ahumada and the mission near it, the Spanish fear encroachment by the French. The

Indians mentioned in this article, taken from other references were the Bidai, Orloquiza and Attacapa. In 1766 the presidio was abandoned by soldiers twice, part of the garrison at a time, until it was completely abandoned.

00024

Bolton, H. E. The location of La Salle's Colony on the Gulf of Mexico. Mississippi Valley Historical Review, 2 (2): 165-182, 1915.

Discussion on the 400 colonizers who set out for the Texas Gulf Coast. All died either by illness or slain by Karanbawas, some taken by Spanish. The settlement was discovered on Garcitas River and not on the Lavaca River.

00025

Dunn, W. E. Spanish and French Rivalry in the Gulf region, 1698-1702. The University of Texas Bulletin #1705, 1917.

00026

Burnham, R. B. Mobile County present day place names showing Aboriginal influence Arrow Points, 1 (6), 1920.

00027

Anonymous. South Alabama Mounds. Arrow Points. 4 (1), 1922.

00028

Brannon, P. A. Aboriginal towns in Alabama, showing locations by present country boundary lines. Arrow Points, 4: 26-28, 1922.

00029

Owen, T. M. Some notes on the shell banks of the Alabama coast. Arrow Points, 4: 2-7, 1922.

00030

Owen, T. M. Some notes on the shell banks of the Alabama Coast. Arrow Points, 4 (1), 1922.

00031

Anonymous. An act to provide for the preservation of the aboriginal and other antiquities, mounds, earthworks, ancient forts and graves in the State of Alabama. Arrow Points, 6: 108-109, 1923.

Alabama State Antiquities Act, provides some sort of protection for antiquities on state property and penalties for violaters.

00032

Bushnell, David I. Investigation of shell and sand mounds on Pinellas Peninsula, Florida. Smithsonian Miscellaneous Collections, 78 (1): 125-132, 1925.

The Pinellas Peninsula extends into Tampa Bay, and was visited by the author in 1925. He describes the general environment, the adjacent areas of Tampa Bay and Boca Ciega Bay. DeSoto landed here in 1539 and describes the area. Three types of work are noted, large mounds of sand and/or shell, which may or may not have a definite form. He uses this type and variations thereon. Some of the mounds are described and some of the artifacts that are associated with them.

00033

Collins, H. B. Archaeological work in Louisiana and Mississippi. Explorations and field-work of the Smithsonian Institution in 1926, Smithsonian Miscel. Collections. 78 (7): 200-207, 1927.

Investigations were conducted at Pointe a la Hache. on the Mississippi about 40 miles south of New Orleans; to Houma in Terrebonne Parish, La.; others were Gibson; Lake Palourde; Bayou L'Ours; Berwich; Cherenton; Avery Island; Pecan Island; Vermillion Parish; Chenier du Ford; south of Grand Lake, Cameron Parish; and elsewhere. These were mostly mound sites and excavations were carried out at the numerous mounds at each of these locales. Collins states this is the southern and western most extension of mound building activities that he knows of (1927). There are linkages made to the Gulf Coast area of Florida.

00034

Garner, Ruby Lee. Galveston during the Civil War. MA thesis, University of Texas, Austin, 1927.

00035

Martin, George C. Preliminary archaeological survey of a portion of the Texas Coast made by George C. Martin, and Wendell H. Potter in 1927, 1928, and 1929. Unpublished.

00036

Martin, George Castor. Notes on some Texas Coast campsites and other remains. Bulletin of the Texas Archaeological and Paleontological Society, 1: 50-57, 1929.

00037

Martin, George C. A vase and some carved stones and pebbles from Nueces County, Texas. Texas Archaeological and Paleontological Society, 2, 18-20, 1930.

A short article on a site with a vase and other pots found in September, 1929 by a Mexican trespassing on property on the Petronila Creek. The vase was thought to be manufactured in Louisiana or Arkansas.

00038

Martin, George Castor. Two sites on the Callo del Oso, Nueces County, Texas. Bulletin of the Texas Archaeological and Paleontological Society, 2: 7-17, 1930.

The first was mainly concerned with skeletal materials; a brief history of former work done on this site by John Dunn, Pearse and Cox. Several theories about bones found at this site. The mud bridge campsite was discovered by Martin on the Callo del Oso, June 15, 1929. Artifacts found consisted entirely of triangular arrowheads with rounded and straight bases and a number of knives, one curved; the others triangular while all have projections at the site. A brief summary of bone surface analysis is included at the end of the article, however, osteotechnology in archaeology was in its formative years at the time the article was written.

00039

Potter, Wendell H. Ornamentation on the pottery of the Texas coastal tribes. Texas Archaeological and Paleontological Society, 2:41-44, 1930.

Includes the area from Baffin Bay north to Matagorda Peninsula (Padre, Mustang, San Jose and Matagorda Islands). The pottery was divided into three parts: class one-heavy type of cooking ware, class 2 - lighter type of cooking ware, and a third type - which was made to contain water and other liquids.

00040

Martin, George Castor. Texas Coastal Pottery. Bulletin of Texas Archaeological and Paleontological Society, 3: 3-56, 1931.

00041

Anderson, A. E. Artifacts of the Rio Grande Delta region. Bulletin of the Texas Archaeological and Paleontological Society, 4: 29-31, 1932.

00042

Czajkowski, J. R. Preliminary report of archaeological excavations in Orleans Parish. Louisiana Conservation Review, 4 (3): 12-18, 1934.

00043

Ford, J. A. An introduction to Louisiana Archaeology. Louisiana Conservation Review. 4 (5): 8-11, 1935.

00044

Ford, J. A. Outline of Louisiana and Mississippi pottery horizons. Louisiana Conservation Review, 4 (6): 33-38, 1935.

00045

Howe, H. and others. Submergence of Indian Mounds. Louisiana Department of Conservation, Geological Survey Bulletin, 6: 64-68, 1935.

00046

Swanton, J. R. Notes on the cultural province of the Southeast. American Anthropologist (M.S.), 87: 373-85, 1935.

00047

Boyd, M. F. The fortifications of San Marcos, Apalachee. Florida Historical Quarterly, 15 (1): 1-32, 1936.

00048

Kniffen, Fred B. A preliminary report on the Indian mounds and middens of Plaquemines and St. Bernard Parishes. Lower Mississippi River Delta--Reports on the Geology of Plaquemines and St. Bernard Parishes. Department of Conservation, Louisiana Geological Survey--Geological Bulletin No. 8: 409-415, 1936.

00049

Greenman, Emerson F. Hopewellian traits in Florida. *American Antiquity* 3(4): 327-332, 1938.

Greenman compares some ceramic items of the Crystal River site with some items taken from the Hopewellian mounds of the Ohio Valley. He discusses how he thinks these ceramics may have been deposited in the mounds.

00050

Owen, Marie Bankhead. *Alabama, a social and economic history of the state.* Dixie Book Co., Inc., Montgomery, Alabama, 624 p. 1938.

00051

Boyd, M. F. Spanish Mission sites in Florida. *Florida Historical Society*, 17(4): 254-280, 1939.

00052

Castenada, Carlos E. *The Mission Era: The Passing of the Missions, 1762-1782.* Catholic Heritage in Texas, 1519-1936, 1939.

00053

Goggin, J. M. Some problems of the Glades Archaeological area, Florida. *Southeastern Archaeological Conference. Newsletter*, II(4): 24-26, 1940.

The relation of the ceramics of the glades area to surrounding areas is discussed.

00054

Chatelain, V. E. *The defenses of Spanish Florida, 1565-1763.* Carnegie Institution. Publications, 11, Washington, 1941.

00055

Sleight, Frederick W. A preview of archaeology in the Ten Thousand Islands of Florida. *The Kiva*, Tucson, 7: 5-8, 1941.

00056

Stone, Doris. General problems of Florida archaeology. Tequesta, I: 33-38, 1941.

00057

Willey, G. R. and R. W. Woodbury. A chronological outline for the northwest Florida Coast. American Antiquity, (3): 232-254, 1942.

The physiographic and cultural divisions found in Florida are discussed. Chronological and Spatial sequence for the northwest Gulf Coastal area of Florida based on ceramic types is defined.

00058

Etchings of old Mobile. Birmingham Printing Company, 1943.

00059

Sleight, F. W. Archaeological needs for Florida. American Antiquity VIII: 387-391 p. 1943.

The state of archaeological fieldwork and theory that existed up to and including 1943 is presented.

00060

Goggin, J. M. Archaeological investigations on the Upper Florida Keys. Tequesta, 4: 13-35, 1944.

00061

Willey, G. R. and P. Phillips. Negative-printed pottery from Crystal River, Florida. American Antiquity, 10(2): 173-185, 1944.

Negative printed pottery that was found at the Crystal River site in Citrus County, Florida and other areas in the Southeastern U. S. is discussed.

00062

Warring, A. J. Jr. and Preston Holder. A prehistoric ceremonial complex in the southeastern United States. American Anthropologist, 47: 1-34, 1945.

The presence of a widespread ceremonial complex in the southeastern U. S. and its forms as found in the archaeological record of different sites is discussed. An attempt to link this highly developed complex with an agricultural economic base is made.

00063

Willey, G. R. The Weeden Island culture: A preliminary definition. *American Antiquity*, 10(3): 225-254, 1945.

A description, definition, and delineation of the distribution and occurrence of the Weeden Island ceramic and stone artifacts are presented. Types of artifacts found and various artifacts found in association are described.

00064

Bennett, J. W. Review of: the Tchefuncte Culture, an early occupation of the Lower Mississippi Valley. *American Anthropologist*, 43(2): 246-251, 1946.

A book review of Ford and Quimby's, the Tchefuncte Culture . . .

00065

Gifford, John C. Some reflections on the South Florida of long ago, *Tequesta*, 6: 38-43, 1946.

00066

Campbell, T. N. The Johnson site. Type site of the Aransas Focus of the Texas Coast Bulletin of the Texas Archaeological and Paleontological Society, 18: 30-75, 1947.

00067

Griffin, J. W. Comments on a site in the St. Marks National Wildlife refuge, Wakulla County, Florida *American Antiquity*, 13: 182-183, 1947.

Griffin refers to an earlier article by Goggin (1946), and discusses a copper plate found at a site in the St. Marks area of Florida. He then adds newer information that further supports Goggin's alternatives.

00068

Goggin, J. M. A preliminary definition of archaeological areas and periods in Florida. *American Antiquity*, 13: 114-127, 1947.

Florida archaeological areas are defined, and archaeological sequences for these areas are postulated. The definition of these sequences are based upon pottery types and changes through time.

00069

Goggin, J. M. Manifestation of a south Florida cult in northwestern Florida. *American Antiquity*, XII: 273-276, 1947.

Goggin discusses some gold and silver artifacts found in a burial ground in the Apalachee Bay area, Wakulla County, Florida. Possibilities of the artifacts being trade items, local manifestation, or a cult found in southern Florida are discussed.

00070

Goggin, J. M. A revised temporal chart of Florida prehistory. *Florida Anthropologist*, 1: 57-60, 1948.

00071

Goggin, J. M. Some pottery types from central Florida. *Journal of the Gainesville Anthropological Association, Bulletin #1*, 1948.

00072

Simpson, J. C. Folsom - like points from Florida. *Florida Anthropologist*, 1(1-2): 11-15, 1948.

00073

Smith, H. G. Two historical archaeological periods in Florida. *American Antiquity*, 13(4): 313-9 p. 1948.

Two ceramic types are described that are found in some archaeological assemblages dating from post-contact times in Florida.

00074

Willey, G. R. The cultural context of the Crystal River negative painted style. *American Antiquity*, 13(4): 325-328, 1948.

00075

Willey, G. R. Culture sequences in the Manatee region of the Florida West Coast. *American Antiquity*, 13(3): 204-218, 1948.

Data are presented for the attempt at a construction of a cultural sequence in the Manatee region of Florida. This information is correlated with sequences elsewhere, dating from 700-1700 A. D.

00076

Griffin, J. W. Notes on the archaeology of Useppa Island. *Florida Anthropologist*, 2(3-4): 1949.

00077

Goggin, J. M. Cultural traditions in Florida Prehistory. *The Florida Indian and His Neighbors*, 13-44, 1949.

00078

Goggin, J. M. and F. H. Summer III. Excavation on the Upper Matacumbe Key, Florida. *Yale University Press in Anthropology*, 41. New Haven, 1949.

00079

Willey, Gordon R. *Archaeology of the Florida Gulf Coast*, Smithsonian Miscellaneous Collection, 113, Washington, D. C., 1949.

The whole known range of Florida Gulf Coast archaeology is presented. Construction is on ceramic sequences, and known archaeological sites and areas. Theoretical information and much data are available.

00080

Bullen, Adelaide, R. and R. P. Bullen. The John's Island Site, Hernando County, Florida. *American Antiquity*, 16(1): 23-45, 1950.

Bullen and Bullen report of a later excavation at Johns Island, Hernando County, Florida, than that of Warings during August 1948. The objectives of the excavations were to determine the associations of large stone tools and to secure data in relation to a rise in sea level during or since occupation. Numerous materials were recovered and discussed.

00081

Bullen, R. P. Perico, Island: 1950. Manuscript in files of Florida Park Service, Gainesville, Florida. No date. (and) Florida Anthropologist, 3(3-4): 49-44, 1950.

While present data do not justify any conclusions, it may be suggested as a speculation that there was an early period at Perico Island when fiber-tempered pottery was known and when fiber-tempered types of decoration were transferred to limestone-tempered vessels (Perico-Incised). This period probably was of very short duration and was followed by a much larger period during which Glades Plain pottery dominated the ceramics of the area upon a Deptford-Santa Rosa-Swift Creek time horizon. "The affiliations of this site with others in the near vicinity are obscure . . . The conclusion to be inferred is that there is still an unlocated Weeden Island burial mound in this area."

00082

Goggin, J. M. The state-wide archaeological site recording system, University of Florida, Gainesville, Anthropology Laboratory notes, 1950.

00083

Goggin, J. M. Florida archaeology - 1950. Florida Anthropologist, 3: 9-20, 1950.

A new chronological culture chart of Florida archaeology has been presented. It is based on a series of dates developed in the Glades area for those periods. While this chart cannot be presented as the absolute picture of Florida archaeology, it is temporarily based on a systematic analysis rather than guess work. Other work in Florida has also been reviewed.

00084

Goggin, J. M. Stratigraphic peaks in the Everglades National Park. American Antiquity, 15(3): 228-246, 1950.

The chronological sequences in the Glades area has been based on the combination of three other sequences of sub-areas. Test excavations were conducted, and the results subjected to testing of a serrational and stratigraphic nature. The end-product of this was the production of a sequence for the area, with some details being amplified.

00085

Goggin, J. M. An early lithic complex from central Florida, American Antiquity. 16(1): 46-49, 1950.

Goggin notes the existence of a new lithic complex, the Santa Fe, found to date only in North Central Florida. It is of the Archaic tradition, dating in part from the Preceramic period but apparently extending into the later Orange and perhaps early Pre-Cades Pond periods. The relation of Suwanee points to this complex cannot be determined as yet.

00086

Goggin, J. M. The Snapper Creek Site, Florida Anthropologist, III: 50-64, 1950.

One hundred and twenty-five feet were excavated in the Snapper Creek Site, a small black dirt midden. Abundant material was recovered from four six inch levels. On analysis, the decorated pottery was found to be predominantly Fort Drum punctated and Fort Drum incised with a few sherds of Opa Locka incised. It seems clear that the Fort Drum types preceded Key Largo incised and thus Glades II horizon. Their complex is now dated as Glades J, late. Glade I, early is still reserved for the non-decorated pottery level horizon, which may be represented at the lowest level of the site.

00087

Griffin, J. W. and R. P. Bullen. The Safety Harbor Site, Pinellas County, Florida. Florida Anthropological Society, Publication No. 2, Gainesville, Florida, 1950.

00088

Willey, G. R. Crystal River, Florida: A 1949 visit. Florida Anthropologist, 2(3-4): 41-46, 1950.

00089

Tests at the Whittaker Site, Sarasota, Florida. Florida Anthropologist, III: 21-30, 1950.

Tenuous evidence has been presented suggesting that the Whittaker site at Sarasota may have been occupied by Indians during the Perico Island and Weeden Island periods. It is unfortunate to have such poor data for such an important site. There is more evidence for occupation during the Safety Harbor period. Large flat-topped mounds like the Whittaker ceremonial mounds are typical of that period along the Gulf Coast of Florida.

00090

Boyd, Mark F., Hale G. Smith and John W. Griffin. Here they once stood; the tragic end of the Apalachee Missions. University of Florida Press, Gainesville, 1951.

00091

Crystal River, revisited, revised. *American Antiquity*, 17(2): 143-144, 1951.

Bullen reports on the findings of a surface survey on the Crystal River site and a test excavation done during February 1951.

00092

Bullen, R. P. The Enigmatic Crystal River Site. *American Antiquity*. 17(2): 142-143, 1951.

Bullen re-reports the Crystal River site, 65 miles north of Tampa and discusses some of the complexities of the site. Originally the site was sampled by Moore in 1903, with little formal archaeology done afterwards. There are interesting facets of the site in relation to its construction (sequence of stratification), pottery types and other cultural remains.

00093

Bullen, R. P. The Terra Ceia Site, Manatee County, Florida. *Florida Anthropological Society Publication*, 3, 1951.

00094

Griffin, J. W. Spanish influence in southeastern Archaeology. *Eastern States Archaeological Federation Bulletin*, 10:9, 1951.

00095

Philips, P., J. A. Ford and J. B. Griffin. *Archaeological Survey in the Lower Mississippi Alluvial Valley, 1940-1947*. *Papers of the Peabody Museum of American Archaeology*, Harvard University, Vol. 25, 1951.

This is a complex, sometimes, somewhat confusing book. There are many discussions about archaeological problems in regards to sequences. Much of the material is not pertinent to the coastal study, but does reflect some manifestations of cultural materials found along the coastal areas.

00096

Campbell, T. M. The Kent-Crane site: A shell midden on the Texas Coast. *Bulletin of the Texas Archaeological and Paleontological Society*, 23: 39-77, 1952.

All except the upper few cm of deposit is referred to Aransas focus occupation. Rockport occupation is in Upper 15 cm as shown by the pot sherds, and arrow points. The length of occupation at this site cannot be estimated. The midden has the thickest deposit on record indicating enough length of time for modifications in the Aransas focus. Although there is little evidence suggesting that there might have been a slow transition from Aransas focus to Rockport culture since there are no European artifacts, the occupation is almost certainly pre-European for the Aransas focus. The Rockport focus was probably late prehistoric or historic as shown by European artifacts found at other sites with Rockport material.

00097

DeJarnette, David L. Alabama Archaeology: A summary. Griffin, Archaeology of eastern United States: 272-284, 1952.

A general summary of archaeology in Alabama. A chapter in Griffin's book that is useful in getting a general chronology and the general sort of archaeological remains. Not much information on the Gulf Coast area, but gives information about other aspects of the state's prehistory.

00098

Ford, J. A. Measurements of some prehistoric design developments in the Southeastern states. Anthropological Papers of the American Museum of Natural History, 44(3), N.Y., 1952.

Ford discusses general sequences of the southeast and gives chronologies and sequences of several areas along the Gulf Coast, based on ceramic reconstructions. The scope of discussion is limited to ceramics, and the varying types that are present throughout the southern sequences.

00099

French, J. D. The Morton shell heap on Week's Island, Louisiana. Unpublished M.A. thesis on file at Dept. of Geography and Anthropology, Louisiana State University, Baton Rouge, 1952.

00100

Griffin, J. B. Prehistoric Florida. A review. Archaeology of Eastern United States. University of Chicago Press, p. 352-364, 1952.

A general discussion of Eastern Archaeology, sequences and chronologies, lightly touches on the Gulf-Coast areas. Griffin provides a background for other areas.

00101

Gunter, G. Historical changes in the Mississippi River and adjacent marine environment. Pub. Inst. Mar. Sci. 2(2): 121-139, 1952.

00102

Webb, Walter Prescott. The handbook of Texas. Texas States Historical Association, Austin, 1952.

00103

Bullen, A. K. and R. P. Bullen. The Battery Point Site, Bayport, Hernando County, Florida. Florida Anthropologist, 6(3): 85-92, 1953.

The authors describe and compare the donated collections of artifacts with surface collected materials from Battery Point. They were unable to find any in situ evidence of Indian habitation, although artifacts were found along the beach that had washed up (or been eroded out). Several large stone tool types were reported in association with certain ceramic types.

00104

Bullen, R. P. The Famous Crystal River Site. Florida Anthropologist, 6:9-37, 1953.

Stratigraphic tests at the Crystal River site have clearly defined two periods. The earlier one, one Santa Rosa-Swift Creek time level, is characterized by large amount of Pasco Plain sherds. Associated decorated sherds possibly trade sherds include those of the Deptford and Santa Rosa-Swift Creek complexes. Deep provenience of two sherds of Crystal River incised supports Willey's contention that this is a pre-Weeden pottery type. A series of earlier excavations and tests are described here, and comparisons are made with other sites in the general area of the Gulf Coast that the site occurs.

00105

Bullen, R. P. Excavations at Manatee Springs, Florida. Florida Anthropologist, VI: 53-67, 1953.

Excavations at Manatee Springs State Park uncovered part of an intensively occupied Indian village. The excavations do not include material from all periods when the site was used by Indians, as sherds of Chattahoochee Bushed, an early Seminole pottery type found in surface collections from this site, were not uncovered in the excavations.

There are evidences of house structures, storage pits, refuse pits, and various faunal remains, giving information as to the nature of aboriginal life.

00106

Bullen, R. P. Notes on the Seminole archaeology of West Florida. Southeastern archaeological conference, newsletter, 3(3): 18-19, 1953.

Bullen remarks on the presence of "Bushed Pottery" types in West Florida in the area of Tallahassee. The presence of the sherds (limited) are discussed in terms of distribution.

00107

Delaney, Cladwell, 1953. The story of Mobile. Gill Printing Co., Mobile, Alabama. 170 p, 1953.

00108

Smith, Hale G. Spanish archaeological sites in Florida. Bulletin of the Eastern States Archaeological Federation, 11: 8, 1953.

00109

Aga-Oglu, Kamer. Late Ming and Early Ching porcelain fragments from archaeological sites in Florida. Florida Anthropologist 2(4): 91-110, 1954.

Some Chinese ceramics are discussed that have been found in Florida and are said to have come to Florida by way of trade through the Philippines. being brought by the Spanish. Similar finds of the same dates are described elsewhere in the U.S.

00110

Allen, Glenn T. Archaeological excavations in the Central Northwest Gulf Coast area. Florida State University Studies, 16: 61-88, 1954.

00111

Bullen, A. K. and R. P. Bullen. Further notes on the Battery Point Site, Bayport, Hernando County, Florida. Florida Anthropologist, 7(3): 103-108, 1954.

Another collection of material from the Battery Point site is examined, and some materials give evidence for trade, possibly from or near Kentucky.

00112

Bullen, R. P. Culture changes during the fiber-tempered period in Florida, in Southern Indian Studies. Chapel Hill, VI: 45-48, 1954.

"There is abundant evidence in the northern Piedmont for the priority of steatite over clay vessels. In the south the general similarity in the shape of fiber-tempered vessels and those made of steatite has been noted . . . The Florida evidence, if I interpret it correctly, would not seem to support this theory." Apparently, Bullen doesn't agree with the hypothesis presented in the paper.

00113

Goggin, J. M. Historic metal plummet pendants. Florida Anthropologist, 7(1): 27-29, 1954.

Some metal plummets from West Florida are discussed.

00114

McIntyre, W. G. Prehistoric settlements in coastal Louisiana. Unpublished Ph. D. dissertation, Louisiana State University, Baton Rouge, 1954.

00115

McIntyre, W. G. Correlation of prehistoric settlement and delta development: trafficability and navigability of delta type coasts: Trafficability and navigability of Louisiana coastal marshes. Louisiana State University Technical Report, S. Baton Rouge, 1954.

00116

Plowden, W. W. Archaeology on Rocky Point, Florida. Florida Anthropologist, 8(1): 17-21, 1954.

The Rocky Point site is a small peninsula on the Northeastern shore of Tampa Bay, mentioned by Willey (1949). There are 5 sites reported and some surface ceramics are reported.

00117

Bullen, R. P. and D. D. Laxson. Some incised pottery from Cuba and Florida. Florida Anthropologist, 7(1): 23-25, 1954.

Ceramics from Florida and Cuba are compared, and it is thought there may be some influences of one on the other, Circa, 1200 A. D. The local chronologies do not forclude the idea.

00118

Clark, J. L. The Texas Gulf Coast, its history and development. Lewis Historical Pub. Co., New York, 1955.

00119

Coater, Gordon C. Recent tests at the Battery Point site, Bayport, Hernando County, Florida. Florida Anthropologist, VIII, 27-30, 1955.

Some test excavations at the Battery Point site are discussed and a report of the recorded material. The author postulates a tentative sequence for the area, based on numerous ceramic types recovered. Many more large stone tools were removed.

00120

Smith, H. C. Archaeological significance of oriental porcelain in Florida sites. Florida Anthropologist, 8(4): 111-116 p, 1955.

Sites discussed include Rookery Mound and San Francisco de Oconee.

00121

Bullen, R. P. Some Florida radiocarbon dates and their significance. Florida Anthropologist, IX: 31-36, 1956.

00122

Campbell, T. N. Archaeological material from Five Islands in the Laguna Madre, Texas Coast. Bulletin of the Texas Archaeological Society, 27: 7-46, 1956.

Archaeological materials collected from 5 sites on a chain of Islands in the Laguna Madre of the Texas Coast. These have been analyzed, described and evaluated. Most of the artifacts are from the surface, but on 2 of the islands some of the artifacts were derived from limited excavation without adequate control. Assemblage from each site were treated as a surface collection.

00123

Neill, W. T., H. J. Gut and P. Brookorb. Animal remains from four preceramic sites in Florida. American Antiquity, 21(4): 383-395, 1956.

00124

Sears, William H. The Turner River sites, Collier County, Florida. Florida Anthropologist, IX: 47-60, 1956.

00125

Adams, Richard E. Investigation of a northwest Florida Gulf Coast site. Florida Anthropologist, X (3-4): 50-56, 1957.

00126

Brannon, H. R., et. al. Humble Oil Company Radiocarbon Dates I. Science, 125 (3239): 147-149, 1957.

Radiocarbon dates from various parts of Louisiana and elsewhere.

00127

Campbell, T. N. Archaeological investigations at the Capien Site, Galveston County, Texas. The Texas Journal of Science, 9(4): 449-471, 1957.

This site was excavated by the University of Texas in 1932, but never fully reported. The site is a shallow midden deposit, with 66 recognizable burials, the skeletal parts of 80 individuals being represented. Burials were nearly all flexed or semiflexed, lying on back or the side with the orientation either easterly or westerly. Few chipped flint artifacts were found in the midden pottery (110 sherds) occurred in the midden, the most common types being Goose Creek plain and Goose Creek incised, intrusive sherds from both the Rockport and the Alto foci were present. The Capien site shares many traits with the Galveston Bay Focus sites of the Addicks Basin west of Houston, but it isn't possible to label this site as a clear-cut Galveston Bay Focus component. Both Holy Fine engraved pottery and European glass beads were found indicating a time range of after AD 1000 to 1519. This site is the source of the only skeletal material thus far attributed to the Atabaran speaking Indians of historic times. The author calls for more investigation in the coastal strip lying between Galveston Bay and the Sabine River and also the area between the Atabapan and Caddoan territory.

00128

Fundaburk, E. L. and M. D. Foreman. Sun Circles and Human Hands: The Southeastern Indians - Art and Industry, 1957.

A book illustration showing arts, crafts and life styles of the Paleo - Indians, Archaic, Woodland and Mississippi before contact. Includes historic descriptions by early colonists and comments by contemporary writers.

00129

Summersell, Charles Grayson, 1957. Alabama history for schools. Colonial Press, Birmingham, Alabama, 658 p, 1957.

00130

Bullen, R. P. Similarities in pottery decoration from Florida, Cuba and the Bahamas. Thirty-third International Congress of Americanists, San Jose, 1958. San Jose, 2: 107-110, 1958.

00131

Campbell, T. N. Archaeology of the central and southern sections of the Texas Coast. Bulletin of the Texas Archaeological Society, 29: 145-176, 1958.

00132

Campbell, T. N. Archaeological remains from the Live Oak point site, Aransas County, Texas. Texas Journal of Science 10:4, 1958.

00133

McIntire, W. G., 1958. Prehistoric Indian settlements of the changing Mississippi River Delta. La. State Univ. Press, Coast. Stud. Ser. 1:128 p, 1958.

00134

Sears, William H. Burial mounds on the Gulf Coastal Plain. America Antiquity, 23: 274-284, 1958.

Three types of burial mounds are to be found along the Gulf Coast: the patterned type, the mass burial or charnal house type, and the continuous use or cemetery type. Conclusions are drawn about mortuary and religious practices of the Gulf Coast Indians.

00135

Sears, William H. Highway salvage archaeology; its background and the Florida program. Florida Anthropology, Tallahassee, 57-60 p, 1958.

00136

Trickey, E. B. A chronological framework for the Mobile Bay Region of Alabama, based on a number of sites in the area, is established.

00137

Armistead, W. An unusual shell gorged from Terra Cela Island, Manatee County, Florida. Florida Anthropologist, XII: 105-107. 1959.

00138

Covington, J. W. Trade relations between southwestern Florida and Cuba, 1600-1840. Florida Historical Quarterly, 38(2): 14-128, 1959.

00139

Jenkins, W. H. Early Alabama forts, according to historic periods, date of erection, location by counties. Alabama Historical Association Paper, Tuscaloosa, 1959.

The locations, dates of construction, and related information concerning military forts in Alabama are presented.

00140

McIntyre, W. G. Methods of correlating cultural remains with stages of coastal development. Second Coastal Geography Conference, Proceedings 341-362, Baton Rouge, 1959.

00141

Mounger, Maria Allen. Mission Espiritu Santo of Coastal Texas. An example of historic site archaeology. Unpublished M.A. thesis, University of Texas, Austin, 1959.

00142

Mosley, S. A. The occurrence of soapstone in Alabama and its use by the Indian. Journal of Alabama Archaeology, IV(1): 9-13, 1959.

A general discussion on the properties, uses and occurrences (outcroppings) and distribution of steatite or soapstone.

00143

Shely, Robert A. An aboriginal shell mound at Drum Point. Alligator Harbor, Franklin County, Florida. Florida Anthropologist, XII: 41-46, 1959.

00144

Smith, H. G. Spanish artifacts of Florida. M.S. thesis on file with department of Anthropology. Florida State University, Tallahassee, 1959.

00145

Bullen, R. P. Beveled stemmed points from Tampa Bay. Florida Anthropologist, 21(2-3): 89-90, 1960.

00146

Dunning, A. R. Lithic factors affecting selection for tools. Greenstone. Journal of Alabama Archaeology, VI (2) 65-70, 1960.

The article is a discussion of the raw materials used by the Indians for stone tools. Various rocks and minerals are listed, together with a location of principal outcrops in Alabama. Special attention is given to the "Hillabee Schist," the source of "Greenstone," a common term for the "Chlorite-epidote," Actinolite - epidote, and "Chlorite schists" used extensively by the Alabama Indian. The mineral composition of this material is discussed.

00147

Kniffen, F. B. Review of McIntyre's prehistoric Indian settlements of the changing river delta. Louisiana History, 1(2): 182-183, 1960.

00148

Lazarus, W. C. Human figurines from the coast of northwest Florida. Florida Anthropologist, XIII (2-3): 61-70, 1960.

00149

Morrell, L. Oakland Mount (Je-53) Florida: a preliminary report. Florida Anthropologist, XIII (4): 101-108, 1960.

00150

Ring, E. Raymond. An evaluation of radiocarbon dates from the Galone site, Southeastern Texas. Bulletin of the Texas Archaeological Society, 31: 317-325, 1960.

A sample of Rangia shell was collected from the top of the shell layer of the Midden yielding a date of 1900 plus or minus 105 years B.P. and a sample from the base of the shell layer produced a date of 3350 plus or minus 115 years B.P. Former dates for Galveston Bay Focus sites placed them in a time range extending from A.D. 500-1700. The author calls for promotion of further archaeological investigations in this area of puzzling cultural complexes called now in the Galveston Bay Focus and also press for several radio-carbon assays to study and evaluate in conjunction with archaeological findings.

00151

Sands, T. French Louisiana. Reprinted from Southern Telephone News, July, 1960.

00152

Sears, W. H. The Bayshore Homes site, St. Petersburg, Florida. Contribution of the Florida State Museum, Social Sciences, 6, 1960.

00153

Sears, William H. The Gulf Coastal Plain in North American Prehistory. Selected Papers of the 5th International Congress of Anthropological and Ethnological Science, 62-638, 1960.

00154

Bullen, R. P. Radiocarbon dates for southeastern fiber-tempered pottery. American Antiquity, 27(1): 104-106, 1961.

Five new radiocarbon dates from an archaic midden at the Palmer site on the Florida Gulf coast confirm the previous estimates of 2000 B.C. for the beginning of pottery making in the Southeast. Correlations over hundreds of miles give extremely close results between archaeological subperiods and radiocarbon dates.

00155

Bullen, Ripley P. and Edward M. Dolan. Shell mounds, Levy County, Florida. Florida Anthropologist, XIII: 17-24, 1961.

00156

Calhoun, C. A. Scored pottery of the Texas Coastal Bend. Bulletin of the Texas Archaeological Society, The George C. Engerrand Volume, 32-321-326, 1961.

00157

Chard, C. W. Invention vs. diffusion: the burial mound of the eastern United States. Southwestern Journal of Anthropology, 17, 1961.

00158

Lazarus, W. C. The Morrison Spring Site (WL-43), Fla. Florida Anthropologist, XIV (1-2): 17-20, 1961.

The reporting is of fresh-water spring that boils up through decomposing limestone. Divers found two projectile points and a ceramic vessel. The report describes the artifacts and their conditions.

00159

Bullen, A. K. and R. P. Bullen. Wash Island in Crystal River. Florida Anthropologist, XIV (3-4): 69-73, 1962.

00160

Lazarus, W. C. Temple mound museum at Ft. Walton Beach, Florida. Florida Anthropologist, XV (3): 65-70, 1962.

Describes the set-ups, displays and facilities of the museum situated at Ft. Walton Beach, Florida.

00161

Lazarus, W. C. and Gerald S. Spence. Pasco Series Sherds from the Bayport Mound. Florida Anthropologist, XV (4): 107-112, 1962.

A large sherd collection from the Bayport Mound revealed a total of 372 limestone tempored sherds of the Pasco series. Complicated stamped of Swift Creek style and Coro Marked sherds seem to be additions to the series which included Pasco Plain, Pasco Red and Pasco Checked Stamped.

00162

Lazarus, William C. Ten middens on the Navy Live Oak Reservation, Santa Rosa County, Florida. Florida Anthropologist, XIV (3-4): 49-64, 1962.

This complex of 10 known sites (and probably an equal number not yet identified) in 2 miles of waterfront on Santa Rosa Sound constitutes an area rich in archaeological materials. The time span extends from the Deptford Period to historic times, with all intervening cultural periods represented.

00163

Olds, D. L. Some highlights in the history of Fort St. Marks, Florida Anthropologist, 15(2): 33-40, 1962.

A brief summary of the highlights in the history of Fort St. Marks established by the Spanish about 1678. It was successively occupied by the Spanish, English, Spanish again, an English freebooter, and American Territorial forces. The paper contains some discussion of Indian relations in the area.

00164

Olds, D. La Venture. History and archaeology of Fort Saint Marks in Apalachee. M.A. Thesis, Florida State University, Tallahassee, 1962.

00165

Olson, S. J. Artillery projectiles from the Civil War engagement at Newport, Florida. Florida Anthropologist, 15, 1962.

The paper discusses the artifacts recovered from the St. Marks at Newport which relate to the defense of that position by the Confederate forces during the Battle of Natural Bridge. Three cannon projectiles and a lead hollow base bullet were recovered. One of the cannon projectiles was equipped with a 6 second Boerman pewter fuse. The other 2 are solid shot. The mechanism of the Boerman fuse is explained and illustrated.

00166

Snow, C. E. Indian burials from St. Petersburg, Florida. Contributions of the Florida State Museum, 8, 29 p, 1962.

The paper describes some 115 prehistoric Indian individuals excavated in 1958 by William Sears from Mound B of the Bayshore Homes site in northwest St. Petersburg, Florida. The paper discusses mortuary practices (secondary), indications of a high mortality rate, pathologies (bone) present, and other relevant factors.

00167

Warren, Lyman O. Early pottery in the Tampa Bay area. Florida Anthropologist, XV (3): 71-72, 1962.

Hydraulic filling operations in the Tampa Bay area have pumped up fiber tempered, St. Johns, and Deptford sherds along with Archaic projectile points from the shallowly submerged areas of the coastal waters. Along with the artifacts there have appeared bones of extinct animals such as mammoth, Miocene deer, Miocene horse, and giant beaver. No direct associations are possible with dredged materials but the author believes many more sites are present.

00168

The Maxima Point Site - 1962. Florida Anthropologist, XV (4): 89-101, 1962.

Report of continued salvage at the Maxima Point Site discussed by Sears (Fla. Antorp. XI:1:1-10). Stratigraphic tests confirm the ceramic and projectile point sequences determined by Sears.

00169

R. P. Bullen and A. K. Bullen. The Lemon Bay School Mound. Florida Anthropologist, XVI (2): 51-56, 1963.

Discusses the salvage excavation of a small burial mound in Charlotte County, Florida. The mound was composed of layers of grey midden soil mixed with scattered shells. A few very badly decayed burials were found. They do not permit the exact dating of the mound.

00170

Bullen, A. K. and R. P. Bullen. The Wash Island Site, Crystal River, Florida. Florida Anthropologist, XVI (3): 81-92, 1963.

Specimens from a stratigraphic test at Wash Island are contrasted with those from the beach. Occupation during several archaeological periods is evident. Typology of Florida basically matched points and suggestions as to their dating are included.

00171

Corbin, James E. Archaeological materials from the Northern Shore of Corpus Christi Bay, Texas. Bulletin of the Texas Archaeological Society, 34 5-30, 1963.

From 1957 to the present, the writer has made an archaeological survey of the Northern shore of Corpus Christi Bay, Texas. During this period, 16 campsites were located. With one possible exception, the McClain Bluffs site all are shell middens. Collecting from the surface of these middens produced well over 4,000 artifacts which are described in detail, and which are assignable to either the Rockport or Aransas focus.

00172

Gagliano, S. M. A survey of preceramic occupations in portions of south Louisiana and south Mississippi. The Florida Anthropologist, 16(4): 105-132, 1963.

A survey was conducted to locate possible preceramic sites in south Louisiana and south Mississippi. The work produced evidence of a long sequence of occupations and extended the known chronology for the area into the Lithic stage. Exploratory excavation at a possible early site on Avery Island in central coastal Louisiana revealed a bipolar flaking industry which can be tentatively correlated with a fossil bed rich in extinct vertebrate remains.

Other lithic materials consist of Clovis-like fluted points found at several locales within the survey area. An Early Archaic horizon is also well represented from surface finds. Four distinct complexes defined in later Archaic and Early Formative have been designated as the Amite River, Pearl River, Bayou Tasmine and Garcia Phases. Artifact assemblages and inferred traits characteristic of these phases showed marked specialization, presumably resulting from adaptation to various ecological situations. The relationships between settlement pattern and geologic and geomorphic setting have been discussed for several key areas.

00173

Holmes, N. H. The site on Bottle Creek. *Journal of Alabama Archaeology*, IX (1): 16-27, 1963.

Material analysis of the mound site on Bottle Creek, Baldwin County, Alabama, shows a predominance of Mississippi pottery similar to that found in shell middens at Dauphin Island and Strong's Bayou. The author plotted to scale the percentage of the various pottery types found and inserted these into Trichey's chronology of the Mobile Bay region. The pottery collection illustrates the close relationship between decoration and motifs of the Moundville - Bottle Creek type and those found to the east and to the west, despite wide variations in temper and manufacture.

00174

Lazarus, W. C. A potter's tool of the Safety Harbor Period. *Florida Anthropologist*, XVI (1): 3-9, 1963.

Report on the presence of potter's marks on ceramic pieces made by the use of Southern Quabog shells.

00175

Morrell, L. R. The Woods Island site in Southeastern Acculturation, 1625-1800. Unpublished M.A. thesis, University of Alabama, 1963.

00176

Sears, W. H. The Tucker Site on Alligator Harbour, Franklin County, Florida. Contributions of the Florida State Museum, 9, 51 p, 1963.

00177

Warren, L. O. and F. Bushnell. A bone hand pendant from Boca Ciega Bay. Florida Anthropologist, XVI (2) 48-50, 1963.

A small carved bone pendant in the shape of a human hand came from dredged material along Boca Ciega Bay, Pinellas County. Sherds in the same dredge tailings contained fiber-tempered, sand tempered, St. John's Pasco, Weeden Island, and Safety Harbor types.

00178

Warren, Lyman O. "Horse's Hoof" core-planes from Pinellas and Pasco Counties, Florida and the Oaxaca Valley, Mexico. Florida, Anthropologist, XVI (4): 133-136, 1963.

The report discusses a widespread type of heavy flint tool called "Horse's Hoof Plane" found on a number of Florida sites and compares them with highly similar tools on sites in the Oaxaca Valley, Mexico. These tools are considered to have functioned as planes or rasps, perhaps in wood on hide working.

00179

Wheat, Joe Ben. An archaeological survey of the Addicks Dam Basin, Southeast Texas. Smithsonian Institution, Bureau of American Ethnology, 154:4, 1963.

Nine prehistoric sites were recorded and 4 were tested in conjunction with construction of Addicks Dam. Each site is located in a low knoll of sand or clay and all are middens containing camp refuse. Houses were not found although 7 human burials were uncovered. The stratification points to a 3 horizon sequence which may be underlaid by Paleo Indian occupation at the Doering site. The first horizon (period) is characterized by expanding stem dart points, the second by pottery and contracting stem dart points and the third by arrow points and pottery.

00180

Wing, E. Vertebrate remains from the Wash Island Site. Florida Anthropologist, XVI (3): 93-96, 1963.

"Vertebrate material from the Wash Island site are identified and compared by cultural levels. The high percentage of species that inhabit salt water agrees with the environmental location of Wash Island. An explanation in terms of food preparation is given for the greater number of front than rear limbs of turtles."

00181

Fairbanks, C. H. Underwater historic sites on St. Marks River. Florida Anthropologist, 17(2): 44-49, 1964.

00182

Gagliano, S. M. An archaeological survey of Avery Island. Coastal Institute. Louisiana State University, 1964.

Some general history of the site is given in terms of past work there. A surface collection, survey and some site excavations were carried out at Avery Island and the results are discussed. Information indicates the area is useful for geological, palaeontological, and archaeological value and the area should be saved for future study.

00183

Laxson, D. D. Strombus hip shell tools of the Tequesta sub-area. Florida Anthropologist, XVII (4): 215-221, 1964.

"Over 600 Strombus tools were examined from the Tequesta sub-area to obtain the percentage of 4 basic types, and to show the Indians adaptability in constructing them from material available in their coastal and swamp habitat."

00184

Lazarus, W. C. The Postl's Lake II Site, Elgin Air Force Base, Florida (OK-71). Florida Anthropologist, XVII (1): 1-16, 1964.

The site (OK-71) is said to be a small Ft. Walton period village. It is thought the site might be a "suburb" of the adjoining site across the lake. If the main village is closer to the bay, it further substantiates (author's opinion) the evidence found at OK-71 that the subsistence pattern of the coastal Ft. Walton culture was oriented toward the sea rather than agriculture.

00185

Warren, Lyman O. Possibly submerged oyster shell middens of upper Tampa Bay. Florida Anthropologist, XVII (4): 227-230, 1964.

Sporadic crude flint artifacts recovered from shell dredged from submerged banks in Upper Tampa Bay suggest that they may be of midden origin.

00186

Welch, E. Twentieth century archaeology of the Florida Glades. In: The archaeology of eastern North America. Harvard University, Dept. of Archaeology, Cambridge, Mass., Spring, 1964.

00187

Aten, Lawrence, E. Five Crania from Jamaica Beach site (41 GV5), Galveston County, Texas. Bulletin of the Texas Archaeological Society, 36: 153-162, 1965.

Anthropometric and morphologic data are presented on 3 complete and 2 fragmentary skulls excavated from a site on Galveston Island which was occupied late in time (approximately A.D. 1500). The burial complex and skeletal materials at the site share traits with those of the Addicks Basin and Caplen sites, but the assessment of any relationship is hazardous at present.

00188

Bullen, R. P. and Walter Askew. Tests at the Askew Site, Citrus County, Florida. Florida Anthropologist, XVIII (3):201-217, 1965.

Stratigraphic tests at Viviparus shell midden on the Withlacooche River, indicate this site was occupied during the Florida Transitional or Formative, Deptford influenced, Perico, and late Weeden Island periods. Ceramics of the Perico Series as well as basally or corner notched points were found below St. Johns and Wakulle Check Stamped Sherds and above Pasco, St. John's and Orange incised pottery. The geographical distribution of Perico ceramics indicates that the concept of a Perico period from the south needs revision. A child's burial, found in the test, is also discussed.

00189

Clausen, C. J. A 1715 Spanish Treasure Ship. Contributions of the Florida State Museum: Social Sciences, 12. University of Florida Gainesville, 1965.

00190

Fairbanks, C. H. Excavations at the Fort Walton Temple Mound, 1960. Florida Anthropologist, XVIII (4): 239-264, 1965.

Occupation at the site began with a thick Deptford midden. The Santa-Rosa Swift Creek period was represented by sherds in mound fill and perhaps by some underlying midden deposit. Weeden Island period sherds were very scarce although well represented clearly in the vicinity. Mound construction was clearly in the Fort Walton period. Some evidence of summit structures was found in the western half. The eastern half was largely occupied by Fort Walton burials. An unusual burial offering was a piece of resinous material that may be opal.

00191

Fairbanks, Charles H. Florida's new antiquities law. Florida Anthropologist, XVIII (3): 155-160, 1965.

The 1965 Florida Legislature passed a law, 65-300, which established the state cabinet as a board of antiquities with broad powers to control antiquities on state-owned lands. An advisory commission was established by law to advise the Board of Antiquities. The Office of the Trustees of the Internal Improvement Fund will carry out the administrative procedures as determined by the Board of Antiquities.

00192

Haag, W. G. Louisiana in North American Prehistory. Louisiana Studies. 279-323, 1965.

This is a general discussion of some important archaeological sites in Louisiana that have been excavated and dated. It is fairly general, but discusses possible influences and developments from outside and within the state. He concludes Louisiana is important not only archaeologically but that the area was also useful for early man and his exploitation of the area, natural resources and the coast as a means of influence.

00193

Lazarus, W. C. Coins recovered from Santa Rosa Pensacola (ES-22). In: Smith, H. G., Archaeological Excavations at Santa Rosa Pensacola. Notes in Anthropology, 10. Florida State University, Department of Anthropology, Tallahassee, 1965.

00194

Lazarus, W. C. Effects of land subsidence and sea level changes on elevation of archaeological sites on the Florida Gulf Coast. Florida Anthropologist, XVIII (1): 49-58, 1965.

Numerous aboriginal and historical sites are located on and in the tidal waters of the Florida Gulf Coast. Meticulous attention is given to land surveying of sites, recording elevation to the nearest hundredth of a foot, but only generalizations have been advanced as to the effects of land subsidence and sea level changes with time. The latter two factors can be of great significance to an understanding of site topography at time of occupation.

00195

Lazarus, W. C. Significance of dimensions of Big Sandy I - like projectile points in northwest Florida. *Florida Anthropologist*, XVIII (3): 187-199, 1965.

A number of projectile points of the Big Sandy I type are sampled to determine the range (s) of size and mean of the type. The validity of a method using descriptive criterion such as small, medium and large is questioned. The necessity and desirability of subjective judgements are disputed.

00196

Lazarus, William C. Alligator Lake, A ceramic horizon site on the northwest Florida coast. *Florida Anthropologist*, XVIII: 83-124, 1965.

The alligator Lake Site (WL-29) is located in the sand dunes beside the Gulf of Mexico in Walton County, Florida. It is a stratified closed site which sand dunes buried about 600 B.C. From the 1482 artifacts recovered, many were in association with Elliott's Point artifacts in the lower level. Cohabitation of two late Archaic Cultures is implied starting about 1170 B.C. with intermittent occupation and/or a small population.

00197

Mathews, C. E., and Brown Anderson. Highlights of 100 years in Mobile. First National Bank of Mobile, Mobile, Alabama. 169 p, 1965.

00198

Warren, L. O. and R. P. Bullen. A Dalton-Complex from Florida. *Florida Anthropologist*, XVIII (1): 29-32, 1965.

Certain projectile points recently dredged Terra Ceia Bay in Manatee County, Florida, are those found in the Dalton zone of the Stonefield-Worley rock shelter of northern Alabama. Two radiocarbon dates from the Dalton zone converge 7300 B.C. While isolated Dalton points have been found before in Florida, this is the first concentration suggesting occupation at a site during a Dalton period.

00199

Bullen, R. P. Stelae at the Crystal River site, Florida. *American Antiquity*, 31, (6): 861-865, 1966.

Two stone stelae at the Crystal River Site, Florida are in similar alignment with two temple mounds. One stela has an incised human head ceremonial caches, and a radiocarbon date of about A.D. 440. The stelae, then spatial relationships, and the ceremonial deposits are evidence of influences from southeastern Mexico.

00200

Bushnell, F. A preliminary excavation of the Navarex Midden, St. Petersburg, Florida. *Florida Anthropologist* XIX (2): 115-124, 1966.

On the basis of some preliminary excavations at the Navarez Midden site, and its type site at Phillips Park are of the same age. There are no burial mounds associated with the Midden remains, but a cemetery, now destroyed, had existed to the north of the site. Bushnell says that at first glance the site appears to be typical of the Safety Harbor type middens.

00201

Clausen, C. J. The proton magnetometer: its use in plotting the distribution of the ferrous components of a shipment site as an aid to archaeological interpretation. *Florida Anthropologist*, 19(2): 17-84, 1966.

00202

Clausen, C. T. A preliminary report on the excavations at the site of the camp of the survivors of the Spanish fleet of 1715. *Conference on Historic Site Archaeology*, 1: 123-126, 1966.

00203

Gamble, R. and L. Warren. Possible stylized hand motif, incised in bone, Navarez Midden, Safety Harbor Period, Saint Petersburg. *Florida Anthropologist*, XIX (4): 154, 1966.

This is a report of an artifact found at the Navarez midden, which is said to represent stylized human hand, engraved on a portion of bone.

00204

Phelps, D. S. Early and late components of the Tucker Site. *Florida Anthropologist*, XIX (1): 11-39, 1966.

Recent changes by man on the shore-side of the Tucker Site (8 Fr4) resulted in exposure of the earliest and latest prehistoric components, neither of which had been reported in 3 previous investigations of the site. These were the Norwood component on the fiber tempered pottery radiocarbon dated to 1012 plus or minus 120 B.C., and a small Fort Walton component, both located along the eroding beach. Total occupation of the site is discussed by components - Norwood through Fort Walton - in an attempt to assign spatial boundaries to each, as well as indicate what the occupational space means in terms of cultural changes. The Norwood phase is proposed for the region of North Central Florida, preceding the Deptford Phase and encompassing the introduction and duration of the typical fiber tempered ceramics in this region. The Norwood Phase is temporally equivalent to the Orange, Stallings, and Wheeler Phases.

00205

Shafer, Harry F. An archaeological survey of Wallisville Reservoir, Chambers County, Texas. Texas Archaeological Salvage Project Survey Reports. (2), 1966.

Forty-seven sites were found altogether in the survey, all but 3 were shell middens. A brief discussion on each site is included and it is stated whether or not excavation or testing is warranted and how much damage has occurred to each site. Seven sites were worthy of intensive excavation and 18 were recommended for testing or small scale excavation. Ceramics, dart points, arrow points, and bone tools were discussed. There were no archaic sites recognized, and only one preceramic site was recorded. There is also evidence for a pre-arrow head point, early ceramic component in 2 sites. They are considered part of the Galveston Bay focus of the Neo-American stage. There is some evidence for possible contact with the Rockport Focus. The site continues into the Historic period.

00206

Warren, Lyman O. A possible Palaco-Indian site in Pinellas County, Florida Anthropologist, XIX (1): 39-41, 1966.

A Palaco-Indian occupational activity site is discussed. Some artifacts were found on the surface, and are described. No excavations were done.

00207

Burtine Island, Citrus County, Florida. Contributions of the Florida State Museum, University of Florida, 14, 28 p, 1966.

The monograph discusses an archaeological survey of the western end of the Cross-Florida Barge Canal right of way, and excavations conducted on Burtine Island. Four sites on the island yielded cultural materials associated with 3 archaeological periods: the Perico Island period, the latter Weeden Island period, and a third as yet unidentified period.

00208

Ambler, Richard. Three prehistoric sites near Cedar Bayou, Galveston Bay area, State Building Commission Archaeology Program, 8:1967.

In 1967, 3 sites were excavated, the Wright site, 41Nr56 and 41Hr59. These are located in the southeastern part of Harris County, a little over a mile north of the mouth of the bayou at Galveston Bay. All 3 sites were shell middens. A discussion of ceramics found there were included. The author mentions the different types of bone tools, arrow-points (alba, catahouia, cliffton and perdy), dart points (angostura and kent) and flakes. Clay figurines, clay lumps, a possible fragment of a poverty point object and some modern artifacts were also present in the sites.

A pre-pottery horizon is presented at all 3 sites. Radiocarbon dates from shell samples were submitted from Wright site and 41Hr56. Results are not available. Five assemblages were proposed for Cedar-Bayou, Wallisville area, pre-pottery, A.D. 150 pottery (tempered with sand) in Wallisville middens.

00209

Huner, J. B. A critical study of French Fork incised pottery in coastal Louisiana. Unpublished M.A. thesis, Louisiana State University, Baton Rouge, 1967.

00210

Lazarus, Y. W., W. C. Lazarus and D. W. Sharon. The Navy Live Oak Reservation Cemetery site, 85a36. Florida Anthropologist, 20 (3-4): 103-117, 1967.

The cemetery site on the Navy Liveoak Reservation near Gulf Breeze, Florida appears to represent the peak of Fort Walton culture in its aboriginal state immediately preceding European contact. Based on a report by Lazarus (1959), such a site was believed to be near the 10 middens on Santa Rosa Sound east of Pensacola. The materials predicted an unusual cemetery adjacent to the area. During 1965 the materials recovered by Mr. and Mrs. Don Sharon and children under supervision of Bill Lazarus for the Temple Mound Museum of Ft. Walton Beach have proven of considerable worth in assaying the culture of a late Ft. Walton occupation. The writer here presents notes from the Lazarus files and field notes and reports of the excavators. It appears that remnant groups of aborigines lived in the area and reached a peak in their ceremonial culture evidenced by the practices apparent in the cemetery.

00211

Sears, W. H. Archaeological survey in the Cape Coral area at the mouth of the Caloosahatchee River. Florida Anthropologist, XX (3-4), 93-103 p, 1967.

The survey was done along the coastal shore-line of the area. Six sites were found to be of midden materials and of considerable size. Aboriginal occupation ranges from the 10th through 17th centuries. Due to surface collecting, the time span seems to be restricted. Nearby sites suggest an occupancy by at least 700-800 B.C.

00212

Sears, W. H. The Tierra Verde Burial Mound. Florida Anthropologist, XX (1-2): 25-73, 1967.

Excavation and analysis of the site and materials indicates that it is a "reasonably normal representative of Safety Harbor burial mounds". There is a continuity of burial mounds in the area, with an overlapping of the periods involved. Forty burials were found (all secondary), with various associated grave goods.

00213

Sibley, J. A. Louisiana's ancients of man. A study of changing characteristics of Louisiana Indian cultures. Claitor's Publishing Division, Baton Rouge, 1967.

00214

Tunnell, Curtis D., J. Richard Ambler. Archaeological excavations at Presidio San Augustin De Ahumada. State Building Commission Archaeological Program, 6: 1967.

The Spanish established the Presidio San Augustin De Ahumada on the lower Trinity River in 1756. In 1766 the presidio was moved to a new location about a quarter of a league east of the original site and in 1771 the Presidio and its mission were abandoned. The Presidio had been built in order to guard against French incursion but the environmental conditions at the Presidio were not favorable to the Spanish. The location of the second Presidio was discovered in 1966 and salvage excavations were conducted at that time. However, most of the site had been destroyed in the 1950's by the removal of a fill which was used for construction of Interstate Highway 10. Identification of the location is based on the La Fora map of 1767 and the artifactual remains recovered during excavation. Presidio San Augustin de Ahumada is the first Spanish settlement in east Texas that has been definitely located and excavated. The importance of this site and other similar sites is due to their rarity and the significant part they played in early Texas history.

00215

Warren, L. O. Two dredged sites on Bear Creek. Florida Anthropologist, 20 (3-4): 170-174, 1967.

Two sites along Bear Creek, that flows into Boca Ciega Bay, Pinellas County, Florida were dredged during 1958. The artifacts and possible manuports found during the dredging operations are reported and described. An attempt is made to ascertain that all the materials found in the stream bottoms belong to the assemblages with which they were found.

00216

Warren, L. O., W. Thompson and R. P. Bullen. The Culbreath Bayou Site, Hillsborough County, Florida. Florida Anthropologist, 20 (3-4): 146-163, 1967.

The large or main shell midden of the Culbreath Bayou site was certainly built up during an early post-Orange ceramic period. Our few Deptford period sherds, being found at the presumed periphery, may well correlate with the highest levels of this midden. While only sand-tempered pottery was found in the face of the midden or in the little grottoes eroded by water into its base, the sample is small. It is possible the lower levels might have produced transitional period pottery if completely excavated. It is also possible that Indians with a Culbreath lithic complex were living at the site but not making pottery at a time when sand-tempered pottery was introduced to them. By interpolation with other sites, the age of the site is estimate to be between 6000 to 4000 years old.

00217

Yates, Dudley V. Prehistoric Indians in Louisiana: A bibliography Unpublished M.A. thesis. Louisiana State University, 1967. Bibliography of archaeological materials.

00218

Askew, W. H. A unique Weeden Island Punctated Sherd from the Bayport Burial Mound. Florida Anthropologist. 21 (11): 38-39, 1968.

The author describes a sherd from the Bayport Burial Mound of the Weeden Island period. He relates the pattern to sun symbolism.

00219

Bullen, R. P. Unfinished Bolen points from Hillsborough County. Florida Anthropologist, 21 (1): 34-35, 1968.

A brief article describing 2 unfinished Bolen points from Hillsborough County and he briefly discusses the process by which they would have been formed into completed points of the Bolen type. A few comments of relevance are added.

00220

Bullen, R. P. and M. H. Wing. A scraper with graver spurs from Florida. Florida Anthropologist, 21 (2-3): 94-95, 1968.

00221

Corbin, James E. and Roy Hester Thomas. Preliminary statement on an archaeological reconnaissance of Clear Creek, Texas. Report submitted to the National Park Service, 1968.

00222

Fairbanks, C. H. Florida Coin Beads. Florida Anthropologist, 21 (4): 102-105, 1968.

At a number of historic sites in Florida a clearly defined type of silver bead has been found associated with both Indian and Spanish Colonial artifacts. Study of these beads and their associations had indicated that they were probably made from Spanish cut silver coins salvaged from wrecks along the coasts. It is suggested that they were hammered into shape by Indians or possibly by Spanish seamen resident in Indian camps. Their wide distribution suggests the existence of some sort of redistributive system.

00223

Gagliano, S. M. Late Archaic-Early Formative Relationships in South Louisiana, Coastal Studies Institute, Louisiana State University, 1968.

Discusses the late Archaic-Early Formative in the Delta and Highland areas of southern Louisiana, and external influences leading to the local developments.

00224

Goodyear, A. C. A human effigy from Levy Z, Cedar Keys, Florida. Florida Anthropologist, 21(1): 35, 1968.

A brief description of a sherd from a burial mound that bears the features of a human face. The sherd was found in a "discard pile" of former "pot-hunters" that were on the site.

00225

Goodyear, A. C. Pinellas Point: A possible site of continuous Indian habitation. Florida Anthropologist, 21 (2-3): 74-82, 1968.

A report of a midden beach on the southern coastal tip of Pinellas County. The analysis was made on the surface collections of 6 individuals who have been collecting sherds, projectile points, and other artifacts of Indian manufacture from a badly eroded shell midden which has been, and is presently being, washed by a wave and tidal action. This site is of particular archaeological interest since representative artifacts from practically all the Gulf Coast cultural periods have been recovered there.

00226

Goodyear, A. C. W. Thompson and L. O. Warren. Suwannee Style Scrapers from Pinella County. Florida Anthropologist, 21(2-3): 91, 1968.

00227

Karklins, Karlis. The Palm River Midden, Hillsborough County, Florida. Florida Anthropologist, 21 (2-3): 67-73, 1968.

"Test pits dug into a shell midden in the Tampa Bay area produced ceramics indicative of a Safety Harbor Period occupation. The site is assigned to the pre-contact portion of this period due to the complete lack of European items. A worked beaver incisor and 2 pottery types evidence trade with peoples to the north."

00228

Neill, W. T. An Indian and Spanish site on Tampa Bay, Florida. Florida Anthropologist, 21 (4): 106-116, 1968.

Although the Rocky Point peninsula, on Old Tampa Bay, appears to offer a complex series of sites, the complexities can be resolved. There were only 2 occupations of the peninsula, one is Safety Harbor times and the other immediately post-dating the Safety Harbor Period. The later occupation resulted in the site called Rocky Point I, not a village midden but the refuse of a shell fishery operated by the Spaniards and probably a few Timuca Indians. Sherds from Rocky Point I include aboriginal (Safety Harbor Period) and Spanish types, as well as aberrant Spanish types with a suggestion of aboriginal treatment.

00229

Story, Dee Ann. Archaeological investigations at 2 central Texas Gulf Coast sites. State Building Commission, Archaeological Program Report, 13, 1968.

Work at the Ingleside Cove site in summer of 1967 uncovered a stratified midden deposit, the lower portion Archaic and the upper portion Neo-American. Only the stemmed form can be definitely attributed to the Rockport Focus. A detailed discussion of artifacts (pottery or clay, stone, shell, bone) found at this site is presented. Ceramics were analyzed by selected attributes, not types. Modern artifacts were also found. Fauna, including mollusks and vertebrates, is studied. Archaic occupation starts late 1100 A.D., and last 100 years or less. Neo-American material can provisionally be placed at 1200 A.D. The Archaic site was most intensely dug in June 19-23, 1967. The analysis of ceramics was thoroughly described, along with stone artifacts found. The site may be classified as Neo-American stage.

00230

Wakefield, Walter H. Archaeological survey of Palmetto Bend and Choke Canyon Reservoirs, Texas. Texas Archaeological Salvage Project survey reports, 5: 1968.

Twenty-two sites were located during the survey of the Palmetto Bend dam area, 17 of which were in the area to be inundated by the reservoir. The 13 prehistoric sites are open middens, and there are 5 historic sites. A brief discussion is given on most of the sites, including recommendations as to what further work, if any, should be done. There is a discussion of pottery and lithic artifacts. Eighteen sites were found in the Choke Canyon Reservoir survey. Most of the sites were near the surface and subject to erosion and cultivation. A description and recommendation of each of these sites are given. An intensive discussion of the ceramics discovered was included in the article along with measurements of length, width, weight, and thickness (it varies) of each artifact. Only 2 pot sherds found plus 28 historic pottery sherds; metal was also found. The author recommends that further research be done, both excavation and surveying.

00231

Waring, Antonio J. Some site reports. B: Johns Island, an archaic site on the northwest Florida coast. The Waring papers. Cambridge, Mass., 261-262 p, 1968.

A survey and test excavations were made at John's Island. The midden material and artifacts are said to be from the Archaic period. A number of archaic type artifacts were surface collected and reported.

00232

Warren, L. O. The Appolo Beach Site, Hillsborough County. Florida Anthropologist, 21 (2-3): 83-88, 1968.

00233

Wimberly S. Indian pottery human effigy herds from the Mobile Bay region of Alabama. *Journal of Alabama Archaeology*, XIV (1): 30-37, 1968.

At some Middle Mississippian Indian sites in the Mobile Bay region of Alabama, both in Baldwin County on the east side of the bay and in Mobile County on the west side of the bay, are found pottery effigy human heads, each exhibiting a complex headdress which apparently was contrived wholly of twisted or knotted hair, supplemented, perhaps with fastening strands of vegetable fiber and some rigid material such as wood in the form of a spool or a hoop. This paper is presented solely for the purpose of alerting the reader to the need for reporting similar effigy heads to a central location (in the case of the Dept. of Anthropology, Univ. of Alabama) so that a continuing study of these specialized forms can be based on as many specimens as possible.

00234

Bird Hammock, Mound B, revised. *Florida Anthropologist*, 2L (2-3): 61-66, 1968.

A salvageable portion of Mound B (8 Wa 10), Bird Hammock, Wakulla County, Florida, was surveyed and excavated. The artifacts recovered include a cache of 7 chert knives; a small, polished Weeden Island I bowl containing 4 caramel colored, chert projectile points and a knife of the same material; a small, plain tetrapodal bowl; 2 caches of sheet mica; and miscellaneous projectile points, knives and celts. Sherds recovered are Swift Creek complicated stamped of the Weeden Island Complex. These finds confirm earlier dating of the mound as Weeden Island I period.

00235

Aten, Lawrence E., and Charles N. Bollich. A Preliminary Report on the development of a ceramic chronology for the Sabine Lake area of Texas and Louisiana. *Bulletin of the Texas Archaeological Society*, 40: 241-258, 1969.

An extensive site survey was undertaken in the Sabine Lake area of Texas and Louisiana with the intention of obtaining sufficient ceramic collections to begin development of a ceramic chronology.

Approximately 5,600 sherds were examined, although collections from only 14 sites (totaling approximately 5,000 sherds) were of sufficient size to use in the quantitative chronologic study. The Sabine Lake sequence of ceramic paste categories is compared and correlated with the Lower Mississippi Valley Red River chronology by means of the Lower Mississippi Valley type ceramics that occurred in the Sabine Lake area collections. It is seen that, although the 2 sequences can be aligned, the cultural dynamics of the coastal area are massed by the use of a stylistic classification in Louisiana on the one hand, and the use of a technological classification in coastal southeast Texas on the other. We urge that some accommodation be made.

The sequence is also compared and correlated with a rough sequence for the upper Galveston Bay area. It is seen that a substantial amount of cultural lag apparently existed between upper Galveston Bay and the Sabine Lake area, but the nature of the Barrier to diffusion of cultural traits remains unclear at present.

00236

Beullen, R. P. A Clovis. Fluted Point from the Santa Fe River, Florida. Florida Anthropologist, 22 (1-4): 36-37, 1969.

00237

Gardner, W. M. An example of the association of archaeological complexes with tribal and linguistic grouping: The Fort Walton Complex of Northwest Florida. Florida Anthropologist, 22 (1-4): 1-12, 1969.

This paper attempts to demonstrate the association of regional variations of an archaeological cultural complex with historically known tribal groups. It is suggested that if our archaeological constructs are not such that they obscure areal differences it is possible to correlate these with ethnic or tribal groupings.

00238

Goodyear, A. C. A Deptford Vessel from Pinellas County, Florida. Florida Anthropologist, 22 (1-4): 34-35, 1969.

00239

Hester, Thomas Roy. Archaeological Investigations in Kleberg and Kenedy Counties, Texas, August 1967. State Building Commission, Archaeological Program Report, (15), 1969.

In August, 1967, an archaeological survey was conducted in the 2 counties of Kleberg and Kenedy in Texas. In Kleberg county, most of the sites represent only short term occupation while a few indicate habitation of a longer duration. In Kenedy County, the sites were found along the southern shore of Laguna Salada and Baffin Bay. Generally, the sites are small and little artifactual debris is found. Two of the sites indicate heavy exploitation of marine resources. Evidence for 2 cultural stages were found, the archaic and Neo-American. The Historic stage is known only from ethnographic material.

00240

Marx, R. F. Shipwrecks in Florida waters. Scott Publishing Company, Eru College, Florida, 1969.

00241

Ambler, J. Richard. Additional archaeological survey of the Wallisville Reservoir area, southeast Texas. Texas Archaeological Salvage Project Survey Reports (6), 1970.

In this survey, 95 additional sites were located. The stages (some tentative) for the area as discussed by the author were "early archaic," "archaic," Lost River phase, "beginning Galveston Bay phase," Early Galveston Bay phase, "Galveston Bay phase," "historic." Most of the sites were compacted accumulations of shell and the middens have clay and sand filling one interstices. The author includes a chart, giving the site, its location, size, depth, stage, disturbance and recommendations on excavation or testing. A brief summary of each site is included as well as a section on ceramics, stone and bone artifacts and non-artifactual material. Occupancy of the delta began in pre-ceramic times, at least by 300 B.C. and then by 100 A.D., pottery is introduced perhaps from the east. By 1000 A.D. or 1200 B.C. pottery is more elaborate, stone tools more common. The shift through time appears to have been from an exploitation of the bayous to a more inclusive exploitation of a wider range of environments (moved away from the actual coast).

00242

Dejarnette, D. L. and V. Searritt. A selected Bibliography of Alabama Archaeology. Journal of Alabama Archaeology, XVI (L): 1-76, 1970.

A bibliographic reference of Alabama giving ethnographic, geological, faunal botanical, environmental and archaeological materials pertaining to the State of Alabama. Emphasis mostly on the Northern aspects of Alabama with a good coverage of early history, early archaeological materials and more spectacular items.

00243

Dibble, E. F. and E. W. Newton. In search of Gulf Coast History. Proceedings of the First Gulf Coast History and Humanities Conference, Historic Pensacola Preservation Board, Pensacola, 1970.

00244

Hays, T. R. and E. Herrin. Padre Island Project, July, 1970.

00245

Holmes, J. D. L. A guide to Spanish Louisiana, 1762-1806. Louisiana Collection Series of Books and Documents on Colonial Louisiana. A. F. LaGorde. New Orleans, 1970.

00246

Lazarus, Y. W. Salvage archaeology at Fort Walton Beach, Florida. *Florida Anthropologist*, 23 (1): 29-42, 1970.

Highway building operations in Fort Walton Beach, necessitated the excavation of shell middens in the areas to be destroyed. A shell heap near the beach contained an amount of Deptford period pottery and Santa Rosa-Swift Creek ceramics, and also Weeden Island types. There is a temple mound adjacent to the area, which was sampled, which contained ceramics as well. Lazarus then postulates a probable reconstruction of reoriginal settlement patterns and sequences of occupation.

00247

Aten, L. E. A study of the Effects of Petroleum Exploration and Production activities on archaeological and Historical Resources along the Texas Coast prepared for the Galveston district, U. S. Army Corps of Engineers Texas archaeological salvage project, Research report, 3: 1971.

Author discusses the significance of the historical and archaeological resources. There are 4 major sources of drainage to sites by the petroleum industry. These are, pipeline excavations, canal excavations, shell mining and well locations. Several recommendations were given to mitigate the damage or destruction. Also recommended that no prohibition of petroleum exploration and production be called for at this time.

00248

Briggs, Alton K. Archaeological Resources, in the Texas Coastal Lowlands and Littoral. Texas Historical Survey Committee, Texas Water Development Board, 1971.

Review discussing known archaeological sites in the Texas Coastal lowlands and littoral, including 35 counties. Recommendations for the preservation of archaeological sites through surveys and salvage programs are included.

00249

Dibble, E. F. and E. W. Newton. Spain and her rivals on the Gulf Coast. Historic Pensacola Preservation Board, Pensacola, 1971.

00250

Hester, Thomas Ray. Loyola Beach: an example of reoriginal adaption to the maritime environment of the lower Texas coast. *Florida Anthropologist*, 24 (3): 41-104, 1971.

The site is to the west of Grullo Bay in Kleberg County. The Loyola Beach site is on a small clay dune with a freshwater pond adjacent to the side of the dune facing toward the land. All artifacts were collected from the surface and most of the specimens came from private collections. Controlled collecting was impractical as the materials had been mixed. The site served as a campsite for lengthy periods of time. The author states that the site seems to be in the Rockport complex. Land snails, oyster shells or marine shells were found on the surface indicating dependence on the sea.

00251

Scurlock, D. Archaeological survey for shipwreck sites in northwest Matagorda Bay. Southern Methodist University, Institute for Underwater Research, Inc. June 1-12, 1971.

A historical background is given concerning Matagorda Bay. The survey procedures used are discussed. Site number, name and transit readings from 2 different platforms and from the land target site descriptions are included on another chart. We recommend that parts of the area be closed to any commercial or industrial activity which would disturb wrecks or artifacts, also that the entire area be recommended for designation as a state historical maritime park.

00252

Trickey, E. B. and N. H. Holmes. A chronological framework for the Mobile Bay Region. Revised 1970. Journal of Alabama Archaeology, XVII (2): 115-128, 1971.

The first chronology for the Mobile Bay Region were delineated by E. Bruce Trickey in 1958. Subsequent investigations allow us to make certain adjustments in the chronology and extend it backwards in time. The sequence of cultures, originally developed using seriation techniques, has been verified by stratigraphy; and radiocarbon dates have anchored some of these cultures in actual time. This paper describes the excavation of 2 out of 3 shell middens, each separated vertically by layers of alluvial mud, on the bank of Tensaw Lake in Baldwin County. Surface collections were made at the other 3 middens.

00253

Anonymous. The National Register of Historic Places, 1972. Prepared in office of Archaeology and Historic Preservation. U. S. Government Printing Office, 1972.

00254

Aten, L. E. An assessment of the Archaeological Resources to be affected by the Taylors Bayou Drainage and Flood Control Project, Texas. Texas Archaeological Salvage Project, U.T. at Austin, 7, 1972.

This report presents results of an evaluative survey for archaeological and historical sites in portions of the Taylors Bayou drainage basin. Six sites were located in the general area to be affected by construction of these, 5 are likely to be damaged or destroyed. An original settlement in the drainage basin appears never to have been intensive and, except for one site located in the "shallow swamp" habitat, all sites are located in the brackish "confined marsh" habitat. Rangia clam samples examined for growth stage information indicated that all sites sampled were occupied in the Spring Season. Clams from 1 possible preceramic site indicated the occurrence of a period of clamatic aberration relating to abnormal air temperatures and or precipitation. The data are insufficient to accurately estimate the age of the sites found, but all probably were occupied within the past 3000 years.

00255

Aten, Lawrence. An assessment of the archaeological resources to be affected by the Highland Bayou Food Control Project, Texas. Texas Archaeological Salvage Project, 8: 1972.

Three sites were found in the area, 41 GU50, 41 GU51, and 41 GU52. A shell fish sample was taken from each of the first 2 sites while 41 GU52 had no clam shells present. These were used to interpret the season of occupation by measuring the growth stages of the shell. The evidence suggests a springtime occupation.

00256

Dibble, David S. An assessment of the Archaeological Resources to be affected by modifications of the La Quinta Navigation channel and Basin (Corpus Christi ship channel) Texas. Texas Archaeological Salvage Program, University of Texas, Austin, 1972.

This report details the results of an archaeological survey of areas to be affected by proposed modifications of the La Quinta Navigation Land surfaces to be thus affected yielded negative results. Also, a review of available documentation on the locations of significant historic shipwrecks or other historic features revealed no listing for bay-bottom areas scheduled for modifications by this project. A brief discussion of known archaeological resources in the near vicinity of this channel project is included.

00257

Shafer, Hany S. An assessment of the archaeological resources to be affected by the Cedar Navigation Project, Texas Archaeological Salvage Project, U.T. at Austin, 6, 1972.

An archaeological survey of lower Cedar Bayou was carried out in advance of the U. S. Army Corps of Engineers' planned dredging and modification. Two sites (41CH58 and 41CH214) containing intact cultural deposits will be directly affected by present plans. Six additional sites will be affected by long-term wave action probably resulting from increased use of the navigation channel. Locations, descriptions and recommendations for each of the sites are presented.

00258

Shore, H. H. Marine archaeology and international law: background and some suggestions. San Diego Law Review, 9(3): 668-700, 1972.

Some of the current legal problems confronting marine archaeology are analyzed including the right to explore and excavate. Current United Nations guidelines and the European Convention on the Protection of the Archaeological Heritage are discussed. The problems presented by current definitions of territorial sovereignty over coastal waters are discussed. Archaeological research differs from state sovereignty interests since the research has no distinct commercial or military objective and does not infringe the security of other nations nor gives an unfair advantage in the exploitation of resources. Suggestions for international principles governing marine archaeology include an international commission, special consideration for certain organizations, control beyond state jurisdiction, and regional commissions.

00259

Comstock, Douglas B., Kerry A. Grombacker, David S. Dibble. A study of the effects of shell dredging on the archaeological and historical resources on San Antonio Bay, Texas. Texas Archaeological Survey, U. T. at Austin, 23: 1973.

An historical background of the bay area is presented. It is concluded that shell dredging may alter historically interesting features, such as shipwreck sites, but that the probability of encountering such sites is quite low. Measures regulating shell dredging operations are proposed.

00260

Day, J. M. Maps of Texas, 1527-1900. Pemberton Press, Austin 1973.

00261

Frome, Michael. National Park Guide. Rand McNally and Company, 192 p, 1973.

00262

Gibson, J. L. The Trappy Mastodon, Lafayette Parish, Louisiana. University of Southwestern Louisiana Research Series, 27, 1973.

