

Table S1. Major events in the early Spanish exploration of the Gulf of Mexico.

1513	Ponce de León explores east coast of Florida, Florida Keys, and Dry Tortugas.
1517	Francisco Hernández de Córdoba explores northern and northwestern coasts of Yucatán to Champotón at the entrance to the Bay of Campeche.
1518	Juan de Grijalva explores southern and southwestern coasts of the Gulf of Mexico northward to near Tampico.
1519	Hernán Cortés repeats the route of Grijalva, mapping in greater detail and continuing up the coast, and discovers the Río Pánuco (at Tampico). From a base at Veracruz he proceeds inland to conquer the Aztec empire in 1521.
1519	Álvarez de Piñeda explores northern and western shores of the Gulf down to Veracruz. He discovers the mouth of the Mississippi River, which he names "Río de Espíritu Santo." He provides detailed maps of the northern and western Gulf.
1527	Núñez Cabeza de Vaca and three companions are shipwrecked in the northern Gulf and make land around Galveston, Texas, where they are captured by the local Indians. They gradually wander westward. After eight years they encounter other Spaniards in northwestern Mexico. Cabeza de Vaca's journal, published in 1542, provides a detailed account of the lands and peoples encountered during his journey.
1539–43	In his quest for the Fountain of Youth, Hernando de Soto lands at Tampa Bay in 1539. His expedition takes him through parts of what are now Florida, Georgia, South Carolina, Tennessee, Alabama, Mississippi, Arkansas, and Louisiana. Following his death in 1542, his followers commit him to a watery grave in the Mississippi River and then float down the river to its mouth.

Table S2. Establishment of political boundaries of lands surrounding the Gulf of Mexico.

- 1521 Cortés conquers Aztecs and claims Mexico for Spain. After subsequent explorations, Spain claims all lands bordering the Gulf of Mexico.
- 1682 Following the explorations of Marquette and Jolliet, who ten years earlier had come from Canada down the Mississippi River as far as the Arkansas River, René-Robert Cavelier, Sieur de La Salle explores the Mississippi to its mouth and claims the entire Mississippi River Valley for France. Later, authorized by the French king to continue his explorations and to colonize the lower river, in 1684 he returns to the northern Gulf but misses the river mouth and lands at Matagorda Bay on the central Texas coast. From this small settlement he searches in vain for the mouth of the Mississippi River. He is eventually murdered by his own men, and the colony does not survive.
- 1718 Two decades after establishing settlements at Mobile and Biloxi, the French under the leadership of Jean-Baptiste le Moyne, Sieur de Bienville found the city of New Orleans and claim lands surrounding the mouth of the Mississippi River. France eventually settles Louisiana, and the Sabine River, which separates Louisiana from Texas, becomes the border between Spanish claims to the west and French claims to the east.
- 1763 At the end of the Seven Years' War in Europe (French and Indian War in America), Louisiana is ceded to Spain by France, and Florida is ceded to Great Britain by Spain.
- 1783 At the end of the American Revolutionary War, Florida is ceded back to Spain by Great Britain.
- 1800 Under pressure from Napoleon, Louisiana is ceded back to France by Spain.

- 1803 Unable to protect French claims in the New World and needing money, Napoleon sells Louisiana to the United States (the Louisiana Purchase).
- 1815 During its first two years, the War of 1812 produces no decisive results. Following the defeat of Napoleon in 1814, the British send an expedition of about 7,500 veteran troops to capture New Orleans. With a much smaller force consisting of Tennessee regulars, Kentucky sharpshooters, and local volunteers, Andrew Jackson defends the city. On January 8, 1815, the British attack and in a brief battle lose nearly a third of their troops, including many of the officers. A few days later the British withdraw. This victory decisively secures America's hold on the lands ceded by the Louisiana Purchase and opens the vast western territory to American settlement.
- 1819 The United States purchases Florida from Spain. At this time Florida includes the peninsula as well as the panhandle, which extends westward to the Mississippi River.
- 1821 By revolution Mexico wins its independence from Spain.
- 1836 The Republic of Texas is established following its successful War of Independence from Mexico. Texas considers its southern border to be the Rio Grande, but Mexico considers it to be at the Nueces River (near Corpus Christi).
- 1845 The United States annexes Texas.
- 1849 At the conclusion of the US-Mexican War, the southern boundary of Texas is firmly established at the Rio Grande.
- 1861–65 Following the outbreak of the Civil War, the state of Louisiana secedes from the Union on January 26, 1861, and after existing for nine days as an independent republic, it joins the Confederate States of America. Shortly thereafter, the Union establishes a naval blockade of southern ports and terminates the import/export trade

from the Mississippi and other rivers of the northern Gulf. In April 1862 the city of New Orleans falls, and for the remainder of the war it is occupied by Union troops.

