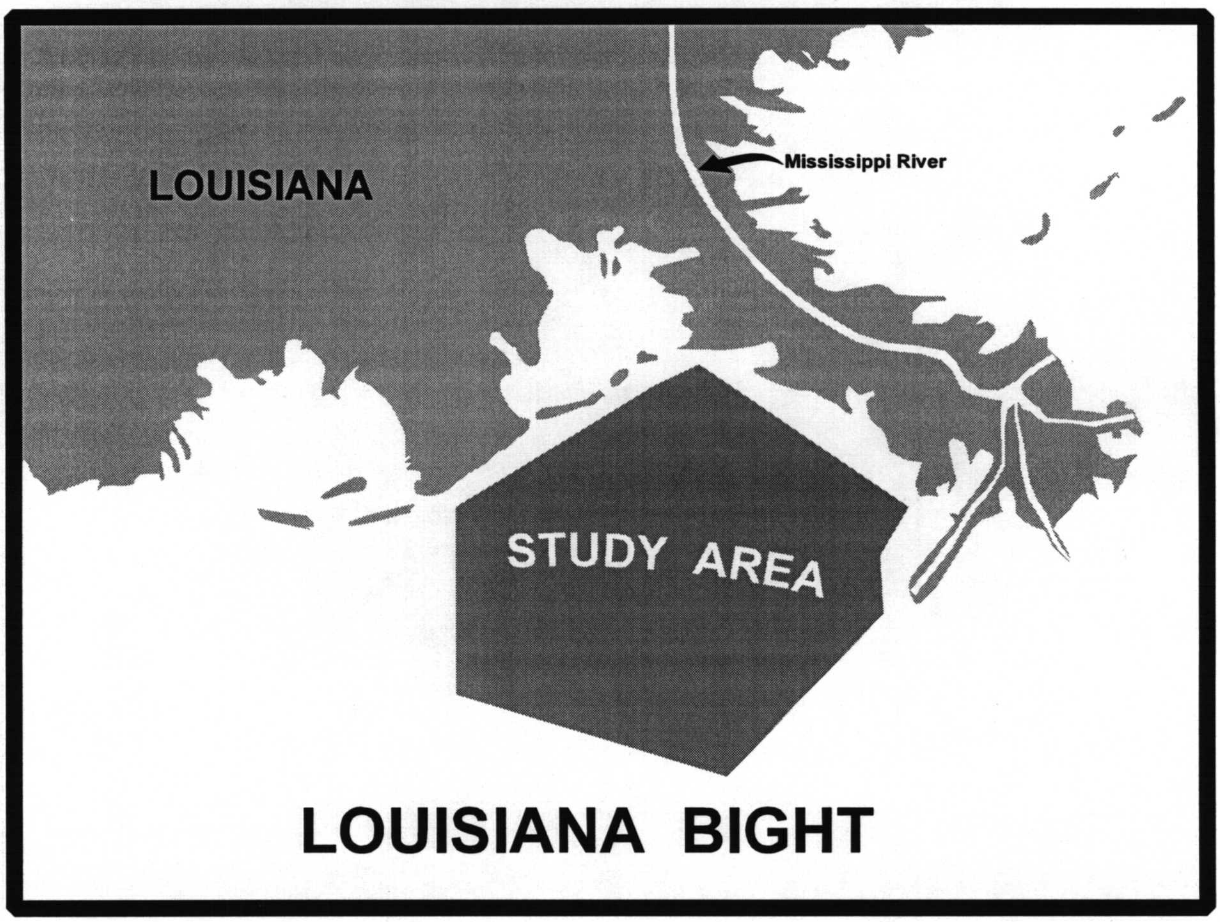
OCS Study
MMS 96-0057

Ecosystem Analysis of the Louisiana Bight and Adjacent Shelf Environments

Volume II: Bibliography of Ecological Studies



MMS
U.S. Department of the Interior
Minerals Management Service
Gulf of Mexico OCS Region

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Ecosystem Analysis of the Louisiana Bight and Adjacent Shelf Environments

Volume II: Bibliography of Ecological Studies

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I would like to especially thank Ms. Claudia Muñoz for her skills in organizing and producing this bibliography. Claudia did an excellent job of keeping the sources in order and directing the graduate students in search of missing citations. This project supported several graduate students that were responsible for gathering the bibliographic materials in this report. They include John Bourgeois, Washington Cárdenas, and Jorge Espinoza. John and Washington both completed Master of Science degrees at USL during this project with significant contributions to understanding nutrient dynamics in continental margin ecosystems. Dr. Silvia Pelegri, a post doctoral associate supported by NECOP funding, also assisted on the project providing summaries of most of the articles on benthic biology.

The Interlibrary loan office at Dupree Library on the campus of University of Southwestern Louisiana was very helpful in assisting with this bibliography. Other library resources for this project include the National Biological Service Southern Science Center in Lafayette, and LUMCON library located at the LUMCON Marine Center in Chauvin, Louisiana. Both of these libraries offered CD-rom search facilities and citation indices.

INTRODUCTION

This second volume of a report to the Mineral Management Service (MMS) is to support efforts toward a focus on understanding ecosystem processes and environmental impacts of the Outer Continental Shelf (OCS) in the Gulf of Mexico. Three of the six recommendations of the National Research Council (NRC) panel for future Environmental Studies Programs (ESP) of MMS refer to the use of ecosystem analysis to evaluate environmental impacts of oil exploration in the OCS.

> 1) The ESP should support more ecological process-oriented studies and studies of ecological relationships designed to predict environmental impacts of OCS oil and gas activities.
>
> 2) Models are important for understanding ecosystem processes and environmental impacts of OCS activities. However, the development of models requires observational data for verification, and use of models does not replace the need for further work in the assessment of environmental impacts of OCS activities.
>
> 3) MMS should sharpen its focus on the specific scientific hypotheses underlying its strategies for the acquisition of information so that the information can be incorporated into regional study plans, and should strive to integrate regional study plans across disciplines and regions.

Information needs as described in this NRC report to develop process-oriented research programs include evaluations of mechanisms that control the distribution of populations and communities such as trophic links between benthic habitats and pelagic communities. In addition, one of the major goals of this process-oriented program should be to improve predictive capability for ecosystem modeling. These ecosystem models should help identify critical data gaps and processes that must be understood to predict accurately the possible environmental impacts of OCS activities.

This bibliography was designed to help evaluate background information on many of the ecological processes of the OCS ecosystem of the Louisiana-Texas coast. There have been several excellent reviews and bibliographies concerning the ecology of the Gulf of Mexico, with particular focus on specific trophic levels or environmental impacts (Geyer 1950; Galtsoff 1954; El-Sayed et al. 1972; Gallaway and Lewbel 1982; Gallaway 1981; Renaud, 1985; Johnson et al. 1989). The more ecological of these reviews are the classic works by Galtsoff (1954) and El Sayed et al. (1972), that include information on the ecological processes of the OCS. In most of these reviews, ecological processes are not given specific categories or indices, but are imbedded in more trophic level categories of the ecosystem. Gallaway (1981) reviewed the characteristic biological assemblages and trophic processes of OCS to develop an ecosystem overview of these ecological processes. While this study focussed specifically on faunal assemblages, it is an example of how information on the ecology of OCS can be organized into the process-oriented approach to understand ecosystem dynamics and impacts. In the bibliography in this volume, ecological processes such as Biogeochemistry, Ecosystem Analysis, and Microbial Ecology are included as specific groups of citations along with more traditional entries such as Nekton, Benthos, and Zooplankton. In the subject index, many specific ecological processes are listed with cross reference to the citations in all the major groups. To help find a specific reference, also included is an Author Index. The conceptual model used as a focus of this project is given in Figure 1. A couple of recent research programs have been developed to focus on these and other processes of the OCS ecosystem in the Louisiana-Texas region; and some of the recent products of these programs are described in this review (e.g. NECOP program, volume 17 of Estuaries, 1994).

Not all of the 571 entries in this bibliography are annotated. Those considered more significant to understanding ecological process rather than systematic or chemical nomenclature are described as to their contribution to understanding ecosystem dynamics. This review is certainly not intended as a bibliographic list of taxonomic entries or reviews, with more emphasis on ecological processes. Physical, chemical, and geologic oceanography of the OCS are considered fundamental processes of any shelf ecosystem and an attempt was made to include those citations that contribute to understanding the Louisiana-Texas OCS. Geologic and physical oceanography are given individual categories, while chemical oceanography is included in the Biogeochemistry section. Impacts such as hypoxia, and oil and gas contamination are listed throughout the individual categories depending on trophic level or ecological process that is affected. The Subject Index can be used to find entries that deal with these interactions (eg. Petroleum Operations or Hypoxia). Thus the Subject Index rather than the broad categories used to organize the citations may be most useful in finding citations concerning a particular ecological process or impact by oil and gas activities. The objective of this bibliography is to present a summary of available references that focus on ecological processes of contiental shelf ecosystems.

This analysis does not include citations that describe the ecology of estuarine areas but only OCS. However, there are a few citations that include information on the coupling of nearshore environments with OCS. There is a wealth of information on the ecosystem processes of Louisiana and Texas estuaries, but only those that may impact shelf processes are included. There are citations from the Mississippi Sound and OCS of Alabama as part of the Central Gulf of Mexico Region. These studies were included since they also represent some of the ecological processes of OCS as influenced by the Mississippi River plume.

To use this bibliography, the reader may want to first peruse the basic categories of references using the Table of Contents. Within each category, the references are listed in alphabetical order and then chronologically. A reference locator number is assigned to each citation under the categories in sequence. Second, location of references that deal with a specific ecological process may be found by using the Subject Index. Each citation in the Subject Index is listed by reference number (reference locator) along with authors last name and date of publication. A full reference and annotation can be found for that citation by finding the entry using the reference number (again by sequence of presentation in the bibliography). Finally, citations made be found by Author Index, where again the reference number is used along with authors last name and date. The use of a general category system along with a more specific Subject Index, along with reference locator number, was decided as the best presentation of the literature with the theme of describing ecological processes of ecosystems. A copy of all citations are also organized on computer disk with Pro-Cite (PC version) and Endnotes (Macintosh version). A list of keywords is given for each citation that allows for more subject indexing than presented in this bibliography. This may also improve locating specific topics of the literature reviewed.

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2. Bandy, O.L. 1956. Ecology of foraminifera in the northeastern Gulf of Mexico. Geological Survey Professional Paper 274-G.

3. Barret, B.B. and M.C. Gillespie. 1973. Primary factors which influence commercial shrimp production in coastal Louisiana. Technical Bulletin 9: 1-28.

   The effects of environmental factors such as water temperature, freshwater discharge, and salinity are related to the commercial shrimp production of Louisiana. A prediction of the May brown shrimp production can be made based on total hours surface water temperatures are below 20°C.

4. Carlgren, O. and J.W. Hedgpeth. 1951. Actiniaria, Zoantharia and Ceriantharia from shallow water in the northwestern Gulf of Mexico. Publications of the Institute of Marine Science 2: 143-172.

   Three orders of anemones from Texas and Louisiana shallow waters are described. Environmental characteristics associated to each order is also discussed, and key to species identification is provided.

5. Chapman, P.M., E.A. Power, R.N. Dexter, and H.B. Andersen. 1991. Evaluation of effects associated with an oil platform, using the sediment quality triad. Environmental Toxicology and Chemistry 10: 407-424.

   The authors studied the effects of oil and gas production platforms, near Matagorda Bay (Gulf of Mexico), on the macrobenthic community. Heavy metals and hydrocarbons were measured at various stations. Stations within 25 m of the platforms showed a lower taxa richness, total abundance and specific taxa abundance compared to more remote stations. However, there was no evidence of depauperate fauna near the platforms, such as might be expected if significant adverse effects were manifest in situ.

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This study reports preliminary results of macrofauna and bacterial biomass related to environmental factors such as depth, distance from the Mississippi River, primary productivity, and organic carbon concentration in the sediments.

12. Defenbaugh, R. E. 1976. A study of the benthic macroinvertebrates of the continental shelf of the northern Gulf of Mexico. Ph.D.Thesis. Texas A&M University. 476 pp.

An extensive study is presented on the benthic macroinvertebrate fauna of the northern Gulf of Mexico. The fauna was described for four subareas that covered from the Mexican coast to the northeastern Gulf. Bathymetric distribution of each species has been indicated as occurring in shallow (0-30 m), mid-depth (30-90 m), and deep (90-200 m) water.

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Several environmental variables were identified that may be influencing the distribution of macroinfauna off the coast of Texas. The sediment characteristics played a major role in structuring the benthos. However, other factors such as water depth, temperature and food sources influenced the infaunal assemblages.

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The fouling community, its planktonic larvae, and its predators were investigated at the Buccaneer Field (Texas), in an effort to determine the structure of the fouling community and its regulating factors.

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This article is a seasonal study of the nektonic and benthic faunas of the Gulf of Mexico off Mississippi, from January 1967 to May 1969. Data of the salinity, temperature, water nutrients, light penetration depth and sediment characteristics are given together with the species composition, abundance and distribution.

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The macrobenthic population of the Calcasieu Estuary, near Lake Charles (Louisiana) was studied. The area was stressed by low dissolved oxygen and concentrations of several metal contaminants. The benthic community (species number and number of individuals) and presence of heavy metals generally were inversely correlated.

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Distribution of three major groups of benthonic foraminifera in the Gulf of Mexico Holocene continental shelf sediments is presented and discussed in relation to broad environmental factors, temperature, salinity and depth.

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This study was directed to determine if the Buccaneer Field (Texas) structures or associated production activities had an effect on the population size, faunal composition, or distribution of the benthic organisms. Some aspect of the platforms effected a macrobenthic abundance decrease, restricted to an area within 50-100 m of the platform. However, it was not clear whether the effect was due to toxic substances, substrate disturbance due to currents eddying around the platform, or some other cause.

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Summary of existing information on the benthic communities of the Gulf of Mexico in the shelf margin zones.

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A collection of marine nematodes from two locations, the Alabama and the Florida coast of the Gulf of Mexico, and collected during the years 1957-1958, were reported in this article. From the 14 species described, 9 were described as new. Changes in the taxonomic classification of some of the species were included.

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Marine nematoda from the Alabama coast of the Gulf of Mexico are reported in this article. A new species was described, and changes in the taxonomic classification of other species were included. A key for the species of the genus Rhynchonema was provided.

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This study describes and discusses the ecological nature and distribution of the macroepibenthic assemblages that occur in the northern Gulf of Mexico, and the significance of the potential impacts on the deep macrobenthic communities of oil and gas exploration and production.

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Benthic macroinvertebrates were surveyed once every two months from June 1973 to March 1974 off Louisiana coast. Mean number of benthic invertebrates decreased as sampled depth increased. Polychaetes numerically dominated the samples. Greatest density appears to be from nearshore stations closest to the Mississippi River.

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This paper summarizes the results of investigations of the ecology of reefs and banks in the northwestern Gulf of Mexico. The authors classified and characterized the banks in function of geologic and biologic criteria. Biotic zonation of the banks was primarily depth related. However substrate characteristics and, climatical and hydrological factors affected the community structure of the various zones.

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The rate of decrease in animal biomass with depth was studied in waters of the Pacific off Peru, the Atlantic off Brazil and the temperate north Atlantic (southern Gulf of Mexico), in order to infer the effects of surface production on the bottom fauna. The rates of decrease in animal density were greatest where surface productivity varied markedly in an offshore direction (Brazil), compared to areas where productivity varied to a lesser degree (Gulf of Mexico, Peru). The data, and comparable literature data from other regions, suggested that while depth exerts the most stringent effects, surface productivity ranked second in controlling benthic biomass. The authors discuss as well the effect of the oxygen minimum zone in the upwelling region off Peru on benthic biomass.

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Benthic community oxygen consumption and nutrient regeneration were measured in cores incubated aboard ship and in situ benthic chambers. This study was done to quantify net carbon and nitrogen remineralization in bottom waters near the Mississippi River plume.

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Benthic fauna communities of the deep Gulf of Mexico were surveyed from anchor dredge samples and by photography. Survey showed that deep-sea benthos of the Gulf is depauperate in number and biomass relative to other basins.

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Research results of the OEI describing the distribution and biomass of invertebrate fauna in benthic and water column environments of the study region.

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63. Yingst, J.Y. and D.C. Rhoads. 1985. The structure of soft-bottom benthic communities in the vicinity of the Texas Flower Garden Banks, Gulf of Mexico. Estuarine, Coastal and Shelf Science 20: 569-592.

Benthic community structures and associated sediments were studied in the vicinity of the Texas Flower Garden Banks from box cores in June 1980. Moderate to low standing stocks of benthos, dominated by meiofaunal-size taxa suggest that the Gulf of Mexico area is relatively oligotrophic for infaunal benthic consumers.

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BIOGEOCHEMISTRY

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The results of this study indicate that degradation and diagenesis of organic matter occurs in steps. The different factors controlling the fate of the organic matter in the aquatic environment are discussed. The authors reported land-derived organic matter at distances over 1000 km from the coast, suggesting that terrigenous organic matter may be more common at great distance from continents than previously assumed.

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Evidence of seasonal variation of phosphate turnover rates and alkaline phosphatase activity is presented for the Mississippi River plume and inner Gulf of Mexico shelf.

72. Anderson, J.B., R.B. Wheeler, and R.R. Schwarzer. 1981. Sedimentology and geochemistry of recent sediments. In B.S. Middleditch. Environmental effects of offshore oil production. The Buccaneer gas and oil field study. Plenum Press, New York, NY.

This investigation reports the effect that exploration/production activities at the Buccaneer Gas and Oil Field (Texas), have in trace metal contamination of the surrounding environment. The authors found that what little potential impact was identified in the zone, is being mitigated by natural processes.

73. Anderson, P.S., G.J. Wasserburg, J. Ingri, and M.C. Stordal. 1994. Strontium, dissolved and particulate loads in fresh and brackish waters: the Baltic Sea and Mississippi Delta. Earth and Planetary Science Letters 124: 195-210.

The isotopic composition of Sr and major elements in dissolved and suspended loads of fresh and brackish waters of the Baltic Sea and Mississippi Delta is presented. The contribution of different parent rocks and minerals to Sr during weathering and the role of Fe-Mn oxyhydroxides in the redistribution of Sr in the water column is also analyzed.

74. Armstrong, D.W. 1974. Some dynamics of carbon, nitrogen and phosphorus in the marine shelf environment of the Mississippi fan. Master Thesis. Texas A&M University. 79 pp.

75. Armstrong, R.S. 1981. Transport and dispersion of potential contaminants. In: B.S. Middleditch. Environmental effects of offshore oil production. The Buccaneer gas and oil field study. Plenum Press, New York, NY.

The author created a model to describe the spread and movement of potential contaminants that enter the water from petroleum operations, at the Buccaneer Gas and Oil Field (Texas). The distribution of three kinds of pollutants: dissolved and suspended materials, floating and surface pollutants and, sinking particulate contaminants is discussed under different hydrologic regimes. The importance of sediment resuspension is evaluated.

76. Baskaran, M. and P.H. Santschi. 1993. The role of particles and colloids in the transport of radionuclides in coastal environments of Texas. Marine Chemistry 43: 95-114.

The role of colloidal material in the scavenging of ^{210}Pb and ^{7}Be was tested in an ultrafiltration experiment using spiked ^{7}Be and ^{210}Pb isotopes. Filtration through 0.5 µm pore size filters was used to separate radionuclides associated with particles.

77. Behrens, E.W. 1981. Total organic carbon and carbon isotopes of sediments. In B.S. Middleditch. Environmental effects of offshore oil production. The Buccaneer gas and oil field study. Plenum Press, New York, NY.

The author assesses the alterations of the sedimentary organic matter at the Buccaneer Gas and Oil Field (Texas), resulted from drilling and producing operations, by using stable carbon isotopes. The most obvious effect of the oil field studied was the erosion of sediments within the field.

78. Behrens, E.W. and et. al. 1979. Sediment texture. In R.W. Flint and C.W. Griffin. Environmental studies, south Texas outer continental shelf, biology and chemistry, chapter 7. 1977 Final Report to the Bureau of Land Management.

The purpose of this study was to provide substrate textural data for benthic organism studies.

79. Benner, R., G. Chin-Leo, W. Gardner, B. Eadie, and J. Cotner. 1991. The fates and effects of riverine and shelf-derived DOM on Mississippi River plume/Gulf shelf processes, pp. 84-94. In Nutrient Enhanced Coastal Ocean Productivity. Publication number TAMU-SG-92-109, Sea Grant Program, Texas A&M University, Galveston, Texas.

This study describes the fate of DOM in the Mississippi River plume/Gulf shelf and its relationship with biological processes such as phytoplankton and bacterioplankton production.

80. Benoit, G., S.D. Oktay-Marshall, A. Cantu II, E.M. Hood, C.H. Coleman, M.O. Corapcioglu, and P.H. Santschi. 1994. Partitioning of Cu, Pb, Ag, Zn, Fe, Al, and Mn between filter-retained particles, colloids, and solution in six Texas estuaries. Marine Chemistry 45: 307-336.

Trace metals concentrations were 5-10 times higher than at the open ocean. Trace metals on suspended particles were derived from resuspended bottom sediments.

81. Betzer, P.R. and M.E. Pilson. 1971. Particulate iron and the nepheloid layer in the western north Atlantic, Caribbean and Gulf of Mexico. Deep-Sea Research 18: 753-761.

Particulate iron concentration was measured in the Gulf of Mexico and Caribbean Sea. Increased concentration of particulate iron near the bottom is related to the presence of a nepheloid layer.

82. Biggs, D.C. 1992. Nutrients, plankton, and productivity in a warm-core ring in the Western Gulf of Mexico. Journal of Geophysical Research 97: 2143.

83. Biglane, K.E. and R.A. Lafleur. 1967. Notes on estuarine pollution with emphasis on the Louisiana Gulf coast, pp. 690-692. In G.H. Lauff, ed. Estuaries. American Association for the Advancement of Science, Washington, D.C.

This short note presents an account on the status of estuarine pollution with emphasis on the Louisiana Gulf coast.

84. Boone, P.A. 1973. Depositional systems of the Alabama, Mississippi, and western Florida coastal zone. Transactions, Gulf Coast Association of Geological Societies 23: 266-277.

Description of the coastal depositional environments of the Alabama, Mississippi, and west Florida from Chandeleur islands to De Soto Canyon. Also, includes descriptions of the estuarine systems along this coast.

85. Bratkovich, A. and S.P. Dinnel. 1991. Lower Mississippi River historical nitrate flux and Mississippi River outflow buoyancy flux, pp. 37-42. In Nutrient Enhanced Coastal Ocean Productivity. Publication number TAMU-SG-92-109, Sea Grant Program, Texas A&M University, Galveston, Texas.

This study reports hydrographic data of the Mississippi River outflow region from two NECOP cruises. Spatial distributions of hydrographic data are compared seasonally and with historical data from an analysis of 35-year time sequences of Lower Mississippi River water discharge, nitrate concentration and nitrate flux.

86. Bratkovich, A., S.P. Dinnel, and D.A. Goolsby. 1994. Variability and prediction of freshwater and nitrate fluxes for the Louisiana-Texas shelf: Mississippi and Atchafalaya River source functions. Estuaries 17: 766-778.

Historical analysis of riverine water discharge, nitrate concentration, and nitrate flux for the Mississippi and Atchafalaya Rivers. Forecasting of discharge and nitrate loadings are described.

87. Brent, C.R., H.P. Williams, W.A. Bergin, J.L. Tyvoll, and T.E. Myers. 1979. Organic carbon, inorganic carbon, and related variables in offshore oil production areas of the northern Gulf of Mexico, pp. 245-264. In C.H. Ward, M.E. Bender, and D.J. Reish. The offshore ecology investigation. William Marsh Rice University, Houston, TX.

Research results of the OEI describing the organic carbon and BOD characteristics of the water column during 1972-73 in the study region.

88. Brooks, J.M., B.B. Bernard, and W.M. Sackett. 1977. Input of low-molecular-weight hydrocarbons from petroleum operations into the Gulf of Mexico, pp. 373-384. In D.A. Wolfe. Fate and effects of petroleum hydrocarbons in marine ecosystems and organisms. Pergamon Press, New York, NY.

Six years of surveying and thousands of analyses indicate that offshore petroleum operations are contaminating the Gulf of Mexico coastal waters with low-molecular-weight hydrocarbons. The chief input from offshore operations in Louisiana waters is the underwater venting of gases.

89. Brooks, J.M. and W.M. Sackett. 1973. Sources, sinks, and concentrations of light hydrocarbons in the Gulf of Mexico. Journal of Geophysical Research 78: 5248-5258.

According to this study, the Gulf of Mexico acts as a sink for atmospheric methane mainly in the Yucatan area, where there is a major upwelling of deep water with low hydrocarbon levels.

90. Brooks, J.M., D.A. Wiesenburg, C.R. Schwab, E.L. Estes, and R.F. Shokes. 1981. Surficial sediments and suspended particulate matter. In B.S. Middleditch. Environmental effects of offshore oil production. The Buccaneer gas and oil field study. Plenum Press, New York, NY.

This paper reports surficial sediment and suspended particulate studies undertaken at the Buccaneer Gas and Oil Field (Texas). The platform did not measurably alter the bulk composition of suspended particulates of biological activity in their immediate vicinity. Surficial sediment data indicated that there was a considerable movement of the fine grain material in the area. Higher productivity and sediment erosion was associated with the platform.

91. Burchfield, H.P., R.J. Wheeler, and W. Subra. 1979. Nutrient concentrations in Timbalier Bay and the Louisiana oil patch, pp. 223-233. In C.H. Ward, M.E. Bender, and D.J. Reish. The offshore ecology investigation. William Marsh Rice University, Houston, TX.

Research report of OEI describing seasonal nutrient concentrations in water column and sediments in the study region (includes values for interstitial waters). Phosphate values are suspect with concentrations above 50 mg/L.

