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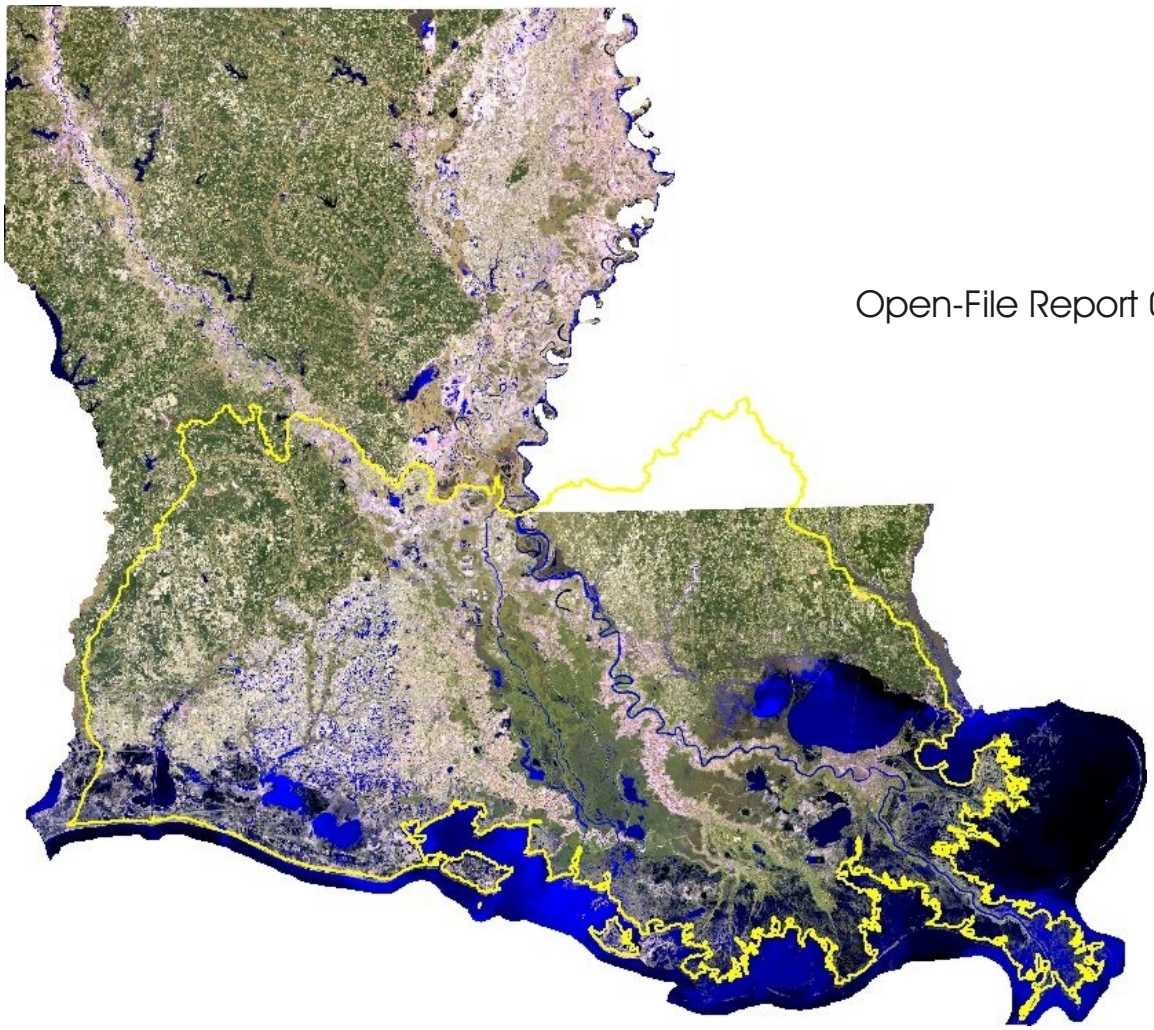
Annotated Bibliography of Water-Related Information and Studies, Acadian-Pontchartrain Study Unit, Louisiana and Mississippi, 1863-2000



Open-File Report 03-9

U.S. Department of the Interior
U.S. Geological Survey

Front Cover:
Source of map: Louisiana Oil Spill Coordinator, Office of the Governor, Louisiana GIS CD: A Digital Map of the State, Version 1.0

Annotated Bibliography of Water-Related Information and Studies, Acadian-Pontchartrain Study Unit, Louisiana and Mississippi, 1863-2000

By Kevin J. Grimsley and Patricia J. D'Arconte

U.S. GEOLOGICAL SURVEY

Open-File Report 03-9

NATIONAL WATER-QUALITY ASSESSMENT PROGRAM

Baton Rouge, Louisiana

2003

U.S. DEPARTMENT OF THE INTERIOR
GALE A. NORTON, Secretary

U.S. GEOLOGICAL SURVEY
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Information regarding the National Water-Quality Assessment (NAWQA) Program is available on the Internet via the World Wide Web. You may connect to the NAWQA Home Page using the Universal Resource Locator (URL) at:

http://water.usgs.gov/nawqa

FOREWORD

The U.S. Geological Survey (USGS) is committed to serve the Nation with accurate and timely scientific information that helps enhance and protect the overall quality of life, and facilitates effective management of water, biological, energy, and mineral resources. (http://www.usgs.gov/). Information on the quality of the Nation's water resources is of critical interest to the USGS because it is so integrally linked to the long-term availability of water that is clean and safe for drinking and recreation and that is suitable for industry, irrigation, and habitat for fish and wildlife. Escalating population growth and increasing demands for the multiple water uses make water availability, now measured in terms of quantity *and* quality, even more critical to the long-term sustainability of our communities and ecosystems.

The USGS implemented the National Water-Quality Assessment (NAWQA) Program to support national, regional, and local information needs and decisions related to water-quality management and policy. (http://water.usgs.gov/nawqa). Shaped by and coordinated with ongoing efforts of other Federal, State, and local agencies, the NAWQA Program is designed to answer: What is the condition of our Nation's streams and ground water? How are the conditions changing over time? How do natural features and human activities affect the quality of streams and ground water, and where are those effects most pronounced? By combining information on water chemistry, physical characteristics, stream habitat, and aquatic life, the NAWQA Program aims to provide science-based insights for current and emerging water issues and priorities. NAWQA results can contribute to informed decisions that result in practical and effective water-resource management and strategies that protect and restore water quality.

Since 1991, the NAWQA Program has implemented interdisciplinary assessments in more than 50 of the Nation's most important river basins and aquifers, referred to as Study Units. (http://water.usgs.gov/nawqa/nawqamap.html). Collectively, these Study Units account for more than 60 percent of the overall water use and population served by public water supply, and are representative of the Nation's major hydrologic landscapes, priority ecological resources, and agricultural, urban, and natural sources of contamination.

Each assessment is guided by a nationally consistent study design and methods of sampling and analysis. The assessments thereby build local knowledge about water-quality issues and trends in a particular stream or aquifer while providing an understanding of how and why water quality varies regionally and nationally. The consistent, multi-scale approach helps to determine if certain types of water-quality issues are isolated or pervasive, and allows direct comparisons of how human activities and natural processes affect water quality and ecological health in the Nation's diverse geographic and environmental settings. Comprehensive assessments on pesticides, nutrients, volatile organic compounds, trace metals, and aquatic ecology are developed at the national scale through comparative analysis of the Study-Unit findings. (http://water.usgs.gov/nawqa/natsyn.html).

The USGS places high value on the communication and dissemination of credible, timely, and relevant science so that the most recent and available knowledge about water resources can be applied in management and policy decisions. We hope this NAWQA publication will provide

you the needed insights and information to meet your needs, and thereby foster increased awareness and involvement in the protection and restoration of our Nation's waters.

The NAWQA Program recognizes that a national assessment by a single program cannot address all water-resource issues of interest. External coordination at all levels is critical for a fully integrated understanding of watersheds and for cost-effective management, regulation, and conservation of our Nation's water resources. The Program, therefore, depends extensively on the advice, cooperation, and information from other Federal, State, interstate, Tribal, and local agencies, non-government organizations, industry, academia, and other stakeholder groups. The assistance and suggestions of all are greatly appreciated.

Robert M. Hirsch
Associate Director for Water

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Annotated Bibliography of Water-Related Information and Studies, Acadian-Pontchartrain Study Unit, Louisiana and Mississippi, 1863-2000

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ABSTRACT

The mission of the National Water-Quality Assessment Program is to describe the status and trends in the quality of a large, representative part of the Nation's surface- and ground-water resources and to improve understanding of the primary natural and human factors affecting the quality of these resources. This report is a collection of 1,364 bibliographic references to water-related information and studies that are pertinent to these goals in the Acadian-Pontchartrain Study Unit of the National Water-Quality Assessment Program. This study unit includes all or parts of 39 parishes in southern Louisiana and 5 counties in southwestern Mississippi. These references encompass a large range of subjects, including aquatic biology, climate, geology, land use, limnology, salinity, sedimentation, subsidence, surface- and ground-water hydrology, urban runoff, water chemistry, and water use and management. Publication dates for references range from 1863 through 2000. Whenever possible, an abstract is included in addition to the bibliographic information.

INTRODUCTION

In 1991, the U.S. Geological Survey (USGS) began the implementation of the National Water-Quality Assessment (NAWQA) Program. The mission of the NAWQA Program is to describe the status and trends in the quality of a large, representative part of the Nation's surface- and ground-water resources and to improve understanding of the primary natural and human factors affecting the quality of these resources (Bauch and Apodaca, 1995). The knowledge gained in meeting these goals will be a useful tool to Federal, State, and local water managers and policy makers in their decision-making processes.

One of the major design features of the NAWQA Program is the national investigation of water-quality conditions on different regional scales. Assessing the quality of water in every location across the Nation would be impractical; therefore, NAWQA Program studies are conducted in more than 50 subunits, referred to as study units, of important river and aquifer systems that represent the diverse geography, water resources, and land and water uses of the Nation. These study units range in size from under 1,000 to over 60,000 square miles and include about 60 to 70 percent of the Nation's freshwater use and population served by public water-supply systems (Bauch and Apodaca, 1995). The assessment of the Acadian-Pontchartrain Study Unit in southern Louisiana and southwestern Mississippi began in 1997.

To make a multidisciplinary assessment of water quality within the Acadian-Pontchartrain Study Unit, sources of available water-related information and studies for the unit, both descriptive and quantitative, needed to be identified. To that end, a computerized literature search of water-related information and studies was performed and the results of this search were compiled.

Purpose and Scope

This report presents a bibliography of water-related information and studies for the Acadian-Pontchartrain Study Unit of the NAWQA Program, which will aid in the water-quality assessment of the unit. It is a comprehensive collection of 1,364 references on water-related information and studies pertaining to the study unit. Whenever possible, references in the bibliography are annotated with an abstract. The collection of references includes journal articles, published reports and books, master's theses and doctoral dissertations, conference proceedings, and maps dating from 1863 through 2000. Unpublished manuscripts, publications in press, and book reviews are omitted.

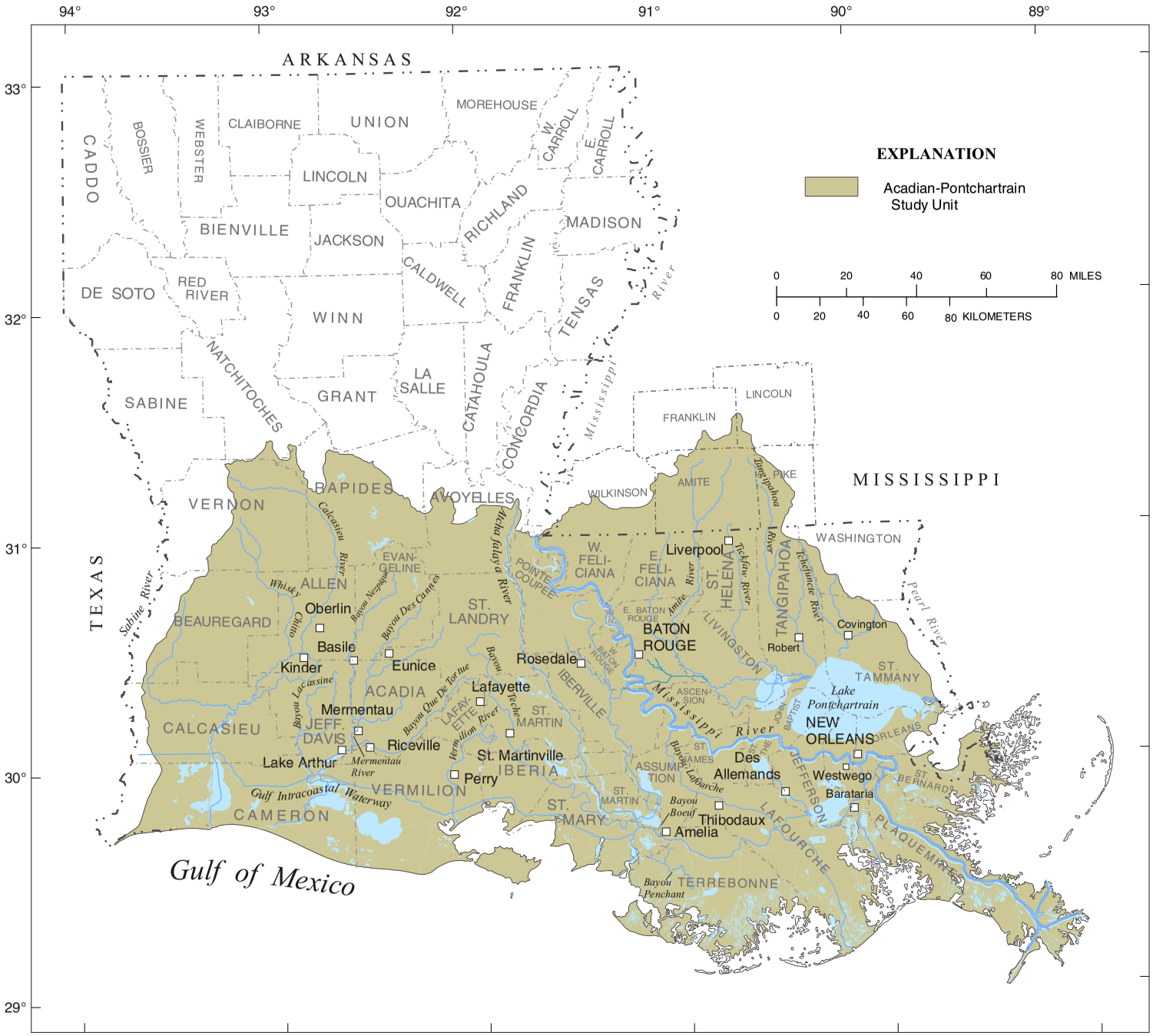
Description of Study Unit

The Acadian-Pontchartrain Study Unit (fig. 1) encompasses all or parts of 39 parishes in southern Louisiana and 5 counties in southwestern Mississippi. The 26,000-square-mile study unit extends north from the Gulf of Mexico to the Red River and the headwaters of the Calcasieu River in west-central Louisiana and to the headwaters of the Amite and Tangipahoa Rivers in southwestern Mississippi; east to the Pearl River Basin; south to the Gulf of Mexico; and west to the Sabine River Basin. Climate in the area is classified as subtropical, and average annual precipitation ranges from 55 to 62 inches per year (Demas and others, 1999).

The Acadian-Pontchartrain Study Unit has an estimated population of 3.1 million people, of which more than two-thirds are located in the three largest urban areas of Louisiana: New Orleans, Baton Rouge, and Lafayette. The major land-use categories for the area in 1990 were cropland interspersed with pasture and woodlands or forest, 47 percent; marshland, 27 percent; swamp, 19 percent; open water, 5 percent; and irrigated land and urban areas, 1 percent each. Dairy farming and timber production are the primary agricultural activities in southeastern Louisiana and southwestern Mississippi. Important agricultural products of southwestern Louisiana include timber, crops such as rice and sugarcane, catfish and crawfish, and beef. Major nonagricultural activities in the study unit include oil and gas exploration and production, petrochemical industries, and marine transport industries. The Port of South Louisiana at LaPlace is the largest port by tonnage in the United States; New Orleans and Baton Rouge are the fourth and sixth largest ports, respectively (Demas and others, 1999).

Sources of Water-Related Information and Studies

A computerized literature search for water-related studies in the Acadian-Pontchartrain Study Unit was conducted on selected online scientific data bases. These data bases covered a large range of subjects and topics, including aquatic biology, climate, geology, land use, limnology, salinity, sedimentation, subsidence, surface- and ground-water hydrology, urban runoff, water chemistry, and water use and management. Seven data bases were searched, six of which were part of the Cambridge Scientific Abstracts. A list of the data bases used, as well as their relevant descriptive information, is presented in table 1. The only search terms used were water, Louisiana, and the names of the five counties in Mississippi (Amite, Franklin, Lincoln, Pike, and Wilkinson Counties) that are within the study unit. In addition to the computerized search, the USGS National Wetlands Research Center in Lafayette, Louisiana, was contacted for information concerning water-related publications that might not have been listed in the online search of the seven data bases. All references were examined to determine their relevance to the mission of the Acadian-Pontchartrain Study Unit.



Louisiana Oil Spill Coordinator, Office of the Governor, Louisiana GIS CD: A Digital Map of the State, Version 2.0

Figure 1. Location of the Acadian-Pontchartrain Study Unit in southern Louisiana and southwestern Mississippi.

Table 1. List of data bases searched for water-related information and studies pertaining to the Acadian-Pontchartrain Study Unit

Name of data base	Time coverage	Description
Aquaculture Abstracts	1984 to 2000	Provides comprehensive information on cultivating marine, freshwater, and brackish water species
Aquatic Pollution and Environmental Quality	1990 to 2000	Focuses on research and policy on the contamination of oceans, seas, lakes, rivers, and estuaries
Biological Sciences and Living	1978 to 2000	Provides comprehensive information on the science, technology, and management of marine and freshwater environments
Ecology Abstracts	1982 to 2000	Focuses on how microbes, plants, and animals interact with their environments and with other organisms. Includes papers on evolutionary biology, economics, and systems analysis relevant to ecosystems or the environment
GeoRef	1785 to 2000	Provides information covering worldwide technical literature on geology and geophysics
Marine Biotechnology Abstracts	1989 to 2000	Focuses on molecular biology and molecular genetics research applied specifically to marine and aquatic organisms
Water Resources Abstracts	1967 to 2000	Provides summaries of the world's technical and scientific literature on water-related topics covering the characteristics, conservation, control, pollution, treatment, use, and management of water resources

Arrangement of References

References are listed alphabetically by principal author, either individual or corporate, and are numbered consecutively. Every reasonable effort has been made to ensure that all references listed herein are correct. However, because the bibliography is the result of several combined computerized searches of reference data bases, some references might be incomplete or might contain errors. Not all references could be checked for accuracy or verified. In some instances, the cited reference might not meet USGS standards for publication of references.

Abstracts were downloaded with the references and included in the bibliography whenever possible. Some abstracts have been edited by the authors for brevity. Terminology and abbreviations might not be consistent between abstracts.

Because this bibliography is being published in electronic form, a subject index has been omitted, and a keyword search is the method to be used for finding particular subjects within the bibliography. For each reference, keywords that generally describe the subject of the reference are included for classification and search purposes, and a list of all keywords is presented in table 2. In addition, the “Find” or “Search” function in the software used to view this report may be utilized to locate a specific word, phrase, or author.

Table 2. Keywords for references in the bibliography

Agriculture
Algae
Aquaculture
Birds
Checklist
Chemistry
Climate
Contaminants (includes polynuclear aromatic hydrocarbon (PAH), general water quality)
Debris (woody debris, leaf litter)
Ecology (species composition, species relations, behavior, other than herbivory)
Estuarine (includes brackish)
Fish
Freshwater (includes swamps and bottomlands)
Geology
Geomorphology
GIS (Geographic Information Systems—includes remote sensing)
Ground water (groundwater)
Habitat
Herbivory
Hydrology (includes flooding, routing, water levels)
Macroinvertebrates
Mammals
Management
Methods
Microbiology
Model
Nutrients
Pesticides
Petroleum
Physiology (includes toxicology, assimilation, processing)
Productivity (individual or population growth, change in biomass)
Reptiles (includes amphibians)
Riparian (includes floodplains)
Salinity
Sediment (includes sedimentation, aggradation, soil characteristics)
Surface water
Trace elements
Urban (includes industrial)
Vascular plants
Wetland loss (marsh loss, degradation, conversion, restoration)

Acknowledgments

The authors wish to thank Mary L. Anderson for her extensive editorial work in preparing this bibliography. We would also like to thank Judy Buys, Librarian for the USGS National Wetlands Research Center in Lafayette, for her efforts in providing additional references that were missed by our computerized search.

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Demas, C.R., Demcheck, D.K., Anderson, M.L., and Garon, J.D., 1999, National Water-Quality Assessment Program, Acadian-Pontchartrain Study Unit: U.S. Geological Survey Fact Sheet FS-185-99, 4 p.

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   The synoptic approach is a rapid assessment method designed to provide a context for evaluating landscape sensitivity to cumulative wetland loss and to complement the site specific information used in reviewing permit applications to alter wetlands. The objectives of the study were to: (1) test the utility of the synoptic approach in prioritizing wetland "functional uses" for the development of wetland water-quality standards; (2) comparatively rank watersheds based on their wetland functional attributes and sensitivity to change; and (3) implement the transfer of the research products to state wetland managers.

   Keywords: estuarine, management, wetland loss, surface water

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   Field and laboratory studies were conducted to determine the levels of cadmium, lead, and hexachlorobutadiene, HCBD, in various samples collected from a swamp environment in Louisiana, and to assess the toxicities of arsenic, cadmium, and mercury to two species of aquatic organisms (bluegills and crawfish) indigenous to this swamp.

   Keywords: surface water, freshwater, trace elements, contaminants, fish, macroinvertebrates, physiology

3. Abdelghani, A.A., Tchounwou, P.B., Anderson, A.C., Sujono, H., Heyer, L.R., and Monkiedje, A., 1997, Toxicity evaluation of single and chemical mixtures of roundup, Garlon-3A, 2,4-D, and syndets surfactant to channel catfish (*Ictalurus punctatus*), bluegill sunfish (*Lepomis macrochirus*), and crawfish (*Procambarus* spp.): Environmental Toxicology and Water Quality, v. 12, no. 3, p. 237-243.

   Keywords: fish, macroinvertebrates, pesticides, physiology

4. Abouel Nour, A.A., 1972, A statistical methodology for predicting the pollutants in a river: Water Resources Bulletin, v. 8, no. 1, p. 15-23.

   Keywords: contaminants, methods, model, freshwater

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Keywords: groundwater, hydrology, freshwater

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   Keywords: estuarine, sediment, hydrology, model

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   A field experiment was undertaken in Lake Barre, a shallow estuary within the Louisiana coastal zone, in November 1991 with the primary goal of acquiring a better understanding of time-mean flow and sediment transport in a shallow Louisiana bay on the periphery of a deteriorating marsh. A network of four monitoring stations recorded current velocity and water turbidity at various levels within the water column while water level, wave, salinity, and wind speed and direction data were acquired at a single station.

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   Keywords: surface water, freshwater, groundwater

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   Keywords: fish, macroinvertebrates, freshwater, checklist

10. Alford, D.P., Delaune, R.D., and Lindau, C.W., 1997, Methane flux from Mississippi River deltaic plain wetlands: Biogeochemistry (Dordrecht), v. 37, no. 3, p. 227-236.

    Methane emissions from three wetland habitats in the Mississippi River deltaic plain were measured over a three year period. Flux data collected indicate that each habitat was a net source of methane to the atmosphere throughout the year. Soil temperature (5 and 10 cm depths) was found to be significantly correlated with methane emission from the three sites.

    Keywords: estuarine, microbiology, physiology

11. Allen, C.M., 1997, A pocket guide to Louisiana native trees: Baton Rouge, Friends of Hilltop Arboretum, Inc. 65 p.

Keywords: vascular plants, checklist

12. Allen, J.A., Chambers, J.L., and Pezeshki, S.R., 1997, Effects of salinity on baldcypress seedlings: Physiological responses and their relation to salinity tolerance: Wetlands, v. 17, no. 2, p. 310-320.

    Growth and physiological responses of 15 open-pollinated families of baldcypress subjected to flooding with saline water were evaluated in this study. Ten of the families were from coastal sites in Louisiana and Alabama that have elevated levels of soil-water salinity. The other five families were from inland, freshwater sites in Louisiana.

    Keywords: vascular plants, physiology, salinity, freshwater

13. Allen, R.L., and Baltz, D.M., 1997, Distribution and microhabitat use by flatfishes in a Louisiana estuary: Environmental Biology of Fishes, v. 50, no. 1, p. 85-103.

    The authors used a 1-meter beam trawl to characterize microhabitat use of flatfishes in monthly samples collected in Barataria Bay, Louisiana. Randomized sampling within strata was chatacterized by salinity, temperature, dissolved oxygen, depth, distance from shore, and substrate type.

    Keywords: fish, estuarine, habitat, sediment, salinity

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    Keywords: model, sediment, freshwater, hydrology

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    A study was conducted of the isotopic composition and concentration of Sr and of major elements in dissolved and suspended loads of fresh and brackish waters. The purpose was to establish the contributions of different parent rocks and minerals to Sr during weathering and transport and to identify the role of Fe-Mn oxyhydroxides in the redistribution of Sr in the water column during the sedimentary cycle. Studies were conducted on a profile across an oxic-anoxic boundary in the Baltic and on rivers covering behavior over an annual cycle.

    Keywords: estuarine, freshwater, trace elements, sediment, chemistry

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Keywords: estuarine, sediment

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    Keywords: surface water, freshwater, nutrients

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    Keywords: estuarine, hydrology, sediment

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    Keywords: hydrology, surface water, estuarine, model

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    Keywords: surface water, freshwater

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    Keywords: surface water, freshwater, hydrology

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    Keywords: surface water, freshwater, hydrology

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    Keywords: surface water, freshwater, chemistry, hydrology

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    Keywords: surface water, freshwater, chemistry, hydrology

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    Keywords: surface water, freshwater, chemistry, hydrology

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    Keywords: surface water, freshwater, chemistry, hydrology

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    Keywords: surface water, hydrology, riparian

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    Keywords: geomorphology, sediment, riparian

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    Keywords: hydrology, surface water, riparian, geomorphology

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    This issue of Estuaries is devoted to papers that describe results from the Nutrient Enhanced Coastal Ocean Productivity (NECOP) Program. The NECOP study was initiated by the Coastal Ocean Program of the NOAA in 1989 to address the effects of nutrient discharge in the coastal waters of the United States. The basic hypothesis posed for NECOP is that the addition of anthropogenic nutrients from sewage, agriculture, industrial sources, and suburban runoff have contributed to the development of eutrophication in coastal waters with significant impacts on water quality.

    Keywords: estuarine, nutrients

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Keywords: hydrology, surface water, riparian, geomorphology

38. Baker, N.T., 1988, Hydrologic features and processes of the Vermilion River, Louisiana: U.S. Geological Survey Water-Resources Investigations Report 88-4019, 49 p.

Keywords: surface water, freshwater, hydrology

39. Baltz, D.M., and Horst, J.W., 1992, Depth and substrate selection, sex ratio, and size distribution in an unexploited Stone Crab (*Menippe adina*) population in Barataria Bay, Louisiana: Proceedings of a Symposium on Stone Crab Biology and Fisheries, Fla. Mar. Res. Publ., no. 50, p. 74-81.

Keywords: estuarine, macroinvertebrates, habitat, ecology

40. Baltz, D.M., Rakocinski, C., and Fleeger, J.W., 1993, Microhabitat use by marsh-edge fishes in a Louisiana estuary: Environmental Biology of Fishes, v. 36, no. 2, p. 109-126.

The authors used a drop sampler to characterize use of the marsh-edge ecotone by small fishes along two transects running inland from the Gulf of Mexico for ca. 25 km in Louisiana's Barataria--Caminada Bay system. Monthly sampling was stratified among upper, middle, and lower reaches and within reaches to characterize fish responses to salinity, depth, distance from shore, substrate, dissolved oxygen concentration, temperature, turbidity, velocity, and emergent stem density.

Keywords: estuarine, fish, habitat

41. Barbe, D.E., Cruise, J.F., and Mo, X., 1996, Modeling the buildup and washoff of pollutants on urban watersheds: Water Resources Bulletin, v. 32, no. 3, p. 511-519.

A model for urban stormwater quality was developed in this study. The basis for the model is the process by which pollutants build up on the watershed surface. The model was calibrated to observed data for two small urban basins in Baton Rouge, Louisiana, and model results were used to analyze the behavior of phosphorus concentrations in storm runoff from these basins over a long period of time.

Keywords: surface water, freshwater, model, urban, contaminants

42. Barbe, D.E., and Francis, J.C., 1995, An analysis of seasonal fecal coliform levels in the Tchefuncte River: Water Resources Bulletin, v. 31, no. 1, p. 141-146.

A model for estimating seasonal fecal coliform concentrations in the Tchefuncte River as a function of river discharge was developed.

Keywords: surface water, freshwater, microbiology, model

43. Barber, L.B., II, 1989, The occurrence and distribution of semivolatile organic compounds in the lower Calcasieu River, Louisiana, by use of the closed-loop-stripping isolation procedure: U.S. Geological Survey Water-Resources Investigations Report 88-4089, p. 23-33.

    Keywords: surface water, freshwater, contaminants

44. Barber, L.B., II, Leenheer, J.A., Tabor, C.F., Jr., Brown, G.K., Noyes, T.I., and Noriega, M.C., 1995, Organic compounds and sewage-derived contaminants, *in* Moody, J.A., Chemical data for water samples collected during four upriver cruises on the Mississippi River between New Orleans, Louisiana, and Minneapolis, Minnesota, May 1990-April 1992: U.S. Geological Survey Open-File Report 94-0523, p. 211-297.

    Keywords: surface water, freshwater, contaminants

45. Bassiouni, Z.A., Bernard, W.J., and Welsh, J.H., 1978, Reservoir study of southeast Pecan Island geopressured water sands: Society of Petroleum Engineers of AIME, no. 53, 4 p.

    Keywords: groundwater

46. Battaglia, L., and Keough, J.R., 1993, Early secondary succession in a Louisiana floodplain: ASLO and SWS 1993 Annual Meeting. Abstracts.

    Spatial and temporal patterns of community structure were examined during the first five years of secondary succession in an abandoned field on a river floodplain.

    Keywords: surface water, freshwater, riparian, ecology, vascular plants

47. Baumann, R.H., and Conner, W.A., 1989, Cultural impacts affecting wetland loss in coastal Louisiana: 1990 AAAS Annual Meeting Abstracts, p. 73.

    Keywords: estuarine, wetland loss

48. Baumann, R.H., and Turner, R.E., 1990, Direct impacts of outer continental shelf activities on wetland loss in the central Gulf of Mexico: Environmental Geology and Water Sciences, v. 15, no. 3, p. 189-198.

    Keywords: estuarine, wetland loss

49. Beck, J.N., and Ramelow, G.J., 1990, Use of lichen biomass to monitor dissolved metals in natural waters: Environ. Contam. Toxicol., v. 44, no. 2, p. 303-308.

Keywords: contaminants, trace elements, surface water, freshwater, algae

50. Beck, J.N., Ramelow, G.J., Thompson, R.S., Mueller, C.S., Webre, C.L., Young, J.C., and Langley, M.P., 1990, Heavy metal content of sediments in the Calcasieu River/Lake complex, Louisiana: Hydrobiologia, v. 192, no. 2-3, p. 149-165.

    The heavy metals Cd, Cr, Cu, Pb, Hg, Ag, and Zn, and the metalloid As were measured in surface sediments at permanent stations located in the Calcasieu River/Lake Complex. The relations among metal concentrations in different areas of the system were investigated to determine sources, source strength, and transport.

    Keywords: surface water, freshwater, trace elements, sediment

51. Belanger, S.E., 1991, The effect of dissolved oxygen, sediment, and sewage treatment plant discharges upon growth, survival and density of Asiatic clams: Hydrobiologia, v. 218, no. 2, p. 113-126.

    The biology of *Corbicula fluminea*, the Asiatic clam, in the Vermilion River, Louisiana, as affected by sediment, DO levels, and sewage treatment plant effluents was investigated.

    Keywords: surface water, freshwater, macroinvertebrates, habitat

52. Bengtson, R.L., and Carter, C.E., 1984, Study shows soil erosion potential of rain in south Louisiana: Louisiana Agriculture, v. 27, no. 4, p. 14-15.

    Keywords: climate, hydrology, model

53. Bengtson, R.L., Carter, C.E., and Fouss, J.L., 1991, Water management research in Louisiana, *in* Anonymous, 1991 International summer meeting of the American Society of Agricultural Engineers: International Summer Meeting—American Society of Agricultural Engineers, v. 1991, unpaginated.

    Keywords: management

54. Bengtson, R.L., Carter, C.E., and Fouss, J.L., 1992, A decade of subsurface drainage environmental research in southern Louisiana, *in* Anonymous, Drainage and water table control; Proceedings of the Sixth international drainage symposium: ASAE Publication, no. 13-92, p. 448-457.

    Keywords: groundwater, hydrology, geology

55. Bennet, B.D., and Rickman, D., 1993, Analysis of plant succession in Louisiana's Atchafalaya delta using remote sensing: ASLO and SWS 1993 Annual Meeting. Abstracts.

The authors present data on plant succession on recently accreted land in the Atchafalaya Bay and on Louisiana's Chenier Plain. The data was collected using NASA's Calibrated Airborne Multispectral Scanner (CAMS).

Keywords: surface water, freshwater, GIS, riparian, vascular plants, ecology

56. Benton, O.L., and Higgins, P.C., 1981, Index to water-resources data for Louisiana—surface-water records, water-quality records: Louisiana Department of Transportation and Development, Office of Public Works Water Resources Basic Records Report no. 10, 138 p.

    Keywords: surface water, freshwater, chemistry, hydrology

57. Bernard, B.B., 1979, Model for interstitial sulfate reduction and methane production: AAPG Bulletin, v. 63, no. 3, p. 420.

    Keywords: estuarine, sediment, microbiology, physiology, chemistry

58. Bernard, W., 1977, Geopressure resource assessment; Southern Louisiana: Proceedings—Geopressured Geothermal Energy Conference, no. 3, p. GI.109-GI.120.

    Keywords: groundwater

59. Berresheim, H., 1993, Distribution of atmospheric sulphur species over various wetland regions in the southeastern U.S.A.: Atmospheric Environment Part A—General Topics, v. 27, no. 2, p. 211-221.

    Atmospheric dimethyl sulfide, sulfur dioxide, aerosol non-sea-salt sulfate, and methane sulfonate were measured periodically at Sapelo Island, Georgia, during March-April 1989 and April-May 1990. The spring 1990 measurements also included the sulfur gases hydrogen sulfide, carbonyl sulfide, and carbon disulfide. In August 1989 single measurements of these compounds were also conducted in various natural environments of southern Louisiana (coastal waters, saltwater marsh, brackish/freshwater marsh, swamp).

    Keywords: estuarine, chemistry

60. Bianchi, T.S., and Argyrou, M.E., 1997, Temporal and spatial dynamics of particulate organic carbon in the Lake Pontchartrain estuary, southeast Louisiana, U.S.A.: Estuarine, Coastal and Shelf Science, v. 45, no. 5, p. 557-569.

    The spatial and temporal distribution of particulate organic carbon (POC) was examined in the Lake Pontchartrain estuary, along with changes in freshwater and nutrient inputs. Increased turbidity due to increases in suspended particulate matter (SPM) concentrations during high freshwater discharge resulted in low inputs from autochthonous POC. A low N/P ratio was maintained throughout the study (from 2.3 to 8.3), primarily due to low

inputs of dissolved inorganic nitrogen (DIN). Thus, phytoplankton communities in the Lake Pontchartrain estuary were primarily limited by light and nitrogen.

Keywords: estuarine, algae, nutrients

61. Bick, G.H., 1954, A bibliography of the zoology of Louisiana: The Louisiana Academy of Sciences, v. 27, p. 5-48.

    Keywords: mammals, fish, birds, macroinvertebrates, checklist

62. Bieber, P.P., and Forbes, M.J., Jr., 1966, Pumpage of water in Louisiana, 1965: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Pamphlet no. 20, 8 p.

    Keywords: groundwater, management

63. Billock, A., Hargis, T., Rafferty, P., and Twilley, R.R., 1993, The flux of sediments and nutrients in a Louisiana brackish marsh: ASLO and SWS 1993 Annual Meeting, Abstracts.

    The exchange of total suspended solids (TSS) and dissolved nutrients were studied in an impounded and control area of a brackish marsh in Louisiana. Changes in concentration with time were compared with changes in water levels to calculate flux using hypsometric techniques.

    Keywords: estuarine, nutrients, sediment

64. Birbiglia, G.V., Serpa, Laura, Bergeron, Clyde, and Holladay, Kenneth, 1995, A geophysical investigation of the fresh water/salt water interface beneath a barrier island along the Louisiana Gulf Coast, *in* Anonymous, Geological Society of America, 1995 annual meeting: Abstracts with Programs—Geological Society of America, v. 27, no. 6, p. 34.

    Electromagnetic (EM) conductivity measurements combined with a shallow seismic reflection survey were used to investigate the shape of the fresh-water/salt-water interface and its relation to shallow structures beneath a barrier island. The site of this experiment was Grand Isle, a barrier island located southwest of New Orleans, Louisiana. The approximate location of the fresh-water/salt-water (F/S) interface was successfully imaged using a Geonics EM-31 ground conductivity meter operating at 9.1 kHz. The EM survey was conducted along two roads which parallel the short axis of the island. Cone-penetrometer conductivity clam from a previous investigation were used as ground truth points for the EM survey.

    Keywords: estuarine, groundwater

65. Birchfield, W., Hollis, J. P., and Martin, W. J., 1978, A list of nematodes associated with some Louisiana plants: Agricultural Experiment Station, 22 p.

Keywords: macroinvertebrates, checklist, vascular plants

66. Birdseye, R.U., and Olson, J.L., 1989, Hydrogeology and contamination potential of the shallow Pleistocene aquifer north of Baton Rouge, Louisiana: Abstracts with Programs—Geological Society of America, v. 21, no. 3, p. 4.

Keywords: groundwater, contaminants, hydrology, freshwater

67. Birdseye, R.U., and Saxton, D.C., 1987, A comprehensive study of the environmental geology of northern Lafayette Parish, Louisiana: Abstracts with Programs—Geological Society of America, v. 19, no. 7, p. 589.

Keywords: groundwater, geology

68. Blackburn, J.B., Jr., 1996, Proceedings of the Sabine Lake Conference—Where Texas and Louisiana come together: TAMU-SG-97-101, 66 p.

The intent of this publication is to begin the task of developing documentation of the baseline environmental conditions in the Sabine Lake and surrounding uplands and wetlands in Texas and Louisiana.

Keywords: management, freshwater, riparian

69. Bodker, E., 1988, Effects of end-on construction on a coastal wetland: Louisiana Transportation Research Center, RR-215, 76 p.

This study was intended to provide a data base of environmental considerations relating to the use of end-on construction for building elevated highways in coastal wetlands. The study was conducted in the LaBranch wetlands where the end-on construction of I-310 was being carried out.

Keywords: estuarine, management

70. Boesch, D.F., 1995, Scientific assessment of coastal wetland loss, restoration and management in Louisiana, *in* Anonymous, Geological Society of America, 1995 annual meeting: Abstracts with Programs—Geological Society of America, v. 27, no. 6, p. 86.

Keywords: estuarine, wetland loss

71. Boesch, D.F., Josselyn, M.N., Mehta, A.J., Morris, J.T., Nuttle, W.K., Simenstad, C.A., and Swift, D.J.P., 1994, Scientific assessment of coastal wetland loss, restoration and management in Louisiana: Journal of Coastal Research, v. 20 (special issue), p. 103.

Keywords: estuarine, wetland loss

72. Boles, R. L., Lovett-Doust, J., and Lovett-Doust, L., 1999, Population Genetic Structure in Green Dragon (*Arisaema dracontium*, Araceae): Canadian Journal of Botany-Revue Canadienne De Botanique, v. 77, no. 10, p. 1401-1410.

    Keywords: ecology, vascular plants

73. Bolger, R.G., Dawson, W.C., and Robertson, E.D., 1993, Remediation of the petro-processors, INC NL site, *in* Anonymous, Proceedings of the Focus conference on Eastern regional ground water issues: Ground Water Management, v. 16, p. 323-329.

    Keywords: groundwater, management

74. Boniol, Donovan, Autin, W.J., and Hanson, B.C., 1988, Recharge potential of Louisiana aquifers; a supplement to the state aquifer recharge map and atlas plates: Open File Series--Louisiana Geological Survey, # 88-07, 56 p.

    Keywords: groundwater, freshwater, hydrology

75. Bonnet, C.W., and Williams, J.F., III, 1987, Development of ground-water resources in the Orange County area, Texas and Louisiana, 1980-spring of 1985: U.S. Geological Survey Water Resources Investigations Report 87-4158, 50 p.

    Keywords: groundwater, management

76. Booth, J.G., McKee, B.A., and Swarzenski, P.W., 1992, Uranium transport in the Mississippi River; spatial and temporal variability in dissolved/colloidal distributions, *in* Anonymous, AGU 1992 fall meeting: Eos, Transactions, American Geophysical Union, v. 73, no. 43 (suppl.), p. 158.

    Keywords: surface water, freshwater, trace elements

77. Bornette, G., and Large, A. R. G., 1995, Groundwater surface-water ecotones at the upstream part of confluences in former river channels: Hydrobiologia, v. 310, no. 2, p. 123-137.

    Keywords: hydrology, surface water, groundwater, habitat, ecology

78. Bostock, H.H., Richards, P.A., Rogers, M.C., and Waldon, M.G., 1991, A GIS approach to potable water protection on the Lower Mississippi River, *in* Dhamotharau, Dhamo, Resource development of the Lower Mississippi River; symposium papers: American Water Resources Association Technical Publication Series TPS, v. 91-3, p. 29-34.

    Keywords: GIS, management, contaminants, freshwater, surface water

79. Boumans, R.M., and Day, J.W., Jr., 1994, Effects of two Louisiana marsh management plans on water and materials flux and short-term sedimentation: Wetlands, v. 14, no. 4, p. 247-261.

The impact of two coastal Louisiana marsh management plans on water and materials flux, short-term sedimentation, and several soil parameters was evaluated between May 1989 and January 1990. The study was carried out in the Fina-Laterre Marsh Management Area and the Rockefeller State Wildlife Refuge in managed and unmanaged areas. Water and material flux was measured each two hours during twelve 48-hour flux studies, and net fluxes per m^2 of drainage area were calculated for water, total suspended sediments, salinity, $NO_3 + NO_2$, PO_4, and NH_4.

Keywords: surface water, freshwater, management, sediment, hydrology, nutrients

80. Boumans, R.M.J., Day, J.W., Kemp, G.P., and Kilgen, K., 1997, The effect of intertidal sediment fences on wetland surface elevation, wave energy and vegetation establishment in two Louisiana coastal marshes: Ecological Engineering, v. 9, no. 1-2, p. 37-50.

Intertidal sediment fences, made from recycled Christmas trees, were built in Louisiana USA, to increase sediment trapping and promote revegetation of submerged vegetation on mudflats. We consider here the effects of Christmas tree fences on wave characteristics, sediment aggradation and vegetation response. Wave energy at the bed decreased 50% across the monitored fences, while elevation increased in the shadow area up to + 3.3 cm yr super(-1) depending on the initial water depth. Part of one site experienced revegetation with submerged and emergent vegetation after three years, while other stations remained uncolonized. Factors affecting the pace and success of plant colonization are discussed.

Keywords: wetland loss, sediment, management, vascular plants, hydrology

81. Boumans, R.M.J., and Sklar, F.H., 1990, A polygon-based spatial (PBS) model for simulating landscape change: Landscape Ecology, v. 4, no. 2-3, p. 83-97.

A spatial model of long term habitat succession at a degrading Louisiana wetland was constructed based upon simulating exchanges across irregularly shaped polygons. Polygons represented the natural morphology which is indicative of the natural landscape. The PBS model was partially successful in simulating spatial habitat changes over a 28-year period when more than 1000 ha of wetland loss occurred ($r^2 = .56$). General landscape trends did, however, emerge from the model development. Areas of high annual water-level fluctuations, and high primary productivity were less likely to change from wetlands to open water and were most likely to recover if altered. We discuss the potential for predictive improvement and for integration with polygon-based geographic information systems, and conclude that a PBS model demonstrates the need for spatially explicit landscape management.

Keywords: model, GIS, geomorphology, wetland loss

82. Boustany, R.G., and Rizzo, W.M., 1996, Partitioning material fluxes sediment communities in meadows of submerged vegetation—Effects of light and nutrient manipulations: Twenty-Fourth Annual Benthic Ecology Meeting, Columbia, S.C., March 7-10, p. 92.

    During the summer of 1995, a greenhouse experiment was carried out to determine the effects of manipulations of photosynthetically active radiation and nutrients on material fluxes between the benthic and water column communities of a bed of *Vallisneria americana* from Lake Pontchartrain, LA.

    Keywords: estuarine, vascular plants, algae, physiology, nutrients

83. Bowles, D.E., Aziz, K., and Knight, C.L., 2000, *Macrobrachium* (Decapoda: Caridea: Palaemonidae) in the contiguous United States—A review of the species and an assessment of threats to their survival: Journal of Crustacean Biology, v. 20, no. 1, p. 158-171.

    Preliminary data from Mississippi and Texas support the notion that populations of river shrimps are restricted by impoundments, and populations, in general, are in decline. A review of the species and a revised key are presented.

    Keywords: checklist, macroinvertebrates, freshwater, ecology

84. Boyer, M.E., 1997, The effect of long-term marsh management on land-loss rates in coastal Louisiana: Environmental Management (New York), v. 21, no. 1, p. 97-104.

    Because of the large amount of Louisiana's coastal wetlands under management and the high cost associated with marsh management, it is important to determine if those management efforts have been successful. The purpose of this study was to determine if land-loss rates were changed as a result of marsh management.

    Keywords: estuarine, wetland loss

85. Boyer, M.E., Harris, J.O., and Turner, R.E., 1997, Constructed crevasses and land gain in the Mississippi River delta: Restoration Ecology, v. 5, no. 1, p. 85-92.

    Extensive land loss, which is mostly wetland loss, has taken place during this century in the Mississippi River delta and other river deltas. Our purpose was to evaluate the effectiveness of constructing "artificial" crevasses, or cuts in the natural levee, made by the U.S. Fish and Wildlife Service in the Delta National Wildlife Refuge (DNWR) to slow or reverse this type of land loss. Land growth of the crevasses was determined from aerial photographs and was related to crevasse-site characteristics. The newly constructed crevasses create emergent wetlands after 2 years of subaqueous growth at about 4.7 ha/year and an average cost of $21,377 per crevasse. The present total cost per hectare declines with age as new land builds, and it will equal $48 per hectare if all the open

water in the receiving ponds fills in. At these rates, the net land loss rates in the DNWR measured from 1958 to 1978 would be compensated for by the building of 63 crevasses, 24 of which are already in place.

Keywords: wetland loss, geomorphology, management, sediment

86. Brantley, C.G., and Platt, S.G., 1992, Experimental evaluation of nutria herbivory on baldcypress: Proceedings of the Louisiana Academy of Sciences, v. 55, p. 21-25.