1898 In the Spanish-American War, interceding on the side of the rebels, the United States helps Cuba win its independence from Spain.

Table S3. Prominent hydrographic and biological investigations of the Gulf of Mexico during the period of early scientific studies (1839–1939).

Date	Ship	Explorations
Hydrographic Investigations		
1839	<i>Vandalia</i>	Hydrographic explorations from Galveston, Texas, to the Mississippi River Delta. Sponsored by the US Navy.
1846–1860		Investigations of the Gulf Stream including observations in the Straits of Florida. Sponsored by the US Coast Survey.
1905		US Navy Hydrographic Office begins supplying all vessels with forms for daily logging of hydrographic and atmospheric information. First data summary published in 1914.
1932	<i>Mabel Taylor</i>	Physical oceanographic expedition to study currents and vertical structure of the water column. Eighty-seven stations made throughout the Gulf with physical profiles of the water column to a depth of 3,000 m. Sponsored by the Bingham Oceanographic Foundation of Yale University.
1934	<i>Atlantis</i>	Hydrographic observations in the Yucatán Channel and Straits of Florida. Sponsored by Woods Hole Oceanographic Institution and Bingham Oceanographic Foundation.

Table S4. Major broad-scale and interdisciplinary investigations of the Gulf of Mexico since 1960 sponsored by federal or state agencies. Abbreviations: BLM (Bureau of Land Management), DOE (Department of Energy), EPA (Environmental Protection Agency), MMS (Minerals Management Service), NMFS (National Marine Fisheries Service), and USGS (US Geological Survey). Note: MMS was formed in 1981–82 by a merger of units from the BLM and USGS.

- 1961–1965 NMFS. Northern Gulf Survey. Rio Grande to Mobile Bay. Monthly transects across the continental shelf to study hydrography, plankton, and demersal shrimp and fish populations.
- 1965–1967 State of Florida. Hourglass Cruises. Monthly transects across Florida shelf off Tampa Bay and Charlotte Harbor. Studies included hydrography, plankton, and benthic fauna (sampled by trawls, dredges, traps, plankton nets, and hand-lines).
- 1972–1974 Gulf Universities Research Corporation. Offshore Ecological Investigations. Louisiana bays and inner shelf. Studies of sedimentology, hydrography, microbiology, plankton, benthic flora and fauna, biofouling communities, trace metals, and hydrocarbons.
- 1974–1979 BLM. Mississippi-Alabama-Florida Baseline Study (MAFLA). Continental shelf off Mississippi, Alabama, and Florida. Studies of sedimentology, geological mapping, hydrography, plankton, neuston, benthos, demersal fishes, and trace metals and hydrocarbons (in water column, sediments, and biota).
- 1975–1980 BLM. South Texas Outer Continental Shelf Baseline Study (STOCS). Transects off south Texas (Rio Grande to Matagorda Bay). Studies included sedimentology, geologic mapping, hydrography, plankton, neuston, benthos, demersal fishes,

histopathology, and trace metals and hydrocarbons (in water, sediment, and biota).

- 1975–1985 BLM/MMS. Topographic Features Program. Study of submarine banks off Texas, Louisiana, and Florida (Florida Middle Ground). Geologic mapping and hydrographic and biological surveys.
- 1977–1980 NMFS, EPA. Buccaneer Gas and Oil Field Program. Inner shelf off Galveston, Texas. Studies included sedimentology, hydrography and circulation, benthos, biofouling, artificial reef investigation, and toxicology.
- 1978–1981 BLM. Central Gulf Outer Continental Shelf Platform Study. Louisiana continental shelf. Studies included sedimentology, microbiology, benthos, trace metals and hydrocarbons (in water, sediments, and biota), histopathology, and platforms as artificial reefs.
- 1980–1987 BLM/MMS. Southwest Florida Shelf Marine Ecosystems Study. Continental shelf off southwest Florida from Fort Myers to 25th parallel (below the Everglades). Studies included sedimentology, geologic mapping, hydrography, biological survey, benthos, biological processes, and productivity.
- 1981–1985 DOE. Strategic Petroleum Reserve Studies. Nearshore shelf off Cameron, Louisiana; and Freeport, Texas. Studies included hydrography, plankton, benthos, demersal fishes, and sediment chemistry.
- 1981–1988 BLM/MMS. Northern Gulf Continental Slope Study. Outer continental shelf and upper continental slope, northeastern Gulf. Studies included biological surveys, benthos, and chemosynthetic communities.