92. Calder, J.A. 1977. Seasonal variations of hydrocarbons in the water column of the Mafla lease area, pp. 432-441. In D.A. Wolfe. Fate and effects of petroleum hydrocarbons in marine ecosystems and organisms. Pergamon Press, New York, NY.

A series of 15 stations in the northeast Gulf of Mexico were occupied during summer, fall and winter 1975-1976. Samples were collected and analyzed by gas chromatography for dissolved hydrocarbons and those associated with suspended particulate material. Total particulate hydrocarbons did not correlate with particulate organic carbon or chlorophyll a.

93. Chan, L.H. and J.S. Hanor. 1982. Dissolved barium in some Louisiana offshore waters: problems in establishing baseline values. Contributions in Marine Science 25: 149-159.

Dissolved barium was analyzed in offshore water samples of Louisiana from 1972 to 1974. Unusually high concentration of barium in coastal waters are related either to offshore drilling platforms or to simple desorption from river-borne suspended material during estuarine mixing.

94. Cogen, W.M. 1940. Heavy mineral zones of Louisiana and Texas Gulf coast sediments. Bulletin of the American Association of Petroleum Geologists 24: 2069-2101.

95. Coleman, J.M. and S.M. Gagliano. 1964. Cyclic sedimentation in the Mississippi River deltaic plain. Transactions, Gulf Coast Association Geological Societies 14: 67-80.

Describes and summarizes previous work on the Mississippi River delta with emphasis on the cycling nature or orderly repetition of depositional events leading to formation of modern sediments in the region.

96. Division of Water Pollution Control, Shellfish Branch, and Department of Sanitation. 1954. Aspects of water pollution in the coastal area of the Gulf of Mexico. Fishery Bulletin No 89. 55: 555-573.

97. Davies, D.K. 1972. Deep sea sediments and their sedimentation, Gulf of Mexico. Bulletin of the American Association of Petroleum Geologists 56: 2212-2239.

This paper describes Quarternary sediments in the Gulf of Mexico, and interprets the dominant sedimentary processes.

98. Davies, D.K. and W.R. Moore. 1970. Dispersal of Mississippi sediment in the Gulf of Mexico. Journal of Sedimentary Petrology 40: 339-353.

Traced the relative influence of basinward and longshore dispersal patterns of sediments to Gulf of Mexico as influenced by Mississippi River.

99. Davis, D.R. 1968. The measurement and evaluation of certain trace metal concentrations in the nearshore environment of the northwest Gulf of Mexico and Galveston Bay. Ph.D. Thesis. Texas A&M University.

100. Dickeson, M.W. and A. Brown. 1848. The sediments of the Mississippi. Proc. Am. Assn. Adv. Sci. 1: 42-55.

101. Dortch, Q., A. Bode, and R.R. Twilley. 1991. Nitrogen uptake and regeneration in surface waters of the Louisiana continental shelf of northwest Gulf of Mexico, pp. 52-56. In Nutrient Enhanced Coastal Ocean Productivity. Publication number TAMU-SG-92-109, Sea Grant Program, Texas A&M University, Galveston, Texas.

Nitrogen uptake and regeneration in surface water of the Louisiana continental shelf influenced by the Mississippi River was studied to assess the effect of regeneration on the impact of new nitrogen river input on productivity.

102. Eadie, B.J., B.A. McKee, M.B. Lansing, J.A. Robbins, S. Metz, and J.H. Trefry. 1994. Records of nutrient-enhanced coastal ocean productivity in sediments from the Louisiana Continental Shelf. Estuaries 17: 754-765.

Shelf sediment cores in vicinity of the Mississippi River plume were collected and analyzed for organic matter, carbon and nitrogen isotopes, and organic tracers, to determine the impact of anthropogenic effects in shelf processes. Increased loading of organic matter to shelf sediments is linked to eutrophication of the shelf.

103. Entzeroth, L.C. 1982. Particulate matter and organic sedimentation on the continental shelf and slope of the northwest Gulf of Mexico. Ph.D. Thesis. University of Texas. Austin, TX.

104. Fairbank, N.G. 1962. Minerals from the eastern Gulf of Mexico. Deep-Sea Research 9: 307-338.

Analysis of minerals from surface sediment samples coarser than 0.074 mm of the eastern Gulf of Mexico is presented. Four sedimentary provinces were characterized by their distinct mineral assemblage: Mississippi River Province, eastern Gulf Coastal Province, Florida Plateau Province, and Central Province.

105. Fanning, K.A., K.L. Carder, and P.R. Betzer. 1982. Sediment resuspension by coastal waters: a potential mechanism for nutrient re-cycling on the ocean's margins. Deep-Sea Research 29: 953-965.

Provides evidence from field observations and laboratory study that resuspension of 1 mm of sediment into the euphotic zone could enhance productivity in shelf waters in northeastern Gulf of Mexico suggesting the importance of recycled nutrients from resuspended sediments.

106. Fanning, K.A. and M.E.Q. Pilson. 1973. The lack of inorganic removal of dissolved silica during river-ocean mixing. Geochimica et Cosmochimica Acta 37: 2405-2415.

Experimental investigation of the inorganic removal of dissolved silicate from estuarine zones at three river mouths: the Orinoco, the Savannah and the Mississippi. Sampling done in 1969 at the principal passes: South Pass, Southwest Pass, and Pass a Loutre.

107. Feely, R.A., W.M. Sackett, and J.E. Harris. 1971. Distribution of particulate aluminum in the Gulf of Mexico. Journal of Geophysical Research 76: 5893-5902.

Horizontal and vertical distribution of particulate aluminum in the Gulf of Mexico were surveyed to understand its source, origin, and transport in this region.

108. Fisk, H.N., E. McFarlan, Jr., C.R. Kolb, and L.J. Wilbert. 1954. Sedimentary framework of the modern Mississippi Delta. Journal of Sedimentary Petrology 24: 76-99.

Presents a more accurate correlation between subsurface sediments and sedimentary facies in the Mississippi River delta and revisions of earlier maps are presented. Excellent review of processes at the river delta and discharge of materials to the shelf based on early 1950 statistics.

109. Flint, R.W. and D. Kamykowski. 1984. Benthic nutrient regeneration in south Texas coastal waters. Estuarine, Coastal and Shelf Science 18: 221-230.

The authors reported that benthic regeneration rates can supply 69% of the nitrogen required to support phytoplankton primary production, in south Texas coastal waters. Nutrient regeneration rates were significantly decreased by the elimination of benthic fauna, which role is discussed, from the sediments.

110. Flint, W.R., G.L. Powell, and R.D. Kalke. 1986. Ecological effects from the balance between new and recycled nitrogen in Texas coastal waters. Estuaries 9: 284-294.

The importance of benthic nitrogen recycling on primary production of Corpus Christy Bay (Texas) was assessed, along a transect from Nueces River upper estuary to coastal waters. The authors suggested that the combined effects of new and recycled nutrient sources buffered coastal productivity against long periods of low nutrient input from fluvial flow.

111. Fox, L.E., F. Lipschultz, L. Kerkhof, and S.C. Wofsy. 1987. A chemical survey of the Mississippi estuary. Estuaries 10: 1-12.

A single survey of nutrients of the Mississippi River estuary was accomplished in 1983 during a period of low river flow. Sampling was restricted to delta channels of Southwest Pass and South Pass. Estimates of nutrient loading rates were calculated.

112. Fox, L.E., S. Sager, and S.C. Wofsy. 1985. Factors controlling the concentrations of soluble phosphorus in the Mississippi estuary. Limnology and Oceanography 30: 826-832.

Laboratory and field experiments of Mississippi River and estuary sediments were performed to study the factors controlling soluble phosphorus. Data indicated a spatial difference in mechanisms responsible for variable phosphate concentrations in this system.

113. Frank, D.J., W. Sackett, R. Hall, and A. Fredericks. 1970. Methane, ethane, and propane concentrations in Gulf of Mexico. Bulletin of the American Association of Petroleum Geologists 54: 1933-1938.

The results suggest that one method of offshore petroleum-seep detection is to survey and map the concentrations of hydrocarbons in near-bottom waters

114. Frazier, D.E. 1967. Recent deltaic deposits of the Mississippi River: their development and chronology. Transactions, Gulf Coast Association of Geological Societies 17: 287-315.

Present study describes the genesis and chronology of recent Mississippi River deltaic deposits and to understand the stratigraphic relationships of the several contiguous and overlapping lobes.

115. Fredericks, A.D. and W.M. Sackett. 1970. Organic carbon in the Gulf of Mexico. Journal of Geophysical Research 75: 2199-2206.

DOC and POC were higher in surface waters except at Yucatan Straits where there was evidence for upwelling. There was a continual loss of DOC to the main stream through Florida Straits and renewal through the Yucatan Strait. Sharp DOC gradient on the USA Gulf coast to the edge of the continental shelf, probably due to mixing of near-shore derived DOC with open gulf surface waters. The resident time of the DOC in the Gulf surface waters was 10 years.

116. Fucik, K.W., K.A. Carr, and B.J. Balcom. 1994. Dispersed oil toxicity tests with biological species indigenous to the Gulf of Mexico. OCS Study MMS 94-0021. U.S. Department of the Interior, Minerals Management Service, Gulf of Mexico OCS Regional Office, New Orleans, La.

117. Gardner, W.S. and D.W. Menzel. 1974. Phenolic aldehydes as indicators of terrestrially derived organic matter in the sea. Geochimica et Cosmochimica Acta 38: 813-822.

Lignin degradation products were measured at the Georgia and Texas coast, as indicators of terrigenous derived organic matter. The data suggested that the greatest deposition of lignin-derived organic materials occurs at the interface of fresh and sea water. Only minimal quantities of the terrestrially derived organic matter are transported great distances seaward.

118. Gearing, P., F.E. Plucker, and P.L. Parker. 1977. Organic carbon stable isotope ratios of continental margin sediments. Marine Chemistry 5: 251-266.

Sediment samples for analysis of stable carbon isotopes were taken in the Gulf of Mexico (from the Mississippi Delta to Veracruz, Mexico), the Beaufort Sea (Alaska) and the Niger Delta (Nigeria). The authors concluded that the bulk of organic carbon in recent sediments from nearshore to outer continental shelves is marine derived.

119. Gearing, P.J. 1975. Stable carbon isotope ratios of continental margin sediments. Ph.D. Thesis. University of Texas. Austin, TX.

120. Gearing, P.J., J.N. Gearing, T.F. Lytle, and J.S. Lytle. 1976. Hydrocarbons in 60 northeast Gulf of Mexico shelf sediments: a preliminary survey. Geochimica et Cosmochimica Acta 40: 1005-1017.

Hydrocarbon composition of recent sediment and benthic algae samples delineated two distinct shelf environments in the northeastern Gulf of Mexico: 1) sediments of Florida with moderate amounts of lipids and low hydrocarbon levels, mainly of marine origin and, 2) sediments close to the Mississippi River with large amounts of lipids and hydrocarbons, mainly coming from the oil industry and terrigenous-derived organic matter.

121. Giammona, C.P. and R.M. Darnell. 1990. Environmental effects of the strategic petroleum reserve program on Louisiana continental shelf communities. American Zoologist 30: 37-43.

The present article is based upon results obtained off the west Hackberry site, and it is focus upon three topics: 1) description of the natural physical and biological setting, 2) impacts of brine disposal in the area, and 3) consideration of impact analysis in coastal waters in general.

122. Griffin, G.M. 1979. Evaluation of the effects of oil production platforms on the turbidity of Louisiana shelf waters, pp. 159-179. In C.H. Ward, M.E. Bender, and D.J. Reish. The offshore ecology investigation. William Marsh Rice University, Houston, TX.

Research report of the OEI describing the turbidity of shelf waters in the vicinity of the study area; and comparison to other shelf regions.

123. Guo, L., C.H. Coleman, Jr., and P.H. Santschi. 1994. The distribution of colloidal and dissolved organic carbon in the Gulf of Mexico. Marine Chemistry 45: 105-119.

This study reports results from determinations of the horizontal and vertical distributions of DOC and colloidal organic carbon in the Gulf of Mexico, as measured using HTCO techniques corrected for blanks. In addition the relationships between DOC and AOU and other hydrographic parameters are discussed.

124. Hanor, J.S. and L.H. Chan. 1977. Non-conservative behavior of barium during mixing of Mississippi River and Gulf of Mexico waters. Earth Planet Letters 37: 242-250.

125. Happ, G., J.G. Gosselink, and J.W. Day, Jr. 1977. The seasonal distribution of organic carbon in a Louisiana estuary. Estuarine and Coastal Marine Science 5: 695-705.

This paper describes: 1) the seasonal distribution of organic carbon in Barataria Bay and nearshore Gulf waters of Louisiana, 2) the relationship among dissolved organic carbon, total organic carbon, and chlorophyll a and 3) the export of organic carbon in the Gulf.

126. Harris, J.E. 1972. Characterization of suspended matter in the Gulf of Mexico. I.Spatial distribution of suspended matter. Deep-Sea Research 19: 719-726.

Survey of suspended particulate matter collected on 0.45 micron filters at stations throughout the Gulf of Mexico during five cruises from 1968 to 1970. Also includes unpublished values from Fredericks surveys of suspended total and organic particulate material in the Gulf of Mexico.

127. Hedges, J.I. and P.L. Parker. 1976. Land-derived organic matter in surface sediments from the Gulf of Mexico. Geochimica et Cosmochimica Acta 40: 1019-1029.

The authors found that lignin distribution was dependent upon freshwater discharge what suggested that rivers are the major transporters of organic matter from land to sea. The results obtained by analyzing lignin were in agreement with the results obtained by using stable isotopes. This suggested that the remains of terrestrial organic matter were thoroughly homogenized during transport.

128. Ho, C.L. and B. Barrett. 1977. Distribution of nutrients in Louisiana's coastal waters influenced by the Mississippi River. Estuarine and Coastal Marine Science 5: 173-195.

Nutrient surveys of the nearshore environment from Quatre Bayou Pass and mouth of Mississippi River were made in May and September 1973. This water year was one of highest on record for last 35 yrs. Total nutrient loading to the shelf ecosystem are estimated by the author.

129. Horowitz, A. and B.J. Presley. 1977. Trace metal concentrations and partitioning in zooplankton, neuston, and benthos from the south Texas outer continental shelf. Archives of Environmental Contamination and Toxicology 5: 241-255.

Marine biota were analyzed for heavy metals along the south Texas outer continental shelf. Patterns of concentration varied according to the area sampled and the biological makeup of the sample.

130. Huang, T.C. and H.G. Goodell. 1970. Sediments and sedimentary processes of eastern Mississippi Cone, Gulf of Mexico. Bulletin of the American Association of Petroleum Geologists 54: 2070-2100.

Discussion of turbidity-current hypothesis as responsible for the transportation of sediments downslope onto submarine fans and across abyssal plains.

131. Jacobs, M.B. and M. Ewing. 1969. Mineral source and transport in waters of the Gulf of Mexico and Caribbean sea. Science 163: 805-809.

Concentration and distribution of different clay minerals in sediments of the Gulf of Mexico are used to describe the relative influence of terrigenous materials from Mississippi River on the greater area of the region.

132. Kamykowski, D.L., C. Van Baalen, and W. Pulich. 1976. Chemical and biological survey component of the environmental assessment of the south Texas outer continental shelf. University of Texas Marine Science Institute. Third quarterly.

133. Kan, D.L. 1970. Isotopic variations of dissolved inorganic carbon in the Gulf of Mexico. Master Thesis. Texas A&M University.

134. Keown, M.P., E. Dardeau, Jr., and E.M. Causey. 1986. Historic trends in the sediment flow regime of the Mississippi River. Water Resources Research 22: 1555-1564.

Sediment sample collection stations established to characterize the suspended-sediment flow regime and bed material gradation of the Mississippi River basin.

135. Kesel, R.H. 1988. The decline in the suspended load of the lower Mississippi River and its influence on adjacent wetlands. Environmental Geology Water Science 11: 271-281.

The purpose of this study was to document the historic change in the magnitude of suspended sediments in the lower Mississippi River regime and this effect on wetland loss in southeast Louisiana.

136. Krumbein, W.C. 1939. Tidal lagoon sediments on the Mississippi Delta, pp. 189. In Recent marine sediments. Am. Assn. Petrol. Geols., Tulsa, Okla.

137. Laseter, J. L. and E. J. Ledet. 1979. Hydrocarbons and free fatty acids associated with the air/water interface, sediments, and beaches of the Timbalier Bay and offshore Louisiana area, pp. 265-286. In C.H. Ward, M.E. Bender, and D.J. Reish. The offshore ecology investigation. William Marsh Rice University, Houston, TX.

Research results of the OEI describing fatty acids and hydrocarbons including techniques to collect and assay samples from the study region.

138. Lopez-Veneroni, D. and L. A. Cifuentes. 1991. Dissolved organic nitrogen distribution and transport in the continental shelf of the northwest Gulf of Mexico,

pp. 57-68. In Nutrient Enhanced Coastal Ocean Productivity. Publication number TAMU-SG-92-109, Sea Grant Program, Texas A&M University, Galveston, Texas.

The distribution of DON in the Mississippi-Atchafalaya Plume region and in two transects perpendicular to the Louisiana and Texas continental shelf are documented for summer 1990. DON were compared to other nitrogen species and showed to be the most important nitrogen form transported from the MAP region in the westward-flowing plume.

139. Lopez-Veneroni, D. and L.A. Cifuentes. 1994. Transport of dissolved organic nitrogen in Mississippi River plume and Texas-Louisiana continental shelf near-surface waters. Estuaries 17: 796-808.

Dissolved organic and inorganic nitrogen were measured during four cruises in the Louisiana Bight to investigate the seasonal patterns of concentrations on the shelf relative to the temporal variations of input from the rivers. Fine scale resolution of DON concentrations in outflow region was also analyzed.

140. Lowman, S.W. 1951. The relationship of the biotic and lithic facies in the recent Gulf coast sedimentation. Journal of Sedimentary Petrology 21: 233-237.

141. Lytle, J.S. and T.F. Lytle. 1977. Sediment hydrocarbons indicators in the northeast Gulf of Mexico, pp. 404-412. In D.A. Wolfe. Fate and effects of petroleum hydrocarbons in marine ecosystems and organisms. Pergamon Press, New York, NY.

Surface sediment samples were collected in 1975-1976 from 45 locations in the Gulf of Mexico along the continental shelf from Pascagoula, Mississippi to Fort Myers, Florida. Hydrocarbons were analyzed in the sediments for the Bureau of Land Management in an effort to survey hydrocarbons in the northeast Gulf and detect man-induced and seasonal effects in Hydrocarbon profiles.

142. Macko, S.A., L. Entzeroth, and P.L. Parker. 1984. Regional differences in nitrogen and carbon isotopes on the continental shelf of the Gulf of Mexico. Natürwissenshaften 71: 374-375.

The isotopic composition of nitrogen and carbon of particulate organic matter, zooplankton, sediment and shrimp, collected along the coast of the Gulf of Mexico, from Yucatan (Mexico) to Florida, was measured. The authors discussed the isotopic composition of the samples in relation to the nutrient source for primary producers in the water column.

143. Manheim, F.T., J.C. Hathaway, and E. Uchupi. 1972. Suspended matter in surface waters of the northern Gulf of Mexico. Limnology and Oceanography 17: 17-27.

Synoptic studies of the suspended matter in the surface waters in the northern Gulf of Mexico to complement work accomplished along the Atlantic continental margin. Information on ranges of total and combustible organic matter in suspended material and major mineral species found in the suspensates.

144. Maurer, L.G. and P.L. Parker. 1972. The distribution of dissolved organic matter in the nearshore waters of the Texas coast. Contributions in Marine Science 16: 109-124.

River waters containing higher DOC concentrations are being diluted with less rich marine waters.

145. Menzies, R.J., J.P. Morgan, C.H. Oppenheimer, S.Z. El-Sayed, and J.M. Sharp. 1979. Design of the offshore ecology investigation, pp. 19-32. In C.H. Ward, M.E. Bender, and D.J. Reish. The offshore ecology investigation. William Marsh Rice University, Houston, TX.

Description of the problem statement, rationale, and experimental design of the OEI.

146. Middleditch, B.S. 1981. Biocides. In B.S. Middleditch. Environmental effects of offshore oil production. The Buccaneer gas and oil field study. Plenum Press, New York, NY.

147. Middleditch, B.S. 1981. Hydrocarbons and sulfur. In B.S. Middleditch. Environmental effects of offshore oil production. The Buccaneer gas and oil field study. Plenum Press, New York, NY.

148. Middleditch, B.S. and B.J. Gallaway. 1981. Prologue. In B.S. Middleditch. Environmental effects of offshore oil production. The Buccaneer gas and oil field study. Plenum Press, New York, NY.

149. Miller-Way, T., G.S. Boland, G.T. Rowe, and R.R. Twilley. 1994. Sediment oxygen consumption and benthic nutrient fluxes on the Louisiana continental shelf: a methodological comparison. Estuaries 17: 809-815.

Sediment oxygen demand and nutrient fluxes were compared between in situ chamber measurements and shipboard chemostatic chambers. Rates of benthic processes were mostly similar between the two methods; except when ambient conditions were artificially altered in the shipboard measurements.

150. Montalvo, J.G., Jr. and D.V. Brady. 1979. Concentrations of Hg, Pb, Zn, Cd, and As in Timbalier Bay and the Louisiana oil patch, pp. 235-243. In C.H. Ward, M.E. Bender, and D.J. Reish. The offshore ecology investigation. William Marsh Rice University, Houston, TX.

Research report of OEI describing concentrations of trace metals in the water column of the study region.

151. Morrison, J.M., W.J. Merrell, R.M. Key, and T.C. Key. 1983. Property distributions and deep chemical measurements within the western Gulf of Mexico. Journal of Geophysical Research 88: 2601-2608.

152. Morrison, J.M. and W.D. Nowlin, Jr. 1976. Repeated nutrient, oxygen, and density sections through the Loop Current. Journal of Marine Research 35: 105-128.

Based on observations made in May 1972, the nutrient and dissolved oxygen concentrations in the offshore waters of the eastern Gulf of Mexico are described and related to the Loop Current and anticyclonic rings. Different water masses are identified and estimates of water transport are presented for the currents.

153. Nelsen, T.A., P. Blackwelder, T. Hood, B. McKee, N. Romer, C. Alvarez-Zarikian, and S. Metz. 1994. Time-based correlation of biogenic, lithogenic and inputs in the Gulf of Mexico NECOP study area. Estuaries 17: 873-885.

Three sediment cores along cross shelf transect within Mississippi River plume region were examined for stratigraphy, radioisotope based geochronology, organic and inorganic chemical analyses, detailed characterization of the sediment's coarse-grained fraction, and foraminifera biostratigraphy. This information was used to test the linkage of nutrient enrichment to enhanced hypoxia and shift in community composition of shelf food webs.

154. Nelsen, T.A. and J.H. Trefry. 1986. Pollutant-particle relationships in the marine environment: a study of particulates and their fate in a major river-delta-shelf system. Rapports et Proces-Verbaux des Reunions, Consiel International pour l'Exploration de la Mer 186: 115-127.

The interactions and fate of particles in the Mississippi river-delta-shelf system is presented. Interaction of biogenic and lithogenic particles with heavy metals and burial is also analyzed.

155. Newman, J.W., P.L. Parker, and E.W. Behrens. 1973. Organic carbon isotope ratios in quaternary cores from the Gulf of Mexico. Geochimica et Cosmochimica Acta 37: 225-238.

This study examines the ∂C^{13} and % organic carbon in cores from all of the deep water provinces of the Gulf of Mexico.

156. Oppenheimer, C.H., R. Miget, and H. Kator. 1979. Ecological relationships between marine microorganisms and hydrocarbons in the OEI study area, Louisiana, pp. 287-324. In C.H. Ward, M.E. Bender, and D.J. Reish. The offshore ecology investigation. William Marsh Rice University, Houston, TX.

Research results of the OEI describing the response of indigenous microorganisms to various added hydrocarbon molecules; also studies of metabolism (BOD) of the water column in the study region.

157. Parker, P.L., E.W. Beherns, J.A. Calder, and D. Shultz. 1972. Stable carbon isotope ratio variations in the organic carbon from Gulf of Mexico sediments. Contributions in Marine Science 16: 139-147.

The author describes the relationship between the stable isotopes results and the geology of eastern Gulf of Mexico deep sediments.

158. Paskausky, D.F. and W.D. Nowlin. 1968. Measured and performed phosphate in the Gulf of Mexico region. Texas A&M Res. Foundation, Tech. Rept. Ref. 68-12T.

159. Pequegnat, L.H. 1979. Pelagic tar concentrations in the Gulf of Mexico over the south Texas continental shelf. Contributions in Marine Science 22: 31-39.

The present study reports upon dry weight of floating tar from 189 neuston samples collected in the Gulf of Mexico over the South Texas continental shelf from 12 station locations sampled monthly during the two-year period from February 1976 through December 1977.

160. Phoel, W.C., G.T. Rowe, B. May, and S. Fromm. 1993. Sediment characteristic of the continental shelf in the northern Gulf of Mexico. Revista de Biologia Tropical 41: 49-52.

Paper reports sediment grain size characteristics and per cent carbon, and makes preliminary associations between these variables and carbon utilization by the benthos based on sediment oxygen consumption, and macrofauna biomass.

161. Pratt, W.E. 1947. Petroleum on continental shelves. Bulletin of the American Association of Petroleum Geologists 31: 657-672.

162. Presley, B.J., J.H. Trefry, and R.F. Shokes. 1980. Heavy metal inputs to Mississippi Delta sediments. Water, Air, and Soil Pollution 13: 481-494.

Heavy metal concentrations from suspended particles, filtered water, and sediments from the Mississippi River and its marine delta. Particle-metal interaction and water chemistry are considered to explain the fate of heavy metal concentrations.