    Experimental plantings of baldcypress (Taxodium distichum) were conducted at the Manchac Wildlife Management Area in St. John the Baptist Parish, Louisiana to evaluate effects of nutria (*Myocastor coypus*) herbivory. During April 1987, 321 one-year-old bare root seedlings were planted in fenced and unfenced plots. Within one growing season 95.8 percent of the unfenced seedlings were uprooted and consumed by nutria. Fenced exclosures eliminated nutria herbivory to planted baldcypress seedlings. In December 1987, 161 two-year-old container grown baldcypress saplings were planted in unfenced plots. Nutria uprooted 28.6 percent of these saplings. We conclude that at 2-3 years of age, baldcypress can apparently establish a root mass or stem diameter sufficient to withstand uprooting by nutria. (DBO)

    Keywords: vascular plants, mammals, herbivory, freshwater

87. Bratkovich, A., Dinnel, S.P., Jones, B.H., and Whitledge, T., 1993, Riverine source functions and impacts—Mississippi and Atchafalaya Rivers: ASLO and SWS 1993 Annual Meeting. Abstracts.

    Historical time series of riverine water discharge, nitrate concentration, and nitrate flux were analyzed.

    Keywords: surface water, freshwater, hydrology, nutrients

88. Bray, R.B., and Hanor, J.S., 1990, Spatial variations in subsurface pore fluid properties in a portion of Southeast Louisiana; Implications for regional fluid flow and solute transport, *in* Anonymous, Gulf Coast Association of Geological Societies and Gulf Coast Section of SEPM meeting; Abstracts: AAPG Bulletin, v. 74, no. 9, p. 1489-1490.

    Keywords: groundwater, chemistry, hydrology

89. Brazelton, S.R., comp., 1994, Water resources abstracts of publications of the Louisiana Department of Transportation and Development and the U.S. Geological Survey, 1954-94: Louisiana Department of Transportation and Development Water Resources Special Report no. 7, 185 p.

    Keywords: groundwater, surface water, freshwater, hydrology, chemistry

90. Breaux, A., Farber, S., and Day, J., 1995, Using natural coastal wetlands systems for wastewater treatment—An economic benefit analysis: Journal of Environmental Management, v. 44, no. 3, p. 285-291.

Wetland systems can be substitutes for traditional wastewater treatment. Additional benefits include the enhancement in wetlands quality stemming from nutrients in the treated wastewaters. This paper reports on estimates of cost savings from using coastal wetlands for substitute treatment in Louisiana, U.S.A. Estimates of discounted cost savings ranged from $785 to $34,700 per acre of wetlands used for treatment.

Keywords: estuarine, nutrients, urban, management

91. Breaux, A.M., 1992, The use of hydrologically altered wetlands to treat wastewater in coastal Louisiana, p. 245.

Keywords: surface water, freshwater, management, nutrients

92. Breaux, A.M., Callaway, J.C., Lu, T., Rybczyk, J., White, M.L., and Wang, F.C., 1991, Water, sediment and salinity fluxes in a tidal salt marsh channel, *in* Dhamotharau, Dhamo, Resource development of the Lower Mississippi River; symposium papers: American Water Resources Association Technical Publication Series TPS, v. 91-3, p. 49-58.

Keywords: estuarine, hydrology, sediment

93. Breaux, A.M., and Day, J.W., Jr., 1994, Policy considerations for wetland wastewater treatment in the coastal zone; a case study for Louisiana: Coastal Management, v. 22, no. 3, p. 285-307.

Two major environmental problems currently affecting the Louisiana coastal zone are a high rate of wetland loss and high levels of surface-water pollution. The application of secondarily treated wastewater to wetlands can be a means of dealing with both of these problems.

Keywords: urban, contaminants, nutrients, management, vascular plants

94. Brewer, J.S., and Grace, J.B., 1990, Plant community structure in an oligohaline tidal marsh: Vegetatio, v. 90, no. 2, p. 93-107.

An oligohaline tidal marsh on the northern shore of Lake Pontchartrain, LA was characterized with respect to the distributions and abundances of plant species over spatial and temporal gradients using Detrended Correspondence Analysis (DCA). In addition, the species distributions were correlated to several physical environmental factors using Detrended Canonical Correspondence Analysis (DCCA). The distributions of species were best correlated with distance from Lake Pontchartrain, and to a lesser

extent with elevation and substrate organic matter. They were least correlated with mean soil salinity (referred to here as background salinity).

Keywords: estuarine, vascular plants, ecology, habitat

95. Brinton, T.I.I., Jr., Garbarino, J.R., Peartt, D.B., Taylor, H.E., and Antweiler, R.C., 1995, Concentration and transport data for dissolved inorganic constituents in water collected during seven cruises on the Mississippi River and some of its tributaries, July 1987-June 1990: U.S. Geological Survey Open-File Report 94-0524, p. 102.

    Keywords: surface water, freshwater, chemistry

96. Britsch, L.D., Dunbar, J.B., and Kemp, E.B., III, 1991, Louisiana coastal plain land loss rates, *in* Dhamotharau, Dhamo, Resource development of the Lower Mississippi River; symposium papers: American Water Resources Association Technical Publication Series TPS, v. 91-3, p. 91-99.

    Keywords: estuarine, wetland loss

97. Britsch, L.D., and Dunbar, J.B., 1993, Land loss rates—Louisiana coastal-plain: Journal of Coastal Research, v. 9, no. 2, p. 324-338.

    Land loss mapping and rate curve development for 62 quadrangles in the Mississippi River deltaic and chenier plains shows that land loss rates and trends vary significantly throughout coastal Louisiana. Land loss rates were defined for each quadrangle for 4 time periods (1930's to 1956-1958, 1956-1958 to 1974, 1974 to 1983, and 1983 to 1990). Differences in landloss rates among the individual quadrangles are a function of the geologic and hydrologic setting and the factors which contribute to land loss such as subsidence, storm induced erosion, channelization of streams and rivers, and canal dredging. Of the 62 quadrangles mapped, 8 quadrangles are losing more than 1 percent of their land area each year, while 21 quadrangles are losing more than 0.5 percent per year during the 1983 to 1990 period. On a regional scale, the land loss rate for the entire Louisiana Coastal Plain has decreased from an average yearly rate of 41.83 square miles in the 1956-1958 to 1974 period to 25.34 square miles during the 1983 to 1990 period. The percentage of land being lost is also decreasing from 0.51 percent per year in the 1956-1958 to 1974 period to 0.35 percent per year during the 1983 to 1990 period. The regional land loss rate will probably continue to decrease slowly until a background rate is reached.

    Keywords: estuarine, wetland loss, sediment, management

98. Broome, S.W., Mendelssohn, I.A., and McKee, K.L., 1995, Relative growth of *Spartina patens* (ait.) Muhl. and *Scirpus olneyi* Gray occurring in a mixed stand as affected by salinity and flooding depth: Wetlands, v. 15, no. 1, p. 20-30.

Mixed stands of *Spartina patens* and *Scirpus olneyi* occur in brackish marshes along the Gulf Coast of Louisiana. *Scirpus olneyi* is considered to be an important wildlife food, and marshes are often managed to favor its dominance over *S. patens*. Two environmental factors that affect growth of the two species are salinity and water regime. The objectives of this study were to determine the effects of salinity and water depth, under controlled greenhouse conditions, on relative dominance of the two species, chemical properties of soil interstitial water, and nutrient concentrations in the plant tissue. Extrapolated to field conditions, the results indicate that increasing salinity favors productivity of *S. patens* relative to *S. olneyi*, while increased depth of flooding favors *S. olneyi*.

Keywords: estuarine, vascular plants, hydrology, productivity, salinity

99. Broussard, L.J., and Grouchy, D.M., 1992, The use of structures and other techniques for wetland restoration and protection in coastal Louisiana: Wetlands; Proceedings of the 13th annual conference; Society of Wetland Scientists, v. 13, p. 236-238.

Keywords: estuarine

100. Browder, J.A., May, L.N., Jr., Rosenthal, A., Gosselink, J.G., and Baumann, R.H., 1989, Modeling future trends in wetland loss and brown shrimp production in Louisiana using Thematic Mapper imagery: Remote Sensing of Environment, v. 28, p. 45-59.

The land-water interface of coastal marshes may influence the production of estuarine-dependent fisheries more than the area of these marshes. To test this hypothesis, the authors created a spatial model to explore the dynamic relationship between land-water interface and degree of land loss in disintegrating coastal marshes of Louisiana's Barataria, Terrebonne, and Timbalier basins. Calibrating the model with Landsat Thematic Mapper satellite imagery, they found a parabolic relationship between land-water interface and marsh disintegration. This relationship suggests that shrimp yields will decline when interface declines, possibly beginning about 1995.

Keywords: GIS, wetland loss, macroinvertebrates, model, estuarine

101. Brown, C.A., 1936, Some wild flowers of Louisiana—Part VII Poisonous Plants: Louisiana Conservation Review, v. 5, no. 4, p. 34-39.

Annotated list of poisonous plants found in Louisiana with distribution information, blooming dates, botanical description, scientific name, reaction to contact, and illustrations of 6 named species.

Keywords: vascular plants, checklist

102. Brown, K.M., and Richardson, T.D., 1987, Foraging ecology of the southern oyster drill *Thais haemastoma* (Gray) —Constraints on prey choice: Journal of Experimental Marine Biology and Ecology, v. 114, no. 2-3, p. 123-141.

Keywords: ecology, macroinvertebrates, estuarine

103. Brown, K.M., and Richardson, T.D., 1992, Phenotypic plasticity in the life histories and production of two warm-temperature viviparid prosobranchs: Veliger., v. 35, no. 1, p. 1-11.

The authors studied cohort dynamics, life-history variation, and secondary production in two viviparid prosobranchs at Bayou Manchac and Old River, two sites in southern Louisiana.

Keywords: surface water, freshwater, macroinvertebrates, ecology

104. Brown, K.M., Varza, D., and Richardson, T.D., 1989, Life histories and population dynamics of two subtropical snails (Prosobranchia: Viviparidae): Journal of the North American Benthological Society, v. 8, no. 3, p. 222-228.

The population dynamics and life histories of two subtropical, viviparid prosobranchs were studied in a small, slow-flowing bayou (alluvial plain river) near Baton Rouge, Louisiana, USA.

Keywords: macroinvertebrates, ecology

105. Bruner, B.G., Wilkerson, G.W., and Nye, J.C., 1990, Using geographic information system technology to assess shallow aquifer vulnerability to ground-water contamination, *in* Proceedings, Application of geographic information systems, simulation models, and knowledge-based systems for landuse management: Virginia Polytechnic Institute, Blacksburg, VA, p. 451-460.

Keywords: groundwater, GIS, freshwater, contaminants

106. Bryan, C.F., Rutherford, A.A., and Beck, L.T., 1993, Roles of the exotic water hyacinth in the distribution and resets of macroinvertebrates in the Atchafalaya River Swamp: ASLO and SWS 1993 Annual Meeting. Abstracts, vp.

Keywords: surface water, freshwater, vascular plants, ecology, macronvertebrates

107. Bryan, C.F., Rutherford, D.A., and Bryan, B.W., 1991, Long-term trends in water quality and fisheries in the lower Mississippi and Atchafalaya rivers, *in* Dhamotharau, Dhamo, Resource development of the Lower Mississippi River; symposium papers: American Water Resources Association Technical Publication Series TPS, v. 91-3, p. 181.

Keywords: surface water, freshwater, chemistry, fish

108. Bryan, C.F., Rutherford, D.A., and Walker-Bryan, B., 1992, Acidification of the lower Mississippi River: Transactions of the American Fisheries Society, v. 121, no. 3, p. 369-377.

Because of the meager information on the role of nonpoint-source and industrial pollution in the acidification of large rivers, the authors examined long-term trends (and cyclic seasonal events) in pH, alkalinity, and selected ions in the lower Mississippi River basin from 1958 to 1986.

Keywords: surface water, freshwater, urban, contaminants

109. Buckner, R.L. and Buckner, S.C., 1993, Description of *Neoechinorhynchus carinatus* n. sp. (Acanthocephala: Neoechinorhynchidae) from the sharpfin chubsucker, *Erimyzon tenuis*, of Louisiana and Mississippi: Journal of Parasitology, v. 79, no. 1, p. 32-36.

Keywords: surface water, freshwater, fish, ecology

110. Buono, Anthony, 1983, The Southern Hills regional aquifer system of southeastern Louisiana and southwestern Mississippi: U.S. Geological Survey Water-Resources Investigations Report 83-4189, 38 p.

Keywords: groundwater, freshwater, chemistry

111. Burden, D.G., and Malone, R.F., 1987, A classification of freshwater Louisiana lakes based on water quality and user perception data: Environmental Monitoring and Assessment, v. 9, no. 2, p. 179-193.

An index system developed for Louisiana lakes was based on correlations between measurable water-quality parameters and perceived lake quality. Support data was provided by an extensive monitoring program of 30 lakes coordinated with opinion surveys undertaken during summer 1984. Water-quality data indicated most of these lakes are eutrophic, although many have productive fisheries and considered recreational assets. Perception ratings of fishing quality and its associated water quality were obtained by distributing approximately 1200 surveys to Louisiana Bass Club Association members.

Keywords: freshwater, methods, management, contaminants

112. Burden, D.G., Malone, R.F., and Gremillion, P., 1987, Instability in a small hypereutrophic urban lake: Environmental Monitoring and Assessment, v. 9, no. 1, p. 13-24.

Keywords: hydrology, nutrients, ecology, urban

113. Burdick, D.M., and Mendelssohn, I.A., 1987, Waterlogging responses in dune, swale and marsh populations of *Spartina patens* under field conditions: Oecologia, v. 74, no. 3, p. 321-329.

Soil waterlogging responses were examined in three *Spartina patens* populations along a steep flooding gradient in coastal Louisiana. Root anatomy and physiological indicators of anaerobic metabolism were examined to identify and compare flooding responses in dune, swale and marsh populations, while soil physicochemical factors were measured to characterize the three habitats. Trends suggest that: 1) Aerenchyma formation was an important, albeit incomplete, long-term adaptation to the prevalent degree of soil waterlogging. 2) All populations adjusted root metabolism in response to a relative (short-term) increase in soil waterlogging.

Keywords: estuarine, hydrology, physiology, vascular plants, sediment, chemistry

114. Burdick, D.M., Mendelssohn, I.A., and McKee, K.L., 1989, Live standing crop and metabolism of the marsh grass *Spartina patens* as related to edaphic factors in a brackish, mixed marsh community in Louisiana: Estuaries, v. 12, no. 3, p. 195-204.

Keywords: estuarine, vascular plants, physiology

115. Buresh, R.J., DeLaune, R.D., and Patrick, W.H. Jr., 1981, Influence of *Spartina alterniflora* on the nitrogen loss from marsh soils: Soil Science Society of America Journal, v. 45, no. 3, p. 660-661.

Keywords: nutrients, estuarine, vascular plants, physiology

116. Burnett, A.W., and Schumm, S.A., 1983, Alluvial-river response to neotectonic deformation in Louisiana and Mississippi: Science, v. 222, p. 49-50.

Keywords: geomorphology, surface water

117. Butera, M.K., and Seyfarth, B.R., 1981, A determination of marsh detrital export from Landsat MSS data; a function of transport distance and water body characterization, *in* Hoffer, R.M., and Mroczynski, R.P., Machine processing of remotely sensed data, with special emphasis on range, forest, and wetlands assessment: Proceedings, Annual Symposium—Machine Processing of Remotely Sensed Data, no. 7, p. 240-253.

Keywords: estuarine, GIS, wetland loss

118. Byrne, C.J., and Deleon, I.R., 1986, Trace metal residues in biota and sediments from Lake Pontchartrain, Louisiana: Bulletin of Environmental Contamination and Toxicology, v. 37, no. 1, p. 151-158.

Keywords: trace elements, contaminants, sediment, fish, urban, estuarine

119. Byrne, P., Borengasser, M., Drew, G., and others, 1976, Barataria Basin—Hydrologic and climatologic processes: Louisiana State University, Center for Wetland Resources, Coastal Zone Management Series, Baton Rouge, La.

Keywords: hydrology, climate, geomorphology

120. Cahoon, D.R., 1994, Recent accretion in two managed marsh impoundments in coastal Louisiana: Ecological Applications, v. 4, no. 1, p. 166-176.

Recent accretion was measured by the feldspar marker horizon method in two gravity-drained, managed, marsh impoundments and unmanaged reference marshes located on the rapidly subsiding coast of Louisiana.

Keywords: estuarine, sediment, wetland loss, management

121. Cahoon, D.R., and Cowan, J.H., Jr., 1988, Environmental impacts and regulatory policy implications of spray disposal of dredged material in Louisiana wetlands: Coastal Management, v. 16, p. 341-362.

Keywords: management, sediment, hydrology

122. Cahoon, D.R., and Groat, C.G., 1990, Study of marsh management practice in coastal Louisiana, volume 1—Executive summary: OCS Rep. Miner. Manage. Serv., 34 p.

The knowledge of the effectiveness of marsh management practices in coastal Louisiana is limited because of gaps in the knowledge about the influence of management on wetland loss, primary production, accretionary processes, nutrient cycling, and cumulative impacts. The authors evaluated 16 sites in coastal Louisiana in an attempt to bridge some of these knowledge gaps.

Keywords: estuarine, management, wetland loss

123. Cahoon, D.R., and Groat, C.G., 1990, Study of marsh management practice in coastal Louisiana, volume 2—Technical description: OCS Rep. Miner. Manage. Serv., 288 p.

This report is the second of a four-volume report. The object of the study was to prepare a factual array of data and data analysis to determine the effectiveness and suitability of marsh management techniques for mitigating wetland deterioration and loss in coastal Louisiana.

Keywords: estuarine, wetland loss, management

124. Cahoon, D.R., and Groat, C.G., 1990, Study of marsh management practice in coastal Louisiana, volume 3—Ecological evaluation: OCS Rep. Miner. Manage. Serv., 398 p.

The knowledge of the effectiveness of marsh management practices in coastal Louisiana is limited because of gaps in the knowledge about the influence of management on wetland loss, primary production, accretionary processes, nutrient cycling, and cumulative impacts. The authors evaluated 16 sites in coastal Louisiana in an attempt to bridge some of these knowledge gaps.

Keywords: estuarine, wetland loss, sediment, nutrients, management

125. Cahoon, D.R., and Groat, C.G., 1990, Study of marsh management practice in coastal Louisiana, volume 4—Appendices: OCS Rep. Miner. Manage. Serv., 440 p.

This report is the fourth of a four volume report. Included in the volume are policy and regulatory guidelines of governmental agencies, a habitat characterization of the coastal zone, and a description of existing private and government management areas.

Keywords: estuarine, habitat, management, wetland loss

126. Cahoon, D.R., Reed, D.J., and Day, J.W., Jr., 1995, Estimating shallow subsidence in microtidal salt marshes of the Southeastern United States; Kaye and Barghoorn revisited: Marine Geology, v. 128, no. 1-2, p. 1-9.

Simultaneous measurements of vertical accretion and change in surface elevation relative to a shallow (3-5 m) subsurface datum were made in selected coastal salt marshes of Louisiana, Florida, and North Carolina to quantitatively test Kaye and Barghoorn's contention that vertical accretion is not a good surrogate for surface elevation change because of autocompaction of the substrate. Rates of subsidence of the upper 3-5 m of marsh substrate were calculated for each marsh as the difference between vertical accretion and elevation change measured with feldspar marker horizons and a sedimentation-erosion table.

Keywords: estuarine, sediment, geomorphology

127. Calandro, A.J., 1967, Rainfall-runoff relations for southeastern Louisiana and southwestern Mississippi: Louisiana Department of Public Works Technical Report no. 2a, 61 p.

Keywords: surface water, freshwater, hydrology

128. Calandro, A.J., 1973, An analysis of stream temperatures in Louisiana: Louisiana Department of Public Works Technical Report no. 6, 16 p.

Keywords: surface water, freshwater

129. Calandro, A.J., 1974, Time of travel of solutes for New River near Geismar, Louisiana: U.S. Geological Survey Open-File Report 74-94, 5 p.

Keywords: surface water, freshwater, chemistry, hydrology

130. Calandro, A.J., 1976, Time of travel of solutes in Mississippi River from the Arkansas-Louisiana State line to Plaquemine, Louisiana: Louisiana Department of Public Works Water Resources Technical Report no. 12, 5 p.

Keywords: surface water, freshwater, chemistry, hydrology

131. Calandro, A.J., 1977, Time of travel of solutes in Mississippi River from Belle Chasse to the vicinity of Head of Passes, Louisiana: Louisiana Department of Transportation and Development, Office of Public Works Water Resources Technical Report no. 13, 5 p.

Keywords: surface water, freshwater, chemistry, hydrology

132. Calandro, A.J., 1978, Time of travel of solutes in Louisiana streams: Louisiana Department of Transportation and Development, Office of Public Works Water Resources Technical Report no. 17, 32 p.

Keywords: surface water, freshwater, chemistry, hydrology

133. Calandro, A.J., 1981, Time of travel of solutes in the Vermilion River, Louisiana: U.S. Geological Survey Open-File Report 81-1065, 19 p.

Keywords: surface water, freshwater, chemistry, hydrology

134. Calandro, A.J., Broussard, W.L., and Kilburn, Chabot, 1966, Water, *in* Vermilion Parish Resources and Facilities: Louisiana Department of Public Works and Vermilion Parish Development Board, p. 26-36.

Keywords: groundwater, freshwater

135. Calandro, A.J., and Harder, A.H., 1960, Water, *in* Cameron Parish Resources and Facilities: Louisiana Department of Public Works and Cameron Parish Development Board, p. 46-60.

Keywords: groundwater, freshwater

136. Calandro, A.J., Whiteman, C.D., and Gaydos, M.W., 1966, Water, *in* East Feliciana Parish Resources and Facilities: Louisiana Department of Public Works and East Feliciana Parish Development Board, p. 32-37.

Keywords: groundwater, freshwater

137. Callaway, J.C., DeLaune, R.D., and Patrick, W.H., Jr., 1997, Sediment accretion rates from four coastal wetlands along the Gulf of Mexico: Journal of Coastal Research, v. 13, no. 1, p. 181-191.

The authors' study of sediment accretion rates from four low tidal-range sites along the Gulf of Mexico does not support previous hypotheses concerning the relation between tidal range and vertical accretion rates.

Keywords: estuarine, sediment, hydrology

138. Callender, L.E., McCallum, B.E., Brazelton, S.R., Anderson, M.L., and Ensminger, P.A., 1998, Flood Tracking Chart, Amite River Basin, Louisiana: U.S. Geological Survey Open-File Report 96-649 (revised 1998), 1 sheet.

Keywords: surface water, freshwater, hydrology

139. Camp, J.D., 1964, Flood of 1962 near Baton Rouge, Louisiana: U.S. Geological Survey Hydrologic Investigations Atlas HA-126, 1 sheet.

Keywords: surface water, freshwater, hydrology

140. Cange, J.B., Saxton, D.C., and Cange, S.M., 1986, Design and implementation of a ground water remediation program at Louisiana's Priority Superfund Site: Proceedings of the NWWA/API Conference on Petroleum Hydrocarbons and Organic Chemicals in Ground Water; Prevention, Detection and Restoration, p. 737-754.

Keywords: groundwater, management, contaminants

141. Cardwell, G.T., 1958, Water, *in* Washington Parish Resources and Facilities: Louisiana Department of Public Works and Washington Parish Development Board, p. 27-39.

Keywords: groundwater, freshwater

142. Cardwell, G.T., Dial, D.C., Nyman, D.J., and Whiteman, C.D., Jr., 1982, Ground-water conditions along route from New Orleans to Grand Cheniere, via Baton Rouge, Lafayette, and Abbeville: Geopressured-Geothermal Energy Resource Appraisal; Hydrogeology and Well Testing Determine Producibility, v. 14, p. 10-13.

Keywords: groundwater, chemistry

143. Cardwell, G.T., Forbes, M.J., Jr., and Gaydos, M.W., 1966, Progress report on the availability of fresh water, Lake Pontchartrain area, Louisiana: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Pamphlet no. 18, 24 p.

Keywords: groundwater, freshwater, management

144. Cardwell, G.T., Forbes, M.J., Jr., and Gaydos, M.W., 1967, Water resources of the Lake Pontchartrain area, Louisiana: Department of Conservation, Louisiana Geological

Survey, and Louisiana Department of Public Works Water Resources Bulletin no. 12, 105 p.

Keywords: groundwater, freshwater, management

145. Cardwell, G.T., and Rollo, J.R., 1960, Interim report on ground-water conditions between Baton Rouge and New Orleans, Louisiana: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Pamphlet no. 9, 44 p.

Keywords: groundwater, chemistry

146. Cardwell, G.T., Rollo, J.R., and Long, R.A., 1963, Basic ground-water data for the Mississippi River parishes south of Baton Rouge, Louisiana: Louisiana Department of Public Works, 5 p.

Keywords: groundwater, chemistry

147. Cardwell, G.T., Sloss, Raymond, and Duncan, A.C., 1965, Water, *in* Assumption Parish Resources and Facilities: Louisiana Department of Public Works and Assumption Parish Development Board, p. 25-38.

Keywords: groundwater, freshwater

148. Cardwell, G.T., and Walter, W.H., 1979, Pumpage of water in Louisiana, 1975: Louisiana Department of Transportation and Development, Office of Public Works Water Resources Special Report no. 2, 15 p.

Keywords: groundwater, management

149. Carlson, D.D., Dantin, L.J., Garrison, C.R., and Stuart, C.G., 1985, Water resources data—Louisiana, water year 1985: U.S. Geological Survey Water-Data Report LA-85-1, 605 p.

Keywords: surface water, freshwater, chemistry, hydrology

150. Carlson, D.D., Dantin, L.J., Garrison, C.R., and Stuart, C.G., 1986, Water resources data—Louisiana, water year 1986: U.S. Geological Survey Water-Data Report LA-86-1, 547 p.

Keywords: surface water, freshwater, chemistry, hydrology

151. Carlson, D.D., Dantin, L.J., Garrison, C.R., and Stuart, C.G., 1988, Water resources data—Louisiana, water year 1987: U.S. Geological Survey Water-Data Report LA-87-1, 445 p.

Keywords: surface water, freshwater, chemistry, hydrology

152. Carlson, D.D., and Firda, G.D., 1983, Floods of 1983 in southern Mississippi and southeastern Louisiana: U.S. Geological Survey Open-File Report 83-685, 32 p.

Keywords: surface water, freshwater, hydrology

153. Carlson, D.D., Garrison, C.R., Jordan, M.M., Dantin, L.J., and Montgomery, P.W., 1989, Index to surface-water data in Louisiana: Louisiana Department of Transportation and Development Water Resources Basic Records Report no. 17, 228 p.

Keywords: surface water, freshwater, chemistry, hydrology

154. Carlson, D.D., and Marshall, S.L., 1980, Water resources*, in* Soil survey of Allen Parish, Louisiana: U.S. Department of Agriculture, Soil Conservation Service, 5 p.

Keywords: groundwater, chemistry

155. Carlson, D.D., Stallworth, G.R., Dantin, L.J., and Stuart, C.G., 1982, Water resources data—Louisiana, water year 1982, volume 1. Central and northern Louisiana: U.S. Geological Survey Water-Data Report LA-82-1, 422 p.

Keywords: surface water, freshwater, chemistry, hydrology

156. Carlson, D.D., Stallworth, G.R., Dantin, L.J., and Stuart, C.G., 1982, Water resources data—Louisiana, water year 1982, volume 2. Southern Louisiana: U.S. Geological Survey Water-Data Report LA-82-2, 404 p.

Keywords: surface water, freshwater, chemistry, hydrology

157. Carlson, D.D., Stallworth, G.R., Dantin, L.J., and Stuart, C.G., 1983, Water resources data—Louisiana, water year 1983, volume 1. Central and northern Louisiana: U.S. Geological Survey Water-Data Report LA-83-1, 392 p.

Keywords: surface water, freshwater, chemistry, hydrology

158. Carlson, D.D., Stallworth, G.R., Dantin, L.J., and Stuart, C.G., 1983, Water resources data—Louisiana, water year 1983, volume 2. Southern Louisiana: U.S. Geological Survey Water-Data Report LA-83-2, 360 p.

Keywords: surface water, freshwater, chemistry, hydrology

159. Carlson, D.D., Stallworth, G.R., Dantin, L.J., and Stuart, C.G., 1984, Water resources data—Louisiana, water year 1984: U.S. Geological Survey Water-Data Report LA-84-1, 608 p.

Keywords: surface water, freshwater, chemistry, hydrology

160. Carman, K.R., Fleeger, J.W., Means, J.C., Pomarico, S.M., and McMillin, D.J., 1995, Experimental investigation of the effects of polynuclear aromatic hydrocarbons on an estuarine sediment food web: Mar. Environ. Res., v. 40, no. 3, p. 289-318.

    The influence of polynuclear aromatic hydrocarbons (PAHs) on a benthic estuarine sedimentary salt-marsh food web was examined using a microcosm system to simulate natural conditions. Microcosms were dosed with sublethal concentrations of PAH-contaminated sediment collected from a produced-water site at Pass Fourchon, Louisiana. Bacterial activity, physiological condition, and abundance were not influenced by PAH, but microalgal activity and physiological condition were.

    Keywords: estuarine, contaminants, ecology, physiology, microbiology, algae

161. Carman, K.R., Fleeger, J.W., and Pomarico, S.M., 1997, Response of a benthic food web to hydrocarbon contamination: Limnology and Oceanography, v. 42(3), p. 561-571.

    The influence of diesel-contaminated sediment on microbes, meiofauna, and meiofauna-microalgae interactions were examined in a microcosm study. Microcosms consisted of an intact sediment community from a Louisiana Spartina alterniflora salt marsh.

    Keywords: estuarine, contaminants, ecology, macroinvertebrates, algae, microbiology

162. Carman, K.R., Means, J.C., and Pomarico, S.C., 1996, Response of sedimentary bacteria in a Louisiana salt marsh to contamination by diesel fuel: Aquat. Microb. Ecol., v. 10, no. 3, p. 231-241.

    In a 28-day microcosm study, the authors examined the effects of diesel-contaminated sediment on the sedimentary bacterial community of a Louisiana salt marsh that has been chronically exposed to petroleum hydrocarbons for decades.

    Keywords: estuarine, contaminants, microbiology

163. Carman, K.R., and Todaro, M.A., 1996, Influence of polycyclic aromatic hydrocarbons on the meiobenthic-copepod community of a Louisiana salt marsh: Journal of Experimental Marine Biology and Ecology, v. 198, no. 1, p. 37-54.

    The influence of sediment contaminated with polycyclic aromatic hydrocarbons (PAHs) on the meiobenthic copepod community of a Louisiana salt marsh was examined with microcosms of sediment containing natural faunal assemblages.

    Keywords: estuarine, macroinvertebrates, contaminants

164. Carter, C.E., McDaniel, V., and Bengtson, R.L., 1982, Potential for subsurface drainage in the lower Mississippi Valley: Proceedings – National Drainage Symposium, v. 4, p. 23-33.

Keywords: groundwater, hydrology

165. Carter, J., Foote, A.L., and Johnson-Randall, L.A., 1999, Modeling the effects of nutria (*Myocastor coypus*) on wetland loss: Wetlands, v. 19, no. 1, p. 209-219.

We created a model to study the process in which nutria (*Myocastor coypus*) feeding activities lead to erosion and loss of marsh area. This model ties together data on nutria population dynamics and feeding behavior from the literature with data from field studies on the phenology of *Scirpus americanus* and *Spartina patens* conducted in the Barataria Basin, Louisiana, USA in 1992. The complete model consists of three linked models: a model of nutria population dynamics (nutria model), a model of the annual marsh biomass cycle of *Scirpus americanus* and *Spartina patens* (biomass model), and a plant-biomass density-dependent marsh area model (area model). When all three models are linked together, they form the "nutria-biomass-area model."

Keywords: mammals, herbivory, vascular plants, estuarine, wetland loss, model

166. Cashner, R.C., Gelwick, F.P., and Matthews, W.J., 1994, Spatial and temporal variation in the distribution of fishes of the LaBranche Wetlands Area of the Lake Pontchartrain estuary, Louisiana: Northeast Gulf Sci., v. 13, no. 2, p. 107-120.

During early summer of 1989 and 1990, an electrofishing survey of 6 stations in Bayou LaBranche and Bayou Trepagnier, a tributary, yielded 10,644 specimens representing 38 species in 19 families.

Keywords: estuarine, fish, checklist

167. Casselman, M.E., Patrick, W.H. Jr., and DeLaune, R.D., 1981, Nitrogen Fixation in a Gulf Coast Salt Marsh: Soil Science Society of America Journal, v. 45, no. 1, p. 51-56.

Keywords: nutrients, estuarine, vascular plants, physiology, microbiology

168. Cassidy, D.P., and Ranganathan, Vishnu, 1992, Groundwater upwelling, near Bay St. Elaine salt dome in southeastern Louisiana, as inferred from fluid property variations: AAPG Bulletin, v. 76, no. 10, p. 1560-1568.

Keywords: groundwater, hydrology

169. Catallo, W.J., Schlenker, M., Gambrell, R.P., and Shane, B.S., 1995, Toxic chemicals and trace metals from urban and rural Louisiana lakes—Recent historical profiles and toxicological significance: Environmental Science and Technology, v. 29, no. 6, p. 1436-1445.

Sediment cores collected from lakes in rural and urban/industrial areas of Louisiana were dated using ^{137}Cs, sectioned, and analyzed for a wide range of pollutant chemicals deposited during the period 1950-1991. Mutagenicity testing also was performed on extracts from the core sections.

Keywords: contaminants, trace elements, urban, surface water, fresh water, sediment

170. Chambers, J.L., and Goyer, R., 1997, Wetland/bottomland forests—Values, problems, and prospects in Louisiana: La. Agric., v. 40, no. 2, p. 27-29.

Keywords: surface water, freshwater, vascular plants, riparian

171. Chandler, G.T., and Fleeger, J.W., 1983, Meiofaunal colonization of azoic estuarine sediment in Louisiana—Mechanisms of dispersal: Journal of Experimental Marine Biology and Ecology, v. 69, no. 2, p. 189-202.

Keywords: estuarine, sediment, macroinvertebrates

172. Chandler, G.T., and Fleeger, J.W., 1987, Facilitative and inhibitory interactions among estuarine meiobenthic harpacticoid copepods: Ecology, v. 68, no. 6, p. 1906-1919.

Keywords: ecology, macroinvertebrates, estuarine

173. Chang, K.R., Ingra, T.S., and Griswold, R.M., 1990, The effects of creosote-contaminated groundwater on slurry cutoff wall soil backfill: Superfund ’90. Proceedings of the 11th National Conference, p. 439-445.

Results from compatibility tests performed on several laboratory-prepared soil backfill mixtures of on-site and off-site and creosote-contaminated groundwater from the Bayou Bonfouca Superfund site in Slidell, Louisiana, were used to evaluate the expected performance of a slurry cutoff wall installed at this site.

Keywords: groundwater, contaminants

174. Childers, D.L., and Day, J.W., Jr., 1987, Direct measurement of particle flux between marshes and the water column in two Louisiana estuaries: Eos, Transactions, American Geophysical Union, v. 68, no. 50, p. 1774.

Keywords: estuarine, sediment, hydrology

175. Childers, D.L., and Day, J.W., Jr. , 1990, Marsh-water column interactions in two Louisiana estuaries 2. Nutrient dynamics: Estuaries, v. 13, no. 4, p. 404-417.

Keywords: hydrology, estuarine, nutrients, vascular plants

176. Childers, D.L., and Day, J.W., Jr., 1991, The dilution and loss of wetland function associated with conversion to open water: Wetlands Ecol. Manage., v. 1, no. 3, p. 163-171.

The functional loss of intertidal wetlands associated with the decrease in the wetland/open water ratio caused by wetland submergence and conversion to open water may significantly alter ecological functions dependent on the interactive coupling of wetland and aquatic habitats. This hypothesis is explored in relation to the Barataria Basin estuary in south Louisiana.

Keywords: estuarine, wetland loss, ecology

177. Chiou, C.T., and Leenheer, J.A., 1988, Properties of Calcasieu River and Suwannee River humic substances that affect contaminant solubility enhancement: U.S. Geological Survey Open File Report 87-0764, p. 81-84.

Keywords: surface water, freshwater, sediment, contaminants

178. Chmura, G.L., 1994, Palynomorph distribution in marsh environments in the modern Mississippi Delta Plain: Bulletin of the Geological Society of America, v. 106, no. 5, p. 705-714.

A palynological study of modern sediments from subaerial environments of the Mississippi Delta plain shows that palynomorph assemblages are characteristic of salinity and depositional environment.

Keywords: vascular plants, salinity, estuarine, ecology

179. Chmura, G.L., and Aharon, P., 1995, Stable carbon isotope signatures of sedimentary carbon in coastal wetlands as indicators of salinity regime: Journal of Coastal Research, v. 11, no. 1, p. 124-135.

Stable carbon isotope values of organic carbon have proven useful in identification of the salinity regime of marsh deposits in the Mississippi Delta plain.

Keywords: estuarine, sediment, salinity

180. Chmura, G.L., Aharon, P., Socki, R.A., and Abernethy, R., 1987, An inventory of ^{13}C abundances in coastal wetlands of Louisiana, USA: Vegetation and sediments: Oecologia, v. 74, no. 2, p. 264-271.

Keywords: estuarine, vascular plants, sediment, nutrients

181. Chmura, G.L., Costanza, R., and Kosters, E.C., 1992, Modeling coastal marsh stability in response to sea level rise: A case study in coastal Louisiana, USA: Ecological Modeling, v. 64, no. 1, p. 47-64.

The authors constructed a dynamic simulation model to study the relationship of accretion to three components of relative sea level rise: compaction, eustatic rise, and submergence. The model is then used to project marsh stability under various future scenarios of sea level rise.

Keywords: estuarine, wetland loss, sediment

182. Chmura, G.L., and Kosters, E.C., 1994, Storm deposition and ^{137}Cs accumulation in fine-grained marsh sediments of the Mississippi Delta Plain: Estuar. Coast. Shelf Sci., v. 39, no. 1, p. 33-44.

Cesium-137 activity and ash contents were measured in shallow cores from marshes on a salinity gradient in the Mississippi Delta plain.

Keywords: estuarine, sediment, salinity

183. Chmura, G.L., Smirnov, A., and Campbell, I.D., 1999, Pollen transport through distributaries and depositional patterns in coastal waters: Palaeogeography, Palaeoclimatology, Palaeoecology, v. 149, p. 257-270.

In this study we compare seasonal pollen and spore assemblages in river waters from the Mississippi River at Vicksburg, Mississippi to those downstream at Belle Chasse, Louisiana and in a distributary, the Atchafalaya River at Morgan City, Louisiana.

Keywords: hydrology, vascular plants, sediment

184. Christians, G.L., and Birdseye, R.U., 1989, An environmental and land use model for southern Ascension Parish, Louisiana, *in* Dymek, R.F., and Shelton, K.L., Geological Society of America, 1989 annual meeting: Abstracts with Programs--Geological Society of America, v. 21, no. 6, p. 21.

Keywords: surface water, freshwater, urban, model

185. Chung, K.H., Ro, K.S., and Roy, D., 1995, Atrazine biotransformation in wetland sediment under different nutrient conditions; I, Anaerobic: Journal of Environmental Science and Health, Part A: Environmental Science and Engineering, v. 30, no. 1, p. 109-120.

Keywords: surface water, freshwater, pesticides, microbiology, physiology, nutrients

186. Claycomb, G.B., 1945, The geology and physiography of Lafayette Parish in relation to the vegetation: The Louisiana Academy of Sciences, v. 9, p. 15-33.

A discussion of the vegetation in relation to the meanders and channels using aerial photographs.

Keywords: geomorphology, vascular plants

187. Clement, Danny, and Stevens, Evon, 1981, Soil surveys help with sinking, shrinking soils: Soil & Water Conservation News, v. 2, no. 3, p. 4-5.

Keywords: surface water, freshwater, sediment

188. Cocks, R.S., 1922, A list of shrubs of Louisiana: Journal Arnold Arboretum, v. 3, p. 173-182.

Keywords: vascular plants, checklist

189. Coleman, J.B., and Hanor, J.S., 1989, Dissolved chloride fluxes and mass balances in the Louisiana reach of the Mississippi River, *in* Dymek, R.F., and Shelton, K.L., Geological Society of America, 1989 annual meeting: Abstracts with Programs--Geological Society of America, v. 21, no. 6, p. 305.

Keywords: surface water, freshwater, chemistry

190. Collier, D.L., comp., 1999, Water resources publications of the Louisiana District of the U.S. Geological Survey, 1904-98: Louisiana Department of Transportation and Development Water Resources Special Report no. 13, 169 p.

Keywords: surface water, freshwater, chemistry, hydrology

191. Collins, A.G., 1970, Geochemistry of some petroleum-associated waters from Louisiana: Bureau of Mines Report of Investigations, no. 7326, 31 p.

Keywords: groundwater, chemistry, petroleum

192. Collins, A.G., and Dickey, P.A., 1970, Geochemistry of some formation waters from Louisiana reservoirs with normal and abnormally high pressures: Abstracts of Papers; Joint Southeast-Southwest Regional (ACS) Meeting, 210 p.

Keywords: groundwater, chemistry

193. Colten, V.A., and Hanor, J.S., 1984, Variations in dissolved lithium in the Mississippi River and Mississippi River Estuary, Louisiana, U.S.A., during low river stage: Chemical Geology, v. 47, no. 1-2, p. 85-96.

Keywords: estuarine, surface water, chemistry, freshwater

194. Combs, P.G., and Russo, E.P., 1973, Water quality aspects of the 1973 opening of the Mississippi River Diversion Spillway at Bonnet Carre, Louisiana, U.S.A.: Water for the Human Environment, v. 4, Special Sessions, Water Pollution, p. 548-557.

Keywords: surface water, chemistry, estuarine, freshwater

195. Congdon, J.D., Fischer, R.U., and Gatten, R.E., Jr., 1995, Effects of incubation temperatures on characteristics of hatchling American alligators: Herpetologica, v. 51, no. 4, p. 497-504.

We examined the effects of egg qualities and incubation temperatures on characteristics of hatchling American alligators (*Alligator mississippiensis*). Alligator eggs were collected from the Rockefeller Wildlife Refuge, Louisiana, and transported to the Savannah River Ecology Laboratory near Aiken, South Carolina. Eggs from each clutch were initially incubated at either 30 C to produce only females or 34 C to produce only males. After 40 days of incubation, the eggs were distributed among four final temperatures (28, 30, 32, and 34 C) for the remaining third of development. Egg and hatchling lipids were extracted with petroleum ether and hatchling nitrogen content was determined using the micro-Kjeldahl procedure.

Keywords: reptiles, physiology, habitat, nutrients

196. Conger, R.M., 1986, Environmental safety of underground injection of oil field brines in Louisiana: AAPG Bulletin, v. 70, no. 9, p. 1179.

Keywords: groundwater, contaminants

197. Conger, R.M., 1995, Remediation alternatives for low-level herbicide contaminated groundwater, *in* Anonymous, AAPG Gulf Coast Section meeting; abstracts: AAPG Bulletin, v. 79, no. 10, p. 1556-1557.

Keywords: groundwater, pesticides, contaminants, management

198. Conner, W.H., 1986, Comparison of a logged and unlogged forest stand in a Louisiana swamp: Proceedings of the Louisiana Academy of Sciences, v. 49, p. 7-14.

Extensive logging of cypress stands in southeastern Louisiana beginning in the spring of 1980 provided the opportunity to begin monitoring cypress regeneration. Vegetation sample plots were established in a section of logged swamp and in an adjacent unlogged area in order to compare vegetational changes. The most obvious effect of logging was the immediate change in tree composition. The large number of cypress seedlings found during the first growing season after logging died quickly. These preliminary data indicate that the survival of cypress is precarious during the first years of growth. Further study needs to be done on regeneration in swamp areas to help better understand and manage these areas for the future.

Keywords: vascular plants, freshwater, management

199. Conner, W.H., and Brody, Michael, 1989, Rising water levels and the future of southeastern Louisiana swamp forests: Estuaries, v. 12, no. 4, p. 318-323.

Keywords: surface water, freshwater, vascular plants, hydrology, ecology

200. Conner, W.H., and Day, J.W., Jr, 1988, Rising water levels in coastal Louisiana: Implications for two coastal forested wetland areas in Louisiana: Journal of Coastal Research, v. 4, no. 4, p. 589-596.

The coastal Barataria and Verret basins of Louisiana contain extensive areas of forested wetlands. Analysis of water gauge data in each basin reveals that apparent water level rise is 8.5 mm/year and 13.7 mm/yr for the Barataria basin and Verret basin, respectively. This high apparent water level rise is due mainly to regional subsidence. Sedimentation in the cypress-tupelo forests of Barataria basin is 6 mm/year versus 8.8 mm/yr in the cypress-tupelo forests of Verret basin. On the higher and drier bottomland ridge in the Verret basin, sedimentation is only 2.7 mm/yr. Apparent water level rise is greater than sedimentation in all areas leading to vertical accretion deficits of 2.5 mm/yr and 4.9 mm/yr in the swamps of Barataria basin and Verret basin, respectively, and 10.8 mm/yr on the bottomland ridge in Verret basin. This deficit is cumulative and is leading to a significant increase in the number of days flooded per year in each basin. If present trends continue, the forested wetlands in these basins will eventually be continually flooded and unable to reproduce themselves.

Keywords: sediment, geomorphology, wetland loss, hydrology, freshwater

201. Conner, W.H., and Day, J.W., Jr., 1991, Leaf litter decomposition in three Louisiana freshwater forested wetland areas with different flooding regimes: Wetlands, v. 11, no. 2, p. 303-312.

Litter decomposition was studied for one year in three Louisiana forested wetland sites with different flooding regimes. Decomposition was significantly higher in a crayfish pond where flooding was manipulated by pumping. Only 20% of the original dry mass remained after 46 weeks versus over 40% in the natural and impounded wetland forests.

Keywords: hydrology, physiology, riparian, sediment, nutrients, freshwater, debris

202. Conner, W.H., and Day, J.W., Jr., 1992, Diameter growth of *Taxodium distichum* (L.) Rich. and *Nyssa aquatica* L. from 1979-1985 in four Louisiana swamp stands: American Midland Naturalist, v. 127, no. 2, p. 290-299.

Annual diameter growth of baldcypress (*Taxodium distichum*) and water tupelo (*Nyssa aquatica*) trees in four swamp stands in south-central Louisiana were measured from 1979 to 1985. Seasonal patterns of growth were also monitored during 1979 and 1980 using vernier tree bands.

Keywords: surface water, freshwater, productivity, vascular plants

203. Conner, W.H., and Day, J.W. Jr., 1992, Water level variability and litterfall productivity of forested freshwater wetlands in Louisiana: American Midland Naturalist, v. 128, no. 2, p. 237-245.

Litterfall was measured in an impounded swamp and managed, wooded crayfish pond swamp in south-central Louisiana from mid-December 1976 through mid-December 1981 and in a natural swamp and a "restored" swamp from mid-December 1977 through mid-December 1981.

Keywords: surface water, freshwater, productivity, vascular plants

204. Conner, W.H., Day, J.W., Jr., and Slater, W.R., 1993, Bottomland hardwood productivity—case study in a rapidly subsiding, Louisiana, USA, watershed: Wetlands Ecological Management, v. 2, no. 4, p. 189-197.

Tree growth, litterfall, and species composition were monitored across a flooding gradient in the Louisiana Verret basin during January 1985 through December 1986.

Keywords: surface water, freshwater, productivity, vascular plants, hydrology, ecology

205. Conner, W.H., and Flynn, K., 1989, Growth and survival of baldcypress (*Taxodium distichum* (L.) Rich.) planted across a flooding gradient in a Louisiana bottomland forest: Wetlands, v. 9, no. 2, p. 207-217.