- 1987–1991 MMS. Mississippi-Alabama Shelf Marine Ecosystems Study. Continental shelf from Mississippi River Delta to DeSoto Canyon. Studies included geologic mapping and hydrographic and biological surveys.
- 1991–1995 MMS. Chemosynthetic Ecosystems Study. Northern Gulf continental slope. Studies included geology and geochemistry of hydrocarbon seep sites as well as composition of chemosynthetic communities and growth rates of the dominant animals.
- 1996–2001 USGS, MMS. Mississippi/Alabama Pinnacle Trend Ecosystem Monitoring. Mississippi/Alabama continental shelf. Studies included the geology and hydrography of nine carbonate banks as well as the associated hard-bottom and fish communities and recruitment of hard-bottom species.
- 1999–2005 MMS. Deepwater Program: Northern Gulf of Mexico Continental Slope and Benthic Ecology. Northern Gulf continental slope. Studies included the physics and chemistry of the water column and sediments at selected sites on the continental slope. Also included were the composition and dynamics of the bottom and near-bottom biota.
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1937 *Atlantis* Studies of submarine topography and geology at 551 stations in the western Gulf, mostly in very deep water. Sponsored by Woods Hole Oceanographic Institution and the Geological Society of America.

Biological Investigations

1850–1880 Biological survey of Florida coral reefs by Louis Agassiz. Sponsored by the US Coast Survey.

1867, 1868 *Corbin, Bibb* Dredging for bottom fauna between Florida and Cuba to depths of 1,500 m. Sponsored by the US Coast Survey.

1872–1878 *Blake* Extensive dredging for bottom fauna off north and west coasts of Cuba, west Florida shelf, and north of Yucatán to depths of 3,658 m. Sponsored by the US Coast Survey.

1884–1885 *Albatross* Dredging in Yucatán Channel, off northern Cuba, on Florida shelf, and east of Mississippi River Delta. Sponsored by the US Commission of Fish and Fisheries.

1895–1917 *Fish Hawk* Extensive fishery surveys of estuaries and inshore waters throughout the northern Gulf (Florida sponge grounds, oyster bottoms, and fishery grounds). Sponsored by the US Commission of Fish and Fisheries.

1904–1939 Extensive marine biological studies carried out at biological station in the Dry Tortugas. Sponsored by the Carnegie Institution of Washington, DC.

1917	<i>Grampus</i>	Survey of continental shelf shrimp and fishery grounds, Texas through Florida. Sponsored by the US Commission of Fish and Fisheries.
1929–1939		Life history studies of estuary-related commercial fish species by Pearson.
1938–1939	<i>Atlantis</i>	Dredging off Cuba by the Harvard-Havana expedition.

Table S5. Some of the more important books, technical reports, and atlases dealing with the Gulf of Mexico that have appeared since 1950.

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- 1954 Galtsoff, P.S. (ed.). *Gulf of Mexico: Its Origin, Waters, and Marine Life*. US Fish and Wildlife Service Fishery Bulletin 89. 604 pp. A summary of environmental and biological knowledge of the Gulf at the time of publication by 55 leading scientists.
- 1956 Springer, S. and H.R. Bullis Jr. *Collections by the Oregon in the Gulf of Mexico*. US Fish and Wildlife Service, Special Scientific Report, Fisheries no. 196. 134 pp. List of the mollusks, crustaceans, and fishes identified from collections made by the exploratory fishing vessel *Oregon* throughout much of the Gulf.
- 1960 Shepard, F.P., F.B. Phleger, and T.H. van Andel (eds.). *Recent Sediments, Northwest Gulf of Mexico: A Symposium Summarizing the Results of Work Carried on in Project 51 of the American Petroleum Institute 1951–1958*. American Association of Petroleum Geologists. 394 pp. A symposium summarizing geological studies on the bays, lagoons, and continental shelf of the northwestern Gulf from the Mississippi River Delta through south Texas.
- 1970 Pequegnat, W.E. and F.A. Chace Jr. (eds.). *Contributions on the Biology of the Gulf of Mexico*. Texas A&M University Oceanographic Studies. Vol. 1. Gulf Publishing, Houston. 270 pp. Contributions by 7 authors on the deep-sea fauna of the Gulf of Mexico.
- 1971 Pequegnat, W.E., L.H. Pequegnat, R.W. Firth Jr., B.M. James, and T.W. Roberts. *Gulf of Mexico Deep-Sea Fauna, Decapoda and Euphausiacea*. American Geographical Society Serial Atlas of the Marine Environment, Folio 20. 12 pp.