163. Rabalais, N.N. 1992. An updated summary of status and trends in indicators of nutrient enrichment in the Gulf of Mexico. U.S. Environmental Protection Agency Office of Water. Gulf of Mexico Program. Publication No. EPA/800-R-92-004.

This report summarizes the status and trends of Gulf of Mexico coastal environments with respect to the effects of nutrient enrichment.

164. Rabalais, N.N., R.E. Turner, and Q. Dortch. 1991. Louisiana continental shelf sediments: indicators of riverine influence, pp. 131-135. In Nutrient Enhanced Coastal Ocean Productivity. Publication number TAMU-SG-92-109, Sea Grant Program, Texas A&M University, Galveston, Texas.

This study reports a long term study of Louisiana continental shelf sediment characteristic of chlorophyll a, phaeopigments, biogenic silica, phytoplankton, and fecal pellets. Seasonal and spatial distribution are discussed.

165. Rogers, M.A. and C.B. Koons. 1969. Organic carbon ∂C13 values from quaternary marine sequences in the Gulf of Mexico: a reflection of paleotemperature changes. Trans. Gulf Coast Assoc. Geol. Soc. 19: 529-534.

166. Rose, C.D. and T.J. Ward. 1981. Acute toxicity and aquatic hazard associated with discharged formation water. In B.S. Middleditch. Environmental effects of offshore oil production. The Buccaneer gas and oil field study. Plenum Press, New York, NY.

167. Russell, R. 1937. Mineral composition of Mississippi River bed materials. Geological Society of America Bulletin 48: 1307.

168. Sackett, W.M. 1964. The depositional history and isotopic organic carbon composition of marine sediments. Marine Geology 2: 173-185.
According to this paper, the isotopic compositions of the total organic carbon in Recent marine sediments have a considerable range. This variation is primarily due to the relative amounts of terrestrial and marine derived organic material in a given sediment. Evidence is presented indicating that the ^{13}C-content of the total organic carbon does not change after deposition and that the same variations as observed in the Recent should also be observed in sediments back through Upper Paleozoic age.

169. Sackett, W.M. and G. Cook. 1969. Uranium geochemistry of the Gulf of Mexico. Transactions, Gulf Coast Association of Geological Societies 19: 233-238.

This study present a preliminary attempt to completely monitor uranium geochemistry in the Gulf of Mexico.

170. Sackett, W.M. and R.R. Thompson. 1963. Isotopic organic carbon composition of recent continental derived clastic sediments of eastern Gulf coast, Gulf of Mexico. Bulletin of the American Association of Petroleum Geologists 47: 525-528.

171. Sahl, L.E. 1984. Suspended sediment on the upper Texas continental shelf. Ph.D. Thesis. Texas A&M University. 92 pp.

This study has established that two grain size modes are present in the substrate of the upper Texas shelf, a fine to very fine sand mode and a clay mode. Currents on the shelf for most of the year are oriented in such way as to cause offshore transport of sediment in the bottom nepheloid layer.

172. Sahl, L.E., W.J. Merrel, and D.C. Biggs. 1993. The influence of advection on the spatial variability of nutrient concentration on the Texas-Louisiana continental shelf. Continental Shelf Research 13: 233-251.

Chemical surveys of three cross shelf transects at Atchafalaya Bay, Galveston, and Port Aransas were done from 8 to 12 March 1989. Includes hydrographic data for each transect and discusses three sources of nutrients on the Texas-Louisiana shelf.

173. Scruton, P.C. 1956. Oceanography of Mississippi Delta sedimentary environments. Bulletin of the American Association of Petroleum Geologists 40: 2864-2952.

Excellent description of the general oceanography in the region of the Mississippi River plume to explain the sedimentary processes in this continental margin.

Objective is to understand older sedimentary rocks through study of their now-forming modern counterparts.

174. Sharp, J.M. 1979. The cumulative effects of petroleum drilling and production in coastal and near-shore areas, pp. 3-15. In C.H. Ward, M.E. Bender, and D.J. Reish. The offshore ecology investigation. William Marsh Rice University, Houston, TX.

An overview of the OEI volume, which was written to present the final reports of the 23 principal investigators, the consensus opinion by the OEI Council, and the conclusions drawn from the independent appraisal of the data made in 1978-79.

175. Shigley, C.M. 1954. The recovery of minerals from sea water. Fishery Bulletin No 89. 55: 153-159.

The purpose of this review is to trace the history of the extraction of minerals from the seas, to describe recent large commercial projects for recovering elemental bromine and magnesium from sea water, and to briefly discuss a few of the economic factors in such sea water extraction operations.

176. Shiller, A.M. and E.A. Boyle. 1987. Variability of dissolved trace metals in the Mississippi River. Geochimica et Cosmochimica Acta 51: 3273-3277.

Dissolved trace metals were analyzed for the Mississippi River at different stages of river flow during a two-year interval. Metal variability and similar concentrations to less disturbed systems were evident in this study.

177. Shinn, E.A. 1975. Effects of oil field brine, drilling mud, cuttings and oil platforms on the offshore environment, pp. 243-255. In Estuarine Research Federation. Marine environmental implications of offshore oil and gas development in the Baltimore Canyon region of the Mid-Atlantic coast.

This paper discusses briefly some known environmental effects of oil field brine, drilling mud, and cuttings discharge on marine organisms in the Gulf of Mexico and infers similar effects for the western Atlantic continental shelf. Also discussed are the benefits of artificial reefs posed by the presence of offshore oil platforms in areas with few natural hard substrates.

178. Shokes, R.F. 1976. Rate-dependent distributions of lead-210 and interstitial sulfate in sediments of the Mississippi River delta. Ph.D. Thesis. Texas A&M University. 123 pp.

Vertical distributions of excess Pb-210 and interstitial sulfate were measured in a suite of sediment cores from the Mississippi River delta. Although geochemically independent, both species have kinetically-controlled distributions which can be related to the high and extremely variable sedimentation rates in this area.

179. Simons, L.H., P.H. Monaghan, and M.S. Taggart, Jr. 1953. Aluminum and iron in Atlantic and Gulf of Mexico surface waters. Analytical Chemistry 25: 989-990.

Seawater samples collected during April 1952 from Baytown, Texas, to Halifax, Nova Scotia were analyzed from soluble aluminum and iron. Two chemical procedures were employed to analyzed these two metals that claimed to be more sensitive and suitable for seawater samples.

180. Slowery, J.F. and D.W. Hood. 1971. Copper, manganese and zinc concentrations in Gulf of Mexico waters. Geochimica et Cosmochimica Acta 35: 121-138.

Neutron activation analysis techniques were used to measure Cu, Mn, and Zn concentrations in water samples collected from 1958 to 1965 in the Gulf of Mexico. Surface water samples showed to be higher and more variable in all three metals than deeper waters. Mn coastal values were higher than open sea. Cu and Zn values were often higher in open sea than coastal regions.

181. Stetson, H.C. and P.D. Trask. 1953. The sedimentation of the western Gulf of Mexico. Papers in Physical Oceanography and Meteorology 12: 1-46.

182. Thayer, G.W., J.J. Govoni, and D.W. Connally. 1983. Stable carbon isotope ratios of the planktonic food web in the northern Gulf of Mexico. Bulletin of Marine Science 33: 247-256.

The present study indicates that in the northern Gulf of Mexico the carbon of the highest trophic level examined, larval fishes, is derived from marine phytoplankton either directly or through zooplankton; not from terrigenous carbon sources.

183. Tieh, T.T. and T.E. Pyle. 1972. Distribution of elements in Gulf of Mexico sediments, pp. 129-152. In R. Rezak and V.J. Henry. Contributions on the geological and geophysical oceanography of the Gulf of Mexico. Gulf Publishing Co., Houston, TX.

An extensive reconnaissance of eleven trace elements analyzed by X-ray fluorescence spectrometry in Gulf of Mexico sediments is presented. Sediment samples ranged from Miocence to Holocene and the Miocence-Pliocene boundary is suggested to be in the vicinity of 345 cm.

184. Trask, P.D. 1953. The sediments of the western Gulf of Mexico, Part II. Chemical studies of sediments in the western Gulf of Mexico. Papers in Physical Oceanography and Meteorology 12: 47-120.

185. Trask, P.D., F.B. Phleger, Jr., and H.C. Stetson. 1947. Recent changes in sedimentation in the Gulf of Mexico. Science 106: 460-461.

Results of cruises aboard the Atlantis during months of February and March in 1947 in the northwest part of the Gulf of Mexico for the purpose of investigating the environmental conditions of deposition of sediments.

186. Trefry, J.H., R.P. Trocine, and D.B. Meyer. 1981. Tracing the fate of petroleum drilling fluids in the northwest Gulf of Mexico. Oceans 81 2: 732-736.

187. Trefry, J.H., S. Metz, T.A. Nelsen, R.P. Trocine, and B.J. Eadie. 1994. Transport of particulate organic carbon by the Mississippi River and its fate in the Gulf of Mexico. Estuaries 17: 839-849.

188. Trefry, J.H., S. Metz, and R.P. Trocine. 1985. A decline in lead transport by the Mississippi River. Science 230: 439-441.

Input of pollutant lead to the Gulf of Mexico from the Mississippi River have declined by about 40 percent within the past decade, possibly associated to lead reduction in gasoline consumption. More than 90 percent of riverborne lead is associated to suspended sediments and is deposited within 50 km of the river mouth.

189. Trefry, J.H., T.A. Nelsen, R.P. Trocine, S. Metz, and T.W. Vetter. 1986. Trace metal fluxes through the Mississippi River delta system. Rapports et Proces-Verbaux des Reunions/ Conseil Permanent International pour l' Exploration de la Mer 186: 277-288.

The transport mechanisms of trace metals as bound to particles were measured in the Mississippi River delta (70-90% Cd, Cu, Ni and >95% Cr, Fe, Mn, Pb were found bound to particles).

190. Trefry, J.H. and B.J. Presley. 1976. Heavy metals in sediments from San Antonio Bay and the northwest Gulf of Mexico. Environmental Geology 1: 283-294.

Heavy metals from acid leached sediment samples were analyzed from the Mississippi Delta to the San Antonio Bay region. Metal concentrations were normalized to Fe in order to assess metal pollution in the region.

191. Trefry, J.H. and B.J. Presley. 1976. Heavy metal transport from the Mississippi River to the Gulf of Mexico, pp. 39-76. In H.L. Windom and R.A. Duce. Marine pollutant transfer. Lexington Books.

Estimates of total flux of particulate and dissolved heavy metals from waters of the Mississippi River and Gulf of Mexico are presented. These estimates assess the anthropogenic metal input to this system, especially for Pb and Cd.

192. Trefry, J.H. and R.J. Presley. 1982. Manganese fluxes from Mississippi Delta sediments. Geochimica et Cosmochimica Acta 46: 1715-1726.

The reducing conditions created by the massive sediment deposition at the Mississippi River delta, were responsible for bringing manganese from the top millimeters of Delta sediment into dissolution. Manganese was then actively transported away from the Delta area, thereby providing excess of manganese to the deep Gulf of Mexico at the expenses of the Delta sediments.

193. Trefry, J.H. and R.F. Shokes. 1981. History of heavy-metal inputs to Mississippi Delta sediments, pp. 193-208. In R.A. Geyer. Marine environmental pollution 2. Elsevier Scientific Publishing Co.

Sediment samples were collected at the Mississippi Delta in order to assess heavy metals concentration and accumulation. Sediment Pb and Cd pollution was observed throughout the Mississippi Delta. No clear evidence of Co, Cr, Cu, Fe, Mn or Ni pollution was found, possibly a function of the high river particulate flux which can dilute away large anomalous inputs.

194. Trefry, J.H., R.P. Trocine, S. Metz, T.A. Nelson, and N. Hawley. 1991. Suspended particulate matter on the Louisiana shelf: concentrations, composition, and transport pathways, pp.126-130. In Nutrient Enhanced Coastal Ocean Productivity. Publication number TAMU-SG-92-109, Sea Grant Program, Texas A&M University, Galveston, Texas.

This study describes the distribution, transport, and chemical composition of suspended particulate matter on the Louisiana shelf.

195. Turner, E.R. and N.N. Rabalais. 1991. Changes in Mississippi River water quality this century. BioScience 41: 140-147.

Documents changes in the water quality of the Mississippi River using historical data bases for nutrients at different sampling stations along the river. Relates changes in nutrient concentration to land use change in the watershed; and implications to ecology of continental shelf ecosystem.

196. Turner, H.J. 1903. Examination of mud from Gulf of Mexico. Bull. U.S. Geol. Survey 212: 107-112.

197. Turner, R.E. and N.N. Rabalais. 1994. Coastal eutrophication near the Mississippi River delta. Nature 368: 619-621.

198. Van Andel, T.H. and D.M. Poole. 1960. Sources of recent sediments in the northern Gulf of Mexico. Journal of Sedimentary Petrology 30: 91-122.

Summary of the sources of sediments (mainly sands and the sand fractions) to the northern Gulf of Mexico (Mississippi River and Rio Grand) and areas of deposition along with mixing of this material with detritus from other sources. Also includes analysis of sources of sediments to bays of Texas coast.

199. Walker, S.H. 1976. An environmental survey of fatty acids in the northeastern Gulf of Mexico. Master Thesis. Louisiana State University and Agricultural and Mechanical College. Baton Rouge, La. 140 pp.

Unsaturated fatty acids were significant components in all environments with greatest concentration based on total fatty acid composition being off the Florida coast. This was a major difference encountered in this study as opposed to other studies in which unsaturated acids were reported as being depleted in sediments.

200. Walsh, J.J., D.A. Dieterle, M.B. Meyers, and F.E. Müller-Karger. 1989. Nitrogen exchange at the continental margin: a numerical study of the Gulf of Mexico. Progress in Oceanography 23: 245-301.

Models of the physical, chemical, and biological characteristics of the Gulf of Mexico are described and simulation results presented to emphasize the ecological importance of nitrogen exchange at the continental margins in the productivity of the Gulf of Mexico. Contour maps and figures of compiled nutrient and carbon numbers for the Gulf of Mexico.

201. Walsh, J.J., G.T. Rowe, R.L. Iverson, and C.P. McRoy. 1981. Biological export of shelf carbon is a sink of the global CO_2 cycle. Nature 291: 196-201.

Based in measurements of carbon metabolism, production and exchange along food webs, this study suggests that large fractions of the organic matter produced on continental shelves must be exported to continental slopes. The annual loss of organic matter from continental shelf ecosystems is far greater than in the open ocean.

The analyses suggest that up to half of the estimated 1.50 x 10^9 tons C yr^{-1} of the slope carbon sink could result from increased eutrophication since the industrial revolution.

202. Williams, R.H. 1954. Distribution of chemical constituents of sea water in the Gulf of Mexico. Fishery Bulletin No 89. 55: 143-151.

Review of existing data on the chemical characteristics of waters in the Gulf of Mexico.

203. Wright, L.D. and J.M. Coleman. 1974. Mississippi River mouth processes: effluent dynamics and morphologic development. Journal of Geology 82: 751-778.

Results of repeated observations from the mouths of the Mississippi River from 1968 to 1973 indicating the relative contributions of outflow inertia, turbulence, bottom friction, buoyancy, and marine forces to river outflow dynamics.

BIRDS AND MAMMALS

204. Aumann, G.D. 1981. The effect of structures on migratory and local marine birds. In B.S. Middleditch. Environmental effects of offshore oil production. The Buccaneer gas and oil field study. Plenum Press, New York, NY.

This study was undertaken to determine the effects of the Buccaneer Gas and Oil Field (Texas), if any, on migratory birds passing through in the Spring and Fall, and to determine the effects of the platform structures on feeding habits of resident marine birds. The collection and analysis of data did not warrant definitive conclusions concerning the overall effects of the oil structures on avian species. The effect of the structures ranged from insignificant for some species to beneficial for others.

205. Fritts, T.H. and R.P. Reynolds. 1981. Pilot study of the marine mammals, birds and turtles in OCS areas of the Gulf of Mexico. The Bureau of Land Management Fish and Wildlife Service. FWS/OBS-81/36.

This study shows the distribution, relative abundance, and ecology of 13 mammals, 35 bird, and 5 turtle taxa, including several endangered and threatened species in the Gulf of Mexico.

206. Gunter, G. 1954. Mammals of the Gulf of Mexico. Fishery Bulletin No 89. 55: 543-551.

Summary of existing information on the mammals of the Gulf of Mexico.

207. Lowery, G.H., Jr. and R.J. Newman. 1954. The birds of the Gulf of Mexico. Fishery Bulletin No 89. 55: 517-540.

Summary of existing information on the birds in the Gulf of Mexico.

208. Smith, F.G.W. 1954. Taxonomy and distribution of sea turtles. Fishery Bulletin No 89. 55: 513-515.

209. Price, W.A. 1954. Shorelines and coasts of the Gulf of Mexico. Fishery Bulletin No 89. 55: 39-65.

Summary of structural and regional geo-oceanographic approach to shoreline description and classification for the Gulf of Mexico including the influence of oceanographic processes on these formations.

ECOSYSTEM ANALYSIS

210. Bedinger, C.A., Jr. 1979. Ecological investigations of petroleum production platforms in the central Gulf of Mexico - Preliminary findings. In 11th Annual Offshore Technology Conference Proceedings OT 3605. Houston, TX.

Preliminary review of project to assess the long term cumulative effects of production platform operation on the outer continental shelf (OCS) environment, and further define their artificial reef effect. Collections and analyses of 24 stations (platforms) include basic hydrography; hydrocarbons in water, sediments, and biota; trace metals from similar samples; sediment physical characterization; benthic microbiology; benthic biota; histopathology in fish and invertebrates; and platform associated fouling organisms and fish.

211. Bender, M.E., D.J. Reish, and C.H. Ward. 1979. Re-examination of the offshore ecology investigation, pp. 35-116. In C.H. Ward, M.E. Bender, and D.J. Reish. The offshore ecology investigation. William Marsh Rice University, Houston, TX.

Review of the ecological information collected during the OEI and the conclusions of the study. Offers criticism of the experimental design and ecological conclusions of the OEI.

212. Berryhill, H.L., Jr. 1977. The sea floor. Environmental studies, south Texas outer continental shelf, 1975: an atlas and integrated summary, pp. 226-267. A Report to The U.S. Bureau of Land Management by the Geological Survey.

213. Berryhill, H.L., Jr. and et. al. 1977. Environmental studies, south Texas outer continental shelf, 1975: an atlas and integrated summary. A Final Report to the U.S. Bureau of Land Management by the Geological Survey. 303 pp.

This is an integrated report on the biogeochemical and climatological characteristics of the South Texas Outer Continental Shelf Environmental Studies for the year 1975.

214. Bierman, V.J., Jr., S.C. Hinz, W.J. Wiseman, Jr., N.N. Rabalais, and R.E. Turner. 1991. Mass balance modeling of water quality constituents in the Mississippi River plume/inner Gulf shelf region, pp. 27-36. In Nutrient Enhanced Coastal Ocean Productivity. Publication number TAMU-SG-92-109, Sea Grant Program, Texas A&M University, Galveston, Texas.

This paper describes preliminary calibration of a mass balance water quality model for the Mississippi River plume/inner Gulf shelf region. State variables include salinity, phytoplankton, phosphorus, nitrogen, dissolved oxygen, and carbonaceous biological oxygen demand.

215. Boesch, D.F., J.N. Butler, D.A. Cacchione, J.R. Geraci, J.M. Neff, J.P. Ray, and J.M. Teal. 1987. An assessment of the long-term environmental effects of U.S. offshore oil and gas development activities: future research needs, pp. 1-53. In D.F. Boesch and N.N. Rabalais. Long-term environmental effects of offshore oil and gas development. Elsevier Applied Science, London and New York.

A chapter that presents a critical evaluation on the large body of information assembled and reviewed in succeeding chapters of a book edited by Boesch and Rabalais on the long-term effects of oil and gas activities on continental shelf ecosystems.

216. Boesch, D.F. and N.N. Rabalais. 1987. Long-term environmental effects of offshore oil and gas development. Elsevier Applied Science, London and New York.

This book presents a large body of information describing the long-term effects of oil and gas activities on continental shelf ecosystems.

217. Bright, T.J., R. Rezak, A.H. Bouma, W.R. Bryant, and W.E. Pequegnat. 1976. A biological and geological reconnaissance of selected topographical features on the Texas continental shelf. Texas A&M Research Foundation and Texas A&M Department of Oceanography. A Final Report to the U.S. Dept. of the Interior, Bureau of Land Management, Outer Continental Shelf Office, New Orleans, La. 377 pp.

The goal of this study was to provide a biological and geological baseline information required to facilitate judgments as to the extent and nature of restrictive regulations on drilling operations near coral reef and fishing banks which might be required to insure their protection.

218. Carney, R.S. 1987. A review of study designs for the detection of long-term environmental effects of offshore petroleum activities, pp. 651-696. In D.F. Boesch and N.N. Rabalais. Long-term environmental effects of offshore oil and gas development. Elsevier Applied Science, London and New York.

Critical review of five long-term effect studies of the outer continental shelf focussing on ability of experimental designs to evaluate impacts of oil and gas activities on the ecology of benthic fauna. The review is divided into three major parts (a review, discussion of design problems and conclusions) on five studies revealing major design strengths and weaknesses. Recommendations and considerations for establishing studies of long-term effects on benthic communities.

219. Conner, W.H., J.W. Day, Jr., R.H. Baumann, and J.M. Randall. 1989. Influence of hurricanes on coastal ecosystems along the northern Gulf of Mexico. Wetlands Ecology and Management 1: 45-56.

As reviewed by this paper, the immediate impact of hurricanes may be to reduce populations of some species but these populations generally recover rapidly. Overall, productivity in natural systems seems to be increased by periodic hurricanes.

220. Dagg, M., C. Grimes, S. Lohrenz, B. McKee, R. Twilley, and W. Wiseman, Jr. 1991. Continental shelf food chains of the northern Gulf of Mexico, pp. 67-106. In

K. Sherman, L.M. Alexander, and B.D. Gold. Food chains, yields, models, and management of large marine ecosystems. Westview Press.

Purpose of the paper is to present preliminary results of several studies to understand the ecological processes that support the high biological productivity of the northern Gulf of Mexico. Values for various ecological processes are given for region of the Mississippi River plume region of the Louisiana Bight.

221. Dagg, M.J. and P.B. Ortner. 1991. Mesozooplankton grazing and the fate of carbon in the northern Gulf of Mexico, pp. 117-121. In Nutrient Enhanced Coastal Ocean Productivity. Publication number TAMU-SG-92-109, Sea Grant Program, Texas A&M University, Galveston, Texas.

This paper reports on the effect mesozooplankton grazing on phytoplankton communities on the continental shelf west of the Mississippi River delta, and its effect on the fate of primary production stimulated by river nutrient inputs.

222. Darnell, R.M. 1992. Ecological history, catastrophism, and human impact on the Mississippi/Alabama continental shelf and associated waters: a review. Gulf Research Reports 8: 375-386.

Summary of the ecological characteristics of coastal ecosystems including estuaries and continental shelf of the Mississippi/Alabama region. Provides a focus on the larger system by reviewing pertinent literature concerning ecological history, natural catastrophic events, and human impacts. Includes analysis of Mississippi Sound, east of the river delta.

223. Darnell, R.M. and T.M. Soniat. The estuary/continental shelf as an interactive system. 487-525.

Conceptual model of the estuary/pass/continental shelf ecosystem with information from several shelf studies, including the Mississippi Delta, to characterize these ecosystems. Describes large river-shelf systems as unique, using the Mississippi as an example.

224. Defenbaugh, R.E. 1990. The Gulf of Mexico: a management perspective. American Zoologist 30: 7-13.

This paper provides the general management perspective and discusses the application of this perspective within the several regions of the Gulf of Mexico that are of particular interest to the Mineral Management Services. Summarizes that there has been little deterioration of the marine environment by the oil and gas activities; and that biota has been enhanced due to physical substrate afforded by the platforms.

225. Dortch, Q., D. Milsted, N.N. Rabalais, S.E. Lohrenz, D.G. Redalje, M.J. Dagg, R.E. Turner, and T.E. Whitledge. 1991. Role of silicate availability in phytoplankton species composition and the fate of carbon, pp. 76-83. In Nutrient Enhanced Coastal Ocean Productivity. Publication number TAMU-SG-92-109, Sea Grant Program, Texas A&M University, Galveston, Texas.

An ecological analysis is presented on the effect of nitrogen and silicone on phytoplankton size and species composition and its influence on the severity and extent of hypoxia on the Louisiana continental shelf.

226. Drucker, B. and et. al. 1990. The offshore environmental studies program (1973-1989). OCS Report MMS 91-0028. U.S. Dept. of the Interior, Minerals Management Service, Environmental Policy and Program Division.

This report presents an overview of 15 years of the Environmental Studies Program conducted initially by the Bureau of Land Management and now as part of the Minerals Management Service.

227. Eadie, B.J., J.A. Robbins, P. Blackwelder, S. Metz, J.H. Trefry, B. McKee, and T.A. Nelson. 1991. A retrospective analysis of nutrient enhanced coastal ocean productivity in sediments, pp. 7-14. In Nutrient Enhanced Coastal Ocean Productivity. Publication number TAMU-SG-92-109, Sea Grant Program, Texas A&M University, Galveston, Texas.

This study reports analysis of sediment cores representing approximately 100 years to trace possible anthropogenic nutrient loading to coastal waters that changes water quality and increases productivity.

228. El-Sayed, S.Z., W.M. Sackett, L.M. Jeffrey, A.D. Fredericks, R.P. Saunders, P.S. Conger, G.A. Fryxell, K.A. Steidinger, and S.A. Earle. 1972. Serial atlas of the marine environment. 29 pp.

A folio that summarizes the state of knowledge with regard to the chemistry of seawater, its primary production, and the pelagic and benthic flora of the Gulf, based primarily on data from continuing research programs at Texas A&M University School of Oceanography. Covers the entire Gulf of Mexico region with some detail measures of the Louisiana Bight. Discussion of available information on structure and function of coastal, shelf and gulf ecosystems with excellent bibliography.