00263

McGuff, Paul R., Wayne N. Cox. A survey of the archaeological and historical resources to be affected by the Clear Creek Flood Control Project, Texas. Texas Archaeological Survey, U.T. at Austin 100: 28, 1973.

An assessment of the impact of the Clear Creek Flood Control Project on the archaeological, historical, and cultural resources was made by the Texas Archaeological Survey, the University of Texas at Austin for the Galveston District, U. S. Army Corps of Engineers. As a result of the survey, 76 prehistoric sites and 2 historic sites were identified. Of this number, 51 prehistoric and 1 historic site may be adversely affected because of their situation in relation to possible stream modifications in the proposed project. The prehistoric sites fall within 2 specific loci and as such represent a significant kind of site density not previously recognized in the area. Recommendations are made for avoiding these archaeological resources as well as alternative plans outlined for mitigative action in the event of the impossibility of avoidance.

00264

Shinkee, J. R. and J. L. Gibson. Big Oak Island, An historical perspective of changing site function. Submitted for publication, 1974.

00265

Aten, Lawrence E. Archaeological excavations at the Dow-Clever site, located on the east bank of the Brazos River some 10 miles upstream from the Gulf of Mexico. The site consisted of a series of 6 thin, unstratified zones of camp site refuse separated by intervals of sterile alluvium. Excavations were focused on 2 problems of significance to this initial phase of archaeological investigations in 1 Brazos delta area. The first and most basic of these problems was development of a chronology to serve as an historic frame of reference for other archaeological investigation. The second problem was an analysis of aboriginal subsistence and settlement patterns, this latter aspect will be repeated elsewhere.

00266

McWilliams, Richebourg Grillard, Undated. History of Beautiful Dauphin Island. Dauphin Island Park and Beach Board. 40 p. undated.

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Wilson, B. Ecological survey of penaeid shrimp of the central Louisiana Gulf coast and estuarine waters. A report to the Louisiana State Science Foundation, 140 p, 1969.

00226

Allen, O. Louisiana Landings: Preliminary Data, Monthly Reports. News analysis, New Orleans, Louisiana, 1970.

00227

The Shrimp Year: 1970. Fishing Gazette, New York (5) May, 1970.

00228

Arnold, Victor. An analysis to determine optimum shrimp fishing effort by area. Working Paper No. 40. Bureau of Commercial Fisheries, United States Department of the Interior, Washington, D. C., 1970.

00229

Barrett, B. Water measurements of coastal Louisiana. Louisiana Wild Life and Fisheries Commission, Division of Oysters, Water bottoms and seafoods, 209 p, 1970.

Water measurements of coastal Louisiana were made based upon the most recent maps available. Total water surface area, water volume, and number of surface acres at different water depths were determined.

00230

Cobb, B. F. Texas marine resources: the fisheries view. Texas Agricultural and Mechanical University, Dept. of Animal Science, 14 p, 1970.

The report, based on information supplied by several key individuals representing the Texas fishing industry, describes briefly the economic importance of the industry and some of the issues facing Texas fishing interests.

00231

Crance, Johnie H. Statement presented at the public hearing affecting shellfish harvesting in Mobile Bay. in: Proceedings conference in the matter of pollution of the navigable waters of Mobile Bay and its tributaries-- Alabama, U.S. Department Interior, Federal Water Pollution Control Admin. p, 316-327, 1970.

00232

Duffy, M. Of princely pincers. The Louisiana Conservationist. March-April, 1970.

00233

Ford, T. B. and L. St. Amant. Management guidelines for predicting brown shrimp, Penaeus aztecus, production in Louisiana. La. Wild Life and Fisheries Comm. 13 p, 1970.

00234

Fore, P. O. Oceanic distribution of the eggs and larvae of the Gulf menhaden. in: Report of the Bur. Commer. Fish. Biol. Lab., Beaufort, N. C., for fiscal year ending June 30, 1968. U.S. Fish. Wildl. Serv. Cir. 341, p. 11-13, 1970.

00235

Gooch, D. M. Studies on brackish water clams of the genus Rangia in Louisiana. Proc. Natl. Shellfisheries Assoc. 60:3-4, 1970.

00236

Heald, E. J. Fishery Resources Atlas 11 - West Florida to Texas. Miami University, Sea Grant Institutional Program, 181 p, 1970.

The report shows the location and magnitude of the principal fishery resources on the continental shelf of the United States, from the west coast of Florida to Texas. A similar report, concerned with the fisheries from New York to Florida, was completed in 1968. The information in the report was obtained from unpublished data supplied by the United States Bureau of Commercial Fisheries. Summaries have been prepared for species whose value was more than \$1,000 to fishermen in any specific area of capture in 1965. Less important species taken by the commercial fishery are listed in the appendix. The latter constitute less than one percent by weight of the annual catch from the area. Little information is available on sport fisheries and they are not included.

00237

Jaworski, E. Biogeography of the blue crab fishery. Barataria estuary, Louisiana. Dissertation, LSU, August 1970, 145 p, 1970.

00238

Lantz, Kenneth E. An ecological survey of factors affecting fish production in a Louisiana backwater area and river. Louisiana Wildlife and Fisheries Commission Bulletin 5, 60 p, 1970.

00239

Lindall, W. N., Jr. and J. R. Hall. Fishery resources: Report of the commercial fishery work unit. NMFS Biological Laboratory, St. Petersburg, Florida, p. 163-188, 1970.

00240

May, Edwin B. and Kenneth R. McLain. Advantages of electronic positioning and profiling in surveying buried oyster shell deposits. Proceedings of National Shellfisheries Association, 60: 72-74, 1970.

The cost of surveying buried oyster shell deposits was reduced about 90% by using an electronic positioning system and an electronic profiler in conjunction with conventional probing. An Autotape Electronic Positioning System provided accurate positioning under all visibility conditions, which eliminated the need for visual triangulation positioning. Electronic positioning reduced conventional survey costs over 85%. An Elac Echograph bottom profiler was used to detect hard substances such as clay, sand, or shell below mud bottom which eliminated unnecessary probes and further reduced the cost. Cost was reduced by surveying more acres per day with the electronic equipment than was possible with conventional methods.

00241

May, Edwin B. and Donald G. Bland. Survival of young oysters in areas of different salinity in Mobile Bay. Proceedings of Southeastern Association of Game and Fish Commission, 23: 519-521, 1970.

00242

Merrill, A. S. and H. S. Tubiash. Molluscan resources of the Atlantic and the Gulf Coast of the United States. Bureau of Commercial Fisheries, Oxford Maryland Biological Laboratory, 32 p, 1970. (Pub. Proceedings of the Symposium on Mollusca, 3: 925-948, 1970.

Approximately 15 species of mollusks are harvested commercially on the east coast of the United States and the Gulf of Mexico, but the major bulk and value of the fisheries are contributed by five species of bivalves. In order of economic importance these are: the American oyster (Crassostrea virginica), the sea scallop, (Placopecten magellanicus), the hard-shell clam (Mercenaria mercenaria), the soft-shell clam (Mya arenaria), and the surf clam (Spisula solidissima). In order of harvested weight, they range as follows: oyster, surf clam, sea scallop, hard-shell clam and soft-shell clam. The total value of these species in 1965 was over 55 million dollars, with the oyster contributing nearly one-half this amount. The total weight of meats for the same year was over 130 million pounds.

000243

Moffet, A. W. The shrimp fishery in Texas. Texas Parks and Wildlife Dept. Bull. No. 50:3-38, 1970.

00244

Swingle, Wayne E. Survey of the live bait shrimp industry of Alabama. Alabama Dep. Conserv. Seafoods Div. Fed. Aid Completion Rep. Mimeo. File Rep. 29 p, 1970.

00245

Tarver, J. W. Clam shell planting for oyster cultch. La. Wildlife and Fisheries Comm. New Orleans, 11 p, 1970.

00246

Tarver, J. W. The clam story. The Louisiana Conservationist, May-June, 1970.

00247

U.S. Department of Health, Education and Welfare. February 1, 1970 inter-state shellfish shippers list. U.S. Public Health Serv. Food and Drug Admin. Washington, D.C., 18 p, 1970.

00248

U.S. Department of Interior. Fisheries of the United States, 1969. Bureau of Commercial Fisheries. Government Printing Office, Washington, 1970.

00249

U.S. Department of the Interior. National estuary study. U.S. Dept. Interior, Fish and Wildl. Serv. Bur. Sport Fish. and Wildl. and Bur. Comm. Fish, 1-7, 1970.

00250

U.S. Department of the Interior. Fish and Wildl. Serv. Bur. Comm. Fish. Alabama Landings, 1969, 4 p, 1970.

00251

Wass, M. and D. Haven. Marsh clams believed potential food supply. Bull. Vir. Inst. Mar. Sci. 2(12): 1 p, 1970.

00252

Allen, O. M. Fisheries of Louisiana, 1969. U.S. Dept. Commerce, NOAA SCFSA-f249 GC-4. 8 p, 1971.

00253

Allen, O. Louisiana Landings: preliminary data, monthly reports. News analysis, New Orleans, Louisiana, 1971.

00254

Boothby, R. N. and J. W. Avault, Jr. Food habits, length-weight relationship and condition factor of the red drum (Sciaenops ocellata) in Louisiana State University, Fisheries Division, 8 p, 1971.

A total of 349 adult red drum (Sciaenops ocellata) were collected from the coastal marsh below Hopedale in southeastern Louisiana, between October, 1967 and October, 1968. A total of 286 fish (82%) contained identifiable food items which were analyzed as to frequency of occurrence and percent of total volume. The main food items in order of occurrence were fish, shrimp, and crabs. Blue crabs, mud crabs, and penaeid shrimp were the crustaceans most frequently eaten, and at least 14 different species of fish were utilized to some degree. Food habits varied substantially from season to season. Fish was the main food item during winter and spring months. Crustaceans, crabs and shrimp combined comprised the bulk of the diet during the summer and fall months. Only slight differences in food habits were detected due to size or sex. Gonadal examination of eight adults indicated that spawning took place between September and December. The length-weight relationship and seasonal condition values were determined.

00255

Caillouet, C. W., Jr., B. J. Fontenot, W. S. Perret, R. J. Duqas, and H. S. Hebert. Catches of postlarval white shrimp (Penaeus setiferus) temperature and salinity observations in Vermilion Bay, Louisiana. March 1963--April 1967. U.S. Dept. of Commerce, NOAA Data Report No. 64, 39 p, 1971.

00256

Chapoton, R. B. The future of the Gulf menhaden, the United States largest fishery. National Marine Fisheries Service, Mid-Atlantic Coastal Fisheries Research Center, 11 p, 1971. (Pub. in Proceedings of the Gulf and Caribbean Fisheries Institute 24: 134-143, 1971)

Landings of Gulf menhaden by the purse seine fleet during the 25 year period 1946-70 show gradual but not consistent annual increase. Data are given on the history and status of the menhaden fishery and estimates are given on the maximum sustainable yield. It is suggested that the fishery is reaching or has already

reached predicted maximum yields. Comparison is made with data on the Pacific sardine and the Atlantic menhaden. The data show that the Gulf menhaden population and the number of fish recruited has undergone marked changes and will likely continue to fluctuate. The correctness of the maximum sustainable yield estimate of 434,000 metric tons will be proven in possibly five years.

00257

Corliss, Jane and Lee Trent. Comparison of phytoplankton production between natural and altered areas in West Bay, Texas. Fishery Bulletin, 69(4): 829-832, October, 1971.

Phytoplankton production was compared between an undredged marsh area, a bay area and an adjacent marsh area altered by channelization, bulkheading and filling.

00258

Crance, Johnie H. Description of Alabama estuarine areas - cooperative Gulf of Mexico estuarine Inventory. Alabama Marine Resources Bull., 6:1-85, 1971.

The physical characteristics of Alabama estuarine areas are presented as part of a cooperative Gulf of Mexico estuarine inventory. The importance of estuaries as nursery areas for marine species and for other uses is discussed and the early history of the exploration and development of the Gulf of Mexico and the coastal area of Alabama is reviewed.

Maps are presented to show the Alabama estuarine study area and the surface sediment types, pollution sources, oyster beds, isotherms, isohalines and certain economic characteristics of the area. Data on climate, tides, open water surface area and average depth, tidal marsh, stream discharge, domestic and industrial wastes, navigation channels, commercial fisheries, and other characteristics of the study area are presented in tables.

00259

Ford, T. B. and L. S. St. Amant. Management guidelines for predicting brown shrimp Penaeus aztecus, production in Louisiana, Gulf and Carrib. 23rd Annu. Sess. Nov. 1970, p. 149-161, 1971.

00260

Grady, J. R. The distribution of sediment properties and shrimp catch on two shrimping grounds on the continental shelf of the Gulf of Mexico. Gulf and Carib. Fish. Inst., Proc. 23rd Annu. Sess., p. 139-148, 1971.

00261

Jaworski, E. Decline of the soft shell blue crab fishery in Louisiana. Texas A & M University, EQNO 4, October, 1971. 1, 33 p, 1971.

00262

Kittredge, J. S., M. Terry and F. T. Takahashi. Sex pheromone activity of the molting hormone, Crustecysone, on male crabs. Fishery Bulletin, U.S. Department of Commerce, NOAA, NMFS 69(2): 337-343, 1971.

00263

Klima, E. F. and D. A. Wichham. Attraction of coastal pelagic fishes with artificial structures. National Marine Fisheries Service. Exploratory Fishing and Research Base, 16 p, 1971. (Publ Transactions of the American Fisheries Society, 100(1): 86-99, 1971).

Artificial structures positioned off Panama City, Florida during July 1969 proved effective in attracting commercial quantities of round scad, Spanish sardines, and scaled sardines. The structure's position in the water column and their design were important in attracting fish. Midwater structures which resembled a small pup tent were effective in attracting up to 25 metric tons of fish and consistently attracted from 1/2 to 5 metric tons daily. Scuba divers made visual estimates of the number of each species present at the structures. This paper discusses the behavior of the fish and presents a possible explanation of why fish are associated with submerged structures.

00264

May, Edwin B. A survey of the oyster and oyster shell resources of Alabama. Alabama Marine Resources Bull., 4:1-53, 1971.

The public oyster reefs and buried shell deposits in Alabama were mapped and inventoried. Second order survey was used to establish triangulation stations used for mapping. There are 3,064 acres of natural oyster reefs in Alabama. The average oyster harvest from 1948 through 1968 was 1,220,000 pounds valued at \$415,000. An average of 655 hand-tong fishermen earned \$638 per year from 1948 through 1968. The fishery is valued at \$1,660,000 annually which is about 4 times the dockside value. Average annual production is 398 pounds of meats per acre with a present value to the fisherman of \$200 per acre. If the economics of the fishery is considered, each acre contributes \$542 yearly to the area economy. Pollution closure of oyster reefs results in an average loss to the fishermen of \$1,671 per day. About 2,000 acres of private oyster bottoms produce 12 percent of Alabama's landings and are valued at \$147 per acre per year.

00265

Moiseev, P. F. (ed.) Biological and oceanographic conditions for the formation of commercial concentrations of fish. Indian National Scientific Documentation Center, New Delhi, 1971.

00266

Perret, William S., et.al. Cooperative Gulf of Mexico estuarine inventory and study, Louisiana. Louisiana Wild Life and Fisheries Commission, 1971.

Tabular data are presented on water volume, vegetation, stream discharge, commercial fishery operations, coastal populations, pollution, filled areas, drained areas, and navigation channels in Louisiana's estuarine zone. Comparisons are made between past years' data and recent information.

00267

Perry, H. M. and J. Y. Christmas. A study of the blue crab industry in Mississippi. Annual Report, Project 2-123-R, Segment 1 (July 1, 1970 to June 30, 1971), 91 p, 1971.

00268

Pike, J. E. Fishery legislation. Congressional Publications, Committee serial no. 92-42, 1971.

Congressional testimony by J. E. Pike representing the Texas Shrimp Association, Southeastern Fisheries Association, Louisiana Shrimp Association, and the National Shrimp Congress.

00269

Sinderman, C. J. Internal defenses of crustacea: A Review, Cont.,L Number 197, National Marine Fisheries Service, Tropical Atlantic Biol. Lab., Miami, Fla. 33149. Reprinted in Fishery Bulletin, U.S. Department of Commerce, 69(3): 455-489, 1971.

00270

Subrahmanyam, C. B. The relative abundance and distribution of Penaeid shrimp larvae off the Mississippi Coast. Gulf Research Reports, Vol. 3(2): 291-345, 1971.

00271

Swingle, Hugh A. Biology of Alabama estuarine areas - cooperative Gulf of Mexico estuarine inventory. Alabama Marine Resources Bull., 5:1-123, 1971.

Twenty trawl stations, five seine stations and four plankton stations were sampled monthly from January 1968 through March 1969. A total of 162 species of fishes and 44 species of invertebrates were collected from the estuarine waters of Alabama. Seventy-six species of fishes are documented from other sources. The areal and seasonal distributions of the species are discussed. Also presented are data on the density of oysters on the public reefs and historical fisheries statistics.

00272

Sykes, James E. and John R. Hall. Comparative distribution of mollusks in dredged and undredged portions of an estuary with a systematic list of species. Fishery Bulletin of the National Oceanic and Atmospheric Administration, 68(2): 299-306, February, 1971.

A survey of benthic mollusks in Boca Ciega Bay, Florida, showed a much smaller number and variety of species in the soft sediments in dredged canals than in the predominantly sand and shell sediments in undredged areas. Samples contained an average of 60.5 live mollusks and 3.8 species in undredged areas and 1.1 individuals and 0.6 species in dredged canals. A list of mollusks collected in this survey and in past studies is appended.

00273

Tagatz, M. E. and A. B. Hall. Annotated bibliography on the fishing industry and biology of the blue crab, Callinectes sapidus. NOAA Technical Report NMFS SSRF-640, 1971.

00274

U.S. Department of Commerce, edited by Sidney Shapiro. Our changing fisheries. National Oceanic and Atmospheric Administration, National Fisheries Service. U.S. Government Printing Office, Washington, 534 p, 1971.

00275

U.S. Department of Commerce. Chartbook of U.S. fisheries supply. Current Economic Analyses Division, 1960-1970, National Oceanic and Atmospheric Administration, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, 1971.

00276

Wheeland, H. A. Fisheries of the United States. Prepared by Statistics and Market News Division, NOAA, NMFS, CFS-5900, 101 p, 1971.

00277

Adkins, Gerald. A study of the blue crab fishery in Louisiana. Louisiana Wildlife and Fisheries Commission, Technical Bulletin, No. 3, December, 1972.

On July 1, 1969, a project entitled "A study of the blue crab fishery in Louisiana" was initiated in Study Area IV, Timbalier-Terrebonne Bays and vicinity, Terrebonne and Lafourche Parishes, Louisiana. This project terminated June 30, 1972. Field activities consisted of weekly, monthly and quarterly sampling at various stations with 16- and 6-foot otter trawls and 1/2 meter plankton net.

00278

Adkins, Gerald. Adkins, G. Notes on the occurrence and distribution of the Rhizocephalan parasite (Loxothylacus texanus Boschma) of the blue crab (Callinectes sapidus Rathbun) in Louisiana estuaries, Louisiana Wildlife and Fisheries Commission, New Orleans, Louisiana, 11 p, 1972.

A total of 592 otter trawl samples were collected from September 1, 1969 through September 31, 1971 in the estuarine waters of Louisiana. These samples were made weekly and monthly throughout the two year period, and yielded a total of 8,833 blue crabs (Callinectes sapidus Rathbun). A total of 295 blue crabs were found to be infested with the parasitic sacculinid barnacle (Loxothylacus texanus Boschma). These infested crabs ranged in size from 30 to 95 millimeters, with a mean size of 58 mm. The highest percentage of infested crabs was recorded during warmer months, July through October; conversely the lowest percentage was taken during colder months, December through March.

00279

Allen, O. Louisiana landings; preliminary data, monthly reports. News analysis, New Orleans, Louisiana, 1972.

00280

Allen, O. M. Fisheries of Louisiana, 1970. U.S. Dept. Commerce, NOAA, SCFSA-5794 GC-4, 8 p, 1972.

00281

Beckert, H., D. G. Bland and E. B. May. The incidence of Labyrinthomyxa marina in Alabama, 1) Alabama Dept. of Conservation and Natural Resources, Alabama Marine Resources Laboratory, Dauphin Island, Ala., 8:18-23, June, 1972. 2) Alabama Marine Resources Bulletin.

The incidence and intensity of infection with Labyrinthomyxa marina, a parasitic fungus of oysters, was determined for the major oyster producing areas of Alabama from April 1968 through September 1969. Reefs in upper Mobile Bay were lightly infected. Reefs in higher salinity areas of the lower bay were more heavily infected. Factors which may affect infection levels: salinity, temperature, pollution and composition of oyster populations are discussed.

00282

Brucher, H. A., W. C. Renfro and R. A. Neal. Notes on distribution, size, and ovarian development of some penaeid shrimps in northwestern Gulf of Mexico, 1961-62. Contributions in Marine Science, 16: 75- ?, 1972.

00283

Dunham, Fred. A study of commercially important estuarine-dependent industrial fishes. Louisiana Wildlife and Fisheries Commission. Technical Bulletin No. 4, p. 3-60, December, 1972.

A study of commercially important estuarine-dependent industrial fishes was conducted from July 1969 through June 1972 in the area of the Barataria and Caminada Bays in the parishes of Lafourche, Jefferson, and Plaquemines in Louisiana. The purpose of the project was to aid the fishing industry in the best utilization of our fish resources. Data were obtained from both field samples, which included those taken with a 1/2 meter plankton net and a 16 foot otter trawl, and samples taken at industrial fish companies.

00284

Florida Dept. of Natural Resources. Summary of Florida commercial marine landings, 1972. Division of Marine Resources, Bureau of Marine Science and Technology, Tallahassee, Florida, 62 p, 1972.

Commercial Fish Landings, 1972.

00285

Fore, P. L. and K. N. Baxter. Diel fluctuations in the catch of larval Gulf menhaden, Brevoortia patronus at Galveston entrance Texas. National Marine Fisheries Service, Gulf Coastal Fisheries Center, 5 p, 1972. (Pub. in Transactions of the American Fisheries Society, 101(4): 729-732, 1972.

The paper reports on catches of larval Gulf menhaden made in a series of collections during a 96 hour period at the mouth of Galveston Bay and relates these catches to certain environmental conditions. The peaks of abundance during periods of maximum ebb tides suggests that the directions and velocities of flow play an important role in regulating the distribution and catch of larval menhaden and young shrimp in estuarine waters.

00286

Fore, P. L. and K. N. Baxter. Collections of larval gulf manhaden, Brevoortia patronus, from Galveston Entrance 1959-1969 and Sabine Pass (1963-1967) Texas. National Marine Fisheries Service, Atlantic Coastal Fisheries Center, 20 p, 1972.

The number of larvae, that were taken per tow with a Renfro beam trawl, and the dates of collection are given for two Texas inlets.

00287

Holland, J. S., Jr. and J. H. Crance. Rigging and gigging for flounder. Galveston Marine Laboratory, 5 p, 1972.

The advisory bulletin provides informative details on rigging and gigging

flounder along the Texas Gulf Coast. Steps in making a gig are set forth. A good light is probably the most expensive piece of equipment needed for floundering. Light rigs may be simple, home-made or store bought. Any light that will illuminate the bottom and make it visible to the fisherman may be used.

00288

Johnson, Milton G. Benefits of environmental prediction in the Eastern Gulf of Mexico. Fourth Annual Offshore Technology Conference, American Institute of Mining, Metallurgical, and Petroleum Engineers, Preprints, 2: 765-778, 1972.

Direct and indirect benefits which may be derived from marine environmental prediction are examined in both quantitative and qualitative terms for the eastern Gulf of Mexico area. Conclusions drawn include the following: of the primary environmental factors affecting the dimensions and types of benefits being derived from marine resources, five appear particularly relevant to commercial fishing and deep-water recreation in the eastern Gulf; 1) sea state, 2) air circulation, 3) temperature, 4) precipitation patterns, and 5) special conditions of tropical storms, fog, etc. Sea state is the most significant factor for marine users, followed by wind information. Additionally they seek reports of barometric readings and predictions of precipitation and temperature ranges. If a prediction service were introduced, commercial fishermen, charter boat operators and sportsmen could enjoy income or other benefits varying from \$0.5 to \$6.0 million per year by 1975. Indirect benefits could add another \$1.2 to \$5.7 million. Optimum weather and sea-state predictions alone would furnish benefits ranging from \$0.5 to \$3.5 million by 1975. If predictable underwater parameters could be correlated with fish location and used by commercial fishermen, additional benefits on the order of \$2.6 million could result.

00289

Jones, L. B. and G. R. Rice. An economic base study of coastal Louisiana. Louisiana State University, Center for Wetland Resources, 178 p, 1972.

The report analyzes and describes some basic sectors of the regional economy. Primary emphasis is toward systematization and generalization with reference to very large economic sectors that are most obviously related to regional characteristics. These sectors are commercial fisheries, mineral extraction, and water transportation. The tourist and recreation sector is described briefly. A list of standard industrial classifications is given for industries independent upon or related to the coastal economy. Population projections are made through use of cohort-survival techniques. Shift-share analysis is used to analyze economic growth trends.

00290

Marcello, Rocco Anthony, Jr. and R. Kirk Strawn. The cage culture of some marine fishes in the intake and discharge canals of a steam-electric generating station, Galveston Bay, Texas. Texas A & M University, College Station, Tx, p. 172.

Considers the possibility of wintering small fish to marketable size by keeping them in the warm waters of intake and discharge canals of a power plant.

00291

May, Edwin B. The effect of floodwater on oysters in Mobile Bay. Proceedings of the National Shellfisheries Association. Alabama Marine Resources Division, Dauphin Island, Alabama, 62:67-71, 1972.

Periodically, floodwaters entering Mobile Bay, Alabama in winter and spring can lower the salinity to such a degree that oyster populations are affected. Oysters and oyster drills are killed and oyster setting is inhibited. The effects of low salinity were studied in 1970 and 1971 by quantitatively sampling oyster reefs and examining gonadal development. Most oysters survived long periods of exposure to salinity below 3 ‰ but high mortality occurred on reefs where salinity was approximately 1 ‰ for about 7 weeks. Large errors were found in the box count method of estimating mortality.

00292

McNulty, J. K., W. N. Lindall, Jr. and J. E. Sykes. Cooperative Gulf of Mexico estuarine inventory and study, Florida: phase I. Area description. National Marine Fisheries Service, Gulf Coast Fisheries Center, 137 p, 1972.

Newly-developed tables and maps depict the dimensions, submerged vegetation, tidal marshes, mangrove swamps, commercial oyster beds, leased oyster-rearing areas, sources of pollution, drained tidal marshes, and filled areas of Florida's west coast estuaries. Published and unpublished information on temperature, salinity, geology, artificial fishing reefs, stream discharge, human population, commercial fishing, and economic development is presented in new form. Increasing population correlates directly with the number of sources of pollution, filled area, and the area closed to shellfishing by public health authorities; thus, failure to control the adverse effects of population growth will clearly result in continued rapid degradation of estuarine habitat on Florida's west coast. A bibliography is included.

00293

Mendenhall, V. T. Oxidative rancidity in raw fish fillets harvested from the Gulf of Mexico. Journal of Food Science, 37(4): 547-550, 1972.

00294

Swingle, Wayne E. Survey of the live bait shrimp industry of Alabama. Alabama Marine Resources Bull., 8:1-33, 1972.

During 1968, there were 24 bona fide live bait shrimp dealers operating in Alabama who sold 1,544,000 live shrimp and 22,200 pounds of dead shrimp having a retail value of \$76,540. The capital investment per dealer was \$3,303 for facilities and equipment. No shrimp were exported from Alabama, and only a negligible amount was imported. Brown Shrimp (Penaeus aztecus) and white shrimp (Penaeus setiferus) were the major species taken. Brown shrimp entered the estuaries first and were gradually replaced by white shrimp. The fishery normally operates from June through November. Length-weight relationships were determined for brown shrimp, white shrimp, and pink shrimp (Penaeus duorarum).

00295

U.S. Department of Commerce. Fisheries of the United States. Current Fishery Statistics No. 6100, 101 p, 1972.

00296

Alabama Dept. of Game and Fisheries. Alabama game and fish news. Alabama Department of Game and Fisheries, Montgomery, Alabama, 1929 - Present, 1973.

00297

Barrett, Barney B. and Marilyn Caunon Gillespie. Primary factors which influence commercial shrimp production in coastal Louisiana. Louisiana Wildlife and Fisheries Commission. Technical Bulletin, No. 9, 26 p, August, 1973.

Louisiana leads the nation in shrimp production, with an average heads-off yield between 1967 and 1972 of 57 million pounds annually. Evidence indicates that a critical factor in brown shrimp population survival may be the number of hours water temperatures are below 20 degrees C after the first week in A prediction of the May brown shrimp production can be made based on total hours that surface water temperatures are below 20 degrees C.

00298

Caillouet, C. W., Jr. and K. N. Baxter. Gulf of Mexico shrimp resource research. Marine Fisheries Review, 35 (3-4): 21-24, 1973.

00299

Florida State Government, Department of Salt Water Fisheries. Summary of Florida commercial marine landings, 1963 to present, 1973.

00300

Gaidry, W. J., III, and Charles J. White., Investigations of commercially important penaeid shrimp in Louisiana estuaries. Louisiana Wildlife and Fisheries Commission. Technical Bulletin No. 8, p, 1-152, 1973.

Graphic and tabular data are presented on penaeid shrimp recruitment, growth, and movement. These parameters are related to hydrological conditions existing in the estuarine systems of coastal Louisiana. The relation between various hydrological conditions and their effects on penaeid shrimp production are also presented. Comparisons are made between the seven coastal areas in relation to life history functions of the two species of penaeid shrimp investigated.

00301

Gulf States Marine Fishery Commission. Annual publication. Report concerning Gulf Coast Fisheries. New Orleans, La., 1973.

Report to the U.S. Congress, Governors and legislators of Alabama, Florida, Louisiana, Mississippi and Texas.

00302

Louisiana Dept. of Conservation, Division of Fisheries. Louisiana-Biennial report of the Bureau of Scientific Research and Statistics, periodical, 1973.

Louisiana fisheries.

00303

Pollard, J. F. Experiments to re-establish historical oyster seed grounds and to control the southern oyster drill. Louisiana Wildlife and Fisheries Commission. Technical Bulletin, No. 6, 82 p, January, 1973.

Biological and hydrological sampling was conducted in the sub-delta bays and marshes east of the Mississippi River below New Orleans, Louisiana. Various materials were screened as candidates for oyster cultch; clamshell (valves of the brackish-water clam) emerged as first choice. Two methods of planting cultch were evaluated, and conditions under which each would be preferable are outlined. Experimental cultch plots were set forth to gather data on oyster setting and growth under near ideal conditions. Plankton sampling to monitor oyster larvae in the water column and the use of spat-catching devices to monitor spatset were employed to determine periods and peaks of oyster spawning activity. Yearly bimodal peaks of setting were noted: a lack of correlation between larvae in the water column and actual setting was detected. The delineation of current infestation by the Southern oyster drill and its historical movement were discovered through field sampling and interviews.

00304

Tarver, Johnnie W. and Ronald J. Dugas. A study of the clam, Rangia cuneata, in Lake Pontchartrain and Lake Maurepas, Louisiana. Louisiana Wildlife and Fisheries Commission, 97 p, February, 1973.

Samples of Rangia cuneata were taken by utilizing a Peterson and modified oyster dredge throughout Lakes Pontchartrain and Maurepas to determine the occurrence, distribution and density of clam populations. Hydrological, sedimentological and plankton samples were analyzed in an effort to determine some of the factors affecting the distribution, density and growth of R. cuneata. Mortality and the effects of dredging operations on the environment are briefly discussed. Annual shell production and overfishing factors are discussed and recommendations to the industry are also proposed.

00305

Tarver, Johnnie W. and Ronald J. Dugas. Experimental oyster transplanting in Louisiana. Louisiana Wildlife and Fisheries Commission, Tech. Bull. No. 7, 5 p, March, 1973.

An experimental oyster transfer on January 8-19, 1973, with harvest and sale after January 26, 1973, was carried in an area where the coliform bacteria counts were above the maximum acceptable standard set by law. Permits were issued and a check-point system designed to allow oyster dredging in Lakes Pontchartrain and St. Catherine, deposition of catch, and harvest following a seven-day purging period was implemented. Sixty-seven oyster vessels representing 37 owners were issued dredging permits; only 64 vessels actually participated. An estimated 8,188 barrels were transported, requiring 99 trips and yielding an average of 82.7 barrels per trip. Several fishermen reported that, after the transplanting operation, approximately 65 to 75 percent of the original estimated oyster catch was recovered upon harvesting.

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Swingle, W. E. Evaluation and planning of Alabama's renewable marine resources research and development requirements. Alabama Department of Conservation and Natural Resources, 49 p, 1973.

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Maps are presented to show the Alabama estuarine study area and the surface sediment types, pollution sources, oyster beds, isotherms, isohalines and certain economic characteristics of the area. Data on climate, tides, open water surface area and average depth, tidal marsh, stream discharge, domestic and industrial wastes, navigation channels, commercial fisheries, and other characteristics of the study area are presented in tables.

Alabama estuaries are located in Mobile and Baldwin counties which are underlain by the Citronelle formation that has estuarine deposits of Miocene Age. The climate is strongly influenced by the Gulf of Mexico. Rainfall at Mobile averages about 62 inches and temperature about 68 F annually. The mean diurnal tide range is about 0.5 to 1.8 feet in the study area. Mobile Bay, the predominant estuarine system, has a surface area of 264,470 acres and a drainage basin of over 44,000 square miles. The Alabama estuarine study area has 397,330 acres of open water, a volume of 3,833,489 acre-feet at mean high water, 34,614 acres of tidal marsh, 433 miles of bay and open water shoreline, 306.8 miles of streams, 3,064 acres of natural oyster reefs, approximately 924 acres of leased oyster bottoms and 1,060 acres of riparian bottoms used to grow oysters. In July 1970, there were 23 sources of municipal wastes and 31 sources of industrial waste that discharged a minimum total of 827.3 million gallons of effluents daily into the estuaries and nearby contributory streams. The effluents had a total estimated population equivalent of 634,190. There were 73,584 acres of estuarine water permanently closed to the harvest of shellfish, 143 miles of navigation channels, and 2,152 acres of emergent spoil banks and other filled areas in the estuaries in 1970. Total human population of Mobile and Baldwin counties in 1960 was 366,400. It is expected to increase to 629,000 by the year 1995.

The Port of Mobile is served by a 40 foot deep ship channel. The principal imports are iron ore, aluminum ore, petroleum products, grain and manganese ore. The gross wholesale value of Alabama's processed fishery products during 1969 was \$17,616,400. During the same year, 67 fishery wholesale and processing firms employed 1,470 employees for a total of 1,014 man-years.

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In the analyses, a 60 year rainfall record was used in a rainfall runoff model that had been calibrated for each site from a 4 to 10 year period of concurrent rainfall and runoff observations. Flood characteristics for each site were then determined from a frequency analysis of the 60 year synthesized flood record and related by multiple regression to the characteristics of each watershed.

The relationships indicate that as urbanization increases the impervious surface from 1 to 35 percent, the magnitude of a 2 year peak is increased by a factor of 9 and the magnitude of a 50 year peak is increased by a factor of 5. Other analyses indicate that urbanization also significantly increases the magnitude of annual runoff.

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There are many factors which should influence any plan for development of Oso Creek. Flood control measures may be proposed for the Oso by the Corps of Engineers, Nueces County Drainage District No. 2, and the Nueces County Development Group. When agreement is reached concerning coordination of flood prevention and control for the upper Oso, then consideration must be given to the development plans for the entire Oso Creek basin. Existing and potential urban-industrial, extractive and agricultural contaminants must be identified and dealt with i.e., sewage, brine or pesticides. Decisions must be reached concerning flood plain management and control of urban development within the Oso flood plain. As an estuary, the delicate ecological balance of the Oso must be maintained. A determination must be made in the near future as to the part Oso Creek will play in the development of Nueces County and the Region.

00054

Coastal Bend Regional Planning Commission, and Department of Housing and Urban Development. Blowing salt research summary report 12 p, 1971.

An area of the Texas Coastal zone extending northwest from the central mud flat region of Laguna Madre has experienced serious problems with blowing sand and salt in the past. The primary area of concern is the basin area below Baffin Bay where mud flats have become exposed providing a large area for the predominant strong southeast winds to erode. These wind blown sands and salt have gradually accumulated in areas extending as far inland as 70 miles during the most severe instances. The report reviews and discusses present study efforts.

00055

Davis, G. H. and J. R. Rollo. Land subsidence related to decline of artesian head at Baton Rouge, Lower Mississippi Valley, U.S.A. (with French Abs.). In: Land subsidence, Vol. 1. International Association of Science Hydrology Publication 88 (IASH-UNESCO),: 174-184, 1971.

Precise leveling in the Baton Rouge area indicates as much as 30 cm subsidence of the surface during the period 1900-65. Maximum subsidence is centered in the industrial district, the area of greatest withdrawals from wells and maximum decline of artesian herd. Lines of equal subsidence for the period 1934-65 show a bowl-shaped depression slightly elongated east-west; the 5 cm subsidence line encloses an area of about 250 sq. mi. Areal distribution of subsidence corresponds closely with distribution of decline in head in the confined aquifer system. Increases in rate of head decline in heavily pumped zones are reflected in accelerating subsidence. Presumably head decline has caused compaction of fine-grain sediments interbedded with and separating beds of water-bearing sand. Average head decline in the area of maximum subsidence approximates 200 feet since pumping of confined water began about 1890. About 0.5 feet of subsidence for each 100 feet of head decline occurs.

00056

Florida. Department of Transportation. Division of Transportation and Planning. 1970 land use and highway functional classification system: State of Florida. Tallahassee, Florida, 1971.

00057

Franklin, J. A. III. Open space plan and program, coastal bend region. Phase I-initial certification. Coastal Bend Regional Planning Commission, and U. S. Department of Housing and Urban Development, 60 p, 1971.

The purpose of this report is to provide concise interim guidance concerning the open space needs of the region. The report also contains the essential components of open space planning and programming required by the Department of Housing and Urban Development.

00058

Frey, H. Thomas and Henry W. Dill, Jr. Land use change in southern Mississippi Alluvial valley, 1950-69, U. S. Government. Publications monthly catalogue, 4: 26 p, October, 1971.

Analysis based on remote sensing.

00059

Gabrysch, Robert K. Land-surface subsidence in the Houston-Galveston region, Texas (with French Abs.). In: Land subsidence, Vol. I. International Association of Science Hydrology Publication 88 9 iash-UNESCO),: 43-54, 1971.

In the Houston-Galveston region, the principal cause of land-surface subsidence is the lowering of pressure head due to the removal of water and oil from subsurface strata. The region is underlain by a thick section of unconsolidated lenticular deposits of sand and clay. Clays separating beds of sand retard vertical movement of water, thus creating artesian conditions within aquifers. The ratio of sand to clay, a major factor controlling degree of compaction, varies from place to place in the aquifers. Reduction of pressure due to withdrawal of water causes additional load to be transferred to the skeleton of the aquifer system, thus causing compaction. As much as 5 feet of subsidence has occurred in the region between 1943 and 1964, and as much as 200 feet of water-level decline. The rate of subsidence increased from about 0.2 feet per year during 1954-59 to about 0.24 feet per year during 1959-64. The decline in water levels increased from about 4 feet per year to about 7 feet per year in those same periods.

00060

Gulf Coast Regional Planning Commission. The regional plan for open space, recreation, and environmental appearance - Hancock, Harrison, Jackson, and Pearl River counties, Mississippi. Gulfport, Miss., 1971.

00061

Fifteenth biennial report of the Louisiana Tax Commission 1970 - 1971. G. Dupre Litton, Chairman, 1971.

00062

Houston-Galveston Area Council of Governments, Land Use - 1971. (Map)

00063

Alabama Law, Act No. 119 (third special session, 1970). H 132, Nettles, Therrell, Owen, Lyons.

To provide for a comprehensive land management and use program in flood-prone areas of this state and to allow governmental units of Alabama to meet the requirements of the National Flood Insurance Act of 1968; to declare the public need for such program; to define terms; to authorize the county governing body in each county to prescribe criteria for land management and use in such areas, including control measures, subdivision planning requirements, building and health code requirements; to require certain permits prior to commencing construction; and to prescribe penalties for violations.

00064

Texas Governor's Advisory Committee on Marine Resources. Goals for Texas in the coastal zone and the sea: Summary of a conference Texas Governor's Advisory Committee on Marine Resources, 27 p, 1971.

The Governor's Advisory Committee planned a program at which ideas could be exchanged on the goals of coastal management in Texas. The Sea Grant Program at Texas A & M University worked at single-purpose workshops to produce needed information for the conference members. In 6 workshops possible research needs and assessment of governmental mechanisms for coordinating and simplifying work in the coastal zone were formulated. Five broad topics formed the nucleus of the meeting--coastal zone development, natural resources--fisheries, natural resources--minerals, science, engineering, education, and coastal zone management. Recommendations for goals for Texas' coastal zone are contained in the report.

00065

Texas urban development commission. A land resource management system for Texas. Arlington, Texas 1971.

A committee report to Texas Urban Development Commission.

00066

U. S. Army Corps of Engineers. National shoreline study: regional inventory report - South Atlantic and Gulf region. Atlanta, Georgia, 1971.

00067

U. S. Department of Agriculture. Water and related land resources coastal and independent streams river basin, Mississippi and Louisiana. Soil Conservation Service, Economic Research Service, Forest Service, Jackson, Mississippi, December, 1971.

00068

Universities Marine Center. State of Mississippi coastal zone management program. Ocean Springs, Mississippi, 1971.

00069

Yokel, B. J. and D. C. Tabb. Can coastal resources survive development. Rosentiel School of Marine and Atmospheric Science, 5 p, 1971.

The establishment of the Rookery Bay Sanctuary in Florida by the Collier County Conservancy, the National Audubon Society, and other interest groups is described. The effectiveness of local interest groups in protecting the environment and controlling local development is clearly demonstrated.

00070

Zack, Allen L. Ground-water pumpage and related effects, southwestern Louisiana, 1970, with a section on surfacewater withdrawals. Louisiana Geological Survey and Department of Public Works, Water Resources Pamphlet 27, 33 p, 1971.

Ground-water withdrawals for rice irrigation in southwestern Louisiana are inversely related to total rainfall during the growing season. This relation can be used to estimate ground-water pumpage if precipitation figures are known. Continually increasing pumpage from Chicot aquifer has caused levels to decline steadily, which necessitates frequent lowering of pump intakes in the Lake Charles area and locally in Evangeline Parish. A map showing average annual rate of water-level decline in southwestern Louisiana can be used to approximate future water levels at any location, highlights critical areas of high pumpage and low transmissivity, and delineates recharge boundaries of Chicot aquifer. Heavy ground-water withdrawals in the Lake Charles area have caused salt-water encroachment in the aquifer. In parishes along Atchafalaya River, salt-water monitor wells indicate decreasing amount of chloride in ground-water probably due to induced recharge from the river.

00071

Town of Coushatta - flood prevention project measure Twin Valley RC and D project, Louisiana (draft environmental statement). The National Technical Information Service, March 16, 10 p, 1972.

The project measure is located in the town of Coushatta, Red River Parish, Louisiana, 7.6 miles of flood prevention channels are proposed along with appurtenant structures for water control and for the protection of the channels. The project will reduce floodwater damages by 63 percent and enhance land for the future expansion of the town of Coushatta. Wetland habitat for fish and waterfowl will be created on 200 acres. Erosion problems will be reduced and hazards to public safety minimized. A small area of deer, quail, and rabbit habitat and about 20 acres of woodland will

be lost. There will be temporary turbid conditions in the channels during construction. Floodwater retarding structures were considered as an alternative to channel improvement.

00072

Buchanan, G. S. Texas navigation districts and regional planning in the Gulf Coast area. The Texas Law Institute of Coastal and Marine Resources. The Houston Law Review, 10(3), 1972.

00073

Dinkins, C. E. Texas seashore boundary law: the effect of natural and artificial modifications. Texas Law Institute of Coastal and Marine Resources, 43 p, 1972.

This study discusses shoreline changes--natural and artificial--and in view of existing case law and legislation, both in Texas and in other states, suggests changes in law and administration which would increase protection of Texas' coastal submerged lands and waters. The specific topics analyzed include: reliction, accretion, erosion, avulsion, submergence, landfills, reclamation, dredging, wharves and piers, subsidence and canals.

00074

Dinkins, C. The Beaches: Public rights and private use. Texas Law Institute of Coastal and Marine Resources, 80 p, 1972.

The report summarizes the Texas law of the beaches. Participants suggested necessary amendments to the Open Beaches Act to make it more protective of the public rights.

00075

Erb, R. B. Utilization of ERTS - 1 data in the Houston area. National Aeronautics and Space Administration, Manned Spacecraft Center, 4 p, 1972.

00076

Erb, R. B. ERTS - An investigation ER600 National Aeronautics and Space Administration, Manned Spacecraft Center, 8 p, 1972.

00077

Escambia-Santa Rosa Regional Planning Council, and Milo Smith and Associates Shoreline management plan for the Escambia-Santa Rosa region, 197 p, 1972.

The Shoreline Management Plan is divided into 6 basic parts: 1) environmental impact of major land use classes; 2) analysis of coastal environment; 3) regional design analysis; 4) existing development patterns; 5) shoreline development plan; and 6) the management program. Combined, these parts make up a comprehensive policy statement and implementation program geared to optimum long-range use of the coastal zone.

00078

Florida Coastal Zone Management Atlas. A preliminary survey and analysis. Florida Coastal Coordinating Council, Tallahassee, Florida, December, 1972.

00079

State of Florida. 1990 land use and highway functional classification system. Tallahassee, Florida, 1972.

00080

Florida legislature. The Florida environmental land and water management act of 1972. Tallahassee, Florida, 1972.

00081

Florida Department of Natural Resources. Coastal coordinating council. Coastal Zone Management in Florida - 1971. Tallahassee, Florida, 1972.

00082

Golden Crescent Council of Governments. Preliminary Report: Open Space Planning. Golden Crescent Council of Governments, Victoria, Texas, 1972.

00083

Hershman, M. J. The federal coastal zone management act of 1972. Louisiana State University, Sea Grant Legal Program, 7 p, 1972.

An overview of the law's impact at local, state and federal levels presented. Interagency coordination and cooperation from the initial planning grant stage through application for federal licenses or permits is discussed. A short explanation of state programs and an outline of the content of management programs is given. Definition of the coastal zone is presented and boundaries indicated.

00084

Hopkins, G. Summary of selected legislation relating to the coastal zone. Texas Law Institute of Coastal and Marine Resources, 121 p, 1972.

The report is a preliminary summarization of federal and state regulation of the coastal zone, in terms of authorizing legislation, planning, financing, and enforcement. The legal authorization is discussed for topics such as water supplies, pollution, transportation, etc. Although the report focuses on Texas, it should be of interest to planners in other states.

00085

Houston-Galveston Area Council. AGAC Regional Data Book, Vol. I (Statistical Information of Houston-Galveston Area to Aid in Planning and Research), 1972.

Includes statistical information: 1) populations, 2) income, 3) housing, 4) education, 5) transportation, 6) agriculture, 7) health, 8) welfare, 9) economic data.

00086

Louisiana Office of State Planning. Initial elements towards comprehensive state planning, Vol. 1, 1972.

00087

Palm Beach County Area Planning Board. Flood plain study and model flood plain ordinance, 56 p, 1972.

The report deals with the flooding problems of the Eastern Coastal Areas of Palm Beach County and offers methods by which the more serious effects of heavy flooding could be minimized or avoided. Sections of the report are concerned with the patterns of development in Palm Beach County, a review of past flooding situations in the eastern areas and the determining of flood criteria as established by the Corps of Engineers, U. S. Army. Also included are proposed Flood Hazard Ordinance criteria, a model Flood Hazard District, Flood Proofing criteria, subdivision criteria and methods of controlling coastal flooding.

00088

Rapp, G. R., D. M. French and J. Miloy. Economic development study of the Texas coastal zone. Texas Agricultural and Mechanical University, Industrial Economics Division, 141 p, 1972.

The report presents a statement on the economic changes in the 36 counties comprising the coastal zone of Texas. Chapter 1 presents a history of

of economic growth. Chapter 2 reviews current resources. Chapter 3 deals with urban and rural changes. Chapter 4 presents future assumptions and economic projections. Appendices provide information on projection methodology, future studies, economic implications of the Texas superport and economic considerations of a nuplex. A nuplex is defined as, a large agglomeration of agricultural and industrial facilities combined with the necessary supporting population and producing and fabricating products derived from the abundant supply of low-cost electricity and desalted water provided by a nuclear power reactor.

00089

Eden watershed, Mississippi (final environmental impact statement). Soil Conservation Service, Jackson, Mississippi, 33 p, 1972.

The project involves conservation land treatment of 10,817 acres in the Eden Watershed area of Yazoo County, Mississippi. Also included in the project is the construction of 1 floodwater retarding structure, 3 grade stabilization and sediment control structures, 25 miles of stream channel enlargement and 4 miles of new channel. The area is largely flat delta with some woods and a bluff area. The project is designed to protect against flooding and to abate erosion of agricultural land. Favorable environmental impacts of the project include: 20 percent erosion and sediment reduction, 70 percent reduction in flood plain sediment damage reduction of floodwater damage, and creation of 14 acres of water surface for fishing and wildlife. Adverse impacts include: loss of agricultural use and wildlife habitat on 16 acres, losses of agricultural production of 50 acres of cropland, temporary turbidity and silting during construction, elimination of channel vegetative cover, and water quality impairment in the channel. Alternatives considered include: conservation land treatment alone, less intensive land use by retiring wetlands, no action, and varying structural alternatives.

00090

Tampa Bay Regional Planning Council. Shoreline Resource Development. Tampa Bay Regional Planning Council, St. Petersburg, Florida. 1972.

00091

Tampa Bay Regional Planning Council. Tampa Bay Region Preliminary Environmental Assessment of Development. Tampa Bay Regional Planning Council, St. Petersburg, Florida. 1972.

00092

Texas Law Institute of Coastal and Marine Resources. The beaches: Public rights and private use. Proceedings of a conference. The Texas Law Institute of Coastal and Marine Resources, 78 p, 1972.

00093

A Description and Analysis of Coastal Zone and Shoreline Management Programs in the United States. Coastal zone management project, Sea Grant Program, University of Michigan. Sea Grant Technical Report, No. 28, March, 1972.

00094

Congressional publications committee, serial no. 92-2. Gulf Islands National Seashore, 1972.

Plans and costs for Gulf Islands National Seashore expansion, development, and maintenance.

00095

Soil Conservation Service, Washington, D. C. Yeager Ditch Project Measure, Southeast Texas Resource Conservation and Development Project, Texas (Final environmental impact statement). National Technical Information Service, September 29, 1971, 14 p, 1971.

The proposed action consists of Channel improvement to solve land and resource problems in the Yeager Ditch drainage area located in Orange County, Texas. At present Yeager Ditch cannot accurately convey the runoff originating within the project area, and flooding occurs frequently resulting in direct flood damage to residential, business, and agricultural properties. The following favorable effects are listed, 1) reduce erosion and sediment production, 2) protect against floodwater damage up to and including a 100 year frequency event, 3) restore property values and opportunity for home improvements, 4) create wildlife habitats, and 5) reduce sediment deposition. Construction of channel improvement will adversely affect some wildlife habitats and destroy or disturb some vegetative cover. Revegetation, however, will occur on much of this area. There is no alternative method, other than channel improvement, which will provide flood protection and meet the objectives of local organizations and residents. The comments of appropriate federal, state and local interests are included.

00096

Yon, J. William, Jr. and Charles W. Hendry, Jr. Suwannee limestone in Hernando and Pasco Counties, Florida. Florida Department of Natural Resources, Bureau of Geology, Bulletin 54(1), 42 p, 1972.

The competition between the mineral and agricultural industries for the use of land, as well as the overshadowing demands of urban sprawl for land, make it imperative that more aspects of the natural resources be available for efficient land use planning. One important aspect of the natural resources in any area is the geology. Limestone, a major component of the geology, occurs in abundance at or near the surface in Hernando and Pasco counties.

Several principal uses of this rock are in road building, agriculture, as an aggregate and in the manufacture of cement. The purpose of this report was to provide information on the distribution and character of the Suwannee Limestone in Hernando and Pasco counties. The study was started in 1969 and has been conducted intermittently since that time. Data on the geology were collected through examination of the quarries in the 2 counties and surrounding area and through the study of rock cuttings from numerous wells in Hernando, Hillsborough, Pasco, Pinellas, and Sumter counties.

00097

Current geographical publications. The American Geographical Society, New York, 36(1): 1-59, 1973.

00098

Current geographical publications. The American Geographical Society, New York, 36(2): 59-127, 1973.

00099

Buchanan, G. S. Texas Navigation Districts and Regional Planning in the Gulf Coast Area. Texas Law Institute of Coastal and Marine Resources, Houston, 67 p, 1973.

The study explores the role that navigation districts should play in regional planning and environmental control. It also analyzes the desirability of state supervision of such districts. The study suggests the need of a review by the state over the districts' right to purchase, use, and remove minerals from state land and condemn private property. Additionally, the study recommends that the districts be regulated by the state, in a fashion similar to other public and private entities, for the purposes of land use and environmental safeguards.

00100

Planning information base report. Imperial Calcasieu Regional Planning and Development Commission, June, 1973. For Louisiana Department of Public Works.

00101

Coastal Bend Regional Planning Commission. Plan and Program: Resource Conservation and Open Space Development in the Coastal Bend Region. Corpus Christi, Texas: Coastal Bend Regional Planning Commission, 1973.

00102

Dinkins, Carol Eggert. Comparative aspects of coastal zone management: background information on the law of Texas and other states in view of the Coastal Zone Management Act of 1972. The Texas Law Institute of Coastal and Marine Resources, 1973.

00103

Ereli, E. Analyzing coastal and marine law to develop an authority for coastal zone management. Texas Law Institute of Coastal and Marine Resources, 16 p, 1973.

This is a final report summarizing progress on a project entitled Analyzing Coastal and Marine Law to Develop an Authority for Coastal Zone Management. The project analyzed coastal and marine law in order to aid the Texas Interagency Council on Natural Resources and the Environment in the development of a coastal zone management framework. The report is divided into several parts: 1) preliminary legal studies, 2) detailed and intensive legal studies, 3) intergovernmental work, 4) public information, 5) evaluation of project, 6) publications of the Texas Law Institute of coastal and marine resources.

00104

Ereli, E. Annual report, 1972. Texas Law Institute of Coastal and Marine Resources, 37 p, 1973.

The 1972 annual report on the Texas Law Institute of Coastal and Marine Resources (a consortium of state law schools, located at the Bates College of Law, University of Houston) is in 2 parts. The first part is a report to the Governor of Texas and to the members of the State Legislature on progress pursuant to 2 resolutions of the 1971 Texas Legislature which directed the Interagency Council on Natural Resources and the Environment to work with the Institute in analyzing the legal and institutional problems associated with the State's Coastal Zone Management Program. The second part of the report summarizes the research completed by the Institute under the first year of the NSF grant, and the publications resulting there from, and also includes a proposal for additional research activities needed in the coastal zone management field.

00105

Recommendations for development activities in Florida's Coastal Zone. State of Florida, Department of Natural Resource, Coastal Coordinating Council, April, 1973.

00106

Statistical inventory of key biophysical elements in Florida's Coastal Zone. State of Florida, Department of Natural Resources, Coastal Coordinating Council, May, 1973.

00107

Geo abstracts. Social geography and cartography. Geo abstracts, Ltd. University of Anglia. Norwich, England, Abstracts 73 D 0462-0961, 1973/2.

00108

Regional Land Use plan for Hancock, Harrison, Pearl River, Jackson Counties, Mississippi. Gulf Regional Planning Commission, 1973.

00109

Gulf Regional Planning Commission. Regional Land Use. Gulf Regional Planning Commission, Gulfport, Mississippi. 1973.

00110

Hershman, Marc J. (ed.). Coastal zone management journal--environmental resources and law. Crane Russak and Company, Inc. N. Y., 1(1): 1973.

00111

Hollings, Ernest F. Congress and Coastal Zone Management. United States Senator from South Carolina. Coastal Zone Management Journal, 1973, 1(1): 155-118, 1973.

00112

Johnson, Stephen L. and Douglas M. Sayre. Effects of urbanization on floods in the Houston, Texas, Metropolitan area. U. S. Geological Survey Water Resources Division, 48 p, 1973.

This study provides relationships for estimating the magnitudes of annual flood peaks having selected recurrence intervals ranging from 2 to 100 years on streams in the Houston metropolitan area. Data on the size of the contributing watershed and the percent of impervious surface within the watershed are required for use of the relationships, which were defined by analyses of the flood peaks and watershed characteristics for 26 sites. In the analyses, a 60 year rainfall record was used in a rainfall runoff model that had been calibrated for each site from a 4 to 10 year period of concurrent rainfall and runoff observations. Flood characteristics

for each site were then determined from a frequency analysis of the 60 year synthesized flood record and related by multiple regression to the characteristics of each watershed. The relationships indicate that as urbanization increases the impervious surface from 1 to 35 percent, the magnitude of a 2 year peak is increased by a factor of 9 and the magnitude of a 50 year peak is increased by a factor of 5. Other analyses indicate that urbanization also significantly increases the magnitude of annual runoff.

00113

Knecht, Robert W. Coastal zone management, a federal perspective. Director, Office of Coastal Environment, National Oceanic and Atmospheric Administration. Coastal Zone Management Journal, 1973. 1(1): 123-128, 1973.

00114

Lindall, William, N., Jr., John P. Hall, and Carl H. Saldman. Fishes, Macroinvertebrates, and hydrological conditions of upland canals in Tampa Bay, Florida. Fishery Bulletin, 7(1): 155-163, January, 1973.

Faced with statutory restraints that prohibit dredging and filling of estuarine bottoms, coastal developers have turned to alternate methods of providing water front property for homesites. One method recently used in Tampa Bay, Florida is the construction of access canals that level from open water to upland acreage. This paper presents biological and hydrological data from new upland canals together with some comparative data from older upland canals and bayfill canals. In all types of canals, as presently engineered, stratified, stagnant water causes low levels of dissolved oxygen in summer months, resulting in mortality or emigration among resident organisms, means of alleviating the problems are discussed.

00115

Wetlands '73: Toward Coastal Zone Management in Louisiana. By Louisiana Advisory Commission on Coastal and Marine Resources, March, 1973.

00116

State of the State in 1973: An Economic and Social Report to the Governor. Prepared by Division of Business and Economic Research, College of Business Administration Louisiana State University in New Orleans for Louisiana Office of State Planning Office of the Governor.

00117

Alabama Law Act No. 1274. (Regular Session, 1973 S311-Owen).

To provide for the preservation, enhancement and development of the coastal areas of Alabama; to establish a board with responsibility and authority for developing, coordinating and maintaining a coastal area program; and to provide for the promulgation of regulations and provisions for the enforcement of this act.

00018

Pope, R. M. and James G. Gosselink. A tool for use in making land management decisions involving tidal marshland. Center for Wetland Resources, Louisiana State University, Baton Rouge, La. Coastal Zone Management Journal 1(1): 65-74, 1973.

This paper outlines a rationale and technique for putting a cash value on the ecological values of a tidal marsh. The summation of calculated values for individual components of the system approaches a total "life support" value based on the primary productivity of the marsh. Using this value, an analysis is made of the cost of highway construction through coastal marshes which takes into consideration the marshland destroyed. The analysis suggests that, except for cases of very shallow spoil removal, bridging is cheaper and ecologically preferable to filled roadway construction.

00119

Russell, Clifford S. and Allen V. Kneese. Establishing the scientific, technical and economic basis for coastal zone management. Resources for the Future Inc., Washington, D. C. Coastal Zone Management Journal, 1(1): 47-63, 1973.

This paper has 3 major aims; first, to put the problems lumped under the rubric "Coastal Zone Management," in perspective; second, to set out a general framework for the construction of coastal zone management models' and third, to discuss institutional problems, particularly those involved in organizing coastal zone research and in transferring the results of that research to the managers and social decision-makers. A fundamental point is that many of the problems commonly discussed in the context of the coastal zone are conceptually the same as "inland" problems with a long history of research and applied management. While there are complications introduced by the peculiarities of the marine and estuarial environment; it is hardly necessary to begin as though nothing were known. Those problems involving large-scale natural systems such as ocean currents, marine fisheries and tropical storms, are, however, unique in the coastal zone. These problems also are properly managed at the national level, and a sensible organization for research probably should involve expansion of NOAA's facilities, particularly in the direction of the social sciences.

00120

Seelig, W. N. and R. M. Sorensen. Historic shoreline changes in Texas. Texas Agricultural and Mechanical University, Coastal and Ocean Engineering Division, 21 p, 1973.

The Texas coastal zone has come under more intensive investigation as coastal areas increasingly become valuable to private landowners, industrial concerns and government agencies. Although research is in process, coastal changes have not been identified in many areas. The net changes in the mean low water (MLW) position at 226 points on the Texas coast have been examined using both the earliest and newer official topographic surveys. Shoreline changes at selected points have been examined in greater detail to suggest uses and limitations of the net MLW change information.

00121

Swanson, R. L. and C. I. Thurlow. Recent subsidence rates along Texas and Louisiana coasts as determined from tide measurements. Journal of Geophysical Research, 78(15): 2665-, 1973.

00122

Tampa Bay Regional Planning Council. Regional Land Use Study - An Inventory and Analysis of Existing Land Use in the Tampa Bay Region. Tampa Bay Regional Planning Council, St. Petersburg, Florida. 1973.

00123

Texas House of Representatives. Report to the 63rd legislature of the House Interim Committee on coastal and marine resources, 1973.

Natural resources of the coastal zone, land use management, federal coastal policies, conflicts in coastal zone usage. Superports, offshore terminals.

00124

Division of Planning Coordination, Ofc. of the Governor. The legal basis for planning in Texas, a handbook, 1973.

Includes: legal responsibilities of planners such as natural resources, recreation and open space, Texas statutes, Texas constitution.

00125

University of Houston, Bates College of Law. Texas Law Institute of Coastal and Marine Resources (Law of Texas and other States in view of coastal zone, Management Act of 1972. August, 1973.

00126

Proposed National Oceanic and Atmospheric Administration Rules on coastal zone management program developing grants. Department of Commerce, National Oceanic and Atmospheric Administration, Washington, D. C., June 13, 1973.

00127

Zwicky, Steven and John Clark. Environmental protection motivation in coastal zone land use legislation. The Conservation Foundation, Washington, D. C. Coastal Zone Management Journal, 1(1): 103-108, 1973.

Analysis of recent substantive coastal land use management laws shows that their main thrust is to provide for protection of the coastal environment from adverse impacts of uncontrolled development. The four purposes cited most frequently among laws of 17 states were: protection of wildlife and fisheries, protection of ecosystems or the natural environment, control of development, and enhancement of esthetic values. Other purposes were to: protect life and property, enhance public recreation, conserve soil, and protect water resources. Development and economic purposes were cited in relatively few laws.

00128

A summary of preliminary findings concerning the Louisiana State plan. Louisiana Department of Public Works. No date of publication.

00129

Golden Crescent Council of Government. Soil Data for Urban and Agricultural Land Uses in the Golden Crescent. The Golden Crescent Council of Governments, Victoria, Texas. No date.

00130

Northwest Florida Development Council. Base Mapping Methods. Northwest Florida Development Council, Panama City, Florida. No date.

00131

Northwest Florida Development Council. Gulf County Comprehensive Plan. Northwest Florida Development Council, Panama City, Florida. No date.

00132

Northwest Florida Development Council. Natural Resources Inventory and Soils Analysis. Northwest Florida Development Council, Panama City, Florida. No date.

00133

Northwest Florida Development Council. Strategy For Change - An Interim Regional Plan. Northwest Florida Development Council, Panama City, Florida. No date.

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May, Edwin B. Summer oyster mortalities in Alabama. Progressive Fish-Culturist 30(2): 99, 1968.

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Yang, W. T. Preliminary report on the culture of the stone crab (Mennippe mercenaria Say). Rosenstiel School of Marine and Atmospheric Science, University of Miami, 1969.

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The study was done on the site of the proposed Wallisville Reservoir, one of several multipurpose structures designed for the water development of the Trinity River basin in Texas. The dam is to be located at Trinity River mile 3.9, where it will traverse the Wallisville Dam, and is expected to alter both the character of the marsh and of the Trinity Bay portion of the Galveston Bay system. The dam will serve as an effective saltwater barrier in addition to serving as a river-water impoundment structure; about 12,500 salinity marsh will be inundated by the conservation pool. The study shows that the entire area serves as a nursery ground for white and brown shrimp, blue crab, and menhaden and that this area will be lost to the dam site. The construction of the dam at least 4.5 miles farther upstream would have spared considerable nursery acreage from destruction.

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Copeland, B. J. and E. G. Fruh. Ecological studies of Galveston Bay, 1969. Galveston Bay study program, Texas Water Quality Board, 482 p, 1970.

The general objective of this study was to assess the relationship between ecological response and quantity and quality of waste input in Galveston Bay, Texas.

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Dexter, D. M. Life history of the sandy-beach amphipod Neohaustorius schmitzi (Crustacea: Haustoriidae) Int. J. Life in Oceans and Coastal Waters 8(3): 232-237, 1970.

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Feray, D. E., D. W. Woodard, B. E. Dahl and R. L. Baker. The use of grasses for dune stabilization along the Gulf Coast with initial emphasis on the Texas coast. Gulf Universities Research Consortium, 73 p, 1970.

The Texas Gulf Coast is the area receiving initial protective measures because it is the most vulnerable of the 1622 miles of coast of the Gulf of Mexico. Barrier islands provide significant protection from storm surge and hurricane-generated waves, but violent storms produce surges of 15-20 feet above sea level causing significant erosion where the sand does not have a vegetative cover. An effective natural protective barrier to storm surges and hurricane waves would be a continuous vegetated dune line of 15 feet plus above mean sea level. The combined detrimental effect of overgrazing, man's destructive force, fire, and storm surges have denuded large expanses.

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Harris, A. H. and J. C. Ragan. Observations on the ecology and incidence of Loxothylacus texanus (Boschma), parasite in the blue crab (Callinectes sapidus rathbun) in south Louisiana, Nicholls State University, Thibodaux, Louisiana, 1970.

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Hopkins, J. W. Studies on brackish water clams of the genus Bangia in Texas. Proc. Nat. Shellfisheries Assoc. 60: 5-6, 1970.

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Lyons, W. G. Scyllarid lobsters (Crustacea, Decapoda): Memoirs of the Hourglass Cruises. Fla. Dept. Nat. Resour. Mar. Res. Lab. 1(4): 74 p, 1970.

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Parker, Jack C. Distribution of juvenile brown shrimp (*Penacus aztecus* Ives) in Galveston Bay, Texas, as related to certain hydrographic features and salinity. *Contribution in Mar. Sci.*, Vol. 15: 1-12, 1970.

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Parker, Robert H. and W. G. Blanton. Environmental factors affecting bay and estuarine ecosystems of the Texas coast. Coastal Ecosystems Management, Inc., 198 p, 1970.

Over 200,000 data points relating to range of environmental factors in all major Texas estuaries from Louisiana to Mexico were utilized to establish variability of total salinity and constituent ions in these estuaries. This was done to determine possible effects of oil field brines upon Texas coastal ecosystems. Diversity and faunal abundance were compared with environmental variability. Baseline values for benthic and nektonic populations were established for both undisturbed and industrially disturbed estuaries. In all bays, salinity and temperature variations were very pronounced, geographically and temporally. Range of variation and mean winter and summer salinities could be directly correlated with sizes and diversity of animal populations and with major changes from year to year to seafoods. Data from 572 stations relating to ionic constituents of Texas Bay waters were statistically evaluated from their variability and translated into 'ionic balance' format. Extreme variability from time to time and place to place demonstrate that this concept of 'ionic balance' is invalid in estuarine systems.

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Pequegnat, W. E., T. J. Bright and B. M. James. The benthic skimmer, a new biological sampler for deepsea studies. *Contribution on the Biology of the Gulf of Mexico*, Texas Agricultural and Mechanical University Oceanographic Studies, 1: 17-20, 1970.

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Pollard, J. F. Area II--Black Bay shell plant. 13th Biennial Report, 1968-69. Louisiana Wild Life and Fisheries Commission: 100-10, 1970.

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Pullen, E. J. and W. L. Trent. Carapace width-total weight relation of blue crabs from Galveston Bay, Texas. Transactions of the American Fisheries Society No. 4, p, 795-798, 1970.

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Pyle, T. E. and T. T. Tieh. Strontium, vanadium, and zinc in the shells of pteropods. Limnology and Oceanography, 15: 153-154, 1970.

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Rezak, Richard, et al. West Flower Gardens Research Facility. Texas Agricultural and Mechanical University, Sea Grant Program, Flower Gardens Feasibility Committee, Publication TAMU-SG-71-103, 23 p, 1970.

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Sherman, K. and K. A. Honey. Vertical movement of zooplankton during a solar eclipse. Nature, 227: 1156-1158, 1970.

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Steidinger, K. A. and J. Williams. Dinoflagellates: Memoirs of the Hourglass Cruises. Fla. Dept. Nat. Resour. Mar. Res. Lab. 2: 251, 1970.

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Thayer, Gordon W., and Richard B. Williams. Identity and regulation of nutrients limiting photosynthesis in an estuarine system. Bull. Ecol. Soc. Amer. 51(2): 32, 1970.

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U. S. Department of the Interior. National estuary study. U. S. Dept. Interior, Fish and Wildl. Serv. Bur. Sport Fish. and Wildl. and Bur. Comm. Fish, 1-7, 1970.

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Whitney, J. O. Absence of sterol biosynthesis in the blue crab, Callinectes sapidus rathbun, and in the barnacle Balanus nubilus Darwin, Journal of Experimental Biological Ecologist, Vol. 4, p, 229-237, 1970.

00155

Bilhorn, T. W., D. W. Woodard, L. C. Otteni, B. E. Dahl and R. L. Baker. The use of grasses for dune stabilization along the Gulf Coast with initial emphasis on the Texas coast. Gulf Universities Research Consortium, 67 p, 1971.

The Texas Gulf Coast is the area receiving initial protective measures because it is the most vulnerable of the 1622 miles of coast of the Gulf of Mexico. Barrier islands provide significant protection from storm surge and hurricane-generated waves, but violent storms produce surges of 15-20 feet above sea level causing significant erosion where the sand does not have a vegetative cover. An effective natural protective barrier to storm surges and hurricane waves would be a continuous vegetated dune line of 15 feet plus above mean sea level.

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Boothby, R. N. and J. W. Avault, Jr. Food habits, length-weight relationship and condition factor of the red drum (Sciaenops ocellata) in southeastern Louisiana. Louisiana State University, Fisheries Division, 8 p, 1971.

A total of 349 adult red drum (Sciaenops ocellata) were collected from the coastal marsh below Hopedale in southeastern Louisiana, between October, 1967 and October, 1968. A total of 286 fish (82%) contained identifiable food items which were analyzed as to frequency of occurrence and percent of total volume. The main food items in order of occurrence were fish, shrimp, and crabs. Blue crabs, mud crabs, and penaeid shrimp were the crustaceans most frequently eaten, and at least 14 different species of fish were utilized to some degree. Food habits varied substantially from season to season. Fish was the main food item during winter and spring months. Crustaceans, crabs and shrimp combined comprised the bulk of the diet during the summer and fall months. Only slight differences in food habits were detected due to size or sex. Gonadal examination of 8 adults indicated that spawning took place between September and December. The length-weight relationship and seasonal condition values were determined.

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Brooks, Ralph H., Jr., Patrick L. Brezonik, Hugh D. Putnam and Michael A. Keirn. Nitrogen fixation in an estuarine environment: the Waccasassa on the Florida Gulf Coast. *Limnology and Oceanography*, 16(5): 701-710, 1971.

Nitrogen fixation has been detected by the acetylene reduction method in the sediments of the Waccasassa estuary, a shallow embayment on the Florida Gulf Coast. Fixation rates in the range 1.6-15.0 mg C₂H₄/g sediment-hr were found within the top 2-5 cm stratum of sediments. Much lower rates (0.03-0.40 mg C₂H₄/g1-hr) were found at greater depths in the sediment, and no fixation was observed in the flocculent unconsolidated 1-2 cm at the sediment surface.

All evidence indicates that the reduction of acetylene to ethylene is a biological phenomenon, directly related to the activity of nitrogen-fixing organisms in the sediments.

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Camp, D. K. Platysquilla horologii (Stomatopoda Lysioquillidae). A new species from the Gulf of Mexico, with an emendation of the generic definition. *Proc. Biol. Soc. Wash.* 84(15): 119-127, 1971.

00159

Conte, Fred S. and Jack C. Parker. Ecological aspects of selected crustacea of 2 marsh embayments of the Texas Coast. Sea Grant Publication No. TAMU-SG-71-211, Texas Agricultural and Mechanical University, 184 p., 1971.

Commercial penaeid shrimp, grass shrimp (*Palaemonetes*), sergestid shrimp, and mysid shrimp were collected from 2 marsh embayments, Oyster and Alligator lakes near West Bay, Texas, twice a month for 2 years, identified, and their seasonal abundance determined relative to temperature and salinity. Effects of aerial application of malathion in mosquito control concentrations on the juvenile commercial shrimp Penaeus aztecus and P. setiferus were studied. Commercial shrimp suffered mortalities (14-80%) while the controls suffered no pesticide deaths.

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Cook, Harry L. and M. Alice Murphy. Early developmental stages of the brown shrimp Penaeus aztecus Ives, reared in the laboratory. *Fishery Bulletin*, 69(1): 233-239, January 1971.

The larval and first postlarval stages of the brown shrimp Penaeus aztecus Ives, reared from eggs spawned in the laboratory, as well as the eggs themselves, are described and illustrated. The larvae and first postlarva are compared with those of the pink shrimp, P. duorarum Burkenroad, and white shrimp, P. setiferus (Linn.).

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Cronin, E. L. and A. J. Mansueti. The biology of the estuary. In: A Symposium on the Biological Significance of Estuaries. Sport Fishing Institute (National Science Foundation Sea Grant No. H000070 1971, p, 14-39, 1971.

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Dawson, C. E. Jr. Occurrence and description of prejuvenile and early juvenile Gulf of Mexico cobia, Rachycentron canadum. Copeia 1971: 65-71, 1971.

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Eldred, B. First records of Anguilla rostrata larvae in the Gulf of Mexico and Yucatan Straits. Fla. Dept. Natur. Resour., Mar. Lab., Leaflet Ser. IV, No. 19. 3 p, 1971.

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El Sayed, S. Z. Photic zone: eleven studies during El Tanin cruise. Antarctic Journal, 6(3): 63, 1971.

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El Sayed, S. Z. Phytoplankton studies in southeastern Indian Ocean. Antarctic Journal, 6(5): 153, 1971.

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Firth, Richard William, Jr. and Willis E. Pequegnat. Deepsea lobsters of the families Polychelioae and Nephropidae (Crustacea, Decapoda) in the Gulf of Mexico. Texas Agricultural and Mechanical University Oceanography Abstracts of Technical Reports, Reference 71L-11-T: 6, 1971.

This is a preliminary report on the deepsea lobsters of the families Polychelidae and Nephropidae with particular emphasis upon their occurrences in the Gulf of Mexico and central Caribbean Sea.

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Fore, P. L. The distribution of the eggs and larvae of the round herring, Etrumeus teres, in the northern Gulf of Mexico. ASB Bull. 18: 34, 1971.

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Futch, C. R. and F. H. Hoff, Jr. Larval development of Syacium papillosum (Bothidae) with notes on adult morphology. Fla. Dept. Nat. Resour. Mar. Res. Lab., Leaflet Ser., 4(1, 20): 22 p, 1971.

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Futch, C. R. Larvae of Monolene sessilicauda Goode, 1880 (Bothidae). Fla. Dept. Natur. Resour., Mar. Lab., Leaflet Ser. IV, No. 21, 14 p, 1971.

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Gillespie, M. C. Analysis and treatment of zooplankton of estuarine waters of Louisiana. Section 2, Cooperative Gulf of Mexico Estuarine Inventory and Study, Louisiana, Phase I, II and IV, Louisiana Wildlife and Fisheries Commission, 128 p, 1971.

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Gouch, D. M. A study of Rangia cuneata Gray in Vermillion Bay, Louisiana, M. S. Thesis, Univ. of Southwestern La., Lafayette, 50 p, 1971.

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Holland, J. S., D. V. Aldrich, and K. Strawn. Effects of temperature and salinity on growth, food conversion, survival and temperature resistance of juvenile blue crabs, Callinectes sapidus rathbun, Sea Grant Publication TAMU-SG-71-222, 166 p, 1971.

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Jacob, J. W., Jr. Observations on the distribution, growth, survival and biomass of juvenile and subadult Penacus aztecus in southern La. Thesis, M. S. La. State Univ. 68 p, 1971.

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Jannke, T. E. Abundance of young sciaenid fishes in Everglades National Park, Florida, in relation to season and other variables. Master's thesis, Univ. Miami, 128 p, 1971.

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Kittredge, J. S., M. Terry and F. T. Takahashi. Sex pheromone activity of the molting hormone, Crustecdysone, on male crabs. Fishery Bulletin, U. S. Department of Commerce, NOAA, NMFS. Vol. 69, No. 2, p, 337-343, 1971.

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Kelly, John A., Jr., Charles M. Fuss, Jr. and John R. Hall. The transplanting and survival of turtle grass, Thalassia testudinum. In: Boca Ciega Bay, Florida. Fishery Bulletin, 69(2): 273-280, April 1971.