Identification, distribution, and zoogeography of the deepwater decapod and euphausiid fauna of the Gulf.

- 1972 Capurro, L.R.A. and J.L. Reid (eds.). *Contributions to the Physical Oceanography of the Gulf of Mexico*. Texas A&M University Oceanographic Studies. Vol. 2. Gulf Publishing, Houston. 288 pp. Contributions by 16 authors on circulation, modeling, hurricane effects, and tides of the Gulf.
- 1972 Rezak, R. and V.J. Henry (eds.). *Contributions on the Geological and Geophysical Oceanography of the Gulf of Mexico*. Texas A&M University Oceanography Studies. Vol. 3. Gulf Publishing, Houston. 303 pp. Contributions by 19 authors on the geophysical structure, sediments, and geochemistry of the Gulf of Mexico.
- 1972 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. *Chemistry, Productivity, and Benthic Algae of the Gulf of Mexico*. American Geographical Society Serial Atlas of the Marine Environment, Folio 22. 29 pp. Contributions by 9 authors on the inorganic and organic chemistry, phytoplankton and primary productivity, benthic algae, and seagrasses of the Gulf of Mexico.
- 1974 Bright, T.J. and L.H. Pequegnat (eds.). *Biota of the West Flower Garden Bank*. Gulf Publishing, Houston. 435 pp. Contributions by 12 authors on the invertebrates, fish fauna, and biotic zonation of a hard bank system on the northwestern Gulf shelf.
- 1976 Defenbaugh, R.E. A study of the benthic macro-invertebrates of the continental shelf of the northern Gulf of Mexico. Ph.D. dissertation. Texas A&M University,

- College Station. 476 pp. Trawl survey of the benthic invertebrate fauna of the US and Mexican continental shelf except Florida and Yucatán.
- 1978 Bouma, A.H., G.T. Moore, and J.M. Coleman (eds.). *Framework, Facies, and Oil-Trapping Characteristics of the Upper Continental Margin*. Amer. Assoc. Petrol. Geol., Stud. in Geol. 7. 326 pp. Physiography, structural characteristics, and sediments of the continental shelves and slopes of the Gulf of Mexico.
- 1983 Pequegnat, W.E., L.H. Pequegnat, J.A. Kleypas, B.M. James, E.A. Kennedy, and G.F. Hubbard. *The Ecological Communities of the Continental Slope and Adjacent Regimes of the Northern Gulf of Mexico*. US Dept. of the Interior, Minerals Management Service, Gulf of Mexico OCS Region, New Orleans, LA. OCS Study MMS 1983-22. 398 pp. Description, ecological analysis, and photographic atlas of the benthic fauna of the continental slope, rise, and abyssal plain of the northern Gulf of Mexico.
- 1983 Darnell, R.M., R.E. Defenbaugh, and D. Moore. *Northwestern Gulf Shelf Bio-Atlas: A Study of the Distribution of Demersal Fishes and Penaeid Shrimp of Soft Bottoms of the Continental Shelf from the Rio Grande to the Mississippi River Delta*. US Dept. of the Interior, Minerals Management Service, Open File Rept. 82-04. 438 pp. Seasonal distribution patterns, life history information, and ecological relations of 12 species of penaeid shrimp and 164 species of fishes on the northwest Gulf shelf.
- 1984 Stickney, R.R. *Estuarine Ecology of the Southeastern United States and Gulf of Mexico*. Texas A&M University Press, College Station. 310 pp. This volume treats the environment and biology of, as well as human impacts to, estuaries of the southeastern states and northern Gulf of Mexico.