Keywords: vascular plants, riparian, hydrology, physiology

206. Conner, W.H., Sasser, C.E., and Barker, N., 1986, Floristics of the Barataria Basin wetlands, Louisiana: Castanea, v. 51, no. 2, p. 111-128.

A survey of the vascular flora of the Barataria Basin, an interdistributary coastal basin in the Mississippi deltaic plain, contains six types of vegetative communities: bottomland hardwood forest, swamp, freshwater marsh, brackish marsh, salt marsh, and successional types of disturbed areas. The survey resulted in a vascular plant of 113 families, 313 genera, and 523 species.

Keywords: vascular plants, checklist, freshwater, estuarine

207. Conner, W.H., and Toliver, J.R., 1990, Long-term trends in the bald-cypress (*Taxodium distichum*) resource in Louisiana (U.S.A.): Forest Ecology and Management, v. 33-34, no. 1-4, p. 543-557.

Bald cypress has long been a dominant timber species in Louisiana's wetland forests. Early estimates of the area of bald-cypress forests range from 0.67 to 3.64 million ha. Bald-cypress timber was cut extensively from 1890 to 1925 when the last virgin stands of timber in the state were depleted. In 1934 there were 0.66 million ha of cutover bald-

cypress forests in Louisiana. Recent estimates indicate that there are 0.14 million ha of bald-cypress swamp forest left in the state. Regeneration problems have increased in recent years due to human changes in hydrology and natural subsidence (> 1 m per century) and the introduction of the rodent, nutria (*Myocastor coypus*), from South America.

Keywords: vascular plants, management, freshwater, wetland loss

208. Constant, W.D., 1990, Fiscal year 1989 program report—Louisiana Water Resources Research Institute: Rep. U.S. Geol. Surv. Water Resources Div., 66 p.

The 1989 cooperative research program of the Louisiana Water Resources Research Institute (LWRRI) addressed priority water resources problem areas identified for Louisiana. Four research projects funded to address priority issues were: (1) Nature and Rates of Bacterial Metabolism in the Aquifers of Southeastern Louisiana, (2) Aquaculture/Marine Fisheries Process Wastewaters, (3) The Importance of Denitrification to the Efficiency of Wastewater Treatment in Forested Wetlands and (4) Field Testing of Rock-Reed Filters for Small Domestic Wastewater Flows.

Keywords: surface water, freshwater, microbiology, physiology, nutrients, vascular plants, management

209. Constant, W.D., 1991, Fiscal year 1990 program report—Louisiana Water Resources Research Institute: Rep. USGS Water Resources Div., 52 p.

The 1990 cooperative research program of the Louisiana Water Resources Research Institute (LWRRI) addressed priority water resources problem areas identified for Louisiana. Four research projects funded to address these priority issues were: (1) A Feasibility Analysis of the Use of Louisiana Wetlands for Wastewater Treatment, (2) Use of Soil Biofilter Beds for Treating High Organic, Low Toxicity Wastewater, (3) Studies on the Uptake, Accumulation and Metabolism of 2,4–Dichlorophenol and Pentachlorophenol by *Lemna gibba*, and (4) Application Colloidal Gas Aphrons for Soil Washing and Groundwater Remediation.

Keywords: surface water, freshwater, microbiology, vascular plants, nutrients, contaminants, macroinvertebrates, groundwater, management

210. Cook, M.F., 1968, Statistical summaries of stream-gaging station records, Louisiana, 1938-64: Louisiana Department of Public Works Basic Records Report no. 1, 286 p.

Keywords: surface water, freshwater, hydrology

211. Cook, M.F., and Forbes, M.J., Jr., 1971, A proposed streamflow data program for Louisiana: U.S. Geological Survey Open-File Report, 24 p.

Keywords: model, hydrology, freshwater, surface water

212. Cook, M.F., and Scarcia,Glenn, 1955, Water, *in* St. John the Baptist Parish Resources and Facilities: Louisiana Department of Public Works and St. John the Baptist Parish Development Board, p. 25-33.

Keywords: groundwater, freshwater, management

213. Copeland, R.R., 1991, Dredging alternatives study Cubits Gap, lower Mississippi River. Report 1. TABS-1 numerical model investigation: Army Engineer Waterways Experiment Station., Vicksburg, MS, Hydraulics Lab., 77 p.

A numerical model of the Mississippi River between Reserve and East Jetty, Louisiana (river miles 140.8 and –19.6) was conducted to evaluate dredging alternatives in the Cubits Gap and Head of Passes reaches.

Keywords: model, freshwater, surface water, hydrology, sediment

214. Cormier, E.S., Andrus, Matthew, and Peterson, Briant, 1994, Water quality inventory in State of Louisiana Water Quality Management Plan, v. 5: Baton Rouge, Louisiana, Louisiana Department of Environmental Quality, Office of Water Resources, Water Quality Management Division, [50] p.

Keywords: surface water, freshwater, chemistry, management

215. Coupe, R.H., Goolsby, D.A., Iverson, J.L., Markovchick, D.J., and Zaugg, S.D., 1995, Pesticide, nutrient, water-discharge and physical-property data for the Mississippi River and some of its tributaries, April 1991-September 1992: U.S. Geological Survey Open-File Report 93-0657, 116 p.

Keywords: surface water, freshwater, nutrients, chemistry, hydrology, contaminants

216. Courtemanche, R. P., Hester, M. W., and Mendelssohn, I. A., 1999, Recovery of a Louisiana barrier island marsh plant community following extensive hurricane-induced overwash: Journal of Coastal Research, v. 15, no. 4, p. 872-883.

The Isles Dernieres barrier island chain provides the front line of protection for the Lower Terrebonne Estuary, Louisiana. Landfall of Hurricane Andrew on August 26, 1992 resulted in overwash of most of this island chain, thereby accelerating the erosional processes and altering the plant communities of the islands. Four zones were identified by the depth of overwash sands received (from >50 cm to <10 cm) to examine the factors affecting the colonization of vegetation following overwash. Within each zone, a permanent transect and thirty permanent plots were established and sampled four times over two years for biotic and abiotic variables.

Keywords: hydrology, vascular plants, ecology, estuarine, sediment, salinity

217. Covay, K.J., Sturrock, A.M., Jr., and Sasser, D.C., 1992, Water requirements for growing rice in southwestern Louisiana, 1985-86: Louisiana Department of Transportation and Development Water Resources Technical Report no. 52, 14 p.

Keywords: surface water, freshwater, agriculture, hydrology

218. Cowan, J.H., Jr., Turner, R.E., and Cahoon, D.R., 1988, Marsh management plans in practice—Do they work in coastal Louisiana, USA?: Environmental Management, v. 12, no. 1, p. 37-53.

Keywords: management, wetland loss, estuarine

219. Craft, B.R., and Smith, E.R., 1987, Changes in vegetation in the Cameron-Creole marshes of Louisiana over a thirty-two-year period: Proceedings of Tenth National Conference, Estuarine and Coastal Management, Tools of the Trade. New Orleans, Louisiana, v. 1, p. 187-204.

The Cameron-Creole marshes and other coastal marshes in Louisiana are among the most fertile and valuable wetland areas in North America. Plant community characteristics play a vital role in the productivity of coastal marshes. Man-induced and natural causes have had adverse impacts on the plant communities in the Cameron-Creole marshes. Large acreages of marsh dominated by emergents have been converted to open water void of vegetation. A high priority was placed on documenting the long-term changes in the marsh plant communities in the Cameron-Creole marshes. The Soil Conservation Service agreed to do the long-term vegetative study.

Keywords: vascular plants, ecology, hydrology, wetland loss

220. Cragwall, J.S., Jr., 1952, Floods in Louisiana magnitude and frequency: Louisiana Department of Highways, 281 p.

Keywords: surface water, freshwater, hydrology

221. Croughan, T.P., and Materne, M.D., 1994, Applications of biotechnology to coastal erosion control: La. Agric., v. 37, no. 3, p. 11-12.

Spartina alterniflora, a plant native to Louisiana marshes, has been identified by the Soil Conservation Service as possessing traits unique to the needs of controlling wetlands loss.

Keywords: estuarine, wetland loss, vascular plants

222. Crozier, C.R., and DeLaune, R.D., 1996, Methane production by soils from different Louisiana marsh vegetation types: Wetlands, v. 16, no. 2, p. 121-126.

This study evaluated quantitative indices (soil organic matter, labile C, and sulfate concentrations) correlated with methane production rates along related vegetation and salinity gradients in the Louisiana coastal marsh region.

Keywords: vascular plants, physiology, nutrients, sediment, salinity

223. Cruz-Orozco, R., 1971, Suspended solids concentrations and their relations to other environmental factors in selected water bodies in the Barataria Bay region of southern Louisiana.

Keywords: estuarine, sediment

224. Cunningham, R., and Hughes, R., 1981, Satellite observations of deltaic and hydrodynamic processes, Atchafalaya-Vermilion Bay Complex, LA: Estuaries, v. 4, no. 3, p. 267.

Keywords: estuarine, hydrology, geomorphology

225. Curwick, P.B., 1988, Simulation of flow and transport in the lower Mississippi River, Louisiana: U.S. Geological Survey Water-Resources Investigations Report 86-4361, 38 p.

Keywords: surface water, freshwater, model, hydrology

226. Curwick, P.B., 1988, Use of dye-tracing techniques to determine mixing and circulation in the loops and lakes of the lower Calcasieu River, *in* Mallard, G.E., U.S. Geological Survey Toxic Substances Hydrology Program, Surface-water Contamination—Proceedings of the technical meeting, Denver, Colorado, February 2-4, 1987: U.S. Geological Survey Open File Report 87-764, p. 67-69.

Keywords: surface water, freshwater, hydrology, contaminants

227. Cushing, E.M., and Jones, P.H., 1945, Ground-water conditions of the Baton Rouge area, Louisiana, with special reference to the shallow artesian sands of the industrial district--A progress report: Louisiana Department of Public Works, 33 p.

Keywords: groundwater, chemistry

228. Dagg, M.J., 1995, Ingestion of phytoplankton by the micro- and mesozooplankton communities in a productive subtropical estuary: Journal of Plankton Research, v. 17, no. 4, p. 845-857.

Grazing on phytoplankton by the micro- and mesozooplankton communities was measured during four cruises in a shallow (1.5 m) productive (up to 6 g C/m/day) estuary in the northern Gulf of Mexico. A simple mode is developed to describe phytoplankton-zooplankton interactions in this estuary. Attempts to understand the distribution and

abundance of phytoplankton in estuaries must include estimates of grazer-induced mortality on the phytoplankton.

Keywords: algae, microbiology, ecology, estuarine, habitat

229. Daniels, G.L., and Felley, J.D., 1992, Life history and foods of *Gambusia affinis* in two waterways of southwestern Louisiana: Southwestern Naturalist, v. 37, no. 2, p. 157-165

Populations of *Gambusia affinis* were sampled monthly from September 1985 to August 1986 in two bayous draining into the Calcasieu Estuary of southestern Louisiana. The two waterways are very different environments. Choupique Bayou is relatively pristine, drains farmland and forest, and supports a rich fish fauna. Contraband Bayou receives runoff and treated sewage effluents from the City of Lake Charles and has a depauperate fish fauna. Growth, foods for individuals, and brood size of females was studied in each population.

Keywords: estuarine, macroinvertebrates, ecology

230. Dantin, E.J., and Kazmann, R.G., 1972, A review of land subsidence in the Baton Rouge area, Louisiana: Simposio Internacional Sobre la Planificacion de Recursos Hidraulicos, v. 1, 20 p.

Keywords: groundwater, hydrology

231. Dantin, L.J., Garrison, C.R., and Lovelace, W.M., 1994, Water resources data—Louisiana, water year 1993: U.S. Geological Survey Water-Data Report LA-93-1, 458 p.

Keywords: surface water, freshwater, hydrology, chemistry

232. Das, T., and Stickle, W.B., 1993, Sensitivity of crabs *Callinectes sapidus* and *C. similis* and the gastropod *Stramonita haemastoma* to hypoxia and anoxia: Marine Ecology Progress Series, v. 98, no. 3, p. 263-274.

Tolerances of the juvenile blue crab *C. sapidus*, lesser blue crab *C. similis*, and the adult southern oyster drill to long-term (28 d) hypoxia and short-term (10 d) changes from normoxia to hypoxia and back to normoxia were monitored at 24 degree C and 30 ppt salinity.

Keywords: estuarine, physiology, macroinvertebrates, habitat

233. Davidson, N.L., Jr., Kelso, W.E., and Rutherford, D.A., 1998, Relationships between environmental variables and the abundance of cladocerans and copepods in the Atchafalaya River Basin: Hydrobiologia, v. 379, no. 1-3, p. 175-181.

The relationship of species abundance to eight environmental variables was tested for 24 common species of crustacean zooplankton collected in the Atchafalaya River Basin

during the summer of 1994. Stepwise regressions (alpha = 0.05) revealed significant relationships between zooplankton abundance and at least one environmental variable for 18 species (R^2 = 0.14 - 0.61, p < 0.0435 - 0.0001). The majority of these species' peak abundances were correlated with variables indicative of seasonal changes in floodplain habitat, as the Atchafalaya River receded, water temperature increased, and/or phytoplanktonic photosynthesis increased. Surface water temperature and the percent saturation of dissolved oxygen showed the most significant relationships, but specific conductance, current velocity, and Secchi disk depths were also related to abundance patterns of certain taxa.

Keywords: freshwater, surface water, habitat, macroinvertebrates

234. Davis, D.W., 1992, Land reclamation in coastal Louisiana; from 1718 to the present: Wetlands; Proceedings of the 13th annual conference; Society of Wetland Scientists, v. 13, p. 674-679.

Keywords: wetland loss

235. Davis, G.H., and Rollo, J.R., 1971, Land subsidence related to decline of artesian head at Baton Rouge, Lower Mississippi Valley, U.S.A.: International Association of Scientific Hydrology Publication, v. 1, no. 88, p. 174-184.

Keywords: groundwater, hydrology, geology

236. Dawson, C. E., 1966, Additions to the known marine fauna of Grand Isle, Louisiana: Proceedings of the Louisiana Academy of Science, v. 29, no. 1, p. 175-180.

Keywords: checklist, fish, estuarine, habitat

237. Day, J.W., Jr., Madden, C.J., Twilley, R.R., Shaw, R.F., McKee, B.A., Dagg, M.J., Childers, D.L., Raynie, R.C., and Rouse, L.J., 1994, The influence of Atchafalaya River discharge on Fourleague Bay, Louisiana, *in* Dyer, K., and Orth, R., eds., Changing Particle Fluxes in Estuaries: Implications from Science to Management, ECSAERF22 Symposium, Olsen & Olsen, Friedensborg, Denmark, p. 151-160.

The effects of the Atchafalaya River discharge on the physics, chemistry, and ecology of Fourleague Bay, Louisiana, are described.

Keywords: estuarine, hydrology, chemistry, ecology

238. Decker, C.J., and Fleeger, J.W., 1984, The effect of crude oil on the colonization of meiofauna into salt marsh sediments: Biology of Meiofauna, Hydrobiologia, v. 118, no. 1, p. 49-58.

The effect of an oil spill on estuarine meiofauna was examined in a controlled colonization experiment. Forty-five replicate azoic sediment chambers treated with 0, 133

or 381 mg hydrocarbons: 100 g dry sediment of South Louisiana crude oil were each quantitatively sampled with three replicate cores for colonizing meiofauna. Chambers were sampled on days 2, 5, 10, 30 and 60 postplacement in a Louisiana *Spartina alterniflora* (Loisel) salt marsh.

Keywords: macroinvertebrates, petroleum, estuarine, ecology

239. Deegan, L.A., 1986, Changes in body composition and morphology of young-of-the-year gulf menhaden, *Brevoortia patronus* Goode, in Fourleague Bay, Louisiana: Journal of Fish Biology, v. 29, no. 4, p. 403-415.

    Body composition and metamorphosis of young-of-the-year gulf menhaden were examined over a yearly cycle in Fourleague Bay, Louisiana.

    Keywords: estuarine, fish, physiology

240. Deegan, L.A., and Thompson, B.A., 1987, Growth rate life history events of young-of-the-year gulf menhaden as determined from otoliths: Transactions of the American Fisheries Society, v. 116, no. 4, p. 663-667.

    Keywords: fish, physiology

241. DeLaune, R.D., and Gambrell, R.P., 1996, Role of sedimentation in isolating metal contaminants in wetland environments: J. Environ. Sci. Health, Part A: Environ. Sci. Eng. Toxic Hazard. Subst. Control, v. A31, no. 9, p. 2349-2362.

    The depositional pattern of metals was determined in the bottom sediment of Bayou Trepagnier (located in the La Branche Wetland bordering Louisiana's Lake Pontchartrain).

    Keywords: estuarine, trace elements, sediment, contaminants, habitat

242. DeLaune, R.D., Gambrell, R.P., Pardue, J.H., and Patrick, W.H., Jr., 1990, Fate of petroleum hydrocarbons and toxic organics in Louisiana coastal environments: Estuaries, v. 13, no. 1, p. 72-80.

    Studies documenting the impact of petroleum hydrocarbons entering Louisiana coastal wetlands are summarized. Also included are research findings on factors affecting the persistence of petroleum hydrocarbons and other toxic organics (pentachlorophenol (PCP), 2,4-dichlorophenoxyacetic acid (2,4-D), creosote, etc.) in sediment-water systems. Sediment pH and redox conditions have been found to play an important role in the microbial degradation of toxic organics. Most of the hydrocarbons investigated degrade more rapidly under high redox (aerobic) conditions although there are exceptions (e.g., 1,1,1-trichloro-2,2-bis(4-chlorophenyl) (DDT) and polychlorobiphenyls (PCBs)). Some of these compounds, due to their slow degradation in anaerobic sediment, may persist in the system for decades.

Keywords: petroleum, chemistry, sediment, contaminants, pesticides

243. DeLaune, R.D., and Lindau, C.W., 1990, Fate of added ^{15}N labelled nitrogen in a *Sagittaria lancifolia* L. Gulf Coast marsh: Journal of Freshwater Ecology, La Crosse, WI, v. 5, no. 3, p. 265-268.

Keywords: nutrients, physiology, vascular plants, estuarine

244. DeLaune, R.D., Lindau, C.W., Knox, R.S., and Smith, C.J., 1990, Fate of nitrogen and phosphorus entering a Gulf Coast freshwater lake; a case study: Water Resources Bulletin, v. 26, no. 4, p. 621-631.

Nitrogen and phosphorus fluxes, transformations, and water quality functions of Lake Verret, Louisiana were quantified.

Keywords: surface water, freshwater, nutrients, chemistry

245. DeLaune, R.D., Lindau, C.W., Sulaeman, E., and Jugsujinda, A., 1998, Nitrification and denitrification estimates in a Louisiana swamp forest soil as assessed by ^{15}N isotope dilution and direct gaseous measurements: Water, Air, & Soil Pollution, v. 106, no. 1-2, p. 149-161.

The transformations of applied (100 kg N ha^{-1}) ^{15}N labelled NO_3 and NH_4 in Mississippi River deltaic plain swamp forest soil which receives agriculture run-off from adjacent sugarcane fields were determined. Results show that this wetland soil has a large capacity to process inorganic nitrogen entering the system as a result of agriculture run-off.

Keywords: freshwater, nutrients, sediment, physiology, chemistry

246. DeLaune, R.D., Nyman, J.A., and Patrick, W.H., Jr., 1991, Sedimentation patterns in rapidly deteriorating Mississippi River deltaic plain coastal marshes; requirement and response to sediment additions*, in* Dhamotharau, Dhamo, Resource development of the Lower Mississippi River; symposium papers: American Water Resources Association Technical Publication Series TPS, v. 91-3, p. 59-68.

Keywords: estuarine, sediment, wetland loss

247. DeLaune, R.D., Nyman, J.A., and Patrick, W.H., Jr., 1994, Peat collapse, ponding, and wetland loss in a rapidly submerging coastal marsh: Journal of Coastal Research, v. 10, no. 4, p. 1021-1030.

The authors hypothesized that marsh elevation decreased rapidly following plant mortality because of structural collapse of the living root network. To investigate this hypothesis, they monitored the elevation of 20 marsh hummocks in coastal Louisiana between April 1990 and April 1992.

Keywords: estuarine, wetland loss, vascular plants

248. DeLaune, R.D., and Patrick, W.H. Jr. , 1990, Nitrogen cycling in Louisiana Gulf Coast brackish marshes: Hydrobiologia, v. 199, no. 1, p. 73-79.

Keywords: nutrients, physiology, estuarine, vascular plants, microbiology

249. DeLaune, R.D., Patrick, W.H., and Pezeshki, S.R., 1987, Foreseeable flooding and death of coastal wetland forests: Environmental Conservation, v. 14, no. 2, p. 129-133.

Keywords: wetland loss, hydrology, geomorphology

250. DeLaune, R.D., Patrick, W.H., and Smith, C.J., 1992, Marsh aggradation and sediment distribution along the rapidly submerging Louisiana Gulf Coast: Environmental Geology and Water Sciences, v. 20, no. 1, p. 57-64.

A coast-wide study of the relationship between marsh aggradation and water-level changes along the rapidly deteriorating Louisiana Gulf Coast was conducted. Rate of vertical marsh accretion determined ^{137}Cs dating was compared to water-level changes or submergence.

Keywords: estuarine, wetland loss, sediment, geology

251. DeLaune, R.D., and Pezeshki, S.R., 1994, The influence of subsidence and saltwater intrusion on coastal marsh stability; Louisiana Gulf Coast, U.S.A., *in* Finkl, C.W., Coastal hazards; perception, susceptibility and mitigation: Journal of Coastal Research, v. 12, p. 77-89.

Keywords: estuarine, wetland loss

252. DeLaune, R.D., Pezeshki, S.R., Pardue, J.H., Whitcomb, J.H., and Patrick, W.H. Jr., 1990, Some influences of sediment addition to a deteriorating salt marsh in the Mississippi River deltaic plain—A pilot study: Journal of Coastal Research , v. 6, no. 1, p. 181-188.

Keywords: sediment, estuarine, geomorphology, vascular plants, physiology

253. DeLaune, R.D., Salinas, L.M., Knox, R.S., Sarafyan, M.N., and Smith, C.J., 1991, Water quality of a coastal river receiving nutrient inputs—Ammonium nitrogen transformations: J. Environ. Sci. Health, Part A, v. A26, no. 7, p. 1287-1302.

A water quality study of the Calcasieu River which discharges into a major Louisiana Gulf Coast estuary (Calcasieu Lake), and receives both point and nonpoint source input of nutrients, characterized the water quality and trophic state in the river. In addition nitrification, denitrification, and nitrogen assimilation rates were estimated.

Keywords: surface water, freshwater, nutrients, chemistry, microbiology, physiology

254. DeLaune, R.D., and Smith, C.J., 1987, Simultaneous determination of nitrification and nitrate reduction in sediment-water columns by nitrate-15 dilution: Journal of Environmental Quality, v. 16, no. 3, p. 227-230.

The magnitude of N loss from nitrification-denitrification reactions in sediment-water columns of a freshwater lake of Louisiana Gulf Coast drainage basin receiving elevated N loading from agricultural runoff was determined using $^{15}NO_3$ dilution. The results presented and isotope dilution technique used are applicable for use in understanding the fate of N in sediment-water systems of other aquatic environments.

Keywords: surface water, freshwater, nutrients, chemistry, sediment

255. DeLaune, R.D., Smith, C.H., and Patrick, W.H., Jr., 1983, Nitrogen losses from a Louisiana Gulf Coast salt marsh: Estuarine, Coastal and Shelf Science, v. 17, no. 2, p. 133-141.

Keywords: nutrients, estuarine, vascular plants

256. DeLaune, R.D., Smith, C.J., and Patrick, W.H., Jr., 1986, Methane production in Mississippi River deltaic plain peat: Organic Chemistry, v. 9, no. 4, p. 193-197.

Keywords: sediment, nutrients, chemistry

257. DeLaune, R.D., Smith, C.J., Patrick, W.H. Jr., Fleeger, J.W., and Tolley, M.D., 1984, Effect of oil on salt marsh biota—Methods for restoration: Environ. Pollut. (A Ecol. Biol.)., v. 36, no. 3, p. 207-227.

South Louisiana crude was applied to replicated plots in a Louisiana *Spartina alterniflora* salt marsh. Various marsh restoration methods were evaluated for mitigating the impact of crude oil on the marsh biota. Oiling the marsh caused no reduction in macrophyte production as compared with the non-oiled plots. Thus the cleanup treatment showed no beneficial effects to *S. alterniflora*. Likewise, there was no oil-induced mortality for the marsh macrofauna or meiofauna. In Louisiana Gulf Coast salt marshes, which have a low sensitivity to oil as shown in this study, the best response is no cleanup action at all.

Keywords: estuarine, petroleum, ecology, management

258. DeLaune, R.D., Smith, C.J., and Sarafyan, M.N., 1986, Nitrogen cycling in a freshwater marsh of *Panicum hemitomon* on the deltaic plain of the Mississippi River: Journal of Ecology, v. 74, no. 1, p. 249-256.

A study was made of nitrogen cycling and the effect of added inorganic nitrogen on biomass production of *P. hemitomon* in the deltaic plain of the Mississippi River.

Nitrogen is apparently a limiting nutrient since supplemental nitrogent increased above-ground biomass by 40%. These marshes are apparently serving as large nitrogen sinks, with 12 g m^{-2} per year being retained as organic nitrogen as a result of accretion as determined by ^{137}Cs dating. The results suggest that these freshwater marshes may improve water quality by removing nutrients from inflowing water.

Keywords: nutrients, vascular plants, productivity, freshwater, chemistry

259. Delong, M.D., 1992, A new species of Gammarus (Crustacea: Amphipoda: Gammaridae) from the lower Mississippi River, Louisiana: American Midland Naturalist, v. 127, no. 2, p. 241-247.

Gammarus paynei, a new species of amphipod crustacean, is described from the littoral benthos of the lower Mississippi River, West Feliciana Parish, Louisiana.

Keywords: surface water, freshwater, macroinvertebrates

260. Demas, C.R., 1976, Analyses of native water, bed material, and elutriate samples of major Louisiana waterways, 1975: U.S. Geological Survey Open-File Report 76-853, 304 p.

Keywords: surface water, freshwater, chemistry, sediment

261. Demas, C.R., 1977, Analyses of native water, core material, and elutriate samples collected from the Atchafalaya River and Atchafalaya Bay: U.S. Geological Survey Open-File Report 77-769, 17 p.

Keywords: surface water, freshwater, sediment, chemistry

262. Demas, C.R., 1983, Hydrology, water quality, and biology of Baptiste Collette Bayou in relation to the lower Mississippi River at Venice, Louisiana: Department of Transportation and Development, Office of Public Works Water Resources Technical Report no. 31, 49 p.

Keywords: surface water, freshwater, hydrology, chemistry, ecology

263. Demas, C.R., 1988, Objectives and preliminary results of reconnaissance sampling for selected hazardous substances in the lower Calcasieu River, Louisiana, *in* Mallard, G.E., U.S. Geological Survey Toxic Substances Hydrology Program, Surface-water Contamination—Proceedings of the technical meeting, Denver, Colorado, February 2-4, 1987: U.S. Geological Survey Open File Report 87-764, p. 61-64.

Keywords: surface water, freshwater, contaminants, hydrology

264. Demas, C.R., ed., 1989, Reconnaissance study of water and bottom material quality in the lower Calcasieu River, southwestern Louisiana, May 29-30, 1985: U.S. Geological Survey Water-Resources Investigations Report 88-4089, 51 p.

Keywords: surface water, freshwater, sediment, chemistry

265. Demas, C.R., and Curwick, P.B., 1987, Suspended-sediment, bottom-material, and associated chemical data from the lower Mississippi River, Louisiana: Louisiana Department of Transportation and Development Water Resources Basic Records Report no. 14, 117 p.

Keywords: surface water, freshwater, sediment, chemistry

266. Demas, C.R., and Curwick, P.B., 1988, Suspended-sediment and associated chemical transport characteristics of the lower Mississippi River, Louisiana: Louisiana Department of Transportation and Development Water Resources Technical Report no. 45, 44 p.

Keywords: surface water, freshwater, sediment, chemistry

267. Demas, C.R., Curwick, P.B., and Demcheck, D.K., 1989, The use of radon-222 as a tracer of transport across the bed sediment-water interface in Prien Lake, Louisiana, *in* Mallard, G.E., U.S. Geological Survey Toxic Substances Hydrology Program, Surface-water Contamination—Proceedings of the technical meeting, Phoenix, Arizona, September 26-30, 1988: U.S. Geological Survey Water-Resources Investigations Report 88-4220, p. 291-300.

Keywords: surface water, freshwater, hydrology, sediment, contaminants

268. Demas, C.R., and Demcheck, D.K., 1989, Fate and transport of organic compounds and trace elements in the lower Calcasieu River, Louisiana, *in* Mallard, G.E., U.S. Geological Survey Toxic Substances Hydrology Program, Surface-water Contamination—Proceedings of the technical meeting, Phoenix, Arizona, September 26-30, 1988: U.S. Geological Survey Water-Resources Investigations Report 88-4220, p. 271-281.

Keywords: surface water, freshwater, contaminants, trace elements, hydrology

269. Demas, C.R., and Demcheck, D.K., 1989, Remobilization of organic compounds from bottom material collected from Bayou d'Inde, Louisiana, upon exposure to differing ionic-strength waters, *in* Mallard, G.E., U.S. Geological Survey Toxic Substances Hydrology Program, Surface-water Contamination—Proceedings of the technical meeting, Phoenix, Arizona, September 26-30, 1988: U.S. Geological Survey Water-Resources Investigations Report 88-4220, p. 283-290.

Keywords: surface water, freshwater, contaminants, sediment, chemistry, hydrology

270. Demas, C.R., and Demcheck, D.K., 1989, Uptake of manmade organic compounds by *Rangia cuneata* in the lower Calcasieu River, Louisiana, *in* Mallard, G.E., U.S. Geological Survey Toxic Substances Hydrology Program, Surface-water Contamination—Proceedings of the technical meeting, Phoenix, Arizona, September 26-30, 1988: U.S. Geological Survey Water-Resources Investigations Report 88-4220, p. 309-319.

Keywords: surface water, freshwater, contaminants, macroinvertebrates, physiology, hydrology

271. Demas, C.R., and Demcheck, D.K., 1991, Significance of drift and organic and nonorganic detritus on the movement of synthetic organic compounds into Bayou d'Inde, Louisiana, *in* Mallard, G.E., and Aronson, D.E., U.S. Geological Survey Toxic Substances Hydrology Program—Proceedings of the technical meeting, Monterey, California, March 11-15, 1991: U.S. Geological Survey Water-Resources Investigations 91-4034, p. 583-587.

Keywords: surface water, freshwater, sediment, contaminants, hydrology

272. Demas, C.R., Demcheck, D.K., Anderson, M.L., and Garon, J.D., 1999, National Water-Quality Assessment Program, Acadian-Pontchartrain study unit: U.S. Geological Survey Fact Sheet FS-185-99, 4 p.

273. Demas, C.R., Demcheck, D.K., Crocker, Philip, and Morrison, George, 1989, Results of biological uptake tests, toxicity tests and chemical analyses of water and bottom material from Bayou d'Inde and the lower Calcasieu River, Louisiana, *in* Pederson, G.L., and Smith, M.M., comp., U.S. Geological Survey Second National Symposium on Water Quality; abstracts of the technical sessions, Orlando, Florida, November 12-17, 1989: U.S. Geological Survey Open-File Report 89-409, p. 16.

Keywords: surface water, freshwater, chemistry, contaminants, physiology

274. Demas, C.R., Demcheck, D.K., and Curwick, P.B., 1988, Occurrence and fate of volatile organic compounds under different wind and sampling conditions in the lower Calcasieu River, Louisiana, *in* Mallard, G.E., U.S. Geological Survey Toxic Substances Hydrology Program, Surface-water Contamination—Proceedings of the technical meeting, Denver, Colorado, February 2-4, 1987: U.S. Geological Survey Open File Report 87-764, p. 99-102.

Keywords: surface water, freshwater, contaminants, hydrology

275. Demas, C.R., Demcheck, D.K., and Curwick, P.B., 1989, Occurrence of nutrients, minor elements, and organic compounds in water and bottom material in the lower Calcasieu River, Louisiana, *in* Demas, C.R., ed., Reconnaissance study of water and bottom material quality in the lower Calcasieu River, southwestern Louisiana, May 29-30, 1985: U.S. Geological Survey Water-Resources Investigations Report 88-4089, p. 1-17.

Keywords: surface water, freshwater, nutrients, chemistry, contaminants, sediment

276. Demas, C.R., and Higgins, P.C., 1977, Analyses of native water and dredged material from southern Louisiana waterways, 1975-76: U.S. Geological Survey Open-File Report 77-503, 180 p.

Keywords: surface water, freshwater, chemistry, sediment

277. Demcheck, D.K., 1988, Automated instrumentation used for the lower Calcasieu River study, *in* Mallard, G.E., U.S. Geological Survey Toxic Substances Hydrology Program, Surface-water Contamination—Proceedings of the technical meeting, Denver, Colorado, February 2-4, 1987: U.S. Geological Survey Open File Report 87-764, p. 65-66.

Keywords: methods, surface water, chemistry, hydrology, contaminants

278. Demcheck, D.K., 1988, Field equipment and techniques for sampling metals and organic compounds in the lower Calcasieu River, *in* Mallard, G.E., U.S. Geological Survey Toxic Substances Hydrology Program, Surface-water Contamination—Proceedings of the technical meeting, Denver, Colorado, February 2-4, 1987: U.S. Geological Survey Open File Report 87-764, p. 71.

Keywords: surface water, freshwater, trace elements, contaminants, hydrology

279. Demcheck, D.K., 1991, Louisiana hydrologic atlas map no. 6—Water-quality survey of the Barataria Basin, 1988: U.S. Geological Survey Water-Resources Investigations Report 90-4170, 2 sheets.

Keywords: estuarine, surface water, freshwater, chemistry

280. Demcheck, D.K., 1994, Louisiana hydrologic atlas map no. 7—Water-quality survey of the Mermentau River basin, 1989-90: U.S. Geological Survey Water-Resources Investigations Report 92-4181, 3 sheets.

Keywords: surface water, freshwater, hydrology, chemistry

281. Demcheck, D.K., 1995, The Lake Pontchartrain watershed—A unique resource of the Louisiana coast: U.S. Geological Survey Fact Sheet FS-118-95, 2 p.

Keywords: surface water, freshwater, hydrology, chemistry

282. Demcheck, D.K., 1996, Analysis of selected water-quality data for surface water in St. Tammany Parish, Louisiana, April-August 1995: U.S. Geological Survey Open-File Report 96-345, 59 p.

Keywords: surface water, freshwater, chemistry

283. Demcheck, D.K., Demas, C.R., and Curwick, P.B., 1989, Estimation of volatilization-rate coefficients for volatile organic compounds in Bayou d'Inde, Louisiana, *in* Mallard, G.E., U.S. Geological Survey Toxic Substances Hydrology Program, Surface-water Contamination—Proceedings of the technical meeting, Phoenix, Arizona, September 26-30, 1988: U.S. Geological Survey Water-Resources Investigations Report 88-4220, p. 321-327.

Keywords: surface water, freshwater, contaminants, chemistry, hydrology

284. Demcheck, D.K., Demas, C.R., and Curwick, P.B., 1990, Plan of study for selected toxic substances in the Calcasieu River, Louisiana: U.S. Geological Survey Open-File Report 90-148, 29 p.

Keywords: contaminants, trace elements, surface water, freshwater

285. Demcheck, D.K., Demas, C.R., and Garrison, C.R., 1990, Chemical, tissue, and physical data from water and bottom material in the lower Calcasieu River, Louisiana, 1985-88: U.S. Geological Survey Open-File Report 89-420, 281 p.

Keywords: surface water, freshwater, chemistry, hydrology, physiology, contaminants

286. Demcheck, D.K., Garrison, C.R., and McGee, B.D., 1996, Selected water-quality data for the lower Mississippi River, Bonnet Carré Spillway, and Lake Pontchartrain area, Louisiana, April through June 1994 and 1974-84: U.S. Geological Survey Open-File Report 96-652A, 125 p.

Keywords: surface water, freshwater, chemistry

287. Demcheck, D.K., and Leone, H.L., Jr., 1983, Water quality of the upper Vermilion River, Louisiana, April-August 1980: Louisiana Department of Transportation and Development, Office of Public Works Water Resources Technical Report no. 30, 37 p.

Keywords: surface water, freshwater, chemistry

288. DePoe, C.E., and Pritchett, D.W., 1986, Secondary succession in a cleared bottomland hardwood area: Proceedings of the Louisiana Academy of Sciences, v. 49, p. 23-33.

Keywords: ecology, vascular plants, freshwater

289. Devai, I., and DeLaune, R.D., 1996, Light hydrocarbon production in freshwater marsh soil as influenced by soil redox conditions: Water, Air, Soil Pollut., v. 88, no. 1-2, p. 39-46.

The potential role of wetland soil redox condition to global atmospheric light hydrocarbon budget was evaluated by studying the effect of soil redox condition on

gaseous hydrocarbon production in freshwater marsh soil. Soil from a Mississippi River Deltaic plain freshwater marsh was equilibrated under controlled redox levels ranging from +550 mV to -170 mV and the production of methane, ethane, propane, butane, ethylene, propylene, and isobutane as influenced by redox condition was quantified.

Keywords: chemistry, sediment, freshwater, wetland loss

290. Devai, Istvan, and DeLaune, R.D., 1995, Evidence for phosphine production and emission from Louisiana and Florida marsh soils: Organic Geochemistry, v. 23, no. 3, p. 277-279.

Keywords: nutrients, chemistry, sediment

291. Devall, M.S., 1990, Cat Island Swamp—Window to a fading Louisiana ecology: Forest Ecology and Management, v. 33-34, no. 1-4, p. 303-314.

The structure and composition of a Louisiana swamp bordering the Mississippi River were investigated; twenty species of trees were encountered in six communities. Hackberry (*Celtis laevigata*) had the highest importance value for the entire tract, followed by cypress (*Taxodium distichum*), green ash (*Fraxinus pennsylvanica*), and tupelo gum (*Nyssa aquatica*). Soil was tested for pH and for extractable nutrients, and a texture analysis was carried out. Discriminant-function analysis was performed to determine which environmental variables influence tree distribution.

Keywords: vascular plants, checklist, habitat

292. Dial, D.C., 1968, Water-level trends in southeastern Louisiana: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Pamphlet no. 22, 11 p.

Keywords: groundwater, hydrology

293. Dial, D.C., 1970, Public water supplies in Louisiana: Louisiana Department of Public Works Basic Records Report no. 3, 460 p.

Keywords: groundwater, hydrology, chemistry, freshwater

294. Dial, D.C., 1970, Pumpage of water in Louisiana, 1970: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Pamphlet no. 26, 10 p.

Keywords: groundwater, management

295. Dial, D.C., 1983, Ground-water data for the Mississippi River parishes in the greater New Orleans area, Louisiana: Louisiana Department of Transportation and Development, Office of Public Works Water Resources Basic Records Report no. 11, 47 p.

Keywords: groundwater, chemistry

296. Dial, D.C., and Huff, G.F., 1989, Occurrence of minor elements in ground water in Louisiana including a discussion of three selected sites having elevated concentrations of barium: Louisiana Department of Transportation and Development Water Resources Technical Report no. 47, 88 p.

Keywords: groundwater, trace elements, contaminants, chemistry

297. Dial, D.C., and Kilburn, Chabot, 1980, Ground-water resources of the Gramercy area, Louisiana: Louisiana Department of Transportation and Development, Office of Public Works Water Resources Technical Report no. 24, 39 p.

Keywords: groundwater, chemistry

298. Dial, D.C., and Sumner, D.M., 1989, Geohydrology and simulated effects of pumpage on the New Orleans aquifer system at New Orleans, Louisiana: Louisiana Department of Transportation and Development Water Resources Technical Report no. 46, 54 p.

Keywords: groundwater, hydrology, management

299. Dial, D.C., and Tomaszewski, D.J., 1988, Geohydrology, water quality, and effects of pumpage on the New Orleans aquifer system, northern Jefferson Parish, Louisiana: U.S. Geological Survey Water-Resources Investigations Report 88-4097, 34 p.

Keywords: groundwater, hydrology, chemistry, management

300. Dickey, P.A., Collins, A.G., and Fajardo, M.I., 1972, Chemical composition of deep formation waters in southwestern Louisiana: The American Association of Petroleum Geologists Bulletin, v. 56, no. 8, p. 1530-1533.

Keywords: groundwater, chemistry

301. Dickey, P.A., Shriram, C.R., and Paine, W.R., 1968, Abnormal pressures in deep wells of Southwestern Louisiana: Science, v. 160, no. 3828, p. 609-615.

Keywords: groundwater

302. Dilks, D.W., Helfand, J.S., Bierman, V.J., and Burkhard, L., 1993, Field application of a steady-state mass balance model for hydrophobic organic chemicals in an estuarine system: Water Science and Technology, v. 28, no. 8-9, p. 263-271.

A one-dimensional, steady-state mass balance model was applied to describe instream and sediment concentrations of four hydrophobic organic chemicals in a discharge canal and receiving water bayou. The chemicals examined were hexachlorobenzene,

Hexachlorobutadiene, hexchloroethane, and 1,2,4-trichlorobenzene. The objective of the study was to test a mass balance modeling approach for relating point source effluents to resulting sediment concentration, in support of future implementation of national sediment quality criteria (SQC).

Keywords: estuarine, chemistry, contaminants, sediment, model

303. Dingler, J.R., 1994, Short-term water and suspended-sediment fluctuations in a Louisiana marsh, *in* Williams, S.J., and Cichon, H.A., Processes of coastal wetlands loss in Louisiana: U.S. Geological Survey Open-File Report 94-0275, p. 31-40.

Keywords: estuarine, chemistry, sediment, wetland loss

304. Doiron, L. N., and Whitehurst, C. A., 1978, Channel erosion in southwestern Louisiana canal: Journal of the Waterway Port Coastal and Ocean Division--ASCE, v. 104, no. 2, p. 201-213.

Keywords: geomorphology, sediment, hydrology

305. Donnell, B.P., and Letter, J.V., 1992, Atchafalaya River Delta. Report 12. Two-dimensional modeling of alternative plans and impacts on the Atchafalaya Bay and Terrebonne marshes: Tech. Rep. U.S. Army Eng. Waterways Exp. Stn., 1992, 118 p.

Keywords: model, estuarine, sediment, management, wetland loss

306. Donnell, B.P., and Letter, J.V., 1992, Atchafalaya River Delta. Report 13. Summary report of delta growth predictions: Army Engineer Waterways Experiment Station, Vicksburg, MS, Hydraulics Lab., 70 p.

This report is part of a series that addresses the U.S. Army Corps of Engineers concern about how the growth of the Wax Lake outlet and lower Atchafalaya River Deltas will evolve over the next 50 years. Goals of the reports are to determine the impacts of the growth of these deltas on navigation, flood control, salinity, and sedimentation. The investigation used several analytical and numerical techniques applied separately to arrive at independent predictions of delta growth. Each of the techniques are summarized and comparisons made. The techniques included an analytical model, regression/extrapolation analysis of past behavior, generic analysis of similar deltas' growth patterns, a quasi-two-dimensional numerical model, and TABS two-dimensional numerical model.

Keywords: estuarine, sediment, geomorphology, model, hydrology, salinity

307. Donnell, B.P., Letter, J.V., and Teeter, A.M., 1991, Atchafalaya River Delta. Report no. 11. Two-dimensional modeling: Rept. no. WES/TR/HL-82-15-11, 199 p.

This report is part of a series that addresses the U.S. Army Corps of Engineers concern about how the growth of the Wax Lake outlet and lower Atchafalaya River Deltas will evolve over the next 50 years. Goals of the reports are to determine the impacts of the growth of these deltas on navigation, flood control, salinity, and sedimentation. The TABS-2 finite element modeling system was used to these goals. The fully two-dimensional models for hydrodynamics, salinity, and sediment transport were first verified to extensive prototype data, then employed to predict delta evolution for existing conditions at years 1980, 1995, 2010, and 2030 within the project area.

Keywords: model, hydrology, geomorphology, salinity, sediment

308. Doody, J.S., 1996, Larval growth rate of known age *Ambystoma opacum* in Louisiana under natural conditions: Journal of Herpetology, v. 30, no. 2, p. 294-297.

Here I report larval growth rate of *Ambystoma opacum* from hatching to metamorphosis for a same age cohort under natural conditions. I also examine relationships between seasonal changes in temperature and growth rate. I monitored nesting, incubation, and hatching of *A. opacum* for six consecutive field seasons between 1990 and 1995 in a 20 x 40 m pond in East Baton Rouge Parish, Louisiana. The depression utilized by nesting *A. opacum* was inundated gradually in five of six years. This resulted in staggered hatching of embryos and considerable variation in larval size, limiting my ability to interpret growth rates of cohorts. In 1990-1991, however, I was able to estimate individual growth rate more precisely because heavy rainfall resulted in rapid pond-filling, and synchronized hatching of almost all embryos.

Keywords: freshwater, reptiles, productivity, habitat

309. Douglas, N.H., 1974, Freshwater fishes of Louisiana: Baton Rouge, La., Claitors Publishing Division, 443 p.

Keywords: fish, freshwater

310. Douglas, N.H., and Davis, J.T., 1975, Checklist of the freshwater fishes of Louisiana: Louisiana Wildlife and Fisheries, 29 p.

Keywords: fish, freshwater, checklist

311. Dowd, P.F., Mayfield, G.U., Coulon, D.P., Graves, J.B., and Newsom, J.D., 1985, Organochlorine residues in animals from three Louisiana watersheds in 1978 and 1979: Bulletin of Environmental Contamination and Toxicology, v. 34, no. 6, p. 832-841.

Keywords: contaminants, pesticides, fish

312. Dowty, B., Carlisle, D., Laseter, J.L., and Storer, J., 1974, Halogenated hydrocarbons in New Orleans drinking water and blood plasma: Science, v. 187, no. 4171, p. 75-77.

Keywords: surface water, freshwater, contaminants

313. Doyle, W.H., Jr., 1972, Sediment transport in a Mississippi River distributary--Bayou Lafourche, Louisiana: U.S. Geological Survey Water-Supply Paper 2008, 48 p.

Keywords: surface water, freshwater, sediment

314. Drake, M.A., 1990, Operational model development for salinity control—Hydraulic engineering: Proceedings of the 1990 National Conference, American Society of Civil Engineers, p. 385-390.

The 800 km^2 Breton Sound estuary and watershed in Louisiana is being systematically and numerically modeled to characterize its salinity regime in terms of important physical hydrometeorological and tidal processes. The ultimate purpose of the hydrologic modeling program is to develop an operational model for the Caernarvon Freshwater Diversion Structure, which will discharge up to 280 m^3/s from the Mississippi River to the estuary to control saltwater intrusion.

Keywords: estuarine, model, hydrology, salinity

315. DuBowy, P.J., 1996, Effects of water levels and weather on wintering herons and egrets: Southwestern Naturalist, v. 41, no. 4, p. 341-347.

Heron and egret (Ciconiiformes: Ardeini) winter ecology was studied in coastal Louisiana. Habitat use, time-activity budgets, and foraging behavior data were collected for six co-occurring species: great blue heron (*Ardea herodias*), great egret (*Casmerodius albus*), little blue heron (*Egretta caerulea*), snowy egret (*E. thula*), tricolored heron (*E. tricolor*), and green-backed heron (*Butorides striatus*). Additionally, energetics models were developed for the six species to understand endogenous reserve loss during adverse weather conditions and risk of mortality.