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Kritzler, H. Observations of a new species of streptosoma from northeast Gulf of Mexico (Polychaeta Terebellidae). Bulletin of Marine Science, 21(4): 904 - ?, 1971.

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Round, F. E. Benthic marine diatoms. Oceanography and Marine Biology Annual Review, 9: 83-140, 1971.

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Rowe, Gilbert T. and David W. Menzel. Quantitative benthic samples from the deep Gulf of Mexico with some comments on the measurement of deepsea biomass. Bull. Mar. Sci. 21(2): 556-566, 1971.

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Sindermann, C. J. Internal defenses of Crustacea: A review. Cont. No. 197, National Marine Fisheries Service, Tropical Atlantic Biological Laboratory, Miami, Florida. Reprinted in Fishery Bulletin, U. S. Department of Commerce, NOAA, NMFS, Vol. 69, No. 3, p, 455-489, 1971.

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Stroud, R. H. Introduction to Symposium. A symposium on the biological significance of estuaries. Sport Fisheries Institute (NFS Grant No. H000070): 3-8, 1971.

00182

Swingle, Hugh A. Biology of Alabama estuarine areas - cooperative Gulf of Mexico estuarine inventory. Alabama Marine Resources Bull., 5: 1-123, 1971.

Twenty trawl stations, 5 seine stations and 4 plankton stations were sampled monthly from January 1968 through March 1969. A total of 162 species of fishes and 44 species of invertebrates were collected from the estuarine waters of Alabama. Seventy-six species of fishes are documented from other sources. The areal and seasonal distributions of the species are discussed. Also presented are data on the density of oysters on the public reefs and historical fisheries statistics.

00183

Sykes, James E. and John R. Hall. Comparative distribution of mollusks in dredged and undredged portions of an estuary, with a systematic list of species. Fishery Bulletin of the National Oceanic and Atmospheric Administration, 68(2): 299-306, February 1971.

A survey of benthic mollusks in Boca Ciega Bay, Florida showed a much smaller number and variety of species in the soft sediments in dredged canals than in the predominantly sand and shell sediments in undredged areas. Samples contained an average of 60.5 live mollusks; and 3.8 species in undredged areas and 1.1 individuals and 0.6 species in dredged canals. A list of mollusks collected in this survey and in past studies is appended.

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Tagatz, M. E. and A. B. Hall. Annotated bibliography on the fishing industry and biology of the blue crab, Callinectes sapidus. NOAA Technical Report NMFS SSRF-640, 1971.

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Tagatz, M. E. Osmoregulatory ability of blue crabs in Peake Science Vol. 12, No. 1, p, 14-17, 1971.

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Thomas, J. P. Wagner and H. Loesch. Studies on the fishes of Barataria Bay, an estuarine community. L.S.U. Coastal Studies Bull. 6: 56-66, 1971.

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Thomas, J. P. Release of dissolved organic matter from natural populations of marine phytoplankton. Mar. Bio. 11(4): 311-323, 1971.

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Acker, Susan. Mangrove ecology. Oceans, 5(4): 36-43, 1972.

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Adkins, Gerald. Notes on the occurrence and distribution of the rhizocephalan parasite (Loxothylacus texanus) of Blue Crabs (Callinectes sapidus rathbun). In: Louisiana estuaries. Louisiana Wildlife and Fisheries Commission Tech. Bull. No. 2, 11 p, December 1972.

A total of 592 otter trawl samples were collected from September 1, 1969 through September 31, 1972 in the estuarine waters of Louisiana. These samples were made weekly and monthly throughout the 2 year period, and yielded a total of 8,833 blue crabs (Callinectes sapidus Rathbun). A total of 295 blue crabs were found to be infested with the parasitic sacculinid barnacle (Loxothylacus texanus Boschma). These infested crabs ranged in size from 30 to 95 millimeters, with a mean size of 80 mm. The highest percentage of infested crabs was recorded during warmer months, July through October; conversely the lowest of percentage was taken during colder months, December through March.

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Alam, M., J. J. Sasner and M. Ikawa. Isolation of Gymnodinium-breve toxin from Florida red tide water. *Toxicon*, 11(2): 201-202, 1972.

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Aprieto, V. L. Early development of carangid fishes of the Gulf of Mexico and the South Atlantic coast of the United States. Ph. D. Dissertation, Univ. Miami. 167 p, 1972.

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Barber, Richard T. The threat to ocean ecology, chapter in: *The Fate of the Ocean*, John Logue (ed.), Villanova University Press, p, 136-160, 1972.

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Baykin, Rosemary E. *Texas and the Gulf of Mexico: a general guide to marine science in the Texas Gulf Coast Region*, compiled by Rosemary E. Baykin; edited by Leatha F. Meldy and Kathi J. Jensen; 2nd edition. Department of Marine Resources Information, Center for Marine Resources, Texas A & M University, College Station, 1972.

00194

Beckert, Heind, Donald G. Bland and Edwin B. May. The incidence of Labyrinthomyxa marina in Alabama. *Alabama Marine Resources Bulletin* Number 8: 18-24, 1972.

The incidence and intensity of infection with Labyrinthomyxa marina, a parasitic fungus of oysters, was determined for the major oyster producing areas of Alabama from April 1968 through September 1969. Reefs in upper Mobile Bay were lightly infected. Reefs in higher salinity areas of the lower bay were more heavily infected. Factors which may affect infection levels: salinity, temperature, pollution and composition of oyster populations are discussed.

00195

Boesch, D. F. and A. E. Smalley. New axiid (Decapoda, Thalassinidea) from northern Gulf of Mexico and tropical Atlantic. *Bulletin of Marine Science*, 22(1): 45-52, 1972.

A new species of axiid "lobster" is described from specimens taken from waters of the inner Continental Shelf of the north central Gulf of Mexico and off British Guiana in the tropical Atlantic. This represents a considerable divergence in vertical and geographical distribution from other closely related species.

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Bright, Thomas, Frank Ferrari, Douglas Martin and Guy A. Franceschini. Effects of a total solar eclipse on the vertical distribution of certain oceanic zooplankters. *Limnology and Oceanography*, 17(2): 296-301, 1972.

The effect of the total solar eclipse of 7 March 1970 on some oceanic Copepoda and Euphausiacea in the Gulf of Mexico was studied by taking 10 minute tows with Clarke-bumpus nets on the days before, during, and after the elipse. Illumination was continuously recorded. Most organisms that responded to the eclipse did so by migrating to the surface during totality. The magnitude of this response appeared to exceed that to the decrease in light intensity at night.

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Brucher, H. A., W. C. Renfro and R. A. Neal. Notes on distribution, size, and ovarian development of some penaeid shrimps in northwestern Gulf of Mexico, 1961-62. *Contributions in Marine Science*, 16: 75 - ?, 1972.

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Chabreck, R. H. Vegetation, water, and soil characteristics of the Louisiana coastal region. *La. Agr. Exp. Sta. Bull.* 664, 72 p, 1972.

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Coull, B. C. Species diversity and faunal affinities of Meio-benthic Copepoda in the deep sea. *Mar. Bio.* 14(1): 48-51, 1972.

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Coull, B. C. Sex ratios of deep sea benthic copepoda. *Am. Zoologist* 12(3): 301, 1972.

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Dawes, C. J. and A. C. Mathieson. A new species of Pseudocodium (Chlorophyta, Siphonales) from the west coast of Florida. *Phycologist* 11(3-4): 273-277, 1972.

00202

Dawson, C. E. Nektonic pipefishes (Syngnathidae) from Gulf of Mexico off Mississippi. *Copeia*, 1972 (4): 844-?, 1972.

00203

Defenbaugh, R. Occurrence and distribution of hydroids in Galveston Bay, Texas area. *Texas Journal of Science*, 24(3): 387-388, 1972.

Study materials were collected at approximately monthly intervals, from June 1968 to September 1969, in the Galveston Bay area. Collecting locations included the front beaches of Galveston Island and Bolivar Peninsula, East Bay, West Bay, San Luis Pass, Lower Galveston Bay, and East Lagoon. Near-shore dredge samples collected by other workers were also examined. Specimens were narcotized with magnesium sulfate, preserved in 4 percent formalin, and stored in 70 percent ethanol. Salinities, temperature, and offshore depths were recorded. Specimens were examined and tentatively identified. Verifications and corrections were made by Miss Joann Allwein, of the Zoology Department, North Carolina State University.

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Dill, W. T. and S. Z. El Sayed. Ecology of phytoplankton in southwestern Pacific Ocean studied during southwind cruise. *Antarctic Journal*, 5(4): 72, 1972.

00205

Doyle, Roger W. Genetic variation in Ophiomusium lymani (Echinodermata) populations in the deepsea. *Deepsea Res.* 19: 661-664, 1972.

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El Sayed, S. Z. Phytoplankton studies between New Zealand and antarctic. *Antarctic Journal*, 7(5): 174, 1972.

00207

El Sayed, S. Z. Primary production of standing crop of phytoplankton. In: Chemistry, primary productivity and benthic algae of the Gulf of Mexico serial atlas of the marine environment, Folio 22, American Geographical Society, p, 8-13, 1972.

00208

Epstein, R. A. Larval trematodes of marine gastropods from Galveston Island, Texas. Texas Journal of Science, 24(3): 389, 1972.

A total of 3957 gastropods of 20 species including 16 genera were collected from 13 locations in the vicinity of Galveston, Texas from October 1970 to March 1972. Larval trematodes of 15 species were found from 8 species of gastropods. They included: 1 ubiquitous cercaria from Littorina irrorata; 3 magalurous cercariae from Littorina irrorata; 3 megalurous cercariae, 2 from L. irrorata and 1 from Cerithidea pliculosa; 2 from L. irrorata and 1 from Cerithidea pliculosa; 2 armate cercariae, 1 from each of L. irrorata and C. pliculosa; a megaperid cercaria from Crepidula plana; a brevi-furcate apharyngeate cercaria from C. pliculosa; 2 echinostome cercariae, 1 from each of Thais haemastoma and Nassarius vibex; a magnacerous cercaria from C. pliculosa; a trichocercous cercaria from Anachis avara; and 2 species of unknown family or cercarial type from each of Melampus bidentatus and Polinices duplicata.

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Fore, P. L. and K. N. Baxter. Collections of larval gulf menhaden, Brevoortia patronus from Galveston Entrance 1959-1969 and Sabine Pass (1963-1967) Texas. National Marine Fisheries Service, Atlantic Coastal Fisheries Center, 20 p, 1972.

The number of larvae, that were taken per tow with a Renfro beam trawl, and the dates of collection are given for 2 Texas inlets.

00210

Freeman, T. E. and F. W. Zettler. A disease of water hyacinth with biological control potential. Abstr. of 1972 meeting Weed Sci. American, 61, 1972.

00211

Goering, J. J., and P. L. Parker. Nitrogen fixation by epiphytes on sea grasses. Limnology and Oceanography, 17(2): 320-323, 1972.

Four species of sea grasses in Redfish Bay, Texas. Thalassia testudinum, Cymodocea manatorum, Diplanthera wrightii, and Ruppia maritima, showed nitrogen-fixing activity as measured by the acetylene reduction technique. Evidence that epiphytes and not the macrophytes are responsible for the observed fixation is presented that leads to the suggestion that nitrogen-fixing epiphytes play an important role in the nitrogen economy of sea-grass communities.

00212

Harris, John E. Suspended matter. Deep Sea Research, 19: 719-726, 1972.

00213

Hayslip, Helen F. Evaluation of plant pathogens as biocontrols of Eurasian watermilfoil (Myriophyllum spicatum L.) M. S. Thesis, University of Florida, Gainesville, 1972.

00214

Hill, H. R., F. M. Zettler and T. E. Freeman. Plant pathogens with potential for biological control of aquatic weeds. Proc. Southern Weed Sci. Soc, 25: 388 (Abstr.), 1972.

00215

Hill, H. R. Survey and evaluation of plant pathogens of alligatorweed. M. S. Thesis, University of Florida, Gainesville, 1972.

00216

Hobson, L. A. and C. J. Lorenzen. Relationships of chlorophyll maxima to density structure in Atlantic Ocean and Gulf of Mexico. Deep-Sea Research, 19(4): 297-306, 1972.

Chlorophyll maxima occur in the Atlantic Ocean and Gulf of Mexico in association with pycnoclines. Spatial distributions of these maxima are patchy and the maximum depths to which they follow pycnoclines are variable. This variability may be related to degree of light adaptation by phytoplankton cells. It is suggested that light adaptation is a function of the taxonomic composition of the phytoplankton crop. Possible relationships between chlorophyll maxima and micro-zooplankton are discussed.

00217

Hoesel, H. Dickson, Walter R. Nelson and Heino Beckert. Seasonal and spatial setting of fouling organisms in Mobile Bay and eastern Mississippi Sound, Alabama. Alabama Marine Resources Bulletin Number 8: 9-17, 1972.

Setting of oysters, barnacles and other species on asbestos plates was studied across a gradient from low salinity in Mobile Bay to high salinity in eastern Mississippi Sound, Alabama. Barnacles (Balanus eburneus) dominated setting with concentrations averaging thousands/m²/day with spring and fall peaks. Oysters (Crassostrea virginica) set only at levels of 1 to 100 plus/m²/day, decreasing while only a single summer or early fall peak occurred in Mobile Bay. Other species recorded were studied less intensively.

00218

Johnson, Corwin W. Legal assurances of adequate flows of fresh water into Texas bays and estuaries to maintain proper salinity levels. Texas Law

Institute of Coastal and Marine Resources, 47 p, 1972.

This study undertakes to determine the legal requirements to assure an inflow of fresh water to Texas' coastal bays, lagoons and estuaries, and the nature of new laws which may be needed to meet such needs. The study suggests that need for a legislative estuarine water policy and recommends adoption of specific measures to implement that policy.

00219

Joyner, B. G. Characterization of a Rhizoctonia sp. pathogenic to aquatic plants. M. S. Thesis, University of Florida, Gainesville, 1972.

00220

Kennedy, F. S., Jr. Distribution and abundance of 'Physalia' in Florida waters. Florida Dept. of Natural Resources, Marine Research Laboratory, 45 p, 1972.

Reports on the distribution, abundance and size of the Portuguese man-of-war, (Physalis physalis), monitored in the western Caribbean, Gulf of Mexico and coastal waters of Florida by aerial surveys from April 1969 through February 1971. The Florida Keys were monitored by field surveys. A seasonal cycle of distribution was observed. Movement and dispersion is controlled by surface currents; winds are the controlling factor for standings along shorelines. Physalia are dioecous and fertilization appears successfully only when animals are abundant.

00221

Lawrence, A. L., G. J. Schulte and W. H. Clark. Active transport of D-glucose dissolved in sea water by the postlarvae of the oyster, Crassostrea gigas. Texas Report Biology Medicine, 1972.

00222

Lawrence, A. L. Absorption of L-valine and D-glucose dissolved in sea water by larvae and postlarvae of the brown shrimp, Penaeus aztecus. Texas Report Biology Medicine, 1972.

00223

Limdall, W. N., Jr., J. R. Hall and C. H. Saloman. Fishes, microinvertebrates and hydrological conditions of upland canals in Tampa Bay, Florida. National Marine Fisheries Service, Gulf Coast Fisheries Center, 19 p, 1972. Included in Fishery Bulletin 71(1): 155-163, January, 1973.

Faced with statutory restraints that prohibit dredging and filling of estuarine bottoms, coastal developers have turned to alternate methods of providing water front property for homesites. One method recently used in Tampa Bay, Fla., is the construction of access canals that lead from open water to upland acreage. This paper presents biological and hydrological data from new upland canals together with some comparative data from older upland canals and bayfill canals. In all types of canals, as presently engineered, stratified, stagnant water causes low levels of dissolved oxygen in summer months, resulting in mortality or emigration among resident organisms. Means of alleviating the problems are discussed.

00224

Lyons, W. G. New Turridae (Gastropoda: Toxoglossa) from south Florida and the eastern Gulf of Mexico. *Nautilus* 86(1): 3-7, 1972.

00225

Lyons, W. G. A new Fasciolaria from the northeastern Gulf of Mexico. *Nautilus* 85(3): 96-100, 1972.

00226

Mangum, C. P. Temperature sensitivity of metabolism in offshore and intertidal onuphid polychaetes. *Mar. Bio.* 17: 108-114, 1972.

00227

Maurer, L. G. and P. L. Parker. Distribution of dissolved organic-matter in near-shore waters of Texas Coast. *Contributions in Marine Science*, 16: 109-?, 1972.

00228

May, Edwin B. The effect of floodwater on oysters in Mobile Bay. *Proceedings of the National Shellfisheries Association*. Alabama Marine Resources Division, Dauphin Island, Ala. 62: 67-71, 1972.

Periodically, floodwaters entering Mobile Bay, Alabama in winter and spring can lower the salinity to such a degree that oyster populations are affected. Oysters and oyster drills are killed and oyster setting is inhibited. The effects of low salinity were studied in 1970 and 1971 by quantitatively sampling oyster reefs and examining gonadal development. Most oysters survived long periods of exposure to salinity below 3 percent but high mortality occurred on reefs where salinity was approximately 1 percent for about 7 weeks. Large errors were found in the box count method of estimating mortality.

00229

Overstreet, Robin M. and Harriet M. Perry. New microphallid trematode from blue crab in northern Gulf of Mexico. Transactions of the American Microscopic Society, 91(3): 436-440, 1972.

Overstreet, R. M. and H. M. Perry. A new microphallid trematode from the blue crab in the northern Gulf of Mexico. Trans. Amer. Micros. Soc., 91: 438-442 Levinseniella (Monarrhenos) capitanea n. sp. is described from metacercariae and the hepatopancreas and gonads of Callinectes sapidus Rathbun from Louisiana and Mississippi. It can be distinguished from all other members of the genus by possessing 11-21 atrial pockets and an acetabulum larger than the oral sucker, not possessing a pharynx nor well-developed ceca, and being 1.9-3.6 mm in length. Heardlevinseniella Yamaguti, 1971 is considered a synonym of Levinseniella Stiles and Hassal, 1901.

00230

Porg, C. W. Shelf-edge submarine banks in Gulf of Mexico - their paleoecology and biostratigraphy. American Association of Petroleum Geologists Bulletin, 56(1): 1902, 1972.

A series of submarine banks along the outer edge of the northern Gulf continental shelf are occupied by reefal foraminiferal assemblages. The majority of specimens at these localities are dead, but a sparse living community is present on the shallowest banks. The reefal assemblages contain many species that have not been reported previously from the Gulf of Mexico, but most are well known from shallow reefs in the Caribbean. Cores recovered from the tops of the banks reveal the paleoecologic and biostratigraphic record of sea level fluctuations during the late Quaternary. The mutual presence of large planktonic and benthonic faunules in the same core samples provides direct means for equating paleobathymetric and paleothermal changes that resulted from glacial-interglacial climatic events.

00231

Presley, R. F. Plankton, nekton, and nightlight collections, with pertinent data, Hourglass cruises, Gulf of Mexico (1965-1967). Fla. Dept. Resour. Mar. Res. Lab., Spec. Sci. Rep. No. 32. 16 p, 1972.

00232

Saunders, R. P. and G. A. Fryxell. Diatom distribution, p, 13-14. In: Chemistry, primary productivity and benthic algae of the Gulf of Mexico. Serial Atlas of the Marine Environment, Folio 22. Am. Geograph. Soc. 13-14, 1972.

00233

Shewbart, K. L., W. L. Nies and P. D. Ludwig. Identification and quantitative analysis of the amino acids present in protein of the brown shrimp Penaeus aztecus. *Marine Biology*, 16(1): 64-67, 1972.

In order to better formulate an artificial shrimp diet, the protein composition of shrimp was assessed and the essential amino acids determined. Penaeus aztecus were treated to remove lipids, carbohydrates and other interfering substances, and the protein was hydrolyzed to its constituent amino acids. The amino acids were then quantitatively analyzed by gas-liquid chromatography as trimethylsilyl derivatives. The essential amino acids were then determined. Shrimp were injected with ¹⁴C-labeled glucose and analyses performed to determine which amino acids then exhibited radioactivity, i.e., were synthesized from the labeled glucose. Those amino acids which were not manufactured from the glucose were categorized as "essential."

00234

Southward, E. C. Some pogonophora from Caribbean and Gulf of Mexico. *Bulletin of Marine Science*, 22(4): 739-776, 1972.

Collections of Pogonophora made by the research vessels OREGON II, OREGON, EXPLORER, and VEMA in the Caribbean and Gulf of Mexico contain 17 species, only 5 of which have been described before. Eight new species and 1 new genus are described in this paper; 4 others are probably new but the material is insufficient for full description. Most of the collections were made in the 500 to 650 m depth-zone of the southern Caribbean and the distribution of pogonophore species suggests the existence of zoogeographical regions associated with different current systems.

00235

Steidinger, K. A. Dinoflagellate distribution, p. 14-15, 23-25. In: *Chemistry, primary productivity and benthic algae of the Gulf of Mexico. Serial Atlas of the Marine Environment, Folio 22.* Am. Geograph. Soc., 14-15, 23-25, 1972.

00236

Sykes, J. E. Report of the National Marine Fisheries Service Biological Laboratory, St. Petersburg Beach, Fiscal Years 1970 and 1971. National Marine Fisheries Service, St. Petersburg Beach, Fla., 19 p, 1972.

The report provides information on the activities in the biological laboratories of the Gulf Coast States. The report of the laboratory Director (St. Petersburg Beach) deals with the biological effects of estuarine engineering. It is followed by a report on the biology and ecology of estuaries referring to Tampa Bay estuarine studies. Environmental studies in South Florida are described. The program of environmental description, monitoring, and management consists of 2 projects: The

Cooperative Gulf of Mexico Estuarine Inventory and Case histories; and review of Louisiana Coastal Studies.

00237

Tarver, Johnnie W. Occurrence, distribution and density of Rangia cuneata in Lakes Pontchartrain and Maurepas, Louisiana. Louisiana Wildlife and Fisheries Commission, Technical Bulletin No. 1, 6 p, June 1972.

Samples of Rangia cuneata populations were taken with a modified 18" oyster dredge throughout Lakes Pontchartrain and Maurepas to determine the occurrence, distribution, and density of clam populations. Depth, bottom type, salinity, temperature, and turbidity were recorded with each sample. A total of 187 samples yielded 37,963 Rangia clams. Rangia catches ranged from 0 to 1,517 clams per 3 minute tow, and specimen sizes ranged from 8 to 64 mm with a mean height of 30.9 mm. Though all the monthly stations reported that the mean height varied from month to month, the data indicate that Rangia populations were stable, having no major fluctuations in mean height during the study. The presence of low salinity, high turbidity, and a substrata of sand, mud and vegetation remnants during the sample period seems to have resulted in a high clam density and, consequently, a small clam size.

00238

Taylor, J. L., C. H. Saldman and K. W. Prest, Jr. Harvest and regrowth of turtle grass (Thalassia testudinum) in Tampa Bay, Florida. National Marine Fisheries Service, Gulf Coast Fisheries Center, 5 p, 1972. Included in Fishery Bulletin, V71 n 1, p, 145-148, January 1973.

A comparison of leaf growth and new leaf production in plots of cut and uncut turtle grass, Thalassia testudinum, indicated that plants suffered no damage when harvested twice during a 6 month growing season in Boca Ciega Bay (Tampa Bay), Fla. In deeper or warmer waters where the growing season is protracted, 3 or more cuttings per year may prove practical.

00239

Texas A & M. Rangia studies. in: Quarterly Report to U. S. Army Corps of Engineers for period ending July 1972. Proj. 739: 3 p, 1972.

00240

Thompson, Roger R., Baxter D. Honeycutt and Jack C. Parker. Cooperative environment projects, High Island Block 24L, Offshore, Texas. Fourth Annual Offshore Technology Conference, American Institute of Mining, Metallurgical, and Petroleum Engineers, Preprints, Volume 2: 543-548, 1972.

Atlantic Richfield's concern for environmental protection has led to participation in several interesting ecological experiments. Space, along with engineering and operational assistance, is currently provided on its offshore Texas platforms in the High Island Block 24-L Field for 3 experiments involving shrimp and oysters. These experiments are being conducted by Texas A & M University, Ralston Purina Company and the National Marine Fisheries Service from gas production platforms that have associated brine discharges and submerged gas flares. They involve reproduction and maturation studies with shrimp, the feasibility of trapping gravid (pregnant shrimp beneath the platforms and the feasibility of rearing oysters attached to strings suspended from the platforms. Success in these endeavors could provide a boom to commercial shrimp farming and a possible source of easily raised salt water oysters. Successful or not, they will help provide additional knowledge concerning the interaction of the offshore oil industry with its environment. This paper describes the experiments, their implications, and Atlantic Richfield's involvement.

00241

Topp, R. W. and F. H. Hoff, Jr. Flatfishes (Pleuronectiformes): Memoirs of the Hourglass cruises. Fla. Dept. Nat. Resour. Mar. Res. Lab, 4(2): 135 p, 1972.

00242

Tresslar, R. C. and C. W. Porg. Living foraminifera of West Flower Garden Bank. American Association of Petroleum Geologists Bulletin, 56(9): 1904, 1972.

00243

National Marine Fisheries Service. Report of the National Marine Fisheries Service, Gulf Coastal Fisheries Center, Fiscal Years 1970, 1971, 32 p, 1972.

The report covers discontinued as well as recently initiated studies at the National Marine Fisheries Service Gulf Coastal Fisheries Lab. In 1970, studies were carried out under 5 programs: shrimp culture, shrimp dynamics, estuarine ecology, estuarine studies, and Gulf oceanography. In 1971 studies were redirected and research was conducted on artificial propagation - shrimp and on the effects of biological, chemical, and physical environments with major emphasis on the former.

00244

Williams, E. H., Jr. Oodinium cyprinodontum Lawler (Dinoflagellida) on Fundulus similis. (Baird and Girard) and Cyprinodon variegatus lacepede from the Gulf of Mexico. Alabama Marine Resources Bulletin 8, Dept. of Fisheries and Allied Aquaculture Agricultural Experiment Station, Auburn University, Auburn, Alabama, p, 32-33, June, 1972.

Oodinium cyprinodontum Lawler (Dinoflagellida), is reported for the first time from the Gulf of Mexico. It was found on the sheepshead minnow, Cyprinodon variegatus Lacepede, and on the longnose killifish, Fundulus similis (Baird and Girard), the latter a new host record.

00245

Williams, E. H., Jr. Parasitic infestation of some marine fishes before and after confinement in feeding cages. Alabama Marine Resources Bulletin No. 8, Department of Fisheries and Allied Aquaculture, Agricultural Experimental Station, Auburn University, Auburn, Alabama, 25-31, June, 1972.

00246

Williams, J. and R. M. Ingle. Ecological notes on Gonyaulax monilata (Doniphycere) blooms along the west coast of Florida. Fla. Dept. Nat. Resour. Mar. Res. Lab., Leaflet Ser. 1(1,5): 12 p, 1972.

00247

Williams, Ernest H., Jr. Oodinium cyprinodontum Lawler (Dinoflagellida) on Fundulus similis (Baird and Girard) and Cyprinodon variegatus Lacepede from the Gulf of Mexico. Alabama Marine Resources Bulletin Number 8: 32-33, 1972.

Oodinium cyprinodontum Lawler (Dinoflagellida), is reported for the first time from the Gulf of Mexico. It was found on the sheepshead minnow, Cyprinodon variegatus Lacepede, and on the longnose killifish, Fundulus similis (Baird and Girard), the latter a new host record.

00248

Barber, Richard T. Organic ligands and phytoplankton growth in nutrient-rich seawater. In: Trace Metals and Metal Organic Interactions in Natural Waters, Philip C. Singer, ed., Ann Arbor Press, (in press), 1973.

00249

Camp, D. K. Stomatopod crustacea: Memoirs of the Hourglass cruises. Fla. Dept. Nat. Resour. Mar. Res. Lab. 3(2): 100 p, 1973.

00250

Cobb, S. P., C. R. Futch and D. K. Camp. The rock shrimp, Sicyonia brevirostris Stimpson, 1871 (Decapoda, Penaeidae): Memoirs of the Hourglass cruises. Fla. Dept. Nat. Resour. Mar. Res. Lab. 3(1): 33 p, 1973.

00251

Cooper, G. A. Brachiopods (Recent): Memoirs of the Hourglass cruises. Fla. Dept. Nat. Resour. Mar. Res. Lab., 3(3): 17 p, 1973.

00252

Cross, F. A., L. H. Hardy, N. Y. Jones and R. T. Barber. Relationship between total body weight and concentrations of Mn, Fe, Cu, Zn, and Hg, in white muscle of bluefish (Pomatomus saltatrix) and a bathyl-demersal fish (Antimora rostrata), (in press), 1973.

00253

Defenbaugh, Richard E. and Sewell H. Hopkins. The occurrence and distribution of the hydroids of the Galveston Bay, Texas area. Sea Grant Program and Department of Biology, Texas A & M University, College Station, Texas 77843. TAMU-SG-73-210, June 1973, 202 pp.

This report presents a key, verbal descriptions and figures of the 62 species of hydroids now reported from the coasts of Texas and Louisiana. Examination of approximately 210 collections of hydroids from the Galveston Bay, Texas, area resulted in the identification of 29 species representing 19 genera in 10 families. Of these species, 3 were described provisionally as new, 9 constituted new records for Texas waters, 1 was new for the Gulf of Mexico and 1 was new for the Atlantic coast.

00254

Dwinell, S. E. and C. R. Futch. Spanish and king mackerel larvae and juveniles in the northeastern Gulf of Mexico June through October 1969. Fla. Dept. Natur. Resour. Mar. Lab., Leaflet Ser. IV, No. 24: 14 p, 1973.

00255

Felder, D. L. A record of Pinnixa lunzi Glassell (Decapoda, Pinnotheridae) from off the coast of Texas, U. S. A. Crustacea, 24(1): 148-149, 1973.

00256

Freeman, T. E., F. W. Zettler and R. Charudattan. Biological control of water weeds with plant pathogens. University of Florida, Gainesville, Florida, 1973.

00257

Freeman, T. E. Survival of sclerotia of Rhizoctonia solani in lake water. Plant Disease Reporter (in press), 1973.

00258

Giam, et al. Chlorinated hydrocarbons and planktons. Bulletin of environmental contamination and toxicology, 19(6): 376-382, 1973.

00259

Hannah, R. P., A. T. Simmons, and G. A. Moshiri. Certain nutrient primary productivity relationships in Bayou estuary. Journ. Water Pollution Control Federation, 1973.

00260

Hill, H. R. and F. W. Zettler. A virus-like stunting disease of alligatorweed from Florida. Phytopathology, 63: (in press), 1973.

00261

Hill, G. W. and R. E. Hunter. Burrows of ghost crab Ocypode quadrata (Fabricius) on barrier islands, southcentral Texas coast. Journal of Sedimentary Petrology, 43(1): 24-30, 1973.

Burrows of the ghost crab Ocypode quadrata (Fabricius) are important biogenic sedimentary structures on Texas barrier islands. Variation in the shape, diameter, length, orientation, and areal density of the burrows can be used to define subenvironments of the beach and foredune ridge.

00262

Houde, E. D. Estimating abundance of sardine-like fishes from egg and larval surveys, Eastern Gulf of Mexico: preliminary report. Proc. Gulf and Carib. Fish. Instit. 25: 68-78, 1973.

00263

Houde, E. D. and P. L. Fore. Guide to identity of eggs and larvae of some Gulf of Mexico clupeid fishes. Fla. Dept. Natur. Resour., Mar. Lab., Leaflet Ser. IV, No. 23, 14 p, 1973.

00264

Joyner, B. G. and T. E. Freeman. Pathogenicity of Rhizoctonia solani to aquatic plants. Phytopathology: (in press), 1973.

00265

Laval, R. K. Observations on biology of Tadarida-brasiliensis Cynocephala in Southeastern Louisiana. American Midland Naturalist 89(1); 112, 1973.

00266

Lawrence, A. L. and M. Hightower. Contribution of D-glucose to respiration in postlarvae of the brown shrimp, Penaeus aztecus. Texas Academy of Science, March, Houston, Texas, 1973.

00267

Lawrence, A. L. and E. Chan. Effect of antibiotics on the respiration of the postlarvae of the brown shrimp, Penaeus aztecus. Texas Academy of Science, March, Houston, Texas, 1973.

00268

Lawrence, A. L. and P. Morgan. Absorption of amino acids by the mid-gut of the brown shrimp, Penaeus aztecus. Texas Academy of Science, March, Houston, Texas, 1973.

00269

Lawrence, A. L. Are bacteria nutritionally important to shrimp larvae and postlarvae? World Mariculture Society Meetings, January, Monterrey, Mexico, 1973.

00270

Lawrence, A. L. and G. J. Schulte. Are bacteria nutritionally important to postlarvae of the oyster, Crassostrea gigas? Texas Academy of Science, March, Houston, Texas, 1973.

00271

Lawrence, A. L. and B. Carr. Absorption of amino acids and monosaccharides by the digestive gland of the shrimp, Penaeus aztecus. Texas Academy of Science, March, Houston, Texas, 1973.

00272

Lindall, William N., Jr., John R. Hall, and Carl H. Saloman. Fishes, macroinvertebrates and hydrological conditions of upland canals in Tampa Bay, Florida. Fishery Bulletin, 7(1): 155-163, January 1973.

Faced with statutory restraints that prohibit dredging and filling of estuarine bottoms, coastal developers have turned to alternate methods of providing water front property for homesites. One method recently used in Tampa Bay, Florida, is the construction of access canals that lead from open water to upland acreage. This paper presents biological and hydrological data from new upland canals together with some comparative data from older upland canals and bayfill canals.

00273

May, E. B. Extensive oxygen depletion in Mobile Bay, Alabama. *Limnology and oceanography*, 18(3): 353-366, 1973.

Extensive areas of bottom water in Mobile Bay, Alabama, one of the largest estuaries on the Gulf of Mexico, suffer oxygen depletion in summer because of salinity stratification in sinks created by shoals in the lower bay and by spoil from construction of the Mobile Ship Channel. When these water masses low in dissolved oxygen are occasionally forced against the beach demersal fishes and crustaceans migrate shoreward in a depressed or moribund state. In the absence of technical data these popular occurrences called "jubilees" provide over a century of historical evidence of oxygen depletion. Oxygen depletion and jubilees occurred in the bay before man physically modified the basin but the conditions responsible for oxygen depletion are worse than in the past. Because of bathymetric changes and modifications which have restricted water circulation, Mobile Bay has exceeded its capacity to assimilate its oxygen demand in summer, which has severely affected the biota of the estuary.

00274

McKinneryney, Beryl and Donald L. Clark. Marine occupations in the Texas Coastal Zone. Sea Grant Program and College of Education, Texas A & M University, College Station, Texas 77843. TAMU-SG-73-606, July 1973, 72 pp.

Prepared as a guide for high school counselors, teachers, curriculum developers, students and career education specialists, this report describes occupations relating to harbor maintenance, marine recreation and tourism, the Merchant Marine industry, shipbuilding and repair, research and development and the seafood industries.

00275

Metziger, E. L. The bongo net plankton sampler: factors affecting extrusion and avoidance of fish eggs and larvae collected off western Florida. Master's Thesis, Univ. Miami, 63 p, 1973.

00276

Moshiri, G. A. and P. J. Conklin. Certain aspects of spatial and temporal periodicities in Phytoplankton populations in a bayou estuary. (Abstract) *Quarterly Journ. Florida Academy Science*, 36(1); 13, 1973.

00277

Naqvi, S. M. Z. Toxicity of 23 insecticides to a tubificid worm Branchiura-sowerbyi from Mississippi Delta. *Journal of Economic Entomology*, 66(1): 70-74, 1973.

Tubificid worms, Branchiura sowerbyi Beddard, from the Mississippi delta region were bioassayed in 23 commercial insecticides (chlorinated hydrocarbons, organophosphates, and carbamates). Maximum concentrations of 15 insecticides (0.5 to 4.0 ppm at 21 degrees C) failed to cause mortality in 72 hours exposure, but they produced reversible morphological changes of the worms. Variations in morphological changes occurred in response to an insecticide type rather than to concentration, and they may possibly be used for monitoring purposes. Insecticide toxicity was influenced also by temperature changes.

00278

Rintz, R. E. Location, identification and characterization of pathogens of the water hyacinth. Ph. D. Dissertation, University of Florida, Gainesville, 1973.

00279

Rintz, R. E. Zonal leaf sport of waterhyacinths. Hyacinth Contr. J., 11: (in press), 1973.

00280

Schmidly, D. J., M. H. Bebeau and H. Hildebrand. First record of Cuvier's dolphin from Gulf of Mexico with comments on taxonomic status of *Stenella frontalis*. Journal of Mammalogy, 53(3): 625-628, 1973.

00281

Shewbart, K. L., W. L. Meis and P. D. Ludwig. Nutritional requirements of brown shrimp *Penaeus aztecus*. Sea Grant Program, Texas A & M University, and Ag-Organics Department, Dow Chemical U.S.A., Lake Jackson, Texas. TAMU-SG-73-205, April 1973, 53 pp.

Basic research was conducted in important areas of shrimp nutrition in order to formulate an artificial shrimp diet that would maximize growth. Essential aminoacids, fat content, mineral content and carbohydrates of shrimp were determined. Growth trials were performed, varying the percentages of protein, energy and minerals.

00282

Sidner, Bruce Robert and C. Wylie Porg. Foraminiferal evidence of late Quaternary sea level fluctuations from the West Flower Garden Bank. Sea Grant Program and Department of Oceanography, Texas A & M University, College Station, Texas 77843. TAMU-SG-73-213. December, 1973, 124 pp.

Foraminiferal assemblages were analyzed in 8 piston cores and 22 surface samples from the West Flower Garden Bank in the northwest Gulf of Mexico in an attempt to determine accurately late Quaternary paleoclimatic and geologic events. The faunas are divided into environmental facies based on the planktonic and benthonic foraminifers.

00283

Stadelbacher, E. A. and T. R. Pfrimmer. Bollworms Lepidoptera-noctuidae and tobacco budworms Lepidoptera-noctuidae mating of adults at 3 locations in Mississippi delta. *Journal of Economic Entomology*, 66(2): 356-357, 1973.

When adult bollworms, Heliothis zea (Boddie), and tobacco budworms, H. virescens (F.) were collected over a 2 year period in insect traps equipped with blacklight lamps at 3 locations (north, central, and south) in the Mississippi delta a high percentage of the bollworm catch at each location was males.

00284

Steidinger, K. A. Phytoplankton ecology: a conceptual review based on eastern Gulf of Mexico research. *CRC Crit. Rev. Microbiol.* 3(1): 49-68, 1973.

00285

Taylor, Dan D. and Thomas J. Bright. The distribution of heavy metals in reef-dwelling groupers in the Gulf of Mexico and Bahama Islands. Sea Grant Program and Department of Oceanography, Texas A & M University, College Station, Texas 77843- cTAMU-SG-73-208, May 1973, 249 pp.

Grouper species of the Epinephelus complex (Family Serranidae) from reefs or reef banks in the Gulf of Mexico and Caribbean Sea were analyzed for heavy metals (Hg, As, Co, Pb, Cu, Mn). Correlation between concentrations of heavy metals and growth factors (age, weight, standard length) indicated differences between members of the same species as well as interspecific differences. A hypothesis is proposed whereby low phosphate reef waters result in accumulation of arsenic by reef organisms, implying a natural mechanism rather than a pollution problem.

00286

Taylor, John L., Carl H. Saloman and Kenneth W. Prest, Jr. Harvest and regrowth of turtle grass (Thalassia testudinum). In: Tampa Bay, Florida. *Fishery Bulletin*, 71(1): 145-148, January 1973.

A comparison of leaf growth and new leaf production in plots of cut and uncut turtle grass, Thalassia testudinum, indicated that plants suffered no damage when harvested twice during a 6 month growing season in Boca Ciega Bay (Tampa Bay), Florida. In deeper or warmer waters where the growing season is protracted, three or more cuttings per year may prove practical.

00287

The University of Texas at Austin. A summary report, bay and estuarine system management in the Texas coastal zone. Office of the Governor, Division of Planning and Coordination, Coastal Resources Management Program. Interagency Council on Natural Resources and the Environment, State of Texas, 100 p, 1973.

00288

Wissing, T. E., R. M. Darnell, M. A. Ibahim and L. Berner, Jr. Caloric values of marine animals from the Gulf of Mexico. *Contrib. Mar. Sci.* 17: 1-7, 1973.

00289

Wright, H. O. Effect of commensal hydroids on hermit crab competition in littoral zone of Texas. *Nature*, 241 (5385): 139-140, 1973.

00290

Florida Department of Natural Resources. Project Hourglass: A systematic ecological study of west Florida Shelf biotic communities. Marine Research Laboratories.

This publication is a bibliography of studies conducted to date as part of Project Hourglass, a 28 month (August 1965-November 1967) systematic sampling program for benthic and planktonic flora and fauna collected along 2 east-west transects on the west Florida shelf. Five stations, in depths of 6, 18, 37, 55 and 73 m, were sampled along each transect. The transects were located off Tampa Bay and Sanibel Island, Florida, approximately 160 km apart. Additional phytoplankton stations were established at locations between the transects. Physical data (surface and bottom temperatures, salinities, etc.) taken with each biological sample have been reported by Joyce and Williams (1969). *Memoirs of the Hourglass cruises: rationale and pertinent data.* Florida Department of Natural Resources Mar. Res. Lab. Vol. 1, Pt. 1, 50 p.). The ultimate goal of the Hourglass program is to make available basic biological information on the flora and fauna within the study area.

00291

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U. S. Department of Interior. Mermentau River Basin, Louisiana. Report of U. S. Bureau of Sport Fisheries and Wildlife, Regional Office, Atlanta, Georgia.

This report describes various ecological factors responsible for favorable waterfowl conditions in the Mermentau River marshes, La. Particular reference is made to the effects of salinity changes. The necessity for such changes is described and recommendations made to sustain natural conditions. The importance of a periodic infiltration of salt water was recognized and confirmed by recent observations following drought and salt water invasion.

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The physical characteristics of Alabama estuarine areas are presented as part of a cooperative Gulf of Mexico estuarine inventory. The importance of estuaries as nursery areas for marine species and for other uses is discussed and the early history of the exploration and development of the Gulf of Mexico and the coastal area of Alabama is reviewed.

Maps are presented to show the Alabama estuarine study area and the surface sediment types, pollution sources, oyster beds, isotherms, isohalines and certain economic characteristics of the area. Data on climate, tides, open water surface area and average depth, tidal marsh, stream discharge, domestic and industrial wastes, navigation channels, commercial fisheries, and other characteristics of the study area are presented in tables.

Alabama estuaries are located in Mobile and Baldwin Counties which are underlain by the Citronelle formation that has estuarine deposits of Miocene Age. The climate is strongly influenced by the Gulf of Mexico. Rainfall at Mobile averages about 62 inches annually and temperature 68 F annually. The mean diurnal tide range is about 0.5 to 1.8 feet in the study area. Mobile Bay, the predominant estuarine system, has a surface area of 264,470 acres and a drainage basin of over 44,000 square miles.

The Alabama estuarine study area has 397,353 acres of open water, a volume of 3,833,489 acre-feet at mean high water, 34,614 acres of tidal marsh, 433 natural oyster reefs, approximately 924 acres of leased oyster bottoms and 1,050 acres of riparian bottoms used to grow oysters. In July 1970, there were 23 sources of municipal wastes and 31 sources of industrial waste that discharged a minimum total of 827.3 million gallons of effluents daily into the estuaries and nearby contributory streams. The effluents had a total estimated population equivalent of 634,190. There were 73,584 acres of estuarine water permanently closed to the harvest of shellfish, 143 miles of navigation channels, and 2,152 acres of emergent spoil banks and other filled areas in the estuaries in 1970. Total human population of Mobile and Baldwin counties in 1960 was 366,400. It is expected to increase to 629,000 by the year 1995.

The Port of Mobile is served by a 40-foot deep ship channel. The principal imports are iron ore, aluminum ore, petroleum products, grain and manganese ore. The gross wholesale value of Alabama's processed fishery products during 1969 was \$17,616,400. During the same year, 67 fishery wholesale and processing firms employed 1,470 employees for a total of 1,014 man-years.

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Gaidry, W. J., III and B. Denie. Riches from the sea. Louisiana Conservationist, vol. 23, No. 7 and 8, p. 5-9, July-August, 1971.

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Gorsline, D. S. Abstract volume National Coastal and shallow water Research Conference (2nd) held at Baton Rouge, Louisiana. Newark, Delaware, Los Angeles, California. October, 1971. University of Southern California, Dept. of Geological Sciences, 332 p, 1971.

The report contains abstracts of papers given at the conference concerning research along the coastal zone and shallow water margins of the continent.

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Hsu, Shih-Ang. Measurement of shear stress and roughness length on a beach. Louisiana State University, Coastal Studies Institute, 8 p, 1971. Journal of Geophysical Research, 76(12): 2880-2885, 1971.

Measurements of surface shearing stress and aerodynamic roughness length on a beach were made by simultaneous temperature and wind-profile methods in the following three areas of the beach slope on the Gulf of Mexico coast near Fort Walton Beach, Florida: the swash zone, the mid-foreshore, and the area near the berm scarp. Under adiabatic and onshore wind conditions, it was found from the roughness ratios that the swash zone is approximately 100 times smoother than the mid-foreshore and 500 times smoother than the area near the berm scarp; the stress ratios revealed that the shear stress is approximately 2.5 and 3.5 times larger at 10 m and 20 m fetch downwind, respectively, from the swash zone. It is concluded that the stress ratios measured from the transition from smooth to rough on the beach are in fair agreement with those predicted by Panofsky and Townsend.

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Perret, W. S., B. B. Barrett, W. R. Latapie, J. F. Pollard, W. R. Mock, B. G. Adkins, W. J. Gaidry, and C. J. White, Cooperative Gulf of Mexico Estuarine Inventory and Study, Louisiana. Wildlife and Fisheries Commission, New Orleans, Louisiana, 175 p, 1971.

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Perret, William S., et. al. Area description. Phase I. Cooperative Gulf of Mexico Estuarine Inventory and Study, Louisiana. La. Wildlife and Fisheries Comm. p. 5-37, 1971.

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Russell, R. J. Beaches and ground water at Cape Sable, Florida during extreme drought. Louisiana State University, Coastal Studies Institute, 27 p, 1971.

In October 1969 beaches and water tables were investigated after 5 months of adequate rainfall in Cape Sable Complex. In April 1971 a similar study was made after 5 months of extreme drought in the Florida Everglades, when water tables were lowered and flattened enough to permit widespread saltwater intrusion. Much of the beach rock and cemented water-table rock under the beaches had been eroded by high-energy waves, probably of Hurricane Laurie (1969)

or various local storms. Slabs of the eroded beach rock were tossed into the deposits. No evidence of subsequent cementation was observed. On East and Northwest capes the ground water had been replaced by stagnant seawater. On Middle Cape the water table was lowered, but a salinity gradient and some potable ground water were present in 1971. The Cape Sable region is isolated from mainland surface runoff by extensive areas of lakes and waterways with seawater salinities, and from subsurface flow of ground water by a thick section of compact marl and compressed peat. Accumulation of ground water depends on local rainfall, and its volume varies with size and permeability of catchment areas. The conclusions of this study are applicable to many other coastal areas and may be useful in assessing their population and survival potentialities.

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Wright, L. D. and J. M. Coleman. Effluent expansion and interfacial mixing in the presence of a salt wedge, Mississippi river delta. Louisiana State University, Coastal Studies Institute. Journal of Geophysical Research, 76(36): 8649-8661, 1971.

Ground observations and remote-sensing imagery indicate that efflux from the mouth of South Pass, Mississippi River, expands as a laterally homogeneous layer above the underlying salt water. Flow deceleration and effluent deconcentration are primarily the result of vertical rather than lateral mixing. Field and imagery data correspond closely to theoretical expansion rates predicted as functions of the lateral hydrostatic pressure gradient created by the density contrasts between the river water and sea water.

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Bault, Edward I. Hydrology of Alabama estuarine areas - cooperative Gulf of Mexico estuarine inventory. Alabama Marine Resources Bull., 7:1-25, 1972.

Twenty-one hydrological stations in five Alabama estuarine areas were sampled monthly from January, 1968 through March, 1969. Nitrite-nitrogen, nitrate-nitrogen, orthophosphate-phosphorus, total phosphorus, pH, dissolved oxygen, temperature, turbidity and salinity were determined for each station. Bimonthly isohalines and isotherms and graphical representations of micronutrients and chemophysical parameters are presented. All data are presented in tables or graphs and comparisons are made among the estuarine areas.

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Doyle, W. H., Jr. Sediment transport in a Mississippi River distributary-Bayou Lafourche, Louisiana. United States Geological Survey Water supply Paper 2008, 48 p, 1972.

The installation of a pumping plant at Donaldsonville, La. in 1955 to solve a watery-supply problem for the residents along Bayou Lafourches created a sedimentation problem in the bayou. Prior to 1904, when the bayou functioned as a distributary, floodflows periodically scoured the sediment deposited in the channel at lower stages. Nearly constant flows maintained by the pumping plant result in limited transport capacity to move the sediment imposed on the channel. A gamma probe was used to determine that 311,000 tons has been deposited in the upper part of the bayou since the pumping plant went into operation. The reach used in this study was a 12.5 mile section of Bayou Lafourche beginning at Donaldsonville, La., and extending to Plattenville, La. A prediction equation was derived to determine the rate of sediment accumulation. A second prediction equation was derived to determine the amount of sediment accumulation between 1955 and 1966 at each cross section in the study reach. The correlation coefficients for the equations were 0.82 and 0.95, respectively.

A comparison of former channel cross sections with the present cross sections enabled the determination of the characteristics of a stable cross section.

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Ellis, E. K. Jensen and L. Faselar. Proceedings: National Sea Grant Conference (5th) held in Houston, Texas. Texas Agricultural and Mechanical University Department of Marine Resources Information 225 p, 1972.

Six papers deal with national marine programs. Eleven papers deal with deepwater terminals and their environmental effects. Seven papers present the special concerns of industry and five papers under the heading of "building a network," deal with the national marine advisory service.

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Gunter, Gordon. Use of dead reef shell and its relation to estuarine conservation. Trans. 37 N. Amer. Wildl. Natur. Resour. Conf., 1972.

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Johnson, Corwin. Legal assurance of adequate flows of fresh water into Texas bays and estuaries to maintain proper salinity levels. The Texas Law Institute of Coastal and Marine Resources. The Houston Law Review, 10(3), 1972.

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May, Edwin B. The effect of floodwater on oysters in Mobile Bay. Proc. Nat. Shellfisheries Ass. 62: 67-71, 1972.

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Prather, S. H. and R. M. Sorensen. A field investigation of Rollover Fish Pass, Bolivar peninsula, Texas. Texas Agricultural and Mechanical University, Coastal and Ocean Engineering Division, 126 p, 1972.

A field study of Rollover Fish Pass, an artificial tidal inlet connecting Galveston East Bay, Texas, with the Gulf of Mexico, was conducted. The objectives of this study were, (1) to evaluate the flow and stability characteristics of the inlet, (2) to investigate the propagation of the tidal wave through the connected bay system, and (3) to evaluate the effect of the inlet on tidal fluctuations and flushing of East Bay. Field work included hydrographic surveys of the inlet and adjacent Gulf beaches, collection and analysis of sediment samples from the inlet and beaches, measurement of tidal fluctuations at selected locations in East Bay, and current measurements in the inlet. Tidal data from the Gulf, provided by the Galveston District, Corps of Engineers, were analyzed along with the field data.

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Texas A & M University. Texas and the Gulf of Mexico: A general guide to marine science in the Texas Gulf Coast region, second edition. Department of Marine Resources Information, Center for Marine Resources, Texas A & M University, September, 1972.

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Texas Law Institute of the Center for Marine Resources, College of Law, University of Houston. Regulation of activities affecting bays and estuaries a preliminary legal study. A report prepared for the Coastal Resources Management Program. Office of the Governor by the Texas Law Institute of Coastal and Marine Resources, College of Law, University of Houston, 1972.

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Marine environmental studies of Florida's Gulf Coast: Summary and selected bibliography. State of Florida, Department of Natural Resources, coastal coordinating council, May, 1973.

00085

May, Edwin B. Environmental effects of hydraulic dredging in estuaries. Alabama Marine Resources Bulletin 9, 80 p, April 1973.

Hydraulic channel and shell dredging and open water disposal have little significant immediate effect on water quality in Alabama estuaries. Almost all of the sediment discharged by dredges settles very rapidly and is transported by gravity along the bottom as a separate flocculated density layer and potentially harmful components of the mud are not dissolved into the water. There is a limited, temporary reduction in benthic organisms in areas affected by dredging. Spoil piles from channel dredges can indirectly affect the ecology and usefulness of estuaries by interfering with water circulation and altering salinity. The basic hydrological concepts which determine the effects of dredging should be applicable in other areas. Extensive regulations apparently are not necessary to protect water quality in open water dredging situations but spoil disposal practices from channel dredges must be reconsidered and appropriate new disposal plans developed.

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Swanson, R. L. and C. I. Thurlow. Recent subsidence rates along Texas and Louisiana coasts as determined from tide measurements. *Journal of Geophysical Research*, 78(15): 2665-?, 1973.

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 St. Bernard 00001
 St. Mary's 00045
 Vermillion 00045

Rivers, Creeks, or Bayous

Buras-Scofield 00016

Mississippi

Coastal 00050

Islands

Horn 00151

Sounds

Mississippi 00059

Texas 00091

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Bay of Campeche 00118 00140

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MARINE GEOLOGY GEOGRAPHICAL INDEX

Counties

Calhoun 00134

Orange 00103

Islands

Padre 00107 00109

St. Joseph 00064

Miscellaneous

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Guadalupe Delta 00134

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Coleman, J. M. Ecological changes in a massive fresh-water clay sequence. Louisiana State University, Coastal Studies Institute, 16 p, 1962. Pub.: Gulf Coast Association of Geological Societies V. 16 p. 159-174, 1966.

Cored borings of recent swamp deposits that accumulated in the Atchafalaya basin presented a difficult problem in deciphering ecological changes. Faunal content was either absent or badly leached; grade size parameters remained nearly constant from top to bottom and the 100 foot cored section consisted of 'massive appearing' assemblage of primary, secondary, and post-depositional sedimentary structures, as well as epigenetic and syngenetic inclusions. Five environmentally controlled facies were recognized in the borings: poorly drained (stagnant) swamp, well drained swamp, fresh water lacustrine, lacustrine delta-fill, and channel-fill. Overlying a cross-bedded sand gravel substratum (braided channel-fill deposits) is a ten foot layer of swamp clays. Large carbonite and iron concretions, finely disseminated iron cement, and replacement of organic fragments by iron oxides all attest to high oxidizing conditions.

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Coleman, J. M. and S. M. Gagliano. Sedimentary structures: Mississippi River Deltaic Plain. Louisiana State University, Coastal Stud. Inst., Contri. No. 65(8): 1-148, 1965.

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Kolb, D. R. and J. R. Van Lopik. Depositional environments of Mississippi River deltaic plain. S. E. Louisiana (abs.). American Assoc. of Petroleum Geol., 49(10): 1755, 1965.

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Smith, L. A. Paleoenvironmental variation curves and paleoestuaries. G.C.A.G.S. Trans., 15: 47-60, 1965.

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Coleman, J. M. Recent coastal sedimentation: Central Louisiana coast. Louisiana State University, Coastal Studies Institute, 84 p, 1966.

The recent near-surface sediments of Vermilion, Iberia and St. Mary Parishes, Louisiana, may be divided into two types: Those sediments which were deposited by now abandoned Mississippi River distributaries and those carried along shore and deposited at the delta margins. Changes in delta position during the past 7000 years have resulted in an accumulation of cyclic deposits consisting of detrital sediments separated by in situ peat horizons. The physical faunal, and floral properties obtained from a study of present-day surface sedimentary environments (natural levee, nearshore marine, mudflat, oyster reef, beach, marsh, brackish bay, lacustrine and swamp) were used to interpret subsurface relationships and establish a stratigraphic section. Five laterally continuous peat horizons, now buried at depths ranging from 4 to 40 feet, were identified and indicate that a positive change of level had taken place since their formation. Abundant evidence for a stillstand in sea level during the past 200 to 5000 years affords a fixed datum for differentiation between eustatic sea level rise and subsidence. The rate of subsidence in the study area is 0.24 foot per century. Using this rate, calculations reveal a eustatic sea level rise of approximately 23 feet in the interval from 7000 to 3650 years B. P. when stillstand was reached. There is no indication that sea level was higher than at present during the interval studied. Similar results were obtained by applying this method to published data on sea level changes in the Netherlands, Massachusetts and Connecticut.

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Davies, D. K. Sedimentary structures and subfacies of a Mississippi River point bar. Jour Geol., 74(2): 234-239, 1966.

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Sonu, C. J., J. M. McCloy and D. S. McArthur. Longshore currents and near-shore topographies. Tech. Rept. No. 51, Coastal Studies Institute, Louisiana State University, 1966.

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The report is part of a series of compilations which is regional in scope. It consists of climatological and air-sea interface data in tabular form for specified water areas adjoining Jacksonville, Miami, and Key West.

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Upshaw, Charles F., Creath B. Wilgus, and Frank L. Brooks. Sediments and microfauna off the coasts of Mississippi and adjacent states. Mississippi Geol. Economics and Topographical Surv. Bull. 106:127, 1966.

00051

Van Lopik, J. R. A remote sensing survey of areas in central coastal Louisiana. Part I-Discussion. Texas Instruments, Inc. Science Service Division, 101 p, 1966.

A remote sensing survey of selected areas in central coastal Louisiana was conducted for the Office of Naval Research. Program objectives were to evaluate and compare the required conventional and nonconventional aerial photography and 8 to 14 micron infrared imagery as to their utility in detecting and delineating landforms, land/water contracts, vegetation types and surface expressions of subsurface structure and features in a deltaic region. The survey areas are characterized by large expanses of marsh and swamp of recent age dissected or bordered by relict streams flanked with firm, tillable levees; tidal bayous; man-made canals; and

beaches and marsh-stranded beaches (i.e., cheniers). Pleistocene exposures, in the form of coastal terraces and upthrust salt-dome islands, also are present. Night coverage of the survey areas with an RS-7 infrared (IR) mapping system was obtained in addition to simultaneous IR and photographic coverage during daytime periods. Photographic films used in this program were: aerial panchromatic (standard black and white)/W12 filter: (standard color)/HF 3 and 4 filters; and ektachrome infrared aero (camouflage detection)/W 12.

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Beall, A. O., Jr. Sedimentary processes operative along the western Louisiana shoreline. *Jour. Sed. Petrology*, 38(3): 869-877, 1967.

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Morfan, J. P. Ephemeral estuaries of the deltaic environment. Louisiana State University. Coastal Studies Institute, 7 p, 1967. Pub: *Estuaries* American Association for the Advancement of Science, p. 115-120, 1967.

The usual definition of the term estuary is not sufficiently inclusive. Most textbook descriptions apply to coastal indentations like the Scandinavian fjords or drowned river mouths like the Chesapeake or Delaware Bays. In addition to these rather obvious illustrations, there are other transitional coastal conditions, including the deltaic environment described here, to which the term estuary is not usually applied. As the word is derived from the Latin *aestus* referring to 'tides', an estuary will be considered here as any coastal embayment periodically affected by brackish oceanic waters. Because deltaic regions comprise the most dynamic of coastal areas, estuaries associated with this environment are short-lived and are characterized by rapid change.

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Morgan, J. P. Ephemeral estuaries of the deltaic environment. Tech. Rept. No. 46, Coastal Studies Institute, Louisiana State University, 1967.

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Walker, H. J., B. G. Thom, S. M. Gagliano, and R. D. Adams. Coastal Studies bulletin number 1. Louisiana State University, Coastal Studies Institute, 50 p, 1967.

Contents include: riverbank dunes in the Colville Delta; humate and coastal geomorphology; bed-load particle transport velocities, Deweyville Terrace, Gulf and Atlantic coasts, program for hydrometer analysis.

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Copeland, C. W. Geology of the Alabama Coastal Plain. Assoc. Amer. State Geologists. Guidebook, 60 Ann. Meeting, 97 p, 1968.

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Folk, Robert L. Petrology of sedimentary rocks. Geol. Pub. of University of Texas, 1968.

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Ho, C. and J. M. Coleman. Consolidation and cementation of recent sediments in the Atchafalaya Basin. Louisiana State University, Coastal Studies Institute, 11 p, 1968. Pub. Geological Society of America Bulletin, 80(2): 183-191, 1969.

Studying the chemical characteristics of Holocene sedimentary accumulations and some of the diagenetic products formed after deposition provides some clues to the history of shale beds and contributes to the understanding of the effects of overburden on compaction, dewatering, and increase in compressive strength with depth of burial. X-ray radiography was utilized extensively in examining core slabs from a fresh-water clay sequence in the Atchafalaya River Basin. From the radiographs, detailed diagenetic features such as cementation by secondary precipitated minerals, pyrite and carbonate replacement of organic fragments, and progressive formation of nodules were revealed. Selected samples were analyzed for various chemical and mineralogical constituents by means of differential thermal analysis, x-ray diffraction, x-ray fluorescence, atomic absorption spectrophotometry, Kjeldahl method for total nitrogen and wet combustion for organic carbon. The results indicated the presence of various cementing agents. The diagenetic mineral accumulations consisted of CaCO_3 , FeCO_3 , and Mg and Mn compounds of unknown nature and have contributed significantly to the observed strength increase with depth. The dewatering process, commonly attributed solely to compaction resulting from overburden, may also be brought about by a gradual replacement of the pore-water space by secondary mineral accumulation. Numerous processes are responsible for the initial mineral accumulations and chemical reactions, especially of soluble organic compounds.

00059

Kwan, H. J. Barrier islands of the northern Gulf of Mexico coast: Sediment source and development. Louisiana State University, Coastal Studies Institute, 61 p, 1969.

The evolution of barrier islands along the northern Gulf of Mexico coast is directly related to source of sediments and littoral formation in 1919, and this theory prevailed for several decades. Johnston's theory resulted from consideration of only two dimensions normal to the coastline; a third, longshore drift, was not regarded as critical for the initiation of barrier

island development. In this study, which is confined to the northern Gulf Coast, major sources of sediment supply and transportation patterns of barrier forming sand were examined, along with results of recent oceanographic investigations in the Gulf of Mexico. This study is based on a comprehensive survey of the literature, maps, and marine charts, which were correlated with field observations. To obtain a perspective, only gross forms and processes of barrier development were considered. Evidence indicates that Santa Rosa Island, Mississippi Sound, and Bolivar Peninsula barriers developed downdrift of sediment-supplying coasts of Quaternary age. These barriers evolved with the recent rise of sea level to its present stand. Apalachicola barriers formed on the flanks of the Pleistocene deltaic plain. Coasts such as the stretch between Destin and Panama City, Florida, and the zero-energy coast of Florida do not have barrier islands. In these cases, the modern shoreline is abutted against Pleistocene deposits which are the local source of sediments.

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Lankford, R. R. and John W. Rogers. Holocene geology of the Galveston Bay Area. Houston Geol. Soc., Houston, Texas: 141 p, 1969.

00061

McArthur, D. S. Sand movement in relation to beach topography. Louisiana State University, Coastal Studies Institute, 34 p, 1969.

Tracer experiments were conducted on the Gulf Coast beach of Hurricane Island, Florida, to obtain information on sediment transfer between foreshore, trough, and bar topography. Concurrent measurements of waves and currents were collected. Alongshore transport of tracer released in the three topographic zones was greater than normal-to-shore movement, even when the angle between wave crests and the shoreline was small. Seaward movement of tracer placed in the trough and bar zones took place during alongshore transport only when waves broke on the bar, and was most marked when wave steepness had a value near 0.04. During these conditions tracer released in the trough moved onto and along the bar crest. At other times landward displacement of bar and trough tracer accompanied alongshore transport. Tracer placed on the bar moved into the trough only when a subaqueous shoal replaced the trough immediately seaward from the foreshore. Rhythmic topography appears, therefore, to provide an important mechanism for onshore-offshore movement of sediment within a beach system. Transport of tracer from the trough and bar onto the foreshore was negligible over all experiments.

00062

McIntire, W. G. and C. Ho. Development of barrier island lagoons. Western Gulf of Mexico. Louisiana State University, Coastal Studies Institute, 13 p, 1969.

Chemical and mineralogical studies of water and sediment samples, and radio-carbon dates from peats associated with lagoonal deposits along the Gulf of Mexico and western Australia coasts reveal the evolution of barrier lagoons. X-Ray diffraction of clays showed high montmorillonite percentages from lagoons in humid areas in contrast to increasing illite and kaolinite toward arid areas. The nitrogen content also decreased with aridity. X-ray radiographs of undisturbed cores revealed details of the sedimentary history and diagenesis of sediments during post deposition.

00063

Murray, S. P., H. H. Roberts, J. M. Coleman, S. M. Gagliano and D. J. Quелlette. Current meters in use at the Coastal Studies Institute. Recently cemented aggregates (grapestones) Grand Cayman Island, B.W.I. Mississippi River subdeltas: natural models of deltaic sedimentation. Sediment and water characteristics South Pass, Mississippi River. Louisiana State University, Coastal Studies Institute, 53 p, 1969.

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Andrews, Peter B. Facies and genesis of a hurricane-washover fan, St. Joseph Island, Central Texas Coast. University of Texas Bureau of Economic Geology, Report of Investigations Number 67, 147 p, 1970.

00065

Antoine, J. W. and T. E. Pyle. Crustal studies in the Gulf of Mexico. Tectonophysics, 10: 477-494, 1970.

The eastern margins of the Gulf of Mexico are areas of carbonate buildup. They are represented by the south Florida and Yucatan platforms which are similar in respect to topography, sediment type, seismic velocities, depth to equivalent age horizons, and bordering buried reefs. The existence of the Lower Cretaceous reefs is of particular importance as they have been the major factor in controlling the sedimentary history during the Mesozoic and Cenozoic in the eastern Gulf of Mexico. The areal extent of the Lower Cretaceous reef is best known on the Florida Platform but its existence on the edge of the Yucatan Platform suggests the possibility of a Lower Cretaceous reef complex that nearly encircles the Gulf. In this case these buried offshore reefs would be part of a system including the Golden Lane (Faja de Oro) of eastern Mexico and the well known oil producing Lower Cretaceous reef trends of Texas and Louisiana. Reef material recovered from topographic highs in the Straits of Florida suggests that the bordering reefs of the west Florida Platform continue to northern Cuba.

These similarities between the Yucatan and Florida platforms allude to a geographical connection between these areas in the geologic past. If this is true, the mode of separation of the platforms suggested by seismic reflection data is erosion (controlled mainly by the Gulf Stream) and faulting.

The western margins of the Gulf of Mexico are characterized by thick deposits of terrigenous clastics. The main structural element is in the north; the Gulf Coast geosyncline. Structure within the geosyncline is very complex structural mobility being caused by the presence of extensive buried Triassic-Jurassic salt. Similar conditions exist in the southwestern Gulf (Bay of Campeche) where salt structures dominate the topography. Although there is no conclusive proof, there is much evidence that indicates the north-south trending ridges of the western Gulf of Mexico are also related to buried Mesozoic salt. If these folds off eastern Mexico prove to be salt anticlines at depth, the post-Paleozoic development of the western margins of the Gulf of Mexico becomes clear; 1) during Mesozoic, salt was deposited on the western margins of the Gulf of Mexico; 2) the salt was covered by pelagic and continental derived sediments; 3) the salt was folded into a series of linear ridges parallel with the seaward extent of the salt; and 4) as sedimentation over the anticlines continued, the salt became more mobile, more complex structures developed and diapirism became the dominant mechanism. Both phases three (3) and four (4) are evident in the western Gulf. The linear features on the central portion of the eastern Mexican slope are examples of the relatively undeformed salt anticlines and the structures of the Bay of Campeche represent an intermediate stage where the ridge outlines can still be detected but secondary growth features are prevalent. The continental slope off Texas and Louisiana represents the final stage of development, i.e., there is no preferred alignment of structures and diapirism predominates.

The crustal structure of the central basin is quasi-oceanic. Earthquake seismology studies and gravity measurements both indicate that the oceanic type crust extends some distance inland on the northern margin of the gulf coastal plain. The northern extent of the oceanic crust and the great thickness of unconsolidated sediments present across the central basin suggest a long history of filling. This is consistent with a hypothesis which considers the Gulf of Mexico as an old ocean basin which is being flooded by sediments. The effect of the filling has been to decrease the water depth in the basin and to increase the depth to the Mohorovicic discontinuity. In terms of the new global tectonics, this concept of the Gulf representing a remnant of an old ocean with the characteristics mentioned above, it appears that the Gulf of Mexico moved passively with the North American continent.

00066

Atwood, D. K. and J. N. Bubb. Distribution of dolomite in a tidal flat environment, Sugarloaf Key, Florida. *Journal of Geology*, 78 (4): 499-505, 1970.

A study of modern tidal flats on Sugarloaf Key, Florida, has been made to determine distribution of penecontemporaneous dolomite, the presence of which was previously reported by Shinn. Dolomite occurs in a crust at or near the surface of recent tidal flat sediments and in lesser amounts in unconsolidated sediments. The greatest concentration of dolomite is near the shoreline and within topographic lows on the flats, that is, areas where sediments are most frequently wet by tides. The dolomite concentration decreases toward

interior and higher portions of the flats; essentially no dolomite was found in adjacent bays. Interstitial waters expressed from recent sediments on the flats were analyzed at different times in the year and found to be near sea water in salinity and chemistry. This combination of dolomite distribution and interstitial water data suggests that dolomitization is occurring with waters near sea water in composition.

00067

Bate, Lyle Frederick. Post-Cretaceous structures and sediment of the northeastern Campeche Platform, Gulf of Mexico. Ph. D. Dissertation, Texas Agricultural and Mechanical University, 1970.

The northeastern Campeche Platform comprises one of the most important areas of the Gulf of Mexico-Caribbean Sea region in terms of geologic history. This large carbonate platform has been thought to be a rather stable feature in the foreland of the Northern Central American Orogen.

Geophysical and geological studies have revealed that in addition to the abrupt period of subsidence noted by several other authors, northeastern Campeche platform has been faulted, tilted and become the locus of large depositional features during post-Cretaceous time.

Investigations in the western Caribbean Sea suggest that a structural link between Cuba and the Yucatan Peninsula may exist and might date back to middle Paleozoic time.

Sedimentary studies on the slope of the platform verify the work of Molinari (1968), indicating that the Yucatan Current has profound effects on sediment dispersal in this region.

00068

Ballard, J. Alan and Robert H. Feden. Diapiric structures on the Campeche Shelf and Slope, Western Gulf of Mexico. Geological Society of America Bulletin, 81(2): 505-512, 1970.

00069

Bouma, A. H. An investigation of changes induced in macrostructures in pelitic sediments during primary consolidation. Report of the Department of Oceanography, Texas Agricultural and Mechanical University, Ref. 70-8-T, 1970.

00070

Darrell, James H., II, and George F. Hart. Environmental determinations using absolute miospore frequency, Mississippi River Delta. Geological Society of America Bulletin, 81(8): 2513-2518, 1970.

Samples of modern sediments were collected from the main depositional environments of the Mississippi River delta according to a predetermined sampling pattern designed to determine if: A) differences could be detected among environments and B) which environments showed differences. The data were analyzed using a nested analysis of variance test and orthogonal comparisons. Significant differences do exist but are not large enough to be clearly definitive of a particular environment.

00071

Davies, D. K. and W. R. Moore. Dispersal of Mississippi sediment in the Gulf of Mexico. *Journal of Sedimentary Petrologists*, 40: 339-353, 1970.

Pleistocene and Recent Mississippi sediments possess a distinctive heavy mineral assemblage which retains its identity between Cairo, Illinois and the Gulf of Mexico Abyssal Plain. Thus this assemblage may be used to trace the Mississippi contribution to the Gulf of Mexico from fluvial, through deltaic, neritic and bathyal, to abyssal environments. Significant changes in the heavy mineral assemblage of sediments in the Gulf are related to source changes and not to the reworking or selective sorting of Mississippi sediments. As a result, three distinct sediment input sources may be recognized for detrital sediments in the Gulf of Mexico Abyssal Plain, 1) the Mississippi, 2) the Rio Grande, and 3) the rivers of northeast Mexico. The Mississippi contribution is dominant and is only replaced by other inputs in the northwest and southwest corners of the abyssal plain. On the Louisiana-Texas Inner Continental Shelf, Mississippi sediment forms a veneer which extends between 10,000 and 7,000 B.P. The interaction of a high zircon content and intense selective sorting in the Inner Continental Shelf sediments has resulted in two areas of zircon enrichment which may be of economic significance.

Because of the insensitivity of the heavy mineral assemblage of the Mississippi contribution to processes of selective sorting and reworking, only 200 non-opaque grains from one size fraction of one sample are needed to characterize this contribution.

00072

Davies, D. K. Distribution and basinward transportation of Pleistocene sands and silts in the Gulf of Mexico. *Geological Society of America, South Central Section, Fourth Annual Meeting, Abstracts*,: 278-279, 1970.

00073

Emery, K. O. Continental margins of the world. in: *The geology of the East Atlantic Continental Margin, 1. General and Economic Papers*, ICSU/SCOR, Working Party 31 Symposium, Cambridge, Report 70/13: 7-29, 1970.

00074

Fisher, W. L. Gulf Coast Basin Tertiary delta systems. in: Delta systems in the exploration for oil and gas - a research colloquium, Austin, Texas, 1969. Syllabus (Number 1) University of Texas at Austin Bureau of Economic Geology, : 30-39, 1970.

The two basic kinds of delta systems, important in the thick terrigenous fill of the Gulf Coast Basin, are high-constructive (fluvial and fluvially influenced facies) and high-destructive (marine facies). Further delineation of these types is based on specific facies make-up, facies geometry, vertical sequence and pattern, lateral facies distribution, and net sand patterns. Ancient high-constructive delta systems occur in the Lower Wilcox, the Yegua and Jackson of Texas, the Woodbine of northeastern Texas, and the Cotton Valley in the northern part of the Basin. The Mississippi delta is a Holocene analog. Examples are described. Ancient high-destructive delta systems occur in the Upper Wilcox and Frio of Texas and in the Vicksburg of the Texas upper Gulf Coast; all are wave-dominated rather than tide-dominated. Examples are described.

00075

Frank, D. J., W. Sackett, R. Hall and A. Fredericks. Methane, ethane, and propane concentrations in Gulf of Mexico. American Association of Petroleum Geologists Bulletin, 54(10): 1933-1938, 1970.

The concentrations of the low-molecular-weight hydrocarbons in the Gulf of Mexico were measured. The ranges of methane, ethane, and propane were found to be $(6--125) \times 10^{-3}$, $(1.6--37.3) \times 10^{-6}$, and $(1.2--38.6) \times 10^{-6}$ ml/liter seawater, respectively, for depths ranging from zero to 3,742 m. For a given water column, these values were found to be in the same range as, but more variable than, those previously reported. These results suggest that one method of offshore petroleum-seep detection is to survey and map the concentrations of hydrocarbons in near-bottom waters.

00076

Hales, A. L., C. E. Helsley, J. B. Nation. Crustal structure study on Gulf Coast of Texas. Texas University, Dallas, Geosciences Division, 20 p, 1970.

A seismic refraction experiment to determine crustal structure of the northern margin of the Gulf of Mexico was made along long. 94 degrees W during the fall of 1966. The quality of the records was generally good, although for some shots no signals were recorded because of anomalously high attenuation in the vicinity of the shot point. This study shows the crust beneath Texas to be approximately 49 km thick, that beneath the shelf to be about 33 km, and that beneath the subshelf to be about 27 km. The low-velocity part of the sediments (1.9-3.3 km/sec) is approximately 10 km thick on the shelf, and thins on the north and probably also on the south. Inasmuch as the crust beneath the shelf is much thinner than that beneath land, we suggest that the sediments of the Gulf Coast were not deposited on a normal continental crust and that most of them may have been deposited in water of moderate depth.

00077

Hoyt, John H. Development and migration of barrier islands, northern Gulf of Mexico; discussion. Geological Society of America Bulletin, 81(12): 3779-3782, 1970.

00078

Huang, T. C. and H. G. Goodell. Sediments and sedimentary processes of eastern Mississippi Cone, Gulf of Mexico. American Association of Petroleum Geologists Bulletin, 54(11): 2070-2100, 1970.

The upper 6-7 m of sediment of the eastern Mississippi cone consists of a repetitious vertical succession of gray silt and silty clay intercalated with a few layers of fine sand and topped by a 20-50 cm layer of yellowish-brown foraminiferal clay. Disequilibrium age determinations indicate that the lower silty layers, representing the deposits of latest low sea-level stand, were deposited more rapidly than the upper foraminiferal clay. These sedimentation rates which depend primarily on the rate of the detrital influx and sea-level change, average about 30 cm/1,000 years.