- 1985 Rezak, R., T.J. Bright, and D.W. McGrail. *Reefs and Banks of the Northwestern Gulf of Mexico: Their Geological, Biological, and Physical Dynamics*. John Wiley & Sons, New York. 259 pp. Hydrography and hard banks of the northwestern Gulf of Mexico with emphasis on hard bank distribution, geology, biota, and zonation.
- 1985 Vittor, Barry & Associates, Inc. *Tuscaloosa Trend Regional Data Search and Synthesis Study*. 2 vols. Final report to Minerals Management Service, New Orleans, LA, contract no. 14-12-0001-30048. Summary of existing knowledge of the biology, ecology, and socioeconomics of the bays, estuaries, and continental shelf from the Mississippi River Delta east to DeSoto Canyon.
- 1985 Yañez-Arancibia, A. (ed.). *Recursos Pesqueros Potenciales de Mexico: La Pesca Acompañante del Camarón*. UNAM, Instituto de Ciencias del Mar y Limnología. 748 p. A discussion of the fishery potential of Mexican coastal waters by 20 authors. Several chapters deal with the fishes, fisheries, and ecology of the continental shelf of the southern Gulf. (In Spanish)
- 1985 Yañez-Arancibia, A. (ed.). *Ecología de Comunidades de Peces en Estuarios y Lagunas Costeras*. UNAM, Instituto de Ciencias del Mar y Limnología. 653 p. Discussions by 49 authors of fish community ecology in estuaries and coastal lagoons worldwide. Several chapters deal with coastal lagoons of eastern Mexico. (In Spanish)
- 1986 NOAA. *Gulf of Mexico Coastal and Ocean Zones Strategic Assessment: Data Atlas*. US Dept. of Commerce, NOAA, National Ocean Service, and National Marine Fisheries Service. A series of maps providing information on the

environment, living marine resources, economic activity, environmental quality, and jurisdictions of the Gulf of Mexico.

- 1986 Yáñez-Arancibia, A. and P. Sánchez-Gil. *Los Peces Demersales de la Plataforma Continental del Sur del Golfo de México. 1. Caracterización Ambiental, Ecología y Evaluación de las Especies, Poblaciones y Comunidades*. UNAM, Instituto de Ciencias del Mar y Limnología. Publ. Esp. 9. 230 pp. The demersal fishes of the southern Gulf of Mexico shelf: Environmental characterization, ecology and evaluation of species, populations, and communities (in Spanish).
- 1987 Darnell, R.M. and J.A. Kleypas. *Eastern Gulf Shelf Bio-Atlas: A Study of the Distribution of Demersal Fishes and Penaeid Shrimp of Soft Bottoms of the Continental Shelf from the Mississippi River Delta to the Florida Keys*. US Dept. of the Interior, Minerals Management Service, New Orleans, LA. OCS Study MMS 86-0041. 548 pp. Seasonal distribution patterns, life history information, and ecological relations of 17 species of penaeid shrimps and 347 species of fishes on the eastern Gulf shelf. Included is a discussion of environmental factors and habitat differentiation.
- 1988 Phillips, N.W. and B.M. James (eds.). *Offshore Texas and Louisiana Marine Ecosystems Data Synthesis*. US Dept. of the Interior, Minerals Management Service, New Orleans, LA. OCS Study MMS 88-0067. 3 vols. Summary of existing knowledge concerning the physical oceanography and meteorology, chemistry, geology, biology, socioeconomics, and potential human impacts on the continental shelf of the northwestern Gulf from the Mississippi River Delta to the level of Corpus Christi, Texas.

- 1989 Britton, J.C. and B. Morton. *Shore Ecology of the Gulf of Mexico*. University of Texas Press, Austin. 387 pp. This volume covers the distribution, habitat characteristics, and biology of hard and soft shorelines and submerged banks and reefs of the western and southern Gulf from Texas through Yucatán.
- 1990 Flock, G. (ed.). *The Environmental and Economic Status of the Gulf of Mexico*. Gulf of Mexico Program Office, John C. Stennis Space Center, Stennis, MS. 186 pp. Results of a symposium sponsored by many federal and state agencies. Contributions by 46 authors, primarily on socioeconomic issues relating to the northern Gulf.
- 1990 Darnell, R.M. and R.E. Defenbaugh (eds.). *Ecology of the Gulf of Mexico*. *Amer. Zool.* 30(1):1–105. Results of a symposium sponsored by the Minerals Management Service. Contributions by 14 authors primarily giving results of major multidisciplinary ecological studies of the northern Gulf.
- 1991 Salvador, A. (ed.). *The Gulf of Mexico Basin*. Geological Society of America, Boulder, CO. Vol. J. 568 pp. This volume summarizes existing knowledge concerning the physiography, structural framework, distribution of isochronal strata, quaternary sedimentation, and mineral resources of the Gulf of Mexico basin.
- 1995 MacDonald, I.R., W.W. Schroeder, and J.M. Brooks. *Chemosynthetic Ecosystems Study*. Final report prepared by the Geochemical and Environmental Research Group, Texas A&M University. US Dept. of the Interior, Minerals Management Service, Gulf of Mexico OCS Region, New Orleans, LA. OCS Study MMS 95-0023. 338 pp. Analysis of the distribution, geology, geochemistry, and growth

dynamics of continental slope chemosynthetic communities of the northern Gulf of Mexico.