Keywords: hydrology, birds, habitat, climate, freshwater, estuarine

316. Duex, T.W., and Sprehe, E.M., 1996, Problems in obtaining hydrogeologic information for a rapidly growing suburban region such as St. Tammany Parish, Louisiana, *in* Anonymous, AAPG Gulf Coast Association of Geological Societies meeting; abstracts: AAPG Bulletin, v. 80, no. 9, p. 1500-1501.

St. Tammany Parish is one of the most rapidly growing areas in the Gulf Coast region, yet this area has had little in the way of detailed hydrogeologic study. The cities of Slidell, Mandeville, and Covington are the largest urban sites in an area that has seen most of the growth occur in rural regions outside of city limits. Consequently, there is no unified approach to the development of ground-water resources. St. Tammany Parish experienced a population growth of over 30% between 1980 and 1990. If this trend continues then the last decade of this century will see a population increase of over

40,000. Increases of this magnitude will likely place additional stresses on the already rapidly developing water resources.

Keywords: groundwater, management, hydrology

317. Duex, T.W., and Williams, C.B., 1995, A hydrogeological study of the Chicot Aquifer in Lafayette Parish, Louisiana, *in* Anonymous, AAPG Gulf Coast Section meeting; abstracts: AAPG Bulletin, v. 79, no. 10, p. 1557.

Keywords: groundwater, freshwater, hydrology

318. Duffy, K.C., and Baltz, D.M., 1998, Comparison of fish assemblages associated with native and exotic submerged macrophytes in the Lake Pontchartrain estuary, USA: Journal of Experimental Marine Biology and Ecology, v. 223, no. 2, p. 199-221.

Since the exotic Eurasian milfoil *Myriophyllum spicatum* (L.) was first reported in the Lake Pontchartrain estuary in 1978, it has become established as a dominant species of submerged macrophyte, but its distribution and abundance have varied considerably. We compared fish assemblages among two native macrophytes, *Vallisneria americana* (Michx) and *Ruppia maritima* (L.), the exotic *M. spicatum*, and unvegetated substratum to determine if milfoil influenced assemblage structure and microhabitat use by common littoral fishes.

Keywords: estuarine, fish, habitat, vascular plants, ecology

319. Dunbar, J.B., Britsch, L.D., and Kemp, E.B., 1990, Land loss rates. Report 2. Louisiana Chenier Plain: Army Engineer Waterways Experiment Station, Vicksburg, MS, Geotechnical Lab., 37 p.

The magnitude and trend in land loss rates for 12 U.S. Geological Survey topographic quadrangles in the Louisiana Chenier Plain are determined and discussed.

Keywords: estuarine, wetland loss

320. Duncan, A.C., 1967, Chemical quality of surface waters of Louisiana 1959-63: Louisiana Department of Public Works Basic Records Report no. 2, 137 p.

Keywords: surface water, freshwater, chemistry

321. Dundee, D.S., and Watt, P., 1962, New Orleans greenhouse gastropods with a list of some other Southern snails: Louisiana Academy of Sciences, v. 25, p. 47-49.

This paper represents a survey of the snails and slugs found in New Orleans greenhouses. Six species are introduced forms having limited distribution in this portion of the Gulf Coast.

Keywords: macroinvertebrates, checklist

322. Dundee, H.A., and Rossman, D.A., 1989, The amphibians and reptiles of Louisiana: Louisiana State University Press.

Keywords: reptiles, checklist

323. Dunn, M.A., Farrish, K.W., and Adams, J.C., 1999, Fertilization response in a natural bottomland hardwood stand in north-central Louisiana: Forest Ecology and Management, v. 114, no. 2-3, p. 261-264.

The effect of nitrogen and phosphorus fertilization on growth of a natural bottomland hardwood stand in north-central Louisiana was evaluated. A typical mixed stand of pole-sized and small saw-timber bottomland hardwoods with about 23.7 m^2 ha^{-1} of basal area was used in the study. Soils were Guyton silt loam (Fine-silty, siliceous, thermic Typic Glossaqualf). Three fertilizer treatments plus a control were replicated three times on 0.1 ha plots. The treatments consisted of nitrogen (168 kg ha^{-1}) as ammonium nitrate, phosphorus (56 kg ha^{-1}) as triple super phosphate, and N+P. Trees greater than 10 cm at dbh were measured for diameter before fertilization and remeasured after one and two growing seasons. Diameter increment served as the response variable.

Keywords: nutrients, riparian, vascular plants, productivity, chemistry

324. Dupree, I.B., and Meyer, E.W., 1995, Site characterization and application of horizontal wells for ground water remediation at the Dow Chemical Company, Louisiana Division in Plaquemine, Louisiana, *in* Anonymous, AAPG Gulf Coast Section meeting; abstracts: AAPG Bulletin, v. 79, no. 10, p. 1557

Keywords: groundwater, contaminants, management

325. Dupuy, A.J., and Couvillion, N.P., 1979, Analyses of native water, bottom material, and elutriate samples of southern Louisiana waterways, 1977-78: U.S. Geological Survey Open-File Report 79-1484, 414 p.

Keywords: surface water, freshwater, chemistry, sediment

326. Durham, C.O., Jr., Hoffman, K., and Rodgers, R.W., 1983, Geology of the Sweet Lake geopressured-geothermal prospect, Cameron Parish, Louisiana; Drilling and testing results: Transactions – Gulf Coast Association of Geological Societies, v. 33, p. 69-81.

Keywords: groundwater, geology

327. Dutton, B.E., and Thomas, R.D., 1991, The vascular flora of Cameron Parish, Louisiana: Castanea, v. 56, no. 1, p. 1-37.

Cameron Parish is located in the southwesternmost corner of Louisiana. There are seven basic vegetational regions within the parish. These may be recognized by the vascular plant species composition and by distinguishing physiographic features. A survey of the vascular flora of the approximately 1,087,360 acres of Cameron Parish was conducted and includes collections made from September 1983 to April 1985. Specimens housed in several other Louisiana herbaria were also examined, as was pertinent literature. Names of the 1,103 species representing 142 families found during this study have been compiled in an annotated catalogue which includes references to the vegetational region in which they occur, habitat, frequency of occurrence, and whether each species is native or non-native. Six species new to the state were discovered during this survey.

Keywords: checklist, vascular plants, habitat

328. Earth Technology Corporation, 1986, Potentiometric-level monitoring program, Mississippi and Louisiana; Annual status report for fiscal year 1984: ONWI (Battelle Memorial Institute), v. 613, 80 p.

Keywords: groundwater, methods

329. Ebert, D.J., Nelson, T.A., Kershner, J.L., Cooper, J.L., Hamre, R.H., 1991, A soil-based assessment of stream fish habitats in coastal plains streams: Warmwater Fisheries Symposium 1, June 4-8, 1991, Gen. Tech. Rep. USDA For. Serv., p. 217-224.

Fish, habitat, and water quality data were collected during low flow conditions in 16 Louisiana coastal plain streams for two consecutive years. Five distinct land/aquatic or soil dominated stream types were delineated and evaluated for fish numbers and biomass, species richness, and habitat diversity.

Keywords: surface water, freshwater, fish, chemistry, habitat, sediment

330. Eddards, M.L., Kister, L.R., and Scarcia, Glenn, 1956, Water resources of the New Orleans area, Louisiana: U.S. Geological Survey Circular 374, 41 p.

Keywords: freshwater, urban, management

331. El-Fawaris, A.H., and Knaus, R.M., 1984, Radiocesium-137 movement in a southern coastal plain ecosystem: Health Physics, v.46, no. 4, p. 883-890.

Keywords: trace elements, contaminants, vascular plants

332. Elliott, C.M., Rentschler, R.E., and Brooks, J.H., 1991, Response of Lower Mississippi River low-flow stages, *in* Fan, Shou-Shan, and Kuo, Yung-Huang, Proceedings of the Fifth Federal Interagency Sedimentation Conference: Proceedings--Federal Interagency Sedimentation Conference, v.5, p. 4.16-4.23.

Keywords: hydrology, surface water, freshwater, sediment

333. Ellsworth, E.A., comp., 1985, Water-resources activities of the Louisiana District in fiscal years 1986-87: U.S. Geological Survey Open-File Report 87-225, 53 p.

Keywords: surface water, freshwater, hydrology, chemistry

334. Elsey, R.M., and Kinler, N., 1996, Range extension of the American beaver, *Castor canadensis*, in Louisiana: Southwest. Nat., v. 41, no. 1, p. 91-93.

The authors describe the finding of two beavers in Cameron Parish which substantially extends the range of the beaver in Louisiana.

Keywords: surface water, freshwater, ecology

335. Engle, V.D., and Summers, J.K., 1999, Refinement, validation, and application of a benthic condition index for northern Gulf of Mexico estuaries: Estuaries, v. 22, no. 3A, p. 624-635.

By applying discriminant analysis to benthic macroinvertebrate data, we have developed an indicator of benthic condition for northern Gulf of Mexico estuaries. The data used were collected by the United States Environmental Protection Agency's Environmental Monitoring and Assessment Program (EMAP) in the Louisianian Province from 1991 to 1994. This benthic index represents a linear combination of the following weighted parameters: the proportion of expected species diversity, the mean abundance of tubificid oligochaetes, the percent of total abundance represented by capitellid polychaetes, the percent of total abundance represented by bivalve mollusks, and the percent of total abundance represented by amphipods. We successfully validated and retrospectively applied the benthic index to all of the benthic data collected by EMAP in the Louisianian Province. This benthic index was also calculated for independent data collected from Pensacola Bay, Florida, in order to demonstrate its flexibility and applicability to different estuarine systems within the same biogeographic region. The benthic index is a useful and valid indicator of estuarine condition that is intended to provide environmental managers with a simple tool for assessing the health of benthic macroinvertebrate communities.

Keywords: estuarine, model, macroinvertebrates, ecology

336. Ensminger, P.A., 1998, Floods in Louisiana, magnitude and frequency (5th ed.): Louisiana Department of Transportation and Development Water Resources Technical Report no. 60, 333 p., 1 diskette.

Keywords: surface water, freshwater, hydrology

337. Ensminger, P.A., 1999, Bathymetric survey and physical and chemical-related properties of False River, Louisiana, June and July 1998: U.S. Geological Survey Water-Resources Investigations Report 99-4193, 1 sheet.

Keywords: surface water, freshwater

338. Ensminger, P.A., and Gilbert, J.J., 1995, Peak-stage data for selected streams in coastal Louisiana, 1905-88: Louisiana Department of Transportation and Development Water Resources Basic Records Report no. 20, 50 p.

Keywords: surface water, freshwater, hydrology

339. Everett, D.E., 1971, Hydrologic and quality characteristics of the lower Mississippi River: Louisiana Department of Public Works Technical Report no. 5, 48 p.

Keywords: surface water, freshwater, hydrology, chemistry

340. Evers, D.E., Gosselink, J.G., Sasser, C.E., and Hill, J.M., 1992, Wetland loss dynamics in southwestern Barataria Basin, Louisiana (USA), 1945-1985: Wetlands Ecol. Manage., v. 2, no. 3, p. 103-118.

The authors determined spatial associations of wetland loss rates in a 950 km^2 study area in the southwestern Barataria basin of Louisiana's Mississippi River delta plain for four intervals spanning 40 years, 1945-1985.

Keywords: estuarine, wetland loss, freshwater, surface water

341. Evers, D.E., Sasser, C.E., Gosselink, J.G., Fuller, D.A., and Visser, J.M., 1998, The impact of vertebrate herbivores on wetland vegetation in Atchafalaya Bay, Louisiana: Estuaries, v. 21, no. 1, p. 1-13.

The Atchafalaya Delta provides an interesting setting for the study of herbivory because of the complex interaction of biotic and physical factors operating in this delta. We hypothesized that grazing by herbivores has a marked effect on vegetation in these developing marshes. To test this hypothesis, exclosures were erected on islands in both deltas in September 1985 and January 1986. Each set of exclosure treatments included an openly-grazed control area, an ungrazed area, an area allowing nutria grazing, and one allowing waterfowl grazing in each site. Results of the experiment, based on field sampling of vegetation, indicated decreases in plant biomass and changes in plant species composition in grazed treatments. Waterfowl and nutria reduced biomass about equally, but there was a more marked effect in the openly grazed areas. These findings may be extrapolated to sediment diversion areas along the Mississippi River.

Keywords: vascular plants, herbivory, mammals, birds, wetland loss, habitat

342. Eversole, A.G., and Brune, D.E., 1995, Water quality and management in crawfish culture ponds: J. Shellfish Res., v. 14, no. 1, p. 264-265.

This overview includes a summary of the water suitable for culture of Procambarus species; a year's observations of water quality in commercial crawfish ponds; an evaluation of water quality in rice forage ponds with and without crawfish; and an examination of water quality and nutrient dynamics in rice forage, rice forage with supplemental feed, and total feed crawfish ponds.

Keywords: surface water, freshwater, chemistry, macroinvertebrates, management, nutrients

343. Ewing, K., McKee, K.L., and Mendelssohn, I.A., 1997, A field comparison of indicators of sublethal stress in the salt-marsh grass *Spartina patens*: Estuaries, v. 20, no. 1, p. 48-65.

Temporal and spatial environmental variation (soil redox potential, interstitial water salinity, pH, ammonium and phosphorus, and cation and trace metal concentrations) was analyzed near Lake de Cade, Louisiana, in a brackish marsh which is a mosaic of healthy plant communities interspersed with areas where wetland loss is occurring. Environmental variation was related to indicators of stress in *Spartina patens*, which included variables derived from the adenine nucleotide levels in plants, leaf spectral reflectance, leaf proline concentrations, and shoot elongation.

Keywords: estuarine, physiology, vascular plants, habitat, salinity, wetland loss

344. Ewing, K., McKee, K., Mendelssohn, I., and Hester, M., 1995, A comparison of indicators of sublethal salinity stress in the salt marsh grass, *Spartina patens* (Ait.) Muhl: Aquatic Botany, v. 52, no. 1-2, p. 59-74.

Wetland plant communities in coastal Louisiana are degrading, resulting in the loss of live emergent vegetation and subsequent succession to open water. Saltwater intrusion has resulted from the construction of navigation canals through the marshes; the subsequent salinity increase is one of the potential sources of sublethal stress on plants. Greenhouse experiments were conducted on *Spartina patens* (Ait.) Muhl. to compare the usefulness of several indicators for the detection of salinity stress. CO_2 uptake, leaf expansion, proline concentration and live aboveground biomass displayed significant responses to the salinity levels employed as treatments (0, 7, 14, 21 and 28 ppt.). CO_2 exchange was the only indicator showing a significant response within 7 days of the initiation of treatments (measurements were made at 7, 14 and 42 days).

Keywords: estuarine, vascular plants, hydrology, physiology, productivity, salinity

345. Ewing, M.S., 1991, Turbidity control and fisheries enhancement in a bottomland hardwood backwater system in Louisiana (U.S.A.): Regulated Rivers—Research & Management, v. 6, no. 2, p. 87-99.

In response to a noticeable decline in recreational fishing in the formerly productive Larto-Saline backwater complex of east central Louisiana, a study was begun to identify

causative factors for the decline and to determine effective methods to remedy the problem. To this end, water quality and fisheries surveys were conducted in the system for the study period 1 July, 1981 to 30 June, 1989. Data collected during the early years of the study indicated chronically high turbidity (> 100 FTU) to be the major factor limiting game fish production. The high turbidity can be related to man-made alterations of natural flood patterns that had changed the major source of backwater flooding from Black River to the highly turbid Red River. In September, 1986, a construction project was undertaken to restore flood patterns to approximate natural conditions, Sampling subsequent to this construction has shown a significant decrease in turbidity and an increase in game fish production.

Keywords: fish, management, habitat, hydrology, freshwater

346. Fabryka-Martin, J.T., 1985, Natural iodine-129 as a ground water tracer: The NSS Bulletin, v. 45, no. 1, p. 46.

Keywords: groundwater, methods

347. Fader, S.W., 1954, An analysis of contour maps of water levels in wells in southwestern Louisiana, 1952 and 1953: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Pamphlet no. 1, 7 p.

Keywords: groundwater, hydrology, freshwater

348. Fader, S.W., 1955, An analysis of contour maps of water levels in wells in southwestern Louisiana, 1954: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Pamphlet no. 2, 13 p.

Keywords: groundwater, hydrology, freshwater

349. Fader, S.W., 1957, An analysis of contour maps of 1955 water levels, with a discussion of saltwater problems in southwestern Louisiana: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Pamphlet no. 4, 27 p.

Keywords: groundwater, hydrology

350. Fader, S.W., 1958, Water levels and water-level contour maps for southwestern Louisiana, 1956 and spring 1957: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Pamphlet no. 5, 23 p.

Keywords: groundwater, hydrology

351. Fader, S.W., and Harder, A.H., 1954, Preliminary memorandum on the effects of the proposed Cocodrie and Longleaf reservoirs and the Vermilion River on ground-water recharge in southwestern Louisiana: U.S. Geological Survey Open-File Report, 13 p.

Keywords: groundwater, surface water, hydrology

352. Fang, Xing, and Stefan, H.G., 1998, Temperature variability in lake sediments: Water Resources Research, v. 34, no. 4, p. 717-729.

Keywords: sediment, freshwater

353. Farber, S., 1992, The economic cost of residual environmental risk—A case study of Louisiana: Journal of Environmental Management, v. 36, no. 1, p. 1-16.

This paper summarizes the results of an extensive economic analysis of the costs associated with residual environmental risks in Louisiana. The analysis has estimated these costs by impact category and allocated them to risk sources. Major risk sources include waste water and non-point source discharges.

Keywords: surface water, freshwater, contaminants, nutrients, urban

354. Farber, S., and Costanza, R., 1987, The economic value of wetlands systems: Journal of Environmental Management, v. 24, no. 1, p. 41-51.

Keywords: management, surface water, ecology

355. Farrar, L.F., 1991, Water-resources activities of the Louisiana District, 1988-89: U.S. Geological Survey Open-File Report 91-201, 38 p.

Keywords: surface water, freshwater, hydrology, chemistry

356. Farrell, K. M., 1985, Alluvial architecture of channel belt margins of Mississippi River, False River Region Louisiana: AAPG Bulletin-American Association of Petroleum Geologists, v. 69, no. 9.

Keywords: geomorphology, surface water

357. Farrish, K.W., Adams, J.C., and Thompson, C.V., 1993, Soil conservation practices on clearcut forestlands in Louisiana: Journal of Soil and Water Conservation, v. 48, no. 2, p. 136-139.

The extent to which soil conservation practices are being employed was investigated and the rates of soil erosion occurring on clearcut harvested forestland in Louisiana was estimated. An inventory of 1,584 forest sites, clearcut harvested within the previous 2 years was conducted in 1985. Information on soil conservation practice implementation

was recorded at each site and the Universal Soil Loss Equation was used to estimate soil erosion.

Keywords: surface water, freshwater, management, sediment

358. Fayard, L.D., 1971, Relation between oxidation potential and the occurrence of iron in ground water from the Chicot aquifer, Lafayette, Louisiana, *in* Geological Survey Research 1971: U.S. Geological Survey Professional Paper 750-D, p. D182-D186.

Keywords: groundwater, chemistry, freshwater

359. Fayard, L.D., and Nyman, D.J., 1976, Surface-water resources of the Tangipahoa, Tchefuncta, and Natalbany River basins, southeastern Louisiana: Louisiana Department of Public Works Water Resources Technical Report no. 11, 49 p.

Keywords: surface water, freshwater, hydrology, chemistry

360. Faye, R.E., and Smith, W.G., 1994, Relations of borehole resistivity to the horizontal hydraulic conductivity and dissolved-soils concentration in water of clastic coastal plain aquifers in the Southeastern United States: U.S. Geological Survey Water-Supply Paper 2414, p. 33.

Aquifer bulk resistivity and grain-surface resistivity (inverse of grain-surface conductance) were tested as geoelectrical analogs to the horizontal hydraulic conductivity of freshwater clastic aquifers in the Southeastern United States. Regression models were developed using borehole resistivity, water-quality, and aquifer-test data collected at more than 100 well sites in 7 southeastern states that indicated a moderate correlation between bulk and grain-surface resistivity and horizontal hydraulic conductivity (70 and 72 percent correlation coefficients).

Keywords: groundwater, chemistry, freshwater

361. Feagley, S.E., and Cremers, R.B., 1984, Acid rain and its accumulation—A problem in Louisiana?: Louisiana Agriculture, v. 27, no. 4, p. 4-5.

Keywords: climate, contaminants

362. Feagley, S.E., Sigua, G.C., Bengston, R.L., Bollich, P.K., and Linscombe, S.D., 1993, Effects of management practices on surface water quality from rice fields: Louisiana Agric., v. 36, no. 1, p. 8-10.

This study evaluates the potential of selected management practices for reducing total solids, nutrients, and pesticides from rice field discharge water to improve surface water quality in the Mermentau River basin.

Keywords: surface water, freshwater, management, contaminants, nutrients, agriculture

363. Featherman, Americus, 1871, Report of botanical survey of southern and central Louisiana made during the year 1870: New Orleans, Office of the Republican (Printer).

Keywords: checklist, vascular plants

364. Feijtel, T.C., DeLaune, R.D., and Patrick, W.H., Jr., 1985, Carbon flow in coastal Louisiana: Marine Ecology Progress Series. Oldendorf, v. 24, no. 3, p. 255-260.

Keywords: chemistry, physiology, estuarine

365. Feijtel, T.C., DeLaune, R.D., and Patrick, W.H., Jr., 1988, Biogeochemical control on metal distribution and accumulation in Louisiana Sediments: Journal of Environmental Quality, v. 17, no. 1, p. 88-94.

Keywords: surface water, freshwater, trace elements, sediment, microbiology, physiology, chemistry

366. Feijtel, T.C., DeLaune, R.D., and Patrick, W.H., Jr., 1988, Seasonal pore water dynamics in marshes of Barataria Basin, Louisiana: Soil Science Society of America Journal, v. 52, no. 1, p. 59-67.

Keywords: estuarine, sediment, chemistry, hydrology

367. Felley, J.D., 1987, Nekton assemblages of three tributaries to the Calcasieu Estuary, Louisiana: Estuaries, v. 10, no. 4, p. 321-329.

Keywords: estuarine, fish, nutrients

368. Felley, J.D., 1989, Nekton assemblages of the Calcasieu Estuary: Contrib. Mar. Sci., Univ. Texas, v. 31, p. 95-117.

Keywords: fish, estuarine, macroinvertebrates

369. Felley, J.D., and Daniels, G.L., 1992, Life history of the sailfin molly (*Poecilia latipinna*) in two degraded waterways of southwestern Louisiana: Southwestern Naturalist, v. 37, no. 1, p. 16-21.

Contraband Bayou and Bayou d'Inde are two highly degraded waterways draining into the Calcasieu Estuary of southwestern Louisiana. Both bayous are affected by municipal wastes, and Bayou d'Inde receives additional effluents from a large petrochemical complex. Bayou d'Inde has many fewer species than does Contraband Bayou. *Poecilia latipinna* is abundant in both waterways. The life history of P. latipinna was investigated to determine whether the added stresses present in Bayou d'Inde would be reflected in this population.

Keywords: surface water, freshwater, fish, ecology, contaminants

370. Felley, J.D., and Felley, S.M., 1986, Habitat partitioning of fishes in an urban, estuarine bayou: Estuaries, v. 9, no. 3, p. 208-218.

Keywords: urban, fish, ecology, habitat

371. Felley, S.M., Vecchione, M., and Hare, S.G.F., 1987, Incidence of ectoparasitic copepods on ichthyoplankton: Copeia, no. 3, p. 778-782.

Keywords: ecology, macroinvertebrates, estuarine, contaminants

372. Fendick, R.B., Jr., 1989, Louisiana ground-water map no. 2—Potentiometric surface, 1987, of the Gonzales-New Orleans aquifer in southeastern Louisiana: U.S. Geological Survey Water-Resources Investigations Report 89-4016, 1 sheet.

Keywords: groundwater, freshwater, hydrology

373. Fendick, R.B., Jr., and Nyman, D.J., 1987, Louisiana ground-water map no. 1--Potentiometric surface, 1985, and water-level changes, 1983-85, of the Chicot aquifer in southwestern Louisiana: U.S. Geological Survey Water-Resources Investigations Report 86-4348, 2 sheets.

Keywords: groundwater, hydrology, freshwater

374. Fischer, S.A., and Kelso, W.E., 1988, Potential parasite-induced mortality in age-0 bluegills in a floodplain pond of the lower Mississippi River: Transactions of the American Fisheries Society, v. 117, no. 6, p. 565-573.

The authors assessed seasonal variations in endoparasite intensity (number per host) for six 1986 cohorts of age-0 bluegill *Lepomis macrochirus* collected from an overflow pond of the lower Mississippi River during March-December 1986. *Allacanthochasmus* sp. (Trematoda) was the predominate endoparasitic taxon infecting bluegills. They noted peaked intensity curves and declines in variance-to-mean ratios for total endoparasites and *Allacanthochasmus* sp. for three cohorts during pond flooding in October. Although changes in the distribution of parasite intensities during this period may have reflected bluegill mortality, declines in variance-to-mean ratios of parasite intensities were smaller than those predicted by theories of parasite-induced host mortality.

Keywords: fish, ecology, riparian

375. Fischer, S.A., and Kelso, W.E., 1990, Parasite fauna development in juvenile bluegills and largemouth bass: Transactions of the American Fisheries Society, v. 119, no. 5, p. 877-884.

The authors assessed parasite prevalence and intensity in juvenile bluegills *Lepomis macrochirus* and largemouth bass *Micropterus salmoides* collected from a pond of the lower Mississippi River from March through December, 1986. Bluegills and largemouth bass were hosts to 11 and 12 parasite taxa, 9 of which parasitized both bass, whereas *Allacanthochasmus* sp. (Trematoda) was the predominate parasite in bluegills under 50 mm in total length. Parasite loads increased as spring progressed, and nearly all the juvenile fishes over 25 mm long supported a parasite fauna. Seasonal changes in the abundance of parasites were evident for most taxa. Increases in Monogenea intensity with host length appeared to be related to increases in gill surface area, whereas factors other than host tissue mass appeared to regulate the intensity of endoparasite infection. Diet composition of the two species appeared to influence relative infection rates by *Proteocephalus ambloplitis* (Cestoda) and *Neoechinorhynchus cylindratus* (Acanthocephala). Differences in spatial distribution between fish and invertebrate hosts may have contributed to differences in parasitism by *Allacanthochasmus* sp. and *Posthodiplostomum minimum* (Trematoda) between the two centrarchids.

Keywords: fish, ecology, freshwater

376. Fleeger, J.W., 1985, Meiofaunal densities and copepod species composition in a Louisiana, U.S.A., estuary: Transactions of the American Microscopical Society, v. 104, no. 4, p. 321-332.

Keywords: macroinvertebrates, estuarine

377. Fleeger, J.W., Sikora, W.B., and Sikora, J.P., 1983, Spatial and long-term temporal variation of meiobenthic-hyperbenthic copepods in Lake Pontchartrain, Louisiana: Estuarine, Coastal and Shelf Science, v. 16, no. 4, p. 441-453.

Keywords: estuarine, macroinvertebrates

378. Fleeger, J.W., Whipple, S.A., and Cook, L.L., 1981, Field manipulations of tidal flushing, light exposure and natant macrofauna in a Louisiana salt marsh—Effects on the meiofauna: Journal of Experimental Marine Biology and Ecology, v. 56, no. 1, p. 87-100.

Keywords: estuarine, hydrology, macroinvertebrates, habitat

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379. Flemer, D.A., Ruth, B.F., Bundrick, C.M., and Gaston, G.R., 1997, Macrobenthic community colonization and community development in dredged material disposal habitats off coastal Louisiana: Environ. Pollut., v. 96, no. 2, p. 141-154.

The authors examined marine benthic macroinvertebrate colonization and community structure at multiple spatial scales (study areas, reference and disposal sites, and depth zones within sites) within a 3-day period at three relatively widely separated (ca 60 km) dredged material disposal areas (Mermentau and Atchafalaya Rivers and Freshwater Bayou) in coastal Louisiana.

Keywords: estuarine, macroinvertebrates, ecology, sediment

380. Fleury, B.E., and Sherry, T.W., 1995, Long-term population trends of colonial wading birds in the southern United States—The impact of crayfish aquaculture on Louisiana populations: Auk, v. 112, no. 3, p. 613-632.

Long-term population dynamics of colonial wading birds (Ciconiiformes) were examined using data from Audubon Christmas Bird Counts (CBC, 1949-1988) and Breeding Bird Surveys (BBS, 1966-1989). Winter populations of Louisiana wading birds increased dramatically over the 40-year period, with the sharpest increases occurring during the last 20 years. Several species populations grew exponentially from 1968 to 1988. High overall positive covariance was found in the abundance of the various species over time, and cluster analysis showed that the species with similar dietary requirements and foraging habits covaried most strongly and positively with each other. These findings have important implications for conservation and management of Louisiana's wading-bird populations.

Keywords: aquaculture, birds, ecology, macroinvertebrates, management, freshwater, productivity

381. Flowers, G.C., Durfee, A.W., and Isphording, W.C., 1988, Environmental sedimentology of the Pontchartrain-Maurepas estuarine complex: Transactions--Gulf Coast Association of Geological Societies, v. 38, p. 579.

Keywords: estuarine, sediment, chemistry

382. Flowers, G.C., and Isphording, W.C., 1990, Heavy metal geochemistry of the Pontchartrain-Maurepas estuarine complex, *in* Anonymous, Gulf Coast Association of Geological Societies and Gulf Coast Section of SEPM meeting; abstracts: AAPG Bulletin, v. 74, no. 9, p. 1495.

Keywords: estuarine, trace elements, sediment

383. Flowers, G.C., Koplitz, L.V., and McPherson, G.L., 1995, The impact of Hurricane Andrew; changes in the texture and chemistry of Barataria Estuary bottom sediments, *in* John, C.J., and Byrnes, M.R., Transactions of the forty-fifth annual convention of the Gulf Coast Association of Geological Societies, a section of the American Association of Petroleum Geologists regional meeting and the forty-second annual convention of the Gulf Coast Section of the Society of Economic Paleontologists and Mineralogists: Transactions--Gulf Coast Association of Geological Societies, v. 45, p. 189-194.

Keywords: estuarine, sediment, chemistry

384. Floyd, M.D., 1995, Vegetative responses to implementation of Cameron-Creole in southwestern Louisiana—An ecosystem-based watershed project: Journal of Soil and Water Conservation, v. 50, no. 6, p. 605-607.

Because of severe saltwater intrusion, marshlands in the Cameron-Creole Watershed Project area were converting to open water as the salt water killed the vegetation that held the soil of the marsh. To counter this conversion, a cooperative construction project for watershed protection was established for Cameron-Creole.

Keywords: estuarine, wetland loss, ecology

385. Flynn, K.M., McKee, K.L., and Mendelssohn, I.A., 1995, Recovery of freshwater marsh vegetation after a saltwater intrusion event: Oecologia, v. 103, no. 1, p. 63-72.

Keywords: estuarine, ecology

386. Focks, D.A., McLaughlin, R.E., and Smith, B.M., 1988, A dynamic life table model of *Psorophora columbiae* in the southern Louisiana rice agroecosystem with supporting hydrologic submodel—Part 1. Analysis of literature and model development: Journal of the American Mosquito Control Association, v. 4, no. 3, p. 266-281.

The objective of this work was to synthesize the literature and unpublished data on the rice agroecosystem into a comprehensive simulation model of the key elements of the system known to influence the population dynamics of *Psorophora columbiae*. This paper describes the development of 2 models.

Keywords: model, hydrology, macroinvertebrates, agriculture

387. Focks, D.A., McLaughlin, R.E., and Smith, B.M., 1988, A dynamic life table model of *Psorophora columbiae* in the southern Louisiana rice agroecosystem with supporting hydrologic submodel—Part 2. Model validation and population dynamics: Journal of the American Mosquito Control Association, v. 4, no. 3, p. 282-299.

In an earlier paper, the development of 2 simulation models designed to describe the interaction between key elements of the rice agroecosystem and the population dynamics of *Psorophora columbiae* were presented (Focks et al. 1988a). The objective of the work reported herein was to validate these models with field data. A discussion is presented of the interaction between agricultural practices and certain key factors of the life history strategy of *P. columbiae* which permit the unusually successful exploitation of the rice agroecosystem by this species.

Keywords: model, hydrology, macroinvertebrates, agriculture

388. Fontenot, M.M., 1986, Hydrogeologic assessment, delineation and remediation of a shallow ground water contaminated zone: Proceedings of the NWWA/API Conference on Petroleum Hydrocarbons and Organic Chemicals in Ground Water; Prevention, Detection and Restoration, p. 633-653.

Keywords: groundwater, contaminants, management

389. Forbes, M.J., Jr., 1980, Low-flow characteristics of Louisiana streams: Louisiana Department of Transportation and Development, Office of Public Works Water Resources Technical Report no. 22, 95 p.

Keywords: surface water, freshwater, hydrology

390. Forbes, M.J., Jr., 1988, Hydrologic investigations of the lower Calcasieu River, Louisiana: U.S. Geological Survey Water-Resources Investigations Report 87-4173, 61 p.

Keywords: surface water, freshwater, hydrology

391. Ford, M.A., Cahoon, D.R., and Lynch, J.C., 1999, Restoring marsh elevation in a rapidly subsiding salt marsh by thin-layer deposition of dredged material: Ecological Engineering, v. 12, no. 3-4, p. 189-205.

Thin-layer deposition of dredged material on coastal marsh by means of high-pressure spray dredging technology has been proposed as a mechanism to minimize wetland impacts associated with traditional bucket dredging technologies and to restore soil elevations in deteriorated marshes of the Mississippi River delta. The impact of spray dredging on vegetated marsh and adjacent shallow-water habitat (formerly vegetated marsh that deteriorated to open water) was evaluated in a 0.5-ha *Spartina alterniflora*-dominated salt marsh in coastal Louisiana. The thickness of dredged sediment deposits was determined from artificial soil marker horizons and soil elevation change was determined from sedimentation-erosion tables (SET) established prior to spraying in both sprayed and reference marshes. The vertical accretion and elevation change measurements were made simultaneously to allow for calculation of shallow (similar to 5 m depth) subsidence (accretion minus elevation change). Measurements made immediately following spraying in July 1996 revealed that stems of *S. alterniflora* were knocked down by the force of the spray and covered with 23 mm of dredged material. Stems of *S. alterniflora* soon recovered, and by July 1997 the percent cover of *S. alterniflora* had increased three-fold over pre-project conditions. Thus, the layer of dredged material was thin enough to allow for survival of the *S. alterniflora* plants, with no subsequent colonization by plant species typical of higher marsh zones.

Keywords: estuarine, sediment, management, wetland loss, geomorphology

392. Ford, M.A., and Grace, J.B., 1998, Effects of vertebrate herbivores on soil processes, plant biomass, litter accumulation and soil elevation changes in a coastal marsh: Journal of Ecology, v. 86, no. 6, p. 974-982.

Submergence of coastal wetlands in Louisiana is currently rapid and widespread. A number of factors contribute to this loss of habitat, including the activities of herbivores. The objective of this study was to examine the effects of large mammals, predominantly nutria and wild boar, on processes controlling soil elevation in coastal marshes. Effects of

herbivores on soil and vegetation were assessed by the use of paired fenced and unfenced plots over two successive growing seasons. Above-ground biomass, litter production, changes in soil elevation, vertical soil accretion, shallow subsidence, below-ground production of roots and rhizomes, the thickness of the root zone, soil bulk density, and soil organic matter were measured. The results indicate that herbivores can have a negative effect on soil building processes, primarily by reducing below-ground production and expansion of the root zone. Where natural rates of mineral sediment deposition are high, coastal marshes are expected to persist, despite herbivore activities. However, where sediment inputs are substantially less, herbivores may lead to destruction of habitat.

Keywords: freshwater, vascular plants, ecology, sediment, herbivory, productivity, habitat, herbivory, mammals

393. Ford, M.A., and Grace, J.B., 1998, The interactive effects of fire and herbivory on a coastal marsh in Louisiana: Wetlands, v. 18, no. 1, p. 1-8.

Both vertebrate herbivores and fire have long been known to have dramatic and important effects on wetland vegetation. However, the interactive effects of burning and herbivory have received less attention. In this study, conducted in the coastal marshes of the Pearl River Basin in Louisiana, USA, both the effects of herbivory and fire as well as the interaction between these effects were examined in three marsh community types: *Sagittaria lancifolia*, *Panicum virgatum*, and *Spartina patens*. At five sites for each of the three community types, the effects of burning and fencing to exclude herbivores were determined over two years. Results showed that total biomass was reduced by burning but increased by fencing, with no interactive effects on total biomass. Species density (the number of species per unit area) was enhanced in plots that were both burned and fenced. The results found here along with other data are generally consistent with the hypothesis that herbivory favors *S. patens* while burning favors other dominant species. Thus, the relative effects of fire and herbivory have an influence (along with other factors such as salinity) on the dominance of *S. patens* in coastal marshes.

Keywords: vascular plants, wetland loss, ecology, mammals, herbivory

394. Fouss, J.L., Rogers, J.S., Willis, G.H., Southwick, L.M., and Carter, C.E., 1996, Automated operation of water table control system for water quality management, *in* Daniel, B.J., Twenty-sixth Mississippi water resources conference: Proceedings--Mississippi Water Resources Conference, v. 26, p. 140-154.

Keywords: groundwater, management

395. Fouss, J.L., Willis, G.H., and Southwick, L.M., 1997, Integrated management of water and agrochemicals in agricultural crop production systems, *in* Daniel, B.J., Proceedings of the Twenty-seventh Mississippi water resources conference: Proceedings--Mississippi Water Resources Conference, v. 27, p. 250-262.

Keywords: agriculture, management, pesticides, nutrients, freshwater

396. Francis, J.C., Poirrier, M.A., Barbe, D.E., Wijesundera, V., and Mulino, M.M., 1994, Historic trends in the secchi disk transparency of Lake Pontchartrain: Gulf Res. Rep., v. 9, no. 1, p. 1-16.

Regression of the available data on secchi disk transparency versus time (1953 through 1990) reveals a statistically significant decrease in transparency of about 40%. The data set is biased, however, in that it does not adequately represent the seasonal effects of salinity and wind speed. Two analytical procedures were undertaken to determine the extent to which the apparent long-term decrease in transparency was dependent on the seasonal bias.

Keywords: estuarine, ecology, sediment, algae

397. Froomer, N.L., 1982, The influence of water salinity on paludal erosion processes: Journal of Geology, v. 90, no. 2, p. 179-185.

Keywords: salinity, wetland loss

398. Fruge, D.W., 1974, The vegetation of Lacassine Pool, Lacassine National Wildlife Refuge, Louisiana—Report of wildlife management study. Final report: U.S. Fish and Wildlife Service, 65 p.

Keywords: freshwater, vascular plants, checklist

399. Fuller, D.A., Sasser, C.E., Johnson, W.B., and Gosselink, J.G., 1984, The effects of herbivory on vegetation on islands in Atchafalaya Bay, Louisiana: Wetlands, v. 4, p. 105-114.

Vegetation establishment proceeded rapidly on islands in Atchafalaya Bay, Louisiana, following subaerial exposure in 1973. By 1980, 11 km^2 of land were vegetated, with four primary plant associations dominating the plant assemblage. *Sagittaria latifolia* on intertidal elevations, *Salix nigra* on higher elevations at the heads of islands, *Typha latifolia* at elevations between the *S. nigra* and the *S. latifolia*, and a transitional community at intermediate elevations composed of the above plants with *Cyperus difformis*, *Eleocharis* spp., *Ammania coccinea*, and *Sphenoclea zeylandica*. Colonization by the furbearers nutria (*Myocastor coypus*) and muskrat (*Ondatra zibethicus*) has also been rapid on the islands. A preliminary exclosure study over a two-year period (1980-81) documented significantly higher plant biomass for *S. latifolia* and *A. coccinea* within exclosed plots than in control plots, and there was some indication that plant species composition was affected by herbivory. Long-term exclosure studies and concurrent population studies of herbivores are recommended.

Keywords: herbivory, vascular plants, mammals

400. Gabrey, S.W., Afton, A.D., and Wilson, B.C., 1999, Effects of winter burning and structural marsh management on vegetation and winter bird abundance in the Gulf Coast Chenier Plain, USA: Wetlands, v. 19, no. 3, p. 594-606.

Marshes in the Gulf Coast Chenier Plain provide important winter habitats for many species of birds. Many of these marshes are managed intensively through a combination of fall/winter burning and construction of impoundments to improve wintering waterfowl habitat, reduce wetland loss, and create emergent wetlands. Little information is available on effects of this management on wintering birds, particularly passerines. We conducted experimental burns in impounded and unimpounded marshes on Rockefeller State Wildlife Refuge in southwest Louisiana and recorded species composition and abundance of birds during the 1996 and 1997 winters. We found that burning and impoundment influenced vegetation structure, which in turn influenced bird abundance and species composition.

Keywords: management, vascular plants, birds, habitat

401. Gabriel, A.O., and Kreutzwiser, R.D., 2000, Conceptualizing environmental stress—A stress-response model of coastal sandy barriers: Environmental Management, v. 25, no. 1, p. 53-69.

The purpose of this paper is to develop and apply a conceptual framework of environmental stress-response for a geomorphic system. Constructs and methods generated from the literature were applied in the development of an integrative stress-response framework using existing environmental assessment techniques: interaction matrices and a systems diagram. Emphasis is on the interaction between environmental stress and the geomorphic environment of a sandy barrier system. The model illustrates a number of stress concepts pertinent to modeling environmental stress-response, including those related to stress-dependency, frequency-recovery relationships, environmental heterogeneity, spatial hierarchies and linkages, and temporal change. Sandy barrier stress-response and recovery are greatly impacted by fluctuating water levels, stress intensity and frequency, as well as environmental gradients such as differences in sediment storage and supply. Aspects of these stress-response variables are articulated in terms of three main challenges to management: dynamic stability spatial integrity, and temporal variability. These in turn form the framework for evaluative principles that may be applied to assess how policies and management practices reflect key biophysical processes and human stresses identified by the model.

Keywords: management, model, geomorphology, estuarine

402. Gagliano, S.M., Light, P., and Muller, R., 1971, Water balance evaluation of salinity management in Louisiana estuaries: Eos, Transactions, American Geophysical Union, v. 52, no. 4, 208 p.

Keywords: salinity, hydrology, estuarine

403. Gagliano, S.M., and Van Beek, J.L., 1973, An environmental approach to management in the deltaic coastal zone of Louisiana: Geological Society of America – Abstracts with Programs, v. 5, no. 7, p. 627-628.

Keywords: estuarine, management

404. Gagliano, S.M., and Van Beek, J.L., 1973, Environmental management in the Mississippi Delta System: Transactions – Gulf Coast Association of Geological Societies, v. 23, p. 203-209.

Keywords: estuarine, management

405. Gagliano, S.M., and Van Beek, J.L., 1975, An approach to multiuse management in the Mississippi Delta System: Deltas, Models for Exploration, p. 223-238.

Keywords: management, estuarine

406. Gagliano, S.M., and Wicker, K.M., 1991, Wetland erosion and water body formation in the Breton Sound basin, Mississippi deltaic plain*, in* Dhamotharau, Dhamo, Resource development of the Lower Mississippi River; symposium papers: American Water Resources Association Technical Publication Series TPS, v. 91-3, p. 79.

Keywords: wetland loss, hydrology, estuarine

407. Garrison, C.R., 1982, Water quality of the Barataria Unit, Jean Lafitte National Historical Park, Louisiana (April 1981-March 1982): U.S. Geological Survey Open-File Report 82-691, 34 p.

Keywords: surface water, freshwater, chemistry

408. Garrison, C.R., 1997, Statistical summary of surface-water quality in Louisiana-- Calcasieu-Mermentau River basin, 1943-95: Louisiana Department of Transportation and Development Water Resources Technical Report no. 55E, 78 p.

Keywords: surface water, freshwater, chemistry

409. Garrison, C.R., 1997, Statistical summary of surface-water quality in Louisiana-- Red River basin, 1943-94: Louisiana Department of Transportation and Development Water Resources Technical Report no. 55B, 136 p.

Keywords: surface water, contaminants, chemistry, freshwater

410. Garrison, C.R., Goree, B.B., Lovelace, W.M., Montgomery, P.A., and Resweber, J.C., 1998, Water resources data—Louisiana, water year 1997: U.S. Geological Survey Water-Data Report LA-97-1, 495 p.

Keywords: surface water, freshwater, chemistry, hydrology

411. Garrison, C.R., Lovelace, W.M., and Montgomery, P.A., 1995, Water resources data—Louisiana, water year 1994: U.S. Geological Survey Water-Data Report LA-94-1, 547 p.

Keywords: surface water, freshwater, chemistry, hydrology

412. Garrison, C.R., Lovelace, W.M., and Montgomery, P.A., 1996 [1997], Water resources data—Louisiana, water year 1996: U.S. Geological Survey Water-Data Report LA-96-1, 500 p.

Keywords: surface water, freshwater, chemistry, hydrology

413. Garrison, C.R., Seanor, R.C., Walters, D.J., and Arcement, G.J., Jr., 1995, Louisiana water-resources conditions, October 1993 through September 1994: Louisiana Department of Transportation and Development Water Resources Special Report no. 10, 24 p.

Keywords: surface water, freshwater, chemistry, hydrology

414. Gaston, G.R., Lee, D.L., and Nasci, J.C., 1988, Estuarine macrobenthos in Calcasieu Lake, Louisiana—Community and trophic structure: Estuaries, v. 11, no. 3, p. 192-200.

Keywords: macroinvertebrates, estuarine, ecology

415. Gaston, G.R., and Nasci, J.C., 1988, Trophic structure of macrobenthic communities in the Calcasieu Estuary, Louisiana: Estuaries, v. 11, no. 3, p. 201-211.

Keywords: macroinvertebrates, estuarine, ecology

416. Gaston, G.R., and Young, J.C., 1992, Effects of contaminants of macrobenthic communities in the upper Calcasieu Estuary, Louisiana: Bulletin of Environmental Contamination and Toxicology, v. 49, no. 6, p. 922-928.

The upper Calcasieu Estuary near Lake Charles, Louisiana, USA, was investigated recently due to contamination from petrochemical industries. Studies showed contamination of surface sediments by metals and organics. The purpose of this study was to investigate the relationship between the macrobenthic trophic structure and selected contaminants of the upper estuary. The discussion centers around specific impacts such as urban and industrial discharge, and illustrates the effects of contaminants on trophic structure of benthic-invertebrate communities.

Keywords: estuarine, macroinvertebrates, contaminants, petroleum, fish, ecology

417. Gauthier, J.D., Soniat, T.M., and Rogers, J.S., 1990, A parasitological survey of oysters along salinity gradients in coastal Louisiana: J. World Aquacult. Soc., v. 21, no. 2, p. 105-115.

Oysters were collected along salinity gradients within four major oyster producing watersheds in Louisiana (Lake Calcasieu, Terrebonne Bay, Barataria Bay, and Lake Borgne) and examined for parasites in relation to oyster condition and reproductive state.

Keywords: estuarine, ecology, macroinvertebrates, salinity

418. Gauthreaux, K., Noble, C.O., Falgoust, T., and others, 1998, Reliability and reproducibility of a sequential extraction procedure for trace metal determination in marsh sediments in southwest Louisiana: Microchemical Journal, v. 60, no. 2, p. 175-183.

This work describes the rationale used to substantiate the reliability and reproducibility of results obtained from a sequential extraction procedure employed to determine trace metals in restored marsh sediments originating from Calcasieu River ship channel dredge spoils in southwestern Louisiana. The determination was conducted using flame and graphite furnace atomic absorption spectrometry. Metals determined were Cr, Cu, Fe, Mn, Ni, Pb, and Zn. The variations in concentrations between replicate samples and duplicate samples were not statistically significant. Concentrations of all trace metals studied were in agreement with previous studies.