Sedimentary processes on the deep-sea fan are interpreted from sedimentary structures, textures, and compositions, as well as from bathymetry, bottom photographs, and continuous seismic profiles. The more than 20 varieties of minor sedimentary structures recognized from x-ray radiographs are grouped into 5 varieties that correlate closely with sediment type. None of the structures is typical of vertical "turbidity sequences". On the contrary, the evidence suggests that the primary mechanisms of sediment transport are differential pelagic settling and low-flow-regime bottom currents, with mass movements by sliding or slumping common in channel and slope areas. Statistical evaluation of the occurrence and distribution of minor structures indicates that 1) most of the structures associated with coarser materials are analogous to structures formed by traction transport or by ripple migration in shallow water, and 2) the distribution of both bottom current intensity and internal waves that create small scale ripples is local. Photographs of the present bottom support this conclusion. The importance of diagenetic solution of carbonate, mostly planktonic foraminifers and pteropods, as verified by laboratory experimentation, is related to the degradation of organic matter in the sediments. The most active solution occurs near the boundary between the upper foraminiferal clay and the lower silty layers and is partly responsible for 1) the abrupt decrease of carbonate downward in the cores, 2) the rearrangement of clay particles into secondary thin laminae, and 3) the shortening of the distance between noncarbonate silt and sand layers or laminae. These results, combined with compaction, accentuate the uniformity of layering.

The upper cone is indented by digitate leveed valleys and canyons cut by transverse ridges, whereas the lower section is characteristically smooth. The bathymetry of the cone reflects its underlying structure. Continuous seismic profiles show that the lower cone is composed of relatively uniform flat-lying beds, representing at least 5 major depositional cycles since Plio-Miocene time and as many as 14 since late Cretaceous time. In

contrast, the upper cone has many internal irregularities, probably caused by gravity sliding, folding, and slumping contemporaneous with deposition, and by diapiric salt intrusion. The cone's depocenter has shifted continuously basinward as the Mississippi delta has prograded gulfward since Late Cretaceous time.

00079

Martinez, Joseph D. Technology of Gulf Coast salt. in: Geology and technology of Gulf Coast salt. Symposium, Baton Rouge, Louisiana, 1967, proceedings. Louisiana State University, School of Geoscience Baton Rouge, Louisiana, p, 149-159, 1970.

Salt occurs in 3 forms in the Gulf Coast in sufficient abundance and availability to be of technological importance: salt domes and anticlines, sea water, and subsurface brines. Currently applied technology consists of dry salt mining, solution mining, liquified petroleum gas storage in domes, and desalination. Future technology may involve other uses for man-made solution caverns in salt domes. Current and future hydrologic developments in the realm of subsurface saline waters include: control of salt waters intrusion, utilization of highly saline waters, and storage of fresh water in saline water aquifers. Hydrocarbon production and sulfur mining are activities closely allied to salt technology. Solution mining of salt is of special importance and particular attention should be given to techniques employed, new uses for evacuated caverns, and prevention of structural failure.

00080

Otvos, Ervin G., Jr. Development and migration of barrier islands, northern Gulf of Mexico: reply, Geological Society of America Bulletin, 81(12): 3783-3788, 1970.

00081

Russell, R. J. Florida beaches and cemented watertable rocks. Louisiana State University, Coastal Studies Institute, 63 p, 1970.

In October 1969 Florida beaches between Cedar Key and Dry Tortugas, on the coast of the Gulf of Mexico, and beaches along the Atlantic Ocean as far north as Anastasia Island (St. Augustine), were investigated in a reconnaissance study of composition and indications of cementation associated with their water tables. Water-table rock on Grassy Key (east of Marathon) and beach rock on Loggerhead Key (Dry Tortugas) and on Cape Sable were given closer attention. In all cases cementation was restricted to the zone of water-table fluctuation.

00082

Walker, Jack R. and H. Robert Ensminger. Effect of diapirism on sedimentation in Gulf of Mexico. American Association of Petroleum Geologists Bulletin, 54(11): 2058-2069, 1970.

In 1969 the USNS Elisha Kane completed an extensive geophysical investigation of the Gulf of Mexico. One of the principal measurement systems used was the medium-frequency (3,500 Hz), high-resolution seismic profiler. The seismic profiles obtained with this system provide information about the effects on recent sediments of deposition, water-energy levels, and diapirism. The various stages of sediment deformation and disruption associated with active diapirism and of faulting resulting from salt dome emplacement are observable. It is concluded that the medium-frequency seismic system is a useful tool to aid the study of concurrent deposition during active diapirism and the subsequent environmental effects at the sea floor.

00083

White, William A. The geomorphology of the Florida peninsula. Bureau of Geology, Florida Department of Natural Resources, Bulletin 1, 164 p, 1970.

00084

Appelbaum, B. S. Geological investigation of a portion of upper continental slope; northern Alaminas Canyon region. Thesis, Texas Agricultural and Mechanical University, 1971.

00085

Barrett, B. B. Johnie W. Tarver, Walter R. Latapie, Judd F. Pollard, Woodrow R. Mock, Gerald B. Adkins, Wilson J. Gaidry, Charles J. White, James S. Mathis. Cooperative Gulf of Mexico estuarine inventory and study, Louisiana. Phase II, Hydrology and Phase III, Sedimentology. Louisiana Wild Life and Fisheries Commission, Division of Oysters, Water Bottoms, and Seafoods: 191 p, 1971.

00086

Barrett, B. B., J. W. Tarver, W. R. Latapie, J. F. Pollard and W. R. Mock. Cooperative Gulf of Mexico estuarine inventory and study, Phase III, Sedimentology. Louisiana Wildlife and Fisheries Commission, 79 p, 1971.

The report presents sedimentological data obtained in coastal Louisiana during the GMEI project. There were 1536 sediment samples taken from the water bottoms between March 1968 and June 1970. The upper 3 inches of the sample were used to determine grain size distribution. Data are given on kurtosis, skewness, standard deviation, median and mean; and on percentage composition of granules, sand, silt and clay. Major differences in sediment occurred at the interface of the Gulf of Mexico and the estuaries where energy levels were high, as well as near the mouths of major streams. In general, the sediment particles graded from coarse near the Gulf of Mexico and the barrier islands to fine in the upper estuaries.

00087

Bergantino, Robert N. Submarine regional geomorphology of the Gulf of Mexico. Geological Society of American Bulletin, 82(3): 741-752, 1971.

Recent work in the Gulf of Mexico has provided sufficient new data to update regional geomorphic classification. The Gulf region is divided into 3 major geomorphic divisions and 16 provinces. Some of the provinces are further subdivided into sections and subsections. Most sections of the continental shelf contain Pleistocene wave-cut terraces, the lowest generally near a depth of 65 fm. The continental slope is considered a major geomorphic division, rather than a province, because of its variety of landforms and areal differences in geomorphic history. The steepness of the continental slope ranges from 2 degrees to greater than 45 degrees. Diapirs underlie all non-carbonate slopes and have largely altered the pre-existing topography. Great thickness of evenly bedded sediments underlie the Gulf floor. The deeper sediments derived from the northwest pre-date the salt tectonism that produced Sigsbee Escarpment and the numerous diapirs.

00088

Bergantino, Robert N. Submarine regional geomorphology of the Gulf of Mexico. Geological Society of America Bulletin, 82(3): 741-752, 1971.

Recent surveys and investigations in the Gulf of Mexico have provided sufficient new data to warrant an updated regional geomorphic classification. The Gulf region is divided, according to the methods used by geomorphologists for continental areas, into 3 major geomorphic divisions and 16 provinces. Some of the provinces are further subdivided into sections and subsections.

Most sections of the continental shelf contain Pleistocene wave-cut terraces. The lowest terraces generally lie near a depth of 65 fm. The continental slope is considered here to be a major geomorphic division, rather than a province, because of its variety of landforms and areal differences in geomorphic history. The steepness of the continental slope ranges from 2 degrees on the DeSoto Slope to greater than 45 degrees over limited areas of the reef-formed West Florida and Campeche Escarpments. Diapirs underlie all non-carbonate slopes and have largely altered the preexisting topography.

Great thicknesses of evenly bedded sediments underlie the Gulf floor. The deeper sediments were derived from the northwest and pre-date the salt tectonism that produced the Sigsbee Escarpment and the numerous diapirs.

00089

Bryant, William R. and Andre P. Del Flache. Geotechnical charts of the deep water portion of the Gulf of Mexico. Third Annual Offshore Technology Conference, American Institute of Mining, Metallurgical, and Petroleum Engineers, Preprints, Volume 2: 493-502, 1971.

The design of adequate foundations for offshore installations requires the determination of the bearing capacity of the sea floor.

In addition to factors such as function, shape and site of the proposed installation and its foundation, the bearing capacity depends upon the engineering properties characteristic of the mechanical behavior of sediments under load.

The most important engineering properties of marine sediments are the shear strength and compressibility in addition to water content and grain size.

This study presents a series of charts showing the values of shear strength and water content of marine sediments of the deeper portions of the Gulf of Mexico. Average values of these properties are given for the depth below the sediment water interface at 1 ft., 8 ft., 15 ft. and 25 ft. The consolidation characteristics of typical sediment samples of the Gulf are given in the form of the compression index.

00090

Conatser, W. E. Grand Isle: a barrier island in the Gulf of Mexico. Geological Society of America Bulletin, 82(11): 3049-3068, 1971.

Grand Isle is a barrier island composed entirely of sediments, most of which are terrigenous. Surface sediments of the island are primarily fine to very fine-grained sand, some silt and with some clay. The sand fraction is basically quartz but contains 18.7 percent feldspar. Size characteristics of the sediments parallel geomorphic features such as the beach, dune, back-island ridges, and inter-ridge areas. Silt and clay fractions of the sediment generally increase behind the dune complex of the island. This finer fraction is interpreted as being secondarily introduced from the bay-sound environment by influxes of high water and by aeolian transport.

00091

Davies, David K., Frank G. Ethridge and Robert R. Berg. Recognition of barrier environments. American Association of Petroleum Geologists Bulletin, 55(4): 550-565, 1971.

The vertical succession of sedimentary structures and textures in the Holocene Galveston Barrier Island, Texas, is the same in a Lower Cretaceous barrier complex in Montana, and in a lower Jurassic barrier in England. A general model of barrier sedimentation was developed from these similarities. Plots of environmentally sensitive textural and compositional parameters, established by analyses of quartz size and content, demonstrate that different environments can be distinguished by thin section study. Full diameter cores may not be necessary in some cases, as reliable environmental interpretations may be made from thin sections of sidewall cores in barrier sandstones.

00092

Dodd, J. Robert and Charles T. Siemers. Effect of late Pleistocene karst topography on Holocene sedimentation and biota, lower Florida Keys. Geological Society of America Bulletin, 82(1): 211-217, 1971.

Detailed mapping of bedrock topography on Bahia Honda and Big Pine Keys has revealed a buried karst topography not previously documented in the lower Florida Keys. This topography, developed during lowered sea level of the Pleistocene, strongly controls Holocene sediment thickness and present biotic distribution. Circular to oval sinkholes, which are up to 75 m or more in diameter and over 4 m deep, are usually completely filled with peat and carbonate sediment. Sinkholes are well developed on both the Miami Limestone (oolitic facies) and the Key Largo Limestone (both late Pleistocene in age). Thick sediment in buried sinkholes in more than a few inches of water favors the growth of thick patches of turtle grass (Thalassia testudinum). Shallower water and supratidally located sinkholes (that is, those partly or wholly surrounded by subaerially exposed bedrock) are generally marked by thick growths of either red or black mangroves (Rhizophora mangle and Avicennia nitida). These distinct, nearly circular vegetation patterns are extremely abundant in the study area, as shown by aerial photographs which suggest that Bahia Honda and Big Pine Keys are "riddled" with sinkholes.

00093

Edward, G. Serpell. Geology of the West Flower Garden Bank. Texas Agricultural and Mechanical University, Sea Grant Program. Report TAMU-SG-71-215, 199 p, 1971.

00094

Ewing, J. I., N. T. Edgar and J. W. Antoine. Structure of the Gulf of Mexico and Caribbean Sea. The Sea, 4: 37 p, 1971.

00095

Hanor, J. S. and M. F. Marshall. Mixing of sediment by organisms. Trace Fossils, B. F. Perkins, ed.), School of Geoscience, Louisiana State University, Miscellaneous Publication 71-1: 127-135, 1971.

00096

Henry, Vernon J., Jr. Origin of capes and shoals along the southeastern coast of the United States: Reply. Geological Society of America Bulletin, 82(12): 3541-3542, 1971.

00097

Hopkins, Edgar M. Origin of capes and shoals along the southeastern coast of the United States: discussion. Geological Society of America Bulletin, 82(12): 3537-3540, 1971.

The hypothesis of a relict, deltaic origin for the shoal-cape systems of North and South Carolina has far-reaching implications regarding the unique nature of certain Holocene and Pleistocene coastal features, for it emphasizes the importance of deposition related to rapid sea-level fluctuations. This writer agrees with the general conclusions of the late J. H. Hoyt and V. J. Henry, Jr. (1971), but offers exceptions and comments.

00098

Louisiana Wild Life and Fisheries Commission. Cooperative Gulf of Mexico estuarine inventory and study, Louisiana. Louisiana Wild Life and Fisheries Commission, New Orleans, Louisiana, 3-191, 1971.

Phase II, Hydrology. Phase III, sedimentology.

Louisiana's estuaries from Sabine Lake to the Pearl River were sampled at 109 stations during 1968 and 1969. Salinity and water temperature were measured at all stations; dissolved oxygen, turbidity, and the nutrients nitrate, nitrite, inorganic phosphate, and total phosphorus were sampled at 82 stations. Tide, barometric pressure, rainfall and wind speed and directions were measured at 1 station. Coastwide data on air temperature, precipitation, and stages and discharges of the principal rivers were also collected.

Salinities were highest during the fall and lowest during peak river discharge while water temperatures were seasonal, closely following air temperatures. Dissolved oxygen concentrations were highest during periods of low water temperature and salinity. Turbidities generally fluctuated directly with river discharge and wind speed. The seasonal distributions of nutrients were generally irregular; However, nitrate values were highest at stations near the mouths of the Atchafalaya and Mississippi rivers during periods of peak discharge.

In general, Louisiana's estuaries and near offshore waters are low in salinity and high in nutrient concentrations as compared with other states bordering the northern Gulf of Mexico. These characteristics are due primarily to Louisiana's high rainfall and the large volume of river water which makes its way through rich alluvial soils to the Gulf of Mexico. The major contributors of nutrients to the estuaries are the Mississippi and Atchafalaya rivers. These rivers are also responsible for major salt water dilutions within the coastal area and in the near offshore waters.

There were 1,536 sediment samples taken from the water bottoms of coastal Louisiana between March 1968 and June 1970. The upper 3 inches of the sample was used to determine grain size distribution. The kurtosis, skewness, standard deviation, median, and mean were calculated for all samples.

Sediments across coastal Louisiana proved to be very similar. Major differences occurred at the interface of the Gulf of Mexico and the estuaries where energy levels were high, as well as near the mouths of major streams. Generally, the sediment particles graded from coarse near the Gulf of Mexico and barrier islands to fine in the upper estuaries.

Size fractions in order of decreasing abundance were silt, clay, sand and granules. Of the silt fraction, coarse silt, 4 to 5 phi, was the most abundant. The percentage of clays smaller in size than 10 phi were much higher than clay percentages larger than 10 phi. The most abundant sand fraction was 3 to 4 phi, which is very fine sand. This sand size was predominantly quartz. Granules were predominantly shell fragments.

Sediments in the larger water areas with wide openings to the Gulf of Mexico were generally coarse-grained and relatively well sorted, had positive skewness values, and were leptokurtic. Sediments in the small, semienclosed water areas surrounded by marsh were usually fine-grained and poorly sorted, had negative skewness values, and were platykurtic.

00099

Mason, C. and R. M. Sorensen. Properties and stability of a Texas barrier beach inlet. Texas A & M University, Sea Grant Publication No. TAMU-SG-71-217, 1965 p, August 1971.

00100

Pequegnat, Willis E., William R. Bryant and John E. Harris. Carboniferous sediments from Sigsbee Knolls, Gulf of Mexico. American Association of Petroleum Geologists Bulletin, 55(1): 116-123, 1971.

A violet siltstone determined by K-AR methods to be Carboniferous (318x10⁻⁶ years old) was dredged from one of the Sigsbee Knolls in the southwest Gulf of Mexico. This is by far the oldest material ever recovered from the deep Gulf or any other oceanic basin.

Analyses by atomic absorption spectrometry, x-ray diffraction and electron microscopy reveal that the siltstone is composed primarily of quartz with lesser amounts of kaolinite, talc, and hematite. Glauconite, anatase, and rutile are present in trace amounts. The delicate lath work of the glauconite crystals indicates that this material was formed in place and is not detrital.

In view of the geologic structure of the Sigsbee Knolls, it is probably that the siltstone was transported from the point of its formation to the knoll's surface by processes related to salt flow.

00101

Pierce, J. W., D. D. Nelson, and D. J. Colquhoun. Pyrophyllite and talc in waters off the southeastern United States. *Mar. Geol.* 11: 9-15, 1971.

00102

Pitt, William A., Jr. Sediment loads in canals 18, 23, and 24 in Southeast Florida. United States Geological Survey Open-file report, 1971.

00103

Rees, A. I. The magnetic anisotropy of samples from the Deep Sea Drilling Project Leg I, Orange, Texas to Hoboken, N. J. *Marine Geology* 11(2): M16-M23, 1971.

Magnetic fabric measurements have been made on 53 specimens from 4 drill holes. Ten specimens, of deep sea clay, seem to have had no significant magnetic fabric. Of the remainder, 19 have been deformed, probably during drilling, and 24 have retained in situ fabric.

The results from hole 1 support the view that the chevron folding took place before the sediments became compacted and is probably due to small scale lateral movements of near surface material.

00104

Scafe, D. W. and G. W. Kunze. A clay mineral investigation of 6 cores from the Gulf of Mexico. *Geology*, 10: 69-85, 1971.

Samples were studied from each color change along 6 gravity cores from near-shore to deep-sea areas in the Gulf of Mexico. Analytical methods and techniques used to characterize the sediments were x-ray diffraction, differential thermal analysis, cation exchange capacity, particle size distribution and fractionation of the clay-size material with the supercentrifuge.

Fractionation of clay-size material expedites clay mineral identification and semi-quantitative estimates of abundance. A 5-g, clay-size sample passed 5 times through a supercentrifuge should remove the fraction when the proposed sample preparation method is employed. Duplicate fractionations usually agree within 3 percent and fractionation efficiency is unaffected by the mineral suite. The clay minerals and semi-quantitative estimates of their abundance suggest that the sum of source conditions has remained constant during and since Pleistocene time represented by the cores in this study. Montmorillonite and kaolinite are not more abundant in warm water than in cold water sediments and illite and chlorite are not more abundant in cold water than in warm water sediments from the Gulf of Mexico. Sand-size material is usually a small weight percent of a sample. Silt and clay-size materials are approximately equal except for the cores farthest from the Mississippi Delta where clay-size material dominates. In the clay-size fraction, montmorillonite is generally more abundant than illite, while kaolinite comprises less than 20 percent and chlorite less than 7 percent. Relative contents of quartz may be obtained by using differential thermal analysis. Quartz of similar particle size as occurs in the sample is used to obtain the standard curve. Possible worm fecal pellets are present in the sand-size fraction of the 2 cores farthest from shore. The effects of differential settling of clay minerals have not been recognized.

00105

Stapor, F. W. Sediment budgets on a compartmented low-to-moderate energy coast in northwest Florida. *Marine Geology*, 10(2): M1-M7, 1971.

Sediment budgets for portions of the Franklin and Gulf County, Florida, coasts have been determined through comparison of old (1860's - 1940's) U. S. Hydrographic Office smooth sheets. Rate of erosion and deposition and, significantly, minimum distances of transport were computed. This coast is divided into at least 6 individual compartments (or longshore drift cells) which most probably experience minimal communication; in each instance erosion and deposition are nearly balanced. This compartmentalization is effected by the low-to-moderate wave energy and the offshore bathymetry of the region.

00106

Veber, V. V., D. Ye, Gershanovich, M. L. Sazonov and S. N. Morozova. The formations of gaseous hydrocarbons in modern shelf sediments of the tropical Atlantic. *Geologiya Hefti l Gaza*, (6): 49-53, 1971.

Samples of bottom sediments from the Brazil-Guiana shelf area and the southern part of the Gulf of Mexico were studied and subjected to laboratory experiments. The results show that it is possible to generate gaseous hydrocarbons of heavy methane in modern marine sediments, both clay and sand, in both clastic and carbonate deposits. Up to a state of vacuum, hydrocarbons occur in connection with certain rock conditions and are separated out only after a sharp decrease in pressure. The escape of gas and formation of fissures in sediments contribute to decreased downward compression in strata, which in turn leads to an elevation of the strata.

00107

Watson, Richard L. Origin of shell beaches, Padre Island, Texas. *Journal of Sedimentary Petrology*, 41(4): 1105-1111, 1971.

Central Padre Island, Texas is the site of a convergence of littoral drift which causes shell and sand from the entire coast to accumulate in the convergence area. Shell material is then concentrated on the beach by Aeolian deflation of finer grained terrigenous sand which blows inland to contribute to the extensive infilling of Laguna Madre by wind-tidal flats, and perhaps ultimately to contribute to the Aeolian sand plain of the mainland.

Ancient shell beaches of the Pleistocene (?) Ingleside Complex of the mainland shore of Laguna Madre bear great similarity to the modern shell beaches of Padre Island suggesting that the general coastal configuration and wind patterns were similar to modern patterns at the time of their formation.

It must be concluded that some large carbonate accumulations can occur solely as the result of a sorting process in an area of great terrigenous sediment supply.

00108

Weaver, Charles E. and Ralph G. Stevenson, Jr. Clay minerals in the Cretaceous of Florida. *Geological Society of America Bulletin*, 81(12): 3457-3460, 1971.

The clay minerals in the Cretaceous carbonate rocks of southern Florida, 7,000 to 10,000 ft thick, should be of value in interpreting the tectonic history of the Caribbean region. The Upper Cretaceous is characterized by montmorillonite and the Lower Cretaceous by illite. The lowermost Cretaceous rocks contain a well-crystallized 2M (2 layer monoclinic) illite; the illite becomes progressively less well crystallized upward. The rocks at the base of the Upper Cretaceous contain an abundance of kaolinite, which is presumably related to an unconformity between the Upper and Lower Cretaceous. Kaolinite is locally abundant in the Collier well and appears to be related to structural highs. Chlorite, brucite, and attapulgite are also present and locally abundant. The clay mineral distribution is largely related to changes in the source area and should provide information for interpreting the tectonic history of the Caribbean.

00109

Zupan, Alan-Jan Wellward. Surficial sediments and sedimentary structures: Middle Ground, Padre Island, Texas. *Texas Agricultural and Mechanical University Oceanography Abstracts of Technical Reports*, Reference 71-12-T: 21-22, 1971.

The Middle Ground, located in the Coastal Bend of Texas, is a modern wind-tidal flat. Analyses of its sediments reveal that the Middle Ground was a shallow lagoonal environment about 1,700 years ago. As sediments accumulated, the environment gradually changed to a very shallow-water grass flat and next to an algal flat covered by only a few centimeters of water.

The normal depositional sequence should have been a slow transition from the subaqueous algal flat to a subaerial wind-tidal flat. However, there is an abrupt appearance of a pure sand wedge overlying the algal flat. The sand wedge thins from 30 cm nearest Padre Island to 10 cm thick nearest the hole. This sand deposit represents a dune field which migrated across Padre Island and encroached upon the algal flat. The present shape of the surface of the Middle Ground is partially an expression of this sand wedge. On top of the sand wedge appears an alternating sequence of tan sands and dark algal-laminated clays--the wind-tidal flat facies. The sand indicates that influxes of sand still occur. The dune field spanning Padre Island at the northern end of the Middle Ground was most likely the source of these sands.

Compositional and textural analyses of the sediments indicate that the main source of sediments--the Gulf of Mexico--has remained constant throughout the sample sequence. Differences in sediment texture within the sequence are a reflection of changing depositional environments.

Presently the Middle Ground is an extensive algal mat surface with a very slow rate of sedimentation. Deposition of sediments is limited to seasons of wind tides when the algal mat is growing and can entrap sediment particles carried onto the Middle Ground by wind tides. During the hot, dry summer and fall, the Middle ground acts mainly as a bridge for wind-blown sediments which continue to fill Laguna Madre.

In the ancient record, a wind-tidal flat would be characterized by alternating laminations of dark shale and detrital material. The shales would show a very disturbed nature. In the case of the Middle Ground, the detrital material would be tan, moniminerallic (quartz) sandstones.

Underlying and partially surrounding the wind-tidal sediments would be lagoonal or bay facies. An offshore barrier or mainland would border one side of the wind-tidal flat. The facies overlying the wind-tidal flat could be dune, grass flat or possibly lagoon again.

00110

Bouma, A. H. Rhythms in deep sediments from Gulf of Mexico and Caribbean American Association of Petroleum Geologists Bulletin, 56(3): 605, 1972.

Rhythmic patterns observed in unconsolidated marine deposits in cores, collected from the western abyssal plain of the Gulf of Mexico and from the Beta Straits in the Caribbean, are based on sedimentary structures rather than on lithology.

From the present knowledge of contourites, nepheolites, pelagites, and turbidites, it is believed that the silty soil intercalations from the Gulf cores, as well as the sandy intercalations from the Caribbean cores, can be interpreted best as incomplete turbidite sequences. This interpretation is based primarily on the incomplete sedimentary facies model as developed for ancient turbidities. The thin clay seams commonly found in recent deposits, as well as some other features not known in ancient turbidities, normally become invisibly thin from the effect of consolidation.

00111

Bouma, A. H. Recent and ancient turbidities and contourites. American Association of Petroleum Geologists Bulletin, 56(9): 1896, 1972.

Fossil turbidities have been recognized and described from many areas all over the world. A turbidite mode, comprised of a fixed succession of sedimentary structures, was established a decade ago and seems to be usable, although some changes have been suggested.

Turbidites are generally assumed to be deposited by turbidity currents, but the presence of these currents in the marine realm has not been definitely established. Submarine canyons presumably are the major, if not only, important transport route for moving "shallow" water material to "deeper" basins. Questions arise about the origin of turbidity currents when studying canyons in which gradual filling followed by sudden emptying has occurred. The material in the canyon head moves downward slowly, comparable to glaciers. Besides this slow sliding traction currents and debris flow have been suggested. Where turbidity currents start, and if they absorb the slow moving canyon fill, are questions that cannot be answered yet. Other problems are the relation between fluxoturbidites, or gravities and turbidites, and the use of the terms "proximal" and "distal" turbidities. In comparing recent turbidites with ancient ones, many discrepancies appear, most of which can be eliminated by considering the influence of primary consolidation on sedimentary structures. Studies indicate that the use of electrical logging and seismic records do not allow detailed interpretation of deposits such as turbidites. The resolution of the records is not fine enough although their application for basin analyses and overall trends is necessary.

Recently a new genetic term "contourites," was introduced for sediments redeposited by contour currents. Recent and ancient contourites are compared with turbidites and only minor differences exist. A combination of parameters may allow a distinction between the 2 types and it is possible that both can be found in the same area.

00112

Bryant, William R. and Peter K. Trabant. Statistical relationships between geotechnical properties of Gulf of Mexico sediments. Fourth Annual Offshore Technology Conference, American Institute of Mining, Metallurgical, and Petroleum Engineers, Preprints, Volume 2: 363-368, 1972.

The design of adequate foundations for offshore installations, of all natures, requires a knowledge of the engineering properties of the sediments from the first dozen meters below the ocean floor. This study presents the profiles of shear strength, water content and bulk (wet) density to a depth of 12 meters for 80 cores retrieved from all provinces of the Gulf of Mexico. Equations of the linear relationships for all data as well as for each physiographic area within the Gulf are presented in order to assist the engineer towards the reliable solution of his problems within the deeper portion of the Gulf of Mexico.

00113

Clark, H. C. Paleomagnetism of late Pleistocene-Holocene sediments, Gulf of Mexico. American Association of Petroleum Geologists Bulletin, 56(9): 1897, 1972.

Detailed paleomagnetic studies have been made on 15 sediment cores selected along north-south lines in the eastern and western Gulf of Mexico. The piston cores were sampled at 20 cm intervals immediately upon extrusion and measurements of natural remanent magnetizations (NRM) were made using a 5hZ spinner magnetometer. Excursions of the geomagnetic field are recorded at 2 levels in many cores. Extrapolation of the ZY boundary in the western Gulf indicates that the younger feature is between 13.5 and 17.5 x 10 years BP, and is consistent with the age determination of the Laschamp event. Dates are not available for the eastern Gulf cores, but the depth of the paleomagnetic feature correlates with the expected sedimentation rates. The older feature is less distinct and further extrapolation of the ZY boundary places it between 20.0 and 24.0 x 10 years BP. This age is within the range of a geomagnetic feature that is not the Laschamp.

These results show that with extreme care, paleomagnetic measurements may be used as a stratigraphic tool in the Gulf of Mexico. Several points should be considered. First, because of the high sedimentation rates, the 2 young features described herein are the only ones expected in piston cores from this region. Second, direction scatter is quite pronounced in the upper 1/2 m and lower few centimeters of several cores. Correlations at these levels are difficult. Finally, as measurement of the geomagnetic features described lasted for only a short time and did not traverse a full 180 degrees; dense sampling is recommended to assure their definition.

00114

Clark, H. C. and J. P. Kennett. Confirmation of reality of Laschamp geomagnetic polarity event in cores from Gulf of Mexico. Translations of American

Geophysical Union, 53(4): 354, 1972.

Confirmation of the reality of the Laschamp geomagnetic polarity event in cores from the Gulf of Mexico. Paleomagnetic and/or micropaleontological studies have been carried out on approximately 40 sedimentary cores of latest Pleistocene age from the Gulf of Mexico. Planktonic foraminiferal frequency changes have enabled detailed correlations to be carried out between 28 cores from the western Gulf and the determination of a paleoclimatic curve for the last 175,000 years. Sedimentation rates generally range from 9 cm to 30 cm/1000 years. A distinct excursion in the earth's magnetic field occurs in the upper parts of 11 of 20 cores for which paleomagnetic studies were conducted. Furthermore a relatively consistent decrease of inclination to zero or near zero occurs at slightly greater core depths. Ages of the inclination changes were determined by extrapolation of sedimentation rates from the Z-Y paleontological boundary which is dated at 11,000 years BP. The magnetic reversal is dated at between 13,500 and 17,500 years BP and occurs within the upper part of zone Y. This falls within the age range of the Laschamp Event as originally defined. The other consistent decrease in inclination ranges in age between approximately 20,000 and 24,000 years BP.

00115

Davies, D. K. Mineralogy, petrography and derivation of sands and silts of continental slope, rise and abyssal plain of Gulf of Mexico. Journal of sedimentary petrologists, 42(1): 59-65, 1972.

Sand and silt interbeds in cores from the continental slope, rise and abyssal plain of the Gulf of Mexico, may be composed of either detrital or carbonate sediments. Because of the insensitivity of the detrital minerals to transport distance and environment, the sand and silt interbeds from the deep portions of the Gulf may be related to specific source areas on the continental shelf. These source areas include 1) the Mississippi, 2) the Rio Grande, and 3) the rivers of northeast Mexico. Vertical variations in mineralogy show no significant trend with increasing depth in any core, indicating that relative contributions from each source remained constant. Carbonate sands and silts of the abyssal plain were derived from the shallow waters of the Campeche Shelf. Transportation along the axis of the Campeche Canyon carried these shelf carbonates northward into deeper water areas, in some instances through the medium of turbidity currents.

00116

Devine, S. B., R. E. Ferrell and G. K. Billings. Quantitative x-ray diffraction technique applied to fine-grained sediments of deep Gulf of Mexico. Journal of Sedimentary Petrology, 42(2): 468-475, 1972.

The application of a quantitative x-ray diffraction technique developed by Moore (1968) enables the mineralogical analysis of fine-grained

sediments with fewer errors due to sample preparation and conditions of a analysis. The computation of linear interaction coefficients reduces the possibility that the change in the weight percent of 1 mineral will cause unreal variations in the abundances of others. The main advantage of the technique is that the use of peak intensity ratios modified by experimentally determined coefficients of interaction help eliminate differences between samples produced by the method of calculation. Comparison of the results of x-ray analyses of bulk sediments and size-fractionated ones from the surficial sediments of the deep Gulf of Mexico illustrate the technique.

00117

Ellis, C. H., and W. H. Lohman. Neogene calcareous nannoplankton, Sigsbee Abyssal Plain, Gulf of Mexico. American Association of Petroleum Geologists Bulletin, 56(3): 617, 1972.

A detailed study of calcareous nannoplankton from 11 upper Miocene to Holocene cores recovered by the D/V Glomar Challenger in the Sigsbee abyssal plain at Site 3, Leg 1 of the JOIDES Deep Sea Drilling Project, was conducted with the use of optical and scanning electron microscopes. Results show the presence of 8 or the 11 nannoplankton zones established for the late Neogene by Martini. The zones present, from youngest to oldest, are Emiliana Huxley; zone, Gephyrocapsa oceanica zone, Pseudoemiliana lacunosa zone, Discoaster surculus zone, Reticulofenestra pseudumbilica zone, Discoaster asymmetricus zone, Ceratolithus tricormiculatus zone, and Discoaster quinqueramus zone. Three of Martini's zones were not detected because there was no core coverage for the intervals where they most likely would be present. These include 2 late Pliocene zones, Discoaster brouweri zone and Discoaster pentaradiatus zone, and the Late Miocene Ceratolithus rugosus zone.

A total of 84 species was recognized; however, a sizable part of the assemblages consists of reworked specimens. Nearly 70 percent of the species present in the Pleistocene assemblage are reworked; in pre-Pleistocene sediments, 25-50 percent are reworked. Relative abundances of individuals vary considerably throughout the 11 cores, but only 2 samples of the 88 examined were found to be entirely barren of nannofossils. Late Neogene calcareous nannoplankton from the Sigsbee abyssal plain occur in a succession of zones that agrees with the Neogene Standard Zonation sequence; they are also comparable to nannofossil assemblages known from continental shelf deposits in the Gulf Coast region.

00118

Ensminger, H. P., and J. E. Matthews. Origin of salt domes in Bay of Campeche, Gulf of Mexico. American Association of Petroleum Geologists Bulletin, 56(4): 802-807, 1972.

A geophysical survey conducted in the Bay of Campeche, Gulf of Mexico, was completed by the USNS Kane in 1969. A magnetic map and a composite geophysical profile constructed from this information have yielded new and significant data concerning the origin of salt domes in this region. Basement structures apparently are coincidental with the area in which salt diapirism has occurred in the Bay of Campeche, and could have been the mechanism by which formation of the diapirs was initiated and subsequently controlled.

00119

Feden, Robert H. H. Robert Ensminger and James V. Massingill. Geophysical investigation of the Catoche Tongue region, Gulf of Mexico. Geological Society of America Bulletin, 83(4): 1157-1162, 1972.

In 1969, a series of geophysical tracks was run across the Catoche Tongue, a major re-entrant into the Campeche Slope, Gulf of Mexico. Seismic reflection profiles within the tongue reveal no significant structural differences between the scarp bordering this feature and the main Campeche Scarp. Magnetic data, however, show a 200-gamma anomaly associated with the Campeche Scarp, but the scarp within the tongue has little or no anomaly. A knoll at the mouth of the tongue shows a 250 gamma anomaly. This knoll may be a remnant of the scarp base upon which the bordering reef grew. The nontectonic theory of origin proposed for the Catoche Tongue is supported by these new geophysical data.

00120

Folger, D. W. Characteristics of estuarine sediments of the United States. U. S. Geological Survey Professional Paper 742, 94 p, 1972.

The texture and the composition of bottom sediments in the estuarine zones of the United States are a function of the geologic, bathymetric, and hydrologic settings in which they were deposited. Most bottom sediments that accumulate in the estuarine zone consist of terrigenous detritus, biogenic debris, and pollutants. Organic carbon generally makes up less than 5 percent of the bottom sediment except in swampy areas, fjords, or where pollutants are abundant. Inorganic constituents are mostly quartz, feldspar, and clay minerals. In general, illite and chlorite are the most abundant clay minerals on the northeast coast; kaolinite predominates on the southeast Atlantic coast and in the eastern Gulf of Mexico and the Pacific Ocean. Shell debris is locally abundant in many areas but is dominant only in areas far from terrigenous sources.

00121

Hunter, R. E. Monitoring changing geologic features along the Texas Gulf Coast. Geological Survey, 3 p, 1972.

00122

Keller, G. R. Possible paleozoic subduction zone along Texas Gulf Coast interpreted from Rayleigh wave dispersion and gravity data. Transactions of American Geophysical Union, 53(11): 1114, 1972.

A possible paleozoic subduction zone along the Texas Gulf Coast interpreted from Rayleigh wave dispersion and gravity data. Tripartite arrays of vertical long-period seismographs were deployed for analysis of Rayleigh wave group and phase dispersion along the Texas Gulf coast. In addition, gravity data was used to limit the ambiguity of the seismic data. The experimentally determined dispersion curves for fundamental and higher modes were matched against theoretical curves calculated for idealized models. These data, along with those from seismic refraction profiles, provide a picture of crustal structure which indicates a thick lower crustal layer which thins toward the present coast, sediments which thicken toward the present coast, and a crust which thins toward the present coast. The structure is interpreted as a buried remnant of a Paleozoic subduction zone inland from the present coast and an essentially oceanic crust covered with thick sediments in the area near the present coast. The geologic history of the area is interpreted in terms of a Paleozoic subduction zone producing the Ouachita system as a Cordilleran-type mountain belt followed by Mesozoic and Cenozoic tectonic inactivity and sedimentation.

00123

Kennett, J. P., P. Huddleston, and H. C. Clark. Associations between late Pleistocene paleoclimatic history, volcanism, paleomagnetism and faunal extinctions and reactions, western Gulf of Mexico. Transactions of American Geophysical Union, 53(4): 423, 1972.

Micropaleontological, tephrochronological and paleomagnetic studies have been conducted on 28 cores of latest Pleistocene age from the western Gulf of Mexico. Frequency changes in planktonic foraminiferal species have enabled definition of 18 zones and close correlation within the last 175,000 years. Sedimentation rates generally range between 9 cm and 30 cm/1000 years. Three interglacial and 2 glacial stages are recognized (zones V to Z). Three major volcanic ash horizons occur within the sequence. The lowest and largest ash horizon immediately precedes the last interglacial stage and correlates rather closely with the base of the Blake Geomagnetic Event as distinguished in Caribbean cores. The middle and second largest ash horizon coincides with the boundary between the last interglacial and the Wisconsin Glacial Stage, and the virtual extinction of 2 planktonic foraminiferal species. The upper ash horizon occurs in the lower part of the Wisconsin. Four consistent high frequency peaks are shown by the planktonic foraminifer "Orbulina universa". The 3 lowest peaks coincide with the 3 ash horizons, while the uppermost peak coincides with the Laschamp Geomagnetic Event. "Orbulina universal" seems to have reacted to environmental changes related to increased volcanism and/or paleomagnetic excursions.

00124

Lynts, George W. Factor-vector analysis models in ecology and paleoecology. 24th Intern. Geol. Congress, Montreal, sec. 7, p, 227-237, 1972.

00125

MacIntyre, Ian G. Submerged reefs of eastern Caribbean. Bull. Am. Ass. Petrol. Geol. 56(4): 720-738, 1972.

00126

McGowen, J. H. and L. E. Garner. Significance of changes in shoreline features along Texas Gulf Coast. American Association of Petroleum Geologists Bulletin, 56(9): 1900-1901, 1972.

The open Texas coast is characterized by 3 distinct types of shoreline: 1) barrier islands consisting of sand beaches, fore-island dunes, and a vegetated or barren back-island area; 2) peninsulas where beaches are dominated by shell (shell ramps with or without incipient dunes form the crest of the peninsula), and storm channels and washover deposits dominate the back-island area; and 3) strand plain a few to several hundred feet across, where shell material and rock fragments are dominant over terrigenous sand. Physiographic features of strand plains are a steep forebeach and a wide shell ramp that terminates as a steep avalanche face. Only the barrier islands and peninsulas are associated with bays and lagoons. When viewed separately, these shoreline features appear to have a random distribution. However, when their occurrence is considered in the context of Pleistocene and Holocene depositional history of the Texas coastal zone, there is order in their distribution. Barrier islands develop in the same areas as do sand-rich Pleistocene deltas with broad strand plains. Peninsulas are positioned along Pleistocene interdeltic areas. Strand plains are situated along the distal parts of mud-rich Pleistocene and Holocene deltas.

Distribution of these 3 shoreline types along the Texas coast cannot be explained adequately by a sand source from modern rivers being transported by longshore drift. Occurrence of the 3 shoreline types can be explained best by local Pleistocene and early Holocene sediment sources. Broad, sand-rich barrier islands are presently moving toward an equilibrium state where sediment input is about equaled by intensity of physical processes. Narrow, shell-rich peninsulas are moving toward the mainland at rates of 2-14 ft/year. Narrow, shell-rich strand plains are in a state of rapid erosion--up to 30 ft/year.

00127

Mathews, T. D., A. D. Fredericks and W. M. Sackett. The geochemistry of radiocarbon in the Gulf of Mexico. Symposium on the Interaction of Radioactive Contaminants with the Constituents of the Marine Environment, July 10-14, 1972.

This study was conducted to achieve a better understanding of the contemporary geochemistry of radiocarbon in the Gulf of Mexico and adjacent areas. Bomb C14 was found in various biological samples and samples of coral, atmosphere, and water as a result of efforts to map bomb C14 distribution in the Gulf. A circulation model for the western Gulf of Mexico was also proposed. Lateral transport from east to west and downward migration due to eddy diffusion were suggested as mechanisms of renewal of intermediate and deep water in the western Gulf. Residence times for these water masses were found to be 130 years and 270 years respectively.

00128

May, J. P. Geology and history of Gulf of Mexico - discussion of late Neogene deposits of some of the coastal regions. Geological Society of America Bulletin, 83(10): 3155-3156, 1972.

00129

McGowen, J. H. and L. E. Garner. Relation between Texas barrier islands and late Pleistocene depositional history. American Association of Petroleum Geologists Bulletin, 56(3): 638-639, 1972.

The 400 mi-long Texas shoreline is characterized by barrier islands separated from the mainland by lagoons, bays, and estuaries up to 8 mi wide. Regional studies indicate that barrier morphology and texture and composition of beach sediment, although largely unrelated to modern rivers, are related to the distribution of sand-rich late Pleistocene facies on the inner continental shelf. For example, Matagorda Peninsula, near the Brazos River, is narrow, receding, and has a high oyster-shell content.

Narrow, regressive barriers occur where Pleistocene strand plains are absent, where Pleistocene deltas are mud-rich, and in Pleistocene interdeltaic areas. These regressive barriers have a high shell content (dominantly estuarine species), and varying amounts of caliche, siderite, beach rock, and sandstone fragment gravel. Beaches retreat 7-40 ft/yr in erosional areas. Dunes are rare on narrow barriers, and shell ramps extend several hundred feet bayward ending abruptly as steep avalanche faces. Terrigenous sand is the dominant sediment type of wide barriers such as Matagorda Island; no modern stream contributes sand to this barrier. Broad barriers develop where sand-rich Pleistocene deltas and strand plains are present and the sand budget is large. Morphologic features of these barriers are fore-island dunes, beach ridges, and broad barrier flats. Beach ridges, indicating rapid accretion, are characteristic of the older barrier segments. Today, fore-island dunes, suggesting cessation of accretion, are relatively well developed on these barriers.

00130

McKee, T. R. Allophane-halloysite spherules and their possible occurrence in Gulf of Mexico sediments. Texas Reports on Biology and Medicine 30(2): 189, 1972.

Halloysite is normally considered to be a hydrous aluminosilicate which is tubular in shape. In some instances, the tubes have been shown to be roughly polygonal in cross section. In the past a peculiar clay consisting of small rounded grains weathered from volcanic ash beds appeared to have some of the properties of halloysite. Recent electron microscopical studies have shown that the rounded grains consist of a series of concentric layers which are seldom visible unless studied with accelerating potentials above 50 kv.

Each spherule exhibits a "roselike" structure with each petal represented by a halloysite flake. The outer petals seem to peel off and roll to form the small tubes often seen associated with the spherules. The spaces between the petals of the spherule are filled with allophane (an amorphous aluminosilicate material). The spherules have both multiple and single cores which may be filled with allophane or small crystals. The spherules are generally considered to be an intermediate state in the crystallization of the amorphous allophane into the clay mineral halloysite, an important process in the formation of soils and sediments.

The occurrence of occasional isolated tubes in micrographs of Gulf of Mexico sediments has often been the main criteria for halloysite identification. Allophane-halloysite spherules were identified in several soils of Central America, prompting a survey of available samples from the southwestern Gulf of Mexico. Samples collected by various members of the Oceanography Department of Texas A & M were selected in view of the various river drainage systems. The survey resulted in the identification of this previously unreported form of halloysite in the Gulf of Mexico.

00131

McLeroy, E. G. Measurement and correlation of the acoustic reflection and sediment properties off Panama City, Florida. Naval Coastal Systems Laboratory, 33 p, 1972.

Continuous fathometer echo measurements were made along a 1200-mile track in the Gulf of Mexico off Panama City, Florida. Bottom samples were taken at 160 locations in the 3500 square mile test area. The amplitude and length of the echoes at the 160 locations were compared with results of the laboratory measurements of various sediment parameters. The echo parameters are readily correlatable with sediment water content, porosity, and the fraction of silt and clay-sized particles. The length of the echo is suggested as a good indicator of the grain size fraction.

00132

Milton, Charles. Igneous and metamorphic basement rocks of Florida. Bureau of Geology, Florida Department of Natural Resources, Bulletin 55, 125 p, 1972.

00133

Moore, G. W. Crust and mantle of Gulf of Mexico. Nature, 238 (5365): 452, 1972.

00134

Morton, Robert A. Clay mineralogy of Holocene and Pleistocene sediments, Guadalupe Delta and San Antonio Bay with smectite the most abundant. The clay minerals of the area studied are interpreted as being an indicator of clay minerals in the source area based on evidence that they 1) are the same for both Pleistocene and Holocene sediments 2) are not related to changes in depth 3) are not significantly different for fresh water and brackish environments and 4) are essentially the same as those in the source area.

00135

Parker, P. L., E. W. Behrens, J. A. Calder and D. Shultz. Stable carbon isotope ratio variations in organic carbon from Gulf of Mexico sediments. Contributions in Marine Science, 16: 139- ? , 1972.

00136

Pierce, J. W., H. D. Roth, and T. C. Huang. Multivariate discriminant analysis of bioclastic turbidites. Jour. Intern. Assoc. Math. Geol. 4: 249-261, 1972.

00137

Poag, C. W. Gulf coast submarine banks as potential hydrocarbon traps. American Association of Petroleum Geologists Bulletin, 56(9): 1902, 1972.

The real possibilities of a serious energy shortage in the U. S. have been emphasized recently by economic and political events affecting the petroleum industry. As a result, many explorationists are pressing for new means and approaches by which to increase domestic reserves. As one example of the latter, interest in subtle traps resulting from facies changes, erosional processes, and paleogeomorphic features is increasing in the Gulf Coast as the more obvious structural features become exhausted. A group of calcareous banks along the outer edge of the northern Gulf continental shelf represents potential paleogeomorphic traps of a type that may have been common on ancient Gulf shelves since the Oligocene Epoch. Microfaunal and lithologic facies analyses, as demonstrated on and around the existing banks, provide powerful tools by which to recognize analogous features in the subsurface.

00138

Quarles, M. Interpretation of unusual geologic features on continental slope off Louisiana. American Association of Petroleum Geologists Bulletin, 56(3): 646, 1972.

Many complex structural features exist on the continental slope off eastern Louisiana that appear to have no land equivalents. Highly contorted near-surface structures overlie complex patterns of deposition. Salt or shale masses apparently intrude into sediments in horizontal planes as well as vertically. The total assemblage may account for new types of oil fields that may be very prolific.

A technique of analysis called "comprehensive interpretation" is used to illustrate structural anomalies. It involves carrying the entire geologic section in color coded display of the 10-20 most reliable reflections available.

00139

Quarles, M. Sedimentary structure across bottom of Gulf of Mexico. American Association of Petroleum Geologists Bulletin, 56(3): 646, 1972.

A continuous profile shot across the abyssal depths of the Gulf of Mexico shows sedimentary features that could constitute stratigraphic traps for hydrocarbons. Faulting is present but of minor importance. The edges of the abyssal plain are abrupt and difficult to explain. Continuous correlation of beds across the section demonstrates these structural features.

00140

Sidner, B. R. and C. W. Poag. Late Quaternary climates indicated by foraminifers from southwestern Gulf of Mexico. American Association of Petroleum Geologists Bulletin, 56(9): 1902, 1972.

Planktonic foraminiferal assemblages were examined in 22 deep-sea cores from the Bay of Campeche in the southwestern Gulf of Mexico. Analysis of these assemblages clearly indicates 3 distinct successive biofacies during the late Pleistocene and Holocene. The biofacies are defined by variations in the relative percentages of the Globorotalia cultrata group and Turborotalia inflata. Excellent correlation can be made between the biofacies and those found in a core from the continental shelf in the northern Gulf of Mexico. These biofacies are interpreted as representing climatic changes.

00141

Stephens, C. F. and C. H. Oppenheimer. Silica contents in Northwestern Florida Gulf Coast. Contributions in Marine Science, 16: 99- ? , 1972.

00142

Bibliography on marine geology and geophysics, Vol. III. U. S. National Oceanographic Data Center, Rockville, Mo., August, 1972.

00143

Walper, J. L. and C. L. Rowett. Plate tectonics and origin of Caribbean Sea and Gulf of Mexico. American Association of Petroleum Geologists Bulletin, 56(9): 1904-1905, 1972.

Previously published reconstruction of the late Paleozoic "fit" of crustal plates and continents fail to explain many geologic features present in the southwestern U. S., Mexico, Central America, and northern South America. In particular, they fail to consider major geologic and tectonic continuities of Paleozoic age observable in the Southern Appalachians, the Ouachita Marathon fold belts, the fold belts of southern Mexico and Central America, and the eastern Andean mountain belt of northern South America, as well as the significance of many major transcurrent fault systems or megashears that cross these regions. With the well-documented joining of Africa-North America as a control for the positioning of South America relative to North America, this report suggests a somewhat different "fit" than any heretofore proposed. Instead of truncating North America in northern Mexico and filling in the Gulf of Mexico with fragments as is most commonly done, this reconstruction wraps Mexico and Central America around the western margin of South America, thus placing in juxtaposition the major tectonic belts of both continents. There is evidence that indicates that the Late Ordovician Taconic orogeny was an arc-continent collision rather than a continent-continent collision as has been suggested previously. Similar evidence indicates that the late Paleozoic Ouachita and Marathon orogenies were arc-continent collisions. Correlative periods of deformation for both of these orogenies have been documented from many places in northern and northwestern South America.

The early Paleozoic history of the Cordilleran mobile belt appears to have been independent from that of the eastern mobile belt. In the late Paleozoic, however, these mobile belts seem to have become coupled tectonically to produce regional stresses that were released along several major megashears. In southern and southwestern North America these include the Wichita and Texas megashears; a third megashear is probably present in northern Mexico. Late Paleozoic movement on these fault zones produced numerous basins and uplifts throughout these regions.

Modifications of the model proposed by Malfait and Dinkleman for the origin of the Caribbean region include the opening of a sphenochasm in the Gulf of Honduras, and regional tensional and compressional stresses resulting from the clockwise rotation of North America. The Gulf of Mexico and the present dislocated positions of the Ouachita and Marathon fold belts are the result of an opening sphenochasm under the present Mississippi embayment and the westward displacement of the Ouachita and Marathon fold belts by left lateral movement on the Wichita and Texas megashears.

00144

Walton, F. Dennis and H. Grant Goodell. Sedimentary dynamics under tidal influences, Big Grass Island, Taylor County, Florida. *Marine Geology*, 13(1): 1-28, 1972.

Tidal currents augmented by a general rise in sea level of about 0.5 ft. since 1910 have reworked and redistributed relict Pleistocene and Holocene sediments in the low-wave energy environment around Big Grass Island, Florida. Alterations in the textural parameters of sediments from the storm berm, and tidal channels, deltas and flats are a result of local hydraulic energy regimes. The position of inflection points on cumulative grain-size distributions from all of the environments represents winnowing at specific levels of wave and/or current power.

Forced tidal flow concentrated by water head accumulation of the flooding tide against a barrier has initiated channel erosion, sediment transport and tidal delta deposition. Better channels facilitate more effective current concentrations, and enhance erosion. An accelerated rate of erosion and deposition results from the process-response mechanism of the tidal-current channel system.

Flood current velocities are controlled by tidal range, amount of tidal-flat exposure during the previous low tide and equalization of head differential. Highest flood velocities occur at the beginning of the cycle. Tidal range and depth of minimum low water control the velocities of the tidal ebb currents. Highest ebb velocities occur in the latter part of each cycle. Tidal erosion is greatest when mean seasonal sea level is lowest.

00145

Wilhelm, Oscar and Maurice Ewing. Geology and history of the Gulf of Mexico. *Geological Society of American Bulletin*, 83(3): 545-600, 1972.

The principal aim of this study has been directed toward a comprehensive interpretation of the historical development of the Gulf of Mexico. The initial stage was an analysis and correlation of seismic profiler records obtained over a considerable period, followed by an endeavor to correlate the results with the surface geology of the land areas surrounding the gulf.

Indication of simatic oceanic crust beneath the abyssal gulf has led to the assumption that it had been a permanent ocean basin. A concept developed in this study proposes that the simatic crust was formed in late Paleozoic time. Subsequent environmental conditions remained epicontinental--including the environment of Jurassic salt deposition.

Proceeding from this viewpoint, the origin of the Gulf of Mexico is proposed to be related to the extensive regional subsidence of more than 10,000 ft during Cretaceous time. and its isolation came about by the continuous contemporaneous carbonate growth of the Florida and Yucatan platforms. Minimum rates of sediment deposition, compared to the rate of platform growth, led to consistent deepening of the gulf, which accordingly must be underlain by a thin Cretaceous section.

Hypothetically, the Straits of Florida and the Yucatan Channel originated from erosion at the front of the Laramide tectogene when carbonate growth was halted, following the inundation by seaways.

The Gulf of Mexico has been reduced to its present size by the invasion from the north and northwest of the huge Cenozoic mass of deposits--referred to as the Gulf Coast geosyncline. the last major volume of clastic sediments was deposited on the Mississippi cone in early Holocene time. However, the latest deposits from the Mississippi and other rivers were laid down on the continental shelves and a minimum of terrigenous material has been reaching the abyssal gulf by turbidity currents.

00146

Barcilon, A. and J. P. Lou. A model for formation of transverse bars. Jour. Geophys. Res., 78(15); 2656-2664, 1973.

00147

Basan, P. B. Aspects of sedimentation and development of a carbonate bank in Barracuda Keys, South Florida. Journal of Sedimentary Petrology, 43(1): 42-53, 1973.

An extensive carbonate bank in the Barracuda Keys, Florida was studied to ascertain those factors influencing its growth and present configuration. Five hydrodynamically or biologically controlled sedimentary subenvironments were distinguished; tidal channels, unstable banks, stable banks (including bare-sand, Thalassia, and mangrove island) and silty lagoons.

The bank is a closed system wherein local biological production of sediment is in equilibrium with physical dispersal of sediment. Small amounts of fine grained sediment are derived from the Gulf of Mexico, but this material is insignificant relative to continued bank development. Sediment is generally of uniform size, and responds to current flow more as unit "sheets" than as individual particles, thereby permitting a maximum amount of sediment transport. The major constructional process is the flood tide current, which transports sediment by traction, saltation, and to a lesser extent, suspension and flotation. Steady southeasterly wind-waves cause cross-bank transportation but are subordinate to tides as an agent of bank construction. The basin-shaped Pleistocene bedrock surface exerted principal control on localization of the overlying bank. A resistant limestone ridge on the northern margin of the study area is a barrier to the dispersal of sediment by waves.

Development of this bank may be summarized as follows: preferential accumulation of fine sediment in sink holes, forming coalescing silty banks; contemporaneous colonization of these banks by calcareous algae and marine grasses; entrapment and accumulation of coarse sediment by these marine plants, forming a single, contiguous sand bank; and continued growth by accretion of sediment over avalanche slopes. The bank is probably extending itself into the adjoining lagoon by a process of differential growth. This process is dependent upon stabilization of one part of the bank, while growth continues in another.

00148

Bassin, N. J., J. E. Harris, and A. H. Bouma. Suspended matter in Caribbean Sea - gravimetric analysis. *Marine Geology*, 12(3): 1-1973.

00149

Exum, F. A. Lithologic gradients in marine bar, Cadeville sand, Calhoun-Field, Louisiana. *American Association of Petroleum Geologists Bulletin*, 57(2): 301-320, 1973.

The Cadeville sand reservoir at Calhoun field, Jackson, Lincoln, and Ouachita Parishes, Louisiana is a lenticular body of Upper Jurassic fine grained quartz sandstone and quartzose limestone, which is enclosed vertically and laterally by impermeable carbonate mudrocks. This gas-condensate reservoir within the Schuler Formation is 11.5 mi long, 2.0 mi wide and has a maximum thickness of 38 ft. It probably was deposited as a non-emergent bar in a shallow-marine environment.

There are progressive and systematic lateral changes in lithology within the reservoir. Both the size of detrital grains and the abundance of fossils are at a maximum along the east-west axis of the reservoir and decrease toward the north and south. The total percent carbonate is also greatest along the axis and decreases in the north and south. Moldic porosity is

best developed along the reservoir axis, whereas intergranular porosity is dominant along the margins. Sorting of detrital grains is best north of the axis and poorest along and south of the axis.

Knowledge of these gradients in lithology was useful in locating the depositional axis of the Cadeville sand reservoir and was helpful in developing the west end of the field. In the event of a discovery of a similar reservoir this knowledge would be useful in determining the probable position of the reservoir axis relative to the discovery well.

00150

Ghazzaly, Osman I. and Billy T. McCaslin. Statistical correlations of engineering properties of offshore clay deposits. Fifth Annual Offshore Technology Conference, American Institute of Mining, Metallurgical, and Petroleum Engineers, Preprints, Volume 2: 767-776, 1973.

A thorough statistical study of engineering properties of the Gulf of Mexico clays was conducted. An extensive amount of data covering a wide range of offshore clay properties was assembled and analyzed. The data presents the results of strength, consolidation and classification tests on clay samples from the upper coast of the Gulf of Mexico. The analysis included a total of 759 samples from depths ranging from about 2 ft. to 446 ft. samples were obtained by 65 undisturbed-sample borings drilled in water depths varying from 3 ft. to 382 ft. Several forms of single and multiple correlations were developed among the engineering properties of Recent and Pleistocene offshore clay deposits. The established relationships were evaluated statistically. The significant correlations were compared with similar equations developed earlier by other investigators for offshore and onland clay formation. It is concluded that several valuable relationships exist between certain properties of Gulf of Mexico clays. Examples are correlations between the plasticity index and liquid limit, between the undisturbed cohesion and preconsolidation pressure, and between the compression index and liquid limit. These correlations agree favorably with results of previous studies. The consolidation and strength characteristics of the clays can be practically predicted from the index properties of the soil. Equations relating the compression index, preconsolidation pressure, remolded and undisturbed cohesion of the Recent and Pleistocene clays, with such soil properties as the liquid limit, moisture content and unit dry weight, are reported.

00151

Harrison, W. E. Heavy minerals of Horn Island, northern Gulf of Mexico. Journal of Sedimentary Petrology, 43(2): 391-395, 1973.

The heavy mineral assemblage of Horn Island is highly diagnostic of a metamorphic source area. The crystalline metamorphic region in east-central Alabama and west-central Georgia which is drained by the South Alabama and Apalachicola Rivers and their respective tributaries is suggested as the ultimate source area for the heavy minerals of Horn Island.

00152

King, V. L. Sea bed geology from Sparker profiles, Vermilion Block 321, Offshore Louisiana. Fifth Annual Offshore Technology Conference, American Institute of Mining, Metallurgical, and Petroleum Engineers, Preprints, Vol. 1: 657-666, 1973.

A diverse pattern of sands, silts and clays occurs below a thin mantle of young seabottom muds at Vermilion Block 321. The shallow layers are clearly recorded on a network of high resolution sparker lines that traverse the 2,500 acre tract in north-south and east-west directions. These lines provide data for possible platform sites and help document a wide variety of geologic features in the near surface interval. The area, located 90 miles offshore in 200 ft of water, lies within the present-day middle continental shelf province. A series of worldwide Pleistocene glaciation and deglaciation episodes directly influenced sedimentation patterns within the study area. Analysis of the sparker profiles suggests the sediments were deposited at or near an ancient shoreline during a period of sea level lowering. The strata represent a typical deltaic rock sequence. Of particular interest is a southward oriented distributary channel recorded in both strike and dip profiles. A small, circular salt dome causing noticeable sea-bottom relief over a 1/2 mile circular area also is shown on the profiles.

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Programs for the forecasting of coastal floods caused by hurricanes and other severe storms, for the construction of protective works to guard against damage produced by these floods, and for insuring against damage produced by storms, have recently been established by the Federal government. Each of these programs calls for an investigation of past storm conditions, and

records of past floods are required for these studies. The most useful records are those made by recording, water-level gages. Such gages are maintained in coastal waters by several government and private agencies. This index of tide gages and tide gage records has been compiled as an aid to the efficient use of this material for the study of coastal floods.

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U. S. Department of Commerce. Climatological Data. Environmental Data Service, 73(13): 1968.

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Bodine, B. R. Hurricane surge frequency estimated for the Gulf Coast of Texas. U. S. Army Coastal Engineering Research Center, 38 p, 1969.

In an investigation of 19 hurricanes of record since 1900, a method was developed for assigning frequencies to water levels of hypothetical hurricanes with various prescribed values of hurricane parameters - central pressure index, forward speed, and radius of maximum winds. A method is also presented for estimating surge frequency in inland bays and adjacent regions subject to flooding by hurricanes. Results are presented in tables and curves.

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Gunter, Gordon, and J. C. Edwards. The relations of rainfall and fresh water drainage to the production of the Penaeid shrimps (Penaeus fluviatilis Say and Penaeus aztecus Ives) in Texas and Louisiana waters. FAO Fish. Rep. (57) Vol. 3: 875-892, 1969.

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U. S. Department of Commerce. Climatological data. Environmental Data Service, 74(13): 1969.

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Adams, Rodney. Effects of hurricanes Camille and Laurie on the Barataria Bay Estuary. Louisiana State University Coastal Studies Institute Bulletin No. 4, 6 p, 1970.

The 2 late-season hurricanes, Camille and Laurie, passed to the east and south of the Barataria Bay estuary but did produce above-normal tides and accumulations of wind driven debris. Maximum winds with Camille reached 45 to 65 miles per hour at Grand Isle and were from the east and north when the most severe effects were felt. Laurie shifted to an easterly course when she was still 175 miles south of Grand Isle, and no severe winds were experienced. Rapid water-level rise was accompanied by high winds from the east and northeast, which drove vast quantities of marsh grass debris against buildings and embankments. There were no significant changes to the shoreline from Southwest Pass to the mouth of Bayou Lafourche. However, aerial photographs taken immediately after the storm show what appears to be small washover fans to the east of Grand Isle on Grand Terre and Shell Island.

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Anderson, E. Ruth (ed.). Keeping tabs on hurricanes (HURRAN). American Meteorological Society Bulletin, 51(6): 585, 1970.

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Criswell, M. E. and R. S. Cummin. Survey of Gulf coast structural damage resulting from Hurricane Camille, August 1969, 158 p, 1970.

The report describes the damage to structures seen by an inspection team sent to the Mississippi and Louisiana Gulf Coast regions after Hurricane Camille, a very violent but relatively small tropical storm, came ashore west of Gulfport, Mississippi, late on 17 August 1969. Many photographs of the storm damage are included. Extensive damage resulted both from the unusually high winds accompanying Camille and from the extremely high tides coupled with wind-driven waves. Damage was greatest in low areas immediately adjacent to the coastline. Because of uncertainties of the material properties for the various buildings and particularly of the loading, the report presents mainly durilitative results. More ductile buildings, such as heavy wooden frame construction, appeared to have survived the storm best. The storm damage indicates a need for more lateral strength in buildings, especially masonry structures, and for more adequate design of connections and other details.

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Ford, Ted B. Effects of Hurricane Camille on Louisiana's oyster growing areas east of the Mississippi River--Lake Borgne to California Bay and other marine fisheries industries. 13th Biennial Report, 1968-69. Louisiana Wild Life and Fisheries Commission: 79-83, 1970.

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Golden, Joseph H. The lower Florida Keys waterspout project, May - September, 1969. American Meteorological Society Bulletin, 51(3): 235-237, 1970.

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Hsu, Shih-Ang. Coastal air circulations system: observations and empirical model. Louisiana State University, Coastal Studies Institute, 24 p, 1970. Pub: Monthly Weather Review 98(7): 487-509, 1970.

Three consecutive early summer studies on the upper Texas coast have produced data that afford a much clearer view of the land and sea breeze system than was previously held. Networks of surface observations, pibal and radiosonde ascents, and aircraft flights have produced observations that are integrated to give a synthesized model of the coastal air-circulation system as a function of space and time.

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Jenson, Jack James. Calculated and observed changes in sea surface temperature associated with hurricane passage. Thesis, Naval Postgraduate School, Monterey, California, Department of Oceanography, 55 p, 1970.

Analyses were made of the sea surface temperatures in the Gulf of Mexico for the month of August for the 4 years 1965 through 1968. No one pattern was found to predominate. The subsurface profiles were then considered and a rate of simulated withdrawal of 4000 calories of heat per day was made, until the temperature did not exceed 26 C. This withdrawal represented heat removed during passage of a hurricane. Difference analyses were constructed for the initial sea surface temperature at each station after 24 hours of simulated withdrawal. The differences ranged from less than 1 degree to over 4 degrees. Again, no consistent pattern was found but generally areas of high concentrations of heat experienced smaller decreases. Actual sea surface temperatures collected after 2 hurricanes were then analyzed and compared to temperature pattern predicted by the computer model. Illustrations of the relative availability of sensible heat energy for different sea surface temperatures are presented and a hypothesis made to account for the greater than average intensities of Hurricanes Betsy (1965) and Camille (1969).

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McGowen, J. H. Effects of Hurricane Celia.

Focus on environmental geologic problems of the Texas coastal zone.

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Mississippi State University. Mississippi Water Resources Conference Proceedings, State College, April 14-15, 1970. Mississippi State University Water Resources Research Institute, 191 p, 1970.

The fifth Mississippi Water Resources Conference was held in Jackson on 14-15 April for the purpose of exchanging information pertaining to water resources. The topics discussed include seaport and transportation development, hurricane damage mapping, hurricane frequency, flood insurance, flood control, alluvial channel morphology, scour, water importation for irrigating the Texas High Plains, recreation, mapping, tracer studies, water analysis, and water pollution indicator organisms.

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Murray, S. P. Turbulence in hurricane-generated coastal currents (124) Louisiana State University, Coastal Studies Institute, 20 p, 1970. Pub.: Proceedings of the Coastal Engineering Conference (12th) V. 3 p, 2051-2068, September 13-18, 1970.

Wind and current meter records taken during the passage of a hurricane were subjected to time series analysis. Filtering techniques isolated the speed fluctuations in the 10-60 CPH frequency band. These turbulent fluctuations proved to follow the Gaussian distribution for both wind and current. With the passage of the storm front the turbulence intensity of the wind actually decreased, while, on the other hand, the turbulence intensity of the current rose to extremely large values, even exceeding 27 percent of the mean flow speed. Three phases of the storm were examined separately, and the energy density of the wind varied with the -1 power of the frequency in all phases. With respect to the energy density of the current, a -1 power dependency on the frequency was approximated by the first 2 phases, whereas in the third phase, which was the most intense, the energy density varied approximately as the -0.5 power of the frequency. The characteristics of the spectra indicate that there is little direct transfer of energy from the wind to the current in the frequency range studied. Energy is passing into the 10-60 CPH band of the current from still lower frequencies.

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Murray, S. P. Bottom currents near the coast during Hurricane Camille. Louisiana State University, Coastal Studies Inst. 4 p, 1970. Pub: Journal of Geophysical Research, 75(24): 4576-4582, 1970.

A ducted current meter, which was mounted on the bottom in 6.3 meters of water off the coast of the Florida panhandle, was operative during much of the activity of Hurricane Camille. Before the arrival of the storm an unexpected outward extension of the wave-driven longshore current was recorded. During the storm bottom current speeds ranged up to 160 cm/sec, and their direction rotated from alongshore parallel to the wind to seaward against the wind.

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Reid, R. O. and K. Gilbert. Studies of mesoscale air-sea interaction. Annual Report of the Themis Project, Texas Agricultural and Mechanical University, Sub Task G, 1970.

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Reixach, Karen A. (ed). 1970 Project Stormfury. News and Notes. in: American Meteorological Society Bulletin, 51(10): 963, 1970).

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Reixach, Karen A. (ed). Why Camille warnings were disregarded. News and Notes. in: American Meteorological Society Bulletin, 51(10): 942, 1970.

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Rossow, Vernon J. Observations of waterspouts and their parent clouds. National Aeronautics and Space Administration Technical Note, NASA TN D-5854, 63 p, 1970.

Waterspouts were studied during the summers of 1967 and 1968 in the area around Key West, Florida. Observations were made from Coast Guard Cutters and from aircraft. Measurements made of the electric and magnetic fields associated with these atmospheric vortices indicate that electricity does not play a primary role in their structure. Although electricity is eliminated as an essential or defining mechanism, some evidence was found (low cloud tops and a lightning demise of a spout) to indicate that these vortices cannot exist if electricity is too prominent. Of the 104 events sighted, it was found that 30

rotated cyclonically, 9 anticyclonically, and the rest either went unnoticed or were not observable. The parent clouds had tops at 8,000-12,000 ft. and bottoms from 800-2,500 ft. altitude. The mechanism responsible for the formation of the vortex at the time and location of its occurrence was not determined. The relationship to tornado structure is uncertain.

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Sherman, K. and K. A. Honey. Vertical movements of zooplankton during a solar eclipse. *Nature*, 227: 1156-1158, 1970.

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Sonu, C. J. Beach changes by extraordinary waves caused by Hurricane Camille. Louisiana State University, Coastal Studies Institute, 19 p, 1970.

Drastic erosion and swift recovery were the major characteristics of beach changes associated with Hurricane Camille at Fort Walton, Florida. Storm waves caused general erosion of the beach surface, and a scarp about 1 meter deep was produced about 40 meters behind the shoreline. After the hurricane, humps of sand in a train with regular spacing along the shore emerged in the surf zone bed. These were formed by longshore currents, which probably acted on large quantities of sand brought into the surf zone bed as a result of the preceding subaerial erosion. The humps subsequently moved shoreward and eventually climbed on the beach; a substantial part of the exposed beach volume was thus restored about a week after the hurricane.

00049

U. S. Naval Weather Service Command. Summary of synoptic meteorological observations: North American coastal marine areas, Volume 4. Area II-Jacksonville, Area 12 - Miami, Area 13, Key West, 484 p. 1970.

The report is part of a series of compilations which is regional in scope. It consists of climatological and air-sea interface data in tabular form for specified water areas adjoining Jacksonville, Miami, and Key West.

00050

U. S. Naval Weather Service Command. Summary of synoptic meteorological observations: North American coastal marine areas. Volume 5, Area 14 - Fort Myers, Area 15 - Apalachicola, Area 16 - Pensacola, 483 p, 1970.

The data contained in these tables were obtained from tape data Family 11 (TDF-11), Marine Surface observations. TDF-11 was primarily funded by the Naval Weather Service Command and selected by NWSER Asheville as the most comprehensive collection of marine surface observations from which to develop a series of coastal marine summaries. The areas discussed include Fort Myers, Apalachicola, and Pensacola, Florida.

00051

U. S. Naval Weather Service Command Summary of synoptic meteorological observations, North American coastal marine areas, Volume 6. Area 17-New Orleans, Area 18-Galveston, Area 19, Corpus Christi, 485 p, 1970.

The data contained in these tables were obtained from tape data Family 11 (TDF-11), Marine Surface observations. TDF-11 was primarily funded by the Naval Weather Service Command and selected by NWSER Asheville as the most comprehensive collection of marine surface observations from which to develop a series of coastal marine summaries. The areas include New Orleans, Louisiana, Galveston, Texas, and Corpus Christi, Texas.

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Woodley, William L., Joanne Simpson, Alan H. Miller, Steven MacKay and Richard Williamson, et. al. Some results of single cloud pyrotechnic seeding in Florida, 1970. U. S. Department of Commerce, National Oceanic and Atmospheric Administration Technical Memorandum RLTM-ACLM 10, 87 p, 1970.

Cloud seeding experiments with silver iodide were conducted over South Florida on 9 days in the spring and early summer of 1970. Five aircraft participated, 1 for seeding, photogrammetry and in-cloud measurements near cloud base, 1 for mid-levels, 1 for following top heights and occasional penetrations, and 1 for dropsondes and high-level observation. Altogether 13 seeded clouds and 16 unseeded cloud controls were studied. Five seeded clouds exhibited the cutoff tower growth mode, 2 underwent hesitation growth and 6 grew explosively. Of the 16 control clouds, 10 reached cumulonimbus stature for the first 40 minutes after seeding, the average seeded minus control rainfall difference was about 100 acre-ft, or more than 100%, for the entire cloud lifetimes.

00053

Woodley, William L. Rainfall enhancement by dynamic cloud modification. Science, V. 170 (3954): p, 127-132, 1970.

There has recently been discussion on whether the relevant seeding technology is reliable for practical use. This question has proved a difficult one to resolve. Some of the confusion can be attributed to failure to recognize 2 major points: 1) there are essentially 2 approaches to seeding for precipitation increases, static and, more recently, dynamic, with each

approach involving different seeding material; and (2) the seeding result depends on the initial conditions of the cloud environment system. This article elaborates on these points in presenting the results of a new and exciting approach to cloud seeding for rain enhancement.

00054

Wright, L. D., F. J. Swaye and J. M. Coleman. Effects of Hurricane Camille on the landscape of the Breton-Chandeleur island chain and the eastern portion of the lower Mississippi Delta. Louisiana State University, Coastal Studies Institute, 24 p, 1970.

Air and ground reconnaissance immediately following the passage of Hurricane Camille disclosed significant modifications to the natural landscape of the Breton-Chandeleur island arc and to the eastern portion of the lower Mississippi Delta. Considerable dissection and redeposition was evident along beach and barrier formations, and total obliteration dominated numerous sections. Trends of redistributed beach material strongly reflected the final direction of hurricane-induced mass transport of water. In the lower delta damage was mainly to marsh vegetation and was attributable to high water and surge currents directed almost entirely from north to south.

00055

Able, K. P. Fall migration in coastal Louisiana and the evolution of migration patterns in the Gulf region, Georgia University, Department of Zoology, 14 p, 1971. Pub: Wilson Bulletin, V84 h3, p, 231-242, September, 1972.

Passerine nocturnal migration was observed with radar and portable ceilometer on 34 nights during fall, 1969, at Lake Charles in southwestern Louisiana. Weather patterns over the Gulf in fall are generally similar to those of late spring and summer and are usually characterized by southerly winds. These conditions, which favor large-scale trans-Gulf migrations in spring, are opposed to such flights in fall. The daily weather patterns observed during this study were grouped into 5 basic types. Passerine migrants at Lake Charles flew with the wind, regardless of its direction. Because of the frequency of southerly winds, 'reverse' migrations were common. However, a strong net flow of birds in a southwesterly direction resulted from prevailing northeasterly winds and the occurrence of disproportionately large migrations when air flow was favorable for movement toward wintering areas. Downwind flight assures that small landbirds will not embark on long overwater flights in unfavorable winds, but at the same time allows them to take advantage of northerly post-frontal winds when they occur.

00056

Allison, Lewis J., G. Thomas Cherrix and Harold Ausfresser. Color analysis of Hurricane Camille, 1969, using Nimbus infrared radiation data. American Meteorological Society Bulletin, 52(9): 862, 1971.

00057

Blumberg, Randolph, Elmer Pendleton, John R. Shaw and Charles Osborn. Real-time prediction of hurricane effects on coastal facilities. Third Annual Offshore Technology Conference, American Institute of Mining, Metallurgical, and Petroleum Engineers, Preprints, Volume 1: 221-234, 1971.

The most critical problems facing management of coastal installations during a hurricane or major cyclonic storm are safety for human life and protection of production facilities while minimizing production losses. Equivalent risks exist for coastal municipalities.

Heretofore, there has been no sound basis for decisions forced on management by these environmental extremes. A proven computer based system is now in use providing critical predictions of environmental effects well in advance of their occurrence. This prediction system was successfully used in the Gulf of Mexico during the 1970 hurricane season for hurricanes Celia and Ella and tropical storm Felice.

00058

Fernandez-Partagas, J. J. Meteorological studies in relation to cloud seeding experiments over South Florida in 1970. Miami University, Rosentiel School of Marine and Atmospheric Science Final Report, 71 p, 1971.

The circulation, synoptic features and large-scale rainfall patterns which were observed during the cloud seeding experiments over south Florida in 1970 are described. Two different seeding operations were conducted; one during the month of May and the other from June to July 19. The following types of meteorological analysis were used to depict the evolution of motion and weather features over Florida and vicinity: (a) streamline analysis, to obtain a multiple-level representation of horizontal wind flow throughout the troposphere, (b) satellite pictures, to estimate total cloud cover and observe cloud patterns and their degree of organization, (c) radar hourly presentation, to evaluate the echo coverage time-evolution over areas of interest and the daily rainfall data from reporting stations over central and south Florida. Day weather conditions prevailed over south and central Florida for much of the month of May. However, heavy precipitation which fell on the last week of the month (May 24-31) was responsible for large rainfall anomalies over localized regions for the entire month. For the June 29-July 19 period, individual synoptic situations and rainfall patterns correlated quite well on a daily basis. Highly disturbed weather conditions were generally associated with troughs of low-pressure whereas essentially undisturbed modes were prevalent under marked anticyclonic patterns.