- 1998 McEachran, J.D. and J.D. Fechhelm. *Fishes of the Gulf of Mexico*. Vol. 1. *Myxiniiformes to Gasterosteiformes*. University of Texas Press, Austin. 1112 pp. This is a treatise on the taxonomy and external morphological characteristics of the cartilaginous and bony fishes of the Gulf of Mexico: Myxiniiformes through Gasterosteiformes. It contains many keys for the identification of major groups and species. Most species are illustrated.
- 1999 Bianchi, T.S., J.R. Pennock, and R.R. Twilley (eds.). *Biogeochemistry of Gulf of Mexico Estuaries*. John Wiley & Sons, New York. 428 pp. This book consists of 13 chapters by 34 authors, and it is divided into 5 sections as follows: Physical Characteristics, Nutrient Dynamics, Organic Matter Cycling, Trace Element/Organic Cycling, and Summary. In addition to the above topics, the book includes discussions of the implications of estuarine biogeochemistry in relation to eutrophication and hypoxia.
- 1999 Kumpf, H., K. Steidinger, and K. Sherman (eds.). *The Gulf of Mexico Large Marine Ecosystem: Assessment, Sustainability, and Management*. Blackwell Science, Malden, MA. 704 pp. This book contains 42 chapters by 89 authors. It is divided into 6 sections as follows: Ecosystem-Level Assessment and Sustainability of Natural Resources (4 ch.), Physical and Biological Characteristics of the Gulf of Mexico (4 ch.), Patterns of Productivity (9 ch.), Assessment of Ecological Stresses on the Gulf Ecosystem (5 ch.), Ecosystem Health (7 ch.), and Management and Governance (13 ch.). The many excellent chapters deal largely with coastal areas of the Gulf or with general concepts of

ecosystem health, sustainability, etc. Despite its title, the volume does not provide a clear picture of how the Gulf can or should be managed and by whom.

2000 Würsig, B., T.A. Jefferson, and D.J. Schmidly. *The Marine Mammals of the Gulf of Mexico*. Texas A&M University Press, College Station. 232 pp. This volume provides a description of the marine mammal fauna of the Gulf of Mexico including keys for identification and descriptions of each species, as well as discussions of the history of research, status, and conservation perspectives.

2000 Continental Shelf Associates, Inc. *Deepwater Program: Gulf of Mexico Deepwater Information Resources Data Search and Literature Synthesis*. 3 vols. US Dept. of the Interior, Minerals Management Service, Gulf of Mexico OCS Regional Office, New Orleans, LA. OCS Study MMS 2000-2004. These volumes summarize existing knowledge of various aspects of the deep Gulf of Mexico from the outer edge of the continental shelf (defined as 305 m or 1,000 ft) to the abyssal plain. Topics include deepwater technology, environment (geology, physics, and chemistry), and biology (water column, nonseep benthos, seep communities, fishes, and protected species), as well as socioeconomic issues (esp. fisheries and impacts of oil and gas development).

2001 Continental Shelf Associates, Inc., and the Geochemical and Environmental Research Group, Texas A&M University. *Mississippi/Alabama Pinnacle Trend Ecosystem Monitoring*. Final synthesis report. U.S. Dept. of the Interior, Geological Survey, Biological Resources Division, USGS BSR 2001-0007 and Minerals Management Service, Gulf of Mexico OCS Region, New Orleans, LA. OCS Study MMS 2001-080. 415 pp. Environment, structure, and ecology of hard-

bottom biological communities of 9 carbonate mounds of the Mississippi/Alabama continental shelf.