Keywords: trace elements, sediment, methods

419. Gelder, S.R., 1991, New location reports of *Nearctic branchiobdellidans* (Annelida: Clitellata): Canadian Field-Naturalist, v. 105, no. 3, p. 390-391.

Cambarincola barbarae and *C. pamelae*, reported previously only from California, were found with *C. mesochoreus* on *Procambarus* (*Scapulicambarus*) *clarkii* from Louisiana.

Keywords: surface water, freshwater, macroinvertebrates, ecology

420. George, S.G., Dickerson, D.D., and Reine, K.J., 1996, Rediscovery of the inflated heelsplitter mussel, *Potamilus inflatus*, from the Pearl River drainage: Journal of Freshwater Ecology, v. 11, no. 2, p. 245-246.

The inflated heelsplitter mussel, Potamilus inflatus, an endemic freshwater mussel of the eastern Gulf Coast drainage, was rediscovered in the West Pearl River, Louisiana. These sightings are the first since 1911.

Keywords: macroinvertebrates, ecology, freshwater

421. Geotimes, 1990, Louisiana's vanishing coastal wetlands: Geotimes., v. 35, no. 6, p. 19-21.

Keywords: estuarine, wetland loss

422. Gilbert, J.J., 1993, Louisiana stream water quality, *in* Paulson, R.W., Chase, E.B., Williams, J.S., and Moody, D.W., National water summary 1990-91--Hydrologic events and stream water quality: U.S. Geological Survey Water-Supply Paper 2400, p. 293-300.

Keywords: surface water, freshwater, chemistry

423. Glahn, J.F., May, A., Bruce, K., and Reinhold, D., 1996, Censusing double-crested cormorants (*Phalacrocorax auritus*) at their winter roosts in the delta region of Mississippi: Colonial Waterbirds, v. 19, no. 1, p. 73-81.

Wintering double-crested cormorants (*Phalacrocorax auritus*) were censused at all identified night roost sites in the Delta region of Mississippi during the winters of 1991-92 and 1992-93 using aerial surveys and systematic ground surveys in mid-December, mid-February and the end of March. Aerial surveys of primary river drainages were particularly useful in locating previously unidentified roost sites and aerial counts were highly correlated with ground counts of the same sites taken within eight days of each other. Despite an increase in monitoring effort and shifts in populations due to human disturbance, there were no significant differences detected in cormorant populations wintering in this region over the past four years.

Keywords: birds, ecology, freshwater, estuarine

424. Glover, W.C., and Means, J.C., 1995, Speciation of dissolved selenium in the Mississippi River, *in* Anonymous, Geological Society of America, 1995 annual meeting: Abstracts with Programs--Geological Society of America, v. 27, no. 6, p. 247.

Keywords: surface water, freshwater, trace elements

425. Goldberg, M.C., Cunningham, K.M., and Sigleo, A.C., 1989, Abiotic photolysis in the Calcasieu River, Louisiana: U.S. Geological Survey Water-Resources Investigations Report 88-4220, p. 329-340.

Keywords: surface water, freshwater, chemistry, contaminants

426. Gonthier, G.J., and Aharon, Paul, 1990, Groundwater sources and flow patterns derived from stable isotopes and elemental chemistry in the Southeast Louisiana freshwater aquifers, *in* Anonymous, Gulf Coast Association of Geological Societies and Gulf Coast Section of SEPM meeting; abstracts: AAPG Bulletin, v. 74, no. 9, p. 1496.

Keywords: groundwater, hydrology, chemistry, freshwater

427. Good, B., 1993, Louisiana's wetlands. Combatting erosion and revitalizing native ecosystems: Restoration Manage. Notes, v. 11, no. 2, p. 125-133.

Keywords: freshwater, estuarine, wetland loss, management, methods

428. Goolsby, D.A., 1995, Dissolved herbicides, *in* Moody, J.A., Chemical data for water samples collected during four upriver cruises on the Mississippi River between New Orleans, Louisiana, and Minneapolis, Minnesota, May 1990-April 1992: U.S. Geological Survey Open-File Report 94-0523, p. 19-87.

    Keywords: surface water, freshwater, contaminants, pesticides, chemistry

429. Goolsby, D.A., Battaglin, W.A., and Thurman, E.M., 1993, Occurrence and transport of agricultural chemicals in the Mississippi River basin, July through August 1993: U.S. Geological Survey Circular 1120-C, p. 22.

    Excessive rainfall and severe flooding in the upper Mississippi River basin during mid-June through early August 1993 swept abnormally large amounts of agricultural chemicals (herbicides and nitrate) into the Mississippi River, many of its tributaries, and finally into the Gulf of Mexico. Daily loads of herbicides transported in some reaches of the river were as much as 70 percent higher than those measured previously. The loads of nitrate transported into the Gulf of Mexico during July and August 1993 were as much as 5,735 metric tons per day. The transport of above normal loads of nitrate and large amounts of freshwater into the Gulf of Mexico during midsummer could increase phytoplankton biomass and affect the Gulf ecosystem along the Louisiana coast.

    Keywords: surface water, freshwater, contaminants, agriculture, chemistry, nutrients

430. Gordon, J.P., Schroeder, R.H., and Cartmill, R.H., 1975, South Louisiana remote-sensing environmental information system: NASA Technical Memorandum, no. X-58168, p. 217-223.

    Keywords: GIS

431. Gosselink, J.G., 1984, The ecology of delta marshes of coastal Louisiana—A community profile: National Coastal Ecosystems Team, Division of Biological Services, Research and Development, Fish and Wildlife Service.

    Keywords: estuarine, ecology

432. Gosselink, J.G., Hopkinson, C.S., Jr., and Parrondo, R.T., 1978, Common marsh plants of the Gulf Coast area: U.S. Army Corps of Engineers, Waterways Experiment Station, Vicksburg, MS.

    Keywords: vascular plants, estuarine, checklist

433. Gosselink, J.G., Shaffer, G.P., Lee, L.C., Burdick, D.M., Childers, D.L., Leibowitz, N.C., Hamilton, S.C., Boumans, R., Cushman, D., et al., 1990, Landscape conservation in a forested wetland watershed: Bioscience, v. 40, no. 8, p. 588-600.

This article addresses general issues in environmental planning related to the cumulative impacts of human activities on the environment. We focus specifically on wetlands, although the problem is more general, and the issues addressed and methods discussed have broad application. To set the stage, we introduce the legal and administrative framework for wetland regulation, the nature of cumulative impacts, and the use of ecological principles (specifically landscape ecology principles) in environmental planning. Next, we assess the cumulative impact of human activities in the Tensas River basin, Louisiana, and show how the assessment can be used for planning purposes.

Keywords: freshwater, riparian, management, wetland loss

434. Gough, L., and Grace, J.B., 1998, Herbivore effects on plant species density at varying productivity levels: Ecology, v. 79, no. 5, p. 1586-1594.

Artificially increasing primary productivity decreases plant species richness in many habitats; herbivory may affect this outcome, but it has rarely been directly addressed in fertilization studies. This experiment was conducted in two Louisiana coastal marshes to examine the effects of nutrient enrichment and sediment addition on herbaceous plant communities with and without vertebrate herbivory.

Keywords: vascular plants, herbivory, productivity, nutrients

435. Goyer, R.A., Lenhard, G.J., and Smith, J.D., 1990, Insect herbivores of a bald-cypress/tupelo ecosystem: Forest Ecology and Management, v. 33-34, no. 1-4, p. 517-521.

The forest tent caterpillar, *Malacosoma disstria* Hubner, and the fruit-tree leafroller, *Archips argyrospila* (Walker), are the two dominant insect herbivores affecting Louisiana's forested wetlands. The lack of tree species diversity and the paucity of natural enemies has resulted in continuous epidemics of these two herbivores. The resultant effects have been severe radial-growth losses of tupelo, *Nyssa aquatica* L., caused by the forest tent caterpillar, and growth reduction, dieback, and scattered mortality of bald cypress, *Taxodium distichum* L., by a relatively new insect pest of this tree species, the fruit-tree leafroller.

Keywords: vascular plants, freshwater, macroinvertebrates, herbivory

436. Grace, J.B., and Ford, M.A., 1996, The potential impact of herbivores on the susceptibility of the marsh plant *Sagittaria lancifolia* to saltwater intrusion in coastal wetlands: Estuaries, v. 19, no. 1, p. 13-20.

The objective of this study was to experimentally evaluate the effects of simulated herbivory on the ability of a freshwater marsh plant to recover from temporary saltwater intrusion such as can be caused by tropical storms.

Keywords: freshwater, salinity, vascular plants, herbivory, wetland loss

437. Grady, J.M., Cashner, R.C., and Rogers, J.S., 1983, Fishes of the Bayou Sara drainage, Louisiana and Mississippi, with a discriminant functions analysis of factors influencing species distribution: Tulane Stud. Zool. Bot., v. 24, no. 2, p. 83-100.

    Keywords: fish, checklist, habitat

438. Greer, R.D., Cordes, C.L., and Anderson, S.H., 1988, Habitat relationships of island nesting seabirds along coastal Louisiana: Colonial Waterbirds, v. 11, no. 2, p. 181-188.

    Keywords: habitat, estuarine

439. Gregg, J.C., Fleeger, J.W., and Carman, K.R., 1997, Effects of suspended, diesel-contaminated sediment on feeding rate in the darter goby, *Gobionellus boleosoma* (Teleostei: Gobiidae): Mar. Pollut. Bull., v. 34, no. 4, p. 269-275.

    The darter goby, Gobionellus boleosoma, a bottom-feeding gobiid fish, was used as a meiofaunal predator in laboratory experiments designed to determine the effect of suspended diesel-contaminated sediment on feeding rate. The darter goby is a small estuarine fish that lives in shallow mudflats surrounding *Spartina alterniflora* marshes, feeding primarily on meio- and small macrofauna.

    Keywords: fish, sediment, petroleum, physiology, ecology

440. Grubb, H.F., 1988, Overview of the Gulf Coast Regional Aquifer-System analysis: Abstracts with Programs – Geological Society of America, v. 20, no. 2, p. 100.

    Keywords: groundwater, freshwater, hydrology

441. Guerin, J.L., and Stickle, W.B., 1995, Effects of cadmium on survival, osmoregulatory ability, and bioenergetics of juvenile blue crabs *Callinectes sapidus* at different salinities: Mar. Environ. Res., v. 40, no. 3, p. 227-246.

    Juvenile blue crabs from the Barataria estuary were exposed to a range of dissolved cadmium concentrations at 2.5 and 25‰ to determine their response to cadmium.

    Keywords: estuarine, trace elements, physiology, macroinvertebrates

442. Guillory, V., and Prejean, P., 1997, Long term trends in blue crab abundance in Louisiana: Journal of Shellfish Research, v. 16, no. 1, p. 317.

Long term trends in abundance of blue crab was obtained from the inshore fishery independent bottom-fish / shrimp assessment and monitoring program of the Louisiana Department of Wildlife and Fisheries.

Keywords: estuarine, ecology, macroinvertebrates

443. Gunning, G.E., and Suttkus, R.D., 1985, Reclamation of the Pearl River—A perspective of unpolluted versus polluted waters: Fisheries, v. 10, no. 1, p. 14-16.

Historically the Pearl River received large amounts of municipal sewage and industrial wastes. The river was ultimately reclaimed by installation of primary and secondary treatment facilities for both effluents. No violations of state or federal water quality criteria were observed in the 10-year period subsequent to installation of treatment facilities. Positive results of pollution abatement and river reclamation were: an increase in clean water species of fishes and invertebrates, a decrease in pollution tolerant species such as the annelid Tubifex, reestablishment of unionid mussel populations in the reclaimed river segment, and increased growth rates for some species of fishes.

Keywords: freshwater, contaminants, ecology, management

444. Guntenspergen, G.R., Cahoon, D.R., Grace, J., Steyer, G.D., Fournet, S., Townson, M.A., and Foote, A.L., 1995, Disturbance and recovery of the Louisiana coastal marsh landscape from the impacts of Hurricane Andrew, *in* Stone, G.W., and Finkl, C.W., Impact of Hurricane Andrew on the coastal zones of Florida and Louisiana; 22-26 August 1992: Journal of Coastal Research, v. 21 (special issue), p. 324-339.

Keywords: estuarine, wetland loss, ecology

445. Guo, Tingzong, DeLaune, R.D., and Patrick, W.H., Jr., 1997, The influence of sediment redox chemistry on chemically active forms of arsenic, cadmium, chromium, and zinc in estuarine sediment: Environ. Int., v. 23, no. 3, p. 305-316.

Kinetics and chemical fractionation procedures were used to quantify the effect of the sediment redox (Eh) condition on the behavior of As, Cd, Cr, and Zn in the bottom sediment collected from a Louisiana coastal site receiving produced water discharge. Sediment samples were incubated in microcosms in which Eh-pH conditions were controlled. Sediment was sequentially extracted to determine metals in various chemical fractions (water soluble, exchangeable, bound to carbonates, bound to iron and manganese oxides, bound to insoluble organics and sulfides) and the chemical inactive fraction (mineral residue).

Keywords: chemistry, trace elements, sediment, estuarine

446. Gustavson, T.C., McGraw, M., Tandy, M., Parker, F., Wohlschag, D.E., 1977, Potential environmental impacts arising from geopressured-geothermal energy development;

Texas-Louisiana Gulf Coast region: Proceedings – Geopressured Geothermal Energy Conference, no. 3, p. E.1-E.40.

Keywords: groundwater

447. Halford, K.J., 1995, Estimating the dynamic water-level surfaces associated with Hurricane Andrew crossing the Louisiana coast, *in* Stone, G.W., and Finkl, C.W., Impact of Hurricane Andrew on the coastal zones of Florida and Louisiana; 22-26 August 1992: Journal of Coastal Research, v. 21 (special issue), p. 265-279.

Keywords: estuarine, hydrology, ecology

448. Halford, K.J., and Lovelace, J.K., 1994, Analysis of ground-water flow in the "1,200-foot" aquifer, Baton Rouge area, Louisiana: Louisiana Department of Transportation and Development Water Resources Technical Report no. 54, 68 p.

Keywords: groundwater, hydrology

449. Halford, K.J., Benton, O.L., and Demcheck, D.K., 1995, Movement and fate of fecal-coliform bacteria through a shallow aquifer system in southeastern Louisiana, 1991: Louisiana Department of Transportation and Development Water Resources Technical Report no. 56, 52 p.

Keywords: groundwater, freshwater, microbiology

450. Hall, H.K., and Stoessell, R.K., 1995, Groundwater study at a site impacted with sulfuric acid, *in* Anonymous, Geological Society of America, 1995 annual meeting: Abstracts with Programs--Geological Society of America, v. 27, no. 6, p. 89.

Keywords: groundwater, contaminants

451. Hall, P.F., 1996, A comparison of herpetofauna captured in forested wetlands damaged by Hurricane Andrew in Louisiana: Thesis (M.S.), Louisiana State University, 50 p.

Keywords: reptiles, ecology, freshwater

452. Hall, P.M., 1991, Estimation of nesting female crocodilian size from clutch characteristics—Correlates of reproductive mode, and harvest implications: Journal of Herpetology, v. 25, no. 2, p. 133-141.

I used morphometric data from nesting crocodilians and associated clutch characteristics to develop regression models whereby demographic profiles of the female reproductive segment of populations could be reliably estimated on the basis of clutch mass or clutch size alone. Comparisons were made between nesting populations of temperate American alligators (*Alligator mississippiensis*) and tropical New Guinea crocodiles (*Crocodylus novaeguineae*). Alligators exhibited a discrete pulse mode of reproduction in contrast to

the near continuous flow pattern of the crocodiles. Reproductively active female alligators from widely disjunct harvested populations were significantly smaller than those in a protected population where larger females may have precluded smaller animals from nesting. Most of the nesting female crocodiles were smaller than the size protected by law and were thus exposed to harvest, which presumably led to a higher turnover rate of the breeding segment and a reduced production of hatchings.

Keywords: reptiles, habitat, ecology

453. Hankins, B.E., Chavanne, R.E., Ham, R.A., Karkalits, O.C., and Palermo, J.I., 1978, Chemical analysis of water from the world's first geopressured-geothermal well: Geothermal Energy; A Novelty becomes a Resource; Transactions; v. 2, sec. 1, p. 253-256.

Keywords: groundwater, chemistry

454. Hankins, B.E., Chavanne, R.E., Ham, R.A., Karkalits, O.C., and Palermo, J.I., 1977, Chemical analysis of geothermal waters from a South Louisiana well: Proceedings – Geopressured Geothermal Energy Conference, no. 3, p. ED.67-ED.93.

Keywords: groundwater, chemistry

455. Hanor, J.S., 1974, Chemical mass balance and change in water composition during injection and withdrawal of Mississippi River water from a gulf coast aquifer: Abstracts with Programs – Geological Society of America, v. 6, no. 7, p. 776-777.

Keywords: groundwater, chemistry, management

456. Hanor, J.S., 1982, Modification of the quality of water injected into Louisiana Gulf Coast sands; Effects of cation exchange: Environmental Geology and Water Sciences, v. 4, no. 2, p. 75-85.

Keywords: groundwater, chemistry, management

457. Hanor, J.S., 1982, The origin of high sodium-bicarbonate waters in the Gulf Coastal Plain; A reassessment of the role of carbonate dissolution and ion-exchange: Abstracts with Programs–Geological Society of America, v. 14, no. 7, p. 506.

Keywords: groundwater, chemistry

458. Hanor, J.S., 1986, Evidence for large-scale vertical overturn of pore fluids in the Louisiana Gulf Coast: Abstracts with Programs-Geological Society of America, v. 18, no. 6, p. 627.

Keywords: groundwater

459. Hanor, J.S., 1987, Techniques for mapping hydraulic field and pore water flow patterns around salt domes: Abstracts–SEPM Midyear Meeting, v. 4, p. 33.

Keywords: groundwater, methods

460. Hanor, J.S., 1988, Effects of discharge of municipal waste on water quality of the lower Mississippi River: Environ. Geol., v. 12, no. 3, p. 163–175.

The effects of discharge of municipal wastes on water quality within the lower Mississippi River (USA) below Old River have been reevaluated using published water quality data in the Louisiana reach of the river for the water years 1974-1984. A novel graphical technique has facilitated the evaluation of upriver sinks along the lover Mississippi. Comparison of calculated annual fluxes at different downstream monitoring stations has simplified some of the problems inherent in evaluation analyses of samples collected from different water masses during a typical sampling run.

Keywords: surface water, freshwater, nutrients, urban, chemistry, contamination

461. Hanor, J.S., 1989, The origin of subsurface brines in the South Louisiana Gulf Coast, *in* Dymek, R.F., and Shelton, K.L., Geological Society of America, 1989 annual meeting: Abstracts with Programs--Geological Society of America, v. 21, no. 6, p. 317.

Keywords: groundwater, contaminants

462. Hanor, J.S., 1989, Pathways, mechanisms, and rates of solute transport across the base of the fresh water zone, South Louisiana, p. 151

Keywords: groundwater, hydrology, freshwater

463. Hanor, J.S., 1993, Effective hydraulic conductivity of fractured clay beds at a hazardous waste landfill, Louisiana Gulf Coast: Water Resources Research, v. 29, no. 11, p. 3691-3698.

Keywords: groundwater

464. Hanor, J.S., 1994, Physical and chemical controls on the composition of waters in sedimentary basins: Mar. Pet. Geol., v. 11, no. 1, p. 31-45.

The south-west Louisiana Gulf Coast provides an instructive field example of the net effects of diagenetic reaction and solute transport on pore water compositions in a regional siliciclastic sequence.

Keywords: groundwater, geology

465. Hanor, J.S., 1995, The role of depositional facies in contaminant migration at Louisiana coastal plain hazardous waste sites, *in* Anonymous, American Association of Petroleum

Geologists 1995 annual convention: Annual Meeting Abstracts--American Association of Petroleum Geologists and Society of Economic Paleontologists and Mineralogists, v. 4, p. 39.

Keywords: groundwater, geology, hydrology, contaminants

466. Hanor, J.S., Bailey, J.E., Rogers, M.C., and Milner, L.R., 1986, Regional variations in physical and chemical properties of South Louisiana oil field brines: Gulf Coast Association of Geological Societies and Gulf Coast Section, 36th Annual Meeting, v. 70, no. 9, p. 1183.

Keywords: groundwater, chemistry

467. Hanor, J.S., Land, L.S., Macpherson, G.L., MacGowan, D.B., and Surdam, R.C., 1993, Carboxylic acid anions in formation waters, San Joaquin Basin and Louisiana Gulf Coast, U.S.A.; implications for clastic diagenesis; critical comment and reply: Applied Geochemistry, v. 8, no. 3, p. 305-312.

Keywords: groundwater, chemistry

468. Hanor, J.S., McManus, K.M., Ranganathan, Vishnu, and Su, Shaobing, 1995, Mineral buffering of contaminated ground water compositions at a hazardous waste site in southwestern Louisiana, *in* Anonymous, AAPG Gulf Coast Section meeting; abstracts: AAPG Bulletin, v. 79, no. 10, p. 1559.

Keywords: groundwater, chemistry, contaminants

469. Hanor, J.S., and Sassen, Roger, 1990, Evidence for large-scale vertical and lateral migration of formation waters, dissolved salt, and crude oil in the Louisiana Gulf Coast, *in* Schumacher, Dietmar and Perkins, B.F., Gulf Coast oils and gases; their characteristics, origin, distribution, and exploration and production significance: Proceedings of the Annual Research Conference, Gulf Coast Section, Society of Economic Paleontologists and Mineralogists Foundation, v. 9, p. 283-296.

Keywords: groundwater, chemistry, geology

470. Hanson, B.C., and Boniol, D.P., 1985, Potential risks to a sole-source aquifer recharge area from waste disposal activities; a case study: Proceedings; Second Canadian/American Conference on Hydrogeology; Hazardous Wastes in Ground Water; a Soluble Dilemma, p. 78-86.

Keywords: groundwater, freshwater, contaminants

471. Haque, S.M., 1981, Ground water pollution related to subsurface brine disposal in Louisiana: Abstracts with Programs--Geological Society of America, v. 13, no. 7, p. 468.

Keywords: groundwater, contaminants

472. Haque, S.M., 1982, Water-level trends in the Florida Parishes, Louisiana: Louisiana Geological Survey, Water Resources Series, 34 p.

Keywords: groundwater, hydrology

473. Haque, S.M., 1984, Ground water quality in the Lake Charles Area, Louisiana: Louisiana Geological Survey, Water Resources Series, 57 p.

Keywords: groundwater, chemistry, contaminants

474. Harder, A.H., 1960, The geology and ground-water resources of Calcasieu Parish, Louisiana: U.S. Geological Survey Water-Supply Paper 1488, 102 p.

Keywords: groundwater, geology, hydrology

475. Harder, A.H., 1960, Water levels and water-level contour maps for southwestern Louisiana, 1958 and 1959: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Pamphlet no. 8, 27 p.

Keywords: groundwater, hydrology

476. Harder, A.H., 1961, Water levels and water-level contour maps for southwestern Louisiana, 1959 and spring 1960, with a discussion of ground-water withdrawals: Department of Conservation and Louisiana Department of Public Works Water Resources Pamphlet no. 10, 25 p.

Keywords: groundwater, hydrology

477. Harder, A.H., Kilburn, Chabot, Whitman, H.M., and Rogers, S.M., 1967, Effects of ground-water withdrawals on water levels and saltwater encroachment in southwestern Louisiana: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Bulletin no. 10, 56 p.

Keywords: groundwater, management, freshwater

478. Harder, A.H., Sauer, V.B., and Broussard, W.L., 1968, Water resources of the Lettsworth-Innis-Batchelor area, Pointe Coupee Parish, Louisiana: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Pamphlet no. 21, 28 p.

Keywords: groundwater, freshwater

479. Harder, A.H., Whitman, H.M., and Rogers, S.M., 1965, Methane in the fresh-water aquifers of southwestern Louisiana and theoretical explosion hazards: Department of

Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Pamphlet no. 14, 22 p.

Keywords: groundwater, freshwater, contaminants

480. Hardy, G.W., III, 1966, Handbook of basic water law (with special reference to Louisiana): Louisiana Water Resources Research Institute Bulletin, no. 1, 77 p.

Keywords: management

481. Hargis, T.G., Rafferty, P.S., Lynch, J.C., Billock, A.G., and Twilley, R.R., 1992, Chemical analysis of pore water in marsh ecosystems subjected to alterations in hydrology: Wetlands; proceedings of the 13th annual conference; Society of Wetland Scientists, v. 13, p. 852-855.

Keywords: surface water, freshwater, hydrology, chemistry

482. Harju, J.A., Charlton, D.S., Kuhnel, Vit, and Evans, J.M., 1995, Observed mercury concentrations in groundwater samples collected from New Mexico, Pennsylvania, and Louisiana research sites, *in* Anonymous, Geological Society of America, Southeastern Section, 44th annual meeting: Abstracts with Programs--Geological Society of America, v. 27, no. 2, p. 59-60.

Keywords: groundwater, trace elements, contaminants

483. Harrel, J.B., Allen, C.M., and Herbert, S.J., 1996, Movements and habitat use of subadult alligator snapping turtles (*Macroclemys temminckii*) in Louisiana: American Midland Naturalist, v. 135, no. 1, p. 60-67.

We conducted a telemetry study of subadult alligator snapping turtles (*Macrolemys temminckii*) to investigate movement and habitat use. Available habitat consisted of baldcypress forest (*Taxodium distichum*) (69.1%) and open channel (30.9%). Twelve (three male, nine female) turtles from Bayou Desiard in northeast Louisiana were each equipped with an ATS external radio transmitter and returned to the capture location within 2 h. A total of 1327 location fixes were recorded from March 1992 to June 1993. At each fix location the date, time, water temperature and depth, direction from last fix and capture site, and nearest shoreline, and habitat were recorded. Significant differences were noted between male and female mean fix distance (males = 352.2 m, females = 160.3 m), mean percentage of movement fixes (males = 62.7%, females = 42.7%) and mean home range length (males = 3495.1 m, females = 1423.2 m).

Keywords: reptiles, habitat, ecology

484. Harris, G.D., 1902, Subterranean waters of Louisiana: La. St. Exp. Sta., G. Agr. La., Part 6, p. 195-252.

Keywords: groundwater

485. Harris, G.D., 1904, Underground waters of southern Louisiana, *with discussions of* their uses for water supplies and for rice irrigation, by M.L. Fuller: U.S. Geological Survey Water-Supply Paper 101, 98 p.

Keywords: groundwater

486. Harris, J.R., 1980, Alternate water-sources for the Baton Rouge-New Orleans industrial corridor, *in* Kazmann, R.G., and Johnson, D.B., If the Old River Control Structure fails? (The physical and economic consequences): Bulletin--Louisiana Water Resources Research Institute, no. 12, p. 49

Keywords: groundwater, freshwater

487. Hart, B.S., Flemings, P.B., and Deshpande, A., 1995, Porosity and pressure—Role of compaction disequilibrium in the development of geopressures in a Gulf Coast Pleistocene basin: Geology, v. 23, no. 1, p. 45-48.

Keywords: groundwater, geology

488. Hartley, W.R., Thiyagarajah, A., and Treinies, A.M., 1996, Liver lesions in the gar fish (Lepisosteidae) as biomarkers of exposure: Mar. Environ. Res., v. 42, no. 1-4, p. 217-221.

The objective of this research was to identify lesions and diseases in fish as biomarkers of exposure to environmental contaminants from polluted wetlands typical of the Mississippi River Basin. Devil's Swamp, located northwest of Baton Rouge, Louisiana, is an ecosystem contaminated with a variety of metals and organic chemicals. The nearby control site was Tunica Swamp. Gar were collected from the study sites by electroshocking and using crab traps. The fish were necropsied and evaluated for disease and histopathology, and tissues were analyzed for metals and organics typical of Devil's Swamp contaminants.

Keywords: surface water, freshwater, fish, contaminants

489. Hartman, R.D., and Cahoon, D.R., 1989, The development of management strategies for Barataria Basin, Louisiana: Contributed Papers and Abstracts for the Conference on Water; Laws and Management, p. 14B.33-14B.47.

Keywords: estuarine, management

490. Hartman, R.D., Ruebsamen, R.N., Jones, P.M., and Koellen, J.L., 1992, The National Marine Fisheries Service habitat conservation efforts in Louisiana, 1989 through 1990: Mar. Fish. Rev., v. 54, no. 3, p. 11-20.

Data quantifying various aspects of the Corps of Engineers wetland regulatory program in Louisiana from 1980 through 1990 are presented. The National Marine Fisheries Service (NMFS) habitat conservation efforts for this time period are described and averages involved delineated.

Keywords: estuarine, management, fish, habitat

491. Hastings, R.W., Turner, D.A., and Thomas, R.G., 1987, The fish fauna of Lake Maurepas, an oligohaline part of the Lake Pontchartrain estuary: Northeast Gulf Sci., v. 9, no. 2, p. 89-98.

Lake Maurepas is a slightly saline body of water located at the upper end of the Lake Pontchartrain estuary. Of 67 fish species collected during 1983-84, 33 species (49%) are primarily freshwater, 6 (9%) are primarily marine, and 28 (42%) are estuarine or diadromous, commonly occurring in both freshwater and marine habitats. Majorfreshwater species (e.g. *Ictalurus furcatus*, *I. punctatus*, and *Aplodinotus grunniens*) were present throughout the year, whereas most marine and estuarine species were seasonally present (e.g. *Anchoa mitchilli*, *Brevoortia patronus*, and *Micropogonias undulatus*), or were present during periods of higher (up to 2.5 ppt) salinity (e.g. *Cynoscion arenarius*, *Leiostomus xanthurus*, and *Pogonias cromis*). Literature records indicate that larger percentages of marine species are present during years when salinities are higher (up to 8-ppt).

Keywords: estuarine, freshwater, fish, checklist, habitat, salinity

492. Hatton, R.S., DeLaune, R.D., and Patrick, W.H., Jr., 1983, Sedimentation, accretion, and subsidence in marshes of Barataria, Louisiana: Limnology and Oceanography, v. 28, no. 3, p. 494-502.

Keywords: wetland loss, estuarine, sediment

493. Hawke, J.P., and Thune, R.L., 1992, Systemic isolation and antimicrobial susceptibility of *Cytophaga columnaris* from commercially reared channel catfish: J. Aquat. Anim. Health., v. 4, no. 2, p. 109-113.

A selective medium was used for the isolation of *Cytophaga columnaris* in 154 routine cases submitted to the Louisiana Aquatic Animal Diagnostic Laboratory.

Keywords: fish, aquaculture

494. Helser, T.E., Condrey, R.E., and Geaghan, J.P., 1993, Spotted seatrout distribution in four coastal Louisiana estuaries: Transactions of the American Fisheries Society, v. 122, no. 1, p. 99-111.

The authors analyzed experimental gill-net catches of spotted seatrout *Cynoscion nebulosus* at 28 stations in various estuarine habitats over 3 years (1988-1990). Cluster

analysis indicated that the 28 stations reduced to three "natural" groupings representing salinity zones that correspond to upper (oligohaline, 0-9ppt), intermediate (mesohaline, 10-14ppt), and lower (polyhaline, 15-30ppt) estuarine zones. Principal components analysis applied to log-transformed gill-net catches yielded a two-factor model that explained 78% of the variation in the data; factors were interpreted as recruit size (females smaller than 31 cm in total length and males smaller than 26 cm) and spawner size (females larger than 31 cm and males larger than 26 cm). Both recruit and spawner models were highly significant ($P < 0.0001$), and the zone-by-season interaction accounted for the greatest proportion of the variation in the models ($P < 0.0001$).

Keywords: fish, salinity, estuarine, ecology

495. Hem, J.D., 1985, Study and interpretation of the chemical characteristics of natural water (3d ed.): U.S. Geological Survey Water-Supply Paper 2254, 264 p.

Keywords: chemistry, groundwater, surface water

496. Hem, J.D., 1993, Factors affecting stream water quality, and water-quality trends in four drainage basins in the conterminous United States, 1905-90, *in* Paulson, R.W., Chase, E.B., Williams, J.S., and Moody, D.W., National water summary 1990-91 -- Hydrologic events and stream water quality: U.S. Geological Survey Water-Supply Paper 2400, p. 67-92.

Keywords: surface water, freshwater, chemistry

497. Henniger, W.F., 1925, Occurrence of sulphur waters in the Gulf Coast of Texas and Louisiana and their significance in locating new domes: Bulletin of the American Association of Petroleum Geologists, v. 9, no. 1, p. 35-37.

Keywords: groundwater, chemistry

498. Henttonen, P., Lindquist, O.V., and Huner, J.V., 1992, Incidence of Psorospermium sp. in several cultivated populations of crayfishes, *Procambarus* sp. (Decapoda, Cambaridae), in southern Louisiana: J. World Aquacult. Soc., v. 23, no. 1, p. 31-37.

Keywords: surface water, freshwater, macroinvertebrates, ecology

499. Herbert, R.A., Carlson, D.D., and Wiche, G.J., 1985, An evaluation of the crest-stage gage program in Louisiana: U.S. Geological Survey Water-Resources Investigations Report 84-4204, 24 p.

Keywords: hydrology, surface water

500. Herbert, R.A., and Ellsworth, E.A., comps., 1985, Water resources activities in Louisiana District fiscal year 1985: U.S. Geological Survey Open-File Report 85-415, 64 p.

Keywords: surface water, freshwater, groundwater, estuarine

501. Herke, W.H., 1995, Natural fisheries, marsh management, and mariculture—Complexity and conflict in Louisiana: Estuaries, v. 18, no. 1A, p. 10-17.

Most of Louisiana's economically important saltwater fishes and crustaceans spawn in the Gulf of Mexico, but their young must use the vast coastal marsh as their nursery. Marsh management in Louisiana usually consists of emplacement of levees and water-control structures in the marsh. These structures significantly reduce fisheries production and offshore recruitment. In addition, in 1987 private entities were authorized to use 32,380 ha of the marsh for experimental mariculture, which (if successful) will likewise lead to greatly reduced natural fisheries production and offshore recruitment. Private interests also nearly succeeded in legalizing entrapment and eventual harvest of the wild fisheries from 100,000 ha, and 20,000 ha, of the marsh in 1991 and 1992, respectively. The effects of all these threats to natural fisheries production are further complicated by Louisiana's confused legal situation regarding coastal land ownership.

Keywords: estuarine, aquaculture, fish, management

502. Herke, W.H., Rogers, B.D., Wright, V.L., and Bradshaw, W.H., 1996, Postlarval *Penaeus aztecus* and *P. setiferus* transport into, and distribution within, adjacent weired and unweired ponds: Wetlands, v. 16, no. 2, p. 197-207.

Previous studies have shown that semi-impounded areas of marsh have lower standing crops and probably lower exports of brown shrimp *Penaeus aztecus* and white shrimp *P. setiferus* to the Gulf of Mexico than similar unimpounded areas. We hypothesized that this was caused by a reduced transport of postlarvae into the semi-impounded areas. To test this hypothesis, we compared postlarval shrimp catches in a semi-impounded pond and an adjacent matched unimpounded pond sampled approximately weekly from 21 February through 29 October 1983 and 17 February through 25 May 1984. Postlarval catches were significantly higher in the unimpounded pond, as was the export of juvenile and adult shrimp from that pond. This supports the hypothesis that reduced recruitment is the cause for lower standing crops and reduced export of these shrimp from semi-impounded areas. Distribution of the postlarvae was recorded by sample date. Even on the minicosm scale of the ponds, currents apparently determined where the postlarvae settled.

Keywords: macroinvertebrates, productivity, estuarine, ecology, habitat

503. Herke, W.H., Wengert, M.W., and LaGory, M.E., 1987, Abundance of young brown shrimp in natural and semi-impounded marsh nursery areas: Relation to temperature and salinity: Northeast Gulf Sci., v. 9, no. 7, p. 9-28.

Samples of brown shrimp (*Penaeus aztecus*, 10 to 130 mm in total length) were collected with otter trawls weekly from 14 March to 20 August 1971 in brackish marsh areas at Marsh Island, Louisiana. Water temperatures above 20 degree C were apparently more

conducive to the growth of young brown shrimp than was a particular salinity range. The range of recorded salinities was 0.57-12.85 ppt; catch per sample was highest in salinities from 2.0 to 2.99 ppt.

Keywords: estuarine, macroinvertebrates, salinity, habitat, management, climate

504. Hern, S.C., Lambou, V.W., and Butch, J.R., 1980, Descriptive water quality for the Atchafalaya Basin, Louisiana: U.S. Environmental Protection Agency, no. EPA-600/4-80-014, 168 p.

Keywords: surface water, freshwater, chemistry, nutrients, wetlands

505. Hesse, I.D., and Conner, W.H., 1996, Leaf production of *Sabal minor* (Jacq.) Pers. in a Louisiana forested wetland: Gulf Mex. Sci., v. 14, no. 1, p. 7-10.

Leaf production of *Sabal minor* (Jacq.) Pers. (dwarf palmetto) was estimated at two sites in a forested wetland near Thibodaux, Louisiana during a 1-year period. One site was flooded throughout the study period, while the other was a drier bottomland hardwood ridge. Palmetto leaves were tagged and measured for total length during May 1989 and May 1990 in two plots within each site. Information on plant trunk height, plants per square meter, leaves per plant, and leaf biomass was also obtained.

Keywords: surface water, freshwater, vascular plants, productivity

506. Hesse, I.D., Day, J.W., Jr., and Doyle, T.W., 1998, Long-term growth enhancement of baldcypress (*Taxodium distichum*) from municipal wastewater application: Environmental Management, v. 22, no. 1, p. 119-127.

Tree ring analysis was used to document the long-term effects of municipal wastewater on the growth rate of baldcypress [*Taxodium distichum* (L.) Rich.]. The study site, a swamp in St. Martin Parish, Louisiana, has received municipal wastewater for the last 40 years. Growth chronologies from 1920 to 1992 were developed from cross-dated tree core samples taken from treated and control sites with similar size and age classes. Mean diameter increment (DINC) and mean basal area increment (BAI) chronologies were constructed separately for each stand. These chronologies were then summarized by tree and stand into seven nine-year intervals resulting in three pretreatment intervals from 1926 to 1952 and four treatment intervals from 1953 to 1988. Significant differences in growth response between sites showed a consistent pattern of growth enhancement in the treated site coincident with the onset of effluent discharge. The ratio of treated to control baldcypress growth rates (computed from DINC) averaged 0.74 during the pre-treatment period and 1.53 during the treatment period. These results clearly demonstrate sustained long-term baldcypress growth enhancement throughout 40 years of municipal effluent discharge.

Keywords: freshwater, vascular plants, nutrients, urban, management

507. Hester, M.W., and Mendelssohn, I.A., 1989, Water relations and growth responses of *Uniola paniculata* (sea oats) to soil moisture and water-table depth: Oecologia, v. 78, no. 3, p. 289-295.

This study examined the water relations and growth responses of *Uniola paniculata* (sea oats) to (1) three watering regimes and (2) four controlled water-table depths. This study demonstrated that excessive solid moisture resulting from inundation or shallow water-table depth has a greater negative effect on plant growth than do low soil moisture conditions.

Keywords: vascular plants, estuarine, hydrology

508. Hester, M.W., Wilsey, B.J., and Mendelssohn, I.A., 1994, Grazing of *Panicum amarum* in a Louisiana barrier island dune plant community—Management implications for dune restoration projects: Ocean Coast. Manage., v. 23, no. 3, p. 213-224.

Panicum amarum, an economically important dune grass used in dune building and stabilization projects throughout the southeastern U.S., was planted in protected and unprotected plots to assess the importance of vertebrate herbivory on *P. amarum* transplant survival on Timbalier Island, Louisiana.

Keywords: estuarine, vascular plants, ecology

509. Higby, J.D., Jr., 1983, Possible capture of the Mississippi by the Atchafalaya River: Information Series – Colorado Water Resources Research Institute, v. 50, 73 p.

Keywords: surface water, freshwater, geomorphology, hydrology

510. Hill, J.M., Nyman, D.J., and Neal, M.E., 1982, Source determination of rice irrigation water in southwestern Louisiana using Landsat data: Applied Modeling in Catchment Hydrology, p. 545-554.

Keywords: groundwater, GIS, hydrology, management, surface water, agriculture

511. Hine, J.A., 1904, A contribution to the entomology of the region of the Gulf Biological Station: Gulf Biologic Station Bulletin, v. 2, p. 65-68.

Keywords: checklist, macroinvertebrates

512. Hine, J.A., 1906, A second contribution to the entomology of the region of the Gulf Biological Station: Gulf Biologic Station Bulletin, v. 6, p. 65-83.

Keywords: checklist, macroinvertebrates

513. Hirschboeck, K.K., and Coxe, M.F., 1989, Identification of high-risk atmospheric and surface conditions for urban flash flooding in Louisiana: Louisiana Water Resources Research Inst., Baton Rouge, LA, 100 p.

This study identified and cataloged significant flash floods that occurred in Louisiana's main urban areas, defined and described the synoptic atmospheric environment leading to flash flooding, and compared and contrasted the atmospheric and surface conditions that develop into urban flash floods in different parts of the state.

Keywords: surface water, freshwater, hydrology, urban

514. Ho, C.L., and Lane, J., 1973, Interstitial water composition in Barataria Bay sediment: Estuarine and Coastal Marine Science, v. 1, no. 2, p. 125-135.

Keywords: estuarine, sediment, chemistry

515. Ho, C.L., Schweinsberg, E., and Reeves, L., 1970, A study of the chemistry of water and surface sediments in Barataria Bay, Louisiana: Abstracts of Papers; Joint Southeast-Southwest Regional (ACS) Meeting, 90 p.

Keywords: estuarine, sediment, chemistry

516. Hoda, B., and Barlow, R.A., 1977, Geohydrologic studies of Mississippi salt domes: An investigation of the utility of Gulf Coast salt domes for the storage or disposal of radioactive wastes: Office of Waste Isolation Pub. Y/OWI/SUB-4112/37, p. 129-155.

Keywords: groundwater, contaminants, hydrology

517. Hodges, A.L., Jr., Rogers, S.M., and Harder, A.H., 1963, Gas and brackish water in fresh-water aquifers, Lake Charles area, Louisiana: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Pamphlet no. 13, 35 p.

Keywords: groundwater, freshwater, contaminants

518. Hoese, H.D., and Konikoff, M., 1995, Effects of marsh management on fisheries organisms—The compensatory adjustment hypothesis: Estuaries, v. 18, no. 1A, p. 180-197.

An overview of data including numbers of species, numbers of individuals, biomass, and average weight per individual from three studies of differing marsh management systems in southwestern Louisiana indicate that populations of managed systems are generally maintained despite partial restrictions on organisms movement due to water control structures.

Keywords: management, hydrology, fish

519. Hohman, W.L., Moore, J.L., Stark, T.M., Weisbrich, G.A., and Coon, R.A., 1994, Breeding waterbird use of Louisiana rice fields in relation to planting practices: Proceedings of the Forty-Eighth Annual Conference of the Southeastern Association of Fish and Wildlife Agencies, Tallahassee, FL, p. 31-37.

Rice fields are managed wetlands that have high potential value to wildlife, especially waterbirds. To better understand factors influencing use of rice fields by breeding waterbirds, the authors compared nest densities in water- and dry-seeded rice fields in southwestern Louisiana, May-July 1993.

Keywords: surface water, freshwater, ecology, agriculture

520. Holba, A.G., Dzou, L.I.P., Hickey, J.J., Frank, S.G., May, S.J., and Lenney, T., 1996, Reservoir geochemistry of South Pass 61 Field, Gulf of Mexico; compositional heterogeneities reflecting filling history and biodegradation, *in* Huc, A.Y., and Jarvie, D.M., Proceedings of the 17th International Meeting on Organic Geochemistry; Part IV, Reservoir and production geochemistry: Organic Geochemistry, v. 24, no. 12, p. 1179-1198.

Keywords: groundwater, chemistry, petroleum, microbiology

521. Holck, A.R., Puissegur, W.J., and Meek, C.L., 1988, Mosquito productivity of crawfish ponds and irrigation canals in Louisiana ricelands: Journal of the American Mosquito Control Association, v. 4, no. 1, p. 82-84.

Ricelands in general were documented in the early 1940s as a primary larval habitat for several species of mosquitoes, notably *Anopheles* and *Psorophora*. In recent years rice fields and pastures within this agroecosystem have been assessed quantitatively regarding mosquito egg and larval production. Other aquatic habitats remaining in the riceland area that are potential sites for mosquito larval development include irrigation canals and commercial crawfish ponds. Currently there are no published data on mosquito productivity for either habitat. Since 1980, however, two separate studies have been conducted in Louisiana to assess the impact ponds on total mosquito population.

Keywords: freshwater, macroinvertebrates, agriculture, productivity

522. Hopkinson, C.S., Jr., Day, J.W., Jr., and Kjerfve, B., 1985, Ecological significance of summer storms in shallow water estuarine systems: Contributions in Marine Science, v. 28, p. 69-77.

Keywords: estuarine, climate, hydrology

523. Horne, J.S., 1976, Possible failure of the low-sill control structure at Old River, Louisiana; Economic and physical consequences: Louisiana Water Resources Research Institute Bulletin, no. GT-5, 58 p.

Keywords: surface water, freshwater, geomorphology, management, hydrology

524. Hosman, R.L., 1972, Ground-water resources of the Norco area, Louisiana: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Bulletin no. 18, 61 p.

Keywords: groundwater, freshwater

525. Hosman, R.L., 1974, Soft-water zone in the Chicot aquifer, Bayou Teche area, Louisiana: U.S. Geological Survey Open-File Report 74-65, 20 p.

Keywords: groundwater, chemistry, freshwater

526. Hosman, R.L., 1988, Geohydrologic framework of the Gulf Coastal Plain: U.S. Geological Survey Hydrologic Investigations Atlas HA-695, 2 sheets.

Keywords: groundwater, hydrology

527. Hosman, R.L., Broussard, W.L., and Calandro, A.J., 1970, Water resources of northwestern St. Landry Parish and vicinity, Louisiana: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Pamphlet no. 23, 29 p.

Keywords: groundwater, freshwater

528. Hover, V.C., Walter, L.M., Bartone, J.M., and Peacor, D.R., 1994, K-uptake by smectite during early marine diagenesis; evidence from porewater and sediment geochemistry of modern Mississippi delta plain sediments, *in* Anonymous, Geological Society of America, 1994 annual meeting: Abstracts with Programs--Geological Society of America, v. 26, no. 7, p. 278-279.

Keywords: groundwater, geology, chemistry

529. Howard, R.J., and Mendelssohn, I.A., 1995, Effect of increased water depth on growth of a common perenial freshwater-intermediate marsh species in coastal Louisiana: Wetlands, v. 15, no. 1, p. 82-91.

The response of *Sagittaria lancifolia* to increased water depths of 7.5 and 15 cm was examined in this field study.

Keywords: freshwater, hydrology, vascular plants

530. Huh, O.K., Moeller, C.C., Menzel, W.P., Rouse, L.J., Jr., and Roberts, H.H., 1996, Remote sensing of turbid coastal and estuarine waters: A method of multispectral water-type analysis: Journal of Coastal Research, v. 12, no. 4, p. 984-995.

Analysis of digital imagery from the 100 m resolution airborne Multispectral Atmospheric Mapping Sensor (MAMS) indicates that scatter plots of remotely sensed sea surface temperature versus visible and near infrared subsurface reflectance can be used to quantitatively distinguish coastal water types. The Louisiana Gulf coast is the setting for this work.

Keywords: estuarine, GIS

531. Huntzinger, T.L., 1982, Water resources programs of the U.S. Geological Survey related to agriculture in Louisiana: U.S. Geological Survey Open-File Report 82-554, 19 p.