229. Fahnenstiel, G.L., M.H. Marcovitz, M.J. McCormick, D.G. Redalje, S.E. Lohrenz, H.J. Carrick, and M.J. Dagg. 1991. High growth and microzooplankton-grazing loss rates for phytoplankton populations from the Mississippi River plume region, pp. 111-116. In Nutrient Enhanced Coastal Ocean Productivity. Publication number TAMU-SG-92-109, Sea Grant Program, Texas A&M University, Galveston, Texas.

Microzooplankton grazing, taxon-specific growth, and sedimentation loss rates measured on the dominant phytoplankton populations in the plume/hypoxia region of the Mississippi River plume showed that during summer phytoplankton production rates are high and most of this production is recycled within the surface layer.

230. Flint, R.W. and C.W. Griffin. 1978. Executive Summary. 1977 Draft final report to the Bureau of Land Management, Washington D.C.

The information contained within this report is a summary of a multidisciplinary study conducted during 1977 on the South Texas outer continental shelf to obtain a better definition of some of these processes within a marine ecosystem.

231. Flint, R.W. and C.W. Griffin. 1979. Environmental studies, south Texas outer continental shelf, chemistry and biology . Final Report to the Bureau of Land Management, Washington, D.C.

This is the final report of the South Texas Outer Continental Shelf Marine Environmental Study Plan created by the Bureau of Land Management. This volume reports on the biogeochemistry aspects of the project during its third year initiated in January 1977 and completed in December 1977.

232. Flint, W., N.N. Rabalais, J.M. Brooks, D.L. Kamykowski, P.L. Paeker, R.S. Scalan, N.P. Smith, and J.K. Winters. 1981. Marine pelagic environment, pp. 15-35. In W. Flint and N.N. Rabalais. Environmental studies of the marine ecosystem south Texas outer continental shelf. University of Texas Press, Austin, TX.

233. Fucik, K.W. and I.T. Show. 1981. Environmental synthesis using an ecosystems model. In B.S. Middleditch. Environmental effects of offshore oil production. The Buccaneer gas and oil field study. Plenum Press, New York, NY.

The authors discuss an ecosystem model for marine environmental assessment of the oil contamination produced by the Buccaneer Gas and Oil Field. This model is comprised of a physical hydrodynamics component, a chemical component, and a biological system component. Model parameters are estimated from sampling data. The authors discuss the outputs of the model in relation to the field data available.

234. Gallaway, B.J. and G.S. Lewbel. 1982. The ecology of petroleum platforms in the northern Gulf of Mexico: a community profile. U.S. Fish and Wildlife Service, Office of Biological Services, Washington, D.C. FWS/OBS-82/27.

This document describes the structure and ecological function of petroleum platforms in the northwestern Gulf of Mexico. Review of literature pertaining to the interaction between petroleum platforms and resident biota. Excellent descriptions of biota include biofouling and fish communities using trophic food web approach. Little specific information on ecological function.

235. Gallaway, B.J. 1981. An ecosystem analysis of oil and gas development on the Texas-Louisiana continental shelf. U.S. Fish and Wildlife Service, Office of Biological Services, Washington, D.D. FWS/OBS-81/27. 89 pp.

The ecosystem is first characterized in terms of major forcing functions, characteristic faunal assemblages are described, followed by summary of trophic processes, and finally a review of impacts of oil and gas on ecosystem components. Includes conceptual model of OCS ecosystem with emphasis on faunal components and interactions.

236. Galtsoff, P.S. 1954. Historical sketch of the explorations in the Gulf of Mexico. Fishery Bulletin No 89. 55: 3-36.

A brief historical sketch of scientific discoveries and explorations in the Gulf of Mexico based on publications available in the U.S. Early maps of the Gulf of Mexico are included.

237. Galtsoff, P.S. 1954. Gulf of Mexico - Its origin, waters, and marine life. U.S. Fish and Wildlife Service 604.

A classic treatise on the physical, chemical and biological oceanography of the Gulf of Mexico.

238. Giam, C.S. and et. al. 1979. Heavy molecular weight hydrocarbons in macroepifauna and macronekton sample, chapter 5. In R.W. Flint and C.W. Griffin. Environmental studies, south Texas outer continental shelf, biology and chemistry. 1977 Final Report to the Bureau of Land Management.

The hydrocarbon profiles for a large number of species were obtained. These profiles provided a wide data base for determining the effects of petroleum exploration and production on the hydrocarbon content of biota from the stocks.

239. Groover, R.D. and et. al. 1977. Environmental studies, south Texas outer continental shelf, rig monitoring program. 1976 Final Report for the Bureau of Land Management, Washington D.C.

This report provides results on the monitoring program that determine any spatial and temporal impact on the immediate environment resulting from exploratory drilling activities on the South Texas Outer Continental Shelf. Results of this report cover the period from September 1976 through March 1977.

240. Harding, J.L. and W.D. Nowlin, Jr. 1966. Gulf of Mexico, pp. 324-330. In R.W. Fairbridge. The encyclopedia of oceanography. Reinhold Publishing Corporation, New York, NY.

This paper presents a brief description of the geomorphology, regional oceanography, and hydrology of the Gulf of Mexico.

241. Hitchcock, G. and T. Whitledge. 1991. Nutrient/pigment variability in the Mississippi River plume and adjacent waters, pp. 43-51. In Nutrient Enhanced Coastal Ocean Productivity. Publication number TAMU-SG-92-109, Sea Grant Program, Texas A&M University, Galveston, Texas.

This study examines the spatial distribution of salinity, temperature, pigments, and nutrients in the vicinity of the Mississippi River delta and contiguous coastal waters in Summer 1990 and Spring 1991. Large scale movement of plume water appears to be the dominant factor determining the temporal and spatial variability in surface properties in the Louisiana Bight.

242. Holland, J.S. and et. al. 1979. Benthic invertebrates: macroinfauna and epifauna. In R.W. Flint and C.W. Griffin. Environmental studies, south Texas outer continental shelf, biology and chemistry. 1977 Final Report to the Bureau of Land Management.

Three major distribution patterns of benthic infaunal invertebrates were observed with nine distinct species groups composing the various pattern.

243. Parker, P.L. and et. al. 1979. High-molecular-weight hydrocarbons in zooplankton, sediment and water, chapter 4. In R.W. Flint and C.W. Griffin. Environmental studies, south Texas outer continental shelf, biology and chemistry. 1977 Final Report to the Bureau of Land Management.

This study describes an extensive survey of the level of natural and petroleum type hydrocarbons in seawater, zooplankton and sediment from the south Texas outer Continental shelf.

244. Pequegnat, W.E. 1976. Ecological aspects of the upper continental slope of the Gulf of Mexico. Bureau of Land Management 08550-CT4-12.

245. Pequegnat, W. E. and et. al. 1979. Meiofauna project. In R.W. Flint and C.W. Griffin. Environmental studies, south Texas outer continental shelf, biology and chemistry, chapter 16. 1977 Final report to the Bureau of Land Management.

This paper determines in a relatively small geographical area of the south Texas outer continental shelf including two hard banks, the distributions, abundances, and environment of the taxonomic components of the meiofauna.

246. Pequegnat, W.E. and F.A. Chace, Jr. 1970. Contributions on the Gulf of Mexico. Gulf Publishing Company, Houston, TX. 270 pp.

This book provides a collection of papers dedicated to different aspects of the biological oceanography of the Gulf of Mexico. Taxonomic, systematic and environmental aspects are covered, especially related to crustaceans.

247. Price, W.A. and G. Gunter. 1942. Certain recent geological and biological changes in South Texas with consideration of probable causes. Proc. and Trans. Tex. Acad. Sci. 26: 138-156.

248. Qureshi, N.A., N.N. Rabalais, and Q. Dortch. 1991. Seasonal differences in the sedimentation of zooplankton fecal pellets in the northern Gulf of Mexico, pp. 122-125. In Nutrient Enhanced Coastal Ocean Productivity. Publication number TAMU-SG-92-109, Sea Grant Program, Texas A&M University, Galveston, Texas.

This paper describes the seasonal and vertical distribution of zooplankton fecal pellets in the northern Gulf of Mexico within the core of the hypoxic area. Observed hypoxia in bottom waters in this region is believed to be fueled by carbon transported to bottom waters through zooplankton feces.

249. Rabalais, N.N. 1990. Biological communities of the south Texas continental shelf. American Zoologist 30: 77-87.

A multi-disciplinary study of the south Texas continental shelf in 1975-1977 investigated physical, chemical, geological, and biological characteristics over spatial and temporal scales, and the results are briefly summarized here.

250. Rabalais, N.N. and D.F. Boesch. 1987. Dominant features and processes of continental shelf environments of the United States, pp. 71-147. In D.F. Boesch and

N.N. Rabalais. Long-term environmental effects of offshore oil and gas development. Elsevier Applied Science, London and New York.

251. Rabalais, N.N., B.A. McKee, D.J. Reed, and JC. Means. 1991. Appendices. Fate and effects of nearshore discharges of OCS produced waters. OCS Study MMS 91-0006 U.S. Dept. of the Interior, Minerals Management Service, Gulf of Mexico OCS Regional Office, New Orleans, La. 225 pp.

252. Rabalais, N.N., B.A. McKee, D.J. Reed, and J.C. Means. 1991. Technical Report. Fate and effects of nearshore discharges of OCS produced waters. OCS Study MMS 91-0005. U.S. Dept. of the Interior, Minerals Management Service, Gulf of Mexico OCS Regional Office, New Orleans, La. 337 pp.

253. Rabalais, N.N., B.A. McKee, D.J. Reed, and J.C. Means. 1991. Executive Summary. Fate and effects of nearshore discharges of OCS produced waters. OCS Study MMS 91-0004. U.S. Dept. of the Interior, Minerals Management Service, Gulf of Mexico OCS Regional Office, New Orleans, La. 48 pp.

254. Rabalais, N.N., L.E. Smith, E.B. Overton, and A.L. Zoeller. 1993. Influence of hypoxia on the interpretation of effects of petroleum production activities. OCS Study MMS 93-0022. U.S. Dept. of the Interior, Minerals Management Service.

Environmental impact of offshore petroleum development on the Louisiana continental shelf was assessed as caused by hypoxic bottom waters. Oxygen concentration, bottom water temperature and salinity, and sediments showed to be important environmental factors that explained the variation in benthic community parameters of species richness and abundance.

255. Redalje, D.G., S.E. Lohrenz, and G.L. Fahnenstiel. 1991. The relationship between primary production and the export of POM from the photic zone in the Mississippi River plume and inner Gulf of Mexico shelf regions, pp. 105-110. In Nutrient Enhanced Coastal Ocean Productivity. Publication number TAMU-SG-92-109, Sea Grant Program, Texas A&M University, Galveston, Texas.

Relationship of phytoplankton primary production and export of POM from the photic zone in the Mississippi River plume and inner Gulf of Mexico shelf was studied during high and low river discharge. Differences in POC export was attributed to temporal variability in phytoplankton species composition and zooplankton grazing.

256. Schwarz, J.R. and et. al. 1979. Benthic bacteriology. In R.W. Flint and C.W. Griffin. Environmental studies, south Texas outer continental shelf, biology and chemistry, chapter 10. 1977 Final Report to the Bureau of Land Management.

According to this study, the addition of oil to sediment increased bacterial populations and changed the composition of the population to one more capable of degrading oil.

257. Szaniszlo, P.J. and et. al. 1979. Water column and benthic microbiology-mycology. In R.W. Flint and C.W. Griffin. Environmental studies, south Texas outer continental shelf, biology and chemistry, chapter 9. 1977 Final Report to the Bureau of Land Management.

Results show that crude oil was initially toxic to the petroleum-degrading fungi, but in general served to stimulate fungal growth after a period of one to several weeks.

258. Twilley, R.R. and W.J. Day, Jr. The coupling of wetlands to ecological processes in shallow bays of coastal Louisiana. In Data Inventory Workshop Proceedings. 1991. BTNEP Publication 5.

This review describes the conceptual framework for studies of shallow coastal bays of Louisiana as land-margin ecosystems coupled to shelf processes. Describes various research programs investigating subsystems of the Mississippi Deltaic plain region.

259. Vittor, B.A. and I & Associates. 1985. Tuscaloosa trend regional data search and synthesis Volume I-Synthesis report. OCS Study MMM 85-0056. U.S. Dept. of the Interior, Minerals Management Service, Gulf of Mexico OCS Region, New Orleans, La. 477 pp.

260. Vittor, B.A. and I & Associates. 1985. Tuscaloosa trend regional data search and synthesis study, Volume II-Supplemental Reports. OCS Study MMM 85-0057. U.S. Dept. of the Interior, Gulf of Mexico OCS Region, New Orleans, La. 349 pp.

261. Williams, H.F. 1951. The Gulf of Mexico adjacent to Texas. The Texas Journal of Science 3: 237-250.

Ecological analysis of the Gulf of Mexico from Sabine River to Rio Grande, northwestern region of shelf margin. Includes information on physical, geological, and biological oceanography. Characterizes some of the scientific issues of the region.

262. Wiseman, W.J., Jr., R.E. Turner, F.J. Kelly, L.J. Rouse, Jr., and R.F. Shaw. 1986. Analysis of biological and chemical associations near a turbid coastal front during winter 1982. Contributions in Marine Science 29: 141-151.

Biological and chemical analysis of at the intense front separating the west Louisiana nearshore waters from the adjacent inner-shelf waters. Test hypothesis that phytoplankton are light limited in the shallow, turbid coastal boundary layer and nutrient limited seaward, where zooplankton biomass is higher owing to exploitation of increased food resources.

GEOLOGY OF THE GULF OF MEXICO

263. Antoine, J.W. 1972. Structure of the Gulf of Mexico, pp. 1-34. In R. Rezak and V.J. Henry. Contributions on the geological and geophysical oceanography of the Gulf of Mexico. Gulf Publishing Company, Houston, TX.

Seismic reflection profiles together with coring, dredging, magnetic and gravity investigation were used to theorize on the evolution of the Gulf of Mexico and formation of its seven provinces.

264. Antoine, J.W., R.G. Martin, Jr., T.G. Pyle, and W.R. Bryant. 1974. Continental margins of the Gulf of Mexico, pp. 683-693. In C.A. Burk and C.L. Drake. The geology of continental margins. Springer-Verlag, New York, NY.

A structural description of the geology of the Gulf of Mexico including the four major ideas concerning the formation of the Gulf, and two distinct physiographic and sedimentological provinces.

265. Ballard, R.D. and E. Uchupi. 1970. Morphology and quaternary history of the continental shelf of the Gulf coast of the United States. Bulletin of Marine Science 20: 547-559.

A detailed bathymetric chart was made of the continental shelf off the Gulf coast region. Description of three continental provinces based on geomorphic features of the Gulf.

266. Bouma, A.H. 1972. Distribution of sediments and sedimentary structures in the Gulf of Mexico, pp. 35-65. In R. Rezak and V.J. Henry. Contributions on the geological and geophysical oceanography of the Gulf of Mexico. Gulf Publishing Company, Houston, TX.

Piston core analysis in the Gulf of Mexico were used to study sediment distribution and sedimentary processes in the upper 7 m of the sediment column.

267. Carsey, J.B. 1950. Geology of Gulf coastal area and continental shelf. Bulletin of the American Association of Petroleum Geologists 34: 361-386.

268. Doyle, L.J. and T.N. Sparks. 1980. Sediments of the Mississippi, Alabama, and Florida (MAFLA) continental shelf. Journal of Sedimentary Petrology 50: 905-916.

Focus on the Gulf of Mexico continental margins east of the Mississippi River delta and north of Cape Romano in Florida. Description of the sediment characteristics in this region of the continental shelf based on four year study.

269. Ewing, M., D.B. Ericson, and B.C. Heezen. 1958. Sediments and topography of the Gulf of Mexico, pp. 995-1053. In L.G. Weeks. Habit of oil. American Association of Petroleum Geologists, Tulsa, Oklahoma.

The purpose of the paper is to present a preliminary account of the sediment cores and interpretation of the sounding records about the recent and pleistocene sediments in deep basins of Gulf of Mexico; but also to present evidence that turbidity currents have played a leading part in sediment accumulation in the deep Gulf and in the evolution of its bottom topography. Nice explanation of the continental provinces with maps.

270. Feely, R.A. 1974. Chemical characterization of the particulate matter in the near bottom nepheloid layer of the Gulf of Mexico. Ph.D. Thesis. Texas A&M University. 145 pp.

This study describes the survey of near bottom suspended matter samples for their chemical characteristics in the Gulf of Mexico and northwestern Caribbean Sea.

Results indicated that a nepheloid layer is present in the Gulf of Mexico but not in the northwestern Caribbean Sea. It appeared that sediments are the most probable source of the increased concentrations of suspended matter in the nepheloid layer.

271. Greenman, N.N. and R.J. Leblanc. 1956. Recent marine sediments and environments of northwest Gulf of Mexico. Bulletin of the American Association of Petroleum Geologists 40: 813-847.

This paper presents results of a megascopic study of 85 sediment cores in the northwestern Gulf of Mexico. About 10 cores are within the Louisiana Bight in less than 100 m of water.

272. Hilgard, E.W. 1871. On the geological history of the Gulf of Mexico. Amer. Jour. Sci. III. II: 391-404.

273. Hilgard, E.W. 1871. On the geology of the delta and the mud lumps of the passes of the Mississippi. Amer. Jour. Sci. II.

274. Hilgard, E.W. 1881. The basin of the Gulf of Mexico. Amer. Jour. Sci. III. XXI: 283-291.

275. Hilgard, E.W. 1891. The late tertiary of the Gulf of Mexico. Amer. Jour. Sci. III. XXII: 58-65.

276. Hilgard, E.W. 1906. The exceptional nature and genesis of the Mississippi Delta. Science 24: 861-866.

277. Jones, J.I. and S.E. Williams. 1979. The distribution and origin of bottom sediments in Timbalier Bay, Louisiana, and the adjacent offshore area, pp. 201-221. In C.H. Ward, M.E. Bender, and D.J. Reish. The offshore ecology investigation. William Marsh Rice University, Houston, TX.

Research report of the OEI describing some of the physical and chemical characteristics of the sediments in the study area.

278. Kennicutt II, M.C., W.W. Schroeder, and J.M. Brooks. 1995. Temporal and spatial variations in sediment characteristics on the Mississippi-Alabama continental shelf. Continental Shelf Research 15: 1-18.

This paper reports the examination of surficial sediments to determine the sources, distribution and variability of selected sediment characteristics. Three transect of four stations on the Mississippi-Alabama continental shelf were sampled five times over 26 month period January 1987-February 1989. The inorganic and organic chemistry of sediments and their temporal and spatial variability were documented.

279. Lehner, P. 1969. Salt tectonics and pleistocene stratigraphy on the continental slope of the northern Gulf of Mexico. Bulletin of the American Association of Petroleum Geologists 53: 2431-2479.

Deep-water sedimentary beds were cored on the continental slope of the Texas and Louisiana shelf to determine finer scale resolution of slope topography, particularly related to salt structures. This study gives insight to topography of the slope boundary of the Texas-Louisiana continental shelf.

280. Ludwick, J.C. 1964. Sediments in northeastern Gulf of Mexico, pp. 204-238. In R.L. Miller. Papers in marine geology. MacMillan Company, New York, NY.

The purpose of this paper is to describe and interpret the distribution pattern of modern surficial sediment deposits on the continental shelf and in nearshore areas in a previously little-studied area in the northeastern Gulf of Mexico. Includes area just east of Mississippi River delta to St. Vincent Island in Florida.

281. Lynch, S.A. 1954. Geology of the Gulf of Mexico. Fishery Bulletin No 89. 55: 67-86.

A synoptic description of historic and current knowledge of the Gulf of Mexico geology is presented.

282. Morgan, J.P. 1979. Recent geological history of the Timbalier Bay area and adjacent continental shelf, pp. 575-589. In C.H. Ward, M.E. Bender, and D.J. Reish. The offshore ecology investigation. William Marsh Rice University, Houston, TX.

Historical description of the geologic evolution of coastal environments in the vicinity of the OEI study region.

283. Oetking, P., R. Back, R. Watson, and C. Merks. 1979. Surface and shallow subsurface sediments of the near-shore continental shelf of south central Louisiana, pp. 181-200. In C.H. Ward, M.E. Bender, and D.J. Reish. The offshore ecology investigation. William Marsh Rice University, Houston, TX.

Research report of the OEI describing the sediments and bathymetry of the study region.

284. Poag, C.W. and W.E. Sweet. 1972. Claypile Bank, Texas continental shelf, pp. 223-261. In R. Rezak and V.J. Henry. Contributions on the geological and geophysical oceanography of the Gulf of Mexico. Gulf Publishing Company, Houston, TX.

This paper describes the geological characteristics and biostratigraphic distribution of foraminifera in Claypile Bank, Texas continental shelf.

285. Prior, D.B., E.H. Doyle, and M.J. Kaluza. 1989. Evidence for sediment eruption on deep sea floor, Gulf of Mexico. Science 243: 517-519.

A large crater has been discovered on the sea floor, Gulf of Mexico, in a water depth of 2176 meters. Deep-tow high-resolution imagery shows that the crater is cut into a low hill surrounded by near-surface concentric faults. A recent eruption evacuated sediments from the crater, apparently because of release of overpressured petrogenic gas.

286. Shepard, F.P. 1955. Delta-front valleys bordering the Mississippi distributaries. Bulletin of the Geological Society of America 66: 1489-1498.

Investigation of the submarine valleys found in the slopes bordering the most advanced portions of the Mississippi River delta.

287. Shepard, F.P. 1956. Marginal sediments of Mississippi Delta. Bulletin of the American Association of Petroleum Geologists 40: 2537-2623.

The paper discusses primarily the characteristics of the surface sediment based on cores east of the Mississippi River delta (1,000 samples), the continental slopes to 550 ft, and Breton sound. These results are compared with core samples from South and Southwest Pass of the Mississippi River delta.

288. Trowbridge, A.C. 1930. Building of Mississippi Delta. Bulletin of the American Association of Petroleum Geologists 14: 867-901.

This paper is based on a season of field work at and below New Orleans with the United States Geological Survey in 1921; a season of field and laboratory work in the same area in 1922 with the United States Engineering Department, and a large amount of analytical work on collected samples in the sedimentation laboratory of the University of Iowa since 1921. An explanation of the method and rate of Delta building is attempted.

290. Upshaw, C.F., W.B. Creath, and F.L. Brooks. 1966. Sediments and microfauna off the coasts of Mississippi and adjacent states. Mississippi Geological, Economic and Topographical Survey Bulletin 106: 54-76.

291. Wilhelm, O. and M. Ewing. 1972. Geology and history of the Gulf of Mexico. Geological Society of America Bulletin 83: 575-600.

Principal aim of study is a comprehensive interpretation of the historical development of the Gulf of Mexico. Analysis based primarily on an extensive examination of the seismic profiler records.

HYPOXIA

291. Bierman, V.J., Jr., S.C. Hinz, D.W. Zhu, W.J. Wiseman, Jr., N.N. Rabalais, and R.E. Turner. 1994. A preliminary mass balance model of primary productivity and dissolved oxygen in the Mississippi River plume/ inner Gulf shelf region. Estuaries 17: 886-899.

Water quality model used to synthesize information on physical, chemical, and biological processes in the Mississippi River plume region and Louisiana Bight. The coarse grid, deterministic model for phytoplankton, nutrients, and dissolved oxygen was calibrated with field data from NECOP; and sensitivity runs form discussion of possible mechanisms controlling hypoxia in the region.

292. Boesch, D.F. 1983. Implications of oxygen depletion on the continental shelf of the northern Gulf of Mexico. Coastal Ocean Pollution Assessment News 2: 25-28.
A brief review of the spatial and temporal extent of the bottom oxygen depletion in the

northern Gulf of Mexico continental shelf is presented. Assessment of lately oxygen depletion severity and potential causes is also addressed.

293. Boesch, D.F. 1985. Oxygen depletion on the inner continental shelf of the northern Gulf of Mexico: distribution, causes and effects. Louisiana Universities Marine Consortium Chauvin, Louisiana.

This brief report is intended as a guideline for future research on the inner shelf of northern Gulf of Mexico hypoxia. Strategic mapping, monitoring, and guiding hypothesis are suggested to address the causes and effect of this phenomenon on living resources.

294. Dortch, Q., N.N. Rabalais, R.E. Turner, and G.T. Rowe. 1994. Respiration rates and hypoxia on the Louisiana shelf. Estuaries 17: 862-872.

Spatial and temporal estimates of water column respiration based on concentrations of enzymatic respiratory electron-transport-system activity during monthly cruises from May to October 1991. In July 1991, water column and benthic respiration measured at four cross shelf stations. Relative contribution of water column and benthic respiration to development of hypoxia is discussed.

295. Fotheringham, N., G.H. Weissberg, and D. Moore. 1979. Some causes, consequences and potential environmental impacts of oxygen depletion in the northern Gulf of Mexico. Offshore Technology Conference Proceedings OT 3611 4: 2205-2207.

A description of some causes and consequences of oxygen depletion in bottom waters on the continental shelf off central Louisiana coast. Environmental impact of hypoxic layer to bottom fauna is also described.

296. Gaston, G.R. 1985. Effects of hypoxia on macrobenthos of the inner shelf off Cameron, Louisiana. Estuarine, Coastal and Shelf Science 20: 603-613.

The author documents the effects of hypoxia on macrobenthos populations of the inner shelf off Cameron (Louisiana). Burrowing species were less affected by the hypoxia. Opportunistic species constituted the majority of the macrofaunal population.

297. Gaston, G.R. and K.A. Edds. 1994. Long-term study of benthic communities on the Continental shelf off Cameron, Louisiana: a review of brine effects and hypoxia. Gulf Research Reports 9: 57-64.