00059

Galveston Daily News. A special salute to the National Weather Service at Galveston. A special supplement, April 19, 1971.

00060

Hsu, Shih-Ang. Measurement of shear stress and roughness length on a beach. Louisiana State University, Coastal Studies Institute, 8 p, 1971. Journal of Geophysical Research, 76(12): 2880-2885, 1971.

Measurements of surface shearing stress and aerodynamic roughness length on a beach were made by simultaneous temperature - and wind-profile methods in the following 3 areas of the beach slopes on the Gulf of Mexico coast near Fort Walton Beach, Florida: the swash zone, the mid-foreshore, and the area near the berm scarp. Under adiabatic and onshore wind conditions, it was found from the roughness ratios that the swash zone is approximately 100 times smoother than the mid-foreshore and 500 times smoother than the area near the berm scarp; the stress ratios revealed that the shear stress is approximately 2.5 and 3.5 times larger at 10 m and 20 m fetch downwind, respectively, from the swash zone. It is concluded that the stress ratios measured from the transition from smooth to rough on the beach are in fair agreement with those predicted by Panofsky and Townsend.

00061

Klazura, G. E. Measurements of precipitation particles in warm cumuli over southeast Texas. Journal of Applied Meteorology, 10(4): 739-750, 1971.

Precipitation particles greater than 250 microns were sampled in the upper regions of warm cumuli over southeast Texas using a foil-belt particle sampler. Drop sizes 1 mm in diameter were common, and 2 mm drops were occasionally found. The effect of cloud height on the precipitation characteristics was pronounced. Higher concentrations and broader distributions were found in the tallest clouds. The height of clouds played a more important role in determining drop concentration and size distribution range than updrafts or downdrafts. In a comparison between concentration of precipitation particles and average cloud water content (CWC), large quantities of drops were associated with low CWC. Conversely, large values of CWC were associated with small numbers of drops greater than 250 microns in diameter.

00062

Paskausky, David F. Numerically predicted changes in the circulation of the Gulf of Mexico accompanying a simulated hurricane passage. Journal of Marine Research, 29(3): 214-225, 1971.

To obtain a quasi-steady-state basic circulation pattern for the Gulf of Mexico, a barotropic prognostic numerical model, with no changes in input conditions and with sufficient friction, has been used. It has been found that a simulated hurricane that would theoretically pass across the Gulf of Mexico from the Yucatan Strait to a point just east of the Mississippi Delta would generate a 2-centered cyclonic flow region in the western Gulf waters, with a remnant of the steady-state anticyclonic flow in the northwestern corner. The passage of such a hurricane would cause the loop

current to extend into the region west of Florida, where a closed anticyclonic flow is generated. The planetary vorticity would cause a westward migration of the lows as well as a migration of the high from the Florida shelf into the loop current; subsequently, an anticyclonic eddy would break off from the loop and migrate westward. The friction and advection of vorticity through the Florida Strait dissipate the extra energy supplied by the storm; the flow would eventually return to the quasi-steady state.

00063

Patterson, M. M. Hindcasting hurricane waves in the Gulf of Mexico. Third Annual Offshore Technology Conference, American Institute of Mining, Metallurgical, and Petroleum Engineers, Preprints, Volume 1: 191-206, 1971.

An estimate of wave heights is needed for risk and venture analysis, for platform design, and for operational planning. Very little reliable data on hurricane waves have been available for a number of years. The present hindcast system uses a moving, 2-dimensional wind field to generate and propagate waves to a location of interest. The basic wind-wave model is based on work reported in the literature by Basil Wilson. The method has been extended and 3 computer programs were written to predict significant wave heights. Wave Program #1 uses a hurricane wind field developed by ESSA or a consultant. This wind field is based on measurements or observations. From this 2-dimensional wind field, wave heights are calculated. Wave Program #2 generates its own wind field within the program. Certain hurricane parameters are required to generate this wind field. They are the track, the time history of the radius to maximum winds, and the barometric pressure. Wave program #3 also generates its own wind fields but does not need the track or the time history of R and P. Instead, the storm is moved along a predetermined path. The results of all 3 hindcast methods have been compared with data gathered from Hurricane Carla. Other hurricanes have also been studied and each of the programs gives comparable results.

00064

Reixach Karen A. (ed.). Drought-breaking experiment. News and Notes. in: American Meteorological Society Bulletin, 52(4): 314, 1971.

00065

Reixach, Karen A. (ed.). Mississippi test facility links earth and space. News and Notes. in: American Meteorological Society Bulletin, 52(1): 85, 1971.

00066

Reixach, Karen A. (ed.). A lady called Camille. in: New Films. American Meteorological Society Bulletin, 52(5): 378, 1971.

A dramatic, on-the-scene documentary film which shows the devastation of this deadly tropical storm and the rescue efforts that saved thousands of lives (DOD CD20-274, 16 mm., color, sound, 29 (min., on loan from U. S. Army Audio Visual Support Centers, or \$96.25 + \$2.45 fiber shipping case, purchase from National Audio Visual Center, National Archives and Record Service, Washington, D. C. 20409).

00067

Russell, Larry and Gerhart Schueller. Probabilistic models for Texas Gulf Coast hurricane occurrences. Third Annual Offshore Technology Conference, American Institute of Mining, Metallurgical, and Petroleum Engineers, Preprints, Volume 1: 177-190, 1971.

The occurrence of Texas Gulf Coast hurricanes is analyzed using various statistical methods. Simple Poisson, periodic Poisson, and Markov chain models are fitted to the occurrence data for a site offshore of Mustang Island, near Corpus Christi. Use of the period Poisson model permits a relatively simple description of cyclical occurrence phenomena.

The goodness of fit of the 3 different models is compared, using interarrival time, hazard function, and comparative maximum likelihood tests. The auto-covariance function for the data is investigated, and the effects of varying record lengths are considered. Results found for other Texas sites are also compared with those found for the Padre Island site.

While the simple Poisson and Markov chain models seem to provide a reasonable fit to the occurrence history, the periodic Poisson model is seen to provide a much better fit to the data. Reasons for the acceptance of a periodic model for hurricane occurrences are discussed.

The cyclical hurricane occurrence pattern implied by the acceptance of the periodic Poisson model is shown to have a very significant effect on the design of both offshore and onshore structures. An important indication of this study is that the Texas coast is currently nearing the peak of cycle of high hurricane occurrence likelihood.

00068

Russell, R. J. Beaches and ground water at Cape Sable, Florida during extreme drought. Louisiana State University, Coastal Studies, Institute, 27 p, 1971.

In October 1969 beaches and water tables were investigated after 5 months of adequate rainfall in the Cape Sable complex. In April, 1971 a similar study was made after 5 months of extreme drought in the Florida Everglades when water tables were lowered and flattened enough to permit widespread saltwater intrusion.

Much of the beach rock and cemented water-table rock under the beaches had been eroded by high-energy waves, probably of Hurricane Laurie (1969) or various local storms. Slabs of the eroded beach rock were tossed up on the beaches, and if sufficiently indurated became incorporated into the deposits. No evidence of subsequent cementation was observed. On East and Northwest capes the ground water had been replaced by stagnant seawater. On Middle Cape the water table was lowered, but a salinity gradient and some potable ground water were present in 1971. The Cape Sable region is isolated from mainland surface runoff by extensive areas of lakes and waterways with seawater salinities, and from subsurface flow of ground water by a thick section of compact marl and compressed peat. Accumulation of ground water depends on local rainfall, and its volume varies with size and permeability of catchment areas. The conclusions of this study are applicable to many other coastal areas and may be useful in assessing their population and survival potentialities.

00069

Tarver, J. W. Rehabilitation of natural oyster seed grounds destroyed by Hurricane Camille. La. Wild Life and Fisheries Comm. New Orleans, 88 p, 1971.

00070

Waddock, Sandra A. (ed.) CICAR study of circulation processes. News and Notes. in: American Meteorological Society Bulletin, 52(8): 809-810, 1971.

00071

Waddock, Sandra A. (ed.). Physical dynamics of coastal upwelling to be studied. News and Notes. in: American Meteorological Society Bulletin, 52(10): 1029, 1971.

00072

Brier, G. W., G. F. Cotton, J. Simpson and W. L. Woodley. Cloud seeding experiments: lack of bias in Florida series. Science, 176 (4031): 163-164, 1972.

Evidence is presented that bias is not detectable in the cloud seeding experiments over the Caribbean Sea in 1965 and over Florida in 1968 and 1970. Covariates and experimental design have been used to obtain an estimate of this bias. A description is given of the cumulus experiments and the statistical analysis of precipitation. The results indicate that there was no selection bias in the Caribbean and Florida series of cloud seeding experiments.

00073

Brower, W. A., J. M. Meserve, and R. G. Quayle. Environmental guide for the U. S. Gulf Coast National Climatic Center, Ashville, N. C., 180 p, 1972.

The report presents detailed environmental profiles for 7 potential Gulf Coast Deep Water Port sites: Corpus Christi, Galveston-Freeport, Sabine Pass, Bayou Lafourche, Southwest Pass, Mobile-Pascagoula and Panama City. Each individual area guide provides information: general description of the area, an area map, pressure, extratropical cyclones, tropical cyclones, winds, extreme winds, waves, visibility, temperature (air and sea), precipitation, cloudiness, relative humidity, and land station summaries as well as marine area summaries.

00074

Davis, D. R. and W. C. Bridges. Minimal tropical depression produces record rains and unprecedented floods. Monthly Weather Review, 100(4): 294-297, 1972.

A weak tropical depression moved out of the Gulf of Mexico on September 19-20, 1969. With the blocking action of a surface high and in the absence of steering currents aloft, the low became stationary in the Florida coast for approximately 48 hours. Torrential rains occurred in a small area 60-65 miles to the east and 50 miles inland from the point where the low made landfall. Record-breaking floods resulted. The 23 inch maximum point rainfall was about 9 inches greater than the previous maximum rainfall of record produced by a 1924 tropical storm in the same area. The location of the area of maximum rainfall with respect to the point of landfall of the low's center closely follows the pattern previously reported for the more intense hurricanes and tropical storms.

00075

D.R. Dawdy, R. W. Lichty and J. M. Bergmann. A rainfall -runoff simulation model for estimation of flood peaks for small drainage basins: U. S. Geol. Survey Prof. Paper 506-B, 28 p, 1972.

00076

Fujita, T. Theodore and Jaime J. Tedson. Use of enhanced ATS pictures of Gulf-storm researches. Fourth Annual Offshore Technology Conference, American Institute of Mining, Metallurgical and Petroleum Engineers, Preprints, Volume 1: 759-764, 1972.

Hurricanes cause severe damage along the Gulf Coast almost annually, Since 2 intense hurricanes, Camille and Celia, resulted in severe damage, it became necessary to predict possible damage based on satellite pictures long before ground-based radar is capable of detecting hurricane structure. Presented in this paper is an example of enhanced satellite picture and the extent of hurricane damage assessed by the damaging wind scale proposed by Fujita.

00077

Franceschini, G. A. Solar-radiation during total eclipse, Gulf of Mexico, 7 March, 1970. Texas Journal of Science, 23(4): 569, 1972.

00078

Garstang, M. A review of hurricane and tropical meteorology. American Meteorological Society Bulletin, 53(7): 612-630, 1972.

Progress in hurricane and tropical meteorology is reviewed over the period 1960-1971. The recognition of the role of scale-interaction; the necessity to include energy sources and sinks in the general circulation models; the complexity of the problem of subgrid scale processes; the growth of a quantitative observational base in the tropics; the advent of the meteorological satellite; and the power of the computer have collectively led to great effort and considerable progress in the realm of tropical meteorology during this period. This progress and the areas of weakness are presented within a framework of spatial and temporal scales ranging from the planetary to the turbulent. Without minimizing the difficulties that lie ahead there is reason for a degree of optimism. A coherent picture of the tropical atmosphere is emerging. Theory and observations are finding common ground. Critical tests of both lie ahead in the first major experiment of the Global Atmospheric Research Program; the GARP Atlantic Tropical Experiment.

00079

Ichiye, T. and H. Sudo. Upper watermass formation in western Gulf of Mexico. Transactions of American Geophysical Union, 53(4): 392, 1972.

Upper watermasses in the western Gulf of Mexico consist of the Yucatan water and the Gulf proper water. The former is formed by westward geostrophic transport north of Campeche Bank from spring to summer and produces an extensive area of high surface salinity above 36.4 ppt south of 25 degrees north almost in all seasons. The Gulf proper water has usually salinity maximum below the upper mixed layer thicker than 50 m in winter and forms a limited area of high salinity in the northern slope from summer to early winter. Oxygen in water warmer than 19 degrees C is lower for the Yucatan water than for the Gulf proper water but the reverse is the case for colder water. Two case studies were made about effects of winds on water mass

modification in cold seasons. In March, 1970 cold northerly winds caused sinking of the surface high salinity water (above 36.4 ppt) to 100 to 150 m in elongated patches (20 km x 100 km) along the northern slope. In November, 1971 southerly winds transported the low salinity shelf water to eastwards along 25 degrees N, producing temperature inversion in the upper 50 m and salinity maximum below it.

00080

Mason, Herbert M., Jr. Death from the sea. Our greatest natural disaster: the Galveston hurricane of 1900. The Dial Press, New York, 260 p, 1972.

00081

Neumann, C. J. and J. R. Hope. Performance analysis of the HURRAN Tropical Cyclone Forecast System. Monthly Weather Review, 100(4): 245-255, 1972.

The HURRAN (hurricane analog) technique, a fully computerized objective forecast aid making use of past tracks in forecasting hurricane motion was developed prior to the 1969 hurricane season. Encouraging operational results during the 1969 and 1970 hurricane seasons suggested further evaluation of the technique. To this end, HURRAN computations were made for approximately 1,000 forecast situations. Results are stratified according to initial direction and speed of movement of the sample storms and the number of analogs selected. The utility of the technique is discussed, and the importance of position accuracy at forecast time is demonstrated.

00082

Patterson, M. M. Hindcasting hurricane waves in Gulf of Mexico. Journal of Society of Petroleum Engineers, 12(4): 321-?, 1972.

00083

Simpson, J. Use of the gamma distribution in single-cloud rainfall analysis. Monthly Weather Review, 100(4): 309-312, 1972.

In a study of rainfall data from 2 south Florida cumulus clouds, 26 seeded and 26 control clouds, the fourth root of the rainfall for both seeded and control populations was well fitted by a gamma distribution for probability density. The gamma distribution is prescribed by 2 parameters, 1 for scale and 1 for shape. Since the coefficient of variation of seeded and control cloud populations was the same, the shape parameters for the 2 gamma distributions were the same, while the seeded population scale parameter was such as to shift the distribution to higher rainfall values than the control distribution. The best-fit gamma functions were found by application of the principle of maximum entropy. Specification of tractable distributions

for natural and modified rainfall populations provides an important prerequisite for the evaluation of seeding effects by Bayesian statistics, a continuing objective in the Experimental Meteorology Laboratory (NOAA) seeding programs.

00084

Wasson, B. E. Floods in Mississippi, October 1967 through September 1969. Mississippi Board of Water Commissioners Bulletin 72-1, 40 p, 1972.

Between October 1967 and September 1969, there were 10 noteworthy periods of flooding in Mississippi. The most notable of these was on August 17-18, 1969, when Hurricane Camille produced all-time record tidal floods along the Mississippi coast and killed 137 people and caused more than 510 million dollars in damage. Greater-than-50-year floods occurred in small streams in Wilkinson County as the result of 12 inches of rain on July 19 and 8 inches on July 23, 1969. Comparatively low floods occurred on Tombigbee River at Columbus on July 8-9, 1968, although the 24-hour total rainfall of 16 inches there was the greatest ever recorded in Mississippi. Split storm periods and the rapid dissipation of the flood flows of small streams draining into Tombigbee River help to explain the minor flooding resulting from the intense rainfall.

00085

Wilson, K. V. Hurricane Camille - effect on stages in Ross Barnett Reservoir, Mississippi United States Geological Survey Research 1972, Chapter, B, United States Geological Survey Professional Paper 800-B: 253-254, 1972.

Hurricane Camille's winds tilted the surface of Ross Barnett Reservoir, Miss., as the storm center passed over the lake. At 8:00 a.m. on August 18, 1969, winds of 50 mph blowing directly downstream created stages of 298.0 feet at the gatehouse of the dam and 296.4 feet at State Highway 43. Between 8:00 and 9:00 a.m. the winds reversed and a large volume of water moved upstream. The inclination of the lake surface caused by the wind had a time lag in adjusting to changing wind direction.

00086

Burnett, C. R. Day-glow observations of upper atmospheric sodium at Boca-Raton, Florida. Journal of Optical Society of America, 63(4): 475- , 1973.

00087

Sterling, G. H. and E. E. Strohbeck. The failure of the South Pass 70 "B" platform in Hurricane Camille. Fifth Annual Offshore Technology Conference, Preprints, Volume 2: 719-730, 1973.

In August of 1969, Hurricane Camille swept across the central Gulf of Mexico making landfall on the Mississippi Coast. This major storm caused the loss of many lives and considerable property damage was inflicted on the Gulf Coast from New Orleans to Biloxi. Shell Oil Company lost its South Pass 70 "B" Platform and Gulf Oil Company lost a similar platform in a neighboring block. This paper discusses the evidence gathered in an intensive after-the-fact study conducted to ascertain the cause of failure of Shell's platform. The data include: post-Camille survey of above-water damage at other platforms in the area, topographical surveys, side-scan sonar runs, soil borings, and detailed diving and underwater television surveys of the fallen structure. The data conclusively show that the South Pass 70 "B" structure failed primarily because of sea floor soil movements.

00088

Stinson, P. J., S. A. Levandow and P. L. Anderkin. Preliminary statistical evaluation of 1971 weather-modification activities in Texas. Bulletin of American Meteorological Society, 54(3): 270-1973.

00089

U. S. Department of Commerce. Climatological data Louisiana. Annual and monthly summaries. 1957-1973.

00090

White, Robert M. The national hurricane warning program. American Meteorological Society Bulletin, 53(7): 631-633, 1973.

00091

Wilson, Basil W., Subrata K. Chakrabarti and Peter H. Feldhausen. Hindcast of deep-water wave energy spectra for Hurricane Audrey of 1957. Fifth Annual Offshore Technology Conference, American Institute of Mining, Metallurgical, and Petroleum Engineers, Preprints, Volume 2: 121-132, 1973.

A numerical procedure to predict wind waves traveling with and through storms, having irregular propagation rates and paths, is used to hindcast the deep water waves and wave spectral energy densities generated by Hurricane Audrey of 1957. The wind-fields for 4 fixed wave paths through Hurricane Audrey, convergent at a point on the Louisiana coast, are input into the deep water hindcast routine which predicts significant wave heights and periods along each path. Spectral energy densities computed for the continental shelf edge in each of the 4 wind fields are compared with

published data on similar storms in the Gulf of Mexico. The multi-directional wave aspects of Hurricane Audrey are examined near Bay Marchand, Louisiana. Approximate directional spectra for Bay Marchand are developed from 3 of the 4 wave paths in order to illustrate how directional spectra can be obtained from a significant wave hindcast routine. These spectra are discussed in relation to the directional spectrum model proposed by Pierson, et. al. for a fully developed sea.

00092

United States Department of Commerce. Climatological data, U. S. Department of Commerce, Environmental Sci. Serv. Adm., National Weather Records Center, Ashville, North Carolina (Alabama climatological data published monthly and annually).

00093

McCoy, Edward G. and Kenneth H. Johnston. The effects of wind and salinity upon the sedimentation rates of soils from dredging in Albemarle Sound, North Carolina. Division Inland Fish. North Carolina Wildl. Resour. Comm. Mimeo. 9 p, no date.

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Repeated injections of salt water through the lock chamber at the W. P. Franklin Dam causes a progressive increase in the chloride content of water in the fresh water reach of the Caloosahatchee River during low-flow periods. Vertical profiles in the contaminated reach of the river show essentially

the same chloride content of the water from the surface to a depth of about 12 feet and consistently higher concentrations at greater depths. The chloride content of the water in the deep and shallow zones decreases with increased distance upstream from the dam. In the deeper parts of the river channel, the upstream limit of water containing 250 mg/l (milligrams per liter) of chlorides was 11.4 miles from the dam in May 1968. At shallow depths, the upstream limit of water containing 250 mg/l of chlorides was 5.3 miles from the dam in May 1967 and 4.7 miles from the dam in April 1968.

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The Middle Gulf area is in the west-central coast of peninsular Florida and encompasses about 1,700 square miles. It contains the cities of Tampa, St. Petersburg, Clearwater, Brooksville, and Crystal River. The area is drained principally by seven streams, Crystal, Homosassa, Chassahowitzka, Weekiwachee, Pithlachascotee, and Anclote Rivers and Cypress Creek. The average daily discharge from the area not including peninsular Pinellas County and some coastal areas, for the period January 1964--June 1966, was 2,300 cfs (cubic feet per second), or about 1.5 bgd (billion gallons a day). The average daily discharge of Crystal River alone was 930 cfs (0.60 bgd), or nearly 40 percent of the total. No permanent regional declines in surface or ground-water levels have occurred in the area. The greatest local declines, ranging from 6 to 14 feet, occurred in the area of the well fields in north-west Hillsborough and Northeast Pinellas counties. The Middle Gulf area is part of a large hydrologic system. The total system encompasses an area of about 3,500 square miles and extends to the eastern topographic divide of the Withlacoochee River. The source of water for the system is rainfall which averages about 55 inches annually. Principal outflow from the system is evapotranspiration which amounts to about 67 percent of the total outflow. Runoff amounts to about 32 percent and ground-water outflow about 1 percent.

The Middle Gulf area is in the downgradient part of the larger Middle Gulf hydrologic system and most of the streamflow and ground-water outflow from the hydrologic system--discharges from the Middle Gulf area. During a near average period, June 1964-May 1966, precipitation on the Middle Gulf area was 114 inches; groundwater inflow, 24 inches; evapotranspiration, 77 inches; runoff, 59 inches; and ground-water outflow, 2 inches. Most of the runoff from the area is discharged either as springflow or seepage to streams from the Floridan aquifer. Eighty percent of the annual streamflow from the area is derived from the Floridan aquifer.

The water-level gradients in the system are about the same as the topographic gradients (2-3 feet per mile). Water levels in all lakes, streams, and aquifers within any one area fluctuate through about the same range, but the fluctuations are greatest in the upgradient areas.

Water levels are highest in the late summer or early fall following the rainy season and are lowest in late May or early June.

Inflow to the system occurs primarily from June to September. The change in storage from periods of high water level in late summer to low water level in late May is equivalent to about 8 inches of water over the Middle Gulf area.

Tide has a pronounced effect on the outflow from the areas. During periods of high tides, outflow is diminished and during periods of low tides outflow is increased.

The chemical quality of ground and surface water is good. The mineral content is generally less than 500 mg/l (milligrams per liter) in the ground water and 20 mg/l in the surface water except near the coast, where the mineral content of both surface and ground water may approach or be the same as that of sea water. Ample supplies of good quality water are available for existing and foreseeable uses. The present (1960) problems is one of water management and optimum development rather than the availability of water. By properly spacing wells, avoiding excessive pumping rates in localized areas and distributing well fields over wide areas, drawdowns between wells and between respective well fields would be minimized. Overdevelopment and subsequent declines in water levels, now reflected to some degree in lowered lake levels and in reduction of stream flow would be decreased. Implementation of measures noted would tend to minimize conflicts of interest between various water users throughout the area.

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On the other hand, autochthonous peats contained numerous ingrown rootlets and exhibited very little to no apparent bedding. Even after compression, these autochthonous peats did not develop the fine parallel laminations characteristic of many carboniferous coals.

The significance of this investigation lies in its contribution to our knowledge of the microscopic appearance of one type of allochthonously deposited peat. This provides some facts with which to evaluate the relative merits of the various arguments for or against the allochthonous and autochthonous

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Dial, Don C. Pumpage of water in Louisiana, 1970. Louisiana Water Resources Pamphlet Number 26, 10 p, 1970.

This report is the result of a survey of water use in Louisiana for 1970. Its purpose is to present basic information relating to surface--and ground-water pumpage. The information is applicable to many uses for which basic water data are needed. Table 1 summarizes surface-and ground-water pumpage by parish and category. The categories are public supply, industrial, thermo-electric, rural, and irrigation. Parish locations are shown on the map of Louisiana. Pumpage values in table 1 are shown to the nearest 0.01 mgd (million gallons per day) for consistency, but generally are not accurate to that degree. The total by source is rounded to the nearest 10 mgd. The data in table 1 were collected in the last half of 1969 and in early 1970. Thus, the pumpage values are indicative of conditions at the beginning of 1970. Total pumpage values for the calendar year 1970 are expected to be slightly higher because the trend in most categories is upward.

00164

Fleischer, Michael. Summary of the literature on the inorganic geochemistry of mercury. IN: Mercury in the environment. Geol. Surv. Prof. paper 713: 6-13, 1970.

00165

Hawkins, T. E. A study of economic value of increased ESSA services as related to estuarine dynamics in the Gulf Coast estuaries, Vol. II, 178 p, 1970.

The need for knowledge of estuarine dynamics; (need for mass flow measurements; need for water level measurements; need for water temperature measurements; need for a systems approach); over-all program concepts; (The instrumentation concept; the model concept); program and program costs; (Galveston Bay program definition; Galveston Bay program costs; long-term program and program costs).

00166

Hem, John D. Chemical behavior of mercury in aqueous media. IN: Mercury in the environment. Geol. Surv. Prof. Paper 713: 19-24, 1970.

00167

Herly, Henry G. Water levels in artesian and nonartesian aquifers of Florida, 1965-1966. Florida Department of Natural Resources, Bureau of Geology, Information Circular 61, 55 p, 1970.

00168

Klein, H., et. al. Some hydrologic and biologic aspects of the Big Cypress Swamp Drainage Area, Southern Florida. United States Geological Survey Open-file Report 70003, 94 p, 1970.

This report shows the importance of the Big Cypress in maintaining an adequate water supply for 1) the Everglades National Park, 2) the expanding population of southwestern Florida, and 3) the adjacent estuaries which constitute nurseries for fish, some of which are commercially important. Hydrological information defining the boundaries of Big Cypress Swamp and its subregions on which Everglades National Park depends for its water supply assist in predicting effects of alternative land uses within Big Cypress Swamp on the ecology of the Everglades National Park.

00169

MacDonald, H. C., A. J. Lewis, and R. S. Wing. Mapping and landform analysis of coastal regions with radar. Kansas University, Center for Research Inc. Lawrence Remote Sensing Lab, 14 p, 1970. Pub. Geological Society of America Bulletin 82: 345-358, 1971.

Except for a few cursory studies, the potential of radar as a tool for coastal geomorphology has not been documented. It was the purpose of this study to define both the capabilities and limitations of radar for coastal geomorphic studies, specifically to determine the coastal landforms that are identifiable.

00170

McCoy, H. J. and Jack Hardee. Ground water resources of the Lower Hillsboro Canal Area, Southeastern Florida. Florida Department of Natural Resources, bureau of Geology, Geological Survey Report of Investigations 55, 44 p, 1970.

The lower Hillsboro Canal area of this report occupies about 60 square miles of Palm Beach and Broward counties in southeastern Florida. All potable ground water in the lower Hillsboro Canal area is obtained from the Biscayne

aquifer. The aquifer extends from the land surface to a depth of about 400 feet and is composed of sand, sandy limestone, shells, and indurated calcareous sand.

Municipal well fields of Deerfield Beach and Boca Raton and most of the domestic, irrigation, and industrial wells obtain adequate water supplies from permeable limestone 90 to 130 feet below land surface. Rainfall in the area and induced infiltration from controlled canals provide the recharge to the aquifer. Sea-water intrusion, although a constant threat, has not advanced inland enough to contaminate either municipal well field. Intrusion from the El Rio Canal toward the Boca Raton well field appears to be stabilized, though further intrusion is a distinct possibility if fresh water levels are further lowered in the area. Data collection stations are maintained to monitor changes of the salt-water front in the aquifer.

Large quantities of water can be withdrawn from the interior part of the area without the attendant threat of salt-water intrusion. Hydraulic characteristics of the aquifer are similar throughout the area and high year-round water levels in the interior afford a potential source of immediate and long-term recharge to the aquifer underlying the coastal ridge.

The lower Hillsboro Canal area is still experiencing rapid growth with resultant demands for larger quantities of potable water. Although potable water is abundant, continuous observation and evaluation of changes in the hydrology of the area should be maintained to protect and efficiently manage the water resources of the area.

00171

Ruecking, F., Jr. A science improvement program for the Gulf Coast region introduction and part I. Rice University, Houston, Texas, Fondren Library, 110 p, 1970.

The work performed in this project was intended to help overcome some of the problems of resource sharing by directing attention to five objectives as follows: 1) to increase the flow of scientific and technical literature between libraries for the benefit of faculty and student, 2) to facilitate access to literature held by remote libraries, 3) to develop and implement a regional plan for acquisition aimed at increasing the total resources of the region by reducing unnecessary duplication of material, 4) to organize a computer-based system for recording any new additions to the regional base and to develop a regional union catalog of resources, 5) to determine the costs of maintaining a regional bibliographic center to permit calculation of participant costs.

00172

Sharp, J. M., D. E. Feray, R. F. Bearden, T. W. Bilhorn, and J. R. Crump. A study of economic value of increased ESSA services as related to estuarine dynamics in Gulf Coast estuaries, Vol. 1, 85 p, 1970.

The report covers an initial effort to determine the economic benefits to be derived from a description and prediction of the dynamic behavior of estuaries, or inland water areas, along the United States margin of the Gulf of Mexico. Such services have not yet been established; therefore, service costs were derived from conceptual design studies and estimates of operation and maintenance requirements. Since the services have not been in use, data have not been accumulated which would permit the determination of economic benefits on the basis of statistical treatment.

00173

Shenton, Edward H. Where have all the submersibles gone? *Oceans*, 3 (6): 38-56, 1970.

00174

Thomas, D. M. and M. A. Benson. Generalization of streamflow characteristics from drainage-basin characteristics: U. S. Geol. Survey Water-Supply Paper 1975, 55 p, 1970.

00175

U. S. Department of Agriculture. General soil map, Harris County, Texas. Soil Conservation Service Interim report, 66 p, 1970.

00176

Sea Grant Program. Sea Grant Program Operations, 1969-1970. Texas Agricultural and Mechanical University, Sea Grant Program, Publication TAMU-SG-71-104, 97 p, 1970.

00177

U. S. Department of Interior. National Estuary Study, Vol. 1 Fish and Wildlife Service, Bureau of Sport Fisheries and Wildlife and Bureau of Commercial Fisheries, Washington, D. C. 1970.

00178

U. S. Department of the Interior. National Estuary Study, Volume 7. Fish and Wildlife Service, Bureau of Sport Fisheries and Wildlife and Bureau of Commercial Fisheries, Washington, D. C. 1970.

00179

U. S. Department of the Interior. Water Resources Data for Louisiana--1968, 1970.

00180

U. S. Department of the Interior. Effects of pollution on water quality of Perdido River and Bay, Alabama and Florida. U. S. Department of the Interior, Fed. Water Pollution Control Admin., SE. Water Lab. Tech. Serv. Prog. Athens, Georgia, 33 p, 1970.

00181

Vernon, R. O. The beneficial uses of zones of high transmissivities in the Florida subsurface for water storage and waste disposal. Florida Department of Natural Resources, Bureau of Geology, Information Circular 70, 39 p, 1970.

00182

American Public Health Association. American Water Works Association and Water Pollution Control Federation. Standard Methods of the Examination of Water and Wastewater, Thirteenth Edition, 1971.

00183

Report on Environment 1971. Resource conservation in Alabama, revised, 12 p. 1971.

00184

Briggs, Philip T. and Joel S. O'Connor. Comparison of shore-zone fishes over naturally vegetated and sand-filled bottoms in Great South Bay. New York Fish Game J. 18 (1): 15-41, 1971.

00185

Barrett, B. B., et. al. Hydrology. Phase II in Cooperative Gulf of Mexico Estuarine Inventory and Study, Louisiana. La. Wild Life and Fisheries Comm., p. 9-130, 1971.

00186

Barrett, Barney B. Cooperative Gulf of Mexico estuarine inventory and study, Louisiana. Phase I, Hydrology, Phase III, Sedimentology. Louisiana Wild Life and Fisheries Commission, New Orleans, 191 p, 1971.

00187

Blanton, Wm. George and Carolyn Jo Blanton. The ecological impact of mercury discharge on an enclosed secondary bay, preliminary report No. 1. Texas Wesleyan College, Fort Worth, 109 p, 1971.

00188

Curliss, Jane, and Lee Trent. Comparison of Phytoplankton production between natural and altered areas in West Bay, Texas. U. S. Nat. Mar. Fish. Serv. Fish Bull. 69 (4): 829-832, 1971.

00189

Dominick, T. F. and B. Wilkins, Jr. Mathematical model for beach ground water fluctuations. Louisiana State University, Coastal Studies Institute, 10 p, 1971. Pub. in Water Resources Research 7 (6): 1626-1635, 1971.

The measurement of changing water levels across a tropical carbonate beach profile over three tidal cycles has provided basic data for the development of a predictive mathematical model of the fluctuation in the level of a beach table. The model is based on partial differential equations governing transient, one-dimensional movement of ground water through porous media. A finite difference algorithm for the digital computer was developed to solve the equations. Beach homogeneity and nonlinear boundary conditions imposed by tidal fluctuations were assumed in these calculations. Field measurements of water table fluctuations in Galleon Beach, Grand Cayman Island, show that the mathematical model simulates this system within the limits of accuracy of the experimental measurements.

00190

Duchrow, Richard M. and W. Harry Everhart. Turbidity measurement. Trans. Amer. Fish. Soc. 100 (4): 682-690, 1971.

00191

Everett, Duane E. Hydrologic and quality characteristics of the lower Mississippi River. Louisiana Dept. of Public Works, Techn. Rept. No. 5, 48 p, 1971.

00192

Ferrell, R. E. and R. A. Brooks. The selective adsorption of sodium by Clay minerals in Lakes Pontchartrain and Maurepas, Louisiana. *Clays and Clay Minerals*, 19: 75-81, 1971.

Ion exchange analyses of the clay-sized fraction of sediments in Lakes Pontchartrain and Maurepas suggest the selective adsorption of Na at the expense of Mg. The literature suggests that Mg should be preferentially adsorbed. As the chlorinity of the lake waters increases from 300 mg/l to 3250 mg/l, the percentage of exchangeable Na increases from 13.6 to 30.6 while the percentage of exchangeable Mg decreases from 65.6 to 36.8. The observed exchangeable Na percentages are higher than the ones calculated from the sodium-ratios. The difference is attributed to an increase in the Na exchange constant of the sediment and therefore an increased selectivity for Na. With an increase in chlorinity, montmorillonite increases from 47 to 61 percent and the total of the exchangeable cations (Na, Mg, Ca, K) increases from 36 to 82 m-equiv/100 G.

00193

Foster, James B. and Charles A. Pascale. Selected water resource records for Okaloosa County and adjacent areas. Florida Department of Natural Resources, Bureau of Geology, Information Circular 67, 95 p, 1971.

00194

Gillespie, M. C. Cooperative Gulf of Mexico Estuarine Inventory and Study, Louisiana, Phase I, Area Description and Phase IV, Biology, La. Wild Life and Fisheries Comm., p. 190-175, 1971.

00195

Healy, Henry G. Water Levels in artesian and nonartesian aquifers of Florida, 1967-1968. Florida Department of Natural Resources Bureau of Geology, Information Circular 68, 61 p, 1971.

00196

Heath, Richard D. and E. Turner Wimberly. Selected flow characteristics of the Florida streams and canals. Florida Department of Natural Resources, Bureau of Geology, Information Circular 69, 595, p, 1971.

Tables of flow duration, lowest mean discharge, and highest mean discharge for selected consecutive periods within each year through September 30, 1965, at 254 stream-gaging stations on Florida streams are presented. These tables summarize daily streamflow records needed to define flow characteristics at stream-gaging sites. The content of each of three summary tables is described,

and techniques for preparing flow-duration curves, and low-flow and high-flow frequency curves are explained.

00197

Keyes, Paul L. Jurassic geology of Flomation area of southern Alabama. American Association of Petroleum Geologist Bulletin, 55 (2): 347, 1971.

Flomation field, in Escambia County, Alabama is the first major gas condensate discovery from the Jurassic Norphlet Formation in Alabama. Structurally the field is a NW-SE trending, low-relief salt feature bounded on the north and east by a major down-to-the-earth fault which is part of the Pickens-Gilbertown-Pollard regional fault system. The Norphlet sandstone reservoir is about 60 ft. thick and produces 002 and sour gas with a high condensate yield.

The paleostructural history of the area indicates that movement of Lournn salt and faulting occurred, probably as a result of gravity slide and basinward salt creep, forming structures, capable of trapping hydrocarbons. Jurassic deposition was affected by these early structural features and by persalt topography that existed updip from the flomation area.

Norphlet clastics were derived from the northeast and deposited by braided stream systems. As the Jurassic Smackover seas transgressed the area, the upper part of the Norphlet was partly reworked. In the Flomation area, the overlying Smackover Formation is a dark-brown, dense, micritic limestone. Above the Smackover, the Haynesville Formation can be subdivided into upper and lower members with the upper Haynesville consisting of predominantly red, coarse clastics and the lower member being fine, red clastics and evaporites. At Flomation, over 300 ft. of bedded salt has been drilled in the lower Haynesville causing many drilling and completion problems. The Cotton Valley Group marks the top of the Jurassic and consists primarily of coarse, gravelly clastics.

00198

Khan, Rashid A. Geochemical Hydrology of the groundwater in Baton Rouge, Louisiana. Ph.D. Dissertation, Louisiana State University and Agricultural and Mechanical College, 104 p, 1971.

Chemical character of the groundwater in the Baton Rouge area of Louisiana is a function of several physiochemical processes, including ion exchange, filtration due to clay compaction, mineral solubility, and mixing of the waters. Chloride water is a mixture of diagenetically altered sea or estuarine water with fresh water. The chloride waters originated from the dilution or original trapped salty water by fresh waters. Sodium bicarbonate water is the result of ion exchange and membrane filtration. Membrane filtration is most active in the area of maximum land surface subsidence. The Ca and Mg bicarbonate waters formed at shallower depths, are principally due

solution of carbonate minerals. Regression analyses suggest that ionic character of the groundwater is not related to the area of supposed recharge, but to the depth of occurrence, the Mississippi River, and extensive withdrawal of water in the industrial area. Hydrochemical facies indicate that Baton Rouge fault acts as a hydrologic barrier.

00199

Klein, Howard. Depth to base of potable water in the Floridan aquifer. Florida Department of Natural Resources, Bureau of Geology, Map Series 42, 1971.

00200

Leach, S. D., Howard Kelin and E. R. Hampton. Hydrologic effects of water control and management of southeastern Florida. United States Geological Survey Open-file Report, 1971.

00201

Louisiana Wild Life and Fisheries Commission. Compilation of laws pertaining to wild life and fisheries: 96, 1971.

00202

Louisiana Wild Life and Fisheries Commission. Cooperative Gulf of Mexico estuarine inventory and study, Louisiana. Phase I Area Description, Phase IV, Biology, 175 p, 1971.

00203

Lynch, Daniel. Phenology, community composition, and soil moisture in a relict at Austin, Texas. Ecology, 52 (5): 840-847, Late Summer 1971.

Two plant communities, one dominated by Andropogon scoparium Michx. and the other by shorter grasses and forbs, have changed considerably in floristic composition and areal coverage since the end of the 1950-56 drought. A phenological study at the end of the drought indicated a direct relationship between percentage of species vegetative and reproducing and percentage of soil moisture. A second study after 4 years of above-normal precipitation showed no such relationship. The total number of species in an enclosure encompassing both communities was relatively unchanged after 4 years of above-normal precipitation, although the species turnover was 37%. Frequency data from 40 permanent plots, 20 in each community, showed a species turnover of 85.5% in the plots in the Andropogon Community and 91.7% in those in the grass and forb community during the 5-year period from 1958-59 to 1963-64.

The total number of species in the plots, however, remained relatively unchanged. The years of above-normal precipitation resulted in the invasion of the grass and forb community by A. scoparius and the replacement of the dominant community by Trisetum interruptum Buckl. and Sporobolus vaginiflorus (Torr.) Wood. The position of the ecotone between the two communities at the end of the drought and the path of A. scoparius invasion appear to be a function of soil moisture as affected by soil depth. The soil in the Andropogon Community to a depth of 6 dm is more moist at almost all times of the year than that in the grass and forb community. At the end of the drought A. scoparius occupied soil 9 dm or more deep. With succeeding years of above-normal precipitation it invaded the grass and forb community along a gradient of decreasing soil depth.

00204

Marie, James R. Ground-water resources of Avoyelles Parish, Louisiana. Louisiana Geological Survey and Department of Public Works, Water Resources Bulletin 15, 70 p, 1971.

Rocks composing the fresh-water-bearing zone underlying Avoyelles Parish in east central Louisiana, range in age from late Tertiary to Pleistocene. Upper Tertiary rocks form a southward-thickening wedge of interfingered continental and marine deposits. They are overlain by Quaternary Alluvial deposits averaging 150 feet in thickness, whose average coefficients of permeability and transmissibility are 2,000 gpd per sq. ft. and 200,000 gpd per ft. respectively. Water from this aquifer is hard, and has a high iron content. The Tertiary aquifer system, from 20 to 80 feet thick, has average coefficients of permeability and transmissibility of 250 gpd per sq. ft. and 10,000 gpd per ft, respectively, in the eastern part of the parish, and of 800 gpd per sq. ft. and 65,000 gpd per ft. respectively, in the western part. Its water is soft, but in the southwest has too high a fluoride content for public use. Water levels in both aquifers are generally less than 50 feet below land surface and wells are the source of water for most uses.

00205

McNulty, J. Kneeland, William N. Lindall, and James E. Sykes. Inventory of natural and man-made features of estuaries of the west coast of Florida. St. Petersburg Beach, Fla.: National Marine Fisheries Service Laboratory.

00206

Meyer, Frederick W. Saline artesian water as a supplement. American Water Works Association Journal, 63 (2): 65-71, 1971.

Large quantities of moderately saline water (less than 5,000 mg/liter dissolved solids) can be obtained from artesian water-bearing zones in the Avon Park Limestone of Eocene age--the top of which occurs at a depth of

about 1,200 ft. in southern Florida. Small quantities of less saline water can be obtained from artesian water-bearing zones in the Hawthorn, Tampa, and Suwanee Formations between 300 and 1,100 ft. in depth. Artesian water could be used for small desalting plants in the Florida Keys and the Coastal Lowlands area at considerable savings over using sea water. The use of raw artesian water from below 1,300 ft. for dry-weather biological survival ponds in the Everglades, such as in the Everglades National Park, is infeasible because the salinity is too high for some species of plants and animals. Generally, piezometric levels, salinities, and flows increase with depth in southern Florida.

00207

Nilsson, Rolf. Removal of metals by chemical treatment of municipal waste water. *Water Res.* 5: 51-60, 1971.

00208

Perret, W. S., B. B. Barrett, W. R. Latapie, J. F. Pollard, W. R. Mock, B. G. Adkins, W. J. Gaidry, C. W. White. Cooperative Gulf of Mexico Estuarine Inventory and Study, Louisiana. Phase I, Area Description and Phase IV, Biology, La. Wild Life and Fisheries Comm. 175 p, 1971.

00209

Physical Sciences Engineering. A directory of information resources in the United States. Science and Technology Division, National Referral Center, Washington, D. C., 1971.

00210

Russell, R. J. Water table effects on seacoasts. Louisiana State University, Coastal Studies Institute, 6 p, 1971

Calcareous cementation of unconsolidated sediments and soils within the zone of water-table fluctuation in tropical climates results in the development of widespread layers of water-table rock that extend between beach rock and stream rock outcrops, as well as for considerable distances inland. Along cliffy coasts in any climate, the water table separates weathered and leached rock, which is readily erodible, from underlying sections of relatively resistant rock. For the reason that coastal retreat lowers levels, and the resulting topography is subject to misinterpretation, such as the postulation of a very recent, somewhat higher, stand of sea level.

00211

Russell, R. J. Beaches and ground water of Cape Sable, Florida during extreme drought. Louisiana State University, Baton Rouge Coastal Studies Institute, 18 p, 1971.

In October 1969 beaches and water were investigated after 5 months of adequate rainfall in the Cape Sable, Florida complex. In April 1971 a similar study was made after months of extreme drought in the Florida Everglades when water tables were lowered enough to permit widespread saltwater intrusion. Much of the beach rock and cemented water-table rock under the beaches had been eroded by high-energy waves. Slabs of the eroded beach rock were tossed up on the beaches and became incorporated into the deposits. On East and Northwest Capes the groundwater had been replaced by seawater. On Middle Cape the water table was lowered, but a salinity gradient and some potable ground water were present in 1971. The Cape Sable region is isolated from mainland surface runoff by extensive areas of lakes and saline waterways, and from subsurface flow of groundwater by a thick section of compact marl and compressed peat. Accumulation of groundwater depends on local rainfall.

00212

Shroff, G. H., I. C. Watson and R. D. Cross. Analysis and summary of reports and data from the Freeport, Texas, test bed plant. Office of Saline Water Research and Development Progress Report number 759, 364 p, 1971.

The multiple-effort falling-fill-evaporation method of desalination is discussed. Most of the data are derived from development studies. Technical, logistical, and economical evaluations are presented, also the process and mechanical development program results are related to the Vertical Tube Evaporator (VTE) process in particular, and desalination in general. Actual capital and operating costs are presented and compared to theoretical "normalized" capital and operating costs. Production and maintenance cost averages are presented; relevant operating and maintenance experiences are discussed. A thorough technical evaluation of the performance of the process, the mechanical equipment, and the construction materials is included.

00213

Stephens, John C. and William H. Speir. Subsidence of organic soils in the U. S. A. with French abs. IN: Land Subsidence, Vol 2, International Association of Science Hydrology Publication 89 (IASH - UNESCO), 523-534, 1971.

Organic soils subside when drained by shrinkage from drying, loss of groundwater buoyancy, compaction, wind erosion, and biochemical oxidation. Relative loss due to each factor depends on soil origin, climate, and land management. Investigations in the U. S. A. show shrinkage rate proportionate to drainage depth--the lower the water table, the greater the subsidence.

Level surveys at 5-year intervals from 1913 to 1968 have established the pattern of subsidence in the Florida Everglades; initially rapid, mainly from shrinkage and compaction, then declining to a steady rate, primarily from oxidation, until underlying mineral material is reached. Arable peats have averaged sinking 3 cm per yr. Predictive studies indicate Everglades peats will be too shallow for agricultural use by 2000 A. D. Under similar drainage organic soils subside faster in warm climates, and lowmoor faster than highmoor peats.

00214

Stewart, J. W., et. al. Potentiometric surface and areas of artesian flow, May 1969, and change of potentiometric surface 1964-1969, Floridan aquifer, Southwest Florida Water Management District, Florida. United States Geological Survey Hydrologic Investigations Atlas HA-440, 1971.

Potentiometric contours of the Southwest Florida Water Management District are shown on a USGS base map, scale 1:500,000, and areas of decline, no change or rise of water levels during the record period are given in various colors. The change in potentiometric surface, 1949-1969, is shown by hydrographs of selected wells, and the various changes and range in amount of changes are shown by color patterns on a smaller map. The water level of the Floridan aquifer in the Water Management District ranges from sea level near the Gulf of Mexico to 120 ft above sea level in the east-central part of the area. Changes in potentiometric surface 1949-69 for the entire area range from no decline to about 60 ft of decline. Areal declines of the potentiometric surface 1964-69 of more than 20 ft are centered about 35 mi. east of Tampa Bay.

00215

Taras, Michael J. Standard methods for the examination of water and wastewater. Amer. Public Health Ass., Washington, D. C. 874 p, 1971.

00216

Interim Study Committee on Oceanography, Texas State House of Representatives and Texas Agricultural and Mechanical University. Report of the interim study committee on oceanography. Texas State House of Representatives. Texas Agricultural and Mechanical University, 24 p, 1971.

As the result of a resolution introduced in the 61st Legislature, the Interim Study Committee on Oceanography was created to study the feasibility of creating a Texas Institute for Oceanography. After a year of hearings and other investigations, the Committee recommended that decision for an Institute be deferred because marine-oriented programs in existing institutions are still in formative stages. Instead, a 12-member Texas Council on Marine-Related Affairs was proposed as a forum for expert judgment and

advice. Also recommended was creation of a position within the Governor's Office of Coastal Zone and Marine Affairs Administrator. The committee report reviews the economic impact of marine activities on Texas and makes recommendations on coastal development, scientific research, education and government functions.

00217

Goals for Texas in the Coastal Zone and the Sea. Summary of a Conference. Co-sponsored by the Office of the Governor of the State of Texas and the Sea Grant Program Office, Texas A & M University. College Station, Texas, January, 1971.

00218

University of Florida. Annual research report of the Institute of Food and Agricultural Sciences. University of Florida, 251 p, 1971.

Bibliography and catalogue of research in progress.

00219

United States Department of Agriculture. Water and related land resources, coastal and independent streams, river basins, Mississippi and Louisiana. The Miss. Board of Water Commissioners and the Louisiana Dept. of Public Works, Jackson, Mississippi, 160 p, 1971.

00220

Clear Creek, Texas, flood control. Army Engineer District, Galveston, Texas, Draft Environmental Statement (12F 1971), 12 p, 1971.

The Clear Creek, Texas flood control project would provide flood protection to the rapidly urbanizing areas adjacent to the stream in Brazoria, Galveston, and Harris Counties through enlargement and rectification of the natural stream channel. The sharper bends would be cut off to improve the channel alignment, resulting in an improved channel length of about 31 miles. The size of the improved channel would vary from a bottom width of 200 feet at the lower end to 76 feet in the upper reaches. The improvement, as authorized, would provide full protection from floods having a frequency of occurrence of once in about 100 years. The removal of brush, undergrowth, weeds, and some trees within the banks of the improved floodway will remove natural habitat and vegetative cover for small animals and birds. Excavation will eliminate relatively small amounts of marsh land. Temporary increase of turbidity during construction would have no permanent effect on water quality.

00221

Environmental Statement. Aquatic plant control program, State of Texas. Army Engineer District, Galveston, Texas, 15 p, October 22, 1971.

The effects of infestations, control, and progressive eradication of obnoxious plants in the major rivers and coastal drainage areas of Texas are presented. Adverse environmental impacts are evaluated.

00222

U. S. Department of Commerce. Fishery statistics of the United States. U. S. G. P. O., Washington Stat. Digest 62: 189 p, 1971.

00223

Environmental Protection Agency. Methods for chemical analysis of water and wastes. Water Quality Office, Analytical Quality Control Lab. Cincinnati, Ohio, 312 p, 1971.

00224

Wright, Arthur L. and Warren T. Mathews. Economic development and factors affecting industrial location on the Texas coast. Texas A & M University, June, 1971.

Socio-economic characteristics of the Gulf Coast.

00225

Yokel, B. J. and D. C. Tabb. Can coastal resources survive development. Rosensteel School of Marine and Atmospheric Science, 5 p, 1971.

The establishment of the Rookery Bay Sanctuary in Florida by the Collier County Conservancy, the National Audubon Society, and other interest groups is described. The effectiveness of local interest groups in protecting the environment and controlling local development is clearly demonstrated.

00226

Zack, Allen L. Ground-water pumpage and related effects, southwestern Louisiana, 1970, with a section on surface-water withdrawals. Louisiana Geological Survey and Department of Public Works, Water Resources Pamphlet 27, 33 p, 1971.

Ground-water withdrawals for rice irrigation in southwestern Louisiana are inversely related to total rainfall during the growing season. This relation

can be used to estimate ground-water pumpage if precipitation figures are known. Continually increasing pumpage from Chicot aquifer has caused levels to decline steadily, which necessitates frequent lowering of pump intakes in the Lake Charles area and locally in Evangeline Parish. A map showing average annual rate of water-level decline in southwestern Louisiana can be used to approximate future water levels at any location, highlights critical areas of high pumpage and low transmissivity, and delineates recharge boundaries of Chicot aquifer. Heavy ground-water withdrawals in the Lake Charles area have caused salt-water encroachment in the aquifer. In parishes along Atchafalaya River, salt-water monitor wells indicate decreasing amounts of chloride in ground water probably due to induced recharge from the river.

00227

Armstrong, A. S. Need for offshore terminal development. Meeting Preprint 1780 of the American Society of Civil Engineers National Transportation Engineering Meeting, July 17-21, 1972, Milwaukee, Wisconsin.

00228

Buchanan, R. J. and J. H. Hartwell. Analysis of water level data for Everglades National Park, Florida. United States Geological Survey Open-file Report 72004, 30 p, 1972.

Stage-duration curves were developed from data collected 1953-69 at five gaging stations in Everglades National Park, Florida. Four of the five curves show similar characteristics with an increase in the slope when the water level is below land surface. Monthly stage-duration curves, developed for one of the stations, reflect the seasonal trends of the water level. Recession curves were prepared for the same five stations. These curves represent the average water-level decline during periods of little or no rainfall, and the decline in level is shown at the end of 10, 30 and 60 days for any given initial state. A family of curves was also prepared to give the recession from various initial stages for any period up to 60 days.

00229

Chabreck, R. H. Vegetation, water, and soil characteristics of the Louisiana coastal region. La. Agr. Exp. Sta., Bull, 664, 72 p, 1972.

00230

Cohen, H. Water law in Alabama - A comparative survey. Alabama Law Review, 24: 453-489, 1972.

The state of the law in Alabama with regard to water in surface watercourses, groundwater and diffused surface waters is analyzed. The Alabama courts rejected very early the prior appropriation rule in favor of the reasonable use and riparian rights rules to regulate consumptive uses of surface watercourses. In relationship to non-consumptive uses discussion focuses on the concept of navigability, ownership of the bed under the water and the public trust doctrine. For underground waters the common law rule, the reasonable use rule, the prior appropriation rule and the correlative rights rule are described. Alabama follows the reasonable use rule. The law relating to diffused surface waters is discussed in terms of the common enemy rule, the civil law rule, and the reasonable use rule. Alabama Courts have followed a modified civil law rule, much like the reasonable use rule and a strict civil law rule. A fundamental deficiency in the law is the lack of recognition of the interrelatedness of the hydrologic cycle. The theme running through a great deal of the present law is reasonable use. However, it is obvious that the present court-made policies are in need of repair. Wise water decision making depends on hydrologic and planning expertise.

00231

Congressional Publications committee Serial No. 92-27. Outer Continental Shelf policy issues, part 3. Congressional Information Service, 1972.

Contains invited comments, submitted statements, correspondence, scientific papers, and prepared responses by various Federal agencies and one State to a set of committee questions on legal, management, economic, environmental, conservation, and other issues related to administration of the Outer Continental Shelf Lands Act.

00232

D'Itri, Frank M. Mercury in the aquatic ecosystem. Michigan State Univ. Inst. Water Res. Tech. Rep. 23. 101 p, 1972.

00233

Ereli, Eliezer. The environmental regulations of the sea and its resources - cases and materials. The Texas Law Institute of Coastal and Marine Resources. University of Houston, 1972.

00234

Ferguson, D. E. Annual compilation and analysis of hydrologic data for urban studies in the Houston, Texas, metropolitan area, 1970. U. S. Geological Survey Open-file Report (Texas District), 275 p, March, 1972.

Basic hydrologic data were collected in the Houston urban area for the 1970 water year (October 1969 to September 1970) primarily to determine the effect of urban development on flood peaks and volume. Rainfall for the year was unevenly distributed. Individual totals ranged from 32.2 inches at the Houston City rain gage to 58.1 inches at the Houston Alief rain gage. The comparison of accumulated monthly rainfall is shown for the 1970 water year over four widely separated drainage basins with the 30 year average (1931-60) at the Houston FAA Airport rain gage. Emphasis is given to the storms of May 1, 15-16, 21 and 30-31 when moderately heavy amounts of rain fell. Because the rains were frequent and had low intensities and long durations, they were the most significant storms of the current year. The largest amount of rainfall for an individual storm was 6.3 inches. This rainfall occurred on May 15 at the station Greens Bayou at U. S. Highway 75.

00235

Fetter, C. W., Jr. The concept of safe groundwater yield in coastal aquifers. Water Resources Bulletin, 8 (6): , 1972.

The traditional factors used to determine safe yield of a groundwater basin (water supply, economics, water quality and water rights) do not include environmental effects. Because of the unique estuarine ecosystems associated with many coastal aquifers, environmental effects should be included in the determination of the safe yield of these aquifers. Controlled saline-water intrusion should be considered as a management tool in coastal aquifers. Artificial aquifer recharge using treated wastewater may be used to increase the safe yield of a coastal aquifer system while preserving the ecology of the coastal ecosystems.

00236

Fisher, W. L., L. F. Brown, Jr., J. H. McGowen, and C. G. Grant. Environmental Geologic Atlas of the Texas Coastal zone. Galveston-Houston area. Bureau of Economic Geology, The University of Texas at Austin, Austin, Texas 78712, 91 p, 1972.

Contents of this Atlas include: 1) environmental geology, 2) physical properties, 3) environments and biologic assemblages, 4) current land use, 5) mineral and energy resources, 6) active processes, 7) man-made feature and water systems, 8) rainfall, discharge, and surface salinity, 9) topography and bathymetry.

00237

Environmental geology and hydrology, Tallahassee area, Florida. Florida Bureau of Geology Special Publication Number 16, 61 p, 1972.

This pictorial review describes the relationships between environment and hydrology in the Tallahassee, Florida, area. Pictures, maps, illustrations,

and literature include descriptions pertinent to topography, geology, water resources, mineral resources, energy resources, and land use. Normal yearly rainfall ranges from 57 inches in southwestern Leon County to about 52 inches in the northeastern part of the county. Leon County's physical features are separated into four major divisions--the high, sandy, clay-hill northern part; the wet, low, sand and limestone southern part, dotted with innumerable small lakes and sinks; the flat, sandy, swampy, and forested western part; and the valleys of the two major rivers. Water for the city of Tallahassee's system is pumped from 13 wells, ranging from 18 to 24 inches in diameter and from 290 to 470 feet deep. Their total rated capacity is 34 mgd. Surface water in Leon County is of good chemical quality, being soft (hardness ranging from 0 to 60 mg/liter) and low in chloride and dissolved solids. Recreation activities constitute its primary use. Most wells in the county yield hard water (121 to 180 mg/liter) and produce water suitable for use without treatment.

00238

State University System of Florida, Institute of Oceanography. Western Florida Continental Shelf Program, 12 p, 1972.

The purpose of this project is to study the natural fluctuations in the yet relatively unexploited stock of commercial fish for annual and seasonal variations in the abundance of spawning products, i.e., eggs and larvae, on the Western Florida Continental Shelf. Samples would be collected by a controlled rate of lowering and retrieval, double oblique 505 mesh plankton tows to within five meters of the bottom or to a maximum depth of 200 meters with environmental support information in the form of temperature and salinity.

00239

Foster, James B. and Donald A. Goolsby. Construction of waste injection monitor wells near Pensacola, Florida. Florida Department of Natural Resources, Bureau of Geology, Information Circular 74, 34 p, 1972.

00240

Foster, J. B. Guide to users of ground water in Bay County, Florida. Florida Department of Natural Resources, Bureau of Geology, Map Series 46, 1972.

00241

Gabrysch, R. K. Development of ground water in the Houston District, Texas, 1966-69. Texas Water Development Board, Report 152 (June): 24, 1972.

Total withdrawals of groundwater in the Houston District increased from about 412 mgd (million gallons per day) in 1966 to 507 mgd in 1969. Almost all of

the increase occurred in the Katy, Pasadena, and Houston areas. Pumpage in the NASA area has become significant in the past few years, increasing from 5.3 mgd in 1966 to 11.2 mgd in 1969. Small increases occurred in the Baytown-La Porte and Texas City areas, but pumpage remained almost constant in the Alta Loma area. Water-level declines continued, generally at a greater rate than before 1966. The greatest declines in the past several years were in the Houston area, but the center of decline is still in the Pasadena area. Although salt-water encroachment is probably in the district, no large increases in chloride were measured at the monitoring points.

00242

Gamles, G. C. The energy crisis in the United States. Unpublished report given at the American Society of Mechanical Engineers Winter Annual meeting on November 27, 1972

00243

Gangstad, E. O. Aquatic plant control program. Proceedings, research planning conference on aquatic plant control project, 12 January, 1972.

Mechanical equipment used for aquatic plant control in Louisiana; current investigations in the Jacksonville district concerning mechanical harvesting of obnoxious aquatic plants; aquatic plant control in the Panama Canal; aquatic plant control program in Texas; beneficial aquatic plants in the coastal areas; mechanical equipment weed witch for aquatic plant control; summary of 002 laser-water hyacinth laboratory research; field laser; capabilities of the WES reproductions and reports office.

00244

Hanor, J. S. The chemical exchange capabilities of the Baton Rouge groundwater system. Louisiana Water Resources Research Institute, Completion Report, 14 p, 1972.

A preliminary study was made of the chemical exchange capabilities of the Baton Rouge groundwater system. Such information is necessary to evaluate the potential of the system for the controlled modification of water quality. All available analyses of subsurface waters in the area were digitized, and series of computer programs were written for the thermodynamic evaluation and classification of the waters. This work has shown that the aquifers constitute a dynamic system which has reacted and evolved in composition as water has been withdrawn. For example, the maximum NA/K ratio of fresh waters in deep aquifers has increased by over an order of magnitude in the last 30 years. Study of subsurface logs has shown that considerable variation exists in the spatial distribution of potential exchange sites within the aquifers. The 2400 foot aquifer may be particularly suited for the controlled modification of water quality because of its abundant intercalated

clay lenses. This work is directed toward a fuller understanding of the reaction kinetics and exchange potential of the system.

00245

Healy, Henry G. Water levels in artesian and nonartesian aquifers of Florida, 1969-1970. Florida Department of Natural Resources, Bureau of Geology, Information Circular 73, 61 p, 1972.

00246

Healy, Henry G. Public water supplies of selected municipalities in Florida, 1970. Department of Natural Resources, Bureau of Geology, Information Circular 81, 213 p, 1972.

00247

Hudson, L. Salt water is a mineral: ownership of a national resource of increasing importance in oil producing states. Texas Law Review, 50: 448-461, 1972.

History, legal precedent, and policy are analyzed to show why salt water should be considered as a mineral subject to ownership as such. The problems in defining salt and domestic water are analyzed. A legal distinction between surface and subsurface water is legally more significant. The historical interrelation of salt water and petroleum is traced to show that the two occur together and that in Eastern states the salt lease was the forerunner of the oil and gas lease. The construction of the phrase oil, gas and other minerals is discussed as cases have defined it. It is concluded that salt water is included in the term other minerals and that the following results arise as salt water is regarded as a mineral; the confusion in cases holding that water belongs to the surface estate would be eliminated since cases salt water belongs to the mineral estate would be explainable; it would become readily apparent that the surface estate and not the mineral estate should lease domestic water; royalty provisions for sale of salt water would become enforceable; making salt water a mineral subjects it to the states' duty to conserve natural resources; salt water production could be taxed; and the state of Texas will be declared owner of salt water under much land.

00248

Jennings, Feenan D. Baseline studies of pollutants in the marine environment and research recommendations. Int. decade Ocean Exploration Baseline Conf. May 24-26, 1972, New York, 54 p, 1972.

00249

Johnson, C. Legal assurance of adequate flows of fresh water into Texas Bays and estuaries to maintain proper salinity levels. *Houston Law Review*, 10 (3), 1972.

00250

Kenney, Dennis R. The fate of nitrogen in aquatic ecosystems. *Univ. Wisconsin Water Resour. Center, Lit. Rev.* 3:59 p, 1972.

00251

Lohse, A., J. W. Tyson, I. A. Miller and T. W. Bilhorn. The Gulf environmental program. Fourth Annual Offshore Technology Conference, American Institute of Mining, Metallurgical, and Petroleum Engineers Preprints, Vol. 2: 569-582, 1972.

The Gulf Environmental Program, representing six years of planning by more than 300 scientists familiar with the Gulf of Mexico, in projects ranging from literature surveys and identification of new information needs to initial selection of 105 proposals designed to meet those needs, is now ready for implementation. Utilizing natural environmental subsystems of the Gulf megasystem and embracing the hard sciences, economics, law and sophisticated modeling, the GEP is designed to provide knowledge of environmental processes and their functional relationships necessary to effective management and optimum use of the Gulf environmental system and resources.

00252

Miloy, Leatha F. and Kathi J. Jensen (ed.). *Texas and the Gulf of Mexico - a general guide to marine science in the Texas Gulf Coast Region - second edition.* Department of Marine Resources Information Center for Marine Resources, Texas A & M University, 300 p, 1972.

Gulf Coast: Geology, offshore oils and minerals, biology, fisheries and fishing industry physical characteristics, engineering, coastal zone, parts and waterways, organization.

00253

Newton, Milton B., Jr. *Atlas of Louisiana: A guide for students.* Louisiana State University School of Geoscience Misc. Publication, 1972.

00254

Pascale, Charles A., Carl F. Essig, Jr., and Renee R. Herrings. Records of hydrologic data, Walton County, Florida. Florida Department of Natural Resources, Bureau of Geology, Information Circular 78, 103 p, 1972.

00255

Potter, Janer Landis and Tom J. Mabry. Origin of the Texas Gulf Coast island populations of *Ambrosia psilostachya*: a numerical study using terpenoid data. *Phytochemistry*, 11 (2): 715-723, 1972.

The volatile terpene and sesquiterpene lactone patterns for 20 populations of *Ambrosia psilostachya* from the Texas Mainland and Gulf Coast Islands and 7 populations of *A. cumanensis* from near Vera Cruz, Mexico, were determined and the resulting volatile terpene data were analyzed by numerical classification methods. The terpene data indicated that the Texas Gulf Coast islands populations of *A. psilostachya* are genetically closer to the Vera Cruz, Mexico populations of *A. cumanensis* than they are to the Texas mainland populations of *A. psilostachya*.

00256

Randazzo, Anthony F. Petrography of the Suwannee limestone. Florida Department of Natural Resources, Bureau of Geology, Bulletin 54, part 2, 13 p, 1972.

The true character of the Suwannee Limestone can be ascertained best by thin section studies. The petrography of this formation has never been determined. In order to describe and recognize the nature of the limestones present and investigate the relationships observed or suspected in megascopic observations, a typical exposure was selected for sampling. Specimens were collected vertically from the south wall of the Camp Quarry located near Brooksville in the NW 1/4 SW 1/4 Sec. 8, T22S, R18E. These samples were taken at approximately one-foot intervals wherever possible. Thin sections were prepared for 27 of these samples. The petrographic analysis which resulted in the establishment of microfacies took into consideration mineralogy, original texture, clastic and chemical constituents, diagenetic effects, and paleontology. Petrographic nomenclature follows that of Folk (1962). Approximately 300 points were counted for each slide resulting in an accuracy of plus or minus 4 percent in the 10-80 percent range according to van der Plas and Tobi (1965). Results of point counting are presented in Table 1. A preliminary set of four microfacies was recognized in the vertical section. This set demonstrates the petrographic nature of the formation in this area but can be applied to megascopically similar rocks in the region. The calcilutite, described megascopically in the field, contains the sandy pelmicrite and sandy intrasparite facies and the calcarenite includes the biopelsparite and biosparite microfacies. Future petrographic studies in nearby areas, as well as in the type section in Suwannee County, will better define the Suwannee limestone and substantiate megascopic observations. The vertical distribution of these facies is shown in figure 1. The biopelsparite and

biosparite facies are confined to the lower 3/4 of the section, while the sandy pelmicrite and intrasparite are found in the upper 1/4.

00257

Snyder, R. H., L. C. Buehrer, W. H. Dorsey, F. O. Bell, and P. Messinger. A survey of the subsurface saline water of Texas, vol. 1, Texas Water Development Board Report, 157, 113 p, 1972.

Results are presented of an investigation of the major saline aquifers in the State of Texas. Saline water, as defined in this report, is water having more than 3,000 ppm of total dissolved solids. The inventory is to serve as a basic reference to the occurrence and availability of large quantities of subsurface saline water that could be utilized in future desalting operations. The study was conducted in three basic parts: the salinity of the aquifers, the productivity of the aquifers, and the geology of the aquifers. The aquifer salinity inventory consists of a computer listing of total dissolved solids, sorted by formation and depth and listed by counties. The aquifer productivity portion consists of an extensive computer listing of the basic rock properties or porosity and permeability, sorted by depth ranges and by geological formation and listed by counties. The geological portions include the mapping of saline aquifers through the development of structural and isopachous maps, as well as the salinity maps. The basic geological data were obtained from the well logs. More than 1,600 wells were correlated and encoded into a computer listing.

00258

Sproul, C. R., D. H. Boggess and H. J. Woodard. Saline-water intrusion from deep artesian sources in the McGregos Isles Area of Lee County, Florida. Florida Department of Natural Resources, Bureau of Geology, Information Circular 75, 30 p, 1972.

00259

Tarver, J. W. Occurrence, distribution and density of *Rangia cuneata* in Lakes Pontchartrain and Maurepas, Louisiana. La. Wild Life and Fisheries Comm. Tech. Bull. 1: 8, 1972.

00260

The Texas Law Institute of Coastal and Marine Resources. Regulation of activities affecting bays and estuaries. A preliminary legal study. The Texas Law Institute of Coastal and Marine Resources, 25 p, 1972.

00261

The Texas Law Institute of Coastal and Marine Resources. Summary of selected legislation relating to the Coastal Zone. The Texas Law Institute of Coastal and Marine Resources, 1972.

00262

The Texas Law Institute of Coastal and Marine Resources. Proceeding of a conference on recent environmental developments in maritime and offshore activities. Houston Law Review, 9 (4) 54 p, 1972.

00263

Thomas, Robert D. Intergovernmental relations and responses to water problems in Florida. Research Project Technical Completion Report. U. S. Department of Office of Water Resources Research. Publication No. 19: 48, 1972.

00264

The University of Texas at Austin. A conceptual report on: The management of bay and estuarine systems - PHASE 1. The coastal resources management program division of planning coordination, Office of the Governor. Division of Natural Resources and the Environment, 150 p, 1972.

00265

Final environmental statement: Arkansas nuclear ore, Unit 2, Arkansas Power and Light Company. U. S. Atomic Energy Commission, Directorate of Licensing, September, 1972.

00266

Congressional publications committee serial No. 92-27. Outer Continental Shelf policy issues, part 2.

Prepared responses by witnesses to a set of committee questions on legal, management, economic, environmental, conservation, and other issues related to administration of the Outer Continental Shelf Lands Act.

00267

U. S. Department of Commerce. Fishery statistics of the United States. U. S. G. P. O., Washington, D. C., 1-10, 1972.

00268

Aquatic plant control program, proceedings research planning conference on aquatic plant control project, January 12, 1971. U. S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi, June, 1972.

00269

Water resources data for Texas: part 1. Surface water records. U. S. Department of the Interior Geological Survey, Austin, 1972.

00270

U. S. Department of Interior. Bibliography of North American Geology, 1969. Geological Survey Bulletin 1269, United States government printing office, Washington, 1972.

00271

U. S. Department of the Interior. Selected Water Abstracts, Office of Water Resources Research. Water Resources Scientific Information Center, 6 (15): Aug., 1973.

Selected water resources abstracts, a semimonthly journal, includes abstracts of current and earlier pertinent monographs, journal articles, reports, and other publication formats. The contents of the documents cover the water-related aspects of the life, physical, and social sciences as well as related engineering and legal aspects of the characteristics, conservation, control, use, or management of water. Each abstract includes a full bibliographical citation and a set of descriptors or identifiers which are listed in the Water Resources Thesaurus. Each abstract entry is classified into ten fields and sixty groups similar to the waste resources research categories established by the Committee on Water Resources Research of the Federal Council for Science and Technology.

00272

U. S. Department of Interior. Proposed hybrid prototype desalting plant for Brownsville, Texas (draft environmental impact statement). Office of Saline Water, Washington, National Technical Information Service, January 28, 34 p, 1972.

The proposed project involved the design, construction, operation, and maintenance of an 8 million gallons per day prototype sea water desalination plant in cooperation with the Rio Grande Valley Municipal Water Authority and the City of Brownsville, Texas. Sea water will be withdrawn from the Brownsville Ship Channel for use in the distillation plant and saline effluent water will be discharged into San Martin Lake. Unavoidable adverse environmental effects

include gas emissions from boilers and turbines, noise from the operating plant, elevation of water temperature, concentrating of solids in the waste water, slightly increased water salinity from effluents, and the presence of copper and nickel and possibly other heavy metals in the waste stream. The consumption of 1.133×10 to the 9th power cu ft/yr of natural gas is an irreversible commitment. The proposed project will establish the feasibility of a single purpose distillation plant for producing low cost fresh water from sea water. As such, there is no alternative. Comments on the proposed action were solicited from appropriate local and regional agencies.

00273

The three-mile limit: its juridical status. Valparaiso University Law Review, 6: 170-184, 1972.

00274

Von Sternberg, M. R. Territorial jurisdiction - mining the deep sea-bed -- international problems and national resolutions. Vanderbilt Journal of Transnational Law, 5: 497-502, 1972.

The tendency of coastal nations to favor extended national maritime jurisdiction has created a serious conflict between the traditional concepts of freedom of the seas and sovereign territorial rights. The proposed Deep Seabed Act, 92801 (1971), would implement and revise the 1970 Draft Convention on the international seabed which was submitted to the United Nations by the United States. Included in this comment is a discussion of the Draft Convention provisions and the Deep Seabed Act. The Act allows the Secretary of the Interior to grant licenses to citizens or corporations of the United States to mine the seabed. The rights attendant with a license, its international ramifications and other provisions are described. The Act appears to be much more acceptable to the international community than its counterpart, the Draft Convention. While unilateral action is unacceptable, any rule of international law that is developed must take into account the sovereign state's traditional demands. The proposed Act more clearly recognizes these conflicting demands than does the Draft Convention.

00275

Wasson, B. E. Floods in Mississippi, October, 1967 through September, 1969. Mississippi Board of Water Commissioners Bulletin 72-1, 40 p, 1972.

Between October, 1967 and September, 1969, there were 10 noteworthy periods of flooding in Mississippi. The most notable of these was on August 17-18, 1969, when Hurricane Camille produced all-time record tidal floods along the Mississippi coast and killed 137 people and caused more than 510 million dollars in damage. Greater-than-50 year floods occurred on small streams in Wilkinson County as the result of 12 inches of rain on July 19 and 8 inches on July 23, 1969. Comparatively low floods occurred on Tombigbee River at Columbus on

July 8-9, 1968, although the 24 hour total rainfall of 16 inches there was the greatest ever recorded in Mississippi. Split storm periods and the rapid dissipation of the flood flows of small streams draining into the Tombigbee River help to explain the minor flooding resulting from the intense rainfall.

00276

Williams, D. C., Jr., C. P. Cartee and M. H. Malchow. An appraisal of plans to meet the fresh water requirements of the Mississippi Gulf Coast area. Mississippi Water Resources, Research Institute, State College, Completion Report, 43 p, 1972.

The purpose was to inventory and assess the plans to meet the fresh water needs of the Mississippi Gulf Coast. Over 30 fresh water related plans and studies involving the three coastal counties (Jackson, Harrison, and Hancock) were identified through literature review and contacts with the various planning agencies and governmental units. Seventeen of the plans considered to be relevant were evaluated in terms of selected criteria, the results of which are presented in tabular form. These plans are also discussed by county, to give a picture of the planning for each county in the study area. There is overlapping and fragmentation of plans and planning agencies. Also, there is a divergence of opinions as to the adequacy of current water supply and recommendations to meet the fresh water needs. Recommended new facilities have not been built. This may be the result of a normal time lag between recommendations and authorization, or the action agencies may not feel the urgency suggested in the reports and/or other factors. The findings suggest there is a gap between the 'planners' and the officials with the direct responsibility of providing fresh water to the various users.

00277

Bagnall, L. O., J. R. Hentges, and R. L. Shirley. Processing, chemical composition and nutritive value of aquatic weeds. Florida Water Resources Research Center, annual report. University of Florida, Gainesville, Florida, 3 p, 1973.

A screw press built for this project has been released to the Agency for International Development for use in Bangladesh. Numerous inquiries from the United States and throughout the world have been received with regard to the utilization of the results of this research.

Six varieties of aquatic plants were collected at monthly intervals throughout the year; calcium, phosphorus, potassium, magnesium, and sodium determined and their content related to the dietary requirements of cattle. The data demonstrate that these plants contain significant sources of the macro-nutrient elements. The high concentrations also indicate that only limited amounts of the aquatic plants should be incorporated into cattle rations. The results obtained during the year have application as guidelines in the formulation of aquatic plants in livestock rations.

00278

Bureau of Land Management. Proposed 1973 outer continental shelf oil and gas general lease sale, offshore Mississippi, Alabama, and Florida volumes 1-5, 1,620 p, 1973.

00279

Courtenay, W. R. and C. R. Robins. Exotic aquatic organisms in Florida with emphasis on fishes - review and recommendations. Transactions of American Fishery Society, 102 (1): 1-12, 1973.