Keywords: surface water, freshwater, hydrology, chemistry, agriculture

532. Huntzinger, T.L., Whiteman, C.D., Jr., and Knochenmus, D.D., 1985, Simulation of ground-water movement in the "1,500- and 1,700-foot" aquifer of the Baton Rouge area, Louisiana: Louisiana Department of Transportation and Development, Office of Public Works Water Resources Technical Report no. 34, 52 p.

Keywords: groundwater, model, hydrology

533. Ingram, R.B., and Crawford, J.L., 1996, The need for wellhead protection; a review of ground water quality in Mississippi and its impact on public water supplies, *in* Daniel, B.J., Twenty-sixth Mississippi Water Resources Conference: Proceedings--Mississippi Water Resources Conference, v. 26, p. 130-139.

Keywords: groundwater, management, contaminants

534. INTERA Technologies, 1986, First status report on regional ground-water flow modeling for Vacherie Dome, Louisiana: ONWI (Battelle Memorial Institute), v. 602, 154 p.

Regional ground-water flow within the principal geohydrologic units in the vicinity of Vacherie Dome, Louisiana, is evaluated by developing a conceptual model of the flow regime within these units and testing the model using a three-dimensional, finite-difference flow code (SWENT). The simulated ground-water flow fields are described with potentiometric surfaces, areas of upward and downward flow across aquitards, tables summarizing the horizontal and vertical volumetric flows through the principal units, ground-water travel times and paths, and Darcy velocities within specified finite-difference blocks. The reported work is the first stage of an ongoing evaluation of Vacherie Dome as a potential repository for high-level radioactive wastes.

Keywords: groundwater, model, hydrology

535. Iricanin, N., and Trefry, J.H., 1985, Seasonal trends of interstitial manganese: Florida Scientist, v. 48, supplement 1, p. 14.

Keywords: groundwater, chemistry

536. Isphording, W.C., and Flowers, G.C., 1985, Use of heavy metal partitioning as an indicator of environmental hazards: Eos, Transactions, American Geophysical Union, v. 66, no. 46, p. 940.

Keywords: trace elements, management

537. Jackson, A.W., Pardue, J.H., and Araujo, R., 1996, Monitoring crude oil mineralization in salt marshes: Use of stable carbon isotope ratios: Environmental Science and Technology, v. 30, no. 4, p. 1139-1144.

In laboratory microcosms using salt marsh soils and in field trials, it was possible to monitor and quantify crude oil mineralization by measuring changes in CO_2 delta ^{13}C signatures and the rate of CO_2 production. These values are easy to obtain and can be combined with simple isotope mass balance equations to determine the rate of mineralization from both the crude oil and indigenous carbon pool.

Keywords: estuarine, sediment, petroleum, chemistry

538. Jackson, W.A., and Pardue, J.H., 1999, Potential for intrinsic and enhanced crude oil biodegradation in Louisiana's freshwater marshes: Wetlands, v. 19, no. 1, p. 28-34.

This study determined the intrinsic rates of biodegradation of Louisiana "sweet" crude oil (LSCO) in a *Panicum hemitomon* freshwater marsh using kinetic microcosm studies and verified the results in a large intact core study. In addition, the potential to enhance biodegradation using inorganic nutrient additions was determined. These freshwater marsh soils have high intrinsic rates of degradation (2.0%/day) for the measured alkane fraction (C11-C66) and even higher rates (6.8%/day) for the measured polycyclic aromatic hydrocarbon (PAH) fraction (naphthalene, methylated naphthalenes, phenanthrene, and methylated phenanthrenes. Nitrogen (ammonium) was primarily the limiting nutrient and increased degradation rate constants (2-3 fold). While crude oil degradation can be enhanced by fertilization, the benefits need to be weighed against the presence of high intrinsic biodegradation rates in these systems.

Keywords: freshwater, petroleum, sediment, nutrients, chemistry

539. Jarboe, H.H., 1990, Toxicity of permethrin to *Procambarus clarkii*, and the effects of permethrin-induced density reduction and supplemental feeding on stunted crawfish populations: Diss. Abst. Int. Pt. B – Sci. Eng., v. 51, no. 4, 122 p.

The acute toxicity of permethrin to red swamp crawfish (*Procambarus clarkii*) was evaluated in laboratory studies. The use of permethrin to effect density reduction in combination with supplemental feeding was evaluated as a management technique to minimize stunting of crawfish at sub-marketable size.

Keywords: macroinvertebrates, pesticides, productivity, freshwater, agriculture

540. Jelgersma, Saskia, 1996, Land subsidence in coastal lowlands, *in* Milliman, J.D., and Haq, B.U., Sea-level rise and coastal subsidence; causes, consequences, and strategies: Coastal Systems and Continental Margins, v. 2, p. 47-62.

Keywords: geomorphology, sediment

541. Jin, Peikang, Barber, M.E., and Flowers, G.C., 1996, Numerical simulation of deep-well injection in Geismar, Louisiana: Ground Water, v. 34, no. 6, p. 989-1000.

Industrial waste water has been injected into a permeable part of the Upper Miocene injection reservoirs near Geismar, Louisiana since 1971. The study area encompasses four industrial facilities and 12 active injection wells. Numerical simulations were performed to evaluate injection well design and potential for movement of injected waste water within the hydrogeologic system. Numerical modeling was conducted in both cylindrical coordinates and Cartesian coordinates.

Keywords: groundwater, model, contaminants

542. Joanen, T., and McNease, L.L., 1989, Ecology and physiology of nesting and early development of the American alligator: American Zoologist, v. 29, no. 3, p. 987-998.

Ambient temperatures were significantly correlated with alligator (*Alligator mississippiensis*) nesting activity. Rainfall had no significant relationship with time of nesting activity although water levels did affect the degree of nesting. The bulk of the nesting took place within a 2-week period each year. Habitat selection, home ranges, and daily movements were delineated for adult males and females. Adult females selectively seek out dense vegetation adjacent to isolated ponds for nesting during the summer. Adult and sub-adult males tend to prefer open water all year round and only occasionally venture into the more secluded and heavily vegetated areas used by the females.

Keywords: reptiles, ecology, habitat, physiology

543. Joanen, T., McNease, L., and Richard, D., 1985, The effects of winter flooding on white-tailed deer in southwestern Louisiana: Proceedings of the Louisiana Academy of Sciences, v. 48, p. 109-115.

Keywords: management, ecology, hydrology

544. John, C.J., Stevenson, D.A., and Groat, C.G., 1990, Geopressured-geothermal resources in South Louisiana; current prospects geology, and environmental monitoring: Bulletin of the South Texas Geological Society, v. 30, no. 5, p. 11-28.

Keywords: groundwater, geology

545. John, C.J., Stevenson, D.A., Groat, C.G., and Hart, G.F., 1990, A review of current well testing and environmental monitoring at geopressured-geothermal prospect sites in South Louisiana, *in* Anonymous, Fifth Circum-Pacific Energy and Mineral Resources Conference; abstracts: AAPG Bulletin, v. 74, no. 6, p. 981.

Keywords: groundwater, contaminants

546. Johnson, A.I., 1974, Review of the symposium on underground waste management and artificial recharge: Hydrological Sciences Bulletin, v. 19, no. 2, 184 p.

Keywords: groundwater, contaminants, hydrology

547. Johnson, D.B., 1980, A change in the course of the Lower Mississippi River; description and analysis of some economic consequences, *in* Kazmann, R.G., and Johnson, D.B., If the Old River Control Structure fails? (The physical and economic consequences): Bulletin--Louisiana Water Resources Research Institute, no. 12, p. 43.

Keywords: surface water, freshwater, hydrology, management, geomorphology

548. Johnson, K.L., and Leenheer, J.A., 1991, Effects of geochemical factors on remobilization and redeposition of contaminated bed sediments in Bayou d'Inde, Louisiana, *in* Mallard, G.E., and Aronson, D.E., U.S. Geological Survey Toxic Substances Hydrology Program; Proceedings of the technical meeting, Monterey, California, March 11-15, 1991: U.S. Geological Survey Water-Resources Investigations Report 91-4034, p. 591-595.

Keywords: groundwater, surface water, sediment, contaminants, hydrology, chemistry

549. Johnson, L.A., and Foote, A.L., 1997, Vertebrate herbivory in managed coastal wetlands—A manipulative experiment: Aquatic Botany, v. 59, no. 1-2, p. 17-32.

Structural marsh management and nutria (*Myocastor coypus*) herbivory are both believed to strongly influence plant production in the brackish, deltaic marshes of coastal Louisiana, USA. Previous studies have tested the effects of structural management on aboveground biomass after implementing management, but very few studies have collected data before and after management. Thus, to test the effects of structural marsh management on *Spartina patens* (Ait.) Muhl. and *Scirpus americanus* Pers., the aboveground biomass of both species was estimated before and after the construction of shallow, leveed impoundments. The water level in each impoundment was managed with a single flap-gated culvert fitted with a variable crest weir. Additionally, the influence of nutria grazing on aboveground biomass was measured by nondestructively sampling fenced (ungrazed) and unfenced (grazed) plots in both managed and unmanaged areas. While there was no significant difference in *S. patens* production between managed and unmanaged areas, marsh management negatively affected Sc. americanus production. The two species also differed in their responses to grazing. Grazing dramatically reduced the sedge, *Sc. americanus*, while the grass, *S. patens*, remained at similar biomass levels

in grazed and ungrazed plant stands. These findings support the belief that herbivory has a strong influence on plant production, but do not support the claim that management increases plant production in the deltaic marshes of Louisiana.

Keywords: vascular plants, herbivory, mammals, management, productivity, estuarine

550. Johnson, R.M., and Pepperman, Armand, 1995, Mobility of atrazine from alginate controlled release formulations: Journal of Environmental Science and Health. Part B. Pesticides, Food Contaminants, and Agricultural Wastes, v. 30, no. 1, p. 27-47.

Keywords: pesticides, surface water

551. Johnson, T.L., 1994, Stratigraphy and pumping test analysis at a hazardous waste disposal facility, East Baton Rouge Parish, Louisiana: New Orleans, La., University of New Orleans, Masters Thesis, 88 p.

This study evaluates the stratigraphy at a hazardous waste disposal facility near Baton Rouge, Louisiana. Lithologic descriptions from 184 soil borings, in an area of approximately 350 acres, have been used to determine the stratigraphy of the near-surface sediments.

Keywords: groundwater, geology, contaminants

552. Johnson, T.L., and Easley, D.H., 1994, Stratigraphy and hydrogeology of Prairie Terrace deposits underlying a hazardous waste facility, East Baton Rouge Parish, Louisiana, *in* Anonymous, AAPG annual convention: Annual Meeting Abstracts--American Association of Petroleum Geologists and Society of Economic Paleontologists and Mineralogists, v. 1994, p. 182.

Keywords: groundwater, geology, contaminants

553. Johnson, W.B., Sasser, C.E., and Gosselink, J.G., 1985, Succession of vegetation in an evolving river delta, Atchafalaya Bay, Louisiana: Journal of Ecology, v. 73, no. 3, p. 973-986.

Keywords: vascular plants, ecology, estuarine

554. Jones, Clyde, and Pagels, John, 1968, Notes on a population of *Pipistrellus subflavas* in Southern Louisiana: Journal of Mammology, v. 49, no. 1, p. 134-139.

Keywords: checklist, ecology, mammals

555. Jones, P. H., 1945, Water, *in* Iberville Parish Resources and Facilities: Louisiana Department of Public Works and Iberville Parish Planning Board, p. 21-25.

Keywords: groundwater, freshwater, surface water

556. Jones, P. H., 1946, Water, *in* Acadia Parish Resources and Facilities: Louisiana Department of Public Works and Acadia Parish Planning Board, p. 30-42.

Keywords: groundwater, freshwater, surface water

557. Jones, P. H., 1946, Water, *in* Pointe Coupee Parish Resources and Facilities: Louisiana Department of Public Works and Pointe Coupee Parish Planning Board, p. 30-34.

Keywords: groundwater, freshwater, surface water

558. Jones, P. H., 1946, Water, *in* Vermilion Parish Resources and Facilities: Louisiana Department of Public Works and Vermilion Parish Planning Board, p. 27-35.

Keywords: groundwater, freshwater, surface water

559. Jones, P. H., 1947, Water, *in* Ascension Parish Resources and Facilities: Louisiana Department of Public Works and Ascension Parish Planning Board.

Keywords: groundwater, freshwater, surface water

560. Jones, P. H., 1947, Water, *in* Cameron Parish Resources and Facilities: Louisiana Department of Public Works and Cameron Parish Development Board.

Keywords: groundwater, freshwater, surface water

561. Jones, P. H., 1947, Water, *in* St. Landry Parish Resources and Facilities: Louisiana Department of Public Works and St. Landry Parish Planning Board.

Keywords: groundwater, freshwater, surface water

562. Jones, P. H., 1947, Water, *in* West Baton Rouge Parish Resources and Facilities: Louisiana Department of Public Works and West Baton Rouge Parish Development Board, p. 29-33.

Keywords: groundwater, freshwater, surface water

563. Jones, P. H., 1949, Water, *in* Iberia Parish Resources and Facilities: Louisiana Department of Public Works and Iberia Parish Development Board, p. 52-61.

Keywords: groundwater, freshwater, surface water

564. Jones, P. H., 1949, Water, *in* Vernon Parish Resources and Facilities: Louisiana Department of Public Works and Vernon Parish Planning Board, p. 25-30.

Keywords: groundwater, freshwater, surface water

565. Jones, P.H., 1950, Depth of occurrence of fresh ground water in southwestern Louisiana: U.S. Geological Survey Open-File Report, 5 p.

Keywords: groundwater, freshwater

566. Jones, P.H., 1950, Ground-water conditions in the Lake Charles area, Louisiana: U.S. Geological Survey Open-File Report, 11 p.

Keywords: groundwater, contaminants

567. Jones, P.H., 1970, Hydrology of Quaternary delta deposits of the Mississippi River: Symposium on the Hydrology of Deltas, v. 1, p. 49-63.

Keywords: groundwater, hydrology

568. Jones, P.H., Hendricks, E.L., Irelan, Burdge, and others, 1956, Water resources of southwestern Louisiana: U.S. Geological Survey Water-Supply Paper 1364, 460 p.

Keywords: groundwater

569. Jones, P.H., Turcan, A.N., Jr., and Skibitzke, H.E., 1954, Geology and ground-water resources of southwestern Louisiana: Louisiana Department of Conservation Geological Bulletin 30, 285 p.

Keywords: groundwater, geology

570. Jones, R.E., 1968, A study of the mosses of Ouachita Parish, Louisiana: Castanea, v. 33, no. 1, p. 18-30.

Keywords: checklist

571. Journal of Coastal Research, 1995, Assessment of the ^{137}Cs method for estimating sediment accumulation rates: Louisiana salt marshes: Journal of Coastal Research, v. 11, no. 2, p. 296-307.

Sediment cores were collected at 33 salt marsh locations in the Louisiana Deltaic Plain and subjectively classified as impaired or healthy using aerial imagery obtained since the 1950's. Cesium-137 inventories from these cores were compared with aerial deposition records of nuclear fallout from the southern United States.

Keywords: estuarine, sediment

572. Journal of Coastal Research, 1995, Relationships among marsh surface topography, hydroperiod, and soil accretion in a deteriorating Louisiana salt marsh: Journal of Coastal Research, v. 11, no. 2, p. 357-369.

The relations among marsh elevation, flooding frequency and duration, and marsh accretion in a *Spartina alterniflora* marsh in coastal Louisiana were evaluated over a 39-month period by using field surveys, tide gauge records, and direct measures of recent accretion above artificial soil markers.

Keywords: estuarine, hydrology, geomorphology, wetland loss, sediment

573. Jung, R.C., 1950, An annotated list of the Lepidoptera of the New Orleans area: The Louisiana Academy of Sciences, v. 13, p. 42-48.

Keywords: checklist, macroinvertebrates

574. Justic, D, Rabalais, N.N., and Turner, R.E., 1994, Riverborne nutrients, hypoxia, and coastal ecosystem evolution: Biological responses to long-term changes in nutrient loads carried by the Po and the Mississippi Rivers: Changes in Fluxes in Estuaries: Implications from Science to Management., Olsen & Olsen, Fredensborg, Denmark, p. 161-167.

Keywords: estuarine, surface water, freshwater, nutrients, ecology

575. Justic, D., Rabalais, N.N., and Turner, R.E., 1995, Stoichiometric nutrient balance and origin of coastal eutrophication: Marine Pollution Bulletin, v. 30, no. 1, p. 41-46.

The authors present here an analysis of the stoichiometry of dissolved nutrients in 10 large world rivers, Amazon, Changiang, Huanghe, Mackenzie, Mississippi, Po, Rhine, Seine, Yukon, and Zaire, and in two river-dominated coastal ecosystems prone to eutrophication, the northern Adriatic Sea and the northern Gulf of Mexico.

Keywords: estuarine, nutrients, chemistry, surface water

576. Kalkhoff, S.J., 1986, Brine contamination of shallow ground water and streams in the Brookhaven oil field, Lincoln County, Mississippi: U.S. Geological Survey Water-Resources Investigations Report 86-4087, p. 57.

Keywords: groundwater, surface water, freshwater, contaminants

577. Kapustka, S.F., [1964], Chemical composition of surface waters of Louisiana, 1943-58: Louisiana Department of Public Works, 212 p.

Keywords: surface water, freshwater, chemistry

578. Karkalits, O.C., and Hankins, B.E., 1978, Chemical analysis of dissolved natural gas in water from the world's first geopressured-geothermal well: Geothermal Energy; A Novelty becomes a Resource; Transactions; v. 2, sec. 1, p. 351-354.

Keywords: groundwater, chemistry

579. Karkalits, O.C., and Hankins, B.E., 1978, Chemical analysis of gas dissolved in geothermal waters in a south Louisiana well: AAPG Bulletin, v. 62, no. 3, 529 p.

Keywords: groundwater, chemistry

580. Kaswadji, R.F., Gosselink, J.G., and Turner, R.E., 1990, Estimation of primary production using five different methods in a Spartina alterniflora salt marsh: Wetlands Ecology and Management, v. 1, no. 2, p. 57-64.

Keywords: estuarine, vascular plants, physiology, methods

581. Kaufman, R., Bentley, H.W., Davis, S.N., and Long, A., 1983, Application of chloride stable isotope analysis to hydrogeology: Hydrology and Water Resources in Arizona and the Southwest, v. 13, p. 85-90.

Keywords: groundwater, chemistry, hydrology

582. Kaufmann, R.S., Long, A., and Campbell, D.J., 1988, Chlorine isotope distribution in formation waters, Texas and Louisiana: AAPG Bulletin, v. 72, no. 7, p. 839-844.

Keywords: groundwater, chemistry

583. Kazmann, R.G., 1970, The present and future ground-water supply of the Baton Rouge area: Louisiana Water Resources Research Institute Bulletin, v. 5, 44 p.

Keywords: groundwater, hydrology

584. Kazmann, R.G., 1979, Interim and final report on the demonstration project to store fresh water in a saline waterbearing formation for the City of Houma, Louisiana: Technical Report--Louisiana Water Resources Research Institute, no. 6, 15 p.

Keywords: groundwater, freshwater, management

585. Kazmann, R.G., and Arguello, Ottoniel, 1973, The Mississippi River; A water source for Texas? (Evaluation of a proposed water diversion): Louisiana Water Resources Research Institute Bulletin, v. 9, 69 p.

Keywords: surface water, freshwater, management

586. Kazmann, R.G., and Heath, M.M., 1968, Land subsidence related to ground-water offtake in the New Orleans area: Eighteenth Annual Meeting of the Gulf Coast Association of Geological Societies and Regional AAPG Meeting, v. 18, p. 108-113.

Keywords: groundwater, hydrology, management

587. Kazmann, R.G., and Johnson, D.B., 1980, If the Old River Control Structure fails? (The physical and economic consequences): Bulletin--Louisiana Water Resources Research Institute, no. 12, p. 135.

Keywords: surface water, freshwater, hydrology, geomorphology, management

588. Kearney, M.S., Stevenson, J.C., and Ward, L.G., 1994, Spatial and temporal changes in marsh vertical accretion rates at Monie Bay--Implications for sea-level rise: Journal of Coastal Research, v. 10, no. 4, p. 1010-1020.

Spatial and temporal changes in vertical accretion rates and sediment characteristics were investigated in a large submerged upland, estuarine marsh on the Eastern Shore of Chesapeake Bay. Eighteen cores were collected from sites spanning shoreline, tidal channel-side and interior marsh environments. Accretion rates over various time scales (similar to 30 years, similar to 100 years, and similar to 200 years) were determined using Cs-137, Pb-179, and pollen geochronologies.

Keywords: wetland loss, hydrology, sediment, estuarine

589. Keeland, B.D., and Conner, W.H., 1999, Natural regeneration and growth of *Taxodium distichum* (L.) Rich. in Lake Chicot, Louisiana after 44 years of flooding: Wetlands, v. 19, no. 1, p. 149-155.

Lake Chicot, in south central Louisiana, USA, was created in 1943 by the impoundment of Chicot Bayou. Extensive establishment of woody seedlings occurred in the lake during a 1.5 year period, including the growing seasons of both 1986 and 1987, when the reservoir was drained for repair work on the dam. Study plots were established in September 1986 to document woody vegetation establishment and to provide a baseline by which to monitor survival and growth after flooding resumed. The lake was reflooded at the end of 1987, bringing water depths at the study plots up to about 1.4 m. Temporary drawdowns were again conducted during the fall of 1992 and 1996. In December 1992, the site was revisited, new plots established, and saplings counted and measured. Preservation of *T. distichum* forests in relatively shallow but continuously flooded areas such as Lake Chicot may be a simple matter of draining the lake after a good seed crop and maintaining the drawdown long enough for the seedlings to grow taller than the typical growing season water level. In the case of Lake Chicot, this period was two growing seasons. This action will mimic natural, drought-related drawdowns of the lake and will allow the seedlings to establish themselves and grow tall enough to survive normal lake water levels.

Keywords: hydrology, management, vascular plants, freshwater, productivity

590. Keeland, B.D., Conner, W.H., and Sharitz, R.R., 1997, A comparison of wetland tree growth response to hydrologic regime in Louisiana and South Carolina: Forest Ecology and Management, v. 90, no. 2-3, p. 237-250.

Numerous investigations have examined the growth of wetland tree species under a variety of hydrologic conditions. Most studies have compared flooded versus non-flooded conditions in greenhouses or in one to a few field sites near each other or within the same region. Comparisons of wetland tree growth among widely separated areas of the country are rare. This study compared the diameter growth of *Nyssa sylvatica* var. *biflora*, *Nyssa aquatica*, and *Taxodium distichum* trees from Louisiana (Gulf Coastal Plain) and South Carolina (Atlantic Coastal Plain). In both regions, individual trees were distributed along a gradient of hydrologic regimes from infrequent to permanent flooding. *Nyssa sylvatica* var. *biflora* was restricted to periodically flooded sites in both regions. Within these sites, this species showed little response to differences in mean water depth. In contrast, significant differences among hydrologic regimes were detected for *N. aquatica* in both regions. In Louisiana, patterns of growth response did not correlate with the gradient of hydrologic regimes, but in South Carolina maximum growth was inversely related to mean water levels during the growing season. Maximum growth of *T. distichum* trees was observed at sites with shallow, permanent flooding in both regions.

Keywords: vascular plants, freshwater, hydrology, productivity, riparian

591. Keeland, B.D., and Young, P.J., 1997, Long-term growth trends of baldcypress (*Taxodium distichum* (L.) Rich.) at Caddo Lake, Texas: Wetlands, v. 17, no. 4, p. 559-566.

A study of tree growth was initiated at Caddo Lake to address concerns about the health of the baldcypress ecosystem. The lake has been subjected to several dramatic water-level changes over the past 200 years, including water-level stabilization following dam construction in 1914. To assess the long-term growth trends of baldcypress trees and determine if a recent growth decline is occurring at Caddo Lake, increment cores were taken from 52 trees. The cores were crossdated and rings between the years 1900 and 1992 measured to the nearest 0.01 mm. Most cores were characterized by high variation in year-to-year growth. From these data, we can conclude that the historic, extreme changes in hydrologic regime and the current stabilized water levels have not resulted in an overall decline in baldcypress growth at Caddo Lake.

Keywords: freshwater, vascular plants, productivity, hydrology

592. Keim, B.D., and Faiers, G.E., 1996, Heavy rainfall distribution by season in Louisiana—Synoptic interpretations and quantile estimates: Water Resources Bulletin, v. 32, no. 1, p. 117-124.

This paper explored the differences between heavy rainfall distributions by season in Louisiana as opposed to annual probabilities.

Keywords: surface water, freshwater, hydrology

593. Keiser, E.D., 1976, Herpetofaunal survey of the the Atchafalaya River Basin: Lafayette Natural History Museum and Planetarium, Center for Environmental Studies.

Keywords: reptiles, freshwater, checklist

594. Keiser, E.D., and Wilson, L.D., 1979, Checklist and key to the amphibians and reptiles of Lousiana: Lafayette Natural History Museum, 49 p.

Keywords: reptiles, freshwater, checklist

595. Keith, L.H., Lin, P.H., and Kilpatrick, M.P., 1981, Characterization and determination of organic pollutants in sediments: Water Quality Bulletin, v. 6, no. 2, p. 34-36.

Keywords: surface water, freshwater, sediment, contaminants

596. Kekker, C.E., Spendelow, J.A., and Greer, R.D., 1984, Atlas of wading bird and seabird nesting colonies in coastal Louisiana, Mississippi, and Alabama, 1983: National Coastal Ecosystem Team, U.S. Fish and Wildlife Service.

Keywords: birds, checklist

597. Kelley, S., and Mendelssohn, I.A., 1995, An evaluation of stabilized, water-based drilled cuttings and organic compost as potential sediment sources for marsh restoration and creation in coastal Louisiana: Ecological Engineering, v. 5, no. 4, p. 497-517.

The influence of various substrate types (drilled cuttings, compost, 50/50 mixture drilled cuttings/compost, and marsh sediment control) and soil fertilizers (macronutrients, micronutrients, and unfertilized control) on growth of *Spartina alterniflora* and *Sagittaria lancifolia* and on soil chemistry were evaluated in greenhouse experiments. Substrate type and fertilizer amendment had significant effects on plant growth, with the two marsh species responding similarly. These experiments demonstrated that when drilled cuttings were amended with organic compost, and especially macronutrient and micronutrient fertilizers, plant growth levels were comparable to those observed in natural estuarine sediments.

Keywords: estuarine, wetland loss, management, nutrients, sediment, debris

598. Kelly, B.G., and Branch, B., 1989, Water quality training program for the Louisiana Cooperative Extension Service: Rep. U.S. Surv. Water Resour. Div., 109 p.

The Information Transfer Program of the Louisiana Water Resources Research Institute, in conjunction with the Louisiana Cooperative Extension Service (LCES), developed a water quality training program for the state and parish staff of LCES. The workshops focused on drinking water issues, and included topics such as natural ingredients to water quality, water quality standards, health treatment devices, and area agency responsibilities over water quality.

Keywords: management, freshwater

599. Kemp, G.P., Conner, W.H., and Day, J.W., Jr., 1985, Effects of flooding on decomposition and nutrient cycling in a Louisiana swamp forest: Wetlands, v. 5, p. 35-51.

Keywords: nutrients, ecology, physiology, freshwater, riparian

600. Kemp, G.P., and Day, J.W., Jr., 1984, Nutrient dynamics in a Louisiana swamp receiving agricultural runoff, *in* Ewel, K.C., and Odum, H.T. (eds), Cypress Swamps: Gainsesville, Fla., University Presses of Florida, p. 286-293.

Keywords: nutrients, freshwater, agriculture, physiology

601. Kennicutt, M.C., II, Brooks, J., McDonald, T., and Kim, J.K., 1982, Volatile organic studies in Gulf of Mexico estuaries and coastal ecosystems: Eos, Transactions, American Geophysical Union, v. 63, no. 3, p. 57.

Keywords: estuarine, contaminants

602. Kesel, R.H., 1988, The decline in the suspended load of the lower Mississippi River and its influence on adjacent wetlands: Environmental Geology and Water Sciences, v. 11, no. 3, p. 271-281.

Keywords: surface water, freshwater, sediment, geomorphology, wetland loss

603. Kesel, R.H., 1989, The role of the Mississippi River in wetland loss in southeastern Louisiana, U.S.A.: Environmental Geology and Water Sciences, v. 13, no. 3, p. 183-193.

Keywords: estuarine, geomorphology, wetland loss

604. Khalid, R.A., Patrick, W.H., Jr., and DeLaune, R.D., 1977, Phosphorus sorption characteristics of flooded soils: Proceedings of the 41st Annual Meeting; Soil Science of America, v. 41, no. 2, p. 305-310.

Keywords: nutrients, chemistry, sediment

605. Khan, R.A., Ferrell, R.E., and Billings, G.K., 1972, The genesis of selected hydrochemical facies in Baton Rouge, Louisiana ground waters: Ground Water, v. 10, no. 4, p. 14-20.

Keywords: groundwater, geology

606. Khan, R.A., Ferrell, R.E., Jr., and Billings, G.K., 1972, Geochemical hydrology of the Baton Rouge aquifers: Bulletin – Louisiana Water Resources Research Institute, v. 8, 63 p.

Keywords: groundwater, chemistry, hydrology

607. Kharaka, Y.K., Brown, P.M., and Carothers, W.W., 1978, Chemistry of waters in the geopressured zone from coastal Louisiana; Implications for the geothermal development: Geothermal Energy; A Novelty becomes a Resource; Transactions; v. 2, sec. 1, p. 371-374.

Keywords: groundwater, chemistry

608. Kharaka, Y.K., Carothers, W.W., and Law, L.M., 1984, The influence of geological membranes on the chemical composition of subsurface waters: Program and Abstracts – Annual Clay Minerals Conference, v. 21, p. 68.

Keywords: groundwater, chemistry

609. Kharaka, Y.K., Law, L.M., and Specht, D.J., 1983, Hydrodynamics, geochemistry, and metal transport of Gulf Coast brines: The Geological Society of America, 96th Annual Meeting, v. 15, no. 6, p. 612.

Keywords: groundwater, hydrology, contaminants, trace elements, chemistry

610. Kilburn, Chabot, and Whitman, H.M., 1962, Water levels in southwestern Louisiana, April 1960 to April 1961, with a discussion of water-level trends from 1950 to 1960: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Pamphlet no. 11, 21 p.

Keywords: groundwater

611. Kim, J.H, Feagley, S.E., Southwick, L.M., Willis, W.H., and Bengtson, R.L., 1992, Movement of triflurarin, metalochlor, and metribuzin in the soil environment; runoff and leaching from fields in Louisiana, *in* Anonymous, 1992 annual meetings; American Society of Agronomy, 84th annual meeting; Crop Science Society of America; Soil Science Society of America; Clay Minerals Society: Agronomy Abstracts, v. 84, p. 45.

Keywords: surface water, freshwater, pesticides, contaminants, agriculture

612. King, D.T., and LeBlanc, D., 1995, Foraging behaviors of snowy egrets (*Egretta thula*) and yellow-crowned night-herons (*Nyctanassa violacea*) in South Louisiana: Colonial Waterbirds, v. 18, no. 2, p. 224-225.

The authors report two previously undescribed foraging techniques used by Snowy Egrets and Yellow-crowned Night-herons to catch crawfish.

Keywords: birds, macroinvertebrates, ecology

613. King, S.L., Keeland, B.D., and Moore, J.L., 1998, Beaver lodge distributions and damage assessments in a forested wetland ecosystem in the southern United States: Forest Ecology and Management, v. 108, no. 1-2, p. 1-7.

Caddo Lake, USA, a Ramsar wetland of international importance, is a lacustrine wetland complex consisting of stands of flooded baldcypress intermixed with open water and emergent wetland habitats. Recently, concern has been expressed over a perceived increase in the beaver population and the impact of beaver on the long-term sustainability of the baldcypress ecosystem. We used intensive beaver lodge surveys to determine the distribution and relative abundance of beaver and the amount, type, and distribution of beaver damage to mature trees and seedlings at Caddo Lake. A total of 229 lodges were located with a combination of aerial and boat/ground surveys. Most lodges were located in open water and edge habitats. About 95% of the lodges were occupied by beaver or nutria. Some form of damage was exhibited by one or more trees near 85% of the lodges. Intensive damage assessments around 35 lodges indicated that most damage to trees, baldcypress in particular, was restricted to peeling or stripping of bark which is believed to have minimal effect on tree survival. Surveys of regeneration indicated that baldcypress seedlings were very abundant; however, over 99.9% were less than 30 cm tall. The lack of recruitment into the larger size classes appears to be a result of high stand densities and water management practices. At this time, the young age and density of the baldcypress forests suggest that recruitment is not a major concern and herbivore damage appears to be having a minimal effect on the forest.

Keywords: vascular plants, wetland loss, mammals, herbivory

614. Kinler, Q.J., Chabreck, R.H., Kinler, N.W., and Linscombe, R.G., 1990, Effect of tidal flooding on mortality of juvenile muskrats: Estuaries, v. 13, no. 3, p. 337-340.

Keywords: estuarine, hydrology, ecology, mammals

615. Klug, M.L., 1955, Geology and ground-water resources of the Alexandria area, Rapides Parish, Louisiana: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Pamphlet no. 3, 23 p.

Keywords: groundwater, geology

616. Knauth, L.P., and Kumar, M.B., 1981, Trace water content of salt in Louisiana salt domes: Science, v. 213, no. 4511, p. 1005-1007.

Keywords: groundwater, chemistry

617. Knauth, L.P., and Kumar, M.B., 1983, Isotopic character and origin of brine leaks in the Avery Island Salt Mine, South Louisiana, U.S.A.: Journal of Hydrology, v. 66, no. 1-4, p. 343-350.

Keywords: groundwater, chemistry

618. Knauth, L.P., Kumar, M.B., and Martinez, J.D., 1980, Isotope geochemistry of water in Gulf Coast salt domes: Journal of Geophysical Research. B, v. 85, no. 9, p. 4863-4871.

Keywords: groundwater, chemistry

619. Knudsen, E.E., Paille, R.F., Rogers, B.D., Herke, W.H., and Geaghan, J.P., 1989, Effects of a fixed-crest weir on brown shrimp *Penaeus aztecus* growth, mortality, and emigration in a Louisiana coastal marsh: North American Journal of Fisheries Management, v. 9, no. 4, p. 411-419.

The authors investigated the effects of water-control weirs on growth, emigration, and mortality of brown shrimp (*Penaeus aztecus*). Juvenile brown shrimp were captured, marked, and released in two shallow-water marsh ponds. One pond had a weir at its only exit. All surviving marked brown shrimp were recaptured as they emigrated from each pond. Although brown shrimp emigrating from the weired pond were larger than those from the unweired pond, probably due to faster growth and delayed emigration, conclusions from concurrent research were that total biomass of brown shrimp emigrating from the unweired pond was more than double the biomass from the weired pond.

Keywords: macroinvertebrates, estuarine, hydrology, productivity

620. Knudsen, E.E., Rogers, B.D., Paille, R.F., Herke, W.H., and Geaghan, J.P., 1996, Juvenile white shrimp growth, mortality, and emigration in weired and unweired Louisiana marsh ponds: North American Journal of Fisheries Management, v. 16, no. 3, p. 640-652.

To study effects of marsh weirs on shrimp ecology, over 6,000 juvenile white shrimp *Penaeus setiferus* were marked with fluorescent pigments and released into two coastal Louisiana marsh ponds, one with a fixed-crest weir at its only opening, the other without. Marked white shrimp were recaptured as they emigrated toward the Gulf of Mexico from each pond.

Keywords: estuarine, macroinvertebrates, habitat, management

621. Knudsen, P.A., Herke, W.H., and Knudsen, E.E., 1985, Emigration of brown shrimp from a low-salinity shallow-water marsh: Proceedings of the Louisiana Academy of Sciences, v. 48, p. 30-40.

Keywords: macroinvertebrates, ecology, estuarine

622. Kobayashi, N., Dalrymple, R.A., Kana, T.W., Kuo, C.Y., and McDougal, W.G., 1991, Effects of sea-level rise on bays and estuaries: Journal of Hydraulic Engineering, v. 118, no. 1, p. 1-10.

The greenhouse effect and resulting increase in the earth's temperature may accelerate the mean sea level rise. The rise of sea level relative to land level is already significant at locations of extreme land subsidence such as coastal Louisiana.

Keywords: estuarine, hydrology, wetland loss

623. Koch, M.S., and Mendelssohn, I.A., 1989, Sulphide as a soil phytotoxin—Differential responses in two marsh species: Journal of Ecology, v. 77, no. 2, p. 565-578.

A glasshouse experiment was conducted to investigate the effects of soil reduction and hydrogen sulphide accumulation on the growth of two marsh species, *Spartina alterniflora* and *Panicum hemitomon*. The addition of 1 multiplied by 0 mM sulphide resulted in significantly less total biomass of *S. alterniflora* and *P. hemitomon*. Sulphide significantly reduced culm, root and rhizome biomass in *P. hemitomon* but only root biomass in *S. alterniflora*. *Panicum hemitomon* had no significant difference in total biomass between the aerated and non-aerated treatments, but *S. alterniflora* total biomass was lower in the aerated treatment than in the non-aerated treatment. Redox potential (mV) in the soil cores of both species was highest in the aerated treatment, intermediate in the non-aerated treatment, and lowest in the sulphide treatment.

Keywords: vascular plants, sediment, chemistry, physiology, nutrients

624. Koetsier, P., and Bryan, C.F., 1989, Winter and spring macroinvertebrate drift in an outpocketing of the lower Mississippi River, Louisiana (USA): Hydrobiologia, v. 185, no. 3, p. 205-209.

To examine temporal variations in macroinvertebrate drift in a high-order river system, surface drift was sampled each month from November 1984 to June 1985 in the lower Mississippi River. Routinely, two stations were sampled at 2-hr intervals through the night, but during January and April samples were taken every 4 hrs for a 24-hr period. Greatest drift density occurred in April, when Hydroida dominated, while lowest densities occurred in December. Drifting organisms displayed the bigeminus pattern with highest densities 4 hrs after dusk and lowest numbers one hour before sunrise.

Keywords: freshwater, macroinvertebrates, ecology

625. Koetsier, P., and Bryan, C.F., 1992, Diel, size-differential drift patterns of three macroinvertebrate species in the lower Mississippi River, Louisiana (USA): Hydrobiologia, v. 228, no. 3, p. 225-230.

We explored macroinvertebrate size-differential drift in the lower Mississippi River (a 9th order system). Because this river system is highly turbid, we hypothesized that visually-dependent vertebrate predators feeding on drifting organisms would be at a disadvantage. Thus, size-differential drift should not occur. For one 24-hour period in both January and April, six drift nets were used to sample surface drift. Nets were emptied once every four hours. Individual intra-ocular distances of three macroinvertebrate species (*Hydropsyche orris*: Trichoptera, *Hexagenia limbata*: Ephemeroptera, *Macrobrachium ohione*; Crustacea) were measured. Percentages of size classes in the drift were determined. In both months, large individuals of *H. orris* and *H. limbata* were prevalent in the nocturnal but scarce in the diurnal drift. In January, large *M. ohione* drifted regardless of time. In April, large *M. ohione* predominated the nocturnal drift. Our results could not be attributed solely to vertebrate predator avoidance. Other mechanisms such as diel microhabitat migration and current velocity may have accounted for the results.

Keywords: freshwater, macroinvertebrates, ecology, habitat

626. Koetsier, P., and Bryan, C.F., 1995, Effects of abiotic factors on macroinvertebrate drift in the lower Mississippi River, Louisiana: American Midland Naturalist, v. 134, no. 1, p. 63-74.

The authors assessed the effects of abiotic factors on invertebrate drift composition in the lower Mississippi River from November 1984 to June 1985. They sampled drift, measured in-situ water quality variables, and recorded river stage and discharge one night each month. Principal component analysis (PCA) and standard multiple regression were used to investigate temporal relationships between drift and abiotic factors in a large river system.

Keywords: surface water, freshwater, habitat, macroinvertebrates

627. Koetsier, P., and Bryan, C.F., 1996, Is macroinvertebrate drift a density-dependent mechanism of the benthos in the lower Mississippi River?: Journal of Freshwater Ecology, v. 11, no. 1, p. 1-10.

In the lower Mississippi River, the authors sampled drifting and benthic macroinvertebrates each month from November 1984 to June 1985.

Keywords: surface water, freshwater, ecology, macroinvertebrates

628. Koplitz, L.V., Urbanik, J., Harris, S., and Mills, O., 1994, Determining lead in sediments by X-ray fluorescence and the method of standard additions: Environmental Science & Technology, v. 28, no. 3, p. 538-540.

Keywords: sediment, trace elements

629. Kopman, H.H., 1903, The butterflies of Louisiana: New Orleans Times-Democrat, v. 12.

Keywords: checklist, macroinvertebrates

630. Kraemer, T.F., 1981, ^{234}U and ^{238}U concentration in brine from geopressured aquifers of the northern Gulf of Mexico basin: Earth and Planetary Science Letters, v. 56, p. 210-216.

Keywords: groundwater, trace elements, contaminants

631. Kraemer, T.F., 1989, Radium in the lower Mississippi River: U.S. Geological Survey Open-File Report 89-0409, p. 48.

Keywords: surface water, freshwater, trace elements, contaminants

632. Kraemer, T.F., and Curwick, P.B., 1991, Radium isotopes in the lower Mississippi River: J. Geophys. Res., v. 96, no. C2, p. 2797-2806.

This report documents the findings of radium isotope measurements at several locations between St. Francisville and Venice, Louisiana.

Keywords: surface water, freshwater, chemistry

633. Kraemer, T.F., and Kharaka, Y.K., 1986, Uranium geochemistry in geopressured-geothermal aquifers of the U.S. Gulf Coast: Geochimica et Cosmochimica Acta, v. 50, no. 6, p. 1233-1238.

Keywords: groundwater, trace elements, chemistry, contaminants, freshwater

634. Krairapanond, N., 1990, Sulfur chemistry of Louisiana tidal marsh soils: Diss. Abst. Int. Pt. B – Sci. & Eng., v. 51, no. 4, 185 p.

The amounts and profile distribution of various sulfur forms in Louisiana coastal marshes were investigated to understand sulfur cycling as related to the origin and type of tidal wetland marshes. Sampling was conducted quarterly from a *Panicum hemitomon* freshwater marsh, a *Spartina patens* brackish marsh, and a *Spartina alterniflora* salt marsh in Barataria Basin, Louisiana.

Keywords: estuarine, sediment, chemistry

635. Krairapanond, N., Delaune, R.D., and Patrick, W.H., 1991, Sulfur dynamics in Louisiana coastal freshwater marsh soils: Soil Science SOSCAK, v. 151, no. 4, p. 261-273.

The profile distribution of specific sulfur forms was examined in a Louisiana freshwater marsh. Soil samples were fractionated into acid-volatile sulfides, HCl-soluble sulfur, elemental sulfur, pyrite sulfur, ester-sulfate sulfur, carbon-bonded sulfur, and total sulfur.

Keywords: estuarine, sediment, chemistry

636. Krairapanond, N., DeLaune, R.D., and Patrick, W.H., Jr., 1992, Distribution of organic and reduced sulfur forms in marsh soils of coastal Louisiana: Org. Geochem., v. 18, no. 4, p. 489-500.

Soil samples from a Louisiana Barataria Basin brackish marsh were fractionated into acid-volatile sulfides (AVS), HCl-soluble sulfur, elemental sulfur, pyrite sulfur, ester-sulfate sulfur, and carbon-bonded sulfur. Results were compared to values reported for fresh and salt marshes.

Keywords: estuarine, sediment, chemistry

637. Kratch, Kellye, 1996, River ecology, coastal projects win sustainability awards—Renew America National Awards: Water Environment and Technology, v. 8, p. 28.

Two projects that were recipients of the 1995 Renew America National Awards for Environmental Sustainability are described. The Southern Illinois University's Rivers Curriculum Project teaches high school students about the scientific and social aspects of river protection. The Jefferson Parish Environmental and Development Control Department's Christmas Tree/Marsh Restoration Program is trying to reverse coastal erosion in Southern Louisiana by placing discarded Christmas trees in canals and shoreline fences to trap sediments.

Keywords: management, wetland loss

638. Kuhnel, I., McMahon, T.A., Finlayson, B.L., Haines, A., Whetton, P.H., and Gibson, T.T., 1990, Climatic influences on streamflow variability; a comparison between southeastern Australia and Southeastern United States of America: Water Resources Research, v. 26, no. 10, p. 2483-2496.

Keywords: climate, hydrology, surface water

639. Kumar, M.B., 1978, Character of brines from the Belle Isle and Weeks Island Salt Mines: An Investigation of the Utility of Gulf Coast Salt Domes for the Storage or Disposal of Radioactive Wastes, v. 1, no. EW-78-C-05-5941/53, p. 235-309.

Keywords: groundwater, chemistry, contaminants

640. Kumar, M.B., 1981, Character of brine leaks at the Avery Island Salt Mine, Louisiana: Abstracts with Programs – Geological Society of America, v. 13, no. 1, p. 12.

Keywords: groundwater, chemistry

641. Kumar, M.B., 1982, Subsurface leaks of salt mines in Louisiana: Abstracts with Programs – Geological Society of America, v. 14, no. 7, p. 537.

Keywords: groundwater, hydrology

642. Kumar, M.B., 1983, Character of meteoric leaks in the salt mines of South Louisiana, U.S.A.: Journal of Hydrology, v. 66, no. 1-4, p. 351-368.

Keywords: groundwater

643. Kumar, M.B., 1983, Surface hydrology study: ONWI (Battelle Memorial Institute, Office of Nuclear Waste-Isolation), v. 417, p. 121-128.

Keywords: hydrology, surface water

644. Kumar, M.B., and Hoda, B., 1978, Hydrologic studies of Belle Isle Salt Mine: An Investigation of the Utility of Gulf Coast Salt Domes for the Storage or Disposal of Radioactive Wastes, v. 1, no. EW-78-C-05-5941/53, p. 153-187.

Keywords: groundwater, hydrology

645. Kumar, M.B., and Hoda, B., 1978, Hydrologic studies of Weeks Island Salt Mine: An Investigation of the Utility of Gulf Coast Salt Domes for the Storage or Disposal of Radioactive Wastes, v. 1, no. EW-78-C-05-5941/53, p. 189-234.

Keywords: groundwater, hydrology

646. Kumar, M.B., and Martinez, J.D., 1978, Sources of subsurface leaks in the Belle Isle and Weeks Island Salt Mines: An Investigation of the Utility of Gulf Coast Salt Domes for the Storage or Disposal of Radioactive Wastes, v. 1, no. EW-78-C-05-5941/53, p. 311-324.

Keywords: groundwater, hydrology

647. Kumar, M.B., and Martinez, J.D., 1981, Character of brines from the Belle Isle and Weeks Island Salt Mines, Louisiana, U.S.A.: Journal of Hydrology, v. 54, no. 1-3, p. 107-140.

Keywords: groundwater, chemistry

648. Kuniansky, E.L., 1984, Hydrology of Fritchie Marsh, coastal Louisiana: U.S. Geological Survey Water-Resources Investigations Report 84-4324, 23 p.

Keywords: estuarine, hydrology

649. Kuniansky, E.L., 1989, Geohydrology and simulation of ground-water flow in the "400-foot," "600-foot," and adjacent aquifers, Baton Rouge area, Louisiana: Louisiana

Department of Transportation and Development Water Resources Technical Report no. 49, 90 p.

Keywords: groundwater, hydrology, model

650. Kuniansky, E.L., Dial, D.C., and Trudeau, D.A., 1989, Maps of the "400-foot," "600-foot," and adjacent aquifers and confining beds, Baton Rouge area, Louisiana: Louisiana Department of Transportation and Development Water Resources Technical Report no. 48, 16 p.