The effects of brine (concentrated salt water) discharge on benthic organisms of the coast off Cameron (Louisiana) was studied. The effects were minimal, because the study area was numerically dominated by opportunistic species, due to frequent bottom waters hypoxic conditions in the zone.

298. Gaston, G.R., P.A. Rutledge, and M.L. Walther. 1985. The effects of hypoxia and brine on recolonization by macrobenthos off Cameron, Louisiana (USA). Contributions in Marine Science 28: 79-93.

Recolonization studies were conducted at two different sites of the southwest coast of Cameron (Louisiana). Recolonization was primarily established by larval settlement rather than adult immigration. The authors concluded that discharged brine had no obvious effects on species combined into feeding groups (suspension feeders, surface deposit feeders, subsurface deposit feeders and carnivores). However, hypoxia was responsible for a 2 weeks delay in colonization in one of the stations.

299. Harper, D.E., Jr., L.D. McKinney, R.R. Salzer, and R.J. Case. 1981. The occurrence of hypoxic bottom waters off the upper Texas coast and its effects on the benthic biota. Contributions in Marine Science 24: 53-79.

The authors describe an hypoxic event in bottom waters off the upper Texas coast, caused by a diatom bloom, the response of the benthic community, and the posterior reestablishment of normal conditions after a storm. Species diversity and abundance decreased during hypoxia. The author refers to hypoxia in the Louisiana shelf during 1973-1976, between 6 and 37 m isobaths.

300. Murrell, M.C. and J.W. Fleeger. 1989. Meiofauna abundance on the Gulf of Mexico continental shelf affected by hypoxia. Continental Shelf Research 9: 1049-1062.

This paper reports the abundance of meiofauna in the coast waters off Louisiana (Terrebone Bay), and the effect of hypoxic conditions on their abundance. Meiofauna was comprised by nematoda, copepoda and kinorhyncha. Copepoda were more affected by low oxygen conditions.

301. Nowlin, W.D., Jr., D.F. Paskausky, and H.J. McLellan. 1969. Recent dissolved-oxygen measurements in the Gulf of Mexico deep waters. Journal of Marine Research 27: 39-44.

Oxygen data obtained in 1966 and 1967 indicate that there is no clearly discernable horizontal variation in dissolved oxygen in the Gulf of Mexico basin waters.

302. Pavela, J.S., J.L. Ross, and M.E. Chittenden, Jr. 1983. Sharp reductions in abundance of fishes and benthic macroinvertebrates in the Gulf of Mexico off Texas associated with hypoxia. Northeast Gulf Science 6: 167-173.

Low abundance or the total elimination of both fishes, shrimps and other macroinvertebrates occurred in bottom waters associated with hypoxic conditions. The authors suggested that the abundance of larger pelagic fishes on the zone was due to the exceptional food opportunity given by an unusually vulnerable bottom fauna.

303. Pokryfki, L. and R.E. Randall. 1987. Nearshore hypoxia in the bottom water of the northwestern Gulf of Mexico from 1981 to 1984. Marine Environmental Research 22: 75-90.

Dissolved oxygen concentrations were surveyed in coastal waters of the northwestern Gulf of Mexico from 1981 to 1984. Statistical models are used to predict bottom dissolved oxygen concentrations using temperature, salinity, river discharge, and density gradient as variables in their respective model.

304. Rabalais, N.N. and D.E. Harper, Jr. 1991. Studies of benthic biota in areas affected by moderate and severe hypoxia, pp. 150-153. In Nutrient Enhanced Coastal Ocean Productivity. Publication number TAMU-SG-92-109, Sea Grant Program, Texas A&M University, Galveston, Texas.

This study describes the temporal variability of benthic communities impacted by hypoxia on the Louisiana continental shelf.

305. Rabalais, N.N., R.E. Turner, and W.J. Wiseman, Jr. 1991. Distribution and characteristics of hypoxia on the Louisiana shelf in 1990 and 1991, pp. 15-20. In Nutrient Enhanced Coastal Ocean Productivity. Publication number TAMU-SG-92-109, Sea Grant Program, Texas A&M University, Galveston, Texas.

This study reports the presence and distribution of near bottom hypoxia on the Louisiana shelf during 1990 and 1991. Hypoxia in 1990 was mainly restricted to the southeastern Louisiana coast but in 1991 it was wide spread to the southwestern shelf, as well.

306. Rabalais, N.N., R.E. Turner, W.J. Wiseman, Jr., and D.F. Boesch. 1991. A brief summary of hypoxia on the northern Gulf of Mexico continental shelf: 1985-1988, pp. 35-47. In R.V. Tyson and T.H. Pearson. Modern and ancient continental shelf anoxia. The Geological Society Special Publication, London.

A description of the extent and timing of oxygen-deficient conditions in the northern Gulf of Mexico during 1985-1988 is presented. Physical processes, water eutrophication, and phytoplankton organic matter production are the forcing functions that determine the fate of hypoxic water formation.

307. Rabalais, N.N., W.J. Wiseman, Jr., and R.E. Turner. 1994. Comparison of continuous records of near-bottom dissolved oxygen from the hypoxia zone along the Louisiana coast. Estuaries 17: 850-861.

Analysis of two continuously recording oxygen meters deployed in the Mississippi River plume region to analyze the forcings that control the variability in development of hypoxia in these two regions of the shelf.

308. Ragan, J.G., A.H. Harris, and J.H. Green. 1978. Temperature, salinity, and oxygen measurements of surface and bottom waters on the continental shelf off Louisiana during portions of 1975 and 1976. Nicholls State University Prof. Pap. Ser. (Biology) 3: 1-29.

This study reports a wide range of depth contours (6-110 m) sampling of temperature, salinity, and oxygen during 1975 and 1976 in the Louisiana shelf waters.

309. Renaud, M.L. 1985. Hypoxia in Louisiana coastal waters during 1983: implications for fisheries. Fishery Bulletin 84: 19-26.

This study report the locations and extent of Louisiana coastal hypoxia in 1983 and discuss the interrelationships of fish and shrimp abundance and distribution with environmental parameters.

310. Stuntz, W.E., N. Sanders, T.D. Leming, K.N. Baxter, and R.M. Barazotto. 1982. Area of hypoxic bottom water found in northern Gulf of Mexico. Coastal Oceanography News 4: 37-38.

A layer of low dissolved oxygen is reported in bottom waters along the Louisiana coast during June-July of 1982. The area of low oxygen concentration was found in depths of 9-46 m along the coast. This layer had an impact on demersal fish and invertebrate distribution.

311. Turner, R.E. and R.L. Allen. 1982. Bottom water oxygen concentration in the Mississippi River delta bight. Contributions in Marine Science 25: 161-172.

Survey of the bottom and water column oxygen concentration was done in the Mississippi River delta bight and cross-shelf transects. Hypoxic conditions were more likely associated to decomposition of material sinking from surface layers and to water column stratification in summer.

312. Turner, R.E., W.W. Schroeder, and W.J. Wiseman, Jr. 1987. The role of stratification in the deoxygenation of Mobile Bay and adjacent shelf bottom waters. Estuaries 10: 13-19.

Oxygen depletion in shallow bottoms waters of Mobile Bay, Al, and adjacent nearshore and continental shelf waters were studied in relation to water column stratification for a period of ten years from 1974 to 1984.

MACROALGAE

313. Taylor, W.R. 1954. Sketch of the character of the marine algal vegetation of the shores of the Gulf of Mexico. Fishery Bulletin No 89. 55: 177-192.

Review of information on the distribution of macro algae in the Gulf of Mexico.

314. Taylor, W.R. 1954. Distribution of marine algae in the Gulf of Mexico. Pap. Mich. Acad. Sci, Arts Lett. 39: 85-109.

Review of information on the distribution of macro algae in the Gulf of Mexico.

MICROBIAL ECOLOGY

315. Balech, E. 1967b. Microplankton of the Gulf of Mexico and Caribbean Sea. Texas A&M Res. Foundation 67-10-T.

316. Biddanda, B., S. Opsahl, and R. Benner. 1994. Plankton respiration and carbon flux through bacterioplankton on the Louisiana shelf. Limnology and Oceanography 39: 1259-1275.

The authors measured bacterial respiration and bacterial production in highly productive shelf and less productive slope waters in the northern Gulf of Mexico. These parameters are discussed in relation to the carbon flow processed through the bacterioplankton.

317. Chin-Leo, G. and R. Benner. 1992. Enhanced bacterioplankton production and respiration at intermediate salinities in the Mississippi River plume. Marine Ecology Progress Series 87: 87-103.

Bacteria abundance and production was studied for a wide range of salinities from the Mississippi River to open waters of the Gulf of Mexico. Bacteria abundance and production seemed to be coupled to season and type of nutrient source.

318. Gardner, W.S., R. Benner, G. Chin-Leo, J.B. Cotner, B.J. Eadie, J.F. Cavaletto, and M. B. Lansing. 1994. Mineralization of organic material and bacterial dynamics in Mississippi River plume water. Estuaries 17: 816-828.

Net remineralization rates of organic matter and bacterial growth rates were measured in dark-bottle incubation experiments conducted in July-August and February in water samples collected in the Mississippi River plume. Objectives were to measure site-specific degradation rates of labile dissolved and particulate organic matter, quantify the potential importance of bacteria in these processes, and examine the kinetics of degradation over time.

319. Hanson, R.B. 1982. Influence of the Mississippi River on the spatial distribution of microheterotrophic activity in the Gulf of Mexico. Contributions in Marine Science 25: 181-198.

The spatial distribution of microheterotrophic activity in the water column of the Mississippi Delta bight and the Gulf of Mexico was investigated in April and May 1977. Microheterotrophic activity in relation to particulate organic carbon and hydrographic conditions, especially as influenced by the Mississippi River's plume is presented.

320. Oujesky, H., W. Brooks, B. Smith, and B. Hamilton. 1979. Water column bacteriological studies of the south Texas and continental shelf. Developments in Industrial Microbiology 20: 695-703.

Water column bacteriological samples were collected from February 1977 to December 1977 on the south Texas outer continental shelf. Heterotrophic and hydrocarbonoclastic microbial populations were surveyed. The effect of south Louisiana crude oil on bacterial growth was also studied.

321. Pomeroy, L.R., L.P. Atkinson, J.O. Blanton, W.B. Campbell, T.R. Jacobsen, K.H. Kerrick, and A.M. Wood. 1983. Microbial distribution and abundance in response to physical and biological processes on the continental shelf of southeastern U.S.A. Continental Shelf Research 2: 1-20.

322. Sizemore, R.K., C.H. Hsu, and K.D. Olsen. 1981. Bacterial community composition and activity. In B.S. Middleditch. Environmental effects of offshore oil production. The Buccaneer gas and oil field study. Plenum Press, New York, NY. The objective of this study was to determine the effects of oil pollutants on the normal bacterial population of uncontaminated sites, and to estimate the success of the microbial population around the production platforms to cope with the pollutants.

323. ZoBell, C.E. 1954. Marine bacteria and fungi in the Gulf of Mexico. Fishery Bulletin No 89. 55: 217-222.

This paper summarizes personal observations by the author in the Gulf of Mexico along with published reports for the region.

NEKTON

324. Al-Yamani, F.Y. 1988. Distribution ecology of zooplankton and fish larvae (spot, croaker, and menhaden) in the northern Gulf of Mexico. Ph.D.Thesis. University of Miami. 269 pp.

This study reports the spatial and temporal correspondence between the highest average density of nauplii and highest average density of spot and menhaden larvae. Significant positive correlations were found between the three target species and nauplii, small copepods and pelecypod larvae, suggesting an ecological relationship.

325. Berry, R.J. and K.N. Baxter. 1967. Predicting brown shrimp abundance in the northwestern Gulf of Mexico. In Proceedings of the World Scientific Conference on the Biology and Culture of Shrimps and Prawns. Food and Agriculture Organization of the United Nations. Rome, Italy.

Brown shrimp postlarvae and juvenile abundance are used as indices to predict the size of brown shrimp annual crops along Gulf of Mexico coasts. Predictions based on postlarval indices have greater potential value because the information is available 4 to 6 weeks sooner.

326. Brusher, H.A., W.C. Renfro, and R.A. Neal. 1972. Notes on distribution, size and ovarian development of some penaeid shrimps in the northwestern Gulf of Mexico, 1961-62. Contributions in Marine Science 16: 75-87.

This report contains information concerning the penaeid shrimp distribution, size and ovarian development during the 2-year period (between January 1961 and December 1962). General seasonal changes in catch per hour were reported for the more abundant species, and size distributions for each species were presented.

327. Burkenroad, M.D. 1939. Further observations on Penaeidae of the northern Gulf of Mexico. Bull. Bingham Oceanogr. Coll. 6: 1-62.

This study describes the relative abundance and bathymetric distribution of Penaeidae family taken in 35 trawl-hauls on the continental shelf in the neighborhood of the Mississippi River.

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

This paper describes shrimp resource research conducted by the Galveston Laboratory of the National Marine Fisheries Service Gulf Coastal Fisheries Center. Discussed are plans for development of a mathematical model capable of explaining and predicting changes in shrimp catch, and ongoing mark-recapture experiments, predation of catch, stock identification studies, and study of spawning grounds.

329. Caldwell, D.K. 1959. Observations on tropical marine fishes from the northeastern Gulf of Mexico. Quarterly Journal Florida Academy of Science 22: 69-74.

Observations on tropical marine fishes have been assembled to record one species each from Panama City and Destin (northeastern Gulf of Mexico) for the first time.

330. Chittenden, M.E., Jr. and D. Moore. 1977. Composition of the ichthyofauna inhabiting the 110-meter bathymetric contour of the Gulf of Mexico, Mississippi River to the Rio Grande. Northeast Gulf Science 1: 106-114.

The ichthyofauna inhabiting the 110-m bathymetric contour from the Mississippi River to the Rio Grande was very diverse in comparison to the inshore fauna, although the number of species collected decreased off south Texas. Dominant taxa were the families Sparidae, Lutjanidae, Triglidae, Serranidae and Synodontidae.

331. Christmas, J.Y. and R.S. Waller. 1975. Location and time of menhaden spawning in the Gulf of Mexico. Gulf Coast Research Laboratory 03-4-042-24.

A total of 1439 plankton samples from Gulf of Mexico coastal waters from Brownsville, Texas to the Everglades in Florida were examined for menhaden eggs larvae. Eggs were found in samples taken in October-March with peak collections in December-February.

332. Connell, C.H. and J.B. Cross. 1950. Mass mortality of fish associated with the protozoan *Gonyaulax* in the Gulf of Mexico. Science 112: 359-363.

The episode (mass mortality of fish) occurred in the summer of 1949 in a salt water lagoon known as Offatt Bayou along Galveston Island. Extraordinarily high values of BOD and consequent anaerobic conditions in the water were attributable to the *Gonyaulax* and were important contributing factors in the mass mortality of fish.

333. Cook, H. 1966. A generic key to the protozoan, mysis, and postlarval stages of the littoral penaeidae of the northwestern Gulf of Mexico. Fishery Bulletin 65: 437-447.

An illustrated key presents criteria for differentiating the stages and substages of Gulf of Mexico penaeid larvae (and post larvae) from comparable stages of the more common nonpenaeids. A second key permits generic identification of penaeid protozoean, mysis, and postlarval stages.

334. Cowan, J.H., Jr. 1988. Age and growth of atlantic croaker, *Micropogonias undulatus*, larvae collected in the coastal waters of the northern Gulf of Mexico as determined by increments in saccular otoliths. Bulletin of Marine Science 42: 349-357.

The age and growth rate of larval Atlantic croaker, *Micropogonias undulatus*, collected in the coastal water of the northern Gulf of Mexico were estimated from growth increments in saccular otoliths Wild-caught larvae of Atlantic croaker collected in the coastal waters off west Louisiana appear to deposit daily growth increments in their saccular otoliths. Although the Atlantic croaker's spawning season was not delineated, analysis of the data suggests that little spawning occurred after January even though it reportedly occurs until March.

335. Cowan, J.H., Jr. and R.F. Shaw. 1988. The distribution, abundance, and transport of larval sciaenids collected during winter and early spring from the continental shelf waters of west Louisiana. Fishery Bulletin 86: 129-142.

The larvae of six species of Scianidae were collected in continental shelf waters off west Louisiana on five midmonthly cruises from December 1981 to April 1982. Total larvae density was highest in April, and by the high densities were associated with the coastal boundary layer, a horizontal density front caused by an intrusion of fresher water onto the inner shelf that probably issued from the Atchafalaya River east of the study area. West-northwest alongshore advection within and just outside of a horizontally stratified coastal boundary layer seems to be the major mechanism transporting sciaenid larvae.

336. Darnell, R.M. and A.B. Williams. 1956. A note on the occurrence of the pink shrimp *Penaeus duorarum* in Louisiana waters. Ecology 37: 844-846.

The presence of the pink shrimp (*Penaeus duorarum*) in autumn 1953 collections from Lake Pontchartrain, and in spring 1954 collections from the Chandeleur Islands, indicates that the species was present in Louisiana waters at least a year before it began to appear frequently in the Pontchartrain collections. Observed fluctuations in the physical environment appear to outweigh postulations of interspecific competition as the possible causative factors of the observed changes in distributional pattern.

337. Dawson, C.E. 1962. New records and notes on fishes from the north central Gulf of Mexico. Copeia 26: 442-444.

The present study extends the known ranges of four species previously recorded from the north-central Gulf and adds six species to the known fish fauna.

338. Ditty, J.G. 1986. Ichthyoplankton in neritic waters of the northern Gulf of Mexico off Louisiana. Fishery Bulletin 84: 935-946.

Ichthyoplankton samples were collected monthly between November 1981 and October 1982 in neritic continental shelf waters off Louisiana. The survey provided the first quantitative data on abundance and seasonal occurrence of larval fishes from open coastal waters of this area. Larval densities were lowest during the winter and highest during the summer.

339. Finucane, J.H., L.A. Collins, and L.E. Barger. 1978. Spawning of the striped mullet, *Mugil cephalus*, in the northwestern Gulf of Mexico. Northeast Gulf Science 2: 148-151.

Pelagic eggs of striped mullet, *Mugil cephalus* were identified from ichthyoplankton samples taken on December 2, 1977, from 89 to 98 km off the Texas coast in the northwestern Gulf of Mexico. This was the first reported spawning of striped mullet in this area.

340. Gallaway, B.J., L.R. Martin, R.L. Howard, G.S. Boland, and G.D. Dennis. 1981. Effects on artificial reef and demersal fish and macrocrustacean communities.

In B.S. Middleditch. Environmental effects of offshore oil production. The Buccaneer gas and oil field study. Plenum Press, New York, NY.

This paper provides a synthesis of the observed effects of the Buccaneer Gas and Oil Field (Texas) on biological systems and fisheries of the study area. Demersal fishes and macrocrustaceans, the biofouling community, and reef and pelagic fishes were used as indicators of impact. The major effect of the platforms was to provide substrate allowing the development of a rich and diverse reef community. The toxicity effects of the contaminant discharge were restricted to within only few meters of the outfall. No important indirect effects of the contaminants or bioaccumulation was detected.

341. Govoni, J.J., A.J. Chester, D.E. Hoss, and P.B. Ortner. 1985. An observation of episodic feeding and growth of larval *Leiostomus xanthurus* in the northern Gulf of Mexico. Journal of Plankton Research 7: 137-146.

The interaction of a high density aggregation of larval *Leiostomus xanthurus* and the principal microzooplanktonic food of these larvae was described. It was suggested that the spatial distribution of *L. xanturus* larvae and their microzooplanktonic food is patchy and that interactions of larvae an microzooplankton may be episodic.

342. Govoni, J.J., D.E. Hoss, and A.J. Chester. 1983. Comparative feeding of three species of fish in the northern Gulf of Mexico: *Brevoortia patronus*, *Leiostomus xanthurus*, and *Micropogonias undulatus*. Marine Ecology Progress Series 13: 189-199.

Gulf menhaden larvae (*Brevoortia patronus*) showed a diverse diet that included phytoplankton (diatoms and dinoflagellates) and zooplankton (tintinnids, pelecypods, pteropods, and copepods). Diets of larval spot and Atlantic croaker (*Leiostomus xanthurus* and *Micropogonias undulatus*, respectively) were largely restricted to zooplankton. Evidence indicate that these species do not compete for food.

343. Govoni, J.J., D.E. Hoss, and D.R. Colby. 1989. The spatial distribution of larval fishes about the Mississippi River plume. Limnology and Oceanography 34: 178-187.

The distribution of larval fishes is shaped by the Mississippi River plume at both coarse (kilometers) and fine (tens to hundreds of meter) spatial scales. Density estimates of larval fishes, based upon ichthyoplankton samples collected about the Mississippi River plume in February 1982, December 1982, and November 1983, were often greater by a factor of 10, and sometimes by several orders of magnitude, at the plume front than they were inside (within) or outside of the plume.

344. Govoni, J.J., P.B. Ortner, F. Al-Yamani, and L.C. Hill. 1986. Selective feeding of spot, *Leiostomus xanthurus*, and Atlantic croaker, *Micropogonias undulatus*, larvae in the northern Gulf of Mexico. Marine Ecology Progress Series 28: 175-183.

The present study indicates that the planktonic larvae of spot and Atlantic croaker feed selectively, but they do not allow a quantitative assessment of the relative contribution of the factors that influence food selection. Nonetheless, these observations do indicate that while food selection is constrained by prey size, it is also influenced by prey perception, recognition, and capture.

345. Grimes, C.B. and J.H. Finucane. 1991. Spatial distribution and abundance of larval and juvenile fish, chlorophyll and macrozooplankton around the Mississippi River discharge plume, and the role of the plume in fish recruitment. Marine Ecology Progress Series 75: 109-119.

Water samples collected during September 1986 in the Mississippi River plume water, Gulf of Mexico shelf water, and frontal water were analyzed for neuston, chlorophyll a, and hydrographic characteristics. Neuston abundance and chlorophyll a values were all significantly greater in frontal waters.

346. Gunter, G. 1938. Seasonal variations in abundance of certain estuarine and marine fishes in Louisiana, with particular reference to life histories. Ecological Monographs 8: 313-346.

The data presented in this paper are chiefly descriptive and are more valuable in this aspect than for purposes of analyses. Many unanswered questions were presented and offered a starting point for future work.

347. Gunter, G. 1938. Notes on invasion of freshwater by fishes of the Gulf of Mexico, with special reference to the Mississippi-Atchafalaya River systems. Copeia 2: 69-72.

348. Gunter, G. 1938. The relative number of species of marine fish off the Louisiana coast. American Naturalist 72: 79-83.

349. Gunter, G. 1941. Relative numbers of shallow water fishes of the northern Gulf of Mexico with some records of rare fishes from the Texas coast. American Midland Naturalist 26: 194-200.

350. Gunter, G. 1967. Some relationships of estuaries to the fisheries of the Gulf of Mexico, pp. 621-638. In G.H. Lauff, ed. Estuaries. American Association for the Advancement of Science, Washington, D.C.

This paper is concerned, primarily, with the Gulf Coast of the United States. It is suggested that organic materials buried in the sediments act as a reserve food supply for estuarine organisms.

351. Gutherz, E.J. 1977. The northern Gulf of Mexico groundfish fishery, including a brief life history of the croaker (*Micropogon undulatus*). Gulf Carbb Fish Inst Proc 29th Ann. Sess: 87-101.

352. Henwood, T., P. Johnson, and R. Heard. 1978. Feeding habits and food of the longspined porgy, *Stenotomus caprinus* bean. Northeast Gulf Science 2: 133-137.

According to this study, long-spined porgy is an opportunistic bottom feeder with a diet composed mainly of smaller invertebrates, with crustaceans and polychaetes predominant. Distribution of the population within the study area (offshore waters of Mississippi, Alabama and Florida) did not appear to be limited to specific zones due to availability of food items. Feeding occurred over all bottom types encountered, and no preference for a particular area was noted. There was a marked tendency for smaller individuals to inhabit shallower waters.

353. Herron, R.C., T.D. Leming, and J. Li. 1989. Satellite-detected fronts and butterfish aggregations in the northeastern Gulf of Mexico. Continental Shelf Research 9: 569-588.

Satellite imagery collected in April and May 1985, 1986 and 1987 suggested a spatial relationship of large schools of Gulf butterfish with fronts between warmer, lower chlorophyll, offshore waters, and cooler, high-chlorophyll shelf and slope waters in the northeastern Gulf of Mexico. Catch rates increased at or near the fronts and remained high until the fronts receded off the shelf and slope or dispersed.

354. Kutkuhn, J.H., H.L. Cook, and K.N. Baxter. 1969. Distribution and density of prejuvenile *Penaeus* shrimp in Galveston entrance and the nearby Gulf of Mexico (Texas). FAO Fishery Report 57: 1075-1099.

Analysis of over 3,000 samples collected systematically during one biological year revealed that the frequency of sampling, although high, was insufficient to trace the rapid onshore movements of recently hatched broods of *Penaeus*; that the gross horizontal distribution of *Penaeus* larvae and postlarvae in the Gulf and vertical distribution of postlarvae in Galveston entrance changed markedly from season to season; that *Penaeus* larvae, rarely occurring within 10 km of shore, were not bottom-dwellers; and that *Penaeus* postlarvae did not frequent the bottom in winter and otherwise were usually more abundant at mid-depths than at the bottom.

355. Lindner, M.J. 1956. Growth, migrations, spawning, and size distribution of shrimp, *Penaeus setiferus*. Fishery Bulletin 56: 555-645.

Tagged shrimp of *Penaeus setiferus* were measured both at release and after recapture. From November to April very little growth was observed. During the rest of the year, growth was rapid. Tagged shrimp released along the major portion of the Gulf coast showed no indication of coastwise migration. Ripe ovaries were taken in most areas from April through September. Judging from size at maturity, shrimp spawned in the spring or summer probably spawn in the corresponding season of the following year.