Many exotic organisms, particularly fishes and plants, have become a part of Florida's aquatic ecosystems. The majority of these organisms was introduced accidentally as a result of activities of professional aquarists, particularly through carelessness by tropical aquarium fish farm operations. One exotic fish species was established from the release of stocks imported for experimental purposes. Amateur aquarists and tourist attractions also have the potential for introducing exotic aquatic organisms. Future introductions can be reduced through better safeguards in respect to prevention of escape and more public education.

Purposeful introductions for sport or food, aquarium resources, or for biological control of pests are more extensive than accidental introductions. Some have the potential for long-term ecological devastation. They are often undertaken without adequate information on the possible consequences.

Fish diseases and parasites and their impact on public health have not heretofore been a consideration in the fish import trade. Investigations are urgently needed to determine what may be entering North America with imported fishes and their transport water.

Proposals for introduction of a species must be closely studied. Rationale for a planned introduction, demonstration of inadequacy of native species, a search for alternate species, preliminary assessment of environmental impact of the planned introduction, and publicity and review are required initially. Recommendations based on experimental research and review are necessary before any introduction is made.

00280

Dinkins, C., R. Hirsch and C. Everett. Recent federal legislation significant in environmental planning programs of the State of Texas. Texas Law Institute of Coastal and Marine Resources, 46 p, 1973.

The 92nd Congress enacted a wide range of Federal laws to foster planning of the protection of the nation's environment. This handbook briefly summarizes the provisions and describes the effects of the more important recently enacted Federal statutes affecting Texas' environmental plans and programs. Some of the acts alter existing law; others supersede state action; and several provide federal financial assistance for state and local programs.

00281

Environmental Periodicals Bibliography. Environmental studies institute, International Academy at Santa Barbara, Santa Barbara, (2) 1: Entries 2: 1-2918, 1973.

00282

Fisher, W. L., L. F. Brown, Jr., J. H. McGowen, and C. G. Grant. Environmental geologic atlas of the Texas Coastal zone. Beaumont - Port Arthur area. Bureau of Economic Geology, The University of Texas at Austin, Austin, Texas 78712, 93 p, 1973.

Contents of this atlas include: 1) environmental geology, 2) physical properties, 3) environments and biologic assemblages, 4) current land use, 5) mineral and energy resources, 6) active processes, 7) man-made features and water systems, 8) rainfall, discharge, and surface salinity, 9) topography and bathymetry.

00283

Florida Dept. of Natural Resources. List of publications of the Bureau of Marine Science and Technology, Marine Research Laboratory. Florida Department of Natural Resources Division of Marine Resources, St. Petersburg, Florida, March 1973.

00284

Jones, J. I., R. E. Ring, M. O. Rinkel, and R. E. Smith (eds.). A summary of knowledge of the eastern Gulf of Mexico. Florida State University System, Institute of Oceanography, St. Petersburg, Florida, 1973.

The study presents the following subject areas: climate, physical oceanography of the Northeast Gulf of Mexico and Florida Continental Shelf area, chemical oceanography, hydrology and flushing of the bays, estuaries, and nearshore areas of the eastern Gulf of Mexico, geological oceanography, salt marshes, benthic algae of the eastern Gulf of Mexico, seagrasses, mangroves, phytoplankton, zooplankton, benthic invertebrates of the eastern Gulf of Mexico, fishes, marine mammals, birds, utilization of marine and coastal resources, recreation and industry - coastal resources, and environmental quality problems.

00285

Grubb, Herbert W. The structure of Texas economy. Office of the Governor, Office of Information Services, Vol. I and II, March, 1973.

Analysis of Texas economy.

00286

The Johns Hopkins University. Addendum to PPSE 1-2 Power plant site evaluation Brandon Shores Site, Maryland Power Plant Siting Program. The Johns Hopkins University, Applied Physics and Environmental Engineering, January 18, 1973.

00287

Louisiana Office of State Planning. Growth and conservation policy alternatives, 1973.

00288

Mathur, D. Food habits and feeding chronology of Black-banded Darter, Peruina nigrofasciata (Agassiz), in Holawakee Creek, Alabama. Transactions of the American Fisheries Society, 102 (1): 48-55, 1973.

In Halawakee Creek, Peruina nigrofasciata showed two distinct feeding peaks; one in the morning and a higher one in late afternoon. Immature forms of Diptera, Ephemeroptera, and Trichoptera were dominant in the diet over the 24 hour period. Although these organisms were most abundant in drift during the night, most were eaten during daylight. Daytime feeding peaks suggests that P. nigrofasciata are visual feeders. Daily ration varied from 2.6 to 4.9% of the body weight.

Optimum temperature range for maximal feeding in natural habitat was 17-23 C. Feeding rate was low or high, above or below this temperature range. The fish were highly insectivorous.

Numerically and on the basis of percent frequency of occurrence dipteran larvae were the most important item in the diet throughout the year. Ephemeropteran nymphs constituted the bulk of the food by weight. Trichopteran larvae ranked third in importance. Other items which were eaten occasionally included copepods, cladocerans, amphipods, isopods, coleopteran larvae, and plecopteran nymphs. An almost complete absence of terrestrial food items and detritus (mud, sand, and gravel) and dominance of drift organisms in the diet suggests subsurface feeding.

00289

Mississippi Monitor Publications, Inc. Profile '73. Gulf Regional Planning Commission, Post Office Box 1346, Gulfport, Mississippi 39501, 16 p, 1973.

A concise statement about the Gulf Regional Planning Commission as to what it is, how it has been performing, and the accomplishments and unfinished tasks ahead.

00290

Spencer, L. J., R. T. Barber and R. A. Palmer. The detection of ferric specific organic chelators in marine phytoplankton cultures. Food and Drugs from the Sea. Leonard R. Worthen (ed.). University of Rhode Island Press, (in press) 1973.

00291

Tarver, J. W. and R. J. Dugas. A study of the clam, in Lake Pontchartrain and Lake Maurepas, Louisiana. La. Wild Life and Fisheries Comm. Tech. Bull. No. 5: 97 p, 1973.

00292

Texas Advisory Commission on Inter-governmental Relations. Handbook of Governments in Texas, March, 1973.

For Texas: state, county, municipal special, regional and federal governments.

00293

Texas A & M University. Transportation in the Texas coastal zone, Office of the Governor, Division of Planning Coordinator, March 1973.

Deep port requirements, deep channels, offshore terminals, super-ports, environmental study needs.

00294

Texas A & M University. Economic development in the Texas Coastal Zone. A conceptual report. Office of the Governor. Division of Planning Coordination, Coastal Resources Management Program, Interagency Council on Natural Resources and the Environment, State of Texas Sea Grant Program, College of Engineering, Texas A & M University, 95 p, 1973.

00295

Texas Law Institute of Coastal and Marine Resources. Summary of selected legislation relating to the coastal zone. The Texas Law Institute of Coastal and Marine Resources, 1973.

00296

Thompson, R. G. and H. P. Young. Forecasting water use for policy making: a review. The American Geophysical Union, Water Resources Research, 9 (4): 792-799, August, 1973.

The derived demand function for water is the basis for forecasting water use in production. Substituting inputs in production is the key idea underlying derived demand functions for water. The form of the derivation is illustrated for certain types of substitutions in a steam electric generating plant. A linear method of approximating derived demand functions is discussed; references to previous studies in agriculture and petroleum refining are made. Several demand functions estimated in this way are then used to evaluate proposed investments in water resource regulation.

00297

Sandeen, William M. and John B. Wesselman. Ground-water resources of Brazoria County, Texas. United States Geological Survey, Texas Water Development Board, April, 1973.

The Chicot and Evangeline aquifers are the only hydrologic units bearing fresh (less than 1,000 milligrams per liter dissolved solids) or slightly saline water (1,000 - 3,000 milligrams per liter dissolved solids) in Brazoria County. These aquifers are composed of gravel, sand, silt, and clay of Pitocene, Pleistocene, and Holocene age. The Chicot aquifer is divided into a lower unit and an upper unit. The lower unit contained 100 to 290 feet of fresh-water sand in the northern part of the county. The upper unit has less than 100 feet of fresh-water sand at most locations and less than 50 feet in much of the county. The Chicot is the only source of fresh ground water in parts of the county. Other areas, notably near salt domes and along the coast of the Gulf of Mexico, have little or no fresh ground water. The fresh ground-water potential of the Brazosport area is fully developed or overdeveloped while in some areas in northern Brazoria County, it is relatively undeveloped. Large saline-water supplies could be developed almost anywhere in Brazoria County.

00298

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Ryan, John J. A sedimentologic study of Mobile Bay, Alabama. The Sedimentological Res. Lab., Dep. Geol., Florida State Univ., Tallahassee, Florida, Contrib. 30, 109 p, 1969.

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U.S. Naval Oceanographic Office. The water planet. U.S. Government Printing Office, Washington, D. C., 49 p, 1969.

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Adams, Rodney. Effects of Hurricanes Camille and Laurie on the Barataria Bay estuary. Louisiana State University Coastal Studies Institute Bulletin No. 4, 6 p, 1970.

The two late-season hurricanes, Camille and Laurie, passed to the east and south of the Barataria Bay Estuary but did produce above-normal tides and accumulations of windblown debris. Maximum winds with Camille reached 45 to 65 miles per hour at Grand Isle and were from the east and north when the most severe effects were felt. Laurie shifted to an easterly course when she was still 175 miles south of Grand Isle and no severe winds were experienced. Rapid water-level rise was accompanied by high winds from the

east and northeast, which drove vast quantities of marsh grass debris against buildings and embankments. There were no significant changes to the shoreline from Southwest Pass to the mouth of Bayou Lafourche. However, aerial photographs taken immediately after the storm show what appear to be small washover fans to the east of Grand Isle on Grand Terre and Shell Island.

00082

Atwood, D. K. and J. N. Bubb. Distribution of dolomite in a tidal flat environment. Sugarloaf Key, Florida. *Journal of Geology*, 78 : 499-505, 1970.

A study of modern tidal flats on Sugarloaf Key, Florida has been made to determine distribution of penecontemporaneous dolomite, the presence of which was previously reported by Shinn. Dolomite occurs in a crust at or near the surface of recent tidal flat sediments and in lesser amounts in unconsolidated sediments. The greatest concentration of dolomite is near the shoreline and within topographic lows on the flats; that is, areas where sediments are most frequently wet by tides. The dolomite concentration decreases toward interior and higher portions of the flats; essentially no dolomite was found in adjacent bays. Interstitial waters expressed from recent sediments on the flats were analyzed at different times in the year and found to be near sea water in salinity and chemistry. This combination of dolomite distribution and interstitial water data suggests that dolomitization is occurring with waters near sea water composition.

00083

Baldauf, R. J., Et. Al. A study of selected chemical and biological conditions of the lower Trinity River and the upper Trinity Bay. Texas Water Resources Institute Technical Report No. 26, 168 p, 1970.

The study was done on the site of the proposed Wallisville Reservoir, one of several multipurpose structures designed for the water development of the Trinity River Basin in Texas. The dam is to be located at Trinity River mile 3.9, where it will traverse about 22,000 acres of a low salinity marsh. The completion of the Wallisville Dam is expected to alter both the character of the marsh and of the Trinity Bay portion of the Galveston Bay system. The dam will serve as an effective saltwater barrier in addition to serving as a river-water impoundment structure; about 12,500 acres of low salinity marsh will be inundated by the conservation pool. The study shows that the entire area serves as a nursery ground for white and brown shrimp, blue crab, and menhaden, and that this area will be lost to the dam site. The construction of the dam at least 4.5 miles farther upstream would have spared considerable nursery acreage from destruction.

00084

Bouma, A. H. An investigation of changes induced in macrostructures in pelitic sediments during primary consolidation. Report of the Department of Oceanography, Texas Agricultural and Mechanical University, Ref. 70-8-T, 1970.

00085

Cernock, Paul John. Sound velocities in Gulf of Mexico sediments as related to physical properties and simulated overburden pressures. Ph.D. Dissertation, Texas Agricultural and Mechanical University, 1970.

Compressional wave velocities, shear strength, and related physical properties were determined in twelve sediment cores from various physiographic provinces in the Gulf of Mexico. Sound velocities fit 25 degrees C and 185 kHz range from 1483-1719 m/sec. A linear relationship is shown between acoustic impedance and bulk density for data from eleven cores. Equations are presented which predict the bulk density of a sediment whose sound velocity is from 1483 m/sec to 1552 m/sec. Porosity of the sediment is then predicted from a linear relationship between porosity and bulk density; the median diameter is estimated from a broad, direct relationship between median diameter and sound velocity. Sound velocity was found not to be related to carbonate content, cohesion, or specific gravity of solids.

Sound velocities were also determined at 165 kHz in five consolidation test samples at pressure intervals from 0.016-256-0 kg/cm². Bulk density and porosity were determined at simulated depths of sediment burial by soil mechanics techniques. Curves relating porosity to velocity enabled the construction of velocity/depth profiles for two typical Gulf of Mexico sediments--fine grained clay sediments representative of moderate to deep-water environments, and clayey sand sediments representative of shallow, near-shore environments. Over a simulated depth range of 0-1000 meters, the increase in bulk density and decrease in porosity is greater in the clays than in the clayey sands (80-38%, 1.36-2.07 gm/cm³ and 58-28%, 1.73-2.22 gm/cm³ respectively). In the same depth interval compressional wave velocities corrected in situ pressure and assumed temperature conditions are initially greater and increase more rapidly in a clayey sand than in a clay sediment (1573-2396 m/sec and 1488-1978 m/sec respectively). The velocity in the upper 40 meters of clay sediment can be less than that of the overlying water.

00086

Chiw, T. Y., Et. Al. Residence times of waters behind barrier islands. Florida Water Resources Research Center, Gainesville, Publication No. 11, 100 p, 1970.

Estuaries separated from the ocean by barrier islands are numerous on the Atlantic and Gulf of Mexico coastlines in general and on the Florida coastline in particular. Attention is focused on the exchange processes of waters behind barrier islands. Part I deals with the nondispersive aspects as affected by tides and freshwater discharges. A computational procedure is developed with reference to Lake Worth and Sarasota Bay, Florida. The tide-induced net flow, through one or two inlets which can be viewed as "mass transport" effect, is stressed. This net flow can be significant in water exchange considerations and could be enhanced by the proper design of inlets. Field and/or model corroboration of this conclusion is recommended. Part II of the report considers the renewal of estuary waters resulting from dispersive transport in tide-driven flows. Assuming quasisteady state conditions, dispersion coefficients are presented, based on field measurements in Lake Worth and Sarasota Bay. The measurements are also interpreted in terms of residence times for the northern and southern portions of Lake Worth, Florida.

00087

Delflache, Andre P. and William R. Bryant. Compressional behavior of high-void ratio marine sediments. Second Annual Offshore Technology Conference, Houston, Texas, 8 p, 1970.

Consolidation tests performed on a large number of marine sediments obtained by the R/V Alaminos, Texas A & M Oceanographic Research Vessel, in the Gulf of Mexico indicate that high void ratio marine clay sediments exhibit a linear void ratio-pressure relation in contrast to the non-linear relation ordinarily observed in clay soils. It is believed that use of this linear relation will provide (1) a more accurate evaluation of the preconsolidation pressure of the marine sediments, (2) a more precise determination of the compressibility of the upper five meters of such sediments, and (3) a better understanding of the actual settlement of engineering structures placed on sea bottom.

00088

Florida Council of 100. Oceanography in Florida: 1970. Tampa, Florida, 1970.

00089

Frank, D. J., W. Sackett, R. Hall and A. Fredericks. Methane, ethane, and propane concentrations in Gulf of Mexico. American Association of Petroleum Geologists Bulletin, 54(10): 1933-1938, 1970.

The concentrations of the low-molecular-weight hydrocarbons in the Gulf of Mexico were measured. The ranges of methane, ethane, and propane were found to be $(6--125) \times 10^{-3}$, $(1.6--37.3) \times 10^{-6}$, and $(1.2--386) \times 10^{-6}$ ml/liter seawater, respectively, for depths ranging from zero to 3,742 m. For a given water column, these values were found to be in the same range as, but more variable than, those previously reported. These results suggest that one method of offshore petroleum-seep detection is to survey and map the concentrations of hydrocarbons in near-bottom waters.

00090

Hann, Roy W., Jr. Mathematical modeling of Gulf coast estuaries. Water Resources Bulletin, 6(3): 323-338, 1970.

An outline is presented of the dominant characteristics which affect the properties of the Gulf Coast estuaries including geography, tide and current effects, wind effects, salinity and density regime, nature and level of waste discharged, low inflow levels, dredging effects and present quality levels. Two basic levels of analytical modeling which are useful in water quality management were presented. The first was a relatively crude completely mixed estuarine model which permitted economical evaluation of varying parameters. The streamflow analysis was made on the San Bernard Estuary and a total of over 2000 separate analyses were made under a variety of system conditions to provide sufficient answers for trends to be analyzed and displayed. The second model was a very general state model which permitted analysis of stratified systems. It was a segmentized finite difference model and calculated steady-state distribution of organic wastes and other materials with a defined decay function and resulted in a dissolved oxygen profile for combinations of waste loads to the system. The ESTPOL computer language designed to simplify the use of the steady state model was described. The practical use of the analytical models as management tools for the solution of Texas estuarine quality problems was demonstrated.

00091

Holland, W. C. Bathymetry maps eastern continental margin. American Association of Petroleum Geologists and Esso Production Reservoir Company (Humble Oil and Refining Company), Tulsa, Oklahoma, 1970.

00092

Huang, T. C. and H. G. Goodell. Sediments and sedimentary processes of eastern Mississippi Cone, Gulf of Mexico. American Association of Petroleum Geologists Bulletin, 54(11): 2070-2100, 1970.

The upper 6-7 M of sediment of the Eastern Mississippi Cone consists of a repetitious vertical succession of gray silt and silty clay intercolated with a few layers of fine sand and topped by a 20-50 cm layer of yellowish-brown foraminiferal clay. Disequilibrium age determinations indicate that the lower silty layers, representing the deposits of latest low sea-level stand, were deposited more rapidly than the upper foraminiferal clay. These sedimentation rates, which depend primarily on the rate of the detrital influx and sea-level change, average about 30 cm/1,000 years.

Sedimentary processes on the deep-sea fan are interpreted from sedimentary structures, textures, and compositions, as well as from bathymetry, bottom photographs, and continuous seismic profiles. The more than 20 varieties of minor sedimentary structures recognized from x-ray photographs are grouped into five varieties that correlate closely with sediment type. None of the structures is typical of vertical "turbidity sequences." On the contrary, the evidence suggests that the primary mechanisms of sediment transport are differential pelagic settling and low-flow-regime bottom currents, with mass movements by sliding or slumping common in channel and slope areas. Statistical evaluation of the occurrence and distribution of minor structures indicates that (1) most of the structures associated with coarser materials are analogous to structures formed by traction transport or by ripple migration in shallow water, and (2) the distribution of both bottom current intensity and internal waves that create small scale ripples is local. Photographs of the present bottom support this conclusion. The importance of diagenetic solution of carbonate, mostly planktonic foraminifers and pteropods, as verified by laboratory experimentation, is related to the degradation of organic matter in the sediments. The most active solution occurs near the boundary between the upper foraminiferal clay and the lower silty layers and is partly responsible for (a) the abrupt decrease of carbonate downward in the cores, (b) the rearrangement of clay particles into secondary thin laminae, and (c) the shortening of the distance between noncarbonate silt and sand layers or laminae. These results, combined with compaction, accentuate the uniformity of layering.

The upper cone is indented by digitate leveed valleys and canyons cut by traverse ridges, whereas the lower section is characteristically smooth. The bathymetry of the cone reflects its underlying structure. Continuous seismic profiles show that the lower cone is composed of relatively uniform flat-lying beds, representing at least five major depositional cycles since Plio-Miocene time and as many as 14 since late Cretaceous time. In contrast, the upper cone has many internal irregularities, probably caused by gravity sliding, folding, and slumping contemporaneous with deposition, and by diapiric salt intrusion. The cone's depocenter has shifted continuously basinward as the Mississippi Delta has prograded Gulfward since late Cretaceous time.

00093

Jenson, Jack James. Calculated and observed changes in sea surface temperature associated with hurricane passage. Thesis, Naval Postgraduate School, Monterey, California, Department of Oceanography, 55 p, 1970.

Analyses were made of the sea surface temperatures in the Gulf of Mexico for the month of August for the four years 1965 through 1968. No one pattern was found to predominate. The subsurface profiles were then considered, and a rate of simulated withdrawal of 4000 calories of heat per day was made, until the temperature did not exceed 26 deg C. This withdrawal represented heat removed during passage of a hurricane. Difference analyses were constructed for the initial sea surface temperature at each station after twenty-four hours of simulated withdrawal. The differences ranged from less than one degree to over four degrees. Again, no consistent pattern was found but generally areas of high concentrations of heat experienced smaller decreases. Actual sea surface temperatures collected after two hurricanes were then analysed and compared to temperature pattern predicted by the computer model. Illustrations of the relative availability of sensible heat energy for different sea surface temperatures are presented and a hypothesis made to account for the greater than average intensities of Hurricanes Betsy (1965) and Camille (1969).

00094

Jones, Paul H. Hydrology of Quarternary delta deposits of the Mississippi River. in: Symposium on the Hydrology of deltas, Vol. I International Association of Science Hydrology-UNESCO Publication 90: 49-63, 1970.

These deposits with interbedded marine sediments have a cumulative maximum thickness greater than 13,000 feet, of which the delta deposits constitute perhaps half. They underlie a coastal belt some 300 mi in length, and extend more than 150 mi from the coast beneath the Gulf. The late Quaternary deltaic mass contains almost no fresh water although crossed by streams carrying runoff, due to expulsion of saline waters from incompetent prodelta clay beds overridden by advancing deltaic sediments. Distributary channel deposits end gulfward in marine clay and join headwards with those of the trunk stream to form an integrated system on conduits, through which water expelled from compacting sediments is discharged upvalley. This continuing discharge causes landward movement of saline ground water threatening fresh-water supplies, and must be considered in development of fresh-water resources.

00095

Lee, G. Fred. Factors affecting the transfer of materials between water and sediments. Eutrophication Info. Prog. Water Resour. Center, Univ. Wisconsin. Lit. Rev. 1:35 p, 1970.

00096

May, Edwin P. Extensive oxygen depletion in Mobile Bay, Alabama. Limnol. Oceanogr., In press, 1970.

00097

McPhearson, R. M., Jr. Hydrography of Mobile Bay and Mississippi Sound, Alabama. Journal of Marine Science, 1(2): 1-83, 1970.

00098

Murray, S. P. Bottom currents near the coast during Hurricane Camille. Louisiana State University, Coastal Studies Inst., 4 p, 1970. Pub. Journal of Geophysical Research, 75(24): 4576-4582, 1970.

A ducted current meter, which was mounted on the bottom in 6.3 meters of water off the coast of the Florida panhandle, was operative during much of the activity of Hurricane Camille. Before the arrival of the storm an unexpected outward extension of the wave-driven longshore current was recorded. During the storm bottom current speeds ranged up to 160 cm/sec, and their direction rotated from alongshore parallel to the wind to seaward against the wind.

00099

Otvos, Ervin G., Jr. Development and migration of barrier islands, Northern Gulf of Mexico. Geological Society of America Bulletin, 81(1): 241-246, 1970.

Historical evidence and drilling results from published sources and U.S. Coast Survey charts indicate that barrier islands form by upward aggradation of submerged shoal areas. Subsequent extensive barrier island migration may completely obscure conditions of formation of the original barrier island. Migration may take place parallel, perpendicular, or at oblique angles to the mainland shoreline and appears to take place much faster when parallel with the shoreline. No evidence indicates barrier island formation from engulfed beach and dune ridges during the early stages of transgression. Many strand plain and chenier ridges form the same way as barrier ridges.

00100

Reid, R. O. and K. Gilbert. Studies of mesoscale air-sea interaction. Annual Report of the Themis Project, Texas Agricultural and Mechanical University, Sub Task G, 1970.

00101

Sherk, J. Albert, Jr. and L. Eugene Cronin. The effects of suspended and deposited sediments on estuarine organisms, an annotated bibliography of selected references. Univ. Maryland Nat. Resour. Inst. Reference No. 70-19, 61 p, 1970.

00102

Sonu, Choule J. Beach changes by extraordinary waves caused by Hurricane Camille. Louisiana State University Coastal Studies Institute Bulletin Number 4, Technical Report 77, 11 p, 1970.

Drastic erosion and swift recovery were the major characteristics of beach changes associated with Hurricane Camille at Fort Walton, Florida. Storm waves caused general erosion of the beach surface, a scarp about 1 meter deep was produced about 40 meters behind the shoreline. After the hurricane, humps of sand in a train with regular spacing along the shore emerged in the surf zone bed. There were formed by longshore currents, which probably acted on large quantities of sand brought into the surf zone bed as a result of the preceding subaerial erosion. The humps subsequently moved shoreward and eventually climbed on the beach; a substantial part of the exposed beach volume was thus restored about a week after the hurricane.

00103

Soule, Gardner. The greatest depths. Macrae Smith Company, Philadelphia, 194 p, 1970.

00104

Soule, Gardner. Wide ocean, discoveries at sea. Rand McNally and Company, 108 p, 1970.

00105

Texas Agricultural and Mechanical University, Dept. of Oceanography. Oceanographic experiment support-remote sensing of coastal oceans, annual report, May 1969 - May 1970, 143 p, 1970.

The status of microwave radiometry uses in making meaningful oceanographic observations is summarized. Plans for international cooperative oceanographic expeditions are cited including measurement of biomass production and associated phenomena in the marine environment.

00106

United States Corps of Engineers. Flood plain information, Destin Coastal Area, Okaloosa County, Florida. Corps of Engineers (Mobile, Alabama) Flood Plain Report, 19 p, 1970.

Tidal flooding along the northern coast of the Gulf of Mexico near Destin, Florida is described to aid local agencies with factual bases for reducing future damages and hazards through planning better utilization of areas subject to flooding. Basic data used in preparation of the report include historical flood heights, hurricane pressure, radius and speed, tide records, and flood damage records.

00107

Walker, J. R. and J. V. Massingill. Slump features on the Mississippi Fan, northeastern Gulf of Mexico. Geological Society of America Bulletin, 81(10): 3101-3108, 1970.

During recent geologic time, the Mississippi River system has been the dominant contributor of terrigenous sediment to the northern Gulf Basin. A large mass of sediments has been produced on the continental slope seaward of the mouth of this system.

00108

Ward, M. and R. M. Sorensen. A method of tracing sediment movement on the Texas Gulf Coast. Texas Agricultural and Mechanical University, Coastal and Ocean Engineering Division, 120 p, 1970.

Two methods of coating sand with fluorescent material and a technique for recovering samples and analyzing fluorescent tracer movement were studied experimentally both in the field and in the lab. The primary objective of the study was to develop from previously used fluorescent tracer techniques a suitable and reliable method of tracing sediment movement on

the Texas Gulf Coast. From the experiments it was found that the best method of investigating the movement of sediment in the littoral drift, was through the use of sediment coated with acrylic lacquer and resin.

00109

Wert, Richard T. A baroclinic prognostic numerical model of the circulation in the Gulf of Mexico. Ph.D. dissertation, Texas Agricultural and Mechanical University, 1970.

Considered is a two-layer prognostic model of the circulation in the Gulf of Mexico. This two-layer model represents the simplest finite difference approximation to the continuously stratified real ocean. The equations of momentum, which are considered for each layer, include horizontal and vertical exchange of momentum, Coriolis effect, non-linear advection of momentum and the effect of topography. In the model, however, the topography is restricted to the lower layer.

Selected patterns of the observed thermal structure in the area of the loop current in the Gulf of Mexico over a one-year period are presented. The thermal structure is used to indicate the current pattern in the Gulf of Mexico and is included for comparison purposes.

00110

Wilson, William J. Distribution of depths in the Gulf of Mexico. Mimeographed, 3 p, 1970.

00111

Wright, L. D. Circulation, effluent diffusion, and sediment transport, mouth of the South Pass, Mississippi River Delta. Louisiana State University, Coastal Studies Institute, 67 p, 1970.

A study was conducted at the mouth of South Pass, Mississippi River, to ascertain the influence exerted by interaction between effluent and ambient fluids; tide; waves; winds; bottom topography and channel mouth geometry; regional coastal currents; horizontal and vertical density gradients; and hydrologic regime of the Mississippi River.

00112

Austin, H. M. The characteristics and relationships between the calculated geostrophic current component and selected indicator organisms in the Gulf of Mexico Loop Current System. Florida State University, 1971.

00113

Barrett, B. B., J. W. Tarver, W. R. Latapie, J. F. Pollard, W. R. Mock, G. B. Adkins, W. J. Gaidry, C. J. White, J. S. Mathis. Cooperative Gulf of Mexico estuarine inventory and study, Louisiana Phase II Hydrology and Phase III; Sedimentology. La. Wildlife and Fisheries Comm., 191 p, 1971.

00114

Blakey, J. F. and H. L. Kunze. Reconnaissance of the chemical quality of surface waters of the coastal basins of Texas. Texas Water Development Board Report 130, 49 p, 1971.

The eight coastal basins in Texas have combined drainage area of more than 19,000 square miles and include all of the 370 miles of the coast except for a few miles across the mouths of the major rivers. Most of the coastal region is a smooth, featureless, depositional plain with altitudes generally less than 200 feet above mean sea level. The activities of man are affecting the chemical quality of surface waters in the coastal basins. Low flows in many of the streams are being degraded to some degree by oil field and other industrial wastes and by irrigation-return flows. Surface waters of the coastal basins are generally of good chemical quality, and in streams receiving little or no man-made wastes, the dissolved-solids concentrations are generally less than 250 milligrams per liter. Recent regulations of the Railroad Commission of Texas should reduce the amount of oil-field brines reaching surface-water courses.

00115

Betzer, Peter R. and Michael E. Q. Wilson. Particulate iron and the nepheloid layer in the western North Atlantic, Caribbean and Gulf of Mexico. Deep-sea Research 18(7):753-761, 1971.

Greatly increased concentrations of particulate iron were found within 1000 m of the bottom in the northwest Atlantic and eastern Gulf of Mexico (6 times and 3 to 4 times the average of shallower water, respectively) while only slightly increased concentrations were found within 1000 m of the bottom in the Caribbean and western Gulf of Mexico (2 times the average concentration in shallower water). These distributions agree with published light-scattering near-bottom nepheloid layer. It is concluded that the increase in the near-bottom concentrations of particulate iron is not a water mass effect, but arises from interaction of water with the bottom.

00116

Bouma, A. H., W. R. Bryant and D. K. Davies. TAMU results from the USNS Kane 1969 expedition, Gulf of Mexico. Texas Agricultural and Mechanical University Oceanography Abstracts of Technical Reports, Reference 71-18-T: 20, 1971.

This final report, terminating the contract period July 1, 1970 through June 30, 1971, contains the results of the Texas A & M University investigations performed during and after the sediment cruises carried out during the summer of 1969 in the Gulf of Mexico on board the USNS ELISHA KANE.

All photographs, radiographs, and core descriptions are not included in this report due to cost limitations. Photographs and core descriptions are filed in the USGS office in Corpus Christi, while negatives of the core photographs, the radiographs and a copy of the core descriptions are in our files. Data on the x-ray radiographs and shipboard operations were presented in our 1970 final report.

In the present report, the results of coarse fraction analysis and textural analysis of all samples are also presented as they may be useful for other investigators.

00117

Bouma, Arnold H., William E. Sweet, Jr., Frank B. Chmelik and George L. Huebner. Shipboard and in situ electrical resistivity logging of unconsolidated marine sediments. Third Annual Offshore Technology Conference, Houston, Texas 16 p, 1971.

The electrical logging project is designed to (a) develop quantitative in situ and laboratory electrical logging hardware and techniques for measurements in unconsolidated sediments, (b) define the relationship between the electrical properties and the chemical, physical and engineering characteristics of sediments, and (c) develop computer models for reducing the electrical measurements to a variety of desired parameters.

00118

Bright, T. J., J. W. Caruthers and R. C. Thompson. Deep scattering layers in the Gulf of Mexico. Texas Agricultural and Mechanical University Oceanography Abstract of Technical Reports, Reference 71-5-T: 2, 1971.

The deep scattering layer (DSL) in the Gulf of Mexico has been studied over a period of three years, utilizing a precision depth recorder operating at 12 kHz. The DSL appears to be divided into four main daytime layers. The

DSL appears to be divided into four main daytime layers. The west-central Gulf shows little deep layering. No definite correlation of DSL and physical parameters was made. The DSL was not found to be seasonally variable. There were some indications that the DSL shoals were to the north.

00119

Brooks, Ralph H., Jr., Patrick L. Brezonik, Hugh D. Putnam and Michael A. Keirn. Nitrogen fixation in an estuarine environment: the Waccasassa on the Florida Gulf Coast. *Limnology and Oceanography*, 16(5): 701-710, 1971.

Nitrogen fixation has been detected by the acetylene reduction method in the sediments of the Waccasassa estuary, a shallow embayment on the Florida Gulf Coast. Fixation rates in the range 1.6-15.0 ng C₂H₄/g sediment-hr were found within the top 2-5 cm stratum of sediments. Expressed in terms of equivalent nitrogen fixed, the range was 0.64-6.0 ng N/g-hr. Much lower rates (0.03-0.40 ng C₂H₂·hr) were found at greater depths in the sediment, and no fixation was observed in the flocculent unconsolidated 1-2 cm at the sediment surface.

All evidence indicates that the reduction of acetylene to ethylene is a biological phenomenon, directly related to the activity of nitrogen-fixing organisms in the sediments. Nitrogen-free media produced growths of Gram-positive spore-forming rods from sediments under an N₂ atmosphere. A pure culture similar to Clostridium sp. was isolated on nitrogen-free media from Waccasassa sediments and was shown capable of nitrogen fixation by the acetylene reduction method.

00120

Campbell, K. S. and D. L. Williams. Development report number 9 V.T.E. process development - Freeport Test Facility - Freeport, Texas. Office of Saline Water Research and Development Progress Report No. 739, 181 p, 1971.

Major importance was placed on evaluating the double-fluted tube bundle and the titanium tube bundle to see how well they perform with time in a large desalination plant. Condensate handling-restrictions in the 5 effect module were studied. A major sump to sump brine transfer system modification was designed, installed and tested. An attempt was made to improve brine distribution by the use of porcelain spray nozzles in two effects. Enhanced surface spirally grooved tubes were evaluated both in a brine preheater and in the high temperature auxiliary test unit. Deaerator control at Run 14 optimum conditions and minimum acid addition rate were closely monitored. A full sized system of oxygen scavenging was operated, modified and evaluated.

00121

Chesnutt, Charles B. and Robert E. Schiller, Jr. Scour of Gulf Coast beaches due to wave action. Third Annual Offshore Technology Conference, American Institute of Mining, Metallurgical, and Petroleum Engineers, Preprints, 1: 269-278, 1971.

This study was the first attempt to investigate scour in front of sea walls and dune barriers for conditions simulating Texas Gulf Coast beaches. Texas beach sand, which was found to be uniform in grain size along the coast from Sabine Pass to mid-way of Padre Island, was used in concluding the experiments.

00122

Davies, David K., Frank G. Ethridge and Robert R. Berg. Recognition of barrier environments. American Association of Petroleum Geologists Bulletin, 55(4): 550-565, 1971.

The vertical succession of sedimentary structures and textures in the Holocene Galveston Barrier Island, Texas, is the same in a lower Cretaceous barrier complex in Montana and in a lower Jurassic barrier in England. A general model of barrier sedimentation was developed from these similarities.

00123

El-Ashry, M. T. Causes of recent increased erosion along United States shoreline. Geological Society of American Bulletin, 82(7): 2033-2038, 1971.

The presence of beach ridges extending parallel to the present shorelines of many areas along U.S. coasts indicates progradation of these areas after the last glacial stage of the Pleistocene epoch. The general trend of shoreline changes in the past 100 years, however, was erosion of several hundred feet of the beaches. Three major causes are considered responsible for such increased erosion. These are: (1) hurricanes and severe storms; (2) recent eustatic rise in sea level; and (3) interference by man with natural shore processes.

00124

Harris, John E. Characterization of suspended matter in the Gulf of Mexico and northern Caribbean Sea. Ph.D. dissertation, Texas Agricultural and Mechanical University, 1971.

Suspended matter in the Gulf of Mexico and northern Caribbean Sea is characterized with respect to its mass distributions particle size distributions, biological components, and its seasonal variations in this study. Electron microscopy was used extensively in characterizing the suspended matter.

00125

Herbich, John B. Ocean engineering programs, 1969-1970. Engineering Education, 61(5): 453-454, 1971.

00126

Herbich, John B. and Z. Lyndell Hales. Remote sensing techniques used in determining changes in coastlines. Third Annual Offshore Technology Conference, American Institute of Mining, Metallurgical, and Petroleum Engineers, Preprints, 2: 319-334, 1971.

The capability of remote sensing techniques to detect the changes that occur in coastlines as a result of long-term climatological phenomena or short-term events of meteorological significance such as hurricanes or other wave attack of intense nature is examined.

00127

Herbich, John. Comparison of model and beach scour patterns. American Society of Civil Engineers, 12th Coastal Engineering Conference, 1970 Proceedings, 2: 1281-1300, 1971.

Artificial or natural barriers are divided into those from which waves are reflected and those on which waves break. Intermediate types may set up severe erosive action of the beach in front of barriers. When reflected waves are superimposed on incident waves a stationary spatial envelope of combined incident and reflected waves is produced. Previous laboratory studies indicated that crests of the sand bed appear fairly closely under the nodes of the envelope and troughs of the scoured sand bed under the loops of the envelope. The predominant scouring pattern had a spacing between crests of one-half the wave length. Studies on parameters for bar and trough depth were compared with beach profiles along the Texas Gulf Coast. Relations between scour depth and sand crest wave length between trough depth and sand bar depth, and between wave characteristics and beach scour were established for selected locations.

00128

Ichiye, Takashi. The general circulation in the Gulf of Mexico as a two-layer basin. Texas Agricultural and Mechanical University Oceanography Abstracts of Technical Reports, Reference 71-21-T: 14-15, 1971.

The general circulation in the Gulf of Mexico is treated with two-layer ocean models. Scaling of vorticity equation for the upper layer with the motionless lower layer indicates that the inertia, horizontal eddy viscosity and wind-stress terms are unimportant compared with planetary vorticity and friction (proportional to velocity) terms for time scales longer than a few months and that a non-stationary motion like Loop Current may develop within a few weeks.

00129

Ichiye, Takashi and Hideo Sudo. Saline deep water in the Caribbean Sea and in the Gulf of Mexico. Texas Agricultural and Mechanical University Oceanography Abstract of Technical Reports, Reference 71-16-T: 16, 1971.

Preliminary analysis of the deep hydrographic data of the Caribbean Sea suggests that the high salinity deep water entered the Caribbean mainly through the Windward Passage. A greater part of this water flows along the Cayman Trench and enters the Gulf of Mexico through Yucatan Straits, reaching its southwestern corner along the continental slope. Apparently this water originates in the high-saline North Atlantic Deep Water of Mediterranean origin. The salinity of this water shows a long term change in the western North Atlantic.

00130

Ichiye, Takashi and Hideo Sudo. Mixing processes between shelf and deep sea waters of the Texas coast. Texas Agricultural and Mechanical University Oceanography Abstracts of Technical Reports, Reference 71-19-T: 17, 1971.

Forty STD stations as well as four Nansen cast stations and eighteen BT stations were made during a cruise of March 18 to 22 on board the Alaminos south of Galveston on the Continental Shelf and slope. The data indicate that the coastal water was not found except at the nearest station less than twenty miles from the coast and that temperature increases offshore but salinity increases inwards.

00131

Kincaid, George Preston, Jr. Contemporary sources and geochemistry of

tritium in the Gulf of Mexico and its distributive province. Ph.D. dissertation, Texas Agricultural and Mechanical University, 1971.

The reaction has been studied and the activation cross section measured at about 40 millibarns. This cross section was applied to tritium production in the Texas A & M University MTR-type nuclear reactor. An estimated tritium inventory of the reactor pool water indicated that at least 98% of the tritium produced was lost from the reactor pool to the environment.

00132

Lemmon, Ray, et. al. Report of the Interim Study Committee on Oceanography. Submitted to the 62nd Legislature of the State of Texas and published as Texas Agricultural and Mechanical University, Sea Grant Program Publication Number TAMU-SG-71-105, 1971.

00133

Longhurst, Alan R. The clupeoid resources of tropical seas. Oceanography and Marine Biology Annual Review, 9: 349-385, 1971.

00134

Martinez, Joseph D. Environmental significance of salt. American Association of Petroleum Geologists Bulletin, 55(6): 810-825, 1971.

The saline waters of the oceans and salt deposits of the continents are an integral part of our ecologic system. This saline environment presents problems (such as disposal of large quantities of common salt), but opportunities as well, in man's attempts to utilize, change, and enhance his environment.

00135

Mason, C. and R. M. Sorenson. Properties and stability of a Texas barrier inlet. Texas Agricultural and Mechanical University, Sea Grant Publication Number TAMU-SG-71-217, 165 p, 1971.

An environmental study was conducted at Brown Cedar Cut, a natural unstable barrier beach inlet connecting east Matagorda Bay, Texas, with the Gulf of Mexico. The objectives of this study were to determine the physical and hydraulic properties of the inlet, and to investigate the inlet's historical stability, as well as its short-term response to a number of physical processes. Results of the study indicate that hurricanes and continuing

erosion of adjacent beaches enhance the long-term stability of the inlet. During winter months, the rapid passage of strong frontal systems and associated winds, as well as substantial amounts of rainfall, are primarily responsible for the day-to-day viability of the channel boundaries. In the absence of such forces, the predominance of littoral drift over the limited flushing ability of astronomical tidal currents leads to degradation of the inlet channel and westward migration of the entire inlet system.

00136

Nowling, Worth D., Jr. Water masses and general circulation of the Gulf of Mexico. *Oceanology International*, 6(2): 28-33, 1971.

00137

Odum, William E. Pathways of energy flow in a south Florida estuary. *Univ. Miami, Sea Grant Tech. Bull.* 7:162 p., 1971.

00138

Paskausky, David F. Numerically predicted changes in the circulation of the Gulf of Mexico accompanying a simulated hurricane passage. *Journal of Marine Research*, 29(3): 214-225, 1971.

To obtain a quasi-steady-state basic circulation pattern for the Gulf of Mexico, a barotropic prognostic numerical model, with no changes in input conditions and with sufficient friction, has been used. It has been found that a simulated hurricane that would theoretically pass across the Gulf of Mexico from the Yucatan Strait to a point just east of the Mississippi Delta would generate a two-centered cyclonic flow region in the western Gulf waters, with a remnant of the steady-state anticyclonic flow in the north-western corner. The passage of such a hurricane would cause the loop current to extend into the region west of Florida, where a closed anticyclonic flow is generated. The planetary vorticity would cause a westward migration of the lows as well as a migration of the high from the Florida shelf into the loop current; subsequently an anticyclonic eddy would break off from the loop and migrate westward. The friction and advection of vorticity through the Florida Strait dissipate the extra energy supplied by the storm; the flow would eventually return to the quasi-steady state.

00139

Patterson, M. M. Hindcasting hurricane waves in the Gulf of Mexico. Third

Annual Offshore Technology Conference, American Institute of Mining, Metallurgical, and Petroleum Engineers, Preprints, 1:

An estimate of wave heights is needed for risk and venture analysis, for platform design, and for operational planning. Very little reliable data on hurricane waves have been available for a number of years. The present hindcast system uses a moving, two-dimensional wind field to generate and propagate waves to a location of interest. The basic wind-wave model is based on work reported in the literature by Basil Wilson.

00140

Pequegnat, Willis E., William R. Bryant and John E. Harris. Carboniferous sediments from Sigsbee Knolls, Gulf of Mexico. American Association of Petroleum Geologists Bulletin, 55(1): 116-123, 1971.

A violet siltstone determined by K-Ar methods to be Carboniferous (318 x 10⁶ years old) was dredged from one of the Sigsbee Knolls in the southwest Gulf of Mexico. This is by far the oldest material ever recovered from the deep Gulf or any other oceanic basin. Analyses by atomic absorption spectrometry, x-ray diffraction, and electron microscopy reveal that the siltstone is composed primarily of quartz with lesser amounts of kaolinite, talc, and hematite. Glauconite, anatase, and rutile are present in trace amounts. The delicate lath work of the glauconite crystals indicates that this material was formed in place and is not detrital.

00141

Prather, S. H. Hydraulic properties of an artificial tidal inlet through a Texas barrier beach. Texas Agricultural and Mechanical University in partial fulfillment for the requirements of Master of Science degree, 1971.

00142

Pytkowicz, Ricardo M. and Dana R. Kester. The physical chemistry of sea water. Oceanography and Marine Biology Annual Review, 9: 11-60, 1971.

00143

Scafe, D. W. and G.W. Kunze. A clay mineral investigation of six cores from the Gulf of Mexico. Geology, 10: 69-85, 1971.

Samples were studied from each color change along six gravity cores from nearshore to deep-sea areas in the Gulf of Mexico. Analytical methods and

techniques used to characterize the sediments were x-ray diffraction, differential thermal analysis, cation exchange capacity, particle size distribution and fractionation of the clay-size material with the super-centrifuge.

00144

Stapor, F. W. Sediment budgets on a compartmented low-to-moderate energy coast in northwest Florida. *Marine Geology*, 10(2): M1-M7, 1971.

Sediment budgets for portions of the Franklin and Gulf County, Florida, coasts have been determined through comparison of old (1860's-1940's) U.S. Hydrographic Office smooth sheets. Rate of erosion and deposition and, significantly, minimum distances of transport were computed. This coast is divided into at least six individual compartments (or longshore drift cells) which most probably experience minimal communication; in each instance erosion and deposition are nearly balanced. This compartmentalization is effected by the low-to-moderate wave energy and the offshore bathymetry of the region.

00145

Stauble, Donald K. Sediment budget for Cape Blas Shoal, Florida. *Coastal Research Notes*, 3(5): 6-7, 1971.

The sediment budget for the past 30 years was calculated across Cape San Blas shoal in northwest Florida. The method of comparing two contour maps and constructing a third contour map of the differences was used. From this rates of erosion and deposition were calculated. Erosion exceeds deposition in this open system. Transport direction appears to be south and east and the shoal therefore is migrating in an easterly direction. This is opposed to the general westward drift found along the Apalachicola River delta coast. The area of study is located on the Panhandle coast of Florida, west of Apalachicola Bay (off Gulf County) and is bounded by latitudes $29^{\circ} 31' 40''$ N and $29^{\circ} 44' 00''$ N and longitudes $85^{\circ} 31' 30''$ W.

00146

Interim Study Committee on Oceanography (Texas State House of Representatives and Texas Agricultural and Mechanical University). Report on the Interim Study Committee on Oceanography. Texas State House of Representatives, Texas Agricultural and Mechanical University, 24 p, 1971.

As the result of a resolution introduced in the 61st Legislature, the

Interim Study Committee on Oceanography was created to study the feasibility of creating a Texas Institute for Oceanography. After a year of hearings and other investigations, the Committee recommended that decision for an Institute be deferred because marine-oriented programs in existing institutions are still in formative stages. Instead, a 12-member Texas Council on Marine-related Affairs was proposed as a forum for expert judgment and advice. Also recommended was creation of a position within the Governor's Office of "Coastal Zone and Marine Affairs Administration." The committee report reviews the economic impact of marine activities on Texas and makes recommendations on coastal development scientific research, education and government functions.

00147

Texas Planning Agency Council (Water Oriented Data Programs Section, Interagency Natural Resources Council, compiler). Catalog of water oriented data (available from 8 Texas state agencies) - Volume 24, bays and estuaries. Texas Water Development Board, Austin, Texas, 69 p, 1971.

This catalog contains information about water data acquisition, activities of various Texas state agencies but not the actual water data. Information is catalogued by river basin (in this volume a basin number has been assigned to bays and estuaries), chapter, subject, county, the agency reporting the data and the agency reporting number. Data on ground water and waste disposal and some electric well logs are included.

00148

Veber, U. U., D. Ye. Gershanovich, M. L. Sazonov and S. N. Morozova. The formations of gaseous hydrocarbons in modern shelf sediments of the tropical Atlantic. *Geologiya Nefti I Gaza*, (6): 49-53, 1971.

Samples of bottom sediments from the Brazil-Guiana shelf area and the southern part of the Gulf of Mexico were studied and subjected to laboratory experiments. The results show that it is possible to generate gaseous hydrocarbons of heavy methane in modern marine sediments, both clay and sand, in both clastic and carbonate deposits. Up to a state of vacuum, hydrocarbons occur in connection with certain rock conditions and are separated out only after a sharp decrease in pressure. The escape of gas and formation of fissures in sediments contribute to decreased downward compression in strata, which in turn leads to an elevation of the strata.

00149

Watson, Richard L. Origin of shell beaches, Padre Island, Texas. *Journal*

of Sedimentary Petrology, 41(4): 1105-1111, 1971.

Central Padre Island, Texas, is the site of a convergence of littoral drift which causes shell and sand from the entire coast to accumulate in the convergence area. Shell material is then concentrated on the beach by aeolian deflation of finer grained terrigenous sand which blows inland to contribute to the extensive infilling of Laguna Madre by wind-tidal flats, and perhaps ultimately to contribute to the aeolian sand plain of the mainland.

Ancient shell beaches of the Pleistocene (?) Ingleside Complex of the mainland shore of Laguna Madre bear great similarity to the modern shell beaches of Padre Island suggesting that the general coastal configuration and wind patterns were similar to modern patterns at the time of their formation.

It must be concluded that some large carbonate accumulations can occur solely as the result of a sorting process in an area of great terrigenous sediment supply.

00150

Whitaker, Robert E. Seasonal variations of steric and recorded sea level of the Gulf of Mexico. Texas Agricultural and Mechanical University Oceanography Abstracts of Technical Reports, Reference 71-24-T: 11-12, 1971.

Monthly mean steric sea levels (geopotential) relative to 150 db are computed for the Gulf of Mexico from monthly mean temperature fields and a constant salinity, 36.30 ‰. The temperature distributions for the upper 150 m of the Gulf are determined from some 17,000 BT observations. The monthly topographies of the 22 degrees C surface, which are roughly expanded mirror images of sea-surface geopotential relative to a deep reference pressure, exhibit a set of regular annual changes. The Loop Current and its seasonal variations and the western high-pressure region are clearly indicated.

00151

Wright, L. D., C. J. Sonu and W. V. Kielhorn. Water-mass stratification and bed form characteristics in East Pass, Destin, Florida. Louisiana State University, Coastal Studies Institute, 16 p, 1971.

Density contrasts between the water of Choctawhatchee Bay and the Gulf of Mexico result in sharp vertical and horizontal stratification in the northern part of East Pass near Destin, Florida, during flood and a portion

of the ebb tidal phases. As a consequence of this stratification, flood tide currents are swiftest and of longest duration in the deeper layers within dredged channels. Ebb currents attain their velocity and duration maxima in the upper layers of the water column. Accordingly, bed form asymmetries indicate that bedload transport is flood dominated in the channels and ebb dominated over shoals. Vertical density homogeneity resulting from greater mixing of the seaward reaches and at the mouth of the inlet channel is accompanied by bidirectional sand transport.

00152

Wright, L. D. and J. M. Coleman. Effluent expansion and interfacial mixing in the presence of a salt wedge, Mississippi River delta. *Journal of Geophysical Research*, 76(36): 8649-8661, 1971.

Ground observations and remote-sensing imagery indicate that efflux from the mouth of South Pass, Mississippi River, expands as a laterally homogeneous layer above the underlying salt water. Flow deceleration and effluent deconcentration are primarily the result of vertical rather than lateral mixing. Field and imagery data correspond closely to theoretical expansion rates predicted as functions of the lateral hydrostatic pressure gradient created by the density contrasts between the river water and sea water. The expansion rate is shown to depend solely upon the density ratio and upon the densimetric Froude number. Flow velocity data agree with predictions based on deceleration caused by salt water entrainment.

00153

Wright, L. D. Hydrography of South Pass, Mississippi River. *American Society of Civil Engineers Proceedings. Journal of the Waterways, Harbors and Coastal Engineering Division*, 97 (WW3), paper 8290: 491-504, 1971.

In the lower South Pass channel of the Mississippi Delta, a combination of salt-water intrusion and tide dominate circulation and mixing. Seaward discharge and vertical mixing in the channel are greatest during ebbing tide, when the hydrostatic gradient is at a maximum. Direction of flow within the salt-water wedge is largely a function of tidal phase, upstream currents prevailing during flooding tide, and downstream currents characterizing ebbing tide. Bed load transport in the lower channel, particularly at low and normal river stage, is therefore considered to be tide dependent.

00154

Zuppan, Alan-Jan Wellward. Surficial sediments and sedimentary structures; Middle Ground, Padre Island, Texas. *Texas Agricultural and Mechanical*

University Oceanography Abstracts of Technical Reports, Reference 71-12-T: 21-22, 1971.

The Middle Ground, located in the Coastal Bend of Texas, is a modern wind-tidal flat. Analyses of its sediments reveal that the Middle Ground was a shallow lagoonal environment about 1,700 years ago. As sediments accumulated, the environment gradually changed to a very shallow-water grass flat and next to an algal flat covered by only a few centimeters of water.

00155

Bault, Edward I. Hydrology of Alabama estuarine areas - cooperative Gulf of Mexico estuarine inventory. Alabama Marine Resources Bulletin Number 7, 36 p, 1972.

Twenty-one hydrological stations in five Alabama estuarine areas were sampled monthly from January, 1968 through March, 1969. Nitrite-nitrogen, nitrate-nitrogen, orthophosphate-phosphorus, total phosphorus, pH, dissolved oxygen, temperature, turbidity and salinity were determined for each station. Bimonthly isohalines and isotherms and graphical representations of micronutrients and chemophysical parameters are presented. All data are presented in tables or graphs and comparisons are made among the estuarine areas.

00156

Bouma, A. H. and W. E. Sweet. Correlation of near-surface sedimentary strata by electric logging. American Association of Petroleum Geologists Bulletin, 56(3): 605, 1972.

Instruments and techniques to measure the electrical resistivity of unconsolidated marine sediments have been developed at Texas A & M University. Electrical logging can be performed in situ and upon extruded cores.

The in situ device using several electrodes makes point resistivity measurements while stationary within the bottom sediments and is thus independent of ship's motion. A minimum number of cores is required to establish the stratigraphy and to calibrate the probe resistivity measurements. The shipboard or laboratory logging system can be used to take continuous readings along a core and also can be used to measure the resistivity of discrete sample units.

The comparison of electrical resistivities of sediments, in particular the formation resistivity factor, with the geotechnical properties of the

sediments reveals correlations which indicate that some of these geo-technical properties may be predicted from future resistivity measurements. A series of rapid in situ measurements then can be made, greatly reducing the number of cores necessary to complete the survey.

00157

Bouma, A. H. Rhythms in deep sediments from Gulf of Mexico and Caribbean. American Association of Petroleum Geologists Bulletin, 65(3): 605, 1972.

Rhythmic patterns observed in unconsolidated marine deposits in cores, collected from the western abysmal plain of the Gulf of Mexico and from the Beta Straits in the Caribbean, are based on sedimentary structures rather than on lithology.

From the present knowledge of contourites, nepheolites, pelagites, and turbidites, it is believed that the silty clay intercalations from the Caribbean cores, can be interpreted best as incomplete turbidite sequences. This interpretation is based primarily on the incomplete sedimentary facies model as developed for ancient turbidites. The thin clay seams commonly found in recent deposits, as well as some other features not known in ancient turbidites, normally become visibly thin from the effect of consolidation.

00158

Caruthers, J. H. Water masses at intermediate depths. Contributions on the physical oceanography of the Gulf of Mexico, Texas Agricultural and Mechanical University, Oceanographic Studies 2: 53-64, 1972.

Potential temperature-salinity characteristics of the Gulf of Mexico are analyzed in considerable detail. The analysis involves a quantitative comparison of O-S data throughout the Gulf with a "standard" O-S relation established in the Yucatan Channel. The standard is represented by a least squares polynomial fit to 33 O-S data pairs. The comparison involves computing the salinity deviations from the standard for various stations throughout the Gulf. The analysis reveals subtle, but distinct, variations in the intermediate water mass of the Gulf in the winter of 1962 and suggests flow patterns and mixing. Analyses of other O-S data for the Gulf are also discussed.

00159

Caruthers, J. W., R. C. Thompson, J. C. Novarini and G. H. Franceschini. Response of deep scattering layers in Gulf of Mexico to a total solar

eclipse. Letter to the Editor, Deep-Sea Research, 19(4): 337, 1972.

00160

Cochrane, John D. Separation of an anticyclone and subsequent developments in the loop current (1969). Contributions on the Physical Oceanography of the Gulf of Mexico, Texas Agricultural and Mechanical University, Oceanographic Studies, 2: 91-106, 1972.

In May, 1969, the process of detachment of an anticyclonic current ring from the Gulf of Mexico Loop Current was observed for the first time.

00161

David, R. A., Jr. and W. T. Fox. Coastal dynamics along Mustang Island, Texas. Western Michigan University, 76 p, 1972

Two modified time-series studies were conducted along the Mustang Island, Texas coast during October-November, 1971 and January-February, 1972. Patterns exhibited by variations in monitored environmental variables show interrelationships that are quite comparable to those observed in eastern Lake Michigan. The dominating factor in controlling coastal processes along the Texas coast is barometric pressure. Large scale fluctuations occur as cold fronts (northers) move through the area in an offshore direction. Changes in wind direction and velocity, breaker height, and longshore current direction and velocity accompany the passage of these fronts. The responses of beach and nearshore topography to the above changes in conditions are also much like those observed in Lake Michigan.

00162

Durham, D. C. Estimates of diurnal tidal volume transports through the Yucatan Channel. Texas A. and M. University, 1972.

00163

Duursma, Egbert Klaas. Geochemical aspects and applications of radio-nuclides in the sea. Oceanography and Marine Geology Annual Review, 10: 137-224, 1972.

00164

Folger, D. W. Characteristics of estuarine sediments of the United States.

U. S. Geological Survey Professional Paper 742, 94p, 1972.

The texture and the composition of bottom sediments in the estuarine zones of the United States are a function of the geologic, bathymetric and hydrological settings in which they were deposited. Most bottom sediments that accumulate in the estuarine zone consist of terrigenous detritus, biogenic debris, and pollutants. Organic carbon generally makes up less than 5 percent of the bottom sediments except in swampy areas, fjords, or where pollutants are abundant. Inorganic constituents are mostly quartz, feldspar, and clay minerals. In general, illite and chlorite are the most abundant clay minerals on the northeast coast; kaolinite predominates on the southeast Atlantic coast and in the eastern Gulf of Mexico; and montmorillonite is common along the coasts of the western Gulf of Mexico and the Pacific Ocean. Shell debris is locally abundant in many areas but is dominant only in areas far from terrigenous sources.

00165

Frank, D. J. Deuterium variations of Gulf of Mexico. Transactions of American Geophysical Union, 53(4): 405, 1972.

Deuterium variations of the Gulf of Mexico. The deuterium concentration of the Gulf of Mexico water masses was measured relative to Standard Mean Ocean Water.

00166

Hahl, D. C. and K. W. Ratzloff. Chemical and physical characteristics of water in estuaries of Texas, October 1968 - September 1969. Texas Water Development Board Report 144, 161 p, 1972.

In September 1967, the U.S. Geological Survey, in cooperation with the Texas Water Development Board, began a water-resources investigation of the principal estuaries along the Texas Coast except Galveston Bay and the Rio Grande. The objectives are to define: (1) the occurrence, source, and distribution of nutrients; (2) current patterns and directions and rates of movements; (3) physical, organic, and inorganic water quality and its areal distribution and time variation; (4) occurrence, quality, quantity, and dispersion of drainage entering the estuarine systems; and (5) chemical and physical characteristics of water which enters the estuaries from the Gulf of Mexico. The data collected from October 1968 to September 1969 are presented.

00167

Hanson, K. J. and N. F. Poindexter. The solar irradiance environment of Florida coastal water during flare. National Oceanic and Atmospheric Administration, Atlantic Oceanographic and Meteorological Laboratories, 104 p, 1972.

Solar irradiance measurements both above and within the mixed layer were obtained at three ocean sites along the southeastern Florida coast from Miami Beach (Government cut) to Key Largo during the Florida Aquanaut Research Expedition of February-March, 1972. The results show that even though the transmittance of the water varied considerably from day-to-day due to changes in turbidity, the average transmittance at the sites was nearly the same. The reflectance and transmittance of the water column were also examined. Results of studies of the immersion effect of the underwater pyranometer are discussed but have not been applied to the basic irradiance data.

00168

Harris, J. E. Characterization of suspended matter in Gulf of Mexico, 1) Spatial-distribution of suspended matter. Deep-Sea Research, 19(10): 719-726, 1972.

The mass distribution of total suspended matter was determined at 45 stations in the Gulf of Mexico using membrane filters. A bimodal distribution was found which can not be completely explained; however, it appears that seasonal variations in primary productivity are important. The average value of total suspended matter for deep water was almost three times higher than the previously reported average.

00169

Hobbie, John E., Osmund Holm-Hansen, Theodore T. Packard, Lawrence R. Pomeroy, Raymond W. Sheldon, James P. Thomas, and William J. Weibe. A study of the distribution and activity of microorganisms in ocean water. Limnol. Oceanogr. 17(4): 544-555, 1972.

00170

Hobson, L. A. and C. J. Lorenzen. Relationships of chlorophyll maxima to density structure in Atlantic Ocean and Gulf of Mexico. Deep-sea research, 19(4): 297-306, 1972

Chlorophyll maxima occur in the Atlantic Ocean and Gulf of Mexico in association with pycnoclines. Spatial distributions of these maxima are

patchy and the maximum depths to which they follow pycnoclines are variable. This variability may be related to degree of light adaptation by phytoplankton cells. It is suggested that light adaptation is a function of the taxonomic composition of the phytoplankton crop. Possible relationships between chlorophyll maxima and micro-zooplankton are discussed.

00171

Hubertz, J. M., A. W. Garcia and Robert O. Reid. Objective analysis of oceanic surface currents. Contributions on the Physical Oceanography of the Gulf of Mexico, Texas Agricultural and Mechanical University, Oceanographic Studies, 2: 139-148, 1972.

Physical oceanographic surveys of the eastern Gulf of Mexico were made in June, 1966, and June, 1967, with the R/V Alaminos. Hourly surface GEK measurements were made during both cruises. Treating measurements from each cruise as synoptic, these results are used to approximate the non-divergent part of the surface velocity field, which is displayed in terms of a stream function. The method used to obtain the stream function is a numerical relaxation of a form of Poisson's equation. Solutions were obtained for two types of boundary conditions.

00172

Ichiye, Takashi. Experimental circulation modeling within the Gulf and the Caribbean. Contributions on the Physical Oceanography of the Gulf of Mexico, Texas Agricultural and Mechanical University, Oceanographic Studies, 2: 213-226, 1972.

Experiments were carried out with scale model of the Gulf of Mexico and Caribbean Sea in a circular plexiglass tank with a diameter of 120 cm mounted on a turntable rotated at speeds between 4 and 8 rpm. The reduction ratios of the model are 5.5×10^{-7} and 3.3×10^{-7} for the Gulf and Caribbean, respectively, in horizontal scale. Vertical exaggeration is 100 times. The driving force for the Gulf was the inflow and outflow system maintained with a reservoir or a circulating pump.

00173

Ichiye, Takashi. Circulation changes caused by hurricanes. Contributions on the Physical Oceanography of the Gulf of Mexico, Texas Agricultural and Mechanical University, Oceanographic Studies, 2: 229-257, 1972.

Observations in the Gulf of Mexico of temperature and salinity changes due to passing hurricanes are reviewed. Observations for Hurricane Carla (1961)

and for Hurricane Inez (1966) were made on the Continental Shelf in the northwestern and the western Gulf, respectively. The data from the latter case indicate upward displacement and deepening of the thermocline near to and to the left hand side of the hurricane center, respectively. The data from Hurricane Hilda (1964) were obtained on several transects across the track in the central Gulf and are the most comprehensive. Comparison of hydrographic data with those of the undisturbed state indicate upward and downward displacement of the thermocline at and outside the track of the eye, respectively.

00174

Ichiye, T. and H. Sudo. Upper watermass formation in western Gulf of Mexico. Transactions of American Geophysical Union, 53(4): 392, 1972.

Upper watermasses in the western Gulf of Mexico consist of the Yucatan water and the Gulf proper water. The former is formed by westward geostrophic transport north of Campeche Bank from spring to summer and produces an extensive area of high surface salinity above 36.4 ppt south of 25 degrees, in almost in all seasons. The Gulf proper water has usually salinity maximum below the upper mixed layer thicker than 50 m in winter and forms a limited area of high salinity in the northern slope from summer to early winter. Oxygen in water warmer than 19 degrees C is lower for the Yucatan water than for the Gulf proper water but the reverse is the case for colder water. Two case studies were made about effects of winds on water mass modification in cold seasons. In March 1970 cold northerly winds caused sinking of the surface high salinity water (above 36.4 ppt) to 100 to 150 m in elongated patches (20 km x 100 km) along 25 degrees N, producing temperature inversion in the upper 50 m and salinity maximum below it.

00175

Ishigurd, S. Electronic analogue in oceanography. Oceanography and Marine Biology Annual Review, 10:27-96, 1972.

00176

Johnson, C. M., A. H. Bouma and W. R. Bryant. Bottom characteristics of northern Gulf of Mexico continental shelf. American Association of Petroleum Geologists Bulletin, 56(9): 1899, 1972.

Photographs of the Gulf of Mexico continental shelf floor between Panama City, Florida, and Galveston, Texas, were examined for evidence of sediment texture, structure, and biologic activity. Sediment size is distinctively

coarser in areas of reef growth near the continental slope.

00177

Lau, J. P. and A. Barcilon. Harmonic generation of shallow water waves over topography, *J. Phys. Ocean*, 2(4), 405-410, 1972.

00178

Leipper, Dale F., John D. Cochrane and J. F. Hewitt. A detached eddy and subsequent changes (1965). *Contributions on the Physical Oceanography of the Gulf of Mexico*, Texas Agricultural and Mechanical University, Oceanographic Studies, 2: 107-117, 1972.

An isolated eddy which was observed in the Gulf of Mexico in August, 1965, is described. The velocity at the core of the current in the eddy, 113 cm/sec was comparable to that in the East Gulf Loop Current itself. A month later, following the passage of Hurricane Betsy, the eddy was considerably modified in shape and the volume transport had decreased from 40 to 19 million m^3 /sec. The velocities decreased from 113 to 73 cm/sec in the core of the current.

Nowlin, Hubertz and Reid (1968) reported on a cruise in June, 1967, and established the existence of a major eddy which had evidently become detached from the Loop Current in the eastern Gulf of Mexico. Such a phenomenon also occurred in 1965 and has been described in technical reports by Leipper (1970) and Cochrane (1966). In this case, a month after the isolated eddy was observed, another cruise was conducted and a marked change was found to have occurred in the eddy. Hurricane Betsy had passed over the area in the interim.

00179

Manheim, Frank T., John C. Hathaway and Elazar Uchupi. Suspended matter in surface waters of the northern Gulf of Mexico. *Limnology and Oceanography*, 17(1): 17-27, 1972.

Analyses of about 200 surface water samples collected during late fall 1966 show that concentrations of suspended matter greater than 1 mg/liter were restricted to within a few kilometers off Florida, but extended more than 100 km off Louisiana and Texas. Suspensates from areas farther than 100 km from shore contained mainly combustible organic matter, part of which was attributable to living plankton.

Organic aggregates encompassing appreciable amounts of inorganic detritus were particularly noteworthy in transition areas. Zooplankton metabolism

and fecal pellet production appears to be a geologically significant mechanism for depositing fine suspended matter and may contribute to the zonation of bottom sediments. The mineral composition of surface suspensates ranges from a low magnesian calcite-argonite suite off Florida to montmorillonite-kaolinite combinations from Alabama to Texas. The mineral composition of the suspensates resembles that of the bottom sediments in each area.

00180

Mann, J. H. Hydrologic aspects of freshening upper old Tampa Bay, Florida. Florida Department of Natural Resources, Bureau of Geology, Information Circular 76, 39 p, 1972.

00181

Mathews, T. D., A. D. Fredericks and W. M. Sacket. The geochemistry of radiocarbon in the Gulf of Mexico. Symposium on the Interaction of Radioactive Contaminants with the Constituents of the Marine Environment, July 10-14, 1972.

This study was conducted to achieve a better understanding of the contemporary geochemistry of radiocarbon in the Gulf of Mexico and adjacent areas. Bomb C^{14} was found in various biological samples and samples of coral, atmosphere, and water as a result of efforts to map bomb C^{14} distribution in the Gulf. A circulation model for the western Gulf of Mexico was also proposed. Lateral transport from east to west and downward migration due to eddy diffusion were suggested as mechanisms of renewal of intermediate and deep water in the western Gulf. Residence times for these water masses were found to be 130 years and 270 years respectively.

00182

McCammon, R. B. Environment pattern reconstruction from sample data. Spatial characteristics - Mississippi delta region. Technical Report Number 2, 14 p, 1972.

The spatial structure of the map pattern for the Mississippi Delta region of southeast Louisiana can be represented by the mean distances which separate the seven major types of depositional environments. This information provides a basis for devising an optimal sampling strategy which takes into consideration the costs of sampling. For areas where it is desired to reconstruct the underlying depositional pattern based on the fewest numbers of samples, such a strategy could yield the greatest

economic savings. Random sampling of the environmental map pattern of the Mississippi Delta region is nearly as effective as that obtained by systematic sampling. Any significant reduction in the sample size necessary for reconstructing the underlying pattern based on sampling requires that information on the spatial structure be obtained. As a first approximation, the distance between nearest boundary points for the seven major types of depositional environments in the Mississippi Delta region can be described by a family of gamma distributions. An optimal sampling strategy is proposed whereby the probability for intersecting environmental boundaries between successive samples is maximized whereas the probability of remaining within a boundary between successive samples is minimized.

00183

McGowen, J. H. and L. E. Garner. Relation between Texas barrier islands and late Pleistocene depositional history. American Association of Petroleum Geologists Bulletin, 56(3): 638-639, 1972.

The 400 mile long Texas shoreline is characterized by barrier islands separated from the mainland by lagoons, bays, and estuaries up to 8 miles wide. Regional studies indicate that barrier morphology and texture and composition of beach sediment, although largely unrelated to modern rivers, are related to the distribution of sand-rich late Pleistocene facies on the inner continental shelf. For example, Matagorda Peninsula, near the Brazos River, is narrow, receding, and has a high oyster shell content. Narrow, regressive barriers occur where Pleistocene strand plains are absent, where Pleistocene deltas are mud-rich, and in Pleistocene interdeltaic areas. These regressive barriers have a high shell content (dominantly estuarine species), and varying amounts of caliche, siderite, beach rock, and sandstone fragment gravel. Beaches retreat 7-40 ft/yr in erosional areas. Dunes are rare on narrow barriers, and shell ramps extend several hundred feet bayward ending abruptly as steep faces.

Terrigenous sand is the dominant sediment type of wide barriers such as Matagorda Island; no modern stream contributes sand to this barrier. Broad barriers develop where sand-rich Pleistocene deltas and strand plains are present and the sand budget is large. Morphologic features of these barriers are fore-island dunes, beach ridges, and broad barrier flats. Beach ridges, indicating rapid accretion, are characteristic of the older barrier segments. Today, fore-island dunes, suggesting cessation of accretion, are relatively well developed on these barriers.

00184

McGowen, J. H. and L. E. Garner. Significance of changes in shoreline

features along Texas Gulf Coast. American Association of Petroleum Geologists Bulletin, 56(9): 1900-1901, 1972.

The open Texas coast is characterized by 3 distinct types of shoreline: (1) barrier islands consisting of sand beaches, fore-island dunes, and a vegetated or barren back-island area; (2) peninsulas where beaches are dominated by shell (shell ramps with or without incipient dunes form the crest of the peninsula), and storm channels and washover deposits dominate the back-island area; and (3) strand plain a few to several hundred feet across, where shell material and rock fragments are dominant over terrigenous sand. Physiographic features of strand plains are a steep fore-beach and a wide shell ramp that terminates as a steep avalanche face. Only the barrier islands and peninsulas are associated with bays and lagoons.

When viewed separately, these shoreline features appear to have a random distribution. However, when their occurrence is considered in the context of Pleistocene and Holocene depositional history of the Texas coastal zone, there is order in their distribution. Barrier islands develop in the same areas as do sand-rich Pleistocene deltas with broad strand plains. Peninsulas are positioned along Pleistocene interdeltic areas. Strand plains are situated along the distal parts of mud-rich Pleistocene and Holocene deltas. Distribution of these 3 shoreline types along the Texas coast cannot be explained adequately by a sandbed source from modern rivers being transported by longshore drift.

Occurrence of the 3 shoreline types can be explained best by local Pleistocene and early Holocene sediment sources. Broad, sand-rich barrier islands are presently moving toward an equilibrium state where sediment input is about equaled by intensity of physical processes. Narrow, shell-rich peninsulas are moving toward the mainland at rates of 2-14 ft/year. Narrow, shell-rich strand plains are in a state of rapid erosion--up to 30 ft/year.

00185

McLeroy, E. G. Measurement and correlation of the acoustic reflection and sediment properties off Panama City, Florida. Naval Coastal Systems Laboratory, 33 p, 1972.

Continuous fathometer echo measurements were made along a 1200-mile track in the Gulf of Mexico off Panama City, Florida. Bottom samples were taken at 160 locations in the 3500 square mile test area. The amplitude and length of the echoes at the 160 locations were compared with results of the laboratory measurements of various sediment parameters. The echo parameters are readily correlatable with sediment water content, porosity, and the fraction of silt- and clay-sized particles. The length of the echo is suggested as a good indicator of the grain size fraction.

00186

Molinari, Robert L. and John D. Cochrane. The effect of topography on the Yucatan Current. Contributions on the Physical Oceanography of the Gulf of Mexico, Texas Agricultural and Mechanical University, Oceanographic Studies, 2: 149-155, 1972.

The effect of topography on a portion of the Yucatan Current east and northeast of Yucatan Peninsula during May of 1962, 1965 and 1966 is investigated. A graphical method is used in solving the conservation of potential vorticity equation on the basis of actual topography and observed velocity. A numerical method based on a simplified topography is also used as a check on the subjectivity of the graphical method. Through this procedure a path of the current core is obtained and then compared to the observed path. In the three cases considered the calculated paths agree quite well with the observed paths from the Yucatan Strait north to approximately 23 degrees 30' N. The current paths all closely follow a particular isobath with meanders of small amplitude. North of 23 degrees 30' N a more complicated topographic region is encountered and the calculated paths appear to diverge from the few observations in that region.

00187

Molinari, Robert L. and Guy A. Franceschini. Bathythermograph sections across the path of Hurricane Celia. Contributions on the Physical Oceanography of the Gulf of Mexico, Texas Agricultural and Mechanical University, Oceanographic Studies, 2: 259-262, 1972.

Three vertical sections constructed from expendable bathythermograph (XBT) profiles taken in the Gulf of Mexico across the track of Hurricane Celia, are presented. The pre-hurricane and one of the posthurricane sections, which nearly coincide geographically, indicate that the storm may have caused upwelling of colder sub-surface waters. Comparison of the two post-hurricane sections suggests that persistence of this effect of upwelling may be dependent on the length of time the strong winds existed over each area of concern.

00188

Morton, Robert A. Clay mineralogy of Holocene and Pleistocene sediments, Guadalupe Delta of Texas. Journal of Sedimentary Petrology, 42(1): 85-88, 1972.

X-ray diffractograms for 80 samples indicate that smectite, illite, and kaolinite are the predominant clay minerals in sediments from the Guadalupe Delta and San Antonio Bay with smectite the most abundant.

The clay minerals of the area studied are interpreted as being an indicator of clay minerals in the source area based on evidence that they (1) are the same for both Pleistocene and Holocene sediments (2) are not related to changes in depth (3) are not significantly different for fresh water and brackish environments and (4) are essentially the same as those in the source area.

00189

Murray, Stephen P. Turbulent diffusion of oil in the ocean. *Limnology and Oceanography*, 17(5): 651-659, 1972.

On-site observations of oil slick geometries and current speeds during the Chevron spill of March 1970 in the Gulf of Mexico have allowed a comparative evaluation of the role of large-scale turbulence (in the form of a horizontal body diffusivity) and surface tension effects in the spreading of oil from a continuously emitting well into a steady current. The initial outline of the slick (roughly the first 50% of slick length) follows the laws of expansion as predicted by Taylor's turbulent diffusion theory. The gross size and overall shape (neglecting details of outline) of this type of slick are well represented by a solution to the Fickian diffusion equations which predict approximate slick geometry as a function of current speed, horizontal eddy diffusivity, the oil discharge rate, and an empirically determined constant (the boundary concentration).

Under the conditions observed the effect of surface tension seems confined to within the first few hundred meters downslick and can probably be neglected for practical purposes under moderate oil discharge rates and current speeds as low as even 5 cm/sec.

00190

Nowlin, Worth D., Jr. Winter circulation patterns and property distributions. *Contributions on the Physical Oceanography of the Gulf of Mexico*, Texas Agricultural and Mechanical University, Oceanographic Studies, 2: 3-51, 1972.

Based on their characteristic properties, the water masses of the Gulf of Mexico and their vertical stratification are discussed. The T-S relationships specific to the region are presented. For the basin waters, below a sill depth of about 2000 m, the potential temperature, salinity and dissolved-oxygen concentrations show no measurable horizontal variation, although weak vertical density gradients evidence slight positive stability.