Keywords: groundwater, geology, hydrology

651. Kuo, C.Y., 1988, Sea level rise and water resources management: Proceedings of the 15th Annual Water Resources Conference; Critical Water Issues and Computer Applications, p. 44-47.

Keywords: wetland loss, hydrology, management

652. LaGarde, V.E., and Heltzel, S.B., 1980, A data management system for finite element sediment transport models: Finite Elements in Water Resources, no. 3, p. 6.35-6.46.

Keywords: model, sediment, chemistry

653. Lambou, V.W., 1961, Fish populations of Mississippi River oxbow lakes in Louisiana: Louisiana Academy of Sciences, v. 23, p. 52-64.

The study was undertaken to gather basic data on populations of fish in Mississippi River oxbow lakes since little was known about the species composition or size of such populations. Oxbow lakes formed by the Mississippi River and located in the old flood plain of the river are considered.

Keywords: fish, freshwater, checklist

654. Lambou, V.W., and Geagan, D.W., 1961, Fish populations of alluvial flood plain lakes in Louisiana: Louisiana Academy of Sciences, v. 24, p. 95-116.

The present study was undertaken to gather basic data on populations of fish in Lousiana alluvial flood plain lakes since little was known about the species composition or size of such populations.

Keywords: fish, checklist, riparian, freshwater

655. Landa, E.R., and Reid, D.F., 1983, Sorption of radium-226 from oil-production brine by sediments and soils: Environmental Geology and Water Sciences, v. 5, no. 1, p. 1-8.

Keywords: groundwater, sediment, trace elements, contaminants

656. Landau, D., and Prowell, D., 1999, A Partial checklist of moths from mixed mesophytic hardwood forests in Louisiana (Insecta: Lepidoptera): Transactions of the American Entomological Society, v. 125, no. 1-2, p. 139-150.

Keywords: checklist, macroinvertebrates

657. Landers, M.N., 1985, Floodflow frequency of streams in the alluvial plain of the lower Mississippi River in Mississippi, Arkansas, and Louisiana: U.S. Geological Survey Water-Resources Investigations Report 85-4150, 21 p.

Keywords: surface water, freshwater, hydrology

658. Landrum, K.E., 1995, Accumulation and trace-metal variability of estuarine sediments, St. Bernard Delta geomorphic region, Louisiana, *in* Anonymous, AAPG Gulf Coast Section meeting; abstracts: AAPG Bulletin, v. 79, no. 10, p. 1562.

Keywords: estuarine, trace elements, sediment

659. Landrum, Kenneth, 1994, Accumulation and trace-metal variability of estuarine sediments, Barataria Basin, Louisiana, *in* Anonymous, Gulf Coast Association of Geological Societies and Gulf Coast Section of SEPM meeting (AAPG Gulf Coast Section); abstracts: AAPG Bulletin, v. 78, no. 9, p. 1465.

Keywords: estuarine, trace elements, sediment

660. Larke, J.O., and Smith, L.M., 1994, Rare plants of pine-hardwood forests in Louisiana: Baker Printing Co., 58 p.

This manual provides accounts of 24 plant species, both herbaceous and woody, that are currently considered rare in Louisiana and are typically found growing in what may generally be called mixed pine-hardwood forests.

Keywords: vascular plants, checklist

661. LaSalle, M.W., and Dakin, M.E., 1982, Dispersal of *Culex salinarius* in southwestern Louisiana: Mosq. News., v. 42, no. 4, p. 543-550.

Keywords: invertebrates

662. Lasseigne, Alex, 1969, Leguminosae of Louisiana: University of Southwestern Louisiana Thesis (M.S.) 1969, 206 p.

Keywords: checklist, vascular plants

663. Lee, F.N., 1969, Evaporation study at Sharp Station pond near Baton Rouge, Louisiana: Louisiana Department of Public Works Technical Report no. 4, 13 p.

Keywords: surface water, freshwater, hydrology

664. Lee, F.N., 1969, Rainfall-runoff relations for southwestern Louisiana: Louisiana Department of Public Works Technical Report no. 2c, 91 p.

Keywords: surface water, freshwater, hydrology

665. Lee, F.N., 1972, Floods of April 13-17, in southern Louisiana*, in* Rostvedt, J.O., and others, Summary of floods in the United States during 1968: U.S. Geological Survey Water-Supply Paper 1880-C, p. C12-C14.

Keywords: surface water, freshwater, hydrology

666. Lee, F.N., 1985, Analysis of the low-flow characteristics of streams in Louisiana: Louisiana Department of Transportation and Development, Office of Public Works Water Resources Technical Report no. 35, 41 p.

Keywords: surface water, freshwater, hydrology

667. Lee, F.N., 1985, Floods in Louisiana, magnitude and frequency (4th ed.): Louisiana Department of Transportation and Development Water Resources Technical Report no. 36, 30 p.

Keywords: surface water, freshwater, hydrology

668. Lee, F.N., 1992, A method for estimating velocity and depth of streams at low flow in southeastern Louisiana*, in* Subitzky, Seymour, Selected papers in the hydrologic sciences, 1988-92: U.S. Geological Survey Water-Supply Paper 2340, p. 131-136.

Keywords: surface water, freshwater, hydrology

669. Leenheer, J.A., Noyes, T.I., and Brown, P.A., 1994, Data on natural organic substances in dissolved, colloidal, suspended-silt and -clay, and bed-sediment phases in the Mississippi River and some of its tributaries, 1987-90: U.S. Geological Survey Water-Resources Investigations Report 93-4204, p. 71.

Keywords: surface water, freshwater, chemistry, sediment

670. Leenheer, J.A., Wershaw, R.L., Brown, P.A., and Noyes, T.I., 1991, Polyethylene-glycol residues from nonionic surfactants in the lower Mississippi River, *in* Dhamotharau, Dhamo, Resource development of the Lower Mississippi River; symposium papers: American Water Resources Association Technical Publication Series TPS, v. 91-3, p. 183.

Keywords: contaminants, surface water

671. Leiker, T.J., 1991, Migration of organic compounds through bed sediments near an industrial outfall in the Calcasieu River estuary, Louisiana, *in* Mallard, G.E., and Aronson, D.E., U.S. Geological Survey Toxic Substances Hydrology Program; proceedings of the technical meeting, Monterey, California, March 11-15, 1991: U.S. Geological Survey Water-Resources Investigations Report 91-4034, p. 588-590.

    Keywords: surface water, freshwater, contaminants, sediment

672. Leiker, T.J., Rostad, C.E., and Barnes, C.R., 1991, A reconnaissance study of halogenated organic compounds in catfish from the lower Mississippi River and its major tributaries, *in* Dhamotharau, Dhamo, Resource development of the Lower Mississippi River; symposium papers: American Water Resources Association Technical Publication Series TPS, v. 91-3, p. 185-194.

    Keywords: surface water, freshwater, contaminants

673. Lemaire, R.J., 1961, A preliminary annotated checklist of the vascular plants of the Chandeleur and adjacent islands, St. Bernard and Plaquemines Parishes, Lousiana: Louisiana Academy of Science, v. 24, p. 116-122.

    A description of the islands and list of plants.

    Keywords: vascular plants, estuarine, checklist

674. Lemaire, R.J., 1961, A preliminary annotated checklist of the vascular plants of the marshes and included higher lands of St. Bernard Parish, Louisiana: Louisiana Academy of Sciences, v. 24, p. 56-70.

    Keywords: vascular plants, checklist

675. Lemmon, B.E., 1966, An ecological and floristic study of the mosses of Lafayette Parish, Louisiana: Louisiana Academy of Sciences, v. 24, p. 23-26.

    Mosses were collected in Lafayette Parish during all seasons for a 2-year period. An annotated check list of 91 taxa includes 45 taxa reported as new to Lafayette Parish. A geological description of the parish is presented; the four types of bryological habitats and the mosses of each are described. No correlation was found between the moss flora of Lafayette Parish and the geological history of the areas in which the mosses occur. Throughout the parish mosses occur wherever their habitat requirements are satisfied.

    Keywords: checklist, habitat, ecology

676. Lenhart, J.D., Lee, J.T., and Londo, H.A., 1995, Bulk-Density of Bottomland Hardwoods in East Texas and West Louisiana: Forest Products Journal, v. 45, no. 10, p. 85-88.

To assist in merchandising certain hardwood trees growing in East Texas and West Louisiana hardwood bottomlands, two measures of bulk density were determined for red oak species, white oak species, and sweetgum trees. One value was the weight (in pounds) of a cubic foot of green wood, and the other value was the green weight of a cubic foot of wood and bark. Average bulk densities were calculated by five classes of diameter at breast height (DBH) according to five 9-foot stem segment positions above the stump up to 45 feet above the stump. In general, for a given species and DBH class, stem position did not significantly influence bulk density values, however bulk density values tended to increase with higher positions on the stem. Likewise, for a given species and stem position, DBH class usually did not significantly affect bulk density, but weight values tended to be heavier with increasing tree size. Bulk density was different between the three species.

Keywords: vascular plants, productivity, freshwater

677. Leone, H.L., Jr., 1976, Analyses of water, core material, and elutriate samples collected near New Orleans, Louisiana (Lake Pontchartrain, Louisiana, and vicinity hurricane protection project): U.S. Geological Survey Open-File Report 76-758, 22 p.

Keywords: surface water, freshwater, chemistry, sediment, contaminants

678. Leone, H.L., Jr., 1977, Analyses of water, core material, and elutriate samples collected near Buras, Louisiana (New Orleans to Venice, Louisiana, hurricane protection project): U.S. Geological Survey Open-File Report 77-310, 14 p.

Keywords: surface water, freshwater, chemistry, sediment, contaminants

679. Leone, H.L., Jr., 1977, Analyses of water, core material, and elutriate samples collected near Galliano, Louisiana (Larose to Golden Meadow, Louisiana, hurricane protection project): U.S. Geological Survey Open-File Report 77-576, 12 p.

Keywords: surface water, freshwater, chemistry, sediment, contaminants

680. Lessmann, J.M., Mendelssohn, I.A., Hester, M.W., and McKee, K.L., 1997, Population variation in growth response to flooding of three marsh grasses: Ecol. Eng., v. 8, no. 1, p. 31-47.

Comparative studies were conducted to evaluate intraspecific variation in leaf elongation and biomass partitioning in response to flooding stress in populations of *Spartina alterniflora*, *S. patens*, and *Panicum hemitomon*. These populations were collected along the Louisiana and Texas coast and grown for four to six vegetative propagations in the greenhouse.

Keywords: estuarine, vascular plants, physiology

681. Letter, J.V., 1993, Grand and White Lakes flood control project. Final Report: Rept. No: WESCRHL9311, 124 p.

The Grand and White Lakes flood control project provides protection over a broad portion of the Louisiana coastline. Numerical modeling techniques capable of addressing the flood routing and salinity intrusion processes required to evaluate project alternatives were developed.

Keywords: estuarine, hydrology, model

682. Levin, D.R., 1993, Tidal inlet evolution in the Mississippi River delta plain: Journal of Coastal Research, v. 9, no. 2, p. 462-480.

This study presents the argument that temporal changes in tidal prism and sediment supply results in a sequential change of inlet morphology. This inlet evolution is noted during the abandonment phase of individual delta lobes of the Mississippi River.

Keywords: geomorphology, sediment, hydrology

683. Levine, W.C., and Griffin, P.M., 1993, Vibrio infections on the Gulf Coast—Results of first year of regional surveillance: J. Infect. Dis., v. 167, no. 2, p. 479-483.

In 1989, the first year of coordinated Vibrio surveillance in four Gulf Coast states (Alabama, Florida, Louisiana, and Texas), 121 infections were reported.

Keywords: estuarine, microbiology

684. Lewis, A.J., 1975, Remote sensing of the Atchafalaya Basin: Abstracts with Programs – Geological Society of America, v. 7, no. 2, 184 p.

Keywords: surface water, freshwater, GIS

685. Li, Y.H., Burkhardt, L., and Teraoka, H., 1984, Desorption and coagulation of trace elements during estuarine mixing: Geochimica et Cosmochimica Acta, v. 48, no. 10, p. 1879-1884.

Keywords: estuarine, trace elements, sediment

686. Lin, H.J., Martin, W.D., and Richards, D.R., 1990, Dredging alternatives study, Cubits Gap, lower Mississippi River. Report 2. TABS-2 numerical model investigation, v. 1, Main text and appendix A: Tech. Rep. U.S. Army Eng. Waterways Exp. Stn., 56 p.

This report presents results from a numerical model investigation. The primary objective of the mathematical models was to determine the best method to control shoaling in the navigation channel between Cubits Gap and Head of Passes in Louisiana.

Keywords: sediment, hydrology, management

687. Lin, H.J., Martin, W.D., and Richards, D.R., 1990, Dredging alternatives study, Cubits Gap, lower Mississippi River. Report 2. TABS-2 numerical model investigation, v. 2, Appendix B: Tech. Rep. U.S. Army Eng. Waterways Exp. Stn., 26 p.

This investigation of the Mississippi River in Louisiana used the TABS-2 finite element numerical model RMA-2V for hydrodynamic analysis and STUDH for sediment transport computation. A large-flow, 87-day hydrograph was used to determine the performance of each plan.

Keywords: model, sediment, hydrology

688. Lin, Q., and Mendelssohn, I.A., 1998, The combined effects of phytoremediation and biostimulation in enhancing habitat restoration and oil degradation of petroleum contaminated wetlands: Ecological Engineering, v. 10, no. 3, p. 263-274.

The combined effects of biostimulation and phytoremediation, as a means of post-oil spill habitat restoration and enhancement of oil degradation in the soil were evaluated. Marsh sods of *Spartina alterniflora* and *Spartina patens* were dosed with 0, 4, 8, 16 and 24 l/m^2 of south Louisiana crude oil in the greenhouse. Plants were killed at oil dosages of 8 l/m^2 in the growing season following oil application. Two years after application of the oil, *S. alterniflora* and *S. patens* individuals were transplanted into the oiled and unoiled sods. Fertilizer was applied 1 and 7 months after transplantation.

Keywords: vascular plants, petroleum, nutrients

689. Lin, Qianxin, and Mendelssohn, I.A., 1996, A comparative investigation of the effects of south Louisiana crude oil on the vegetation of fresh, brackish, and salt marshes: Mar. Pollut. Bull., v. 32, no. 2, p. 202-209.

The impact of south Louisiana crude oil on the dominant vegetation, *Spartina alterniflora*, *Spartina patens*, and *Sagittaria lancifolia*, found in the three types of coastal wetlands, salt, brackish, and freshwater marshes, respectively, was studied.

Keywords: estuarine, contaminants, vascular plants, freshwater

690. Lindau, C.W., 1994, Methane emissions from Louisiana rice fields amended with nitrogen fertilizers: Soil Biology and Biochemistry, v. 26, no. 3, p. 353-359.

Methane emissions and dissolved CH_4 concentrations were measured from a flooded Louisiana rice field. Treatment plots contained the early long-term cultivar Lacassine,

drill-seeded into a Crowley silt loam (Typic Albaqualfs). Before flooding urea, ammonium sulfate and potassium nitrate were applied at 0, 60 or 120 kg N/ha and CH_4 fluxes were measured twice a week until harvest. Dissolved CH_4 concentrations in vertical floodwater-soil profiles (with or without plants) were measured during the early, middle and late growing season. No positive correlations were observed between seasonal soil temperatures (0, 5 and 10 cm depths) and fluxes. Dissolved concentrations increased during the growing season and concentrations as high as 245 mu M were measured in unplanted plots ca 3 weeks before harvest.

Keywords: nutrients, chemistry, agriculture, management, freshwater

691. Lindau, C.W., Alford, D.P., Bollich, P.K., and Linscombe, S.D., 1994, Inhibition of methane evolution by calcium sulfate addition to flooded rice: Plant and Soil, v. 158, no. 2, p. 299-301.

Calcium sulfate, a common soil amendment was applied at rates of 0, 1,000 and 2,000 kg/ha to flooded rice plots treated with urea-N (128 kg/ha). Experimental plots were drill-seeded with Toro-2, a mid-season long-grain rice cultivar, and CH_4 emissions were measured over the first cropping season. Over the 70 d sampling season, the low and high rate of $CaSO_4$ reduced CH_4 evolution 29 and 46%, respectively, compared to control plots. No significant correlation between soil temperature (0, 5, 10 cm depths) and CH_4 emission was observed.

Keywords: agriculture, nutrients, chemistry, freshwater

692. Lindau, C.W., and DeLaune, R.D., 1991, Dinitrogen and nitrous oxide emission and entrapment in *Spartina alterniflora* saltmarsh soils following addition of N-15 labelled ammonium and nitrate: Estuarine, Coastal and Shelf Science, v. 32, no. 2, p. 161-172.

Sediment cores were collected from a *Spartina alterniflora* saltmarsh (dormant season) located in Barataria Basin, Louisiana, U.S.A. Highly N-15 labelled ammonium and nitrate sources were added and gaseous emission and entrapment of $15N_2$ and N_2O resulting from nitrification/denitrification in the flooded sediments were investigated over 33 days.

Keywords: nutrients, vascular plants, estuarine, sediment, physiology

693. Lindau, C.W., DeLaune, R.D., and Alford, D.P., 1997, Monitoring nitrogen pollution from sugarcane runoff using ^{15}N analysis: Water, Air, Soil Pollut., v. 98, no. 3-4, p. 389-399.

This field study assesses the input of fertilizer N, applied to sugarcane fields, to forested wetlands. The potential use of natural abundance variations in ^{15}N / ^{14}N ratios for identification and tracing surface water N sources (NH_4^+ and NO_3^-) was evaluated. Runoff and surface water samples were collected from sugarcane fields and bordering

forested wetlands over a 16 month period and analyzed for NH_4^+ - N, NO_3^- - N, and associated NH_4^+ - delta ^{15}N and NO_3^- - delta ^{15}N ratios.

Keywords: surface water, freshwater, nutrients, agriculture, chemistry

694. Lindau, C.W., DeLaune, R.D., and Pardue, J.H., 1994, Inorganic nitrogen processing and assimilation in a forested wetland: Hydrobiologia, v. 277, no. 3, p. 171-178.

A field study was conducted to assess the capacity of a lower Mississippi Valley, USA forested wetland to process and assimilate inorganic N. Elevated levels of N-15 labeled NH sub(4+)- and NO sub(3-)-N concentrations in the floodwater were measured over a 67 day study period. Results are given which show the forested wetland soil can remove significant quantities of NH sub(4+) and NO sub(3-) from the surface water by assimilation and denitrification processes.

Keywords: freshwater, riparian, vascular plants, nutrients, physiology

695. Lindeman, P.V., 1999, Surveys of basking map turtles *Graptemys* spp. in three river drainages and the importance of deadwood abundance: Biological Conservation, v. 88, no. 1, p. 33-42.

Eight replicated spotting-scope surveys of basking turtles and deadwood were conducted in the Pearl and Pascagoula River drainages in Mississippi and Louisiana and the lower Tennessee River in Kentucky.

Keywords: debris, reptiles, freshwater, ecology, habitat

696. Liner, E.A., 1954, The herpetofauna of Lafayette, Terrebonne and Vermilion Parishes, Louisiana: The Louisiana Academy of Sciences, v. 27, p. 65-85.

The survey includes specimens collected by the author except the Lake Arthur specimens which are part of the Tulane collection.

Keywords: reptiles, checklist

697. Liu, H., and Avault, J.W., Jr., 1996, Effect of nitrite on growth of juvenile red swamp crawfish, *Procambarus clarkii*: J. Shellfish Res., v. 15, no. 3, p. 759-761.

The authors' preliminary study evaluated the chronic effect of nitrite on juvenile red swamp crawfish.

Keywords: surface water, freshwater, nutrients, macroinvertebrates, physiology

698. Llewellyn, D.W., and Shaffer, G.P., 1993, Marsh restoration in the presence of intense herbivory—The role of *Justicia lanceolata* (Chapm.) small: Wetlands, v. 13, no. 3, p. 176-184.

The present study was undertaken to elucidate the potential in wetlands restoration of Justicia lanceolata, a wetland plant that is resistant to herbivory by nutria.

Keywords: surface water, freshwater, ecology, vascular plants

699. Llewellyn, D.W., Shaffer, G.P., Craig, N.J., Creasman, L., Pashley, D., Swan, M., and Brown, C., 1996, A decision-support system for prioritizing restoration sites on the Mississippi River alluvial plain: Conservation Biology, v. 10, no. 5, p. 1446-1455.

    Conversion of forest wetlands to agricultural use and the resulting fragmentation of the landscape has led to concerns for the functional integrity of the Mississippi River Alluvial Plain ecosystem. The authors describe an effort spearheaded by the Nature Conservancy to initiate a multi-decade partnership dedicated to creating and implementing a viable, cooperative, landscape-level restoration project in the Mississippi River Alluvial Plain.

    Keywords: surface water, freshwater, agriculture, management, wetland loss

700. Lock, B.E., 1993, The proposed Cade II Landfill site, South Louisiana; threat to the Chicot Aquifer, *in* Anonymous, Gulf Coast Association of Geological Societies and Gulf Coast Section of SEPM meeting (AAPG Gulf Coast Section): AAPG Bulletin, v. 77, no. 9, p. 1593.

    Keywords: groundwater, contaminants, freshwater

701. Long, R.A., 1962, Water, *in* St. Charles Parish Resources and Facilities: Louisiana Department of Public Works and St. Charles Parish Development Board, p. 26-35.

    Keywords: groundwater, freshwater, surface water

702. Long, R.A., 1965, Feasibility of a scavenger-well system as a solution to the problem of vertical saltwater encroachment: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Pamphlet no. 15, 27 p.

    Keywords: groundwater, contaminants, freshwater, management

703. Long, R.A., 1965, Ground water in the Geismar-Gonzales area, Ascension Parish, Louisiana: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Bulletin no. 7, 67 p.

    Keywords: groundwater, surface water

704. Long, R.A., [1965], Water, *in* Iberville Parish Resources and Facilities: Louisiana Department of Public Works and Iberville Parish Development Board, p. 26-29.

Keywords: groundwater, surface water

705. Louisiana Academy of Sciences, 1949, Studies on the fauna and flora of Cypress Lake: The Louisiana Academy of Sciences, v. 12, p. 34-37.

Keywords: checklist, vascular plants, fish

706. Louisiana Department of Environmental Quality, 1993, Nonpoint source pollution in State of Louisiana water quality management plan, v. 6, pt. B: Baton Rouge, Louisiana, Louisiana Department of Environmental Quality, Office of Water Resources, Water Quality Management Division, 334 p.

Keywords: surface water, freshwater, contaminants

707. Louisiana Department of Health and Hospitals, 1990, Health assessment for Petro-Processors of Louisiana Incorporated, Scotlandville, East Baton Rouge Parish, Louisiana, Region 6: CERCLIS no. LAD057482713, 23 p.

The Petro-Processors of Louisiana, Inc. (PPI) site, located in Scotlandville, East Baton Rouge Parish, Louisiana, is on the NPL of CERCLA. Until remedial action is taken at the site, concern for public health stems from: (1) the volatilization of contaminants during remedial activities; (2) ingestion of fish and wildlife contaminated with hexachlorobenzene and hexachlorobutadiene; (3) the potential of groundwater contamination from agents present on-site; and (4) dermal contact with contaminated sediments off-site.

Keywords: surface water, freshwater, contaminants, groundwater

708. Louisiana Ground Water Advisory Group, 1985, Ground water protection in Louisiana; Problems and options: 122 p.

Keywords: groundwater, management

709. Louisiana Office of Tourism, 1998, Birds of Louisiana: Louisiana Dept. of Culture, Recreation & Tourism, Office of Tourism, 36 p.

Keywords: birds, checklist

710. Lovelace, J.K., 1991, Water use and trends for withdrawals from the lower Mississippi River in southeastern Louisiana, 1990, *in* Dhamotharau, Dhamo, Resource development of the Lower Mississippi River; symposium papers: American Water Resources Association Technical Publication Series TPS, v. 91-3, p. 205-213.

Keywords: surface water, freshwater, hydrology, management

711. Lovelace, J.K., 1991, Water use in Louisiana, 1990: Louisiana Department of Transportation and Development Water Resources Special Report no. 6, 131 p.

Keywords: surface water, freshwater, management

712. Lovelace, J.K., 1994, Storm-tide elevations produced by Hurricane Andrew along the Louisiana coast, August 25-27, 1992: U.S. Geological Survey Open-File Report 94-371, 45 p., 12 pls.

Keywords: estuarine, hydrology

713. Lovelace, J.K., 1994, Water requirements for crawfish farming at selected sites in south-central Louisiana, 1992-94: Louisiana Department of Transportation and Development Water Resources Special Report no. 8, 12 p.

Keywords: surface water, freshwater, macroinvertebrates, aquaculture, management, groundwater

714. Lovelace, J.K., 1998, Distribution of saltwater in the Chicot aquifer system in the Calcasieu Parish area, Louisiana, 1995-96: Louisiana Department of Transportation and Development Water Resources Technical Report no. 62, 59 p.

Keywords: groundwater, salinity

715. Lovelace, J.K., and Johnson, P.M., 1996, Water use in Louisiana, 1995: Louisiana Department of Transportation and Development Water Resources Special Report no. 11, 127 p.

Keywords: groundwater, surface water, freshwater, management

716. Lovelace, J.K., and Lovelace, W.M., 1995, Hydrogeologic unit nomenclature and computer codes for aquifers and confining units in Louisiana: Louisiana Department of Transportation and Development Water Resources Special Report no. 9, 12 p.

Keywords: groundwater

717. Lowe, A.S., [1965], Floods of 1964 near Baton Rouge, Louisiana: U.S. Geological Survey Open-File Report, 1 p.

Keywords: surface water, freshwater, hydrology

718. Lowe, A.S., 1975, Floods in East Baton Rouge Parish and adjacent areas, Louisiana, for the period 1953-74: U.S. Geological Survey Water-Resources Investigations Report 44-74, 12 p.

Keywords: surface water, freshwater, hydrology

719. Lowe, A.S., 1979, Magnitude and frequency of floods for small watersheds in Louisiana: Louisiana Department of Transportation and Development, Office of Highways Research Study no. 65-2H, 52 p.

Keywords: surface water, freshwater, hydrology

720. Lowe, A.S., 1980, Flood depth-frequency relations for Louisiana: Louisiana Department of Transportation and Development, Office of Public Works Water Resources Technical Report no. 23, 14 p.

Keywords: surface water, freshwater, hydrology

721. Ludwig, A.H., 1974, Quality of water in the Red River alluvial aquifer, Shreveport to the mouth of the Black River, Louisiana: U.S. Geological Survey Open-File Report, 7 p.

Keywords: groundwater, chemistry, contaminants

722. Ludwig, A.H., 1979, Preconstruction and postconstruction ground-water levels, Lock and Dam 1, Red River Valley, Louisiana: U.S. Geological Survey Open-File Report 79-918, 17 p.

Keywords: groundwater, hydrology

723. Ludwig, A.H., 1979, Preconstruction and postconstruction ground-water levels, Lock and Dam 2, Red River Valley, Louisiana: U.S. Geological Survey Open-File Report 79-919, 18 p.

Keywords: groundwater, hydrology

724. Ludwig, A.H., and Terry, J.E., 1980, Methods and applications of digital-model simulation of the Red River alluvial aquifer, Shreveport to the mouth of the Black River, Louisiana: U.S. Geological Survey Water-Resources Investigations Report 79-114, 103 p.

Keywords: groundwater, model, hydrology

725. Lundegard, P.D., Land, L.S., MacGowan, D.B., and Surdam, R.C., 1993, Carboxylic acid anions in formation waters, San Joaquin Basin and Louisiana Gulf Coast, U.S.A.; implications for clastic diagenesis; discussion and reply: Applied Geochemistry, v. 8, no. 3, p. 297-304.

Keywords: groundwater, geology, chemistry

726. Lurry, D.L., 1983, Analyses of native water, bottom material, elutriate samples, and dredged material from selected southern Louisiana waterways and selected areas in the Gulf of Mexico, 1979-81: U.S. Geological Survey Open-File Report 82-690, 105 p.

Keywords: estuarine, surface water, freshwater, chemistry, sediment

727. Lurry, D.L., 1987, Pumpage of water in Louisiana, 1985: Louisiana Department of Transportation and Development, Office of Public Works Water Resources Special Report no. 4, 14 p.

Keywords: groundwater, management

728. Lurry, D.L., 1987, Pumpage of water in Louisiana, 1985: U.S. Geological Survey Water-Resources Investigations Report 87-4059, 1 sheet.

Keywords: groundwater, management

729. MacGowan, D.B., and Surdam, R.C., 1990, Carboxylic acid anions in formation waters, San Joaquin Basin and Louisiana Gulf Coast, U.S.A.; implications for clastic diagenesis, *in* Kharaka, Y.K., and Barnes, H.L., Water-rock interactions: Applied Geochemistry, v. 5, no. 5-6, p. 687-701.

Keywords: groundwater, chemistry, geology

730. Macpherson, G.L., 1989, Sources of lithium and barium in Gulf of Mexico basin formation waters, USA: Proceedings of the 6th International Symposium on Water-Rock Interaction, p. 453-456.

Keywords: groundwater, chemistry

731. Macpherson, G.L., 1993, Mg and Ca during burial of sea water; relation to salt dissolution and other water-rock interaction, *in* Anonymous, Geological Society of America, 1993 annual meeting: Abstracts with Programs--Geological Society of America, v. 25, no. 6, p. 253.

Keywords: groundwater, chemistry, geology

732. Macpherson, G.L., Farr, M.R., and Posey, H.H., 1988, Rare earth element concentrations in formation waters, Gulf Coast sedimentary basin: Abstracts--SEPM Midyear Meeting, v. 5, p. 33.

Keywords: groundwater, chemistry

733. Macpherson, G.L., and Land, L.S., 1989, Boron in saline brines, Gulf of Mexico sedimentary basin, USA: Proceedings of the 6th International Symposium on Water-Rock Interaction, p. 457-460.

Keywords: groundwater, chemistry

734. MacRoberts, D.T., 1984, The vascular plants of Louisiana—An annotated checklist and bibliography of the vascular plants reported to grow without cultivation in Louisiana: Museum of Life Sciences, Louisiana State University in Shreveport.

Keywords: vascular plants, checklist

735. Madden, C.J., and Day, J.W., Jr., 1992, Induced turbulence in rotating bottles affects phytoplankton productivity measurements in turbid waters: Journal of Plankton Research, v. 14, no. 8, p. 1171-1191.

Enclosing phytoplankton in bottles to measure photosynthesis imposes an artificial environment on the sample that can influence rate processes. The absence of turbulence inside incubation bottles can affect productivity measurements by altering both the irradiance level and sedimentation rates of confined cells and particles. In Fourleague Bay, LA, a turbid lagoon-estuary, we compared productivity measurements in motionless bottles to those in bottles that were continuously rotated at 15 r.p.m. to prevent the sedimentation of bottle contents. Productivity differed significantly in rotating and non-rotating treatments. Integrated production rates were overestimated in non-rotated samples by up to 95%, demonstrating the importance of maintaining a cell-particle suspension which approximates that in situ when measuring productivity in turbid systems.

Keywords: algae, methods, productivity

736. Madden, J.D., 1989, Xenobiotic residues in Louisiana crayfish tissues and their environs: Diss. Abst. Int. Pt. B – Sci. & Eng., v. 49, no. 8, 175 p.

Two commercially important species of Louisiana crayfish, *Procambarus clarkii* and *P. acutus acutus*, from the Atchafalaya River basin and from open ponds, as well as sediment and water from these environs, were sampled at three times during two consecutive fishing seasons. The abdominal muscle and hepatopancreatic tissue were digested with nitric acid; the sediment was dried prior to digestion with hydrofluoric acid and aqua regia; and the water was filtered prior to analysis by inductively coupled plasma emission spectrometry (ICP) for As, Cd, Cu, Cr, Hg, Pb, and Ni. Using the standard U.S. FDA Pesticide Analysis Manual and AOAC Standard Methods for the clean-up and extraction of organochlorine pesticides from tissues, sediment, and water, DDT, DDD, DDE, aldrin, dieldrin, endrin, heptachlor, heptachlor epoxide, and Mirex were targeted.

Keywords: surface water, freshwater, macroinvertebrates, contaminants

737. Madigosky, S.R., Alvarez-Hernandez, X., and Glass, J., 1991, Lead, cadmium, and aluminum accumulation in the red swamp crayfish *Procambarus clarkii* G. collected

from roadside drainage ditches in Louisiana: Archives of Environmental Contamination and Toxicology, v. 20, no. 2, p. 253-258.

The concentration of Pb, Cd, and Al in tissues of crayfish *Procambarus clarkii* were evaluated from several wetland sites located adjacent to roadways and were compared to crayfish harvested from a commercial site free from roadside influences. Abdominal muscle, hepatopancreas, alimentary tract, exoskeleton and blood were analyzed for metal content. Results indicated that levels of contamination obtained in almost all tissues of crayfish from roadside ditches contained significantly higher amounts of metals than those of the commercially harvested control crayfish.

Keywords: trace elements, macroinvertebrates, urban, chemistry

738. Madigosky, S.R., Alvarez-Hernandez, X., and Glass, J., 1992, Concentrations of aluminum in gut tissues of crayfish (*Procambarus clarkii*), purged in sodium chloride: Bull. Environ. Contam. Toxicol., v. 49, no. 4, p. 625-632.

The objectives of this study were to 1) document the amount of Al found in water, soil, and gut tissues of crayfish collected from a roadside wetland site, 2) determine the effect of NaCl purging on the release of Al in the crayfish and 3) assess the differences in Al levels found between stomach tissue, stomach contents, intestine tissue, and intestine contents.

Keywords: surface water, freshwater, trace elements, macroinvertebrates, physiology

739. Maher, J.C., 1939, Fluoride in the ground water of Avoyelles and Rapides Parishes, Louisiana: Louisiana Department of Conservation Geological Pamphlet no. 1, 23 p.

Keywords: groundwater, chemistry

740. Maher, J.C., 1940, Ground-water resources of Rapides Parish, Louisiana: Louisiana Department of Conservation Geological Bulletin 17, 100 p.

Keywords: groundwater

741. Maher, J.C., 1940, Preliminary report on ground-water conditions at Alexandria, Louisiana: Louisiana Department of Conservation Geological Pamphlet no. 2, 54 p.

Keywords: groundwater, chemistry

742. Maher, J.C., 1942, Ground-water conditions at Camp Livingston, Camp Beauregard, and Esler Field, Louisiana: U.S. Geological Survey Open-File Report, 51 p.

Keywords: groundwater, chemistry

743. Maher, J.C., 1942, Memorandum on ground-water conditions in the Alexandria area: U.S. Geological Survey Open-File Report, 3 p.

Keywords: groundwater, chemistry

744. Maher, J.C., 1943, Ground water and its relation to Louisiana's war effort, *in* Louisiana Conservationist, February 1943: Louisiana Department of Conservation, v. 1, no. 3, p. 7-8.

Keywords: groundwater

745. Maher, J.C., 1943, Summary and review of ground-water levels in Louisiana during 1942, *in* Louisiana Conservationist, March 1943: Louisiana Department of Conservation, v. 1, no. 4, p. 1, 5.

Keywords: groundwater

746. Maher, J.C., 1945, Ground-water geology of Camp Polk and North Camp Polk, Louisiana: Bulletin of the American Association of Petroleum Geologists, v. 29, no. 8, p. 1169-1188.

Keywords: groundwater, geology

747. Maher, J.C., Guyton, W.F., Drescher, W.J., and Jones, P.H., 1955, Ground-water conditions at Camp Polk and North Camp Polk, Louisiana: U.S. Geological Survey Open-File Report, 67 p.

Keywords: groundwater, chemistry

748. Maher, J.C., and Jones, P.H., 1945, Ground-water exploration at Alexandria, Louisiana: Economic Geology, v. 40, no. 3, May 1945, p. 164-182.

Keywords: groundwater

749. Maher, J.C., and Stanley, T.B., Jr., 1940, Progress of ground-water investigations in Louisiana, *in* Louisiana Conservation Review, winter, 1939-40: Louisiana Department of Conservation, p. 35-38.

Keywords: groundwater

750. Maher, J.C., and Stanley, T.B., Jr., 1940, Louisiana, *in* Water levels and artesian pressure in observation wells in the United States in 1939: U.S. Geological Survey Water-Supply Paper 886, p. 228-251.

Keywords: groundwater, hydrology

751. Mallard, G.E., 1988, U.S. Geological Survey Toxic Substances Hydrology Program, Surface-water Contamination--Proceedings of the technical meeting, Denver, Colorado, February, 2-4, 1987: U.S. Geological Survey Open File Report 87-0764, 161 p.

Keywords: surface water, freshwater, contaminants

752. Malone, R.F., Tittlebaum, M.E., Crane, S.M., Sanders, N.S., and Alston, S.R., 1980, Water related problems in the coastal zone of Louisiana: Technical Report--Louisiana Water Resources Research Institute, v. 7, 151 p.

Keywords: estuarine

753. Maples, R.S., 1982, Bluegreen algae of a coastal salt panne and surrounding angiosperm zones in a Louisiana salt marsh: Northeast Gulf Sci., v. 5, no. 2, p. 39-43.

Keywords: estuarine, algae, vascular plants

754. Maples, R.S., Cruze, M.D., and Donahoe, R., 1983, Observations on "red tide" organisms in coastal waters of southwestern Louisiana: Northeast Gulf Sci., v. 6, no. 2, p. 157-160.

Keywords: algae, estuarine

755. Maples, R.S., Jr., and Lates, D.D., 1966, A checklist of fern in Lincoln Parish, Louisiana: American Fern Journal, v. 56, no. 1, p. 33-36.

Keywords: vascular plants, checklist

756. Marie, J.R., 1971, Ground-water resources of Avoyelles Parish, Louisiana: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Bulletin no. 15, 70 p.

Keywords: groundwater

757. Marlin, Don, and Schramm, Bill, 1995, Thermohaline pore water trends of southeastern Louisiana; Geologic applications and control on fluid movement, *in* Anonymous, AAPG Gulf Coast Section meeting; abstracts: AAPG Bulletin, v. 79, no. 10, p. 1563.

Keywords: groundwater, geology

758. Marlin, Don, and Schramm, W.H., 1995, Thermohaline pore water trends of southeastern Louisiana; natural, anthropogenic, or unjustified environmental fear?, *in* Anonymous, American Association of Petroleum Geologists 1995 annual convention: Annual Meeting Abstracts--American Association of Petroleum Geologists and Society of Economic Paleontologists and Mineralogists, v. 4, p. 60.

Keywords: groundwater

759. Marshall, D.L., Kim, J.J., and Donnelly, S.P., 1996, Antimicrobial susceptibility and plasmid-mediated streptomycin resistance of *Plesiomonas shigelloides* isolated from blue crab: J. Appl. Bacteriol., v. 81, no. 2, p. 195-200.

Five Plesiomonas shigelloides strains isolated from retail or wild catch Louisiana blue crabs were examined for resistance to selected antibiotics and presence of plasmids.

Keywords: estuarine, microbiology

760. Marshall, S.L., 1978, Index to water-resources data for Louisiana, ground-water records: Louisiana Department of Transportation and Development, Office of Public Works Water Resources Basic Records Report no. 9, 176 p.

Keywords: groundwater

761. Marten, G.G., Bordes, E.S., and Nguyen, M., 1994 Use of cyclopoid copepods for mosquito control: Ecology and Morphology of Copepods, Hydrobiologia, v. 292-293, p. 491-496.

The New Orleans Mosquito Control Board mass produces *Mesocyclops longisetus* and *Macrocyclops albidus* for introduction to mosquito breeding sites as a routine part of control operations. *Mesocyclops longisetus* is used in tires that collect rainwater; M. albidus is used in temporary pools. Field trials in a *Spartina* marsh, rice fields, and residential roadside ditches in Louisiana suggest that *M. longisetus* and *M. albidus* could be of use to control larvae of *Anopheles* spp. and *Culex quinquefasciatus*. *Mesocyclops longisetus* has proved to be effective for *Aedes aegypti* control in cisterns, 55-gallon drums, and other domestic containers in Honduras.

Keywords: freshwater, macroinvertebrates, ecology, management

762. Martens, L.A., and Neely, B.L., Jr., 1970, Tributary to the Intracoastal Waterways at Interstate Highway 10 near Port Allen, Louisiana: U.S. Geological Survey Open-File Report, 4 p.

Keywords: surface water, freshwater

763. Martens, L.A., and others, 1974, Time of travel of solutes in Mississippi River from Baton Rouge to Pointe a la Hache, Louisiana: Louisiana Department of Public Works Water Resources Technical Report no. 9, 1 sheet.

Keywords: surface water, freshwater, hydrology

764. Martin, Angel, Jr., and Early, D.A., 1987, Statistical analysis of aquifer-test results for nine regional aquifers in Louisiana: U.S. Geological Survey Water-Resources Investigations Report 87-4001, 26 p.

Keywords: groundwater, freshwater

765. Martin, Angel, Jr., and Whiteman, C.D., Jr., 1985, Map showing generalized potentiometric surface of aquifers of Pleistocene Age, southern Louisiana, 1980: U.S. Geological Survey Water-Resources Investigations Report 84-4331, 1 sheet.

Keywords: groundwater, freshwater, hydrology

766. Martin, Angel, Jr., and Whiteman, C.D., Jr., 1985, Map showing generalized potentiometric surface of the Evangeline and equivalent aquifers in Louisiana, 1980: U.S. Geological Survey Water-Resources Investigations Report 84-4359, 1 sheet.

Keywords: groundwater, freshwater, hydrology

767. Martin, Angel, Jr., and Whiteman, C.D., Jr., 1989, Geohydrology and regional ground-water flow of the coastal lowlands aquifer system in parts of Louisiana, Mississippi, Alabama, and Florida--A preliminary analysis: U.S. Geological Survey Water-Resources Investigations Report 88-4100, 88 p.

Keywords: groundwater, hydrology, freshwater

768. Martin, Angel, Jr., and Whiteman, C.D., Jr., 1990, Calibration and sensitivity analysis of a ground-water flow model of the coastal lowlands aquifer system in parts of Louisiana, Mississippi, Alabama, and Florida: U.S. Geological Survey Water-Resources Investigations Report 89-4189, 54 p.

Keywords: groundwater, model, hydrology, freshwater

769. Martin, Angel, Jr., and Whiteman, C.D., Jr., 1991, Hydrology of the coastal lowlands aquifer system in parts of Alabama, Florida, Louisiana, and Mississippi: U.S. Geological Survey Open-File Report 91-72, 115 p.

This study is limited to that part of the aquifer system containing water with 10,000 mg/l or less dissolved solids. Prior to development, flow in the aquifer system was primarily from upland outcrop areas in southwestern Mississippi and central and southeastern Louisiana toward lowlands along the coast and in the major river valleys.

Keywords: groundwater, freshwater, hydrology

770. Martinez, J.D., 1967, The recent alluvium of Thomas and Duncan Points; A geologic evaluation of the Mississippi River alluvium as a potential source of ground water supply for the Baton Rouge area, Louisiana: Coastal Studies Institute – Louisiana State University – Technical Report, 24 p.

Keywords: groundwater, geology

771. Martinez, J.D., and Thoms, R.L., 1977, Hydrologic isolation of mined openings in salt domes--An investigation of the utility of Gulf Coast salt domes for the storage or disposal of radioactive wastes: Office of Waste Isolation, no. Y/OWI/SUB-4112/37, p. 161-206.

Keywords: groundwater, hydrology, contaminants

772. Masscheleyn, P.H., Pardue, J.H., DeLaune, R.D., and Patrick, W.H., 1992, Chromium redox chemistry in a lower Mississippi Valley bottomland hardwood wetland: Environmental Science and Technology, v. 20, no. 6, p. 1217-1226.

Experiments were conducted to identify and quantify biogeochemical processes controlling chromium redox chemistry in a seasonally flooded Lower Mississippi Valley forested wetland (Spring Bayou Wildlife Management Area, Avoyelles Parish, Louisiana). Chromium speciation, transformations, and solubility were studied in the overlying floodwater column and in the wetland soil.

Keywords: surface water, freshwater, trace elements, chemistry, physiology

773. Masscheleyn, P.H., Pardue, J.H., DeLaune, R.D., and Patrick, W.H., Jr., 1992, Phosphorus release and assimilatory capacity of two Lower Mississippi Valley freshwater wetland soils: Water Resources Bulletin, v. 28, no. 4, p. 763-773.

Keywords: freshwater, nutrients, physiology, riparian

774. Mathies, P.S., Holmes, W.C., and Allen, A.S., 1983, The vascular flora of Cunningham Brake, A cypress-gum swamp in Natchitoches Parish, Louisiana: Castanea, v. 48, no. 1, p. 24-31.

Keywords: checklist, vascular plants, freshwater

775. McAnally, W.H., and Pritchard, D.W., 1997, Salinity control in the Mississippi River under drought flows: J. Waterway Port Coast. Ocean Eng., v. 123, no. 1, p. 34-40.

The U.S. Army Corps of Engineers employed one-dimensional and two-dimensional numerical models to design a temporary underwater sill that would limit potential upstream salinity intrusion during the record low-flow conditions encountered on the Mississippi River in 1988.

Keywords: surface water, freshwater, hydrology, chemistry

776. McBride, R.A., Penland, Shea, and Mestayer, J.T., 1992, Facies architecture of the Bayou Grand Caillou area; an abandoned shallow water delta of the Mississippi River delta plain, *in* Williams, S.J., Cichon, H.A., Westphal, K.A., and Ramsey, K.E., Representative publications from the Louisiana Barrier Island Erosion Study: U.S. Geological Survey Open-File Report 92-0530, p. 297-305.

Keywords: geomorphology, sediment

777. McDowell, L.L., Willis, G.H., Murphree, C.E., Southwick, L.M., and Smith, S., 1981, Toxaphene and sediment yields in runoff from a Mississippi Delta watershed: Journal of Environmental Quality, v. 10, no. 1, p. 120-125.

Keywords: surface water, freshwater, sediment, contaminants

778. McGee, B.D. 1997, Occurrence of nitrate in the Mississippi River alluvial aquifer in Louisiana, June through December 1993: Louisiana Department of Transportation and Development Water Resources Technical Report no. 61, 21 p.

Keywords: freshwater, nutrients, groundwater

779. McGee, B.D., and Demcheck, D.K., 1995, Occurrence and estimation of trace elements in bottom material for selected streams in coastal Louisiana, 1991-92: Louisiana Department of Transportation and Development Water Resources Technical Report no. 57, 49 p.

Keywords: surface water, freshwater, trace elements, sediment

780. McGinnis, L.D., Thompson, M.D., Miller, S.F., Johnson, D.O., Wilkey, P.L., Scott, V.L., Kuecher, G.J., Penland, S., and Isaacson, H.R., 1992, Hydrogeophysics of the Louisiana wetlands*, in* Anonymous, AGU 1992 spring meeting: EOS, Transactions, American Geophysical Union, v. 73, no. 14 (suppl.), p. 132.

Keywords: sediment, hydrology, geomorphology

781. McGinnis, L.D., Johnson, D.O., Zimmerman, R.E., Isaacson, H.R., and Penland, S., 1991, Quantifying the role of degasification subsidence in wetland loss; Mississippi Delta plain: U.S. Department of Energy, Argonne National Laboratory, Energy Systems Division, no. ANL/ES/PP-72739, p. 18.

Modern and ancient delta plains in Louisiana that border the northern Gulf of Mexico are undergoing unprecedented rates of land loss. Subsidence due to compaction and loss of pore water is believed to be one of the primary land loss factors, whereas subsidence due to gas emission is generally believed to play a significant role only in the upper one or two meters of a wetland. Evidence to the contrary is presented here that suggests that degasification subsidence is a more important mechanism contributing to land loss than previously thought.