356. Lindner, M.J. and W.W. Anderson. 1954. Biology of commercial shrimps. Fishery Bulletin No 89. 55: 457-461.

357. Lukens, R.R. 1981. Ichthyofaunal colonization of a new artificial reef in the northern Gulf of Mexico. Gulf Research Reports 7: 41-46.

Ichthyofaunal colonization of a new artificial reef was monitored from June 1975 through September 1977. Direct observations were accomplished using SCUBA. Data indicate that ichthyofaunal communities in the northern Gulf of Mexico are heavily influenced by seasonal changes in temperature, and that colonization by reef fish in that area does not conform to theories of immigration and extinction for island biotas.

358. Modde, T. 1980. Growth and residency of juvenile fishes within a surf zone habitat in the Gulf of Mexico. Gulf Research Reports 6: 377-385.

The present study points out that the surf zone habitat of an exposed sand beach represents a significant spatial resource to the early life stages of certain fishes within the northern Gulf of Mexico. Nearly half of the fishes collected from the surf zone of Horn Island used this area as a residence. In addition, this habitat appeared to attract a large number of immature migrant fish which may briefly utilize this environment either as a refuge or an orientation site.

359. Modde, T.C. and S.T. Ross. 1981. Seasonality of fishes occupying a surf zone habitat in the northern Gulf of Mexico. Fishery Bulletin 78: 911-922.

Surf zone habitat of Horn Island, Mississippi was dominated by immature clupeiform fishes, such as *Anchoa lyolepis* and *Harengula jaguana* which together constituted 80.2% of the 154,469 fishes collected during 1975 and 1977. Differences in number of these species were closely associated to diel changes, such as tidal regime and time of day.

360. Modde, T.C. and S.T. Ross. 1983. Trophic relationships of fishes occurring within a surf zone habitat in the northern Gulf of Mexico. Northeast Gulf Science 6: 109-120.

In summary, the surf zone of Horn Island, Mississippi provides trophic and spatial resources to certain juvenile fishes. This study suggests that *Menticirrhus littoralis,* and *Trachinotus carolinus* utilize this habitat as a nursery in exploiting both resources.

361. Moore, D., H. Brusher, and L. Trent. 1970. Relative abundance, seasonal distribution, and species composition of demersal fishes off Louisiana and Texas, 1962-1964. Contributions in Marine Science 15: 45-70.

The information was analyzed: (1) to provide the fishing industry with information of the relative abundance and seasonal distribution of the demersal fishes caught (species combined) and (2) to denote species composition of the catches. Catches were generally two to five times greater off Louisiana than off Texas, with the greatest differences occurring in the shallowest waters.

362. Moseley, F.N. 1966. Biology of the red snapper, *Lutjanus aya Bloch*, of the northwestern Gulf of Mexico. Publications of the Institute of Marine Science 11: 90-101.

The present study had two objectives. One was to ascertain the general biology and ecology of red snappers. The other was to compare the food habits of adults and juvenile snappers from Louisiana and Texas waters. The spawning season for red snappers off the Texas coast was found to be June to Mid-September, with the peak occurring in August. Adults were primarily piscivorous while juveniles fed primarily on crustaceans.

363. Overstreet, R.M. and R.W. Heard. 1978. Food of the Atlantic croaker, *Micropogonias undulatus*, from Mississippi Sound and the Gulf of Mexico. Gulf Research Reports 6: 145-152.

In this study, the stomach and intestinal contents of specimens of the Atlantic croaker, *Micropogonias undulatus*, was determined. The frequency of occurrence of items revealed primarily crustaceans followed by polychaetes, molluscs, and fishes, and less common items, and, in the open Gulf, molluscs appeared slightly more often than inshore croaker and than polychaetes in offshore fish.

364. Perry, A. 1979. Fish of Timbalier Bay and offshore Louisiana environments collected by trawling, pp. 537-545. In C.H. Ward, M.E. Bender, and D.J. Reish. The offshore ecology investigation. William Marsh Rice University, Houston, TX.

Research results of the OEI describing the distribution and biomass of fish in the study region.

365. Perry, H., R. Waller, C. Trigg, J. McBee, R. Erdman, and N. Blake. 1995. A note on bycatch associated with deepwater trapping of *Chaceon* in the northcentral Gulf of Mexico. Gulf Research Reports 9: 139-142.

Four crustacean and five finfish species were collected in association with Chaceon trap sets. Bycatch associated with deepwater trapping of *Chaceon* was dominated by isopod, *Bathynomus giganteus*. Other crustacean megafauna consisted of the majid crab, *Rochinia crassa*, and the portunid crabs, *Benthochascon schimitti* and *Bathynectes longispina*.

366. Price, W.W., A.P. McAllister, R.M. Towsley, and M. DerRe. 1986. Mysidacea from continental shelf waters of the northwestern Gulf of Mexico. Contributions in Marine Science 29: 45-58.

This paper documents the species composition, ecology and morphology of three collections of mysids from continental shelf waters off Texas and Louisiana. This information supplements scanty knowledge of offshore mysids in the northwestern Gulf of Mexico. In addition, a preliminary zoogeographical comparison of the mysid fauna of the northwestern and northeastern Gulf is made.

367. Ragan, J.G., E.J. Melancon, A.H. Harris, R.N. Falgout, J.D. Gann, and J.H. Green. 1978. Bottomfishes of the continental shelf off Louisiana. Professional Paper Series (Biology) 2: 1-34.

Trawl samples of demersal fishes were collected from September 1975 through August 1976 at the continental shelf of Louisiana. Catches were heaviest immediately adjacent to both sides of the Mississippi River delta, and lightest on the state's western shelf. The heaviest fish concentrations appeared to be centered over bottoms with fine granular components (mainly clay-silt) and high organic content.

368. Rivas, L.R. 1954. The origin, relationships, and geographical distribution of the marine fishes of the Gulf of Mexico. Fishery Bulletin No 89. 55: 503-505.

369. Rogers, R.M. 1977. Trophic interrelationships of selected fishes on the continental shelf of the northern Gulf of Mexico. Ph.D. Thesis. Texas A&M. 229 pp.

This study presents information on the trophic interrelationships of demersal fishes of the northern Gulf of Mexico between Brownsville, Texas and St. Andrew's Bay, Florida in depths of approximately 3 to 200 meters. Information gathered was used to propose trends in the life history and food habits of continental shelf fishes.

370. Roithmayr, C.M. 1965. Industrial bottomfish fishery of the northern Gulf of Mexico, 1959-63. U.S. Department of the Interior, Fish and Wildlife Service 518.

Distribution of fishing effort, composition of landings, harvesting operations, and processing methods are described for the industrial bottomfish fishery of the northern Gulf of Mexico. The more important fishing grounds are located between the Mississippi River delta and the entrance to Mobile Bay. The Atlantic croaker contributed, on the average, 56 percent by weight to the total annual bottomfish landing during 1959-1963. Recommendations concerning complete utilization of the bottomfish resource of the area are suggested.

371. Rosas, C., A. Sanchez, L. Soto, E. Escobar, and A. Bologaro-Crevenna. 1992. Oxygen consumption and metabolic amplitude of decapod crustaceans from the northwest continental shelf of the Gulf of Mexico. Comparative Biochemistry and Physiology 101A: 491-496.

This study analyzed seasonal fluctuations in the respiration rate of pre-adults decapod crustaceans. The respiration rates of seven species revealed uni-, bi- and trimodal pattern during the 24 hr cycle during both season. Metabolic amplitude of the shrimp species was reduced by 42% during the coldest months of the year.

372. Ross, S.T., R.H. McMichael, Jr., and D.L. Ruple. 1987. Seasonal and diel variation in the standing crop of fishes and macroinvertebrates from a Gulf of Mexico surfzone. Estuarine, Coastal and Shelf Science 25: 391-412.

The present study suggests that factors governing the occurrence and abundance of surf zone organisms may be visualized as a hierarchy ranging from: (1) climatic events which may result in annual variation in year-class strength; (2) the timing of reproduction or feeding movements, which results in seasonal patterns of occurrence and abundance; (3) short-term physicochemical factors such as wave height, salinity, temperature, and wind speed, which may govern point abundance.

373. Rounsefell, G.A. 1954. Biology of the commercial fishes of the Gulf of Mexico. Fishery Bulletin No 89. 55: 507-512.

374. Russell, M. 1977. Apparent effects of flooding on distribution and landings of industrial bottomfish in the northern Gulf of Mexico. Northeast Gulf Science 1: 77-78.

Evidence is presented that suggests river discharge affected bottomfish distribution from January through June 1972 and 1973. Comparison between river runoff and annual bottomfish landings for the last 17 years. However, flooding may be

beneficial to annual production by increasing availability of nutrients and extending the estuarine nursery boundaries.

375. Shaw, R.F., J.H. Cowan, Jr., and T.L. Tillman. 1985. Distribution and density of *Brevoortia Patronus* (Gulf Menhaden) eggs and larvae in the continental shelf waters of western Louisiana. Bulletin of Marine Science 36: 96-103.

Eggs and larvae of Gulf menhaden were identified from 179 oceanic samples taken during the five monthly ichthyoplankton cruises from December 1981 to April 1982. A peak in average egg density occurred in December between the 10 and 23 m isobaths where surface temperatures and salinities ranged from 15 to 18 °C and 30 ‰. The peak in average larval density (120/100 m^3) occurred in February.

376. Shaw, R.F., W.J. Wiseman, Jr., R.E. Turner, L.J. Rouse, R.E. Condrey, and F.J. Kelly, Jr. 1985. Transport of larval Gulf menhaden *Brevoortia patronus* in continental shelf waters of western Louisiana: a hypothesis. Transactions of the American Fisheries Society 114: 452-460.

The present study hypothesizes that longshore advection within the horizontally stratified coastal boundary layer is the major mechanism transporting larvae to the Calcasieu nursery ground rather than cross-shelf transport from immediately offshore of the estuary. The data collected during this study, at least, support this model.

377. Smith, F.G.W. 1954. Biology of the spiny lobster. Fishery Bulletin No 89. 55: 463-465.

378. Sogard, S.M., D.E. Hoss, and J.J. Govoni. 1987. Density and depth distribution of larval Gulf menhaden, *Brevoortia Patronus*, Atlantic croaker, *Micropogonias Undulatus*, and spot, *Leiostomus Xanthurus*, in the northern Gulf of Mexico. Fishery Bulletin 85: 601-609.

This study examined the density and depth distribution of larval Gulf menhaden, spot, and Atlantic croaker at three locations in the northern Gulf of Mexico. Both species were most abundant off Southwest Pass, Louisiana, which is a major outlet of the Mississippi River into the Gulf of Mexico.

379. Sonnier, F., J. Teerling, and H.D. Hoese. 1976. Observations on the offshore reef and platform fish fauna of Louisiana. Copeia 105-111.

Observations, photographs and collections of fishes on the western reefs of the outer Louisiana continental shelf and around oil platforms verified the presence of an extensive tropical fish fauna. Of 105 species recorded, about 50% were tropical species either unreported or rarely reported from the northwestern Gulf of Mexico.

380. Soto, L.A. 1972. Decapod shelf-fauna of the northeastern Gulf of Mexico. Distribution and zoogeography. Master Thesis. The Florida State University. 129 pp.

This study reports the distribution and zoography of the decapod shelf-fauna of the NE Gulf of Mexico. One hundred and twenty decapod species divided into 26 families were recorded.

381. Springer, S. and H.R. Bullis, Jr. 1956. Collections by the Oregon in the Gulf of Mexico. Special Scientific Report - Fisheries 196: 1-134.

The present report summarizes a part of the data obtained during cruises of the Oregon from 1950 through the end of 1955. Entries noting time, position, water depth, weather conditions, type of fishing gear used, and total weight of the catch, and other details were recorded for most stations. In addition to these entries, a list of species, the number of each species in the catch and other details were recorded for most stations.

382. St Amant, L.S., J.G. Broom, and T.B. Ford. Studies of the brown shrimp, *Penaeus aztecus*, in Barataria Bay, Louisiana, 1962-1965. In Proceedings of the Gulf and Caribbean Fisheries Institute. 1965. Miami Beach, Florida. Institute of Marine Science of the University of Miami.

Data analyses representing four complete brown shrimp cycles between 1962 and 1965 in Barataria Bay, Louisiana are presented. Intensive and broadened sampling was made to assess brown shrimp life cycle timing and ultimate production.

383. Subrahmanyan, C.B. 1971. The relative abundance and distribution of penaeid shrimp larvae off the Mississippi coast. Gulf Research Reports 3: 291-345.

The vertical distribution of protozoeal, mysis and postlarval stages of all the genera has been studied. Protozoeal and mysis stages showed similar patterns in their vertical spread. In general, they showed a tendency to aggregate in mid-water layers and sometimes at the surface. When maximal numbers of larvae were considered, definite inshore and offshore movements within the bathymetric range of species were obvious.

384. Sutter III, F.C. and J.Y. Christmas. 1983. Multilinear models for the prediction of brown shrimp harvest in Mississippi waters. Gulf Research Reports 7: 205-210.

A multilinear regression analysis of water temperature, salinity, and number of postlarval brown shrimp in nursery areas was used to predict the June and July commercial harvest of brown shrimp in Mississippi waters. A total of 80.2% of the variation in harvest was accounted by this model. When an effort variable was added to the equation, the amount of variation explained by these parameters increased to 85.4%. The results indicate that predictive models of brown shrimp harvest in Mississippi Sound may be a practical management tool.

385. Temple, R.F. and C.C. Fischer. 1967. Seasonal distribution and relative abundance of planktonic-stage shrimp (*Penaeus* spp.) in the northwestern Gulf of Mexico, 1961. Fishery Bulletin 66: 323-334.

Planktonic stages of shrimp (*Penaeus spp.*) were sampled systematically in the Gulf of Mexico near Galveston, Texas during January-December 1961. Trends in seasonal abundance of larvae varied with depth. Stations at 14 m observed a unimodal trend and the peak abundance was during May to September. In deeper waters a bimodal trend was apparent; peak abundance extended from late summer through fall. Postlarvae were taken in plankton tows during January to April but were most abundant during August to December.

386. Thompson, J.R. 1979. A study of the temporal changes in offshore macrofauna in the northern Gulf of Mexico during the development of the offshore oil industry, pp. 547-551. In C.H. Ward, M.E. Bender, and D.J. Reish. The offshore ecology investigation. William Marsh Rice University, Houston, TX.

Research results to supplement the OEI describing the nekton communities of the study region.

387. Waller, R., H. Perry, C. Trigg, J. McBee, R. Erdman, and N. Blake. 1995. Estimates of harvest potential and distribution of the deep sea red crab, *Chaceon quinquedens*, in the northcentral Gulf of Mexico. Gulf Research Reports 9: 75-84.

A commercial harvest potential of crabs in the northcentral Gulf of Mexico, east of the Mississippi River was suggested. However, fishery development must take into consideration the preponderance of females on the defined fishing grounds and the high incidence of ovigerous females during much of the year. Females generally dominated at all depth strata, but the proportion of males to females increased with depth.

PHYSICAL OCEANOGRAPHY

388. Adams, R.M. and E.F. Sorgnit. 1951. Comparison of summer and winter sea temperatures, Gulf of Mexico. Dept. of Oceanography, Texas Agricultural and Mechanical College.

389. Allen, R.L. and R.E. Turner. 1977a. Hydrographic data: July 15-24, 1975. Center for Wetland Resources, Louisiana State University. Baton Rouge, La.

390. Allen, R.L. and R.E. Turner. 1977b. Hydrographic data: October 28-November 7, 1975. Center for Wetland Resources, Louisiana State University. Baton Rouge, La.

391. Allen, R.L., R.E. Turner, and L.J. Rouse. 1977c. Hydrographic data: March 11-27, 1975. Center for Wetland Resources, Louisiana State University. Baton Rouge, La.

392. Angelovic, J.W. 1976. Physical oceanography. U.S. Department of Commerce.

393. Barrett, B. B., J. W. Tarver, W. R. Latapie, J. F. Pollard, W. R. Mack, G. B. Adkins, W. J. Gaidry, C. R. White, and J. S. Mathio. 1971. Cooperative Gulf of Mexico estuarine inventory and study. Louisiana Phase II, hydrology, and Phase III, sedimentology. 191 pp.

394. Beard, J.H. 1969. Pleistocene paleotemperature record based on planktonic foraminifers, Gulf of Mexico. Transactions, Gulf Coast Association of Geological Societies 19: 535-553.

Planktonic foraminifers from sediment cores in the northern Gulf of Mexico were used as paleotemperature records of the pleistocene epoch.

395. Blaha, J. and W. Sturges. 1981. Evidence for wind-forced circulation in the Gulf of Mexico. Journal of Marine Research 39: 711-734.

The study explores the correlations among winds, coastal sea level, and dynamic heights in the western Gulf of Mexico for those periods greater than a few months per cycle. Description of the influence of wind stress curls on circulation of Gulf of Mexico.

396. Brown, R.M. 1910. Maximum, minimum and average hydrographs of the Mississippi River. Bull. Amer. Geogr. Soc. 42: 107-110.

397. Capurro, L.R.A. and J.L. Reid. 1972. Contribution on the physical oceanography of the Gulf of Mexico. Gulf Publishing Company, Houston, TX. 288 pp.

This book published by Texas A & M University presents a comprehensive review of the physical oceanography of the Gulf of Mexico. General circulation of the Gulf waters, major currents and its variability, numerical and experimental modeling, effect of hurricanes and tides are the major points described in the book.

398. Chew, F. 1964. Sea-level changes along the northern coast of the Gulf of Mexico. Transactions of the American Geophysical Union 45: 272-280.

Information provided on the mean monthly sea levels along the northern shores of Gulf of Mexico (1952-1956), with explanations of the seasonal and spatial variation. Focus on the July sea-level minimum.

399. Chew, F., K.L. Drennan, and W.J. Demoran. 1962. Some results of drift bottle studies off the Mississippi Delta. Limnology and Oceanography 7: 252-257.

Surface water circulation off the Mississippi Delta was monitored by drifting bottles released in fall 1960 and summer 1961. Data obtained by this method was supported with other means such as wind effect .

400. Chew, F., K.L. Drennan, and W.J. Demoran. 1962. On the temperature field east of the Mississippi Delta. Journal of Geophysical Research 67: 271-279.

In the area east of the Mississippi Delta strong surface temperature fronts were common in the winter of 1960-1961. They separated surface streaks of cold river discharge from the surrounding warmer Gulf water.

401. Chuang, W. and W.J. Wiseman, Jr. 1983. Coastal sea level response to frontal passages on the Louisiana-Texas shelf. Journal of Geophysical Research 88: 2615-2620.

Sea level variations resulting from wind forcing were analyzed on a 5-month winter records along the Louisiana-Texas shelf. Sea level response showed considerable variability associated to alongshore and cross-shelf wind and water depths over the inner shelf.

402. Clarke, G.L. 1938. Light penetration in the Caribbean Sea and Gulf of Mexico. Journal of Marine Research 1: 85-94.

403. Cochrane, J.D. and F.J. Kelly. 1986. Low-frequency circulation on the Texas-Louisiana continental shelf. Journal of Geophysical Research 91: 10645-10659.

Description of the prevailing low-frequency circulation on the Texas-Louisiana continental shelf on the basis of several sources of information. Tables and maps with summaries of prevailing shelf currents based on several studies of the region. Emphasis on the relative influence of winds and river discharge.

404. Collier, A. and J.W. Hedgpeth. 1950. An introduction to the hydrography of tidal waters of Texas. Publications at the Institute of Marine Science 1: 121-194.

405. Crout, R.L., W.J. Wiseman, Jr., and W.S. Chuang. 1984. Variability of wind-driven currents, west Louisiana inner continental shelf: 1978-1979. Contributions in Marine Science 27: 1-11.

Two-month summer time series of winds and currents from the west Louisiana inner shelf show little evidence of local wind forcing. Longer records from the fall and winter indicate a strong local current response to the winds associated with cold fronts.

406. Daddio, E. 1977. Response of coastal waters to atmospheric frontal passage in the Mississippi Delta regions. Coastal Stud. Inst., Louisiana State University. Technical Report 234.

407. Daddio, E., W.J. Wiseman, Jr., and S.P. Murray. 1978. Inertial currents over the inner shelf near 30°N. Journal of Physical Oceanography 8: 728-733.

Analysis of two month-long current records, one in February and one in May, from the inner shelf (28.9 °N) west of the Mississippi River delta show strong oscillations in the diurnal-inertial frequency band. Lack of correlation of these currents with the predicted or measured tide and strong association with frontal passages suggest that they are wind-induced inertial oscillations.

408. Danek, L.J. and M.S. Tomlinson. 1981. Currents and hydrography of the Buccaneer field and adjacent waters. In B.S. Middleditch. Environmental effects of offshore oil production. The Buccaneer gas and oil field study. Plenum Press, New York, NY.

The authors provide a description of the existing hydrographic environment in and around the Buccaneer Gas and Oil Field (Texas). The bottom sediments in the vicinity of the Buccaneer Field were subjected to considerable erosional stress. Thus, most unconsolidated sediments and particulate matter resulting from oil production will be periodically flushed from the area.

409. DiMego, G.J., L.F. Bosart, and G.W. Endersen. 1976. An examination of the frequency and mean conditions surrounding frontal incursions into the Gulf of Mexico and Caribbean Sea. Monthly Weather Review 104: 709-718.

Maps of mean monthly frequency and duration of frontal incursions into the Gulf of Mexico and Caribbean Sea are presented for the 1965-72 period. The transition from the low-frequency regime of summer to the high-frequency regime of winter is quite sharp in the fall, occurring between September and October.

410. Dinnel, S.O. and W.J. Wiseman, Jr. 1986. Fresh water on the Louisiana and Texas shelf. Continental Shelf Research 6: 765-784.

Hydrographic data collected on monthly cruises over the west Louisiana and Texas shelf from 1963 to 1965 were analyzed and the volume of fresh water on the shelf was estimated for each data set. Fill times for fresh water on the Louisiana Bight are estimated, assuming a continuous throughput system. Study made during two extremely low discharge years.

411. Dinnel, S.P. 1988. Circulation and sediment dispersal on the Louisiana, Mississippi, Alabama continental shelf. Ph.D.Thesis. Louisiana State University. Baton Rouge, La. 145 pp.

412. Dowgiallo, M.J. 1994. Coastal oceanographic effects of 1993 Mississippi River flooding. Special NOAA Report. NOAA Coastal Ocean Office/ National Weather Service, Silver Spring, MD. 76 pp.

This report presents a comprehensive summary of the meteorology, hydrology, and oceanographic effects related to the extreme Mississippi River flooding during summer of 1993.

413. Drennan, K.L. 1963. Surface circulation in the northeastern Gulf of Mexico. Gulf Coast Research Laboratory # 1.

This study describes the surface circulation features east and west of the Mississippi River delta and the seasonal changes in the area considered.

414. Duxbury, A.C. 1962. Averaged dynamic topographies of the Gulf of Mexico. Limnology and Oceanography 7: 428-431.

Dynamic height anomalies were calculated using pressure levels of 500 db and 1,000 db as reference, covering the entire Gulf of Mexico. These calculations were used to produce a set of dynamic topographies which are indicative of the mean circulation pattern of the Gulf.

415. Ebbesmeyer, C.C., G.N. Williams, R.C. Hamilton, C.E. Abbott, B.G. Collipp, and C.F. McFarlane. 1982. Strong persistent currents observed at depth off the Mississippi River delta. In Proceedings of the 14th International Offshore Technical Conference. Houston, TX.

416. Eleuterius, C.K. 1978. Location of the Mississippi Sound oyster reefs as related to salinity of bottom waters during 1973-1975. Gulf Research Reports 6: 17-23.

Maps provided with contours of the average salinity in Mississippi Sound during 1973-1975.

417. Elliott, B.A. 1982. Anticyclonic rings in the Gulf of Mexico. Journal of Physical Oceanography 12: 1291-1309.

418. Emiliani, C., S. Gartner, K. Eldridge, D.K. Elvey, T.C. Huang, J.J. Stipp, and M.F. Swanson. 1975. Paleoclimatological analysis of late quaternary cores from the northeastern Gulf of Mexico. Science 189: 1083-1088.

A report is presented describing the paleoclimate of northeastern Gulf of Mexico by the analysis of late quaternary cores. Core analysis presented evidences of a rapid ice melting and sea-level rise at about 9,600 years B. C.

419. Emiliani, C., C. Rooth, and J.J. Stipp. 1978. The late Wisconsin flood into the Gulf of Mexico. Earth and Planetary Science Letters 41: 159-162.

Oxygen and carbon natural isotope abundance in deep-sea cores from Gulf of Mexico were used to determine the discharge of Mississippi River between 12,000 and 11,000 years ago. Evidence for the occurrence of major flooding of ice meltwater into the Gulf of Mexico.

420. Etter, P.C. 1983. Heat and freshwater budgets of the Gulf of Mexico. Journal of Physical Oceanography 13: 2058-2069.

Heat and freshwater budgets are calculated for the Gulf of Mexico in an attempt to provide more refined assessments of the heat and hydrologic balances in support of contemporary investigations into the impact of anticyclonic rings on the heat and salt budgets of the Gulf.

421. Etter, P.C. and J.C. Cochrane. 1975. A summary of water temperature on the Texas-Louisiana shelf. Institute of Applied Geoscience Texas A&M University.

422. Etter, P.C. and J.D. Cochrane. 1975. Water temperature on the Texas-Louisiana shelf. Texas A&M Univ. Sea Grant Program Mar. Adv. Bull. SG75-604: 24.

423. Everett, D.E. 1971. Hydrologic and quality characteristics of the lower Mississippi River. Technical Report 5: 48.

424. Florida A&M University. 1988. Meteorological database and synthesis for the Gulf of Mexico. OCS Study/MMS 83-0064. U.S. Dept. of the Interior, Minerals Management Service, New Orleans, La.

This meteorological summary consists of a compilation of data from a number of sources and a statistical description by month, season and year of the pertinent meteorological variables affecting oceanographic operations in the Gulf of Mexico.