00191

Nowlin, Worth D., Jr. and J. M. Hubertz. Contrasting summer circulation pattern for the eastern Gulf - Loop Current versus anticyclonic ring. Contributions on the Physical Oceanography of the Gulf of Mexico, Texas Agricultural and Mechanical University, Oceanographic Studies, 2: 199-137, 1972.

The results of two oceanographic surveys of the eastern Gulf of Mexico in June, 1966, and June, 1967, illustrate two contrasting summer circulation patterns of the area and provide the first detailed description of an anticyclonic ring detached from the Loop Current. This ring was observed in 1967 along with part of an anticyclonic ring detached from the Loop Current. This ring was observed in 1967 along with part of an older ring which appears to have moved westward. The transport in the upper 1350 m of the principal ring, as well as the Loop Current in 1966 and 1967, is at least 30×10^6 m³/sec. The potential incipient formation of an eddy is noted in 1966 as a meander of the Loop Current.

00192

Paskausky, David F. and Robert O. Reid. A barotropic prognostic numerical circulation model. Contributions on the Physical Oceanography of the Gulf of Mexico, Texas Agricultural and Mechanical University, Oceanographic Studies, 2: 163-176, 1972.

A prognostic vorticity equation for a barotropic numerical model is applied to a basin simulating the Gulf of Mexico. Advection of vorticity, planetary vorticity tendency and frictional torques associated with lateral and bottom stresses are included. Wind stress is not included; instead, the forcing function of this model is the prescribed input flow at one of the two ports (Yucatan Channel). Vorticity is predicted using the old stream-field; then Gauss-Seidel over relaxation is used to obtain a new stream-field from the predicted vorticity field. An increase from weak to strong western intensification in the input flow over a period of four months approximates the inflow conditions in the Yucatan Channel from late winter to early summer. This variation of western intensification in the input is associated with the subsequent detachment of an anticyclonic eddy, a feature which agrees qualitatively with observed seasonal patterns in the Gulf of Mexico.

00193

Pequegnat, Willis E. A deep bottom current on the Mississippi Cone. Contributions on the Physical Oceanography of the Gulf of Mexico, Texas Agricultural and Mechanical University, Oceanographic Studies, 2: 65-87, 1972.

A preliminary study of a swift bottom current discovered from biological evidence in the eastern Gulf of Mexico has been carried out by means of cameras and current meters. Studies thus far have been confined to the Mississippi Cone at depths between 3000-3300 m. Short times series measurements made from an anchored vessel and an independently mounted current meter yield current speeds up to 19 cm/sec. These values are compared with ripple marks, lineations, scour and other manifestations of bottom currents in photographs. Observations were made in close geographical proximity from 1967 to 1969. It is proposed that this current be named the East Gulf Deep Bottom Current.

00194

Pequegnat, Willis E. William R. Bryant, Alan D. Fredericks, Thomas R. McKee and Roy Spalding. Deep-sea ironstone deposits in the Gulf of Mexico. *Journal of Sedimentary Petrology*, 42(3): 700-710, 1972.

A silty ironstone (up to 47 percent Fe by dry weight) of unique type was dredged by the Texas A & M University research vessel *Alaminos* from 16 locations in deep water (1,746-3,438 m) of the Gulf of Mexico. The most extensive known development of this ironstone is on the eastern part of the Mississippi Fan at depths around 3,200 m. This development probably owes its existence to the concurrence here of a swift bottom current and high concentrations of dissolved oxygen. Present evidence indicates that undisturbed ironstone forms a crust at the water-sediment interface.

00195

Pomeroy, Lawrence R., L. R. Shenton, R. D. H. Jones, and Robert L. Reimold. Nutrient flux in estuaries. *Amer. Soc. Limnol. Oceanogr. Spec. Symp. Michigan St Univ.*, 1: 274-293, 1972.

00196

Prather, S. H. and R. M. Sorensen. A field investigation of Rollover Fish Pass, Bolivar Peninsula Texas. Texas Agricultural and Mechanical University, Coastal and Ocean Engineering Division, 126 p, 1972.

A field study of Rollover Fish Pass, an artificial tidal inlet connecting Galveston East Bay, Texas, with the Gulf of Mexico, was conducted. The objectives of this study were, (1) to evaluate flow and stability characteristics of the inlet, (2) to investigate the propagation of the tidal wave through the connected bay system, and (3) to evaluate the effect of the inlet on tidal fluctuations and flushing of East Bay. Field work included hydrographic surveys of the inlet and adjacent Gulf beaches, collection and

analysis of sediment samples from the inlet and beaches, measurement of tidal fluctuations at selected locations in East Bay, and current measurements in the inlet. Tidal data from the Gulf, provided by the Galveston District, Corps of Engineers, were analyzed along with the field data.

00197

Reid, Robert O. A simple dynamic model of the Loop Current. Contributions on the Physical Oceanography of the Gulf of Mexico, Texas Agricultural and Mechanical University, Oceanographic Studies, 2: 157-159, 1972.

When it is well developed in the Gulf of Mexico (north of Yucatan Shelf) the northern portion of the Loop Current is confined entirely to the deep-water region where topographic control is absent. However, the dimensions (northern penetration and width) of the Loop Current can be explained in terms of the variation of Coriolis parameter with latitude and the current speed.

00198

Schlemmer, Frederic C., II, and Kendall L. Carder. Particles as indicators of circulation in eastern Gulf of Mexico. (in vitro). Transactions of the American Geophysical Union, 53(4): 424, 1972.

Particle size distribution and light-scattering measurements were performed on suspended particle samples (preserved with Lugol's solution) from stations encompassing the eastern Gulf of Mexico. The samples were obtained along with temperature and salinity data over a one-week period using four oceanographic vessels. Horizontal contours of total particle volume and total particle number were very similar to those of sea-surface temperature and the topography of the 22 degrees C isotherm, two proven circulation indicators. The ratio formed from the components of the light-scattering vector proved to be an excellent indicator of regions of high biological productivity, with minimum values occurring in the upwelling regions. In vitro shipboard light scattering measurements during two later cruises confirmed the existence of a shallow nepheloid layer beneath the Loop Current.

00199

Sheldon, R. W., A Prakash, and W. H. Sutcliffe, Jr. The size distribution of particles in the ocean. Limnol. Oceanogr. 17(3): 327-340, 1972.

00200

Sloss, P. W. Coastal processes under hurricane action: numerical simulation of a free boundary shoreline. Rice University, 1972.

00201

Spalding, R. F. Uranium in sized fractionated river sediments from Gulf of Mexico distributive province. Transactions of the American Geophysical Union, 53(11): 977, 1972.

Ten river sediment samples were size separated into three fractions and analyzed for uranium by the delayed neutron method. The highest uranium concentration in 7 out of 10 samples was in the fraction.

00202

Spalding, R. F., and W. M. Sackett. Uranium in runoff from the Gulf of Mexico distributive province: anomalous concentrations. Science, 175 (4022): 629-631, 1972.

Uranium concentrations in North American rivers are higher than those reported 20 years ago. The increase is attributed to applications to agricultural land of larger amounts of phosphate fertilizer containing appreciable concentrations of uranium. Experiments showing a constant phosphorous/uranium ratio for various types of fertilizers and for the easily solubilized fraction of 0-46-0 fertilizers support this view.

00203

Spalding, R. F. and W. M. Sackett. Uranium in runoff - reply. Science, 178(4056): 77, 1972.

00204

Von Sternberg, M. R. Territorial jurisdiction - mining the deep sea-bed -- international problems and national resolutions. Vanderbilt Journal of Transnational Law, 5: 497-502, 1972.

The tendency of coastal nations to favor extended national maritime jurisdiction has created a serious conflict between the traditional concepts of freedom of the seas and sovereign territorial rights. The proposed Deep Seabed Act S2801 (1971), would implement and revise the 1970 Draft Convention on the international seabed which was submitted to the United Nations by the United States.

00205

Walton, F. Dennis, and H. Grant Goodell. Sedimentary dynamics under tidal influences, Big Grass Island, Taylor County, Florida. *Marine Geology*, 13(1): 1-28, 1972.

Tidal currents augmented by a general rise in sea level of about 0.5 ft. since 1910 have reworked and redistributed relict Pleistocene and Holocene sediments in the low-wave energy environment around Big Grass Island, Florida. Alterations in the textural parameters of sediments from the storm berm, and tidal channels, deltas and flats are a result of local hydraulic energy regimes. The position of inflection points on cumulative grain-size distributions from all on the environments represents winnowing at specific levels of wave and/or current power.

00206

Wert, Richard R. and Robert O. Reid. A baroclinic prognostic numerical circulation model. Contributions on the Physical Oceanography of the Gulf of Mexico, Texas Agricultural and Mechanical University, Oceanographic Studies, Volume 2: 177-209, 1972.

Considered is a two-layer prognostic model of the circulation in the Gulf of Mexico. This two-layer model represents the simplest finite difference approximation to the continuously stratified real ocean. The equations of a momentum, which are considered for each layer, include horizontal and vertical exchange of momentum, Coriolis effect, non-linear advection of momentum and the effect of topography. In the model, however, the topography is restricted to the lower layer.

00207

Wolfe, D. A., and T. R. Rice. Cycling of elements in estuaries. U.S. Nat. Mar. Fish. Serv. Fish. Bull., 70(3): 959-972, 1972.

00208

Wright, L. D., C. J. Sonu and W. V. Kielhorn. Water-mass stratification and bed form characteristics in East Pass, Destin, Florida. *Marine Geology*, 12(1): 43-58, 1972.

Density contrasts between the water of Choctawhatchee Bay and the Gulf of Mexico result in sharp vertical and horizontal stratification, flood tide currents are swiftest and of longest duration in the deeper layers within dredged channels. Ebb currents attain their velocity and duration maxima in the upper layers of the water column. Accordingly, bed form asymmetries indicate that bed-load transport is flood dominated in the

channels and ebb dominated over shoals. Vertical density homogeneity resulting from greater mixing in the seaward reaches and at the mouth of the inlet channel is accompanied by bidirectional sand transport.

00209

Wright, L. D. and J. M. Coleman. The discharge/wave-power climate and the morphology of delta coasts. Louisiana State University, Coastal Studies Institute, 18 p, 1972.

The morphology of delta coasts can be partially attributed to opposition between the depositional tendencies of the river efflux and the marine wave-power regime. The discharge/wave-power climate of a delta may be described in terms of the magnitudes and spatiotemporal distributions of river discharge and wave power computed from hindcast deep-water wave characteristics. A FORTRAN IV computer program has been developed to facilitate the analyses taking into account the effects of refraction, shoaling and frictional attenuation over varying subaqueous topographies. A comparison of two deltas indicates that morphologies reflect the discharge/wave-power climates.

00210

Wright, I. D. and J. M. Coleman. River delta morphology: wave climate and the role of the subaqueous profile. Louisiana State University, Coastal Studies Institute, 4 p, 1972. (also in: Pub. in Science 176: 282-284.)

Application of a comprehensive wave climate program to seven major deltas indicates that deltaic configuration and coastal landform combinations depend to a considerable degree on the wave power adjacent to the shore and on the river discharge relative to wave forces. Nearshore wave power is not correlative with deepwater wave power but, owing to frictional attenuation, is a function of the subaqueous slope. The subaqueous slope, in turn, depends partially on the slope and width of the continental shelf but primarily on the rate by which the river can supply sediments to the near-shore zone.

00211

Zetler, B. D. and D. V. Hansen. Tides in the Gulf of Mexico. Contributions on the Physical Oceanography of the Gulf of Mexico, Texas Agricultural and Mechanical University, Oceanographic Studies, 2: 265-275, 1972.

A hypothesis is proposed to explain the observed diurnal tide in the Gulf of Mexico. The tide in the Gulf is believed to be co-oscillating with the

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Devine, S. B., R. E. Ferrell, and G. K. Billings. Mineral distribution patterns, deep Gulf of Mexico. American Association of Petroleum Geologists Bulletin, 57(1): 28-41, 1973.

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Duing, W. O. Low-frequency fluctuations in vertical structure of Florida Current. Transactions of American Geophysical Union, 54(4): 310, 1973.

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Hoskin, C. M. Oyster reef sedimentation, Biloxi Bay area, Mississippi. Mississippi State University, State College, Water Resources Research Institute, 1973 (?).

Size-frequency distributions were generated for sediment from three oyster reefs (27 samples) and two non-reef environments (33 samples). Reef sediments contained 10 percent gravel (shells), probably more sand, and less silt and clay than non-reef sediments. Reef sediments had leptokurtic, and non-reef sediments had platykurtic, size distributions. Grainsize modes in a given reef match fairly well with grainsize modes for sediment recovered from living oyster shells and dead shells. Sand and silt modes mean size, standard deviation and skewness did not discriminate reef and non-reef sediments.

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Hydraulic channel and shell dredging and open water spoil disposal have little significant immediate effect on water quality in Alabama estuaries. Almost all of the sediment discharged by dredges settles very rapidly and is transported by gravity along the bottom as a separate flocculated density layer and potentially harmful components of the mud are not dissolved into the

water. There is a limited, temporary reduction in benthic organisms in areas affected by dredging. Spoil piles from channel dredges can indirectly affect the ecology and usefulness of estuaries by interfering with water circulation and altering salinity. The basic hydrological concepts which determine the effects of dredging should be applicable in other areas.

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The paper is intended to provide the reader with a background in the design of tidal inlets. In order to adequately achieve this end, an effort is made to present the hydraulic equations generally used to describe the flow in a tidal inlet along with an explanation of the simplifying assumptions normally made. Consequences of these assumptions as well as relative sizes of the terms deemed negligible are included. Consideration is given to the response of tidal inlets to such outside influences as wave action, littoral drift and tides. Presently accepted methods for determination of inlet stability are included, and the necessary parameters for an effective inlet design are presented. Finally, a bibliography containing the foremost publications in the field of tidal inlets is presented. Materials on specific topics are listed under categories deemed appropriate by the writers.

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Leipper, D. F. A sequence of current patterns in the Gulf of Mexico. Journal of Geophysical Research, 75(3): 637-658.

The primary current in the Gulf of Mexico is in the form of a loop entering through the Yucatan Channel and eventually leaving through the Florida Straits. It usually transports more than 25 million m³/sec of water at 50 to 200 cm/sec. Although it retains its basic characteristics along the line of flow, it is known to be highly variable in position. Little information on the exact nature of the variations is published.

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Since December 1970 the U. S. Geological Survey has modified its OCS Lease Management Program in the Gulf of Mexico to include periodic, systematic inspections based on statistical sampling theory. To insure a consistent interpretation and enforcement of OCS Orders and Regulations, the substance of these requirements has been expressed as a list of specific items of safety equipment and procedures. The items reflect the existence of potentially hazardous conditions if the specified equipment is missing (or not operable) or the specified procedures are not followed. Although Geological Survey technicians are inspecting operations daily, special inspections or randomly selected operations are conducted periodically. The special inspection results provide management with an indication of the degree of compliance with the regulations and identify operating problem areas where inspection efforts should be concentrated, based on the items found most frequently in non-compliance. Specific enforcement action is taken when an item is found not to be in compliance. Incidences of non-compliance (INC's) have decreased since the initiation of the program in late 1970, and it is expected that increased industry initiative in the installation and maintenance of platform safety equipment and the development of new equipment and procedures will further reduce the incidences of non-compliance and the inherent danger thereof.

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In 1969 the USNS Elisha Kane completed an extensive geophysical investigation of the Gulf of Mexico. One of the principal measurement systems used was the medium frequency (3,500 Hz), high-resolution seismic profiler. The seismic profiles obtained with this system provide information about the effects on recent sediments of deposition, water-energy levels, and diapirism. The various stages of sediment deformation and disruption associated with active diapirism and of faulting resulting from salt dome emplacement are observable. It is concluded that the medium-frequency seismic system is a useful tool to aid the study of concurrent deposition during active diapirism and the subsequent environmental effects at the sea floor.

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The design of adequate foundations for offshore installations requires the determination of the bearing capacity of the sea floor.

In addition to factors such as function, shape and site of the proposed installation and its foundation, the bearing capacity depends upon the engineering properties characteristic of the mechanical behavior of sediments under load.

The most important engineering properties of marine sediments are the shear strength and compressibility in addition to water content and grain size.

This study presents a series of charts showing the values of shear strength and water content of marine sediments of the deeper portions of the Gulf of Mexico. Average values of these properties are given for the depth below the sediment water interface at 1 ft., 8 ft., 15 ft. and 25 ft. The consolidation characteristics of typical sediment samples of the Gulf are given in the form of the compression index.

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Flomation field, in Escambia County, Alabama, is the first major gas condensate discovery from the Jurassic Norphlet Formation in Alabama. Structurally the field is a NW-SE trending, low-relief salt feature bounded on the north and east by a major down-to-the-basin fault which is part of the Pickens-Gilbertown-Pollard regional fault system. The Norphlet sandstone reservoir is about 60 ft. thick and produces CO₂ and sour gas with a high condensate yield.

The paleostructural history of the area indicates that movement of Louann salt and faulting occurred, probably as a result of gravity slide and basinward salt creep, forming structures capable of trapping hydrocarbons. Jurassic deposition was affected by these early structural features and by presalt topography that existed updip from the Flomation area.

Norphlet clastics were derived from the northeast and deposited by braided stream systems. As the Jurassic Smackover seas transgressed the area, the upper part of the Norphlet was partly reworked. In the Flomation area, the overlying Smackover Formation is a dark-brown, dense, micritic limestone. Above the Smackover, the Haynesville Formation can be subdivided into upper and lower members with the upper Haynesville consisting of predominantly red, coarse clastics and the lower member being fine, red clastics and evaporites. At Flomation, over 300 ft. of bedded salt has been drilled in

the lower Haynesville causing many drilling and completion problems. The Cotton Valley Group marks the top of the Jurassic and consists primarily of coarse, gravelly clastics.

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Bragg, Dan M. Identification of studies needed to determine the feasibility of an offshore port. Fourth Annual Offshore Technology Conference, American

Institute of Mining, Metallurgical, and Petroleum Engineers, Preprints, 2: 253-258, 1972.

If the United States is to remain competitive in world trade, it will be necessary to provide a number of offshore ports along our coasts to accommodate the rising number of VLCC's (very large crude carriers) and other large ships now in service and under construction in shipyards around the world.

The heavy emphasis on petroleum and petrochemicals in the economy of Texas and the Western Gulf of Mexico makes this area especially sensitive to the need to accommodate the large ships. This paper is a report of a study made concerning the specific requirements for establishing the feasibility and economics of an offshore port in the Texas Gulf region.

00056

Brower, W. A., J. M. Meserve, R. G. Quayle. Environmental guide for the U. S. Gulf Coast. National Climatic Center, Ashville, N. C., 180 p, 1972.

The report presents detailed environmental profiles for 7 potential Gulf Coast Deep Water Port sites: Corpus Christi, Galveston-Freeport, Sabine Pass, Bayou Lafourche, Southwest Pass, Mobile-Pascagoula and Panama City. Each individual area guide provides information: general description of the area, an area map, pressure, extratropical cyclines, tropical cyclones, winds, extreme winds, waves, visibility, temperature (air and sea), precipitation, cloudiness, relative humidity, and land station summaries as well as marine area summaries.

00057

Bryant, William R. and Peter K. Trabant. Statistical relationships between geotechnical properties of Gulf of Mexico sediments. Fourth Annual Offshore Technology Conference, American Institute of Mining, Metallurgical, and Petroleum Engineers, Preprints, Volume 2: 363-368, 1972.

The design of adequate foundations for offshore installations, of all engineering properties of the sediments from the first dozen meters below the ocean floor.

This study presents the profiles of shear strength, water content and bulk (wet) density to a depth of 12 meters for 80 cores retrieved from all provinces of the Gulf of Mexico. Equations of the linear relationships for all data as well as for each physiographic area within the Gulf are presented in order to assist the engineer towards the reliable solution of his problems within the deeper portion of the Gulf of Mexico.

00058

Davies, D. K. Mineralogy, petrography and derivation of sands and silts of continental slope, rise and abyssal plain of Gulf of Mexico. *Journal of Sedimentary Petrology*, 42(1): 59-65, 1972.

Sand and silt interbeds in cores from the continental slope, rise and abyssal plain of the Gulf of Mexico, may be composed of either detrital or carbonate sediments. Because of the insensitivity of the detrital minerals to transport distance and environment, the sand and silt interbeds from the deep portions of the Gulf may be related to specific source areas on the continental shelf. These source areas include (1) the Mississippi, (2) the Rio Grande, and (3) the rivers of northeast Mexico. Vertical variations in mineralogy show no significant trend with increasing depth in any core, indicating that relative contributions from each source remained constant. Carbonate sands and silts of the abyssal plain were derived from the shallow waters of the Campeche Shelf. Transportation along the axis of the Campeche Canyon carried these shelf carbonates northward into deeper water areas, in some instances through the medium of turbidity currents.

00059

Devine, S. B., R. E. Ferrell and G. K. Billings. Quantitative x-ray diffraction technique applied to fine-grained sediments of deep Gulf of Mexico. *Journal of Sedimentary Petrology*, 42(2): 486-475, 1972.

The application of a quantitative x-ray diffraction technique developed by Moore (1968) enables the mineralogical analysis of fine-grained sediments with fewer errors due to sample preparation and conditions of analysis. The computation of linear interaction coefficients reduces the possibility that the change in the weight percent of 1 mineral will cause unreal variations in the abundances of others. The main advantage of the technique is that the use of peak intensity ratios modified by experimentally determined coefficients of interaction help eliminate differences between samples produced by the method of calculation. Comparison of the results of x-ray analyses of bulk sediments and size-fractionated ones from the surficial sediments of the deep Gulf of Mexico illustrate the technique.

00060

Ellis, E., K. Jensen and L. Faseler. Proceedings: National Sea Grant Conference (5th) held in Houston, Texas. Texas Agricultural and Mechanical University Department of Marine Resources Information, 255 p, 1972.

Six papers deal with national marine programs. Eleven papers deal with deepwater terminals and their environmental effects. Seven papers present the special concerns of industry and 5 papers under the heading of "building a network," deal with the national marine advisory service.

00061

Harper, William B., and W. Everett Smith. The Mineral Industry of Alabama. Minerals Yearbook, 1970, Vol. II, Area Reports: Domestic, 53-68. U. S. Department of the Interior, Bureau of Mines. 1972.

00062

James, W. P., R. W. Hann, Jr., D. R. Basco, J. S. Osoba, J. Dameron. Environmental aspects of a supertanker port on the Texas Gulf Coast. Texas Agricultural and Mechanical University, 452 p, 1972.

The study is an evaluation of the environmental impact of a deep-sea port off the Texas coast. Both the non-spill impact of construction and operation of the port and the potential oil spill impact on the coastal environment are considered. The scope is limited to 2 terminal locations, 3 designs of port facilities, and 3 sizes of oil spills. Also considered is the environmental impact of not constructing the port but expanding the present methods to meet the oil import needs of the area. The major physical, biological and cultural features of the Texas Coastal Zone that might be impacted by the supertanker activity were inventoried. Models were developed to predict where oil from potential offshore oil spills would go and which environmental features would be affected.

00063

James W. P., R. W. Hann, Jr., D. R. Basco, D. M. Bragg, and J. S. Osoba. Environmental aspects of a supertanker port on the Texas Gulf Coast. Texas Agricultural and Mechanical University, 463 p, 1972.

The study conducts an evaluation of the environmental impact of a deep-sea port off the Texas coast. Considered are both the non-spill impact of construction and operation of the port and the potential oil spill impact on the coastal environment. The scope was limited to 2 terminal locations, 3 designs of port facilities, and 3 sizes of oil spills. The study also considered the environmental impact of not constructing the port but expanding the present methods to meet the oil impact needs of the area. The major physical, biological and cultural features of the Texas Coastal Zone that might be impacted by the supertanker activity were inventoried. Models were developed to predict where oil from potential offshore oil spills would go and which environmental features would be affected.

00064

Lewis, J. R. North American drilling activity in 1971 - development in upper Gulf Coast of Texas in 1971. American Association of Petroleum Geologists Bulletin, 56(7): 1289-1294, 1972.

Exploration for oil and gas in the Upper Gulf Coast of Texas declined in 1971. Exploratory drilling decreased 23%, successful completions were down 6% and seismic exploration was down 75 crew weeks from the 1970 totals. Development drilling increased from 492 wells in 1970 to 535 in 1971, thus reversing a 3 year trend. Successful completions were down slightly, from 73 to 72%. Exploratory drilling emphasis shifted from the Oligocene trend to the Eocene trend, whereas geophysical emphasis, after heavy concentration on the Cretaceous trend in 1970, centered in the Oligocene trend in 1971. The year's most numerous discoveries were in the Eocene trend, but the most significant were in the Miocene trend.

00065

Louisiana State University Center for Wetlands Resources. Louisiana superport studies. Report No. 1 Preliminary recommendations and data analysis, 425 p, 1972.

The legal problems, economic considerations, environmental ramifications, and engineering aspects of constructing a deep water port in the Gulf of Mexico to service supertankers are discussed by various members of the Louisiana State University staff. It is recommended that a deep water port be located off the coast of Louisiana between Bayou La Fourche and Southwest Pass, that a governmental agency be created to deal specifically with the superport problems, and that the port be an oil-receiving terminal, with the potential capability of handling the flow of all types of commodities in the future.

00066

Macaulay, G. R., and L. C. Powell. North American drilling activity in 1971 - developments in Louisiana Gulf Coast in 1971. American Association of Petroleum Geologists Bulletin, 56(7): 1295-1302, 1972.

The Louisiana Gulf Coast region consists of the southern 38 parishes of Louisiana and the 16 continental shelf areas extending out to the 600 ft. water depth.

Total drilling operations in 1971 declined 11% from 1970. Exploratory drilling showed an increase of 20% in number of wells, from near a doubling of offshore exploratory tests drilled. In 1971, development drilling dropped 21% from 1970.

A total of 36 new-field discoveries was made in 1971, 19 onshore and 17 offshore. Additional offshore discoveries have been made but as wells are being held suspended and data not released, they are not included in this report. Large new reserves have been added offshore as a result of initial drilling on the 116 tracts bought in the 1970 West Gulf sale.

Numerous new pool and extension discoveries represented the major additions to reserves in the onshore area. Geophysical activity was up onshore by 15% and down 24% offshore. There were 12 Louisiana state sales which netted the state \$12,499,388, and 1 federal drainage sale which took in \$96,491,023. The East Gulf sale scheduled for December 1971 was cancelled.

00067

Railroad Commission of Texas. Oil and Gas Annual Production by Actual Fields. Railroad Commission, Oil and Gas Division, 1972.

00068

Skinner, Hubert C. (ed.). Gulf Coast stratigraphic correlation methods with an atlas and catalog of principal index foraminifera, 1st edition. New Orleans, Heritage Press, 1972.

00069

Stone, J. H. Louisiana superport studies. Report No. 2. Preliminary assessment of the environmental impact of a superport on the southeastern coastal area of Louisiana. Louisiana State University Center for Wetlands Resources, 364 p, 1972.

The study presents an overall environmental evaluation of a superport operation at 2 hypothetical locations on the continental shelf off the southeast coast of Louisiana, establishes within the limits of available data the existing environmental conditions at and around the proposed sites, and predicts (a) the effects of an oil spill at or near the proposed sites and (b) the effects of operations. Only a superficial assessment was made of the effects that a superport would have on people and their activities. No research was done on the impact of ancillary developments, such as pipelines, tank farms, new refining and/or manufacturing complexes. The latter activities would probably have a more serious and adverse impact on the environment than the port itself.

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Stowasser, William F. The Mineral Industry of Florida. Minerals Yearbook, 1970, Vol. II, Area Reports, Domestic, 195-206. U. S. Department of the Interior, Bureau of Mines. 1972.

00071

Texas A & M University. Environmental aspects of a supertanker port on the Texas Gulf Coast, 1972.

00072

Trisko, Ralph L., et. al. United States deep water port study. Robert R. Nathan Associates, Inc. Washington D. C. Distributed by N.T.I.S., August, 1972.

00073

Congressional Publications Committee Serial No. 92-27. Outer continental shelf policy issues, part 2, 1972.

Prepared responses by witnesses to a set of committee questions on legal, management, economic, environmental, conservation, and other issues related to administration of the Outer Continental Shelf Lands Act.

00074

Congressional Publications Committee Serial No. 92-26. Deep water port policy issues.

Hearing as part of the national fuels and energy policy study on current Federal programs and plans for the formulation of a national policy for deep water port development. This hearing deals especially with Army Corps of Engineers Study on a deep water port at Corpus Christi, Texas.

00075

U. S. Army Corps of Engineers. Crude oil and natural gas production in navigable waters along the Texas coast. Final environmental impact statement. U. S. Army Engineer District, 210 p, 1972.

The report describes the proposal for erection of structures and construction of ancillary facilities associated with exploration for and production of crude petroleum and natural gas within the coastal waters, lagoons, and estuaries of the State of Texas. A summary of environmental effects is given.

00076

U. S. Corps of Engineers. Crude oil and natural gas production, and other mining operations in navigable water along the Louisiana coast. Draft environmental impact statement. Army Engineer District, 85 p, 1972.

The statement concerns the determination of permissibility or acceptability of any request for a permit to explore for oil or gas or develop production of such resources or other mineral resources in navigable waterways along the

Louisiana coast. State-owned water bottoms in the Gulf of Mexico and bays, lakes, and sounds directly connected thereto are included. The adverse environmental effects include; creation of obstructions to navigation and fishing activities; temporary turbidity during exploration, dredging, construction and development, altered salinity and circulation of marsh areas, possible significant damage to ecosystems as a result of exploration activities, dredging and disposal of dredged materials, disposal of drill mud, brines, and sanitary wastes, spillages of petroleum and leakage of gas, and burning of wastes and gases.

00077

U. S. Department of the Army, Corps of Engineers. United States deep water port study. Institute for Water Resources, August, 1972.

00078

Wood, S. O., Jr., and Alvin R. Bicker, Jr. The Mineral Industry of Mississippi. Minerals Yearbook, 1970, Vol. II, Area Report, Domestic, 395-407. U. S. Department of the Interior, Bureau of Mines, 1972.

00079

Wood, S. O., Jr., and Leo W. Hough. The Mineral Industry of Louisiana. Minerals Yearbook, 1970, Vol. II, 319-338. U. S. Department of the Interior, Bureau of Mines. 1972.

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Zaffarand, Richard F., Roselle Girard and Eugene R. Slatick. The Mineral Industry of Texas. Minerals Yearbook, 1970, Vol. II, Area Reports, Domestic, 681-712. U. S. Department of the Interior. Bureau of Mines, 1972.

00081

American Association of Petroleum Geologists Bulletin, 57(8): 1514-1518, 1973.

Oil exploration and new developments.

00082

American Gas Association. Gas Data Book. American Gas Association, Bureau of Statistics, New York, 1973.

00083

Brooks, J. M., A. D. Fredericks, Wm. M. Sackett, and J. W. Swinnerton. Baseline concentrations of light hydrocarbons in Gulf of Mexico. Environmental Science And Technology 7(7): 639-642, July 1973.

A 2500-mile survey of light hydrocarbon concentrations in surface water of the Gulf of Mexico was conducted to determine baseline concentrations for a program to identify problems related to oceanic environmental quality. High concentrations seem to be associated solely with man's activities in the vicinity of ports and offshore petroleum drilling and production operations and in one case in the high seas, near a tanker reportedly discharging "clean ballast water".

00084

Brown, Frank M. and Charles C. Evans. Workover and recompletion of subsea completions in the Gulf of Mexico. Fifth Annual Offshore Technology Conference, American Institute of Mining, Metallurgical, and Petroleum Engineers, Preprints, Volume 2: 451-453, 1973.

Eight subsea wells were drilled and completed in Eugene Island Block 175 Field from 1966 through 1968. Average water depth of the field is 85 feet. Service work, similar to wireline service on conventional wells, has been performed using thru-flowline pumpdown wells because of normal depletion and mechanical problems. Three phases of the workover operation will be presented: 1. planning phase, 2. actual performance of the work, and 3. evaluation and conclusions of the job success. The planning phase will include rig selection, subsea inspection prior to moving in the rig, and formulating a particular plan of attack as in any workover. The second phase or work phase will include subsea inspection while moving in the rig and establishing contact with the wellbores. The removal and reinstallation of the subsea tree and installation of blowout preventers will be covered. Diver assist operations are documented by 16 mm color underwater photography. Once the blowout preventers have been installed, the problems of normal workovers will be excluded.

Three subsea wells were approved as workover candidates. One well did not require removal of the subsea tree, because problems were solved by conventional wireline and 1 inch pipe fishing operations through the tubing bores once contact with the well was established. The other 2 wells required removal of subsea Christmas tree and installing of 16" high pressure riser to repair the wells. Once the well was worked over the subsea trees were reinstalled.

00085

Cook, Earl. Municipal regulation of oil and gas drilling and production at Corpus Christi, Texas. Texas A & M University, 1973.

00086

Council on Environmental Quality. Potential onshore effects of deepwater oil terminal - related industrial development. National Technical Information Service, Volume III: 1973.

00087

Exum, F. A. Lithologic gradients in marine bar, Cadeville sand, Calhoun-Field, Louisiana. American Association of Petroleum Geologists Bulletin, 57(2): 301-320, 1973.

The Cadeville sand reservoir at Calhoun field, Jackson, Lincoln, and Quachita Parishes, Louisiana, is a lenticular body of Upper Jurassic fine-grained quartz sandstone and quartzstone limestone, which is enclosed vertically and laterally by impermeable carbonate mudrocks. This gas-condensate reservoir within the Schuler Formation is 11.5 mi long, 2.0 mi wide, and has a maximum thickness of 38 feet. It probably was deposited as a nonemergent bar in a shallow-marine environment.

There are progressive and systematic lateral changes in lithology within the reservoir. Both the size and detrital grains and the abundance of fossils are at a maximum along the east-west axis of the reservoir and decrease toward the north and south. The total percent carbonate is also greatest along the axis and decreases in the north and south. Moldic porosity is best developed along the reservoir axis, whereas intergranular porosity is dominant along the margins. Sorting of detrital grains is best north of the axis and poorest along the south of the axis. Knowledge of these gradients in lithology was useful in locating the depositional axis of the Cadeville sand reservoir and was helpful in developing the west end of the field. In the event of a discovery of a similar reservoir, this knowledge would be useful in determining the probable position of the reservoir axis relative to the discovery well.

00088

Grubb, Herbert W. Texas Petroleum Industry Selected Papers on Its Economic Impact on the Texas Economy. Office of the Governor, Office on Information Service, 1973.

The papers include economic analysis of the Texas Petroleum Industry regarding crude oil supplies, increased oil production, chemical industry in Texas.

00089

King, R. E. Beaufort sea petroleum potential appears good. World Oil, 176(6): 105-107, 1973.

00090

King, R. E. Louisiana offshore has tap potential in 1973. World Oil, 176(5): 59-62, 1973.

00091

King, V. L. Sea bed geology from Sparker profiles, Vermilion Block 321, offshore Louisiana. Fifth Annual Offshore Technology Conference, American Institute of Mining, Metallurgical, and Petroleum Engineers, Preprints, Vol. 1: 657-666, 1973.

A diverse pattern of sands, silts and clays occurs below a thin mantle of young seabottom muds at Vermilion Block 321. The shallow layers are clearly recorded on a network of high resolution sparker lines that traverse the 2,500 acre tract in north-south and east-west directions. These lines provide data for possible platform sites and help document a wide variety of geologic features in the near surface interval. The area, located 90 miles offshore in 200 feet of water, lies within the present-day middle continental shelf province. A series of worldwide Pleistocene glaciation and deglaciation episodes directly influenced sedimentation patterns within the study area. Analysis of the sparker profiles suggests the sediments were deposited at or near an ancient shoreline during a period of sea level lowering. The strata represent a typical deltritic rock sequence. Of particular interest is a southward oriented distributary channel recorded in both strike and dip profiles. A small, circular salt dome causing noticeable sea-bottom relief over a 1/2 mile circular area also is shown on the profiles.

00092

Louisiana State University. Preliminary assessment of the environmental impact of a superport on the southeastern coastal area of Louisiana. Louisiana Superport Studies. National Technical Information Service, U. S. Department of Commerce, 1973.

00093

Oil and Gas Journal, April 4, 1973

Refinery locations.

00094

Sterling, G. H. and E. E. Strohbeck. The failure of the South Pass 70 "B" platform in Hurricane Camille. Fifth Annual Offshore Technology Conference, Preprints, Volume 2: 719-730, 1973.

In August of 1969, Hurricane Camille swept across the central Gulf of Mexico making landfall on the Mississippi Coast. This major storm caused the loss of many lives and considerable property damage was inflicted on the Gulf Coast from New Orleans to Biloxi. Shell Oil Company lost its South Pass 70 "B" Platform and Gulf Oil Company lost a similar platform in a neighboring block.

This paper discusses the evidence gathered in an intensive after-the-fact study conducted to ascertain the cause of failure of Shell's platform. The data include: post-Camille survey of above-water damage at other platforms in the area, topographical surveys, side-scan sonar runs, soil borings, and detailed diving and underwater television surveys of the fallen structure. The data conclusively show that the South Pass 70 "B" structure failed primarily because of sea floor soil movements.

00095

Sweet, William E., Jr. Marine acoustical hydrocarbon detection. Fifth Annual Offshore Technology Conference, American Institute of Mining, Metallurgical, and Petroleum Engineers, Preprints, Vol. 1: 667-672, 1973.

Hydrocarbon seepage in the marine environment has long been recognized. The presence of dissolved, light gaseous hydrocarbons can be detected by the various sniffing devices currently in use. However, because of oceanic currents and the 6 to 8 minute sampling lag time it is very difficult to pinpoint the source of the seepage.

Escaping hydrocarbon bubbles can be detected rising in the water column by means of high resolution subbottom profiling equipment. Bubbles have been detected upon 3.5 kHz acoustical recorders and also on a 30 kHz recorder. The precise point of seepage can be located by these instruments. The velocity contrast between gas and sea water is approximately 1100 meters-second. This reflectivity contrast plus a resonant energy source from the bubbles give rise to a very strong return signal. This shows up as an apparent cloud in the water.

The presence of bubbles as the causative reflectivity factor has been proven by visual sighting of the bubble streams from the ship and the bubbles have been recorded upon video tape both emanating from the bottom and also at various midwater depths. The relationship between seepage, subsurface structure and bottom topography is demonstrated. It is suggested that there may be a direct relationship between near surface, Pleistocene structures and secondary accumulation, and that the seepage comes from these secondary traps.

00096

Texas A & M University. Environmental aspects of a supertanker port on the Texas Gulf Coast. National Technical Information Service, U. S. Department of Commerce, 1973.

00097

Texas House of Representatives. Report to the 63rd legislature of the House Interim Committee on coastal and marine resources, 1973.

Natural resources of the coastal zone, land use management, federal coastal policies, conflicts in coastal zone usage. Superports, offshore terminals.

00098

Texas Mid-continent Oil and Gas Associates. Independent Petroleum Associates of America. 73 facts about Texas oil and gas, 1973.

Texas drilling, offshore production, refining - processing economics, reserves and discoveries.

00099

Interim report of the Texas offshore terminal commission, June, 1973.

00100

Thompson, Roger R., Baxter D. Honeycutt and Jack C. Parker. Cooperative environment projects, High Island Block 24L, Offshore, Texas. Fourth Annual Offshore Technology Conference, American Institute of Mining, Metallurgical, and Petroleum Engineers, Preprints, Vol. 2: 543-548, 1972.

Atlantic Richfield's concern for environmental protection has led to participation in several interesting ecological experiments. Space, along with engineering and operational assistance, is currently provided on its offshore Texas platforms in the High Island Block 24-L Field for 3 experiments involving shrimp and oysters. These experiments are being conducted by Texas A & M University, Ralston Purine Company and the National Marine Fisheries Service from gas production platforms that have associated brine discharges and submerged gas flares. They involve reproduction and maturation studies with shrimp, the feasibility of trapping gravid (pregnant) shrimp beneath the platforms and the feasibility of rearing oysters attached to strings suspended from the platforms. Success in these endeavors could provide a boon to commercial shrimp farming and a possible source of easily raised salt water oysters. Successful or not, they will help provide additional knowledge concerning the interaction of the offshore oil industry with its environment. This paper describes the experiments, their implications, and Atlantic Richfield's involvement.

00101

Thomas, Pauline. Three successful new methods of oil slick control. Fairplay, Feb. 1, 1973, pp, 29-31.

00102

U. S. Department of Commerce. Appendices to the final environmental impact statement, Volume III: maritime administration tanker construction program. Maritime Administration, N.T.I.S. Report No. EIS-730725-F, 1973.

00103

U. S. Department of Commerce. Appendices to the final environmental impact statement Volume I: maritime administration tanker construction program. Maritime administration, N.T.I.S. Report No. EIS-730725-F, 1973.

00104

U. S. Department of Commerce. Final environmental impact statement: maritime administration tanker construction program. Maritime administration, N.T.I.S. report number. EIS-730725-F, 1973.

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U. S. Department of Commerce. Appendices to the final environmental impact statement Volume II: maritime administration tanker construction program. Maritime Administration, N.T.I.S. report No. EIS-730725-F, 1973.

00106

Whitehorn, Norman C. Economic analysis of the petrochemical industry in Texas. Texas A & M University, 1973.

00107

World Petroleum Report. Mona. Palmer Publishing Company, Inc., New York, 1973.

00108

Gilmore, George A., and others. Systems study of oil spill clean-up procedures. La Jolla, California. No date given.

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Oceanographic observations near the Chevron spilling well off the Mississippi Delta in March, 1970, revealed relative roles of various physical factors of the regional estuarine system in the behavior of oil slicks. Surface stress from the wind was most important; at speeds above 15 mph the slick orientation was generally by the wind direction. The wind also indirectly affected oil which was sunk by dispersant, in that wind waves promoted mixing, which in turn affected the vertical stability, hence eventually the velocity profile. Wind setups and setdowns were correlated with downward and upward isopycnal movements, respectively. Both calculations and observations showed that tidal currents produced an L-shaped slick geometry when winds were below about 15 mph. The diurnal rotation of the tidal currents served to limit the excursion length of oil from the source, keeping it short of the nearest shore. The presence of fresh water from the Mississippi River in the surface layer and the consequent development of convergence lines often formed a

natural barrier, preventing oil from encroaching upon the shore. Theoretical analysis using turbulent diffusion theory disclosed that the area and length of a steady-state oil slick increased with oil discharge but decreased with current speed and the lateral diffusion coefficient.

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Scarlett, Harold. SOS (Save Our Seas), Parts 1-5. The Houston Post, October 4, 5, 6, 7, 8, 1970.

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"Die-back" is a term applied to degeneration and death of large areas of Spartina townsendii marshes in England. What appears to be the same condition affects S. alterniflora marshes in Louisiana and possibly elsewhere in North America. Several factors are likely to be involved and should be assessed in future work. These include (1) excess salinity, (2) pathogenic organisms, (3) lack of available iron, (4) hydrogen sulfide toxicity, (5) change of tidal regime, and (6) pollution. It is especially important that the effects of pollution and alteration of tidal regime through dredging be investigated.

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Wright, L. D. Circulation, effluent diffusion, and sediment transport, mouth of South Pass, Mississippi River Delta. Louisiana State University, Coastal Studies Institute, 67 p, 1970.

A study was conducted at the mouth of South Pass, Mississippi River, to ascertain the influence exerted by interaction between effluent and ambient fluids; tide; waves; winds; bottom topography and channel mouth geometry; regional coastal currents; horizontal and vertical density gradients; and hydrologic regime of the Mississippi River.

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Allen J. B. and J. C. McWhorter. A status report on waste treatment lagoons in Mississippi. Completion report, Mississippi Water Resources Research Institute, State College, 17 p, 1971.

The objective was to evaluate the current use of and attitudes toward lagoons as devices for waste treatment. Surveys were conducted in order to determine the location and number of both municipal and agricultural waste treatment lagoons. Selected lagoons were visited and chemical and bacteriological analyses of their effluents were performed. There were 216 municipal lagoon systems covering 1,971.5 acres of land. This total does not include privately owned lagoons serving subdivisions, trailer parks, schools, etc. There were 241 animal waste treatment lagoons, of which 221 were used for swine, 16 for dairy, and 4 for poultry. Chemical and bacteriological analyses were made of the effluents from 7 municipal lagoons and 5 animal waste lagoons. The BOD of the municipal lagoon effluents varied from 18.0 to 79.5 mg/l. Agricultural waste treatment lagoons have been readily accepted by farmers and the number of lagoons is expected to increase rapidly, partially because the federal government will cover 80 percent of the construction cost through the Rural Environmental Assistance Program.

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The purpose of the report is to develop a comprehensive wastewater collection and treatment system plan for the coastal bend area until the year 1990.

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Conference in matter of pollution of interstate waters of Escambia River basin (Alabama - Florida) and intrastate portions of Escambia basin within state of Florida. Proceedings, 2nd Session, Pensacola Florida, 23-24, February 1971.

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Eckhardt, B. How we got the dirtiest stream in America. Texas International Law Journal, 7(1): 5-28, 1971.

The Houston Ship Channel is polluted by both industry and the city of Houston. Although a joint city-county pollution control program was initiated in 1953, it failed because the various governments failed to provide financial support. Houston's own sewage plants were primary pollution contributors. Various industries also caused much of the pollution. Texas courts, however, held that a corporate executive could not be liable for pollution if a subordinate may have actually been responsible. They also held that corporations cannot be criminally prosecuted. Hence, corporations were free to pollute at will. Legislation was proposed to correct this situation, but it was emasculated through effective lobbying and amendments. The Texas Pollution Control Act was finally passed. It created a control board composed of members representing polluting industries. The federal pollution abatement program has also been ineffective, but prosecutions have recently begun under the Refuse Act. Houston itself has an encouraging new abatement program, and the county has recently won prosecutions, although state action is still ineffective. Amendments to state law and revised federal water quality standards are needed.

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Goolsby, Donald A. Hydrogeochemical effects of injecting wastes into a limestone aquifer near Pensacola, Florida. Ground Water Journal, Technical Division, National Water Well Association, 9(1): 13-19, 1971.

Acidic industrial wastes have been injected into deep wells in a limestone aquifer near Pensacola, Florida, since 1963. Prior geohydrologic studies in the area had indicated that the limestone aquifer contained nonpotable water and was overlain by an extensive clay confining layer.

Two injection wells are presently being used to inject the waste at a rate of approximately 2,000 gallons per minute. The injection pressures are about 200 pounds per square inch. Over 3 billion gallons have been injected. Data from a current study indicate that the waste may extend outward about 1 mile from the injection wells, and pressure effects may extend outward more than 25 miles. Monitor wells show that pressure changes are following a predictable pattern. No wastes have been detected in a monitor well open to the Floridan aquifer immediately above the Bucatunna Clay Member of the Byram Formation and 100 feet from one of the injection wells.

A monitor well open to the receiving formation was constructed about 1,300 feet south of the injection wells. Geochemical effects of the wastes were detected at this well about 10 months after injection began. In early 1968, the pH of the waste was lowered to about 3. Effects of this waste, which included a large increase in calcium, were detected at the monitor well about 5 months later.

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00079

Hays, A. J., Jr., and Ernest F. Gloyna. Optimal water quality management for the Houston Ship Channel. Journal of Sanitary Engineering Division, American Society of Civil Engineers, 98(1): 195-214, 1972.

A non-linear programming model was developed to determine least-cost solutions for improved dissolved oxygen levels in the Houston Ship Channel. Results showed that non-linear programming can be successfully applied to estuarine quality problems. Steady state solutions were obtained indicating the wastewater treatment efficiencies required at each discharge site if the total cost was to be minimized. An important feature of the Upper Houston Ship Channel was the high oxygen demand exerted by existing benthic deposits. Elimination of solids deposition was required if aerobic conditions were to be obtained. In an attempt to solve the problems of implementing least-cost solutions, an equitable tax and bounty system was formulated.

00080

Huggett, Robert J., Michael E. Bender, and Harold D. Slone. Mercury in sediments from three Virginia estuaries. Chesapeake Sci. 12(4): 280-282, 1971.

00081

Hutton, Welford S., et. al. A quantitative and qualitative survey of of benthic deposits contained in the Houston Ship Channel. Estuarine Systems projects, Texas Agricultural and Mechanical University, Technical Report Number 8, 1971.

00082

Kolipinski, M. C. et. al. Organochlorine insecticide residues in Everglades National Park and Loxahatchee National Wildlife Refuge, Florida. Pesticides Monitoring Journal, 5(3): 281-288, 1971.

The Water Resources Division of the U. S. Geological Survey has field programs for monitoring environmental concentrations of selected organochlorine insecticides in the Everglades of south Florida. Water in Everglades National Park and Loxahatchee National Wildlife Refuge contained DDT and its metabolites DDD and DDE in the range 0.00 to 0.03 micrograms/liter. Some samples of soils underlying marshes had concentrations of the DDT

family as much as 3 orders of magnitude greater than the concentrations found in water. Algal mats, omnivorous marsh dwelling crustaceans, and marsh fishes showed concentrations of the DDT compounds up to 3 or 4 orders of magnitude greater than traces found in water. DDT and its metabolites were found more frequently than other organochlorine insecticides in the materials examined. Residues come from transport mechanisms such as surface water inflow and aerial transport, the latter consisting of direct particulate fallout and precipitation.

00083

Kuzmack, R. A. Measures of the potential economic loss from oil pollution. Center for Naval Analyses, 22 p, 1971.

The specific problem addressed in the report is that of empirically estimating the potential impact of a large scale oil spill into the public waters on the economy of a nearby coastal community. Taking 2 areas as case studies, the sensitivity of their economies to exogenous changes income was estimated using an economic base model. The potential loss was then calculated from the amount of income directly susceptible to oil pollution damages.

00084

Lee, T. N. and J. B. McGuire. The use of ocean outfalls for marine waste disposal in southeast Florida's coastal waters. Miami University, Sea Grant Institutional Program, 25 p, 1973.

It was found that the ocean outfall method of sewage disposal as presently practiced in South Florida is unsafe and a detriment to the ecology and aesthetics of the area. Options for the improvement of the system are proposed. These are: extend all of the existing outfall lines to a depth of 300 to 400 feet; install diffusers to improve the mixing and initial dilution of the effluent; and provide secondary treatment before discharge with a high level of chlorination for 99 percent bacteria kill; and attempts should continue to find methods to locate and remove viruses.

00085

McCluney, William Ross. The environmental destruction of South Florida, 1971.

00086

Nilsson, Rolf. Removal of metals by chemical treatment of municipal waste water. Water Res. 5: 51-60, 1971.

00087

Sparr, Ted M., et al. A study of the flushing times of the Houston Ship Channel and Galveston Bay. Estuarine Systems Projects, Texas Agricultural and Mechanical University, Technical Report Number 12, 1971.

00088

Taylor, John L., John R. Hall, and Carl H. Saloman. Mollusks and benthic environments in Hillsborough Bay, Fla. Fishery Bulletin of the National Oceanic and Atmospheric Administration, 68(2): 191-202, February, 1971.

Analysis of benthic mollusks and sediments at 45 stations showed that the diversity and abundance of mollusks was affected by bottom conditions which were influenced by varying degrees by domestic and industrial pollution and dredging. Nineteen stations had no living mollusks, 18 stations had 1 or more of the 4 mollusk species that were predominant and 8 had 1 or more of the 4 mollusk species that were predominant and 8 stations had mollusks well represented by numerous species and large numbers of individuals. Stations with no living mollusks were termed unhealthy, and others were designated marginal or healthy on the basis of the mollusks present. From station data, isopleths connecting similar areas indicated that 42 percent of the bay bottom was unhealthy, 36 percent marginal and 22 percent healthy. Infrequent occurrence of the American oyster (Crassostrea virginica) further suggests that the major portion of Hillsborough Bay was seriously contaminated. An appendix has a checklist of the 64 species of mollusks collected in the bay.

00089

Texas Water Quality Board and the Department of Housing and Urban Development. Municipal waste water. Coastal Bend Regional Planning Commission, 102 p, 1971.

The study outlines the following: A survey and analysis of existing facilities; a survey and analysis of existing water quality; an analysis of population projections and determinations of the quantity and quality of effluent through 1990; an analysis of waste treatment facility needs through 1990; a conceptual design of an area-wide sewage and waste collection and treatment system; developments of proposals for system implementation and determination of jurisdictional responsibilities for implementation; preparation of a general financial program for implementation of the proposed system.

00090

Texas Water Quality Board and the Department of Housing and Urban Development. Industrial inventory. Coastal Bend Regional Planning Commission, 76 p, 1971.

The Texas Water Quality Board periodically monitors most of the industrial and commercial plants that hold waste discharge permits. This is accomplished by making non-scheduled inspection trips to the plants for observing operations and collecting effluent for analysis.

00091

Texas Water Quality Board and the Department of Housing and Urban Development. Surface water quality. Coastal Bend Regional Planning Commission. 98 p, 1971.

The purpose of the report is to examine and report on the quality of the surface waters in the Coastal Bend Region. To this end statistical chemical analysis reports by the TWQB, the USGS and the City of Corpus Christi are presented for review and comparison with existing standards. The report includes a description of the various contaminants found in surface waters and their effect on its quality. A summarized evaluation of the rivers in the region that have continuous flow is included.

00092

Congressional Publications Committee serial no. 92-24. Water pollution control legislation. 1971.

Mainly concerned with pollution of Lake Michigan. Contains brief memorandum and opinion of U. S. A. vs. ARMC0 Steel Corp., enjoining effluent waste discharge into Houston Ship Channel.

00093

Congressional Publications Committee serial no. 92-1. Mercury pollution and enforcement of the Refuse Act of 1899, part 2. 1971.

Hearings before the subcommittee on Conservation and Natural Resources on enforcement of the 1899 Refuse Act on actions taken or planned by EPA and the Justice Department concerning mercury polluters, and on Administration efforts to let ARMC0 Steel Corp., Sheffield, Texas, continue dumping toxic wastes into the Houston Ship channel, in spite of a recent Federal District Court Order Prohibition.

00094

Wright, L. D. and J. M. Coleman. Effluent expansion and interfacial mixing in the presence of a salt wedge, Mississippi River delta. Louisiana State University, Coastal Studies Institute. In: Journal of Geophysical Research, 76(36): 8649-8661, 1971.

Ground observations and remote-sensing imagery indicate that efflux from the mouth of South Pass, Mississippi River, expands as a laterally homogeneous layer above the underlying salt water. Flow deceleration and effluent deconcentration are primarily the result of vertical rather than lateral mixing. Field and imagery data correspond closely to theoretical expansion rates predicted as function of the lateral hydrostatic pressure gradient created by the density contrasts between the river water and sea water.

00095

Barber, Richard T., A. Vijayakumar, and Ford A. Cross. Mercury concentrations in recent and ninety-year old benthopelagic fish. *Science* 178: 636-639, 1972.

00096

Epifanio, C. E. Effects of Dieldrin-contaminated food on the development of Leptodius floridanus larvae. *Mar. Bio.* 13: 292-297, 1972.

00097

D'Itri, Frank M. Mercury in the aquatic ecosystem. Michigan State University Inst. Water Res. Tech. Rep. 23, 101 p, 1972.

00098

Giam, C. S., A. R. Hanks, R. L. Richards, W. M. Sackett and M. K. Wong. DDT, DDE, and polychlorinated biphenyls in biota from Gulf of Mexico and Caribbean Sea - 1971. *Pesticidies Monitoring Journal*, 6(3): 139, 1972.

00099

Hopkins, G. Summary of selected legislation relating to the coastal zone. Texas Law Institute of Coastal and Marine Resources. 121 p, 1972.

The report is a preliminary summarization of federal and state regulation of the coastal zone, in terms of authorizing legislation, planning, financing, and enforcement. The legal authorization is discussed for topics such as water supplies, pollution, transportation, etc. Although the report focuses on Texas, it should be of interest to planners in other states.

00100

Hoese, H. D., W. R. Nelson and H. Beckert. Seasonal and spatial setting of fouling organisms in Mobile Bay and eastern Mississippi Sound, Alabama. *Alabama Marine Resources Bul.* Alabama Marine Resources Laboratory, Dauphin Island, Alabama, 8: 9-17, June, 1972.

Setting of oysters, barnacles and other species on asbestos plates was studied across a gradient from low salinity in Mobile Bay to high salinity in eastern Mississippi Sound, Alabama. Barnacles (Balanus eburneus) dominated setting with concentrations averaging thousands m^2/day with spring and fall peaks. Oysters (Crassostrea virginica) set only at levels of 1 to 100 plus/ m^2/day , decreasing to the east. Bimodal peaks predominated in heavy setting areas while only a single summer or early fall peak occurred in Mobile Bay. Other species recorded were studied less intensively.

00101

James, W. P., R. W. Hann, Jr., D. R. Basco, D. M. Bragg, and J. S. Osoba. Environmental aspects of a supertanker port on the Texas Gulf Coast. Texas Agricultural and Mechanical University, 463 p, 1972.

The study is an evaluation of the environmental impact of a deep-sea port off the Texas coast. Both the non-spill impact of construction and operation of the port and the potential oil spill impact on the coastal environment are considered. The scope is limited to 2 terminal locations, 3 designs of port facilities, and 3 sizes of oil spills. Also considered is the environmental impact of not constructing the port but expanding the present methods to meet the oil import needs of the area. The major physical, biological and cultural features of the Texas Coastal Zone that might be impacted by the supertanker activity were inventoried. Models were developed to predict where oil from potential offshore oil spills would go and which environmental features would be affected.

00102

James, W. P., R. W. Hann, Jr., D. R. Basco, J. S. Osobo, J. Dameron. Environmental aspects of a supertanker port on the Texas Gulf Coast. Texas Agricultural and Mechanical University, 452 p, 1972.

The study conducts an evaluation of the environmental impact of a deep-sea port off the Texas coast. Considered are both the non-spill impact of construction and operation of the port and the potential oil spill impact on the coastal environment. The scope was limited to 2 terminal locations, 3 designs of port facilities, and 3 sizes of oil spills. The study also considered the environmental impact of not constructing the port but expanding the present methods to meet the oil impact needs of the area. The major physical, biological and cultural features of the Texas Coastal Zone that might be impacted by the supertanker activity were inventories. Models were developed to predict where oil from potential offshore oil spills would go and which environmental features would be affected.

00103

Jennings, Feenan D. Baseline studies of pollutants in the marine environment and research recommendations. Int. Decade Ocean Exploration Baseline Conf. May 24-26, 1972, New York, 54 p, 1972.

00104

Ellis, E., K. Jensen and L. Faseler. Proceedings: National Sea Grant Conference (5th) held in Houston, Texas. Texas Agricultural and Mechanical University Department of Marine Resources Information, 255 p, 1972.

Six papers deal with national marine programs. Eleven papers deal with deepwater terminals and their environmental effects. Seven papers present the special concerns of industry and 5 papers under the heading of building a network deal with the national marine advisory service.

00105

Lindall, W. N., Jr., J. R. Hall, and C. H. Saloman. Fishes, microinvertebrates and hydrological conditions of upland canals in Tampa Bay, Florida. National Marine Fisheries Service, Gulf Coast Fisheries Center 10 p, 1972. Included in Fishery Bulletin, 71(1): 15-163, January, 1973.

Faced with statutory restraints that prohibit dredging and filling of estuarine bottoms, coastal developers have turned to alternate methods of providing water front property for homesites. One method, recently used in Tampa Bay, Florida, is the construction of access canals that lead from open water to upland acreage. This paper presents biological and hydrological data from new upland canals together with some comparative data from older upland canals and bayfill canals. In all types of canals, as presently engineered, stratified, stagnant water causes low levels of dissolved oxygen in summer months, resulting in mortality of emigration among resident organisms. Means of alleviating the problems are discussed.

00106

Mayer, J. K., F. W. MacDonald., D. E. Stimle. Sewer bedding and infiltration Gulf Coast area. Tulane University, New Orleans, Louisiana, 174 p, 1972.

Many locations in the southern coast of the United States along the Gulf of Mexico, shown above, experience higher infiltration rates and greater maintenance difficulties with sanitary sewers than other sections of the nation. In addition to pollution coasts, excessive infiltration places additional financial burdens on sewerage authorities. Thus a study was conducted of actual sewer systems to obtain and delineate information that will be helpful to those persons engaged in the design, construction, maintenance, and regulation of sewer systems. The purpose of the manual is to present the nature, status and cost of infiltration, methods of measuring infiltration, the causes, measurement and various aspects of sewer settlement, sewer bedding materials, and sewer construction in general and with respect to infiltration control.

00107

Murray, Stephen P. Turbulent diffusion of oil in the ocean. Limnology and Oceanography, 17(5): 651-659, 1972.

On-site observations of oil slick geometries and current speeds during the Chevron spill of March 1970 in the Gulf of Mexico have allowed a comparative evaluation of the role of large-scale turbulence (in the form of a horizontal eddy diffusivity) and surface tension effects in the spreading of oil from a continuously emitting well into a steady current. The initial outline of the slick (roughly the first 50 percent of slick length) follows the laws of expansion as predicted by Taylor's turbulent diffusion theory. The gross site and overall shape (neglecting details of outline) of this type of slick are well represented by a solution to the Fickian diffusion equations which predict approximate slick geometry as a function of current speed, horizontal eddy diffusivity, the oil discharge rate, and an empirically determined constant (the boundary concentration).

Under the conditions observed the effect of surface tension seems confined to within the first few hundred meters downslick and can probably be neglected for practical purposes under moderate oil discharge rates and current speeds as low as even 5 cm/sec.

00108

Stone, J. H. Louisiana Superport Studies. Report no. 2. Preliminary assessment of the environmental impact of a superport on the southeastern coastal area of Louisiana. Louisiana State University Center for Wetlands Resources, 364 p, 1972.

The study presents an overall environmental evaluation of a Superport operation at 2 hypothetical locations on the continental shelf off the southeast coast of Louisiana, establishes within the limits of available data the existing environmental conditions at and around the proposed sites, and predicts (a) the effects of an oil spill at or near the proposed sites and (b) the effects of operations. Only a superficial assessment was made of the effects that a Superport would have on people and their activities. No research was done on the impact of ancillary developments, such as pipelines, tank farms, new refining and/or manufacturing complexes. The latter activities would probably have a more serious and adverse impact on the environment than the port itself.

00109

Texas Law Institute of Coastal and Marine Resources. Regulation of activities reflecting bays and estuaries: A preliminary legal study, 30 p, 1972.

Federal, state and local agencies who regulate or in some way oversee coastal activities identified by the Bay and Estuarine Management study are indicated on the charts and graphs of this preliminary legal study to indicate the gaps and overlaps in institutional authority to supervise coastal zone activities for an adverse effect on the environment. The report will aid in developing future legal studies.

00110

Congressional Publications committee serial no. 92-27. Outer continental shelf policy issues, part 1, 1972.

Hearings to examine present and future national policies regarding development of outer continental shelf energy resources, with a view toward balancing needs for fuel with needs for protection, the marine environment from hazards of oil spills, fires, and drilling operations.

00111

United States Department of Interior. Proposed hybrid prototype desalting plant for Brownsville, Texas (draft environmental impact statement). Office of Saline Water, Washington, National Technical Information Service, January 28, 34 p, 1972.

The proposed project involves the design, construction, operation, and maintenance of an 8 million gallons per day prototype sea water desalination plant in cooperation with the Rio Grande Valley Municipal Water Authority and the city of Brownsville, Texas, sea water will be withdrawn from the Brownsville Ship channel for use in the distillation plant and saline effluent water will be discharged into San Martin Lake. Unavoidable adverse environmental effects include gas emissions from boilers and turbines, noise from the operating plant, elevation of water temperature, concentration of solids in the waste water, slightly increased water salinity from effluents, and the presence of copper and nickel and possibly other heavy metals in the waste stream. The consumption of 1.133×10 to the 9th power cu ft/yr of natural gas in an irreversible commitment. The proposed project will establish the feasibility of a single purpose distillation plant for producing low cost fresh water from sea water. As such, there is no alternative. Comments on the proposed action were solicited from appropriate local and regional agencies.

00112

U. S. Coast Guard 8th District. Sixth coastal region oil and hazardous substances pollution contingency plan. 333 p, 1972.

The plan represents an agreement among concerned Departments and agencies of the Federal Government, state and local governments, and private groups, and provides for a pattern of coordinated and integrated response to pollution spills within the Six Coastal Region which includes the coasts of Texas and Louisiana extending into the Gulf of Mexico. It establishes regional response teams and provides guidelines for the establishment of sub-regional contingency plans and response teams. The plan provides for assignment of duties and responsibilities: establishment and identification

of local strike forces; a system of notification, surveillance and reporting; establishment of a regional center to direct operations in carrying out this plan; a schedule for the use of dispersants and other chemicals to treat oil spills; enforcement and investigative procedures to be followed; directions on public information releases; and instruction covering on-scene coordinators.

00113

Yeaple, Donald S., George Feick, and Ralph A. Horne. Dredging of mercury-contaminated sediments. Preprint in Fourth Ann. Offshore Technol. Conf. 1(1584): 695-702, 1972.

00114

Brooks, J. M., A. D. Fredericks, Wm. M. Saceet, and J. W. Swinnerton. Baseline concentrations of light hydrocarbons in Gulf of Mexico. Environmental Science and Technology 7(7): 639-642, July 1973.

A 2500 mile survey of light hydrocarbon concentrations in surface water of the Gulf of Mexico was conducted to determine baseline concentrations for a program to identify problems related to oceanic environmental quality. High concentrations seem to be associated solely with man's activities in the vicinity of ports and offshore petroleum drilling and production operations and in one case in the high seas, near a tanker reportedly discharging clean ballast water.

00115

Hipsch, R. and C. Everett. Recent federal legislation significance in environmental planning programs of the state of Texas. Texas Law Institute of Coastal and Marine Resources, 24 p, 1973.

The handbook briefly summarizes the provisions and describes the effects of the more important recently enacted Federal statutes affecting Texas' environmental plans and programs. Some of the Acts alter existing law; others supersede state action; and several provide Federal financial assistance for State and local programs.

00116

James, Wesley P. and Roy W. Hann, Jr. Environmental impact of a supertanker port. Fifth Annual Offshore Technology Conference, American Institute of Mining, Metallurgical, and Petroleum Engineers, Preprints, Volume 1: 119-128, 1973.

This paper describes a study of the environmental aspects of an offshore supertanker port. The methodology for conducting the environmental assessment is presented and is applicable to any site; however, the Texas coast is given as an example. Since there are several feasible site locations and many different sea and wind conditions to consider, components of a computer model are being developed to evaluate the relative impact of one site over another.

The environmental inventory was completed and indexed on a 3-mile section along the beach for the coastal features. Utilizing available wind and water current data, a model was developed for predicting the probability that the oil will reach a specific grid element from a given spill site. Depending on the size of the spill and the sea conditions, it is assumed that the environmental impact will be reduced by the latest developments for control and containment of oil at sea. For each grid element the probability of oil reaching that point is determined along with the approximate travel time of the oil. The reduction in oil toxicity due to evaporation, solution, and decay is included.

00117

May, Edwin B. Environmental effects of hydraulic dredging in estuaries. Alabama Marine Resources Bulletin Number 9, 88 p, 1973.

Hydraulic channel and shell dredging and open water spoil disposal have little significant immediate effect on water quality in Alabama estuaries. Almost all of the sediment discharged by dredges settles very rapidly and is transported by gravity along the bottom as a separate flocculated density layer and potentially harmful components of the mud are not dissolved into the water. There is a limited, temporary reduction in benthic organisms in areas affected by dredging. Spoil piles from channel dredges can indirectly affect the ecology and usefulness of estuaries by interfering with water circulation and altering salinity. The basic hydrological concepts which determine the effects of dredging should be applicable in other areas. Extensive regulations apparently are not necessary to protect water quality in open water dredging situations but spoil disposal practices from channel dredges must be reconsidered and appropriate new disposal plans developed.

00118

McKie, W. T. Temperature distribution in vicinity of a cooling water discharge into Mississippi River. Mechanical Engineering, 95(6): 61, 1973.

A study was conducted to define the temperature profile in the vicinity of the cooling water discharge from the Baxter Wilson Steam Electric Station, Mississippi Power and Light Company, and to identify and describe the mixing zone below the outlet structure.

The Baxter Wilson Plant is located on the Mississippi River at Vicksburg, Mississippi and during the period these measurements were taken a 500 MW unit was in operation. Field data were collected for a period of 15 months, June, 1969 to August, 1970. All measurements were taken at several depths at predetermined points along cross-sections located above and below the discharge location. A unique experimental methodology was used to insure that all measurements would be made at relatively the same points throughout the entire study.

Temperature profiles were plotted at several depths and correlated to the plant operating conditions and the river characteristics. These profiles were analyzed to determine the extent of the influence of the heated discharge of the Mississippi River.

00119

May, E. B. Extensive oxygen depletion in Mobile Bay, Alabama. *Limnology and Oceanography*, 18(3): 353-366, 1973.

Extensive areas of bottom water in Mobile Bay, Alabama, one of the largest estuaries on the Gulf of Mexico, suffer oxygen depletion in summer because of salinity stratification in sinks created by shoals in the lower bay and by spoil from construction of the Mobile Ship Channel. When these water masses low in dissolved oxygen are occasionally forced against the beach, demersal fishes and crustaceans migrate shoreward in a depressed or moribund state. In the absence of technical data these popular occurrences called "jubilees" provide over a century of historical evidence of oxygen depletion. Oxygen depletion and jubilees occurred in the bay before man physically modified the basin but the conditions responsible for oxygen depletion are worse than in the past. Because of bathymetric changes and modifications which have restricted water circulation, Mobile Bay has exceeded its capacity to assimilate its oxygen demand in summer, which has severely affected the biota of the estuary.

00120

May, Edwin B. Environmental effects of hydraulic dredging in estuaries. *Alabama Marine Resources Bulletin* Number 9, 88 p, 1973.

Hydraulic channel and shell dredging and open water spoil disposal have little significant immediate effect on water quality in Alabama estuaries. Almost all of the sediment discharged by dredges settles very rapidly and is transported by gravity along the bottom as a separate flocculated density layer and potentially harmful components of the mud are not dissolved into the water. There is a limited, temporary reduction in benthic organisms in areas affected by dredging. Spoil piles from channel dredges can indirectly affect the ecology and usefulness of estuaries by interfering with water circulation and latering salinity. The basic hydrological concepts which determine the effects of dredging should be applicable in other areas. Extensive regulations apparently are not necessary to protect water quality in open water dredging situations but spoil disposal practices from channel dredges must be reconsidered and appropriate new disposal plans developed.

00121

Maqvi, S.M.Z. Toxicity of 23 insecticides to a tubificid worm *Branchiura sowerbyi* from Mississippi Delta. *Journal of Economic Entomology*, 66(1): 70-74, 1973.

Tubificid worms, *Branchiura sowerbyi*, from the Mississippi delta region were bioassayed in 23 commercial insecticides (chlorinated hydrocarbons, organophosphates, and carbamates). Maximum concentrations of 15 insecticides (0.5 to 4.0 ppm at 21 degrees C) failed to cause mortality in 72 hours exposure. But they produced reversible morphological changes of the worms. Variations in morphological changes occurred in response to an insecticide type rather than to concentration, and they may possibly be used for monitoring purposes. Insecticide toxicity was influenced also by temperature changes.

The worms were extremely susceptible to dissolved chlorine in tap water (6-10 ppm) which caused complete disintegration of the body, leaving a residual black ring at the site of death.

Insecticide-treated worms of known weight and treatment time were fed to crayfish, *Procambarus clarkii* Girrad, and their mortality was recorded. The insecticide toxicity to crayfish was inversely proportional to treatment time of the worms prior to feeding, but it was directly proportional to insecticide concentration. Crayfish showed less ill effects when they ate carbamate-treated worms, especially if the worms were exposed to the insecticide for a long time.

Gas-chromatographic analyses of field-collected worms exhibited a high concentration of organochlorine compounds, especially DDT, DDD, and DDE. Trace amounts of toxaphene also were detected. Possible mechanisms of insecticide resistance in tubificids are discussed, including the effects of mud in reducing the bioactivity of various insecticides.

00122

Sweet, William E., Jr. Marine acoustical hydrocarbon detection, Fifth Annual Offshore Technology Conference, American Institute of Mining, Metallurgical and Petroleum Engineers, Preprints, Volume 1: 667-672, 1973.

Hydrocarbon seepage in the marine environment has long been recognized. The presence of dissolved, light gaseous hydrocarbons can be detected by the various sniffing devices currently in use. However, because of oceanic currents and 6 to 8 minute sampling lag time it is very difficult to pinpoint the source of the seepage.

Escaping hydrocarbon bubbles can be detected rising in the water column by means of high resolution subbottom profiling equipment. Bubbles have been detected upon 3.5 kHz acoustical recorders and also on a 30 kHz recorder. The precise point of seepage can be located by these instruments. The velocity contrast between gas and sea water is approximately 1100 meters/second. This reflectivity contrast plus a resonant energy source from the bubbles give rise to a very strong return signal. This shows up as an apparent cloud in the water.

00123

State of Florida. State Water pollution control work plan; Fiscal year 1974, Volume 2. Department of Pollution Control, State of Florida, 2: 507, p, 1974.

00124

Pollution Abstracts. San Diego, 1972-1974.

00125

Butler, Philip A. Organochlorine residues in estuarine mollusks, 1965-1972. A report of one segment of the national pesticide monitoring program. Pesticide Monitoring J. In press.

00126

Lauer, G. J., et. al. Pesticide contamination of surface waters by sugar cane farming in Louisiana. Trans. Amer. Fish Soc., 95(3): 310-316. Undated.

00127

Tanner, William F., C. Everett Brett, John Rya, and Frank Stapor. Mobile Bay estuarine system--case study. in: Case studies of estuarine sedimentation and its relation to pollution of the estuarine environment, Gulf University Research Corporation. Houston, Texas, C-1 to C-46, Undated.

00128

The Environmental destruction of South Florida. University of Miami Press, Coral Gables, Florida. Undated.

00129

Inventory of waste sources in the coastal zone center for research in water resources. The University of Texas, Austin. Undated.

00130

Mercury Pollution and Enforcement of the Refuse Act of 1899, part 2. Abstracts of Congressional Publications and Legislative Histories. Congressional Information Service. Undated.

Hearings concerning Mercury polluters, in particular ARMCO Steel of Houston. Focuses on administration efforts to allow ARMCO to dump despite Federal court order.

00131

Outer continental shelf policy issues, part 2. Abstracts of congressional publications and legislative histories-S441-73. Congressional Information Service.

Hearings to examine present and future national policies regarding development of outer continental shelf energy resources. Undated.

00132

Water Pollution Control Legislation. Abstracts of Congressional Publications and Legislative Histories, Congressional Information Service.

Mainly concerned with pollution of Lake Michigan; contains brief memorandum and opinion of USA vs. ARMCO steel discharge into Houston Ship Canal. Undated.

00133

Outer Continental Shelf Policy Issues, part 3. Abstracts of Congressional Publications and Legislative Histories-S441-88. Congressional Information Service. Undated.

Collection of congressional testimony related to management of outer continental shelf.

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This work includes discussions on the Ivory-billed Woodpecker and the Florida Cougar.

00002

Wilson, Alexander. American ornithology. Philadelphia, 4:20-26, 1811.

A discussion of the status and ecology of the Ivory-billed Woodpecker.

00003

Boie, F. Ornithologische Beautrage. Isis, 21:326, 1828.

A discussion of the Ivory-billed Woodpecker is included in this work.

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Audubon, John James. Ornithological biography, Vol. 1. Edinburg, p. 341-347, 1831.

A discussion of the ecology of the Ivory-billed Woodpecker.

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Audubon, John James. Birds of America, Vol. 4. New York, p. 214-226, 1842.

This is one of the most authoritative accounts on the ecology of the Ivory-billed Woodpecker written to date.

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Malherbe, Alfred. Nouvelle classification des picinees on pics. Memoirs Academia, Metz, 30:318, 1849.

A journal note on the Ivory-billed Woodpecker.

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Bryant, Henry. Birds observed in Eastern Florida, south of St. Augustine. Proc. Boston Soc. Nat. History, 7:11, 1859.

This reference deals with an Ivory-billed Woodpecker sighting in Florida.

00008

Taylor, G. C. Five weeks in the peninsula of Florida, 1861. Ibis, 4:128, 133, 135, 1862.

This includes several Ivory-billed Woodpecker sightings in and near the Gulf of Mexico.

00009

Dresser, H. E. Notes on the birds of southern Texas. Ibis, 1:468, 1865.

This includes a note on an Ivory-billed Woodpecker sighting from Texas.

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Allen, F. A. On mammals and winter birds of east Florida. Bull. Mus. Comp. Zool. Harvard, 2:301, 393, 1871.

Notes on Ivory-billed Woodpecker sightings.

00011

Gunlach, Jean. Neve bietrage zur ornithologie Cubas. Jour. of Ornith., 22: 148-158, 1874.

The ecology of the Ivory-billed Woodpecker in Cuba (and its relation to the populations of these birds in the U.S.) is discussed here.

00012

Baird, S. F. et. al. A history of North American Birds. Boston, 2:491-493, 496-499, 1875.

This book gives additional data on the natural history of and an update of the range of the Ivory-billed Woodpecker.

00013

Allen, J. A. History of North American Pinnipeds: A monograph of the walruses, sea lions, seabears, and seals of North America. U.S. Department of the Interior. U.S. Geological and Geographical Survey of the Territories, Misc. Publication 12, 785 p, 1880.

The Caribbean monk seal is discussed in this volume.

00014

Brewster, William. With the birds on a Florida river. Bul. Nuttal Ornith. Club, 6:41-42, 1, 1881.

A note on the Ivory-billed Woodpecker.