- 2002 Rowe, G.T. and M.C. Kennicutt II. *Deepwater Program: Northern Gulf of Mexico Continental Slope Habitat and Benthic Ecology*. Year 2: Interim Report. U.S. Dept. of the Interior, Minerals Management Service, Gulf of Mexico OCS Region, New Orleans, LA. OCS Study MMS 2002-063. 158 pp. Progress report on analysis of the composition, structure, and function of benthic faunal assemblages of the northern Gulf of Mexico in the depth range of 300–3,000+ m within the context of an ecosystem energy flow model.
- 2002 Tunnell, J. W., Jr. and F.W. Judd (eds.). *The Laguna Madre of Texas and Tamaulipas*. Texas A&M University Press, College Station. 346 pp. This volume provides a historic background and treats the environment, natural resources, and matters of special concern (red and brown tides, conservation issues, and information needs) for the saline and hypersaline lagoons of south Texas and northeastern Mexico.
- 2004 Blackburn, J.B., Jr. *The Book of Texas Bays*. Texas A&M University Press, College Station. 290 pp. This beautifully written volume of 26 chapters describes the ecology and grandeur of the bays and wetlands of the Texas coast from the Sabine River in the north to the Rio Grande in the south. The author, a lawyer and environmental activist, vividly describes the various public hearings, legal battles, and other activities that have gone into efforts to protect the fragile ecology of the coastal habitats.
- 2005 McEachran, J.D. and J.D. Feltham. *Fishes of the Gulf of Mexico*. Vol. 2. *Scorpaeniformes to Tetraodontiformes*. University of Texas Press, Austin. 1004

pp. This is the second and final volume of the definitive treatise on the taxonomy and morphological characteristics of the fishes of the Gulf of Mexico. It contains many keys for the identification of major groups and species. Most species are illustrated.

2005 Sturges, W. and A. Lugo-Fernandez (eds.). *Circulation in the Gulf of Mexico: Observations and Models*. Geophysical Monographs 161. American Geophysical Union, Washington, DC. 347 pp. This book contains an introduction plus 21 chapters by 52 authors. It deals primarily with circulation patterns and processes of surface waters of the northern Gulf, although some attention is given to circulation at intermediate depths and in the southern Gulf. Information is provided on water exchange between the Gulf and the Caribbean Sea and the Atlantic Ocean, and some attention is given to linkages between water currents and larval transport and to links with sperm whale distribution patterns.

2007 Tunnell, J.W., Jr., E.A. Chávez, and K. Withers, (eds.). *Coral Reefs of the Southern Gulf of Mexico*. Texas A&M University Press, College Station. 194 pp. This book of 13 chapters, authored by 10 scientists from Mexico and the United States, describes the islands and coral reefs of the east Mexican continental shelf and Campeche Bank. It addresses their distribution, origin and geology, and present environments. The biota is described in some detail. Attention is also given to human use and impacts and to the conservation and management of these fragile ecological systems. Color plates enrich the volume.

Table S6. Average concentrations of total suspended matter (TSM), inorganic suspended matter (ISM), and organic suspended matter (OSM) in Gulf of Mexico waters expressed as milligrams per liter of water. (Modified from Sackett 1972.)

Portion of Gulf	TSM (mg/L)	ISM (mg/L)	OSM (mg/L)	ISM as % of TSM
Continental shelf	0.761	0.333	0.428	43.8
Open Gulf – surface (0 – 90 m)	0.194	0.094	0.100	48.5
Open Gulf – deep (90 m – bottom)	0.166	0.110	0.056	66.3

Table S7. Approximate concentrations of the major ions in surface waters of the open Gulf of Mexico and the Mississippi River (in parts per million). (Modified from Sackett 1972.)

Ion	(A) Gulf of Mexico surface water (ppm)	(B) Mississippi River water (ppm)	Ratio (A/B)
Cations			
Sodium	10,950	11	1,000
Magnesium	1,410	8	176
Calcium	420	34	12
Potassium	400	3	130
Anions			
Chloride	20,000	13	1,540
Sulfate	2,760	33	83
Bicarbonate	140	108	1.3
Total	36,080	210	171.8

Table S8. Average concentrations of some minor elements in waters of the Gulf of Mexico expressed as micrograms per liter of water. CS refers to surface waters of the continental shelf. (From Sackett 1972.)

Element	Location	Concentration ($\mu\text{g/L}$)	
		Dissolved	Particulate
Aluminum	CS	3.3	--
Copper	CS	1.1	0.7
	0–100 m	0.7	0.4
	> 1,000 m	0.8	0.4
Iron	CS	3.7	--
Manganese	CS	1.8	2.0
	0–100 m	0.4	0.07
	> 1,000 m	0.2	0.002
Nickel	CS	0.2	0.5
Zinc	CS	3.4	0.9
	0–100 m	2.3	0.4
	> 1,000 m	1.9	0.5

Table S9. Concentrations of particulate organic carbon (POC) and dissolved organic carbon (DOC) in the Gulf of Mexico. (From Fredericks 1972.)