425. Forshey, C G. 1873. The delta of the Mississippi - The physics of the river, etc. Proc. Amer. Soc. Adv. Sci. 21: 78-111.

426. Gaul, R.O. 1967. Circulation over the continental margin of the northeast Gulf of Mexico. Ph.D. Thesis. Texas A&M University.

427. Grace, S.F. 1932. The principal constituent of the tidal motion in the Gulf of Mexico. Monthly Notices Roy Astr. Soc. Geophysic. Sup. May: 70-83.

428. Grubb, H. Freshwater inflow planning in Texas. In Proceedings of the National Symposium on Freshwater Inflow to Estuaries. 1981. Slidell, La.

This article presents a short discussion of the socio-economic, ecologic, and legislative aspects of freshwater inflow planning in Texas.

429. Gunter, G. 1952. Historical changes in the Mississippi River and the adjacent marine environment. Publications of the Institute of Marine Science 11: 120-139.

According to this study, in certain large estuarine areas on the Louisiana Coast, alluviation, sedimentation and the influx of river flood waters in the spring have ceased. This probably lowered the amount of nutrient salts draining from land. Certain general changes that have taken place in the fauna can be predicted with some surety.

430. Gunter, G. 1979. The annual flows of the Mississippi River. Gulf Research Reports 6: 283-290.

Analysis of discharge data for the Mississippi and Atchafalaya Rivers for the period 1900 to 1978. Discusses low and high flow events and changes in discharge patterns in the two river systems. 1927 and 1973 are described as two 50-yr floods during this period.

431. Halper, F.B. and W.W. Schroeder. 1990. The response of shelf waters to the passage of tropical cyclones-observation from the Gulf of Mexico. Continental Shelf Research 10: 777-793.

A set of unusual circumstances in the summer of 1979 provided an opportunity to observe flow on the continental shelves of the northern Gulf of Mexico during the passage of several tropical cyclones.

432. Henry, W.K. 1979. Some aspects of the fate of cold fronts in the Gulf of Mexico. Monthly Weather Review 107: 1078-1082.

This paper summarizes the frontal activity in the Gulf of Mexico and the Caribbean Sea based on the fronts rather than on the more standard climatological summary of frequency in latitude-longitude squares

433. Hofmann, E.E. and S.J. Worley. 1986. An investigation of the circulation of the Gulf of Mexico. Journal of Geophysical Research 91: 14221-14236.

434. Hubertz, J.M., R.O. Reid, and A. Garcia. 1972. Objective analysis of oceanic surface currents, pp. 139-148. In L.R.A. Capurro and J.L. Reid. Contribution on the physical oceanography of the Gulf of Mexico. Gulf Publishing Company, Houston, TX.

Physical oceanographic surveys of the eastern Gulf of Mexico were made in June 1966, and June 1967. The purpose here is to demonstrate a technique for obtaining a description of the nondivergent part of the surface velocity field using a quasi-synoptic, discrete set of surface current.

435. Huh, O.K., W.J. Wiseman, Jr., and L.J. Rouse, Jr. 1981. Intrusion of Loop current waters onto the west Florida continental shelf. Journal of Geophysical Research 86: 4186-4192.

From analysis of remote sensing data for west Florida shelf, estimates were made of the time scale of an intrusion event of the Loop current onto shelf, area of shelf affected, and induced modification of shelf waters.

436. Huh, O.K., W.J. Wiseman, Jr., and L. J. Rouse. 1978. Winter cycle of sea surface thermal patterns, northeastern Gulf of Mexico. Journal of Geophysical Research 83: 4523-4529.

437. Hurlburt, H.E. and J.D. Thompson. 1980. A numerical study of Loop current intrusions and eddy shedding. Journal of Physical Oceanography 10: 1611-1651.

This paper attempts to simulate and understand the dynamics of the Loop Current and its eddy shedding using an ensemble of numerical models, including two-layer, barotropic and reduced gravity prototypes.

438. Ichiye, T. 1962. Circulation and water mass distribution in the Gulf of Mexico. Geofisica Internacional 2: 47-76.

439. Ichiye, T. 1972. Experimental circulation modeling within the Gulf and the Caribbean, pp. 213-226. In L.R.A. Capurro and J.L. Reid. Contributions on the physical oceanography of the Gulf of Mexico. Gulf Publishing Co., Houston, TX.

Experiments were carried out with scale models 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 driving force for the Gulf was the inflow and outflow system maintained with a reservoir or a circulating pump. The driving force for the Caribbean model was wind.

440. Ichiye, T. 1972. Circulation changes caused by Hurricanes, pp. 229-257. In L.R.A. Capurro and J.L. Reid. Contribution on the physical oceanography of the Gulf of Mexico. Gulf Publishing Company, Houston, TX.

Observations in the Gulf of Mexico of temperature and salinity changes due to passing hurricanes are reviewed. Observations for Hurricane Carla and for Hurricane Inez were made on the continental slope in the northwestern and the western Gulf, respectively. Theoretical models are also reviewed.

441. Kennett, J.P. and N.J. Shackleton. 1975. Laurentide ice sheet meltwater recorded in Gulf of Mexico deep-sea cores. Science 188: 147-150.

According to this study, oxygen isotopic measurement in three Late Quaternary deep-sea cores from Gulf of Mexico record a major anomaly between about 15,000 and 12,000 years ago superimposed on a more characteristic oceanic oxygen isotopic curve. This resulted from major influx of isotopically light glacial meltwater via the Mississippi River from disintegrating Late Wisconsin Laurentide Ice Sheet 2000 km to the north.

442. Kimsey, J.B. and R.F. Temple. 1963. Currents on the continental shelf of the northwestern Gulf of Mexico. U.S. Bur. Commer. Fish. Circ. 161: 23-27.

443. Kimsey, J.B. and R.F. Temple. 1964. Currents on the continental shelf of the northwestern Gulf of Mexico. U.S. Bur. Commer. Fish. Circ. 183: 25-27.

444. Leipper, D.F. 1954. Marine meteorology of the Gulf of Mexico, a brief review. Fishery Bulletin No 89. 55: 89-98.

Overview of marine meteorology in the Gulf of Mexico.

445. Leipper, D.F. 1954. Physical oceanography of the Gulf of Mexico. Fishery Bulletin No 89. 55: 119-137.

This paper reviews the general physical oceanography of the Gulf of Mexico.

446. Leipper, D.F. 1970. A sequence of current patterns in the Gulf of Mexico. Journal of Geophysical Research 75: 637-657.

Results of a series of eight cruises during 16 month period beginning in May 1964 conducted in the Gulf of Mexico with the objective of studying changes in the thermal structure throughout the year. Initial suggestion of a systematic development and breakdown of the loop current in Gulf of Mexico; with some possible seasonal aspects.

447. Leipper, D.F., J.D. Cochrane, and J.F. Hewitt. 1972. A detached eddy and subsequent changes (1965), pp. 107-117. In L.R.A. Capurro and J.L. Reid. Contribution on the physical oceanography of the Gulf of Mexico. Gulf Publishing Company, Houston, TX.

This paper describes the effect of the Hurricane Betsy on an isolated eddy observed in the Gulf of Mexico in August 1965.

448. Marmer, H.A. 1954. Tides and sea level in the Gulf of Mexico. Fishery Bulletin No 89. 55: 101-118.

Tides and sea level of the Gulf of Mexico are reviewed in this study.

449. Maul, G.A. 1977. The annual cycle of the Gulf Loop current. Part I: observations during a one-year time series. Journal of Marine Research 35: 29-47.

Shipboard observations of the seasonal variation of the Gulf Loop current is described at 36-day intervals for fourteen months during 1972-1973. Values are given for excess inflow of Yucatan Current required to make the loop current grow.

450. McLellan, H.J. and W.D. Nowlin. 1963. Some features of the deep water in the Gulf of Mexico. Journal of Marine Research 21: 233-245.

Sampling of waters having depths greater than 1500 m at 52 stations in central portion of Gulf of Mexico measuring temperature, salinity, and dissolved oxygen.

Analysis of the stability of the water column and evidence of exchange of deep waters in central region with adjacent channels.

451. Molinari, R.L. 1977. Synoptic and mean monthly 20 °C topographies in the eastern Gulf of Mexico. NOAA Technical Memorandum ERL AMOL-27.

452. Molinari, R.L., S. Baig, D.W. Behringer, G.A. Maul, and R. Legeckis. 1977. Winter intrusions of the Loop current. Science 198: 505-507.

A report is given on the considerably north extension of the Loop Current in the Gulf of Mexico as sea-surface satellite and subsurface ship temperatures analysis have shown.

453. Molinari, R.L., J.F. Festa, and D.W. Behringer. 1978. The circulation in the Gulf of Mexico derived from estimated dynamic height fields. Journal of Physical Oceanography 8: 987-996.

Geostrophic circulation in the Gulf of Mexico was calculated from extensive temperature data. Dynamic height topographies computed relative to various depths and averaged over time intervals ranging from monthly to annual are presented. Geostrophic transports are also calculated.

454. Molinari, R.L. and D.A. Mayer. 1982. Current meter observations on the continental slope at two sites in the eastern Gulf of Mexico. Journal of Physical Oceanography 12: 1480-1492.

455. Murray, S.P. 1970. Bottom currents near the coast during Hurricane Camille. Journal of Geophysical Research 75: 4579-4582.

The present record, although incomplete, provides some knowledge of the structure of the coastal circulation during storms.

456. Murray, S.P. 1972. Observations on wind, tidal, and density-driven currents in the vicinity of the Mississippi River delta, pp. 127-142. In D.J.P. Swift, D.B. Duane, and O.H. Pilkey. Shelf sediment transport: process and pattern. Dowden, Hutchinson and Ross, Inc., Stroudsburg, Pennsylvania.

This paper describes the time-variant velocity profiles of nontidal component of the observed current, and the role played by the density gradient forces in determining the current structure.

457. Murray, S.P. 1976. Currents and circulation in the coastal waters of Louisiana. Sea Grant Publication No LSU-T-76-003: 33.

458. Nowlin, W.D., Jr. 1972. Winter circulation patterns and property distributions, pp. 3-51. In L.R.A. Capurro and J.L. Reid. Contribution on the physical oceanography of the Gulf of Mexico. Gulf Publishing Company, Houston, TX.

459. Nowlin, W.D., Jr. and J.M. Hubertz. 1972. Contrasting summer circulation patterns for the Eastern Gulf, pp. 119-137. In L.R.A. Capurro and J.L. Reid.

Contribution on the physical oceanography of the Gulf of Mexico. Gulf Publishing Company, Houston, TX.

This study illustrates two contrasting summer circulation patterns of the eastern Gulf of Mexico and provide the first detailed description of an anticyclonic ring detached from the Loop current.

460. Nowlin, W.D., Jr. and H.J. McLellan. 1967. A characterization of the Gulf of Mexico waters in winter. Journal of Marine Research 25: 20-59.

The results of a rapid survey of the Gulf of Mexico in the winter of 1962 are presented. In the eastern Gulf, water enters through Yucatan Strait and leaves through Florida strait, flowing in an anticyclonic loop that extends well into the Gulf. In the western Gulf, circulation is anticyclonic around an elongeted cell oriented NE-SW over the Gulf basin.

461. Nowlin, W.D., Jr. and C.A. Parker. 1974. Effects of a cold-air outbreak on shelf waters of the Gulf of Mexico. Journal of Physical Oceanography 4: 467-486.

Two surveys of the waters over an area of the continental shelf in the northwestern Gulf of Mexico were made during January 1966. The first observation period was just before a major outbreak of cold, dry air; the second was about 15 days later with the region still under the influence of this outbreak

462. Oetking, P., R. Back, R. Watson, and C. Merks. 1979. Physical studies of the near-shore continental shelf of south central Louisiana: currents and hydrography, pp. 119-143. In C.H. Ward, M.E. Bender, and D.J. Reish. The offshore ecology investigation. William Marsh Rice University, Houston, TX.

Research report of the OEI describing the currents and hydrography of the study area.

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This study reports one of first extensive surveys on the hydrographic conditions of the Gulf of Mexico and adjacent straits made during the Yale oceanographic expedition on the 'Mabel Taylor' in 1932.

464. Physical Oceanography Panel, Committee to Review the Outer Continental Shelf Environmental Studies Program, Board on Environmental Studies and Toxicology, and E. A. R. Commission on Geosciences. 1990. Assessment of the U.S. outer continental shelf environmental studies program. I.Physical Oceanography. National Research Council, Washington D.C.

This report reviews the current state of the Environmental Studies Program executed through the Minerals Management Service on the physical oceanography of the U.S. Outer Continental Shelf that includes the Gulf of Mexico region.

465. Price, K.C. 1979. Onshore hydrography of Timbalier Bay, Louisiana, pp. 145-157. In C.H. Ward, M.E. Bender, and D.J. Reish. The Offshore Ecology Investigation. William Marsh Rice University, Houston, TX.

Research report of the OEI describing the currents and hydrography of the study area in Timbalier Bay, Louisiana.

466. Rickman, D., M.C. Ochoa, K.W. Holladay, and O.K. Huh. 1989. Georeferencing airborne imagery over new deltas in Louisiana. Photogrammetric Engineering and Remote Sensing 55: 1161-1165.

Description of a new system to geometrically integrate different data sets using CAMS images. The technique is applied to analysis of the Atchafalaya Delta.

467. Rouse, L.J. and J.M. Coleman. 1976. Circulation observations in the Louisiana Bight using LANDSAT imagery. Remote Sensing of Environment 5: 55-66.

Describes a method for quantifying the turbidity of offshore water masses using LANDSAT imagery and presents the results of applying this method to images of the Louisiana bight. Contours of suspended sediment depend on the speed and direction of the wind as well as the amount of fresh water discharged by the Mississippi River.

468. Russell, R.J. 1936. Physiography of lower Mississippi River delta. Geology Bulletin 8: 3-199.

469. Sackett, W.M. and J.G. Rankin. 1970. Paleotemperatures for the Gulf of Mexico. Journal of Geophysical Research 75: 4557-4560.

An analysis of the water temperatures in the region of the Sigsbee knoll based on oxygen isotopes indicating a range of 5 °C during the Pleistocene. The anomalous temperature range predicted based on carbon isotopes (35 °C) is due to the increased influence of terrigenous input on sediment carbon during Wisconsin period.

470. Salas de Leon, D.A. and M.A. Monreal-Gomez. 1986. The role of the Loop current in the Gulf of Mexico fronts, pp. 295-300. In J.J. Nihoul. Marine interface hydrodynamics. Elsevier Oceanography Series 42, Amsterdam.

This study presents a numerical model used to describe the Loop Current dynamics and its role in many features of the Gulf of Mexico front.

471. Schroeder, W.W., S.P. Dinnel, W.J. Wiseman, Jr., and W.J. Merrell, Jr. 1987. Circulation patterns inferred from the movement of detached buoys in the eastern Gulf of Mexico. Continental Shelf Research 7: 883-894.

Describes surface circulation patterns on the east Louisiana-Mississippi-Alabama shelf and in the eastern Gulf of Mexico based upon the movement of buoys which detached accidentally from moorings on the Alabama inner shelf. The results show that the inner-shelf circulation is strongly wind-driven.

472. Schroeder, W.W., O.K. Huh, L.J. Rouse, Jr., and W.J. Wiseman, Jr. 1985. Satellite observation of the circulation east of the Mississippi Delta: cold air outbreak conditions. Remote Sensing of Environment 18: 49-58.

This paper, based on 12 year of Landsat multispectral scanner images, reports a recurrent pattern of westward flow immediately south of the Mississippi-Alabama barrier islands under northerly winds.

473. Science Applications International Corporation. 1987. Technical Report. S.A.I. Corporation. Gulf of Mexico physical oceanography program, final report: year 4. OCS Study MMS 87-0007. U.S. Dept. of the Interior, Minerals Management Service, New Orleans, La.

This reports describes the Gulf circulation patterns and the mechanisms producing these patterns. It is expected that insights from this study will provide an expanded basis for making informed management decisions related to outer continental shelf oil and gas exploration.

474. Science Applications International Corporation. 1987. Executive Summary. S.A.I. Corporation. Gulf of Mexico physical oceanography program, final report: year 4. OCS Study MMS 87-0006. U.S. Dept. of the Interior, Minerals Management Service, New Orleans, La.

This report presents results from three years of observations in the eastern Gulf. It contains a description of conditions and processes governing Gulf circulation.

475. Seim, H.E., B. Kjerfve, and J.E. Sneed. 1987. Tides of Mississippi Sound and the adjacent continental shelf. Estuarine, Coastal and Shelf Science 25: 143-156.

Hourly water level and current data were collected for one year in the Mississippi Sound and adjacent continental shelf to analyze large-scale tidal features of the northern Gulf of Mexico.

476. Shoemaker, W.S. 1954. Light penetration in the Gulf of Mexico. Fishery Bulletin No 89. 55: 139-141.

This paper summarizes the present knowledge and recent efforts in Gulf of Mexico underwater illumination.

477. Smedes, G. W., R.P. Herbst, and J. Calman. 1981. Hydrodynamic modeling of discharges. In B.S. Middleditch. Environmental effects of offshore oil production. The Buccaneer gas and oil field study. Plenum Press, New York, NY.

478. Smith, N.P. 1975. Seasonal variations in nearshore circulation in the northwestern Gulf of Mexico. Contributions in Marine Science 19: 49-65.

Sub-surface current data from a late winter and midsummer period are used to describe the nearshore circulation in the northwestern Gulf of Mexico. Comparison of simultaneously collected wind and current data suggests that many features of the nearshore current patterns can be explained as a response to surface windstress.

479. Smith, N.P. 1978. Low-frequency reversals of nearshore currents in the northwestern Gulf of Mexico. Contributions in Marine Science 21: 103-115.

This study describes features of the near shore circulation in the northwestern Gulf of Mexico by analysis of sub-surface current time series from midwinter and midsummer periods.

480. Smith, N.P. 1980. On the hydrography of shelf waters off the central Texas Gulf coast. Journal of Physical Oceanography 10: 806-813.

Gulf of Mexico shelf waters off the central Texas coast showed minimum salinities in late spring with values as low as 18 ‰ over the inner shelf. The rest of the year salinities average 31-32 ‰. Outer shelf surface salinities may decrease to 32-33 ‰ in late spring, but deviate little from 36 ‰ at other times. Freshwater runoff is restricted largely to inner and mid-shelf waters.

481. Smith, N.P. 1980. Temporal and spatial variability in longshore motion along the Texas Gulf coast. Journal of Geophysical Research 85: 1531-1536.

Longshore motion along the central and lower Texas Gulf coast was studied during summer 1977. Data recorded simultaneously with current meters at three sites provided information on the coherence and phase relationships in a predominantly wind driven current.

482. Soong, Y. 1978. A study of the northward intrusion of the Loop current in the Gulf of Mexico. Ph.D. Thesis. Florida State University. Tallahassee, Fl.

483. Sturges, W. and J.P. Blaha. 1976. A western boundary current in the Gulf of Mexico. Science 192: 367-369.

Description of a western boundary current in the Gulf of Mexico and an internal flow field similar to principal mid-latitude anticyclonic gyres.

484. Sturges, W. and J.C. Evans. 1983. On the variability of the Loop current in the Gulf of Mexico. Journal of Marine Research 41: 639-653.

This paper examines Loop current variability for application to questions of the rate of ring formation by comparing the positions of the Loop current with sea-level data

485. Sugimoto, T. and T. Ichiye. 1988. On seasonal and year-to-year variations of the Loop current and eddy formation in the Gulf of Mexico based on rotating model experiments. Deep-Sea Research 35: 569-594.

486. Temple, R.F., D.L. Harrington, and J.A. Martin. 1977. Monthly temperature and salinity measurements of continental shelf waters of the northwestern Gulf of Mexico. U.S. Department of Commerce NMFS SSRF-707.

Monthly temperature and salinity measurements in surface and bottom waters of continental shelf waters of northwestern Gulf of Mexico were done during 1963 to 1965. Vertical temperature and salinity structures were associated to spatial and seasonal effects.

487. Thompson, P.A., Jr. and T.D. Lemming. 1978. Seasonal description of winds and surface and bottom salinities and temperatures in the northern Gulf of Mexico, October 1972 to January 1976. U.S. Department of Commerce NMFS SSRF-719.

Seasonal surface and bottom salinities and temperatures in the northern Gulf of Mexico during October 1972 to January 1976 are described. Seasonal patterns are deducted from variations in temperatures and salinities coupled to shift in wind speed and direction.

488. Tolbert, W.H. and G.G. Salsman. 1964. Surface circulation of the eastern Gulf of Mexico as determined by drift-bottle studies. Journal of Geophysical Research 69: 223-230.

According to this paper, drift-bottle studies conducted to date in the eastern Gulf of Mexico not only indicate the prevailing surface circulation pattern and its seasonal variation but also provide evidence for the existence of subsurface water movements toward the northern Gulf.

489. Uchupi, E. 1967. Bathymetry of the Gulf of Mexico, pp. 161-178. Transactions of Gulf Coast Association Geological Societies.

An excellent description of the bathymetry of the Gulf of Mexico including the major topographic provinces. Based on some of the first comprehensive bathymetric studies of the continental margins initiated in 1966.

490. Vukovich, F.M., B.W. Crissman, M. Bushnell, and W.J. King. 1979. Some aspects of the oceanography of the Gulf of Mexico using satellite and in situ data. Journal of Geophysical Research 84: 7749-7768.

This paper describes the results of a synoptic-scale study of the oceanography in the Gulf of Mexico. The primary data source for this analysis was satellite infrared images for the period 1973-1977.

491. Waddell, E. and P. Hamilton. 1981. Physical oceanography. Vol I, pp. 130. In C.E. Comiskey and T.A. Farmer. Characterization of baseline oceanography for the Texoma region brine disposal sites. DOE, Strategic Reserve Office, Washington, D.C.

492. Watson, R.L. and E.W. Behrens. 1970. Nearshore surface currents, southeastern Texas Gulf coast. Contributions in Marine Science 15: 133-143.

Surface current patterns was studied along the Texas Gulf coast by releasing monthly drifting bottles at 18 stations from October 1966 to December 1967. Data analysis showed that nearshore surface circulation in depths of 8 fathoms and less is strongly influenced by local wind circulation.

493. Wiseman, W.J., Jr., J.M. Bane, S.P. Murray, and M.W. Tubman. 1976. Small-scale temperature and salinity structure over the inner shelf west of the Mississippi River delta. Mémoires Société Royale des Sciences de Liège 10: 277-285.

This paper reports the result of many STD profiles collected immediately west of the Mississippi River delta to determine the fate of the effluent plume from Southwest Pass.

494. Wiseman, W.J., Jr., V.J. Bierman, Jr., N.N. Rabalais, and R.E. Turner. 1991. Physical structure of the Louisiana shelf hypoxic region, pp. 21-26. In Nutrient Enhanced Coastal Ocean Productivity. Publication number TAMU-SG-92-109, Sea Grant Program, Texas A&M University, Galveston, Texas.

Time and length scale variability of water circulation and stratification patterns over the west Louisiana-Texas inner shelf are discussed in relation to the presence of summer hypoxia.

495. Wiseman, W.J., Jr. and S.P. Dinnel. 1988. Shelf currents near the mouth of the Mississippi River. Journal of Physical Oceanography 18: 1287-1291.

This paper suggests that minimal flow occurs around the front of the Mississippi River delta during normal conditions. The observed currents exhibit variations on time scales of days to months. Much of this variability is attributed to an intrusion of the Loop current into the northern Gulf of Mexico during the deployment.

496. Wiseman, W.J., Jr., S.P. Murray, J.M. Bane, and M.W. Tubman. 1982. Temperature and salinity variability within the Louisiana Bight. Contributions in Marine Science 25: 109-120.

The purpose is to characterize the hydrography of the inner continental shelf immediately west of Southwest Pass, the Louisiana Bight, and the interactions of freshwater discharge with physical processes affecting that hydrography. Data collected during June 1973 and April 1974, following 50-yr flood in 1973. Differences between mixing patterns of Texas shelf waters and those of Louisiana Bight are noted.

497. Wright, L.D. and J.M. Coleman. 1971. Effluent expansion and interfacial mixing in the presence of a salt wedge, Mississippi River delta. Journal of Geophysical Research 76: 8649-8661.

Describes the mode of river effluent expansion and deconcentration in the zone immediately seaward of the mouth of the Mississippi River at South Pass. These processes are fundamental to determining deposition and development of subaqueous river mouth and prodeltaic morphology. Effluent expansion is primarily a response to the buoyancy of the lighter river water in south pass.

498. Zetler, B.D. and D.V. Hansen. 1972. Tides in the Gulf of Mexico, pp. 265-275. In L.R.A. Capurro and J.L. Reid. Contribution on the Physical Oceanography of the Gulf of Mexico. Gulf Publishing Company, Houston, TX.

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 tide in the nearby Atlantic Ocean with amphidromic points in the Florida Strait near Miami and in Yucatan Channel.

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499. Arnold, E.L., Jr. 1958. Gulf of Mexico plankton investigations, 1951-53. U.S. Dept. of the Interior, Fish and Wildlife Service 269.

An extensive two years survey from March 1951 to July 1953 of Gulf of Mexico plankton is presented. Emphasis was put on plankton distribution related to hydrography in deeper waters than shallow inshore areas.

500. Balech, E. 1967. Dinoflagellates and tintinnids in the northeastern Gulf of Mexico. Bulletin of Marine Science 17: 280-298.

Plankton collected between May and September 1964 in the northeastern Gulf of Mexico gave about 115 species of dinoflagellates and 55 species of tintinnids, recorded for the first time in this region.

501. Bert, T.M. and H.J. Humm. 1979. Checklist of the marine algae on the offshore oil platforms of Louisiana, pp. 437-446. In C.H. Ward, M.E. Bender, and D.J. Reish. The Offshore Ecology Investigation. William Marsh Rice University, Houston, TX.