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Scott, W. E. D. On birds observed in Sumpter, Levy, and Hillsborough counties, Florida. Bull. Nuttall, Ornith. Club, 6:16, 1881.

A sighting of an Ivory-billed Woodpecker is included here.

00016

Neherling, H. List of birds observed Houston, Harris Co., Texas and in counties Montgomery, Galveston and Fort Bend. Bull. Nuttal Ornith. Club, 7:170, 1882.

A note on an Ivory-billed Woodpecker sighting on the Texas Gulf Coast.

00017

Boardman, G. A. The big woodpeckers. Forest and Stream, 24:388, 1885.

The Ivory-billed Woodpecker (along with the Pileated Woodpecker) is discussed here.

00018

Clarke, S. C. The Ivory-billed Woodpecker in Florida. Forest and Stream, 24:367, 1885.

00019

Kline, H. A. Ivory-billed Woodpecker. Forest and Stream, 26:163, 1886.

00020

Koch, August. Zwei Monate in West Florida. Mittheilungen des Ornithologischen Vereines in Wien, 12:1, 2, 26, 1886.

A report on several Ivory-billed Woodpecker sightings in Florida.

00021

Kline, H. A. Florida bird notes. Forest and Stream, 28:412-413, 1887.

Recent (as of 1887) Ivory-billed Woodpecker sightings in Florida are included here.

00022

Laurent, Philip. Notes on birds of Levy county, Florida. Ornith. and Oologist, 12:157-159, 1887.

Another sighting of an Ivory-billed Woodpecker from a Gulf coastal county of Florida.

00023

Cooke, W. W. Report on bird migration in the Mississippi valley in the years 1884 and 1885. U.S. Department of Agriculture.

Movements of the Ivory-billed Woodpecker are discussed here.

00024

Coahoma. The pileated Woodpecker. Forest and Stream, 31:122, 1888.

The Ivory-billed Woodpecker is discussed in conjunction with the Pileated Woodpecker.

00025

Avery, W. C. Birds observed in Alabama. American Field, 34:608, 1890.

A sighting of an Ivory-billed Woodpecker in Alabama.

00026

Brewster, W. and F. M. Chapman. Notes on the birds of the lower Suwanee River. Auk, 8:136-137, 1891.

An Ivory-billed Woodpecker sighting is preserved here.

00027

Hasbrouck, E. M. The present status of the Ivory-billed Woodpecker. (*Campephilus principalis*). Auk, 8:174-186, 1891.

00028

Wayne, A. T. Additional notes on the birds of the Suwanee River. Auk, 10:338, 1893.

Another Ivory-billed Woodpecker sighting from the Suwanee River is presented here.

00029

Bendire, Charles. Life histories of North American birds, from the parrots to the grackles. Spec. Bull. U. S. Nat. Mus., 3:42-45, 1895.

This work includes a discussion of the life history of the Ivory-billed Woodpecker.

00030

Wayne, H. T. Notes on the birds of the Nacissa and Aucilla River regions of Florida. Auk, 12:364, 366-367, 1895.

Additional Ivory-billed Woodpecker sightings in Florida are given here.

00031

Maynard, C. J. The birds of North America, p. 371-373, 1896.

A discussion of the Ivory-billed Woodpecker is presented here.

00032

Thompson, Maurice. Anarcher's sojourn in the Okefenokee. Atlantic Monthly, April, 1896.

This includes additional data on the Ivory-billed Woodpecker.

00033

Ridgway, Robert. The home of the Ivory-bill. Osprey, 3:35-36, 1898.

00034

Beyer, G. E. The Ivory-billed Woodpecker in Louisiana. Auk, 17:97-99, 1900.

A summary of the records of sightings of Ivory-billed Woodpeckers in Louisiana.

00035

Pennock, C. J. Recent capture of Ivory-billed Woodpeckers in Florida. Proc. Del. Valley Ornith. Club, 4:8, 1901.

00036

Howe, R. H. and L. Kink. Notes on various Florida birds. Contr. N. A. Ornith., 1:30, 1902.

This presents additional sight data on the Ivory-billed Woodpecker.

00037

Elliot, Daniel Giraud. The land and sea mammals of middle America and the West Indies. Publications of the Field Columbian Museum, Zoological Series, Vol. 4, part 2. 1904.

This work contains a good discussion on mammals, including species that are now rare and endangered on the Gulf Coast.

00038

Bailey, Vernon. Biological survey of Texas. North American Fauna, 25:1-222, 1905.

An excellent treatment of the fauna of Texas as it existed in the nineteenth and early twentieth century. Several species, which are now rare and endangered, are discussed here.

00039

Dutcher, William. Report of A.O.U. Committee for Protection of North American Birds. Auk, 22: 111, 1905.

Several rare species are discussed in this paper.

00040

Hoyt, R. D. Nesting of the Ivory-billed Woodpecker in Florida. Warbler (2nd Ser.), 1:52-55, 1905.

00041

Wayne, A. T. A rare plumage of the Ivory-billed Woodpecker. Auk, 22:414, 1905.

00042

Townsend, Charles Haskins. Capture of the West Indian seal (Monachus Tropicalis) at Key West, Florida. Science 23:583, 1906.

00043

Howell, A. H. Birds of Alabama N. S. Bur. Biol. Survey, p. 159-162, 1907.

A discussion of the Ivory-billed Woodpecker in Alabama is given here.

00044

Smith, A. P. Destruction of Imperial Woodpeckers. Condor, 10:91, 1908.

The Imperial Woodpecker, another large species of woodpecker very similar to the Ivory-billed Woodpecker, is discussed in relation to the Ivory-billed Woodpecker.

00045

Baynard, O. E. Echoes from Florida. Oologist, 26:5-7, 1909.

This paper presents additional Ivory-billed Woodpecker reports from Florida based on sightings and calls.

00046

Gordon, Theodore. Ivory-billed Woodpecker. Forest and Stream, 72:972, 1909.

00047

Graham, S. C. The Ivory-billed Woodpecker. Forest and Stream, 72:892, 1909.

00048

Beal, F. E. L. Food of the woodpeckers of the United States. Bull. U.S. Bur. Biol. Surv. 37:62-63, 1911.

Food and feeding behavior of the Ivory-billed Woodpecker is included in this report.

00049

Baynard, O. E. Breeding birds of Alachua county, Florida. Auk, 30:245, 1913.

This includes a record for breeding Ivory-billed Woodpeckers in Alachua county.

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Baynard, O. E. Two months in the Everglades. Oologist 31:36, 1914.

This paper includes a record of Ivory-billed Woodpecker sightings in the Everglades by the author.

00051

Phelps, F. M. The resident bird life of the Big Cypress Swamp Region. Wilson Bull, 26:99, 1914.

This includes a reference to Ivory-billed Woodpeckers as being a resident of

the Big Cypress swamp area.

00052

Ridgway, Robert. The birds of North and Middle America. Bull. U.S. Nat. Mus., 6(50):167-169, 1914.

This bulletin includes a discussion on the status of the Ivory-billed Woodpecker and some notes on its ecology.

00053

Kennard, F. H. On the trail of the Ivory-bill Auk. 32:1-14, 1915.

A review of recent (around 1915) reports of Ivory-billed Woodpeckers. The author attempts, through investigations, to establish the Ivory-bill's presence or absence in many areas of suitable habitat.

00054

Laurent, Philip. My Ivory-billed Woodpeckers. Oologist, 34:65-67, 1917.

00055

Pennock, C. J. Some notes from St. Marks, Florida. Wilson Bull., 29:165-166, 1917.

This includes a reference to Ivory-billed Woodpeckers.

00056

Arthur, Stanley C. The birds of Louisiana. Bul. La. Dept. Conservation 5:53, 1918.

This book includes a short discussion of the areas of occurrence of the Ivory-billed Woodpecker in Florida.

00057

Ellis, J. B. Ivory-billed Woodpecker not yet extinct. Oologist, 35:11-12, 1918.

00058

Cory, C. B. Catalogue of the birds of the Americas. Pub. Field Mus. Nat. Hist. Zool. Series, 13 (2):461-462, 1919.

This excellent monograph summarizes some recent data on Ivory-billed Woodpeckers.

00059

Howell, A. H. Notes on the fox squirrels of the southwestern states with descriptions of a new form from Florida. Journal of Mammalogy, 1:36-38, 1919.

This paper presents the original description and delineation of the Everglades fox squirrel as a separate subspecies.

00060

Pennock, C. J. Notes on the birds of Wakulla county, Florida. Wilson Bull., 32:10, 1920.

This paper includes a reference to Ivory-billed Woodpeckers seen in this Florida county.

00061

Corrington, J. D. The winter birds of the Biloxi, Mississippi, Region. Auk, 39:545, 1922.

A report of an Ivory-billed Woodpecker from this area is included.

00062

Barbour, Thomas. The birds of Cuba. Memoirs Nuttall Ornith. Club, 6:91, 1923.

This paper includes a reference to the Ivory-billed Woodpecker in Cuba and its status there.

00063

Townsend, Charles Haskins. The West Indian Seal. Journal of Mammalogy, 4:5, 1923.

A discussion of the Caribbean Monk Seal is the subject of this paper.

00064

Blackman, M. W. and H. H. Stage. On the succession of insects living in the bark and wood of dying, dead, and decaying hickory. Tech. Pub. N.Y.S. Col. Forestry, 17:3-269, 1924.

Included in this bulletin is a discussion of the food and feeding habits of Ivory-billed Woodpeckers.

00065

Herrick, F. H. Daily life of the American Eagle: late phase. Auk. 41:389-422, 517-541, 1924.

00066

Miller, Gerrit S. List of North American recent mammals. Proc. United States Nat. Mus. No. 128: 1-673, 1924.

This is a general reference on mammals and their ecology including a discussion of those species now considered to be rare or endangered on the Gulf Coast.

00067

Bailey, H. H. The birds of Florida, Baltimore. 81 p, 1925.

This text is a good general reference to the birds of Florida and their natural history. Included in this book are good discussion of those bird species which are now rare or endangered.

00068

Nicholson, D. J. My first Ivory-billed Woodpecker. Oologist, 43:156-158, 1926.

00069

Phillips, J. C. An attempt to list the extinct and vanishing birds of the western hemisphere. Verhandlungen VI Internationalen Ornithologen-Kongresses, Kopenhagen, 1926.

00070

Bailey, H. H. The Ivory-billed Woodpecker in Florida. Auk, 44:18-20, 1927.

A good discussion on the present and past status of this bird in Florida.

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Holt, E. G. The status of the Great White Heron and Wurdemann's Heron. Scientific Pub. of Cleveland Museum of Natural History, 1(1):1-35, 1928.

A good treatment on the status and ecology of the Florida Great White Heron.

00072

Howell, A. H. Birds of Alabama, Second Edition. U.S. Department of Agriculture, Bureau of Biological Survey, and Department of Game and Fisheries of Alabama, Birmingham, Alabama, 384 p, 1928.

An excellent treatise on the natural history of the birds of Alabama, including those species now categorized as rare or endangered which previously or still occur in the state.

00073

Kellog, Remington. What is known of the migrations of some of the whalebone whales. Smithsonian Report, Washington, D.C., Publication No. 2997:467-494, 1928.

An early authoritative work on the migration and distribution patterns of whalebone whales.

00074

Morris, Frank and Edward A. Eames. Our wild orchids. Charles Scribner's Sons, New York, 1929.

A good book on the identification and approximate ranges of orchids some of which are now rare or endangered.

00075

Butler, A. W. Some bird records from Florida. Auk, 48: 438, 1931.

Reference is made to an Ivory-billed Woodpecker reported in Florida.

00076

Chapman, F. M. Handbook of birds of eastern North America. 2nd Rev. ed., New York, 1932.

This book includes updated (as of 1932) ranges of several rare and endangered species. Life histories of these species are also included in this volume.

00077

Herrick, F. H. Daily life of the American Eagle: early phase. Auk, 43(3 and 4):307-323, 428-435, 1932.

An excellent paper on the natural history of the young and immature stages in the life of the Bald Eagle.

00078

Howell, A. H. Florida bird life. New York, 313-315, 1932.

An updated discussion on the status of the Ivory-billed Woodpecker in Florida.

00079

Pearson, T. G. Protection of the Ivory-billed Woodpecker. Birdlore 34:300-301, 1932.

00080

Putnam, J. A. and H. Bull. The trees of the bottomlands of the Mississippi River Delta region. South Forest. Exp. Stat. Occ. Paper, No. 27, 1932.

Included in this paper is a discussion of the type of habitat required by Ivory-billed Woodpeckers for successful reproduction.

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Herrick, F. H. Daily life of the American eagle: Early phase (concluded). Auk 50:35-53, 1933.

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Pearson, Gilbert T. Woodpeckers, Friends of our forests. National Geographic, May, 63:453-479, 1933.

A good presentation on woodpeckers and their ecology with special emphasis placed on the benefits that woodpeckers (including the Ivory-billed) provide to forests through the consumption of large quantities of insects.

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Herrick, F. H. The American eagle. D. Appleton-Century Co., New York, 1934.

A book dealing with the ecology and life history of the Bald Eagle.

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Barrett, O. W. Notes concerning manatees and gurgongs. Journal of Mammalogy 16(3):216-220, 1935.

This paper discusses the ecology and status of the manatee.

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Lowery, George H. The Ivory-billed Woodpecker in Louisiana. Proc. Louisiana Acad. Sci., 2:96-107, 1935.

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Brand, Albert R. Bird voices in the southland. Natural History, February, 1936.

This report deals, in part, with attempts to "track" and find the Ivory-billed Woodpecker utilizing its distinctive call.

00087

Forbush, Edward and John May. A natural history of American birds of eastern and central North America. Bramhall House, New York, 1936.

This includes natural history studies of the (now) rare and endangered bird species of the Gulf Coast.

00088

Pearson, T. Gilbert, *Birds of America*. Garden City Books, New York, 1936.

One of the most authoritative sources of life histories of North America birds, including rare, endangered and extinct forms.

00089

Allen, Arthur A. Hunting with a microphone the voices of vanishing birds. *National Geographic Mag.*, 71:697-723, 1937.

This article presents methods utilized in searching for and recording the call of the Ivory-billed Woodpecker and other birds.

00090

Allen, A. A. and P. P. Kellogg. Recent observations on the Ivory-billed Woodpecker. *Auk*, 54:164-187, 1937.

00091

Sherman, H. B. A list of the recent wild land mammals of Florida. *Proc. Florida Acad. Sci.* 1:102-128, 1937.

Everglades fox squirrel, Key Largo woodrat and Florida panther (among others) are listed here.

00092

Matthews, L. Harrison. The sperm whale, Physeter Catadon. *Discovery Reports*, Cambridge, Mass. 17:9;31-168, 1938.

00093

McIlhenny, E. A. Florida crane, a resident of Mississippi. *Auk*, 55:598-602, 1938.

A description of sightings of the Florida sandhill crane in Mississippi (this race was later recognized as a separate subspecies, the Mississippi Sandhill Crane).

00094

Norman, J. R. and F. C. Fraser. Giant fishes, whales and dolphins. W. W. Norton and Co., Inc., New York, 1938.

A good book on the natural history of whales.

00095

Oberholser, H. C. The bird life of Louisiana. Bull. La. Dept. Cons., 28: 308-382, 1938.

A discussion of the Ivory-billed Woodpecker in Louisiana is included here.

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Allen, Arthur A. Ivory-billed woodpecker. Life histories of North American Woodpeckers. Bent, A. C. ed. Dover Publ, Inc., New York, p. 1-12, 1939.

The most authoritative life history of the Ivory-billed woodpecker to date.

00097

Bent, A. C. Life histories of North American Woodpeckers. Dover Pub., Inc. New York, 1939.

Life history of the Red-cockaded Woodpecker is included in this work.

00098

Calahane, Victor N. Report of the Committee on bird protection 1938. Auk, 56:212-213, 1939.

Committee on bird protection lists several birds whose survival is doubtful, including: Calif. Condor, Ivory-billed Woodpecker, Eskimo Curlew, Trumpeter Swan, Great White Heron, Masked Bobwhite, Everglade Kite and Lumpkin.

00099

Christy, B. H. Northern Pileated Woodpecker. Bent, A. C. ed., Life Histories of North American Woodpeckers. U. S. Nat. Mus. Bul., No. 174:181, 1939.

The Pileated Woodpecker is compared with the Ivory-billed Woodpecker in this account.

00100

Cottam, C. and Phoebe Knappen. Food of some uncommon North American Birds. Auk, 56:162, 1939.

Food of the Ivory-billed Woodpecker is listed as beetles, seeds, fruits and nuts.

00101

Cahalane, Victor N. Report of the committee on bird protection, 1939. Auk, 57:279-291, 1940.

An updated report of the 1938 committee report (see above). A report of a committee for bird protection which discussed the status of the California border Eskimo Curlew, Ivory-billed Woodpecker, Whooping Crane, Trumpeter Swan, Great White Heron, Everglade Kite and others.

00102

Moore, J. The crocodile in Everglades National Park of Florida. Univ. of Florida Press, Gainesville, Florida, 1940.

00103

Cahalane, Victor N. Report of the committee on bird protection, 1940. Auk, 58:292-298, 1941.

An update of the previous committee reports on rare birds.

00104

Fowler, H. W. A collection of freshwater fishes obtained in Florida, 1939-40, by Francis Harper. Proc. Acad. Nat. Sci., Philadelphia, 92:227-244, 1941.

Included in this study is an account of the collection records for the Okaloosa darter.

00105

Lehmann, V. W. Attwater's prairie chicken, its life history and management. North American Fauna 57, 1941.

The definitive work on the ecology of Attwater's Prairie Chicken.

00106

McIlhenny, E. A. The passing of the Ivory-billed Woodpecker. Auk 58:582-584, 1941.

00107

Tanner, J. T. Three years with the Ivory-billed Woodpecker, America's rarest bird. Audubon Mag. 43:5-14, 1941.

In this article, the author describes the results of three years of study of the Ivory-billed Woodpecker in the Singer forest tract of Louisiana and the Santee swamp of South Carolina, the only two areas studied which could definitely be said to contain breeding populations. Tanner estimated the total breeding population of these areas as 24 birds.

00108

Allen, G. M. Extinct and vanishing mammals of the western hemisphere, with the marine species of all the oceans. American Committee for International Wildlife Protection, New York, 620 p., 1942.

The first definitive and scholarly work on the extinct and rare mammals of the western hemisphere. This book contains a good discussion of these rare and extinct animals including details of their natural history and reasons for their decline.

00109

Baker, John H. Save the Ivory-billed Woodpecker. Audubon Mag., 44:370-373, 1942.

The Executive Director of the National Audubon Society reports on the step-by-step destruction of the Singer tract in Louisiana, one of the last refuges of the Ivory-billed Woodpecker, and efforts by the Society to save the area.

00110

Beard, Daniel B. *Fading Trails, the story of endangered American wildlife.* MacMillan, New York, 279 p, 1942.

Another excellent book summarizing existing knowledge on rare and endangered species.

00111

Bick, George H. *Ivory-billed Woodpecker and wild turkeys in Louisiana.* *Auk* 59:431-432, 1942.

This article presents an excellent discussion of the avifauna of the endangered Singer forest tract of Louisiana, the turkey and Ivory-billed Woodpecker being notable examples.

00112

Cahalane, Victor N. *Report of the Committee on Bird Protection, 1941.* *Auk*, 59:286-296, 1942.

Present status of and recommendations for several rare bird species are reported. This is a further update of previous reports.

00113

Tanner, J. T. *The Ivory-billed Woodpecker. Research Report No. 1.* National Audubon Society, New York, 111 p, 1942.

A scholarly report on the natural history and present status of the Ivory-billed Woodpecker based on three years of research by the author in Louisiana and South Carolina. The author states that lumbering is the primary cause of the reduction of the bird.

00114

Cahalane, Victor N. *Report of the committee on bird protection, 1942.* *Auk*, 60:152-162, 1943.

A further update of previous reports.

00115

Christy, Bayard. *The vanishing Ivory-bill.* *Audubon Mag.*, 45:99-102, 1943.

A detailed description of the Singer tract of northern Louisiana (an area not on the coast, but of the utmost importance when considering the status of the bird in Louisiana, its ecology when confronted with man, and subsequent reports of the bird in the coastal regions of Louisiana after the destruction of this area).

00116

Lowery, George H. Check-list of the mammals of Louisiana and adjacent waters. *Occas. Papers Mus. Comp. and Physiol. Psych.* 41:111-123, 1943.

A list of reported records of cetaceans (whales and porpoises) and sirens (manatees) from the coastal region of Texas, Louisiana and Mississippi.

00117

McIlhenny, E. A. Major changes in the bird life of southern Louisiana during 60 years. *Auk*, 60:541-549, 1943.

Changes in numbers and condition of about 30 species of unusual birds in southern Louisiana including the Ivory-billed Woodpecker.

00118

Baker, John H. Singer tract agitation. *Audubon Mag.*, 46:55-56, 1944.

This article presents a review of efforts by the National Audubon Society and other organizations to save the Singer tract, one of the few remaining refuges of the Ivory-billed Woodpecker.

00119

Young, Stanley P. and Edward A. Goldman. *The wolves of North America*. American Wildlife Institute, Washington, D. C., 636 p, 1944.

The first authoritative work on the ranges, taxonomic standing and ecology of the wolves of North America. Included in this work is a discussion of the Red Wolf.

00120

Sherman, H. B. Recent literature and some new distribution records concerning Florida mammals. *Proc. Florida Acad. Sci.* 7:199-202, 1945.

A good literature review and summary of recent mammal reports (including several rare species) in Florida.

00121

Sprunt, A., Jr. The phantom of the marshes. Audubon Magazine, 47:15-72, 1945.

A summary of the ecology and status of the Florida Everglades Kite. This is one of the first reports indicating the rarity of this unique bird.

00122

Young, S. P. and E. A. Goldman. The Puma, mysterious American cat; parts I and II. American Wildlife Institute, Washington, D.C., 358 p, 1946.

This book presents the most authoritative and thorough account of the ecology of the puma or cougar to date.

00123

Brolley, C. L. Migration and nesting of Florida bald eagles. Wilson Bulletin 59:3-20, 1947.

Previous to January 1939 few Bald Eagles (Haliaeetus L. Leucocephalus) had been banded in Florida. The Florida Bald Eagle was considered non-migratory and was regularly recorded as a permanent resident of the State. In 1938, Richard H. Pough, of the National Audubon Society, suggested that a few eagles be banded as an experiment, and during the eight years, 1939 to April 1946 814 Bald Eagles along the Gulf Coast of Florida were banded--practically all in January and February, a few in March. Meanwhile, a year-by-year record was kept of most of the nests in the banding area, which extended from Hernando County south to Lee County.

00124

Gunter, Gordon. Sight records of the West Indian seal, Monarchus Tropicalis (Gray) from the Texas coast. Journal of Mammalogy 28:289-290, 1947.

Unverified sight records of the West Indian Seal (Caribbean Monk seal) along the coast of Texas.

00125

Peterson, Roger T. A field guide to the birds: eastern land and water birds. Houghton Mifflin Co., Boston, 230 p, 1947.

A good pictorial and descriptive key of the birds of the eastern U.S. Habitat preferences and ranges are also given for each species (included are all the rare and endangered or peripheral Gulf Coast species with the exception of several species reaching the U.S. only in south Texas).

00126

Dennis, John V. A last remnant of the Ivory-billed Woodpecker in Cuba. Auk, 65:497-507, 1948.

A report on the status of the Ivory-billed Woodpecker in Cuba. A good comparison is given between the Cuban subspecies and the American subspecies.

00127

Walkinshaw, L. H. The sandhill crane. Cranbrook Institute of Science Bul. 29, 202 p, 1949.

00128

Gabrielson, Ira N. Report of the Committee on Bird Protection 1949. Auk, 67:316-324, 1950.

00129

Anonymous. Ivory-bills in Florida. Audubon Mag., 52:168-169, 1951.

Two Ivory-billed Woodpeckers were seen March 3, 1950 in Florida.

00130

Baker, John H. Ivory-bills now have sanctuary. Audubon Mag., 52:391-392, 1951.

The Chipola River Wildlife Sanctuary, the area where two Ivory-billed Woodpeckers were sighted, has been closed to hunting to protect these rare birds.

00131

Moore, J. C. The status of the manatee in the Everglades National Park, with notes on its natural history. *Journal of Mammalogy*, 32(1):22-36, 1951.

A thorough study of the morphology and ecology of the Manatee in Everglades National Park.

00132

Moore, J. C. The range of the Florida manatee. *Quarterly Journal of the Florida Academy of Sciences* 14(1):1-19, 1951.

This paper deals with the range of the Florida manatee in detail with respect to migration and distribution in southern Florida, up the East Coast, the Florida West Coast, and in Florida rivers.

00133

Schwartz, A. The land mammals of southern Florida and the upper Florida keys. Ph.D. Dissertation. University of Michigan, Ann Arbor, Mich., 1952.

This dissertation deals with the Key deer, Florida panther and the Everglades fox squirrel among others. This study presents details of the ecology and status of these species.

00134

Allen, R. P. The whooping crane. *National Audubon Society Research Report* No. 3, New York, 246 p, 1952.

A thorough study of the Whooping Crane, including descriptions of both its Canadian nesting grounds and wintering area at Aransas Wildlife Refuge on the Texas coast.

00135

Bent, A. C. Life histories of North American wood warblers. *U.S. National Museum Bulletin* 203. Washington, D. C., 1953.

A life history for Bachman's Warbler is presented by Mr. Bent in this book.

00136

Moore, Joseph C. Distribution of marine mammals to Florida waters. The American Midland Naturalist 49(1): 117-158, 1953.

A list of marine mammals of Florida waters and their distribution with a key to identification.

00137

Gabrielson, Ira N. Report of the Committee on Bird Protection, 1953. Auk 71:186-190, 1954.

00138

Moore, J. C. Fox squirrel receptionists. Everglades Natural History 2:153-160, 1954.

A study of the Everglades fox squirrel is given here.

00139

Sprunt, Alexander, Jr. Florida bird life. Coward and McCann, Inc. New York, 1954.

The ecology and distribution of birds in Florida (including several rare and endangered species) is given here.

00140

Imler, R. H. and E. R. Kalmbach. The Bald Eagle and its economic status. U.S. Fish and Wildlife Service Circular 30:1-51, 1955.

00141

Oliver, J. Natural history of North American amphibians and reptiles. B. Van Nostrand Co., Inc., Princeton, N. J., 359 p, 1955.

Details of the natural history of the American alligator and crocodile and the Green sea turtle are given here.

00142

Sherman, H. B. Description of a new race of woodrats from Key Largo, Florida.

Journal of Mammalogy 36:113-120, 1955.

A new subspecies of woodrat, Neotoma Floridana Smalli, now considered to be endangered, is described from Florida.

00143

Allen, R. P. A report on the whooping crane's northern breeding grounds. Supplement to National Audubon Society Research Report, No. 3, New York, 60 p, 1956.

Some details about its wintering grounds in Texas are included here.

00144

Gabrielson, Ira N. Report of the Committee on Bird Protection, 1955. Auk, 73:119-123, 1956.

00145

Moore, J. C. Variation in the fox squirrel in Florida. American Midland Naturalist 55:41-65, 1956.

A study which defines the geographic ranges of races of fox squirrels occupying western, central and southern Florida (the Everglades fox squirrel) and presents detailed descriptions of the color phases exhibited, and states the proportion in which these phases occur.

00146

National Wildlife Federation, Ed. Our endangered wildlife. National Wildlife Federation, Washington, D.C., 32 p, 1956.

00147

Stimpson, L. A. Cape Sable seaside sparrow: its former and present distribution. Auk, 73:489-502, 1956.

This paper deals with the ecology and distribution of the Cape Sable seaside sparrow and discusses reasons for its decline.

00148

Gabrielson, Ira N. Report of the Committee on Bird Protection, 1956.
Auk, 74: 90-93, 1957.

00149

Schmidt, Karl P. and Robert P. Inger. Living reptiles of the world.
Doubleday and Company, Inc., Garden City, New York, 1957.

Included in this book are natural histories of several rare and endangered reptiles.

00150

Broley, C. L. The plight of the American Bald Eagle. Audubon Magazine,
60:162-163, 171, 1958.

A paper discussing the decline of the American Bald Eagle.

00151

Eastman, Whitney. Ten-year search for the Ivory-billed Woodpecker.
Atlantic Naturalist, 13:413-427, 1958.

After studying the existing literature on the Ivory-bill, the author conducted a ten-year search for the bird in the locales where it had previously existed. He also summarizes all the recent reports he could find and assesses their validity.

00152

Greenway, J. C. Extinct and vanishing birds of the world. American Committee for International Wildlife Protection, New York, 1958.

An excellent treatment on extinct, rare and endangered birds. The book discusses the causes of extinction or rarity of the birds and gives salient points on their life histories.

00153

Lamb, George P. Cuban Ivory-billed Woodpecker. Nature Mag., 51:34-37, 1958.

A discussion on the status of the Ivory-billed Woodpecker in Cuba and its relationship to the American Ivory-billed Woodpecker.

00154

Scheffer, Victor B. Seals, sea lions and walruses. Stanford University Press, Stanford, California, 179 p, 1958.

A very authoritative and in-depth treatment of the ecology of seals, sea lions and walruses, including the Caribbean monk seal.

00155

Carr, Archie and Coleman J. Goin. Guide to the reptiles, amphibians, and freshwater fishes of Florida. University of Florida Press, Gainesville, 1959.

A good discussion of the Florida distribution and ecology of three notable rare or endangered Florida reptilian and fish species, the American alligator and crocodile and the Okaloosa darter are included in this book written by two noted Florida zoologists.

00156

Carr, A. and R. Ingle. The green turtle in Florida. Marine Science Gulf and Caribbean Bul., 9(3):315-320, 1959.

A discussion of the status of the Green sea turtle in Florida with notes on its reproduction and feeding behavior.

00157

Gilmore, R. Is the West Indian seal extinct? Sea Frontiers 5(4):225-236, 1959.

The status of the Caribbean Monk seal is assessed.

00158

Hall, E. Raymond and Keith R. Kelson. The mammals of North America. Ronald Press, New York, 2 Vols. 1083 p, 1959.

A complete treatment on the mammals of North America, including their life histories and ecology (The mammalian species of the Gulf Coast, among others, are well treated in these volumes).

00159

Matthiessen, Peter. Wildlife in America. Viking, New York, 304 p, 1959.

The present status and future of wildlife and wilderness areas in America are pondered in this book.

00160

McCarley, Howard. The mammals of eastern Texas. Texas Journal of Science, 11(4):385-426, 1959.

A description of the geographic and ecologic distribution of the mammalian fauna of eastern Texas, including the Red Wolf.

00161

Williams, G. G. Probable Eskimo Curlew on Galveston Island, Texas. Auk, 76:539-541, 1959.

A report of sightings of the Eskimo Curlew on Galveston Island by Trevor Feltner, Dudley Deaver, Victor Emanuel, E. P. Edwards, and others.

00162

Wright, Bruce S. The ghost of North America: the eastern puma. Vantage Press, New York, 1959.

The puma in Florida is also noted.

00163

Cunningham, R. L. The status of the Bald Eagle in Florida. Audubon Magazine, 62:24-26, 41, 43, 1960.

The decline of the Bald Eagle in Florida has stimulated research on this rare and endangered species.

00164

Meyerricks, A. J. Comparative breeding behavior of four species of North American Herons. Publications of the Nuttall Ornithological Club, No. 2, 1960.

A good synopsis of the breeding behavior of the Florida Great White Heron (now considered to be only a subspecies of the Great Blue Heron) and a comparison with other species.

00165

Robbins, C. S. Status of the Bald Eagle, summer of 1959. U.S. Fish and Wildlife Service Leaflet 418:1-8, 1960.

00166

Vines, Robert A. Trees, shrubs and woody vines of the southwest. University of Texas Press, Austin, 1104 p, 1960.

Ranges, growth form, habitat requirements, and seed and flower types of the trees, shrubs and woody vines of Texas and Louisiana (including the coastal region) are given in this book. Several state rare and endangered plant species of Texas and Louisiana receive treatment here.

00167

Bent, A. C. Life histories of North American birds of prey. Dover Publications, New York, 1961.

Life histories of rare and endangered hawks, falcons, kites, eagles, and ospreys are included here.

00168

Cottam, Clarence. Report of the Committee on Bird Protection, 1960. Auk 78:246, 1961.

00169

Ehrlich, Paul R. and Anne H. How to know the butterflies. William C. Brown Company, Dubuque, Iowa, 262 p, 1961.

A guide to the identification and ranges of butterflies of the United States including several rare forms.

00170

Kellogg, Remington. Whales, giants of the sea. National Geographic Magazine 77(1):39-90, 1961.

An excellent treatment of the ecology and life history of whales. Excellent photographs of whales make this article particularly noteworthy.

00171

Sprunt, A., IV and R. L. Cunningham. Continental Bald Eagle Project. Progress Report No. I. National Audubon Society, Tavernier, Florida. Unpublished mimeo, Looseleaf N.P. 1961.

00172

Collette, B. B. and R. W. Yerger. The American percid fishes of the sub-genus Villóra. Tulane Studies in Zoology, 9(4):213-230, 1962.

Included in this paper are some details of the ecology of the Okaloosa darter and a comparison with related forms.

00173

Cottam, Clarence. Report of the Committee on Bird Protection, 1961. Auk, 79:474, 1962.

00174

Emanuel, V. C. Texans rediscover the nearly extinct Eskimo Curlew. Audubon Magazine, 64:162-165, 1962.

Sited in 1959 after 14 years absence, one of the world's rarest birds returned to Galveston Island this spring for the fourth straight season.

00175

Goin, Coleman J. and Olive B. Goin. Introduction to Herpetology. H. H. Freeman Co., San Francisco, 341 p, 1962.

A good general herpetology text with data on the reproduction, feeding behavior and niche requirements for the American alligator and crocodile and the Green Turtle.

00176

Imhof, T. A. Alabama birds. University of Alabama Press, Tuscaloosa, Alabama, 591 p, 1962.

Natural histories of the Eastern Brown Pelican, Southern Bald Eagle, Red-Cockaded Woodpecker and Bachman's Warbler in Alabama.

00177

McCarley, Howard. The taxonomic status of wild Canis (Canidae) in south central United States, Southwestern Naturalist, 7(3-4):227-235, 1962.

The relationship based on skull morphology of populations known as Canis latrans and C. Niger in Arkansas, Oklahoma and Texas is considered. Available evidence indicates that C. Niger has become extinct except in isolated areas of Louisiana. Elsewhere, C. Latrans has replaced C. Niger as a primary predator. Probable previous hybridization between C. Latrans and C. Niger is discussed.

00178

Palmer, R. S. Handbook of North American birds. Vol. 1, Loons through Flamingos. Yale University Press, New Haven, Conn., 1962.

A life history of the Brown Pelican is included here.

00179

Slijper, E. J. Whales. Hutchinson and Company, London, 1962.

00180

Sprunt, A., IV and R. L. Cunningham. Continental Bald Eagle project. Progress Report No. II. National Audubon Society, Tavernier, Florida, Unpublished mimeo, looseleaf N.P., 1962.

00181

Carr, Archie. The reptiles. Time-Life Books, New York, 192 p, 1963.

A popular, yet scientific, book on reptiles, including numerous photographs, notes on the ecology and life histories of many species, a history of the science of herpetology, a paleontological review of reptiles, and a treatment of the economic importance of reptiles (sea turtles are particularly

well covered.)

00182

Cottam, Clarence. Report of the Committee on Bird Protection, 1962. Auk, 80:361, 1963.

00183

Lehmann, V. W., and R. G. Mauermann. Status of Attwater's prairie chicken. Journal of Wildlife Management, 27:713-725, 1963.

The Attwater's prairie chicken (Tympanuchus cupido Attwateri) is extinct in Louisiana and has decreased to approximately 1,335 in Texas. The decline since the last comprehensive studies of the 1930's has been approximately 7,365 chickens or 85 percent. Intensified use of grasslands, exclusion of controlled fire, oil development, predator increase, and expanded rice farming (now under a control program which actually encourages the breaking of additional prairie and the use of cultivated acres to the resolute limits of capability) are largely responsible. The current wide use of agricultural chemicals may also be important. Public sentiment favors a strong program to save Attwater's prairie chicken, a hallmark of the prairies that used to be. A program with landowners, predator control, habitat improvement, transfer of chickens, establishment of a prairie chicken preserve, lease of nesting areas in fallow rice lands, multiple land-use management, continuation of closed season on prairie chickens, warning signs on roads, and enlarged life-history and management studies.

00184

Peterson, Roger T. a field guide to the birds of Texas and adjacent states. Houghton Mifflin Co., Boston 304 p, 1963.

A field guide devoted to the birds of Texas and surrounding areas, including many of the peripherally endangered species which range into the United States only in the southern portions of Texas.

00185

Scheffer, V. B. and D. W. Rice. A list of the marine mammals of the world. U.S. Fish and Wildlife Service, Special Scientific Report - Fisheries. No. 431, 12 p, 1963.

00186

Sprunt, A., IV, and Frank J. Ligas. Continental Bald Eagle Project. Progress Report No. III. A Florida Notebook. Proceedings of the 59th Convention of the National Audubon Society, p. 2-7, 1963.

00187

Wallace, George J. An introduction to ornithology. The MacMillan Company, New York, 491 p, 1963.

Basic ornithology textbook dealing with evolution, physiology, ecology, etc of birds and includes one chapter on extinct and threatened birds.

00188

Anonymous. Manatee for weed control. Florida Wildlife, 18(3): 29-30, 1964.

This paper presents an excellent reason for the preservation of the manatee other than aesthetic or scientific: the control of aquatic weeds, such as water hyacinth, which are choking Florida's waterways.

00189

Cahalane, V. H. Report of the Committee on bird protection. Auk, 81:420, 1964.

00190

Cahalane, V. H. A preliminary study of distribution and numbers of cougar, grizzly and wolf in North America. New York Zoological Society, Bronx, N. Y., 1964.

00191

Caras, Roger. Dangers to man: wild animals, a definitive study of their reputed dangers to man. Chilton Books, Philadelphia, 433 p, 1964.

This book includes a brief account of the danger wild animals pose to man, including several rare and endangered species. Mr. Caras makes an impassionate plea for the preservation of these animals because they are an integral part of our wildlife heritage.

00192

Garfield, G. Nature's living herbicide. *Outdoor America*, 29(11):9, 1964.

Another short note on the Florida manatee's fondness for aquatic weeds.

00193

Lowery, George H. The woodpeckers: Family Picidae. Wetmore, Alexander (ed). *Song and garden birds of North America*. National Geographic Society, Washington, D. C. 1964.

The Ivory-billed Woodpecker and the Red-Cockaded Woodpecker are treated in this volume.

00194

Enderson, J. H. A breeding and migration survey of the Peregrine Falcon. *Wilson Bul.*, 77, 327-339, 1965.

A study of the status of the Peregrine in the central Rocky Mountain region and description of its migration on the Gulf Coast.

00195

Paradiso, John L. Recent records of red wolves from the Gulf Coast of Texas. *Southwestern Naturalist*, 10(4):318-319, 1965.

An examination of recent records of red wolves and an explanation of cranial comparisons of the red wolf and the coyote.

00196

Pimlott, Douglas H. Progress report, a study of the status and ecology of the red wolf in the south central United States. University of Toronto, Department of Zoology, Toronto, Ont., Canada, 6 p, 1965.

00197

Weston, F. M. and E. A. Williams. Recent records of the Eskimo Curlew. *Auk*, 82:493-496, 1965.

This note records four hitherto unpublished observations of the Eskimo Curlew and cites seven published records of these together, nine were made within less than 20 years (1945-1963).

00198

Davis, William B. The mammals of Texas. Texas Parks and Wildlife Department Bulletin N. 41. Austin, Texas, 267 p, 1966.

Taxonomic key and natural history discussions on mammals found in Texas.

00199

McNulty, F. The whooping crane, the bird that defies extinction. E. P. Dutton and Co., New York, 190 p, 1966.

00200

Norris, K. W. (ed.) Whales, dolphins, and porpoises. University of California Press, Berkeley, 1966.

00201

Red Data Book. Survival Service Commission, International Union for the Conservation of Nature and Natural Resources, Morges, Switzerland. 4 Vols., 1966.

The definitive, international text on rare and endangered animals of the world. This text gives some details of animals' life history, their status, methods being taken to prevent extinction, and further methods needed to prevent further depredations in numbers.

00202

Sprunt, A., IV, and Frank J. Ligas. Audubon Bald Eagle studies 1960-1966. Proceedings of the 62nd Convention of the National Audubon Society, 1966.

00203

American Society of Mammalogists. Report of conservation of land mammals committee. Defenders of Wildlife News, 42(3):267-270, 1967.

00204

Beezley, Clarence. Marsh Fugitive. Texas Parks and Wildlife, 24(1):18-20, 1967.

A report on recent studies conducted on the Red Wolf in order to ascertain its status in Texas and provide methods of preservation.

00205

Carr, Archie. So excellent a fish: A natural history of sea turtles. Doubleday/Natural History Press. Garden City, N. Y. 248 p, 1967.

Two decades of study by the author on sea turtles are detailed in this book. He describes his studies in Costa Rica and Nicaragua in attempting to decipher the turtle's system of navigation.

00206

Defenders of Wildlife. Does the red wolf persist in Arkansas? Defenders of Wildlife News, 42(4):380-381, 1967.

This article discusses the present limits of the Red Wolf in the United States and the identity of the wild canids in Arkansas.

00207

Dennis, John V. The Ivory-bill flies still. Audubon Mag., 38-44, 1967.

A search through the Big Thicket area of Texas for the Ivory-billed Woodpecker.

00208

Douglas, William O. Farewell to Texas, a vanishing wilderness. McGraw-Hill Book Company, New York, 1967.

The author, a U.S. Supreme Court Justice, details the numerous forces working to destroy natural and scenic areas in Texas, and with these areas some of the rare and endangered species they contain. All segments of Texas from the Big Thicket to Big Bend are covered in this book.

00209

Greenway, J. C. Extinct and vanishing birds of the world, 2nd ed. Dover Publications, Inc., New York, 1967.

An excellent synopsis of birds threatened with extinction in the U.S.

00210

Lawrence, Barbara and William H. Bossert. Multiple character analysis of Canis Lupus, Latrans and Familiaris, with a discussion of the relationships of Canis Niger. American Zoologist 7(2):223-232, 1967.

A multiple character analysis was undertaken of a broadly representative sample of three species: Canis lupus (wolf), C. latrans (coyote), and C. familiaris (dog). These species are clearly and significantly distinguished by the technique of linear discrimination. The analysis provides a basis for the identification of skulls not obviously distinguishable by size or other diagnostic characters.

Early populations of Canis n. niger and C. n. gregoryi (red wolf) are compared with the three species above and are found to form a cluster with Lupus and to be sharply distinct from the other two species. Additional comparisons show that while Lupus lycaon and Niger both overlap with Lupus, they are distinct from Latrans, with Niger being the farthest removed. A sample population of C. n. gregoryi, from the edge of the extending range of C. latrans, was examined and found to show too great a range of variation to be attributed to a single species.

00211

Nowak, Ronald M. The red wolf in Louisiana. Defenders of Wildlife News, 42(1): 60-70, 1967.

This article discusses the status of the Red Wolf in the coastal areas of Louisiana and the effort being made to preserve this population.

00212

Rickett, Harold William. Wild flowers of the United States States: Vol. 2, the southeastern states. McGraw-Hill, New York, 700 p, 1967.

An excellent book containing photographic and scientific descriptions of the wild flowers of the southeastern U.S. including Louisiana, Alabama, Mississippi and Florida. Some discussion of each species status and distribution is also included.

00213

Rutter, Russell J., and Douglas H. Pumlott. The world of the wolf. J. B. Lippincott, Philadelphia, 202 p, 1967.

Details of the ecology of the Red Wolf are discussed in this book.

00214

Ziswiler, Vincenz. Extinct and vanishing animals. Springer-Verlag. New York, 1967.

00215

Blair, W. Frank, Albert P. Blair, Pierce Broadkorb, Fred R. Cagle, and George A. Moore. Vertebrates of the United States. McGraw-Hill, Inc. New York, 616 p, 1968.

A thorough listing and synopsis of all vertebrate species in the U.S. including their distribution. Detailed keys are also included.

00216

Cruikshank, Helen G. A paradise of birds: when spring comes to Texas. Dodd, Mead & Co., New York, 398 p, 1968.

A compilation of observations of Texas birds.

00217

Hickey, J. J. and D. W. Anderson. Chlorinated hydrocarbons and egg-shell changes in raptorial and fish-eating birds. Science 162:271, 1968.

A report concerning eggshell changes due to chlorinated hydrocarbons in the Red-Tailed Hawk, Golden Eagle, Bald Eagle, Osprey, Peregrine Falcon, and Great Horned Owl.

00218

Howell, J. C. The 1966 status of 24 west sites of the bald eagle. Auk 85: 680-681, 1968.

Report on a survey of 24 Bald Eagle nests that began in 1935 to 25 percent in 1966.

00219

Lehmann, V. W. The Attwater's Prairie Chicken current status and restoration opportunities. Trans. 33rd North American Wildlife Conference, p. 398-407, 1968.

00220

Louisiana Wildlife and Fisheries Commission. Biennial Report, 1966-1967. Baton Rouge, Louisiana 1968.

A report on studies on the Red Wolf and its status in Louisiana is included here.

00221

National Audubon Society. Brown Pelican Newsletter No. 1, New York, 1968.

00222

Paradiso, John L. Canids recently collected in east Texas, with comments on the taxonomy of the red wolf. American Midland Naturalist, 80(2): 529-534, 1968.

Data on 279 canid skulls collected in east Texas after 1960 are presented and discussed. The skulls vary from those typical of the red wolf to those typical of the coyote, with every intermediate type represented. A possible interpretation of this wide variation is that various altered environmental factors are causing massive hybridization between red wolves and coyotes in east Texas, resulting in a single interbreeding population of great diversity. Possibly this interbreeding should be regarded merely as intergradation, which would imply only subspecific differentiation of red wolf and coyote. But proposal of such a taxonomic change is postponed until the completion of more detailed analyses that are now under way. The assignment of eastern races of red wolf to conspecific status with grey wolf is held to lack sufficient basis for acceptance. To avoid further complicating the taxonomy of North American canids, it is suggested that treatment of the red wolf as a full species be continued until further studies are completed that may throw more light on its relationships to the wolf and to the coyote.

00223

Pimlot, Douglas H. and Paul W. Joslin. The status and distribution of the red wolf. Trans. 33rd North American Wildlife and Natural Resources Conference, 373-389, 1968.

00224

Stutzenbacker, C. D. Coastal marsh management. Survey Job No. 6. Mottled duck status. Job Progress report on Federal Aid Project No. W-96-R-3 for U.S. Fish and Wildlife Service, Washington, D. C. 9 p, 1968.

00225

American Alligator Council. Proceedings of the American Alligator Council, 1968-69, p. 1-24, 1969.

00226

Anonymous. Turtles in trouble. New Scientist 42, No. 643, 1969.

A good synopsis of the sea turtles, their status, and some causes for their decline.

00227

Anonymous. Peregrine Falcon, nature's expert hunter may become extinct. Defenders of Wildlife 44(2):172, 1969.

A brief account of the natural history of the Peregrine Falcon and conditions causing his decline.

00228

Eddy, Samuel. How to know the freshwater fishes. William C. Brown Company, Dubuque, Iowa. 286 p, 1969.

An illustrated, taxonomic key to the freshwater fishes of the U.S. (The Okaloosa darter is included here).

00229

Etter, Alfred G. Adventures on the trail of the hooved locust. Defenders of Wildlife News, 44(2):156-166, 1969.

This article discusses the status of the Red Wolf and methods utilized to ascertain its presence (signs, voice recording played, etc.).

00230

Fisher, James, Noel Simon and Jack Vincent. Wildlife in Danger. Viking Press, New York, 1969.

An excellent, up-to-date book on wildlife threatened with extinction.

00231

Klimstra, W. D., J. Hardin and N. Silva. Key deer investigation, annual report 1968-1969. Cooperative wildlife research laboratory, Southern Illinois University, Carbondale, Illinois, 1969.

00232

National Audubon Society. Brown Pelican Newsletter, No. 2. New York, 1969.

00233

Rickett, Harold William. Wild flowers of the United States: Vol. 3, Texas. McGraw-Hill, New York, 496 p, 1969.

Pictorial key to wildflowers of Texas including pictures, descriptions, habitat and distribution.

00234

Scheffer, Victor B. The year of the whale. Charles Scribner's Sons, New York, 244 p, 1969.

A natural history of whales written like a novel. The life of the whale is described month by month including details of reproduction and feeding behavior.

00235

Snyder, N. F. R., and H. P. Snyder. A comparative study of the mollusk. Predation by Limkens, Everglade Kites, and Boat-tailed Grackles. In: The Living Bird, 8th Annual Edition. Lab. Ornith. Cornell University. Ithaca, New York, 175 p, 1969.

00236

Tanner, James T. The decline and status of the Imperial Woodpecker of Mexico. Auk, 81:74-81, 1969.

A report on the status of the Imperial Woodpecker of Mexico and a comparison of this species with the American Ivory-bill.

00237

Department of Interior. Whooping cranes. Superintendent of Documents, Washington, D. C. 16 p, 1969.

A short bulletin on the ecology and preservation of the Whooping Crane.

00238

Anderson, D. W. and J. J. Hickey. Oological data on egg and breeding characteristics of Brown Pelicans. Wilson Bulletin 82:14-28, 1970.

This paper presents data from major oological collections in North America regarding some egg and reproductive parameters of the Brown Pelican.

00239

Blus, L. J. Measurement of Brown Pelican eggshells from Florida and South Carolina. Bio. Science, 20:867-869, 1970.

The results of a survey which was undertaken in the summer of 1969 to determine weight and thickness of Brown Pelican eggshells in South Carolina and Florida. Measurements of these eggs are compared with those of eggs collected prior to 1947.

00240

Brown, L. N. Unique mammals found in the Florida Keys. Florida Naturalist 43:146-147, 1970.

Several rare mammalian species found on the Florida Keys, such as the Key deer, are discussed here.

00241

Cade, T. J. and R. Fyke. The North American peregrine survey. Canadian Field Naturalist, 84:231-245, 1970.

00242

Correll, D. S. and M. C. Johnston. Manual of the vascular plants of Texas. Texas Research Foundation, Renner, Texas, 1881 p, 1970.

A dichotomous key to the vascular plants of Texas, non-illustrated. Status,

distribution and descriptions are also given for each species.

00243

Deramus, Rebecca. Flora of Dolphin Island, Alabama. Unpublished Ph.D. Thesis, University of Alabama, Tuscaloosa, 1970.

Several unique coastal plant species are listed in this dissertation.

00244

Eberly, L. The 1969 N.A.F.A. Peregrine Falcon symposium, Raptor Research News, 3(4): 73-74, 1970.

00245

Eaton, R. L. Pilot-study on ecology of Florida panther. Unpublished manuscript, 1970.

00246

Hornocker, Maurice G. The American Lion. Natural History 79(9):40-49, 68-71, 1970.

The ecology and status of the distinct populations of the American Cougar.

00247

Lay, D. W. and D. N. Russell. Notes on the Red-cockaded Woodpecker in Texas. Auk, 87:781-786, 1970.

General observations on a small population of Red-cockaded Woodpeckers near Lufkin, Texas (although not a coastal population, this study is one of the best on the ecology of the Red-cockaded Woodpecker in Texas).

00248

Mech, L. David. The wolf: the ecology and behavior of an endangered species. Doubleday/Natural History Press, Garden City, N. Y. 384 p, 1970.

One of the most comprehensive books ever written on the wolf. Details of food, habitats, hunting, mating, and social behavior are also included.

00249

Mettee, M. F. A survey of the fishes of the Choctawhatchee Bay drainage in Alabama and Florida. Unpublished Master's Thesis. University of Alabama, 120 p, 1970.

The Okaloosa darter was collected here and some details of its ecology are given here.

00250

Nowak, Ronald M. Report on the red wolf. Defenders of Wildlife News, 45(1): 82-94, 1970.

The red wolf is the rarest mammal in North America. A thorough search for this animal revealed its presence in a few counties of Texas and Louisiana.

00251

Ogilvie, P. W. Interim report on the red wolf in the United States. International Zoo Yearbook, p. 122-124, 1970.

00252

Peakall, P. B. Pesticides and the reproduction of birds. Scientific American 222(4): 72-78, 1970.

High concentrations of chlorinated hydrocarbon residues accumulate in such flesh eaters as hawks and pelicans. Among the results are upsets in normal breeding behavior and eggs too fragile to survive.

00253

Risebrough, R. W., J. Davis and D. W. Anderson. Effects of various chlorinated hydrocarbons. Gillett, J. W. (ed.) In: The Biological Impact of Pesticides in the Environment. Environmental Health Science Series No. 1, Oregon State University, Corvallis, Oregon, p. 40-53, 1970.

00254

Smith, G. Mystery Cat. Florida Wildlife, 1970.

A short article on the status of the Florida puma.

00255

U.S. Forest Service. Endangered, rare and uncommon wildflowers. U.S. Department of Agriculture, U.S. Forest Service (Southern region), Atlanta, Georgia. 20 p, 1970.

Brief, pictorial guide to some rare, endangered and uncommon wildflowers of the eastern U.S.

00256

Valentine, J. M., Jr. and R. E. Noble. A colony of Sandhill Cranes in Mississippi. *Journal of Wildlife Management*, 34: 761-768, 1970.

00257

Anonymous. They're still not safe. *Audubon* 73(4):12-13, 1971.

Alligator poachers, because of fashion demands, are keeping the population of these reptiles at low levels.

00258

Brown, L. N. Everglades fox squirrel, rare and becoming rarer. *Florida Wildlife*, 1971.

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Blus, L. M., R. G. Heath, G. D. Gish, A. A. Belisle and R. M. Prouty. Eggshell thinning in the Brown Pelican implication of D.D.E. *Bioscience*, 21(24):1213-1215, 1971.

Report on the Brown Pelican's extreme susceptibility to DDE-which induces eggshell thinning.

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Czuhai, E. Synoptic review of forest resource and use within the range of the red-cockaded woodpecker. In the ecology and management of the red-cockaded woodpecker. Proc. of Symposium at Okefenokee Natl. Wildlife Refuge, Folkston, Georgia, sponsored by the Bureau of Sport Fisheries and Wildlife and Tall Timbers Research Station, 1971.

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Farney, Dennis. New hope at Patuxent. *National Wildlife* 9(6):44-47, 1971.

An article describing the work of the Bureau of Sport Fisheries and Wildlife's Center for the Study of Endangered Species in Patuxent, Maryland. Several species, such as the Whooping Crane, are being reared at Patuxent.

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Fodor, B. The wolf in the southeastern United States. U.S. Department of the Interior Library Bibliography, No. 19, Washington, D. C., 1971.

A survey and bibliography of information on the Red Wolf and other wild canids in the southeastern United States.

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Hess, John. Where have all the ospreys gone? *National Wildlife* 9(1):36-37, 1971.

An article on the status and causes for the decline of the American Osprey.

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Jackson, J. A. The evolution, taxonomy, distribution, past populations and current status of the red-cockaded woodpecker. In: The ecology and management of the red-cockaded woodpecker. Proc. of Symposium at Okefenokee Natl. Wildlife Refuge, Folkston, Ga., sponsored by the Bureau of Sport Fisheries and Wildlife and Tall Timbers Research Station, 1971.

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Julsrud, Julia. Is it good-bye to the great whales? *Defenders of Wildlife* 46(4):388-389, 1971.

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Milne, Lorus and Margery. *Invertebrates of North America*. Doubleday and Company, New York, 249 p, 1971.

Life history synopsis of selected North American Invertebrates several rare invertebrate forms (both marine and fresh water) are discussed here.

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Olsen, Jack. Slaughter the animals, poison the earth. Simon and Schuster, New York, 287 p, 1971.

This book deals with man's insatiable urge to kill wild animals by whatever means possible because they are necessary to man as furs, plumes, etc. or because man has declared them vermin. Man's desire for an aseptic world without vermin or insects will in the author's opinion, ultimately lead to the poisoning of the world.

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Paradiso, J. L. and R. M. Nowak. A report on the taxonomic status and distribution of the Red Wolf. United States Department of the Interior, Fish and Wildlife Service, Washington, D. C. 36 p, 1971.

The taxonomic question of whether the Red Wolf is an identifiable species separate from the coyote or coyote-wolf mix is treated in this paper. This paper also deals with one of the factors leading to the decline of the Red Wolf: the hybridization of the Red Wolf with other wild canids.

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Rand, Austin L. Birds of North America. Doubleday and Co., Inc., New York. 255 p, 1971.

A complete family and order treatment of most of the birds of North America. Salient points of the ecology and life history of several of the rare, endangered, peripheral or status undetermined bird species are presented here.

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Regenstein, Lewis. The whales near extinction. Defenders of Wildlife, 46(4):390-395, 1971.

An up-to-date status report on the status of the whales and the problems they face from extensive whaling ventures.

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Russell, D. and J. H. Shaw. Notes on the red wolf (Canis Rufus) in the coastal marshes and prairies of eastern Texas. Proc. Tex Acad. Sci., 5 p, 1971.

A synopsis of research done by the two authors on the red wolf on the Texas coast. Red wolves were tagged with radio transmitters and their movements were studied. Numerous howl surveys to determine the population density of the animals were also performed.

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Russell, Dennis. Texas cats. Texas Parks and Wildlife, 29(10):24-27, 1971.

Natural history summaries and the status of the bobcat, jaguar, ocelot, jaguarund, margay and mountain lion or cougar in Texas. The populations of these cats in the state at the present are also estimated.

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Sand, George X. The Everglades today -- endangered wilderness. Four Winds Press, New York, 191 p, 1971.

This book discusses the Everglades, a unique wilderness, with its complement of unique animals. The pressures that human populations are forcing on the Everglades and the effects of this pressure on the wilderness and the animals and plants of this area are discussed.

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Teale, Edwin Way. Big Thicket: crossroads of nature. Audubon 73(3):12-32, 1971.

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Thompson, R. L. and W. W. Baker. A survey of red-cockaded woodpecker habitat requirements. In: The ecology and management of the red-cockaded woodpecker. Proc. of Symposium at Okefenokee Natl. Wildlife Refuge, Folkston, Ga., sponsored by Bureau of Sport Fisheries and Wildlife and Tall Timbers Research Station, 1971.

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Department of the Interior. Whooping crane: winning its battle for survival. Defenders of Wildlife 46(4):387, 1971.

This article notes recent population gains by the whooping crane.

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Werner, H. W. Cape Sable sparrows rediscovered on Cape Sable. *Auk*, 88: 432, 1971.

A report on the discovery of a colony of Cape Sable sparrows on Cape Sable, Florida.

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Aldrich, J. W. A new subspecies of sandhill crane from Mississippi. *Proc. Biol. Soc. Washington, D. C.*, 85:63-70, 1972.

A description of the Mississippi Sandhill Crane as a distinct subspecies and its status are noted here.

00279

Anonymous. Key deer victims of autos. *Defenders of wildlife* 47(2):173, 1972.

Road kills since 1948 have taken 598 Key deer including 52 in the first ten months of 1971. The increased kill is probably due to an increase in the size of the population.

00280

Barnett, Howard. Birds of prey. *Texas Parks and Wildlife* 30(3):6-9, 1972.

A brief general discussion of birds of prey in Texas. This article presents a discussion of the food habits of predatory birds (hawks, eagles, and owls) and pictures of a few of the species found in Texas.

00281

Carmichael, James H., Jr. It's not too late to save Atchafalaya. *National Wildlife* 10(3)26-30, 1972.

A marshland wilderness in Louisiana faces several threats from man. Several rare and endangered species receive sanctuary here (a possible recent sighting of the Ivory-billed woodpecker was also reported from here).

00282

Correll, Donovan S. and Helen B. Aquatic and wetland, plants of southwestern United States. Superintendent of Documents. Washington, D. C. 1777 p, 1972.

Dichotomous, illustrated key to common wetland plants of the southwestern U.S., including some forms of the Texas Coast which are threatened with extinction.

00283

Cousteau, Jacques - Yves. I learned the secrets of the mighty whales. International Wildlife 2(4):5-11, 1972.

Most species of whale appear to communicate with sounds. Recordings indicate that frequency and intensity of vocalization increases at night and in turbid water and ceases when a diver is near.

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Dennis, J. V. Red-cockaded woodpecker. National Parks and Conservation Magazine, 46(2):24-27, 1972.

A brief review of the habits and reproductive behavior of the Red-cockaded woodpecker.

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Ehrenfield, David. Conserving life on earth. Oxford University Press, New York, 1972.

The author presents forceful arguments for the preservation of animal and plant life on earth.

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Cranston, Alan (Senator). Statement of Senator Alan Cranston before the House Subcommittee on Fisheries and Wildlife Preservation regarding the protection of rare and endangered species. Defenders of wildlife 47(3): 309-312, 1972.

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Houck, Oliver A. Atchafalaya. *National Wildlife*, 10(3):31, 1972.

A pictorial account and short essay on some of the animals and plants of Atchafalaya in Louisiana.

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Keating, Bern. Florida. Rand McNally and Company, Chicago. 160 p, 1972.

The wildlife and wilderness areas of Florida (the Everglades, etc.) are treated in this book on the sites and scenes of Florida.

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Keeler, James E. (ed.). Rare and endangered vertebrates of Alabama. Alabama Department of Conservation and Natural Resources, Division of Game and Fish, Montgomery, 92 p, 1972.

This symposium gives the present status of the rare and endangered vertebrates found in Alabama.

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Leviton, Alan E. Reptiles and amphibians of North America. Doubleday and Company, Inc., New York, 250 p, 1972.

Taxonomic treatment of North American amphibians.

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Matthiessen, Peter. Lignumvitae - the last Key. *Audubon* 74(1):20-31, 1972.

Some of the animals and plants of a portion of the Florida Keys are noted in pictures and essay. Both marine and terrestrial life are covered.

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Miller, Robert Rush. Threatened freshwater fishes of the United States. *Transactions of the American Fisheries Society* 101(2):239-252, 1972.

Threatened, native freshwater fishes are listed for 49 of the 50 U.S. States, the first such compilation. Over 300 kinds are included in a

formal classification, cross-indexed to states (Table 1), followed by state lists and the status of each fish, whether rare, endangered, depleted, or undetermined. The concern for native fishes and the important factors responsible for threats to their existence are briefly outlined. Although the lists vary from those based on extensive recent state surveys to others in which current information is sparse, publication is expected to enhance the chances for survival through protective legislation (already enacted by a number of states) and stronger concern for such natural resources.

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Morse, D. Habitat utilization of the Red-cockaded Woodpecker during the winter. *Auk*, 89:429-434, 1972.

Males and females foraged similarly, concentrating their activities up trunks of longleaf pines. This woodpecker is separated spatially from Downy Woodpeckers.

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National Geographic Society. Alligators, vital to swamp life, winning fight against extinction. *Defenders of wildlife*, 47(3):272-273, 1972.

This article tells of recent gains in alligator populations, especially in Louisiana.

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Nobile, Philip and John Deedy (ed.) *The complete ecology fact book*. Anchor Books, Doubleday and Company, Inc., Garden City, New York, 472 p, 1972.

A compilation of statistics dealing with ecological concepts. One chapter of this book is devoted to rare and endangered and extinct species with numerous statistics detailing the rate of decline and extinction of animals.

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Nowak, Ronald M. The mysterious wolf of the south. *Natural History* 81(1): 50-53, 74-77, 1972.

The red wolf was once found over much of SE United States. The red wolf is larger than the coyote it hybridizes with and is presently on the edge of extinction. Some life history notes are supplied.

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Nuckles, L. D. El tigre chiquito. Texas Parks and Wildlife 30(12):12-14, 1972.

An article on the range, status and ecology of the ocelot in South Texas.

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Redford, Polly. Mangroves are for people. Audubon 74(6):56-59, 1972.

The author discusses threats by man (developers) to the mangroves and its animal inhabitants in the Florida Keys. The pollution caused by increasing habitation of the Keys and its effect on aquatic life and vegetation is also discussed.

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Regenstein, Lewis. A last chance for America's wolves. Defender of Wildlife, 47(5):477-481, 1972.

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Reiger, George. Bulldozers of butterflies: the choice for Big Cypress, Florida. National Wildlife 10(6):5-11, 1972.

This article deals with the threat that destruction of a portion of Big Cypress swamp poses to butterflies of the area.

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Ricciuti, Edward R. The American alligator: its life in the wild. Harper and Row, New York, 67 p, 1972.

A life history investigation of the American alligator.

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Riley, Glynn A. and Roy T. McBride. A survey of the red wolf (Canis rufus). United States Department of the Interior, Fish and Wildlife Service, Bureau of Sport Fisheries and Wildlife. Special Scientific Report - Wildlife No. 162, 15 p, 1972.

This paper discusses the red wolf's (Canis rufus) status, distribution, and ecology; and describes and differentiates the red wolf from other

closely related canids.

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Roos, Barbara. Paradox of a superstar. *National Wildlife*, 10(3):14-17, 1972.

The paradox of the endangered status of our national bird, the Bald Eagle, is treated in this article.

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Russell, Dennis N. and James H. Shaw. Red wolf - situation critical. *Texas Parks and Wildlife* 30(3):12-15, 1972.

The results of radio transmitter tagging and howl surveys of the Red wolf are presented here. The rapid reduction of the Red Wolf's range is clearly presented and discussed. The principal reasons for their decline is also discussed.

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Seater, Stephen R. Native wildlife endangered as exotics invade Florida. *Defenders of Wildlife* 47(2):151-153, 1972.

Over 1000 foreign plants, 60 exotic birds and a dozen imported fishes plus species of mammals, reptiles and amphibians may cause reduction of many species of organisms found in Florida.

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Seater, Stephen R. Sea turtles decline as human predation increases. *Defenders of Wildlife* 47(1):44-47, 1972.

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Truby, J. David. The turbulent wars that whales have fought against man. *Smithsonian* 3(2):58-65, 1972.

Previous examples of depredation of whales by man.

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Truslow, Frederick Kent. The private life of the Bald Eagle. Audubon, 74(6):44-51, 1972.

Pictorial account of part of the life history of the Bald Eagle.

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U.S. Department of Agriculture. The fairest one of all. U. S. Department of Agriculture, U.S. Forest Service (Eastern Region), Milwaukee, Wisconsin, 32 p, 1972.

A report of rare and endangered species in eastern and southern National Forests (or near National Forests) including the Red wolf, the Osprey, and the Red-cockaded Woodpecker. Proposals for saving and enhancing the habitat for these species is presented for each species.

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Department of Interior. Protection provided to 32 additional families of birds in convention with Mexico. Defenders of Wildlife, 47(3):270, 1972.

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Department of the Interior. Everglades wildlife. Superintendent of Documents, Washington, D.C., 105 p, 1972.

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Rare and endangered plants native to Texas, 2nd edition. The University of Texas, Rare Plant Study Center, Austin, 5 p, 1972.

A listing, by region, of plants considered rare and endangered in Texas.

00313

Williams, L. E., Jr., and R. W. Phillips. North Florida sandhill crane populations. Auk, 89:541-548, 1972.

This paper reports recent data on migration time and routes and the nesting and wintering grounds of the Sandhill crane population in northern Florida.

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Annunzio, Frank. Endangered species are part of Nature's balance. Defenders of Wildlife News, 48(2):140, 1973.

A report on the benefits to endangered species if the Endangered Species Act of 1973 (H.R. 470) is passed.

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Anonymous. Rare and endangered animals of Mississippi. Mississippi Wildlife Federation, Jackson. Loose-leaf publication N.P., 1973.

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Arnold, Keith A., Chairman. Preliminary TOES list of Texas rare and endangered, declining and peripheral bird species. Texas Organization for Endangered Species (TOES), bird subcommittee, College Station, Loose-leaf publication N.P., 1973.

00317

Cahn, Robert. Good news for ocelots, pumas, jaguars. Defenders of Wildlife News, 48(2):111-112, 1973.

The breakup of the biggest ring of illegal traffic in animal pets ever discovered may lead to more protection for ocelots, pumas, jaguars, and other endangered species abroad.

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Corvell, C. V., Jr. Notes on the status of two endangered butterfly species in southern Florida. Presented at 1973 meetings of the Entomological Society of America, Dallas, Texas, November 25-29, 1973.

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Hendrickson, John R. In defense of Mexican sea turtles. Defenders of Wildlife News, 48(3):299-304, 1973.

Principal sea turtle nesting beaches of Mexico are given. The Mexican sea turtle catch peaked at 15,000 metric tons in 1967 and has fallen off substantially since. Protection of nesting beaches and eggs is taking place and will undoubtedly help the population.

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Jurries, Royce and Jim Dodd. The Attwater can be helped. Texas Parks and Wildlife, 31(5):12-14, 1973.

Converting fallow ricefields to grassland provides new habitat for the Attwater's prairie chicken.

00321

Lehman, William M. C. Protect our endangered species. Defenders of Wildlife News, 48(5): 575, 1973.

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Moan, Sally-Jo. Red Wolf's decline. Defenders of Wildlife News 48(5): 552-553, 1973.

About 100 individuals remain wild in the U.S. and there is a concerted effort to save this population.

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National Wildlife Federation. Born captive. National Wildlife, 12(1):17, 1974.

Dr. Heinz Merg has successfully reared 7 peregrine Falcons in captivity. This method of rearing may offset high natural mortality caused by high pesticide levels.

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Ramsey, Charles W. Preliminary list of rare and endangered fishes of Texas. Texas Organization for Endangered Species (TOES), Animal Committee, College Station. Loose-leaf publication N.P. 1973.

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Ramsey, Charles W. Preliminary list of rare and endangered birds of Texas. Texas Organization for Endangered Species (TOES), Animal Committee, College Station. Loose-leaf publication N. P., 1973.

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Ramsey, Charles W. Preliminary list of rare and endangered mammals of Texas. Texas Organization for Endangered Species (TOES), Animal Committee, College Station, Loose-leaf publication N.P., 1973.

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Ramsey, Charles W. Preliminary list of rare and endangered amphibians and reptiles of Texas. Texas Organization for Endangered Species (TOES), Animal Committee, College Station, Looseleaf publication N.P., 1973.

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Reiger, George. The world shepherds its wildlife. International Wildlife, 3(4):4-13, 1973.

Eighty nations signed an agreement outlawing or limiting the trade in some 650 plant and animal species.

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Ripley, S. Dillon. The view from the castle. Smithsonian, 4(3):4, 1973.

International endangered species will be aided by a recently framed international convention if it is soon ratified.

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Rowell, Chester. Preliminary TOES list of Texas' rare, endangered and peripheral plant species. Texas Organizations for Endangered Species (TOES), Plant Committee, San Angelo, Texas, Loose-leaf publication N.P., 1973.

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Sehter, Stephen. Saving the world's whales. Defenders of Wildlife News, 48(4):417-418, 1973.

Five species (blue, humpback, bowhead, right and gray) of whales have been driven to the very brink of extinction by over exploitation. Only the sei, sperm and minke whales are abundant enough to profitably exploit. Although several countries have banned whale meat products Japan and Russia maintain large whale fishing fleets.

00332

Seater, Stephen. Eighty nations sign treaty to protect endangered plants and animals. *Defenders of Wildlife News*, 48(4):416-417, 1973.

The convention of International Trade in Endangered Species of Wild Fauna and Flora agreed to outlaw or carefully control the trade in some 650 species of plants and animals.

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Scheffer, Victor B. Gallery of U.S. animals in peril grows, but a new wildlife ethic is emerging. *Smithsonian* 4(7):45-51, 1973.

The present state of several lesser-known endangered species is outlined along with comments on changing attitudes of concerned individuals.

00334

Smyth, Jeanette. Seashells join list of ecologists' taboos. *Dallas Times Herald*, November 4, Dallas, 1973.

Collecting of marine shellfish by professionals and amateur collectors is causing a decline in number of many species.

00335

Sprunt, Alexander IV, William B. Robertson, Jr., Sergei Postupalsky, Richard J. Hensel, C. Eugene Knoder, and Frank J. Ligas. Comparative productivity of six Bald Eagle populations. Presented at 38th North American Wildlife and Natural Resources Conference, Washington, D. C., 1973.

Of six populations studied in various parts of the U.S., three are declining in numbers and three are stable. Large differences in reproductive rates were related to contamination with hydrocarbon pesticides, principally DDT and its metabolites.

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Snyder, Noel F. R., Helen A. Snyder, Jeffrey L. Lincer and Richard T. Reynolds. Organochlorides, heavy metals and the biology of North American accipiters. *Bioscience*, 23(5):300-305, 1973.

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Texas Organization for Endangered Species. Texas Almanac list of rare and endangered species for 1973 - 1974. Texas Organization for Endangered Species (TOES) Committee, Temple, Texas. Loose-leaf publication, N.P., 1973.

00338

Texas Parks and Wildlife. Proposed list of native fish and wildlife threatened with extinction in Texas as prescribed by article 913A, Protection of Endangered Species. Texas Parks and Wildlife Commission, Austin, 1973.

00339

Thomas, Joab. Rare and endangered flora of Alabama. Personal Communication, University of Alabama, Tuscaloosa, 1973.

00340

U.S. Department of the Interior, Fish and Wildlife Service. Bureau of Sport Fisheries and Wildlife. Office of Endangered Species and International Activities. Threatened wildlife of the United States. U.S. Printing Office, Washington, D.C., 299 p, 1973.

The most up-to-date source on rare or endangered wildlife of the United States. An introduction is included giving the scope of the work, federal acts dealing with rare and endangered species criteria for determining an "endangered species," and details of the work of the office of endangered species. Extinct or presumed extinct wildlife is included. All species of threatened fish, amphibians, reptiles, birds and mammals are listed with distinguishing characters, distribution (present and former), status, estimated numbers, reasons for decline, and protective measures to be taken or proposed. State listing of rare and endangered species and state agencies responsible for their protection in each state are given as appendices.

00341

U.S. Department of the Interior. List of endangered native fish and wildlife. U.S. Department of the Interior, Bureau of Sport Fisheries and Wildlife, Washington, D.C. Loose-leaf publication N.P., 1973.

00342

Whitehurst, G. William, M.C. Extending the protection of animals.
Defenders of Wildlife News, 48(5):578, 1973.

This statement by a member of the U.S. House of Representatives gives positive reasons for the passage of an expanded endangered and threatened species conservation act (of 1973).

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Ditto, Larry R. The caracara. Texas Parks and Wildlife, 32(1):21-22, 1974.

A brief synopsis of the natural history, etc. of the Caracara.

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Pullin, Thomas M. Rare and endangered plant species of Mississippi. Personal communication, University of Mississippi, University, Mississippi, 1974.

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Layne, Jim. Rare and endangered vertebrates of Florida. Florida and National Audubon Society meetings of Rare and Endangered Species Committee. Archibald Research Station, Lake Placid, Florida 1974.

00346

Murry, Robert, Biologist. Wildlife of limited distribution in Louisiana. Personal Communication. Louisiana Wildlife and Fisheries Commission, Division of Game, Baton Rouge, 1974.

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Piehl, Martin. Rare and endangered plants of Louisiana. Personal Communication. Louisiana State University, Botany Department, Baton Rouge, 1974.

00348

Powell, James A. Chief of Game. Rare and Endangered Species of Florida.

Personal Conversation. Florida Department of Natural Resources, Division of Game and Fresh Water Fish, Tallahassee, 1974.

00349

Reiger, George. The river of grass is drying up. National Wildlife 12(1): 55-63, 1974.

For almost 100 years man has reduced the living Everglades to half its original size and the remaining half could disappear in one generation if development is not curtailed.

00350

Schmidly, David J. and Betty A. Melcher. Whales, porpoises and dolphins of Texas. Texas Parks and Wildlife, 32(1):12-15, 1974.

A list of marine mammals recorded off the Texas coast with some discussion of each is included here.

00351

Turcott, W. H. Rare and endangered wildlife of Mississippi. Personal Communication. Mississippi Game and Fish Commission, Jackson, 1974.

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Ward, Dan. Rare and endangered plant species of Florida. Florida and National Audubon Society Meetings of Rare and Endangered Species Committee. University of Florida Agricultural Experiment Station, Gainesville, 1974.

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Weems, Howard. Rare and endangered arthropods of Florida. Florida and National Audubon Society Meetings of Rare and Endangered Species Committee. Florida Department of Agriculture, Division of Arthropods, Gainesville, 1974.

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Yancey, Rickard K. Rare and endangered wildlife of Louisiana. Personal Communication. Louisiana Wildlife and Fisheries Commission New Orleans, 1974.

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The Department of the Interior Mission

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.



The Minerals Management Service Mission

As a bureau of the Department of the Interior, the Minerals Management Service's (MMS) primary responsibilities are to manage the mineral resources located on the Nation's Outer Continental Shelf (OCS), collect revenue from the Federal OCS and onshore Federal and Indian lands, and distribute those revenues.

Moreover, in working to meet its responsibilities, the **Offshore Minerals Management Program** administers the OCS competitive leasing program and oversees the safe and environmentally sound exploration and production of our Nation's offshore natural gas, oil and other mineral resources. The MMS **Minerals Revenue Management** meets its responsibilities by ensuring the efficient, timely and accurate collection and disbursement of revenue from mineral leasing and production due to Indian tribes and allottees, States and the U.S. Treasury.

The MMS strives to fulfill its responsibilities through the general guiding principles of: (1) being responsive to the public's concerns and interests by maintaining a dialogue with all potentially affected parties and (2) carrying out its programs with an emphasis on working to enhance the quality of life for all Americans by lending MMS assistance and expertise to economic development and environmental protection.