Area of Gulf	POC (mg C/L)		DOC (mg C/L)	
	Mean	Range	Mean	Range
Continental shelf (< 200 m)	0.214	0.022–1.911	1.08	0.58–2.35
Open Gulf – surface (0–90 m)	0.050	0.013–0.126	0.79	0.45–1.07
Open Gulf – deep (90–3,600 m)	0.028	0.004–0.117	0.52	0.33–0.94

Table S10. Sulfate reduction rate, pyrite burial rate, and percentage of reduced sulfur retention for a transect off the Mississippi River Delta. (From Lin and Morse 1991.)

Depth of water column (m)	Sulfate reduction rate (mmol/m ² /day)	Pyrite burial rate (mmol/m ² /day)	Reduced sulfur retention rate (%)
59	13.8	3.65	26.4
107	7.70	1.21	15.7
218	5.95	0.256	4.3
415	7.19	0.038	0.5
574	4.85	0.014	0.3
1,540	0.922	0.000424	0.9

Table S11. Average annual transport of heavy metals by the Mississippi River to the Gulf of Mexico. (From Trefry and Presley 1976.)

Metal	Particulate (kg × 10 ⁴)	Dissolved (kg × 10 ⁴)	Particulate (%)	Dissolved (%)
Iron	13,300	2.8	> 99.9	0.02
Manganese	366	5.7	98.5	1.5
Zinc	52	5.7	90.1	9.9
Lead	13	0.1	99.2	0.8
Copper	12	1.1	91.6	8.4
Chromium	20	0.3	98.5	1.5
Nickel	16	0.9	94.7	5.3
Cadmium	0.4	0.05	88.9	11.1
Arsenic	4	1.7	70.2	29.8

Table S12. Comparison of metal concentrations of suspended matter in the Mississippi River and nearby Gulf of Mexico and in bottom sediments near the river mouth. Concentrations of Fe and Al are in %; for all other elements in µg/g. (From Trefry and Presley 1976.)

Location	Fe	Al	Mn	Zn	Pb	Cu	Co	Cr	Ni	Cd
Concentrations										
River (suspended matter)	4.74	8.80	1,307	184	45.4	42.3	21.3	72.5	55.6	1.4
Gulf (suspended matter)	5.02	9.20	1,191	226	66.4	55.6	20.1	72.8	58.5	2.0
Gulf (bottom sediments)	4.33	7.83	675	160	35.1	29.2	18.9	79.6	39.3	1.2
Metal/iron ratio (× 1,000)										
River (suspended matter)	--	1,860	27.6	3.9	0.96	0.89	0.45	1.3	1.2	0.03
Gulf (suspended matter)	--	1,830	23.7	4.5	1.30	1.10	0.40	1.4	1.2	0.04
Gulf (bottom sediments)	--	1,810	15.6	3.7	0.81	0.67	0.44	1.8	0.91	0.03

Table S13. Distribution of total extractable hydrocarbons on continental shelves of the northern and eastern Gulf of Mexico. All values are in terms of $\mu\text{g/g}$ of sediments (dry weight). (From Presley and Brooks 1988.)

Location	Total hydrocarbons	
	Average	Range
Texas		
- Lower	1.14	0.22–5.6
- Upper	7.15	0.9–45
Louisiana		
- Shelf	--	20–190
- Offshore banks	--	0.2–0.8
Mississippi / Alabama		
- Shelf	1.61	--
Florida		
- Inshore	3.1	--
- Offshore	1.39	--

Table S14. Distribution of hydrocarbons on the continental slopes off Louisiana and Florida at depths of 500–2,800 m. Average values and ranges (in parentheses) are given. All values are in terms of $\mu\text{g/g}$ of sediments (dry weight). (From Kennicutt, Sericano, et al. 1987.)

Location	Extractable organic matter	Aliphatic hydrocarbons	Unresolved complex mixture
Off central Louisiana	26.0 (14.0–55.2)	1.1 (0.8–1.3)	11.1 (5.2–11.4)
West of Mississippi River Delta	22.7 (4.0–61.3)	1.6 (0.6–4.6)	14.0 (4.4–29.8)
Off Florida shelf	7.9 (4.7–13.4)	0.5 (0.1–1.0)	3.7 (0.5–7.3)