Research results of the OEI describing the distribution and community composition of marine macro algae on oil platforms in the study region.

502. Bianchi, T.S., C. Lambert, and D.C. Biggs. 1995. Distribution of chlorophyll a and phaeopigments in the northwestern Gulf of Mexico: a comparison between fluorometric and high-performance liquid chromatography measurements. Bulletin of Marine Science 56: 25-32.

The authors compare the use of HPLC and fluorometric methods for analysis of chlorophyll a, b and c and, phaeopigments. The former appeared to provide more accurate measurements both in the inner and outer shelf.

503. Bogdanov, D.V., V.A. Sokolov, and N.S. Khromov. 1968. Regions of high biological and commercial productivity in the Gulf of Mexico and Caribbean sea. Oceanology 8: 371-381.

In this article hydrological and hydrochemical conditions, plankton distribution, and the commercial possibilities of the common species of fishes in the Gulf of Mexico and the Caribbean Sea are discussed. Certain recommendations are made on commercial possibilities in certain productive regions in the Gulf of Mexico and the Caribbean Sea.

504. Conger, P. 1954. Present status of diatom studies in the Gulf of Mexico. Fishery Bulletin No 89. 55: 227-232.

Summary of existing information on the occurrence of diatoms in the Gulf of Mexico.

505. Davis, C.C. 1954. Phytoplankton of the Gulf of Mexico. Fishery Bulletin No 89. 55: 163-169.

This paper is a review of previous studies on phytoplankton and macroalgae in the Gulf of Mexico. The author gives some recommendations for further investigations.

506. Dortch, Q. and T.T. Packard. 1989. Differences in biomass structure between oligotrophic and eutrophic marine ecosystems. Deep-Sea Research 36: 223-240.

The authors discuss in this paper the proportion of plant and non-plant biomass, integrating the plankton of eutrophic and oligotrophic areas, in function of the chlorophyll a/protein ratio of the particulate organic matter, a relative index of phytoplankton to total biomass. They indicate that ecosystem structure must be different between eutrophic and oligotrophic areas.

507. Dortch, Q. and T.E. Whitledge. 1992. Does nitrogen or silicon limit phytoplankton production in the Mississippi River plume and nearby regions. Continental Shelf Research 12: 1293-1309.

Phytoplankton was not nitrogen limited in the area of the Mississippi River plume. Silica was more likely a limiting nutrient than nitrogen, resulting in changes in phytoplankton size and species composition, and ultimately influencing trophodynamics, regeneration, the fate of carbon, and the severity and extent of hypoxia.

508. Ednoff, M.E. 1974. Surface phytoplankton communities and their relationship to the loop current in the Gulf of Mexico. Master Thesis. Florida State University. Tallahassee, Fl. 187 pp.

Surface phytoplankton samples were collected along transects in the Florida Straits, Yucatan Straits and open Gulf of Mexico. High species diversity and cell concentrations were observed in February. Minimum values were recorded in June and July. *Rhizozsolenia alata* was the most abundant diatom in the Gulf surface waters during summer of 1973.

509. Edwards, P. and D.F. Kapraun. 1973. Benthic marine algal ecology in the Port Aransas, Texas area. Contributions in Marine Science 17: 15-52.

The benthic marine algal flora in the vicinity of the University of Texas Marine Science Institute at Port Aransas, was considered in terms of spatial and seasonal distribution of the species. Correlations were sought between the observed distribution of each local species in the area and various environmental factors.

510. Eiseman, N.J. and S.M. Blair. 1982. New records and range extensions of deepwater algae from east Flower Garden bank, northwestern Gulf of Mexico. Contributions in Marine Science 25: 21-26.

The authors give a benthic algae species inventory of the Gulf of Mexico, made with a research submersible. Some of the species were reported for the first time in the Gulf of Mexico.

511. Franceschini, G.A. and S.Z. El-Sayed. 1968. Effect of hurricane Inez (1966) on the hydrography and productivity of the western Gulf of Mexico. Deutsche Hydrogr. Z. 21: 193-202.

512. Fucik, K.W. 1974. The effect of petroleum operations on the phytoplankton ecology of the Louisiana coastal water. Texas A&M University. 81 pp.

513. Fucik, K.W. and S.Z. El-Sayed. 1979. Effect of oil production and drilling operations on the ecology of phytoplankton in the OEI study area, pp. 325-353. In C.H. Ward, M.E. Bender, and D.J. Reish. The Offshore Ecology Investigation. William Marsh Rice University, Houston, TX.

Research results of the OEI describing phytoplankton community composition, biomass, and productivity along with nutrient concentrations in the study region. Nutrient concentrations seem suspect with very high concentrations (200 mg-at NO_3/L).

514. Graham, H.W. 1954. Dinoflagellates of the Gulf of Mexico. Fishery Bulletin No 89. 55: 223-226.

Summary of existing information on the occurrence of dinoflagellates in the Gulf of Mexico.

515. Gunter, G. 1951. Mass mortality and dinoflagellate blooms in the Gulf of Mexico. Science 113: 250-251.

The author discusses the occurrence of *Gonyaulax* blooms in the Gulf of Mexico, responsible for large mass mortality of fishes, as a recurring phenomena over the years.

516. Gunter, G. and C.H. Lyles. 1979. Localized plankton blooms and jubilees on the Gulf coast. Gulf Research Reports 6: 297-299.

A short description of plankton blooms related to fish killing in localized places of the Gulf of Mexico coast is given. Two phytoplankton genera *Chaetoceros* and *Gonyaulax* are mentioned as organisms involved in these plankton blooms. Runoff after a heavy rain could be associated to the appearance of these blooms.

517. Hawes, S.R. and H.M. Perry. 1978. Effects of 1973 floodwaters on plankton populations in Louisiana and Mississippi. Gulf Research Reports 6: 109-124.

Studies to assess the impact of floodwater diversion on plankton populations in coastal waters of Mississippi and Louisiana were conducted by the authors. Data are presented on changes in species composition of zooplankton subsequent to the opening of floodways in these areas.

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

Chlorophyll maxima distribution were studied in the Atlantic Ocean and Gulf of Mexico. There seems to be a relationship between chlorophyll maxima and pycnoclines. Light adaptation may be related to chlorophyll maxima variability, and a possible relationship of this layer to microzooplankton abundance is discussed.

519. Ivanov, A.I. 1966. Some data on phytoplankton of the Gulf of Mexico and Florida Strait, pp. 81-90. Studies on the Central American Seas.

520. Iverson, R. L. and T. L. Hopkins. 1979. A summary of knowledge of plankton production in the Gulf of Mexico: recent phytoplankton and zooplankton research. In Proceedings of Symposium of Environmental Research Needs in the Gulf of Mexico. Key Biscayne, Fl.

521. Justic, D., N.N. Rabalais, R.E. Turner, and W.J. Wiseman, Jr. 1993. Seasonal coupling between riverborne nutrients, net productivity, and hypoxia. Marine Pollution Bulletin 26: 184-189.

The authors demonstrate a close coupling between riverborne nutrients, net productivity and hypoxia in the northern Adriatic Sea and the northern Gulf of Mexico. Anthropogenic nutrient loads in their major rivers, Po River and Mississippi River respectively, can easily overcome the homeostatic potential of a coastal marine ecosystem.

522. Kamykowski, D. and J.L. Bird. 1981. Phytoplankton associations with the variable nepheloid layer on the Texas continental shelf. Estuarine, Coastal and Shelf Science 13: 317-326.

The nepheloid layer of Texas continental shelf was sampled during June, July, September, and November 1978 at a fixed station for 24-h. Physico-chemical characteristics of this layer was related to phytoplankton biomass and its ecological importance to higher trophic levels.

523. Kapraun, D.F. 1974. Seasonal periodicity and spatial distribution of benthic marine algae in Louisiana. Contributions in Marine Science 18: 139-167.

An investigation was conducted of the seasonal and spatial distribution of benthic marine algae from several locations differing in respect to salinity, wave action and substrate. The respiration/photosynthesis ratio for the area is compared with other Gulf and Atlantic floras, and the nature and affinity of the local flora are discussed. This article includes some taxonomic studies on the benthic algae, and 31 new records for Louisiana.

524. Khromov, N.S. 1969. Distribution of plankton in the Gulf of Mexico and some aspects of its seasonal dynamics, pp. 36-56. In A.S. Bogdanov. Soviet-Cuban Fishery Research. Jerusalem.

A comprehensive survey of plankton distribution in the Gulf of Mexico between 1962 and 1964 is presented. Gulf of Mexico is poor in plankton, but localized areas on the shelf showed a rich abundance of plankton. These areas are northern part of the western Florida shelf, and areas east and west of the mouth of the Mississippi.

525. Lasker, R. and F.G.W. Smith. 1954. Red tide. Fishery Bulletin No 89. 55: 173-176.

Occurrence of red tides and fish mortalities in the Gulf of Mexico.

526. Lawler, A.R. 1980. Studies of *Amyloodinium ocellatum* (Dinoflagellata) in Mississippi Sound: natural and experimental hosts. Gulf Research Reports 6: 403-413.

This study describes the occurrence of the parasitic dinoflagellate *Amyloodinium ocellatum* in fishes of the Mississippi Sound, the characteristics of the infection and mortality rates.

527. Lohrenz, S.E., M.J. Dagg, and T.E. Whitledge. 1990. Enhanced primary production at the plume/oceanic interface of the Mississippi River. Continental Shelf Research 10: 639-664.

Mechanistics and empirical models were used to examine relationships between primary production and environmental variables along the Mississippi River plume/oceanic gradient off Southwest Pass during April 1988. A large portion of variation in primary production could be explained by light availability and biomass. Production was controlled by nutrient supply at salinities above 30 ‰.

528. Lohrenz, S.E., G.L. Fahnenstiel, and D.G. Redalje. 1994. Spatial and temporal variations of photosynthetic parameters in relation to environmental conditions in coastal waters of the northern Gulf of Mexico. Estuaries 17: 779-795.

On a series of eight cruises conducted in the northern Gulf of Mexico in the vicinity of the Mississippi River plume, efforts were made to characterize temporal and spatial variability in parameters of the photosynthesis-irradiance saturation curve and to relate the observed variations to environmental conditions (such as temperature, nutrients, salinity, turbidity, mixed layer depth).

529. Lohrenz, S.E., D.G. Redalje, G.L. Fahnenstiel, and G.A. Lang. 1991. Regulation and distribution of primary production in the northern Gulf of Mexico, pp. 95-104. In Nutrient Enhanced Coastal Ocean Productivity. Publication number TAMU-SG-92-109, Sea Grant Program, Texas A&M University, Galveston, Texas.

This study reports the regulation and distribution of phytoplankton production, growth, and photosynthesis associated to levels of nutrients in coastal Gulf of Mexico waters affected by the Mississippi River outflow.

530. Lowe, G.C., Jr. and E.R. Cox. 1978. Species composition and seasonal periodicity of the marine benthic algae of Galveston Island, Texas. Contributions in Marine Science 21: 9-24.

Sampling of benthic algae from selected sites on Galveston Island, Texas, was carried out to determine species composition and seasonal periodicity of the communities. Results of the study regarding species composition are compared to similar Gulf coast studies.

531. Madden, C.J., J.W. Day, Jr., and J.M. Randall. 1988. Freshwater and marine coupling in estuaries of the Mississippi River deltaic plain. Limnology and Oceanography 33: 982-1004.

A comparison of three estuaries, Atchafalaya Bay, Fourleague Bay and Barataria Bay, offers an excellent opportunity to observe coupling of freshwater and marine environments at the extremes of their scale of interaction. The authors suggest that deltaic ecosystems are centers of high production throughout their life cycles. Through adjustments in the interaction of morphology, chemistry, and biology, high production is maintained throughout the life cycle of a delta lobe; evolution of the delta allows efficient exploitation of the changing river and marine subsidies.

532. Marshall, N. 1956. Chlorophyll a in the phytoplankton in coastal waters of the eastern Gulf of Mexico. Journal of Marine Research 15: 14-32.

Chlorophyll a was surveyed twice a month during one year in coastal waters of the eastern Gulf of Mexico. Phytoplankton species composition is also presented. Light history of natural phytoplankton cells was explored with light and dark bottles.

533. Ortner, P.B., R.L. Ferguson, S.R. Piotrowicz, L. Chesal, L. Berberian, and A.V. Palumbo. 1984. Biological consequences of hydrographic and atmospheric advection within the Gulf Loop intrusion. Deep-Sea Research 31: 1101-1120.

Changes in plankton productivity, abundance, vertical distribution, and relative sensitivity to added copper are discussed in terms of hydrographic and atmospheric advection within the Gulf Loop intrusion in the Gulf of Mexico during February 1981.

534. Pecora, R.A. 1980. Observations on the Genus *Vaucheria* (Xanthophyceae, Vaucheriales) from the Gulf of Mexico. Gulf Research Reports 6: 387-391.

Habitat preference, distribution, and morphology of the genus Vaucheria (Xanthophyceae, Vaucheriales) were surveyed along the Gulf of Mexico from February 1979 to February 1980. Five species of Vaucheria are first reports for the Gulf of Mexico coastal region, and one is reported for the first time in North America from coastal Mississippi.

535. Perry, H.M., K.C. Stuck, and H.D. Howse. 1979. First record of a bloom of *Gonyaulax monilata* in coastal waters of Mississippi. Gulf Research Reports 6: 313-316.

Data are presented on a bloom of the toxic dinoflagellate *Gonyaulax monilata* in coastal waters of Florida, Alabama, Mississippi and Louisiana. The paper documents the first record of a bloom of this species in Mississippi Sound and adjacent Gulf of Mexico.

536. Randall, J.M. and J.W. Day, Jr. 1987. Effects of river discharge and vertical circulation on aquatic primary production in a turbid Louisiana (USA) estuary. Netherlands Journal of Sea Research 21: 231-242.

Aquatic primary production spatial and seasonal patterns in Fourleague Bay, was found to be strongly influenced by the Atchafalaya River discharge. At low salinities, production was light-limited because of the extreme turbidity of the river water. At high salinities, production declined, apparently due to nitrogen limitation.

537. Ray, S.M. and D.V. Aldrich. 1966. Ecological interactions of toxic dinoflagellates and molluscs in the Gulf of Mexico, pp. 75-83. In F.E. Russell and P.R. Saunders. Animal Toxins. Pergamon Press, New York, NY.

Laboratory experiments of shellfish with red tide forming dinoflagellates were performed to explained the scarcity of shellfish poisoning in the Gulf of Mexico. The infrequent incidence of toxic dinoflagellates blooms and failure of molluscs to filter them were suggested as the main cause of shellfish poisoning scarcity.

538. Redalje, D.G., S.E. Lohrenz, and G.L. Fahnenstiel. 1994. The relationship between primary production and the vertical export of particulate organic matter in a river-impacted coastal ecosystem. Estuaries 17: 829-838.

Part of continuing effort to examine the temporal variability in the relationship between depth integrated primary productivity and the export of POM from the euphotic zone of the Mississippi River plume region. Zonal rates of primary production during four cruises in the region are given along with vertical transport of POM from the water column.

539. Riley, G.A. 1937. The significance of the Mississippi River drainage for biological conditions in the northern Gulf of Mexico. Journal of Marine Research 1: 60-74.

The large amount of phosphorus carried by the Mississippi River stimulated marine primary and secondary production around the mouth of the River. However, the zone of high primary production and high phosphorus content do not exactly coincide. The author suggested that there must be another nutrient in the river water which is a limiting factor in this region.

540. Simmons, E.G. and W.H. Thomas. 1962. Phytoplankton of the eastern Mississippi Delta. Publication of the Institute of Marine Sciences 8: 269-298.

Phytoplankton populations at the Mississippi River delta are described in relation to meteorological and hydrological conditions. The phytoplankton species composition changed from riverine to seawater locations.

541. Sklar, F.H. and R.E. Turner. 1981. Characteristics of phytoplankton production off Barataria Bay in an area influenced by the Mississippi River. Contributions in Marine Science 24: 93-106.

Seasonal changes in the Mississippi riverflow volume altered the nutrient supply, water color, turbidity and salinity/temperature regimes in the coastal waters off Barataria Bay. Changes in nutrient concentrations were indicative of nitrogen limitation in this area.

542. Smith, S.M. 1993. Nutrient regulation of phytoplankton on the Louisiana shelf. Master Thesis. University of Miami. Miami, Fl.

543. Smith, S.M. and G.L. Hitchcock. 1994. Nutrient enrichments and phytoplankton growth in the surface waters of the Louisiana Bight. Estuaries 17: 740-753.

Bioassays were performed with nutrient additions to surface waters collected from the Louisiana shelf to examine the potential for specific nutrient limitation. Experiments were conducted in March and September 1991, and May 1992.

544. Steele, J.H. 1964. A study of production in the Gulf of Mexico. Journal of Marine Research 22: 211-222.

The authors give theoretical reasons to show that midwater chlorophyll maxima may be due to an increase in the chlorophyll content of the phytoplankton rather than to an accumulation of primary producers due to sinking. Data from the Gulf of Mexico were used to support this explanation.

545. Thomas, W.H. and E.G. Simmons. 1960. Phytoplankton production in the Mississippi Delta, pp. 103-116. In F.P. Shepard, F.B. Phleger, and T.H.Van Andel. Recent sediments, northwest Gulf of Mexico. The American Association of Petroleum Geologists, Tulsa, Oklahoma.

Phytoplankton production and species composition and, hydrological and chemical parameters at the Mississippi River delta, are discussed in this paper. Phytoplankton production increased during high river discharge periods. Primary producers, most likely limited by nitrogen, were not an important contributor to organic carbon in the sediment.

546. Turner, R.E. and R.L. Allen. 1982. Plankton respiration rates in the bottom waters of the Mississippi River Delta bight. Contributions in Marine Science 25: 173-179.

The authors measured community plankton respiration rates in the bottom waters of the Mississippi River Delta bight. They concluded that low oxygen values were influenced by sinking phytoplankton, benthic respiration, and water stratification. The nepheloid layer appeared to have a minor importance in the oxygen consumption rates.

547. Turner, R.E., S.W. Woo, and H.R. Jitts. 1979. Estuarine influences on a continental shelf plankton community. Science 206: 218-220.

The authors reported that the gross zooplankton community of the South Carolina and Georgia continental shelf, was dominated by couplings with the local estuaries and shallow nearshore zone.

548. Zernova, V.V. 1970. On phytoplankton in the Gulf of Mexico and Caribbean Sea. Oceanography Research 20: 69-104.

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549. Burke, W.D. 1975. Pelagic cnidaria of Mississippi Sound and adjacent waters. Gulf Research Reports 5: 23-38.

Investigations were made in Mississippi Sound and adjacent waters from March 1968 through March 1971 to record the occurrence and seasonality of planktonic cnidarians. Sixty-one species of cnidarians were collected from Mississippi Sound and the adjacent Gulf of Mexico. Open Gulf waters south of a barrier islands displayed considerably greater faunal diversity than the relatively impoverished sound. Present in the samples were 26 species of hydromedusae, 25 species of siphonophores, and 10 species of scyphomedusae.

550. Cummings, J.A. 1983. Habitat dimensions of calanoid copepods in the western Gulf of Mexico. Journal of Marine Research 41: 163-188.

The vertical distributions of 49 species (53 taxa) of calanoid copepods were determined in cyclonic and anticyclonic hydrographic features in the western Gulf of Mexico for three seasons of the year. It is proposed in this study that on a broad scale the observed constancy of copepod species and vertical spatial structure is related to the "nutrient-limited" and "light-limited" physiological regimens documented for oceanic phytoplankton species.

551. Dagg, M.J. 1988. Physical and biological responses to the passage of a winter storm in the coastal and inner shelf waters of the northern Gulf of Mexico. Continental Shelf Research 8: 167-178.

Laboratory experiments were conducted to determine whether biological responses sufficient to affect intermediate trophic levels such as zooplankton or ichthyoplankton could occur on the time scale of winter storms on the northern Gulf of Mexico. Nearshore waters were monitored over a 3 day period immediately after the passage of a maritime Polar cold front to measure some of the physical and biological response. No biological responses were observed at the copepod level in this study.

552. Dagg, M.J., P.B. Ortner, and F. Al-Yamani. 1987. Winter-time distribution and abundance of copepod nauplii in the northern Gulf of Mexico. Fishery Bulletin 86: 319-330.

According to the present study, large freshwater inflow of the Mississippi River during the wintertime spawning period of the Gulf menhaden contributes to the feeding success and survival of larval fish by providing physical stratification which in turn results in a vertical stratification of phytoplankton and microzooplankton in layers or patches of relatively high concentrations.

553. Dagg, M.J. and T.E. Whitledge. 1991. Concentrations of copepod nauplii associated with the nutrient-rich plume of the Mississippi River. Continental Shelf Research 11: 1409-1423.

During spring and summer, discharge plumes of the Mississippi River were located visually by water color. Temperature, salinity, nutrients, chlorophyll a and copepod nauplii were sampled coincidentally in a cross-plume direction. Strong seasonality in zooplankton production is suggested, with greatest production in summer.

554. Deevey, E.S., Jr. 1950. Hydroids from Louisiana and Texas, with remarks on the pleistocene biogeography of the western Gulf of Mexico. Ecology 31: 334-367.

Examination of two small collections of marine hydroids, mostly from Texas, has yielded results of interest quite out of proportion to the size of the collections and the number of species identified. The hydroid fauna of Texas and Louisiana, so far as it is now known, is dominated numerically by tropical and subtropical species. A

significant proportion of species, however, are of boreal rather than tropical distribution.

555. Fleminger, A. 1956. Taxonomic and distributional studies on the epiplankton calanoid copepods (Crustacea) of the Gulf of Mexico. Ph.D.Thesis. Harvard University. Cambridge, Mass.

556. Gunter, G. and R.A. Geyer. 1955. Studies on fouling organisms of the northwest Gulf of Mexico. Publications of the Institute of Marine Science 4: 38-67.

The work reported here was carried out on the Louisiana and Texas coast between July 1949 and February 1950. Barnacles, a fuzz of hydroids, the horse oyster, *Ostrea equetris* and the bryozoan, *Acanthodesia*, dominated the complex on the lower 25 feet of the Texas platforms. Common oysters, *Crassostrea virginica*, were present at upper levels. The Louisiana platforms were similar, except that one had no oyster, and the other had *C. virginica* at upper levels with *O. equestris* and *O. frons*, the tree oyster., at lower levels.

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This paper discusses the occurrence of *Sagita friderici* in the northern Gulf of Mexico, and the methods currently used to separate the species from *S. tenuis*. This work is based, in part, on a thesis concerning the distribution of chaetognaths in the northeastern Gulf of Mexico.

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This study examines in detail the temporal and spatial distributional patterns for major groups of zooplankton and common species of calanoid and cyclopoid copepods. The relationships between the densities of these groups and various physical and chemical factors were also examined.

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Nemopsis bachei was collected or observed on a number of occasions during the years 1958 through 1960. *N. bachei* was found to be an abundant species in the northern Gulf of Mexico. It ranges from Florida to Texas, and appears in the plankton from January to May.

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This paper is a review of previous studies on zooplankton of the Gulf of Mexico. The author gives some recommendations for further investigations.

563. Ortner, P.B., L.C. Hill, and S.R. Cummings. 1989. Zooplankton community structure and copepod species composition in the northern Gulf of Mexico. Continental Shelf Research 9: 387-402.

Zooplankton community structure and copepod species composition are analyzed in samples obtained during spring and winter from three areas of the northern Gulf of Mexico: near the Mississippi River outflow, off Cape San Blas, and in the central Gulf of Mexico.

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Variability in zooplankton samples was examined to identify a proper sampling design for unbiased zooplankton abundance estimation. Samples were selected in the nearshore about 16 km south of Louisiana during one night and 2 days in October 1985 using a 1 m^2 multiple opening/closing net and environmental sensing system fitted with 0.333 mm mesh nets.

566. Park, T.S. 1970. Calanoid copepods from the Caribbean Sea and Gulf of Mexico. 2. New species and new records from plankton samples. Bulletin of Marine Science 20: 472-546.

Twenty-eight new species of calanoid copepods and the male of *Bathypontia minor* (Wolfenden, 1906) are described from specimens found in vertically collected samples of plankton obtained in the Caribbean sea and Gulf of Mexico. Diagnoses or systematic remarks are presented for 16 other species of calanoid copepods. Fifty-eight species of calanoid copepods not previously known from the Caribbean Sea and Gulf of Mexico are reported. A key is included for the identification of the species of *Spinocalanus*.

567. Phillips, P.J. and W.D. Burke. 1970. The occurrence of sea wasps (Cubomedusae) in Mississippi Sound and the northern Gulf of Mexico. Bulletin of Marine Science 20: 853-859.

Two species of Cubomedusae, *Chiropsalmus quadrumanus* and *Tamoya haplonema* are reported from the northern Gulf of Mexico in Mississippi coastal waters. *C quadrumanus* was commonly taken in Mississippi Sound in August and September. Conditions of high salinity and temperature in Mississippi Sound probably allow the development of populations of these bottom-dwelling medusae in the estuary.

568. Phleger, F.B. 1960. Sedimentary patterns of microfaunas in northern Gulf of Mexico, pp. 267-301. In F.P. Shepard, F.B. Phleger, and T.H.Van Andel. Recent sediments, northwestern Gulf of Mexico. American Association of Petroleum Geologists, Tulsa, Oklahoma.

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571. Stuck, K.C., H.M. Perry, and A.G. Fish. 1980. New records of Hyperiidea (crustacea: amphipoda) from the north central Gulf of Mexico. Gulf Research Reports 6: 359-370.

Records of 54 species of amphipods of the suborder Hyperiidea from the Gulf of Mexico are presented. The first time forty-seven species are recorded from the Gulf. Previous records of occurrence in the Gulf of Mexico, Caribbean Sea, and associated North Atlantic waters are provided for each species.

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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 **Royalty Management Program** 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.