Keywords: estuarine, wetland loss, sediment, chemistry

782. McKee, K.L., and Mendelssohn, I.A., 1989, Response of a freshwater marsh plant community to increased salinity and increased water level: Aquatic Botany, v. 34, no. 4, p. 301-316.

Greenhouse experiments in which salinity and elevation were manipulated demonstrated that the response of freshwater marshes to saltwater intrusion may be variable and dependent upon a number of factors including: species composition; level, duration, and abruptness of exposure to saline water; flooding depth; a source of propagules of a more salt-tolerant species. In the field, saltwater intrusion was simulated by transplanting swards of a freshwater marsh to a higher salinity area. The three dominant species, *Panicum hemitomon* Schultes, *Leersia oryzoides* (L.) Swartz, and *Sagittaria lancifolia* L., succumbed to the sudden increase in salinity to 15 ppt.

Keywords: vascular plants, hydrology, freshwater, salinity, ecology

783. McLaughlin, R.E., Vidrine, M.F., and Willis, O.R., 1987, Distribution of *Anopheles quadrimaculatus* and *An. crucians* larvae within rice field habitats in southwestern Louisiana: Journal of the American Mosquito Control Association, v. 3, no. 4, p. 574-578.

This study, conducted in 3 parishes of Louisiana, documented the distribution pattern of *Anopheles quadrimaculatus* and *An. crucians* during the first crop season.

Keywords: freshwater, macroinvertebrates, agriculture

784. McQueen, D.R., and O'Quinn, E.B., 1995, Ground water chemistry and environmental toxicology of pesticides in Louisiana aquifers; a preliminary data base, *in* Anonymous, Geological Society of America, 1995 annual meeting: Abstracts with Programs--Geological Society of America, v. 27, no. 6, p. 106.

Keywords: groundwater, freshwater, pesticides, contaminants, chemistry, physiology

785. McWreath, H.C., III, and Lowe, A.S., 1986, Louisiana hydrologic atlas map no. 1—Mean annual runoff in Louisiana: U.S. Geological Survey Water-Resources Investigations Report 86-4149, 1 sheet.

Keywords: surface water, freshwater, hydrology

786. McWreath, H.C., III, and Smoot, C.W., 1989, Geohydrology and development of ground water at Fort Polk, Louisiana: U.S. Geological Survey Water-Resources Investigations Report 88-4088, 53 p.

Keywords: groundwater, hydrology

787. Meade, R.H., 1995, Contaminants in the Mississippi River, 1987-92: U.S. Geological Survey Circular 1133, 140 p.

Keywords: surface water, freshwater, contaminants

788. Meador, M.R., and Kelso, W.E., 1989, Behavior and movements of largemouth bass in response to salinity: Transactions of the American Fisheries Society, v. 118, no. 4, p. 409-415.

Salinity preferences of adult and young-of-the-year largemouth bass *Micropterus salmoides* from a freshwater lake and a brackish marsh in south-central Louisiana were tested at 22 degree C in salinity-gradient chambers (0, 3, 6, 9, and 12 ppt salinity) under a photoperiod of 12 h light: 12 h dark. Young largemouth bass from both collection sites preferred 0 ppt. salinity. Although adult marsh and freshwater largemouth bass preferred 3 ppt salinity, differences in salinity selection were noted: mean number of observations at 0 ppt salinity was significantly greater for freshwater fish, whereas mean number of observations at 3 ppt salinity was significantly greater for marsh fish. Salinity preferences were not affected by prior acclimation of fish to salinities of 0 or 5 ppt. Salinities of less than 5 ppt did not influence short-term (daily) movements of marsh fish implanted with ultrasonic transmitters.

Keywords: freshwater, salinity, fish, habitat

789. Meador, M.R., and Kelso, W.E., 1990, Growth of largemouth bass in low-salinity environments: Transactions of the American Fisheries Society, v. 119, no. 3, p. 545-552.

The authors evaluated age and growth data for largemouth bass *Micropterus salmoides* inhabiting either a brackish marsh or a freshwater oxbow lake in south-central Louisiana. Laboratory trials consisting of 120-d exposure of marsh and freshwater largemouth bass to four salinity levels (0, 4, 8, and 12 ppt) indicated a significant decrease in growth rate of freshwater largemouth bass with increasing salinity level up to 8 ppt. No such decrease was observed for marsh largemouth bass. All fish held at 12 ppt stopped feeding within 1 week after the experiment began and died before the experiment ended. Sheared principal components analysis indicated differences in body shape between marsh and freshwater largemouth bass. Characteristic body morphology and length at age of marsh fish suggest that largemouth bass adapt to biotic conditions in low-salinity marshes through an alternative growth strategy.

Keywords: fish, freshwater, productivity, salinity, estuarine

790. Meffert, D.J., 1996, The effectiveness of the Coastal Wetlands Planning, Protection and Restoration Act in achieving Louisiana's coastal restoration objectives, Doctoral Dissertation, University of California, Los Angeles, p. 195.

Keywords: estuarine, management

791. Melancon, E., Soniat, T., Cheramie, V., Barras, J., Dugas, R., and Lagarde, M., 1997, Oyster resource zones based on wet and dry estuarine cycles and its implication to coastal restoration efforts in Louisiana: Journal of Shellfish Research, v. 16, no. 1, p. 272.

Oystermen and biologists have developed a 1:100,000 scale map of the oyster resource zones within Louisiana's Barataria and Terrebonne estuaries. Federal and state agencies are addressing Louisiana's wetland loss by diverting relatively large quantities of freshwater from the Mississippi River into the estuaries in an effort to restore historical salinity patterns and to enhance coastal restoration. Diversions have the potential of shifting oyster production away from the outflow. The map is being used by state and federal resource managers as an environmental assessment tool for oyster beds that will be impacted.

Keywords: estuarine, hydrology, management, macroinvertebrates, habitat

792. Mendelssohn, I.A., and McKee, K.L., 1987, Experimental field and greenhouse verification of the influence of salinity intrusion and submergence on marsh deterioration: Proceedings--Gulf of Mexico Information Transfer Meeting, # 88-0035, p. 180-183.

Keywords: estuarine, wetland loss, vascular plants, physiology

793. Mendelssohn, I.A., and McKee, K.L., 1988, Spartina alterniflora die-back in Louisiana: Time-course investigation of soil waterlogging effects: Journal of Ecology, v. 76, no. 2, p. 509-521.

Transplantation of streamside *Spartina alterniflora* swards into the more water-logged and less productive inland marsh caused rapid decreases in soil redox potential and increases in interstitial water sulphide and NH_4 concentrations and root alcohol dehydrogenase activity. One year later, standing crops in these transplanted swards were significantly reduced compared to their streamside controls. Reciprocal transplantation from inland to streamside resulted in the amelioration of the detrimental conditions associated with the waterlogged inland marsh. Soil salinity and pH were not significant factors in causing reduced growth of *S. alterniflora*. Sulphide toxicity, in combination with extended periods of anaerobic metabolism in the roots, appeared to be a major factor associated with reduced growth of *S. alterniflora* and may be a cause of dieback in these marshes.

Keywords: hydrology, sediment, vascular plants, chemistry, nutrients, productivity, estuarine

794. Mercado, O.A., Bengtson, R.L., Feagley, S.E., and Southwick, L.M., 1994, Environmental impact of subsurface water management on surface water quality, *in* Anonymous, American Society of Agricultural Engineers; 1994 international summer meeting: International Summer Meeting--American Society of Agricultural Engineers, v. 1994, p. 25.

Keywords: groundwater, management

795. Meyer, R.R., 1953, Summary of ground-water conditions in southwestern Louisiana: U.S. Geological Survey Open-File Report, 7 p.

Keywords: groundwater

796. Meyer, R.R., and Rollo, J.R., 1965, Saltwater encroachment, Baton Rouge area, Louisiana: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Pamphlet no. 17, 9 p.

Keywords: groundwater, freshwater, contaminants

797. Meyer, R.R., and Turcan, A.N., Jr., 1953, Summary report on the geology and ground-water resources of the Baton Rouge area, Louisiana: U.S. Geological Survey Open-File Report, 23 p.

Keywords: groundwater, geology

798. Meyer, R.R., and Turcan, A.N., Jr., 1955, Geology and ground-water resources of the Baton Rouge area, Louisiana: U.S. Geological Survey Water-Supply Paper 1296, 138 p.

Keywords: groundwater, geology

799. Meyers, S.P., and Ahearn, D.G., 1971, Yeast populations of *Spartina alterniflora* marshlands in southeastern Louisiana: National Coastal and Shallow Water Research Conference, Abstracts, v. 2, p. 156.

Keywords: microbiology, vascular plants, estuarine

800. Michot, T.C., and Chadwick, P.C., 1994, Winter biomass and nutrient values of three seagrass species as potential foods for redheads (*Aythya americana* Eyton) in Chandeleur Sound, Louisiana: Wetlands, v. 14, no. 4, p. 276-283.

The authors studied biomass and macronutrient content of *Halodule wrightii* (shoalgrass) throughout the winter and of *Thalassia testudinum* (turtlegrass) and *Syringodium filiforme* (manateegrass) in January in Chandeleur Sound, Louisiana.

Keywords: estuarine, ecology

801. Michot, T.C., Custer, T.W., Nault, A.J., and Mitchell, C.A., 1994, Environmental contaminants in redheads wintering in coastal Louisiana and Texas: Arch. Environ. Contam. Toxicol., v. 26, no. 4, p. 425-434.

Whole body and liver analyses were performed on wintering redheads at one site in coastal Louisiana and two in Texas. Analyses performed included common trace elements, organochlorines, and hydrocarbons.

Keywords: surface water, freshwater, contaminants, ecology

802. Mihuc, T.B., Battle, J.M., Mihuc, J.R., and Bryan, C.F., 1999, Zebra mussel (*Dreissena polymorpha*) seasonal colonization patterns in a sub-tropical floodplain river: Hydrobiologia, v. 392, issue 2, p. 121-128.

Zebra Mussel (*Dreissena polymorpha*) seasonal colonization patterns, growth and habitat preferences were determined in a sub-tropical floodplain river at the southern edge of its distribution in North America during 1995-96 (Atchafalaya River Basin, Louisiana). Zebra Mussel movement into subtropical areas represents a major frontier for this species worldwide.

Keywords: ecology, macroinvertebrates, habitat, productivity, freshwater

803. Mikuska, T., Kushlan, J.A., and Hartley, S., 1998, Key Areas for Wintering North American Herons: Colonial Waterbirds, v. 21, no. 2, p. 125-134.

Nearly all North American heron populations are migratory, but details of where they winter are little known. Locations where North American herons winter were identified using banding recovery data. North American herons winter from Canada through northern South America but especially in eastern North America south of New York, Florida, California, Louisiana, Texas, Mexico and Cuba, these areas accounting for 63% of winter recoveries.

Keywords: birds, habitat

804. Miller, Chester, Hales, C.H., Clark, J.E., Nopper, R.W., Jr., and Hanor, J.S., 1990, Horizontal flow of pore fluids; discussion and reply: Nature (London), v. 347, no. 6290, p. 238.

Keywords: groundwater, hydrology

805. Miller, G.B., 1994, Coastal habitat restoration planning in Louisiana—Lessons from the Greenhill-Timbalier Bay oil spill case: Coast. Manage., v. 22, no. 4, p. 413-420.

This case history details a 1992 well blowout and oil spill in Timbalier Bay, Louisiana, and the assessment and restoration activities that have been associated with the incident. Emphasis is placed on the post-spill activities to demonstrate the increasing relevance and implementation of habitat restoration efforts.

Keywords: estuarine, management

806. Miller, K.R., Laswell, B.H., and Hullinger, J.P., 1985, Fast-tracked hydrogeologic study; Cleve Reber Superfund Site: Management of Uncontrolled Hazardous Waste Sites, p. 136-141.

Keywords: groundwater, hydrology, contaminants

807. Minor, H.E., 1925, Chemical relation of salt dome waters: Bulletin of the American Association of Petroleum Geologists, v. 9, no. 1, p. 38-41.

Keywords: groundwater, chemistry

808. Mitchell, J.E., 1996, Effect of spatial resolution of estimating hydrologic response and economic value of an urban forest, *in* Hallam, C.A., Salisbury, J.M., Lanfear, K.J., and Battaglin, W.A., Symposium proceedings; GIS and water resources: American Water Resources Association Technical Publication Series TPS, v. 96-3, p. 29-36.

Keywords: surface water, freshwater, urban, GIS, hydrology, model

809. Moeller, C.C., Huh, O.K., Roberts, H.H., Gumley, L.E., and Menzel, W.P., 1993, Response of Louisiana coastal environments to cold front passage: J. Coast. Res., v. 9, no. 2, p. 434-447.

The effect of a cold front passage on suspended sediment concentrations, water temperatures, and coastal circulation off Louisiana is examined via remote sensing with the Multi-spectral Atmospheric Mapping Sensor (MAMS).

Keywords: estuarine, climate, sediment, GIS, hydrology

810. Montz, G.N., 1972, A seasonal study of the vegetation on levees: Castanea, v. 37, p. 140-146.

The frequency and percentage composition of plants was determined on levees in East St. Charles Parish (County), Louisiana. This parish is west of New Orleans and is bounded on the south by the Mississippi River and on the north by Lake Pontchartrain. The vegetation was sampled by 55 line transects at the same locations in February-March, May-June and August -September. Eighty-nine species were recorded in this study. Field notes indicate vernal, estival and autumnal flowering periods in the area. Eleven species were noted to flower only in the February-March study, six species only in the May-June study and eight species only in the August -September study.

Keywords: vascular plants, checklist

811. Montz, G.N., 1976, Vegetational studies conducted in Atchafalaya Bay, Louisiana: U.S. Army Corps of Engineers, New Orleans District, Environmental Quality Section, 35 p.

One year vegetative survey of new emergent lands in Atchafalaya Bay has been completed. Prior to 1973 the bay in this area was shallow, open water. Disposal of dredged material and natural accretion have resulted in many acres of bay bottom being converted to land. One square meter and ten square meter permanent quadrats were established on three transects crossing the ridge community into the fringing marsh. Data has been condensed to show a seasonal trend in this survey. Soil samples were collected and analyzed for moisture content, composition, and pH. Ridge community soils contained a greater percent of sand and less moisture than the marsh soils. Acreages of mudflats, vegetated marshland, and ridges have been determined. Elevation contours at mean sea level were determined at 100 meter intervals along the three transects. An elevation of 1.56 feet mean sea level has been determined as the maximum elevation in the upper reaches of Atchafalaya Bay for development of marshlands. Elevations above this are dominated with ridge community species. As land is formed in the bay by natural and man-made activities, a similar trend of vegetation establishment can be expected.

Keywords: vascular plants, checklist, estuarine

812. Montz, G.N., 1977, A vegetational study conducted along southwest pass in the Mississippi River Delta, Louisiana: U.S. Army Corps of Engineers, New Orleans District, 12 p.

Report to delineate elevations of the unconfined dredged material and determine optimum elevations that were vegetated with marsh plants. Elevations were made on lands and were correlated with vegetation growing at each site. These elevations and corresponding vegetative types are important in a successful marsh creation program.

Keywords: geomorphology, vascular plants, management

813. Montz, G.N., 1977, A vegetational study of the Timbalier and Isles Dernieres Barrier Islands, Louisiana: The Proceedings of the Louisiana Academy of Sciences, v. 60, p. 59-69.

The vegetation on these barrier islands was studied by the quadrant method. One square meter and 10 square meter quadrants were utilized to study species cover. Abundant species on the sand dunes, on dredged material along a canal and in the tidal saline marsh are indicated. The effects of Hurricane Carmen which passed over this area in September 1974, were observed; movement of sand dunes into the mangrove-oystergrass tidal areas was noted to cover and kill herbs and mangrove shrubs. Submerged beds of vegetation on the bay side of these island are discussed. A complete list of all plants reported on the Timbalier and Isles Dernieres island complex, and on the Chandeleur and adjacent islands, has been compiled.

Keywords: vascular plants, checklist

814. Montz, G.N., 1978, The submerged vegetation of Lake Pontchartrain, Louisiana: Castanea, v. 43, p. 115-128.

The submerged vegetation of Lake Pontchartrain, in southeast Louisiana, was surveyed before and after the April 1973 opening of the Bonnet Carre' Spillway. The study revealed approximately 2,000 acres of waterbottom covered with submerged vegetation, the greater portions of which was recorded between Green Point near Mandeville, and Big Point near Slidell, along the northeastern shoreline of the lake. In general, similar abundance values were recorded in both surveys for submerged vegetation along the northeast shoreline. The release of fresh river water did not have observable effects on the submerged vegetation.

Keywords: estuarine, vascular plants, checklist

815. Montz, G.N., 1978, Vegetation characteristics of the Atchafalaya River Delta: The Proceedings of the Louisiana Academy of Sciences, v. 61, p. 71-84.

Keywords: vascular plants, checklist

816. Montz, G.N., 1979, Preliminary checklist of the vascular plants of the Bonnet Carre Spillway in Louisiana: U.S. Army Corps of Engineers, New Orleans, LA, 28 p.

This checklist is an update of the August 1976 report. All plants collected have been forwarded to the LSU Baton Rouge Herbarium. Taxonomic categories include 95 families, 290 genera, and 512 species.

Keywords: checklist, vascular plants

817. Montz, G.N., and Cherubini, A., 1973, An ecological study of a baldcypress swamp in St. Charles Parish, Louisiana: Castanea, v. 38, no. 4, p. 379-386.

A baldcypress (*Taxodium distichum* (L.) Richard) swamp bordering a marsh in St. Charles Parish was studied by the quadrat method. A dense undergrowth of alligatorweed (*Alternanthera philoxeroides* (Mart) Griseb.) covered most of the study area. Plant succession with extension of baldcypress into the marsh was studied by comparing township maps of 1860 and quadrangle maps of 1955 and 1957 to quadrangle maps of 1969. Only baldcypress was recorded with tree diameters increasing from the marsh-swamp zone into the swamp. Of the 639 trees recorded in the study area, 357 were dead.

Keywords: freshwater, vascular plants, checklist

818. Monzyk, F.R., Kelso, W.E., and Rutherford, D.A., 1997, Characteristics of woody cover used by brown madtoms and pirate perch in coastal plain streams: Transactions of the American Fisheries Society, v. 126, no. 4, p. 665-675.

The authors measured or described microhabitat characteristics of woody debris accumulations (i.e., structural complexity, cavity space, stem diameter, suspended and

benthic leaves, depth, inside and outside flow, undercut bank, and lateral position) found in headwater coastal plain streams of central Louisiana.

Keywords: surface water, freshwater, debris, hydrology, habitat, fish

819. Moody, J.A., 1993, Evaluation of the Lagrangian scheme for sampling the Mississippi River during 1987-90: U.S. Geological Survey Water-Resources Investigations Report 93-4042, p. 31.

Keywords: surface water, freshwater, methods

820. Moody, J.A., 1995, Chemical data for water samples collected during four upriver cruises on the Mississippi River between New Orleans, Louisiana, and Minneapolis, Minnesota, May 1990-April 1992: U.S. Geological Survey Open-File Report 94-0523, p. 297.

Keywords: surface water, freshwater, chemistry

821. Moody, J.A., and Meade, R.H., 1992, Hydrologic and sedimentologic data collected during three cruises at low water on the Mississippi River and some of its tributaries, July 1987-June 1988: U.S. Geological Survey Open-File Report 91-0485, p. 143.

Keywords: surface water, freshwater, hydrology, sediment

822. Moody, J.A., and Meade, R.H., 1993, Hydrologic and sedimentologic data collected during four cruises at high water on the Mississippi River and some of its tributaries, March 1989 through June 1990: U.S. Geological Survey Open-File Report 92-0651, p. 227.

Keywords: surface water, freshwater, hydrology, sediment

823. Moody, J.A., and Meade, R.H., 1995, Hydrologic and sedimentologic data collected during three cruises on the Mississippi River and some of its tributaries from Minneapolis, Minnesota to New Orleans, Louisiana, July 1991-May 1992: U.S. Geological Survey Open-File Report 94-0474, p. 159.

Keywords: surface water, freshwater, hydrology, sediment

824. Moore, S.E., Ferrell, R.E., Jr., and Aharon, P., 1992, Diagenetic siderite and other ferroan carbonates in a modern subsiding marsh sequence: J. Sediment. Petrol., v. 62, no. 3, p. 357-366.

Mineralogical and carbon and oxygen stable isotope compositions in siderite-rich concretions from a marsh within the Mississippi River Deltaic Plain were found to be highly variable.

Keywords: geomorphology, sediment, chemistry

825. Moorman, T.B., and Harper, S.S., 1989, Transformation and mineralization of metribuzin in surface and subsurface horizons of a Mississippi delta soil: J. Environ. Qual., v. 18, no. 3, p. 302-306.

The rates of degradation and mineralization of metribuzin were determined in the surface and subsurface horizons of a Dundee silty clay loam soil from the Mississippi Delta.

Keywords: chemistry, contaminants, pesticides, sediment

826. Moran, J.E., and Fehn, U., 1994, ^{129}I as a hydrologic tracer; determination of source ages and migration patterns of brines in sedimentary basins, *in* Lanphere, M.A., Dalrymple, G.B., and Turrin, B.D., Abstracts of the Eighth International Conference on Geochronology, Cosmochronology, and Isotope Geology: U.S. Geological Survey Circular 1107, p. 224.

Keywords: groundwater, hydrology

827. Moran, J.E., Fehn, U., and Hanor, J.S., 1993, Iodine-129 as a tracer for brine migration in the Louisiana Gulf Coast basin, *in* Anonymous, Geological Society of America, 1993 annual meeting: Abstracts with Programs--Geological Society of America, v. 25, no. 6, p. 90-91.

Keywords: groundwater, hydrology

828. Moran, J.E., Fehn, Udo, and Hanor, J.S., 1995, Determination of source ages and migration patterns of brines from the U.S. Gulf Coast basin using ^{129}I: Geochimica et Cosmochimica Acta, v. 59, no. 24, p. 5055-5069.

Keywords: groundwater, hydrology

829. Morgan, C.O., 1961, Ground-water conditions in the Baton Rouge area, 1954-59, with special reference to increased pumpage: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Bulletin no. 2, 78 p.

Keywords: groundwater, management

830. Morgan, C.O., 1963, Ground-water resources of East Feliciana and West Feliciana Parishes, Louisiana: Louisiana Department of Public Works, 58 p.

Keywords: groundwater

831. Morgan, C.O., and Winner, M.D., Jr., 1962, Hydrochemical facies in the "400-foot" and "600-foot" sands of the Baton Rouge area, Louisiana, *in* Geological Survey research

1962; short papers in geology, hydrology, and topography, articles 1-59: U.S. Geological Survey Professional Paper 450-B, article 50, p. B120-B123.

Keywords: groundwater, geology, chemistry, hydrology

832. Morgan, C.O., and Winner, M.D., Jr., 1964, Salt-water encroachment in aquifers of the Baton Rouge area—preliminary report and proposal: Louisiana Department of Public Works, 37 p.

Keywords: groundwater, freshwater, contaminants, salinity

833. Morrison, George, Torello, Elise, and Redmond, Michele, 1989, Toxicity of sediments, effluents and receiving waters of the lower Calcasieu River, Louisiana: U.S. Geological Survey Open-File Report 89-0409, p. 65.

Keywords: surface water, freshwater, contaminants, ecology, sediment

834. Mossa, Joann, 1990, Managing the sediment and water surplus of the Mississippi and Atchafalaya Rivers for wetland restoration, *in* Anonymous, Gulf Coast Association of Geological Societies and Gulf Coast Section of SEPM meeting; abstracts: AAPG Bulletin, v. 74, no. 9, p. 1505-1506.

Keywords: surface water, freshwater, sediment, management, hydrology, wetland loss

835. Mossa, Joann, 1991, Causes of temporal and downstream changes in suspended sediment transport in the lower Mississippi and Atchafalaya Rivers, *in* Dhamotharau, Dhamo, Resource development of the Lower Mississippi River; symposium papers: American Water Resources Association Technical Publication Series TPS, v. 91-3, p. 47.

Keywords: surface water, freshwater, sediment

836. Mossa, Joann, 1995, Recent geomorphic adjustments of the Mississipi-Atchafalaya River system, southern Louisiana, *in* Anonymous, Geological Society of America, 1995 annual meeting: Abstracts with Programs--Geological Society of America, v. 27, no. 6, p. 213.

Keywords: surface water, freshwater, geomorphology

837. Mossa, Joann, 1996, Sediment dynamics in the lowermost Mississippi River, *in* Saucier, R.T., Smith, L.M., and Autin, W.J., Geology in the Lower Mississippi Valley; implications for engineering, the half century since Fisk, 1944: Engineering Geology, v. 45, no. 1-4, p. 457-479.

Suspended sediment dynamics in the lowermost Mississippi River system in Louisiana are characterized using three approaches: (1) temporal changes in discharge-suspended sediment relationships showing interannual variations and the effects of floods over short timescales; (2) empirical relationships between discharge and suspended sediment

variables at various locations; and (3) downstream changes in discharge-suspended sediment relationships. Interpretation of this data set is enhanced with other secondary data regarding processes, morphology, and bed materials.

Keywords: estuarine, surface water, freshwater, sediment, hydrology, geomorphology

838. Mossa, Joann, and McLean, M., 1997, Channel planform and land cover changes on a mined river floodplain--Amite River, Louisiana, USA: Applied Geography, v. 17, no. 1, p. 43-54.

The Amite River in southeastern Louisiana, USA, is a disturbed floodplain and channel, where combined gravel and sand extraction has exceeded 10 million tons per year. To examine relationships between mining and channel change along this river, land cover data from a 55-km floodplain reach with variable mining intensity were compiled from photographic, map, and documentary sources for two different time periods. These data were manipulated using a geographic information system and analysed using nonparametric statistics, producing statistically robust, moderate correlations between the degree of floodplain mining and change in channel position. The approach and results have application in research, planning and management concerning floodplain disturbances and channel instability.

Keywords: geomorphology, riparian, sediment, GIS, hydrology

839. Mouton, E.C., Jr., and Felder, D.L., 1996, Burrow distributions and population estimates for the fiddler crabs *Uca spinicarpa* and *Uca longisignalis* in a Gulf of Mexico salt marsh: Estuaries, v. 19, no. 1, p. 51-61.

The distribution of fiddler crab (*Uca spinicarpa* and *Uca longisignalis*) burrows in coastal marsh habitats is described, and the influence of substratum characteristics on the distributions of each is examined.

Keywords: estuarine, macroinvertebrates, habitat, ecology

840. Mueller, C.S., Ramelow, G.J., and Beck, J.N., 1989, Spatial and temporal variation of heavy metals in sediment cores from the Calcasieu River/Lake complex: Water, Air and Soil Pollution, v. 43, no. 3-4, p. 213-230.

Keywords: estuarine surface water, freshwater, trace elements, sediment

841. Mueller, C.S., Thompson, R.L., Ramelow, G.J., Beck, J.N., Langley, M.P., Young, J.C., and Casserly, D.M., 1987, Distribution of Al, V, and Mn in lichens across Calcasieu Parish, Louisiana: Water, Air, & Soil Pollution, v. 33, no. 1-2, p. 155-164.

Keywords: trace elements, contaminants, physiology

842. Mueller, C.S., Ramelow, G.J., and Beck, J.N., 1989, Mercury in the Calcasieu River/Lake complex, Louisiana: Bull. Environ. Contam. Toxicol., v. 42, no. 1, p. 71 – 80.

The Calcasieu River/Lake Complex has been the focus of an interdisciplinary study to assess the types and areas of pollution along this important waterway. Particular attention has been given to Hg because of the toxicity of this metal, and the local importance of the chloralkali industry, an industry that is known to discharge Hg into the environment.

Keywords: estuarine, surface water, freshwater, trace elements, contaminants

843. Mulholland, P.J., Best, G.R., Coutant, C.C., Hornberger, G.M., Meyer, J.L., Robinson, P.J., Stenberg, J.R., Turner, R.E., Vera-Herrera, F., and Wetzel, R.G., 1997, Effects of climate change on freshwater ecosystems of the Southeastern U.S. and the Gulf Coast of Mexico: Hydrological Processes, v. 11, no. 8, p. 949-970.

Keywords: climate, freshwater, habitat

844. Murray, H.E., and Beck, J.N., 1989, Halogenated organic compounds found in shrimp from the Calcasieu Estuary: Chemosphere, v. 19, no. 8-9, p. 1367-1374.

Keywords: estuarine, contaminants, macroinvertebrates

845. Murray, H.E., and Beck, J.N., 1992, Methane in well water from Lake Charles, Louisiana: Bulletin of Environmental Contamination and Toxicology, v. 48, no. 5, p. 768-771.

Keywords: groundwater, freshwater, contaminants

846. Murray, H.E., Murphy, C.N., and Gaston, G.R., 1992, Concentration of HCB in *Callinectes sapidus* from the Calcasieu Estuary, Louisiana: J. Environ. Sci. Health, Part A, v. A27, no. 4, p. 1095-1101.

Blue crabs were collected from several areas in the estuary, and edible tissues were analyzed for the organic compound hexachlorobenzene (HCB).

Keywords: estuarine, contaminants, macroinvertebrates

847. Murthy, A.S.P., and Ferrell, R.E., Jr., 1972, Comparative chemical composition of sediment interstitial waters: Clays and Clay Minerals, v. 20, no. 5, p. 317-321.

Keywords: chemistry, sediment, surface water

848. Myers, R.S., Shaffer, G.P., and Llewellyn, D.W., 1995, Baldcypress (Taxodium distichum (L.) Rich.) restoration in southeast Louisiana—The relative effects of herbivory, flooding, competition, and macronutrients: Wetlands, v. 15, no. 2, p. 141-148.

This study was conducted to isolate the major factors prohibiting cypress restoration. Specifically, four hundred baldcyress seedlings were planted in a tree-way factorial treatment arrangement that included nutrient augmentation (fertilized vs. unfertilized), management of entangling vegetation (managed vs. Unmanaged), herbivore protection (tubex tree shelters, PVC sleeves, Tanglefoot), and elevation (included as a covariable).

Keywords: surface water, freshwater, nutrients, ecology, vascular plants, hydrology

849. Naghavi, B., Singh, V.P., and Yu, Fang Xin, 1993, Development of 24-hour rainfall frequency maps for Louisiana: J. Irrig. Drain. Eng., v. 119, no. 6, p. 1066-1080.

Maximum annual 24-hour rainfall maps for return periods of 2, 5, 10, 25, 50, and 100 years were developed by using hourly precipitation data. Data from 92 rain gauges for the period of 1948 to 1987 were compiled and combined into 26 synthesized stations. Log-Pearson Type 3 distribution (LPEAR3) with parameter estimation by the method of moments was used to compute the 24-hour rainfall quantiles. This combination was found to be the best for the Louisiana rainfall data.

Keywords: surface water, freshwater, hydrology, model

850. Naghavi, B., and Yu, F.X., 1991, Generalized skew coefficients of annual floods for Louisiana streams: Water Resources Bulletin, v. 27, no. 2, p. 209-216.

A generalized skew map for Louisiana streams was developed using data from Louisiana, Mississippi, Arkansas, and Texas with 20 or more years of annual flood records. A comparison between the newly developed Louisiana Generalized Skew Map and the generalized skew map recommended by the U.S. Water Resources Council was performed.

Keywords: surface water, freshwater, hydrology, model

851. Nakashima, L.D., and Louden, L.M., 1989, Water level change, sea level rise, subsidence, and coastal structures in Louisiana; an annotated bibliography: Louisiana Geological Survey Open File Series, no. 89-01, 27 p.

Keywords: estuarine, wetland loss, sediment, hydrology, management, geomorphology

852. Naqvi, S.M., and Flagge, C.T., 1990, Chronic effects of arsenic on American red crayfish, *Procambarus clarkii*, exposed to monosodium methanearsonate (MSMA) herbicide: Bulletin of Environmental Contamination and Toxicology, v. 45, no. 1, p. 101-106.

Keywords: surface water, freshwater, trace elements, pesticides, physiology, macroinvertebrates, contaminants

853. Naqvi, S.M., Flagge, C.T., and Hawkins, R.L., 1990, Arsenic uptake and depuration by red crayfish, *Procambarus clarkii*, exposed to various concentrations of monosodium methanearsonate (MSMA) herbicide: Bulletin of Environmental Contamination and Toxicology, v. 45, no. 1, p. 94-100.

This study was conducted to evaluate the bio-accumulative potential of As by the American red crayfish, *Procambarus clarkii*, in the laboratory and also to assess the level of arsenic present in the tissues of crayfish collected from south Louisiana.

Keywords: freshwater, macroinvertebrates, physiology, trace elements, pesticides, contaminants

854. Naqvi, S.M., and Howell, R.D., 1993, Cadmium and lead uptake by red swamp crayfish (*Procambarus clarkii*) of Louisiana: Bull. Environ. Contam. Toxicol., v. 51, no. 2, p. 296-302.

Keywords: freshwater, trace elements, physiology, macroinvertebrates

855. Naqvi, S.M., and Howell, R.D., 1993, Toxicity of cadmium and lead to juvenile red swamp crayfish, *Procambarus clarkii*, and effects on fecundity of adults: Bulletin of Environmental Contamination and Toxicology, v. 51, no. 2, p. 303-308.

Adult crawfish were obtained from the Ben Hur Experiment Station in Baton Rouge, Louisiana. The juveniles raised in the laboratory were used in static bioassays. A total of 50 juveniles per concentration of $CdCl_2$ and $Pb(NO_3)_2$ were exposed for a period of 96 hours. For chronic toxicity tests, 48 males and 48 females were allowed to mate. After the mating period was completed, 24 females were exposed to 0.5 mg/l $CdCl_2$ and 24 to 100 mg/l $Pb(NO_3)_2$, individually; and 24 females were kept as controls. Test solutions were analyzed to determine the exact amount of heavy metals present in solution.

Keywords: freshwater, trace elements, physiology, macroinvertebrates, contaminants

856. Naqvi, S.M., Howell, R.D., and Sholas, M., 1993, Cadmium and lead residues in field-collected red swamp crayfish (*Procambarus clarkii*) and uptake by alligator weed, *Alternanthera philoxiroides*: J. Environ. Sci. Health, Part B: Pestic., Food Contam., Agric. Wastes, v. B28, no. 4, p. 473-485.

The whole-body residues of Cd and Pb in the tissues of Louisiana swamp crayfish (*Procambarus clarkii*) were determined by flame AAS technique. Test animals were collected from roadside ditches (18 location) alongside major highways. The water and soil samples were also collected from the same sites. Alligator weed (*Alternanthera philoxiroides*) plants were exposed to 0.5 mg/l Cd-chloride or Pb-nitrate solutions for a 3-week period, thrice.

Keywords: freshwater, vascular plants, contaminants, macroinvertebrates, physiology, trace elements

857. Nasci, R.S., 1987, Adult body size and parity in field populations of the mosquitoes *Anopheles crucians*, *Aedes taeniorhynchus* and *Aedes sollicitans*: Journal of the American Mosquito Control Association, v. 3, no. 4, p. 636-637.

The purpose of this project was to examine the body size of *Anopheles crucians* Wiedemann, *Aedes taeniorhynchus* (Wiedemann), and *Aedes solicitans* (Walker) populations, to determine if these three salt marsh inhabiting species demonstrate similar amounts of variation in size. Fish (1985) previously reported that the body size of *Ae. solicitans* collected in New York is highly variable. Additionally, the author examined the relationship of body size to parity in these species. The mosquito populations were sampled by collecting host-seeking mosquitoes coming to human bait at the edge of a salt marsh located in Calcasieu Parish, Louisiana.

Keywords: macroinvertebrates, ecology, estuarine, freshwater

858. Nasci, R.S., 1988, Biology of *Aedes triseriatus* (Diptera: Culicidae) developing in tires in Louisiana: Journal of Medical Entomology, v. 23, no. 5, p. 402-405.

Keywords: macroinvertebrates, urban

859. Nasci, R.S., Hare, S.G.F., and Vecchione, M., 1987, Habitat associations of mosquito and copepod species: Journal of the American Mosquito Control Association, v. 3, no. 4, p. 593-600.

Copepods and mosquitoes were collected and identified over a 12-month period from three woodland ponds, discarded tires and a salt marsh. The species distribution of both mosquitoes and copepods varied among habitats and seasonally. *Acanthocyclops vernalis* was the predominant copepod in all of the habitats except the discarded tires, where *Thermocyclops dybowskii* was the predominant species. *Amblyospora* sp.-infected mosquitoes and copepods were found on several occasions in one of the woodland ponds and in the salt marsh. Results indicate that several copepod species have the potential to influence larval mosquito populations either directly as predators or indirectly as intermediate hosts of parasites.

Keywords: macroinvertebrates, habitat, management, ecology

860. Neely, B.L., Jr., 1968, Tickfaw River at Starns bridge near Magnolia, Louisiana: U.S. Geological Survey Open-File Report, 7 p.

Keywords: surface water, freshwater

861. Neely, B.L., Jr., 1976, Floods in Louisiana, magnitude and frequency (3d ed.): Louisiana Department of Highways, 340 p.

Keywords: surface water, freshwater, hydrology

862. Neely, B.L., Jr., 1978, Study to determine discharge at 50-percent flow duration and ordinary high water for streams in Louisiana: U.S. Geological Survey Open-File Report 78-218, 21 p.

Keywords: surface water, freshwater, hydrology

863. Negm, A.A., Hensley, S.D., and Roddy, L.R., 1969, A list of spiders in sugarcane fields in Louisiana: Louisiana Academy of Science, v. 32, p. 50-52.

Using aspirators, sweeping nets, headlights, flashlights, and pitfall traps, 107 species representing 18 families were collected from eight sugarcane fields between April and August (or September) 1958 through 1967.

Keywords: agriculture, macroinvertebrates, checklist

864. Neill, C., and Deegan, L.A., 1986, The effect of Mississippi River delta lobe development on the habitat composition and diversity of Louisiana coastal wetlands: American Midland Naturalist, v. 116, no. 2, p. 296-303.

Keywords: geomorphology, habitat, estuarine, ecology

865. Neill, C., and Turner, R.E., 1987, Comparison of fish communities in open and plugged backfilled canals in Louisiana coastal marshes: North American Journal of Fisheries Management, v. 7, no. 1, p. 57-62.

Fish communities were compared among 13 open, partially open, and plugged backfilled canals in coastal Louisiana brackish marshes. Captured fish were divided into two categories: residents, those species that complete their entire life cycles in shallow marsh ponds, and migrants, species that move into shallow marsh areas as postlarvae or juveniles. Plugging canals reduced their use by migrant species and decreased available nursery habitat by rendering areas behind plugs inaccessible. Leaving backfilled canals open or only partially plugged would allow access by migrating fishes and would increase the area of available nursery habitat.

Keywords: estuarine, fish, hydrology, habitat

866. Nesbit, S.P., and Breitenbeck, G.A., 1992, A laboratory study of factors influencing methane uptake by soils: Agriculture, Ecosystems & Environment, v. 41, no. 1, p. 39-54.

Keywords: nutrients, sediment, chemistry

867. Newchurch, E.J., and Kahwa, I.A., 1984, Heavy metals in the lower Mississippi River: Journal of Environmental Science and Health, Part A: Environmental Science and Engineering, v. 19, no. 8, p. 973-988.

Keywords: surface water, freshwater, trace elements

868. Newcome, Roy, Jr., 1960, Ground-water resources of the Red River Valley alluvium in Louisiana: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Pamphlet no. 7, 21 p.

Keywords: groundwater

869. Newcome, Roy, Jr., 1961, Sources of emergency water supply in the Alexandria area, Louisiana: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works, 7 p.

Keywords: groundwater, freshwater

870. Newcome, Roy, Jr., Page, L.V., and Sloss, Raymond, 1963, Water resources of Natchitoches Parish, Louisiana: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Bulletin no. 4, 189 p.

Keywords: groundwater, surface water, freshwater

871. Newcome, Roy, Jr., and Sloss, Raymond, 1966, Water resources of Rapides Parish, Louisiana: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Bulletin no. 8, 104 p.

Keywords: groundwater, surface water, freshwater

872. Neyland, R., and Meyer, H.A., 1997, Species diversity of Louisiana Chenier woody vegetation remnants: Journal of the Torrey Botanical Society, v. 124, no. 3, p. 254-261.

The cheniers of southwestern Louisiana are linear arrayed ridges up to 3 meters high and 450 meters wide. These prehistoric shorelines now stand as relict "islands" surrounded by coastal marsh. Although the chenier woodlands were once extensive, most have now been converted to rangeland, roads and homesites, and therefore presently exist as remnants. The woody species in six remnant sites were sampled in order to determine species diversity and importance.

Keywords: vascular plants, checklist

873. Niethammer, K.R., Baskett, T.S., and White, D.H., 1984, Organochlorine residues in three heron species as related to diet and age: Bulletin of Environmental Contamination and Toxicology, v. 33, no. 4, p. 491-498.

Keywords: contaminants, pesticides, physiology

874. Niethammer, K.R., White, D.H., Baskett, T.S., and Sayre, M.W., 1984, Presence and biomagnification of organochlorine chemical residues in oxbow lakes of northeastern Louisiana: Archives of Environmental Contamination and Toxicology, v. 13, no. 1, p. 63-74.

Keywords: contaminants, pesticides, surface water

875. Norden, Carroll R., 1969, The seasonal distribution of fishes in Vermilion Bay, Louisiana: Transactions of the Wisconsin Academy of Science, Arts, and Letters, v. 55, p. 119-137.

Keywords: checklist, estuarine, fish

876. Nunn, J.A., Sarkar, Alok, and Hanor, J.S., 1993, Effects of dissolving salt structures on the regional hydrogeology of the Louisiana Gulf Coast, *in* Anonymous, Geological Society of America, 1993 annual meeting: Abstracts with Programs--Geological Society of America, v. 25, no. 6, p. 244.

Keywords: groundwater, chemistry, geology

877. Nyman, D.J., 1978, The occurrence of saline ground water in the coastal area of Southwestern Louisiana: EOS, Transactions, American Geophysical Union, v. 59, no. 12, p. 1065.

Keywords: groundwater, contaminants, salinity

878. Nyman, D.J., 1981, Stream-induced water-level changes, Chicot aquifer, southwestern Louisiana: U.S. Geological Survey Professional Paper 1275, p. 196.

Keywords: groundwater, hydrology, surface water, freshwater

879. Nyman, D.J., 1984, The occurrence of high concentrations of chloride in the Chicot aquifer system of southwestern Louisiana: Louisiana Department of Transportation and Development, Office of Public Works Water Resources Technical Report no. 33, 75 p.

Keywords: groundwater, contaminants, freshwater

880. Nyman, D.J., 1989, Quality of water in freshwater aquifers in southwestern Louisiana: Louisiana Department of Transportation and Development Water Resources Technical Report no. 42, 22 p.

Keywords: groundwater, chemistry, contaminants, freshwater

881. Nyman, D.J., Beck, J.N., Rao, G.N., and Murray, H.E., 1991, The Sabine River diversion canal and groundwater conservation in Calcasieu Parish, Louisiana*, in* Dhamotharau, Dhamo, Resource development of the Lower Mississippi River; symposium papers:

American Water Resources Association Technical Publication Series TPS, v. 91-3, p. 253-259.

Keywords: groundwater, hydrology, surface water, freshwater

882. Nyman, D.J., and Fayard, L.D., 1978, Ground-water resources of Tangipahoa and St. Tammany Parishes, southeastern Louisiana: Louisiana Department of Transportation and Development, Office of Public Works Water Resources Technical Report no. 15, 76 p.

Keywords: groundwater

883. Nyman, D.J., Halford, K.J., and Martin, Angel, Jr., 1990, Geohydrology and simulation of flow in the Chicot aquifer system of southwestern Louisiana: Louisiana Department of Transportation and Development Water Resources Technical Report no. 50, 58-p.

Keywords: groundwater, hydrology, model

884. Nyman, J.A., Carloss, M., DeLaune, R.D., and Patrick, W.H., Jr., 1994, Erosion rather than plant dieback as the mechanism of marsh loss in an estuarine marsh: Earth Surf. Process. Landforms, v. 19, no. 1, p. 69-84.

Coastal marsh loss in Louisiana is attributed to plant dieback caused by processes that stress vegetation, and a common landscape pattern is broken marsh that expands at the expense of surrounding unbroken marsh. The authors tested the hypothesis that vegetation is more stressed in broken marsh than in adjacent unbroken marsh, as indicated by vegetation above-ground biomass, species diversity, and soil Eh on transects that extended from broken marsh to unbroken marsh at Marsh Island, Louisiana.

Keywords: estuarine, wetland loss, ecology

885. Nyman, J.A., and Chabreck, R.H., 1996, Some effects of 30 years of weir-management on coastal marsh aquatic vegetation and implications to waterfowl management: Gulf Mex. Sci., v. 14, no. 1, p. 16-25.

Aquatic vegetation was compared between weir-managed and unmanaged brackish marsh ponds at Marsh Island, Louisiana, parts of which have been weir-managed since 1958.

Keywords: estuarine, management, ecology

886. Nyman, J.A., Chabreck, R.H., and Kinler, N.W., 1993, Some effects of herbivory and 30 years of weir management on emergent vegetation in brackish marsh: Wetlands, v. 13, no. 3, p. 165-175.

Weirs are low-level dams used in Louisiana's coastal marshes to improve habitat quality for ducks and furbearers; however, some ecologists question whether weir management

inhibits soil drainage and thereby negatively affects the emergent plant community. We compared the emergent plant communities of unmanaged marsh and marsh that was weir managed since 1958 at Marsh Island, Louisiana to test for management effects. Two data sets were analyzed: 4 permanent transects sampled 8 times between 1958 and 1988, and 44 random transects sampled in 1987.

Keywords: hydrology, management, wetland loss, mammals, herbivory, birds, vascular plants, estuarine

887. Nyman, J.A., Chabreck, R.H., and Linscombe, R.G., 1990, Effects of weir management on marsh loss, Marsh Island, Louisiana, USA: Environmental Management, v. 14, no. 6, p. 809-814.

Parts of Marsh Island, Louisiana, have been weir-managed since 1958 to improve duck and furbearer habitat. Using aerial photographs, marsh loss that occurred between 1957 and 1983 in a 2922-ha weir-managed area was compared to that in a 2365-ha unmanaged area. Marsh loss was 0.38%/yr in the weir-managed area, and 0.35%/yr in the unmanaged area. Because marsh loss in the two areas differed less than 0.19%/yr, it was concluded that weirs did not affect marsh loss. Weirs may have different effects under different hydrological conditions; additional studies are needed before generalizations regarding weirs and marsh loss can be made.

Keywords: freshwater, estuarine, hydrology, management, wetland loss

888. Nyman, J.A., Crozier, C.R., and DeLaune, R.D., 1995, Roles and patterns of hurricane sedimentation in an estuarine marsh landscape: Estuarine, Coastal and Shelf Science, v. 40, no. 6, p. 665-679.

The passage of hurricane Andrew across the Louisiana coastal zone in 1992 was used to study the effects of hurricane sedimentation on estuarine marshes. (1) The thickness and nutrient content of hurricane sediments, (2) the composition of hurricane sediments relative to pre-existing sediments, and (3) the relationship between hurricane sedimentation and small-scale heterogeneity in the emergent plant community were investigated.

Keywords: estuarine, geomorphology, sediment, hydrology, vascular plants

889. Nyman, J.A., and DeLaune, R.D., 1991, CO_2 emission and soil Eh responses to different hydrological conditions in fresh, brackish, and saline marsh soils: Limnology and Oceanography, v. 36, no. 7, p. 1406-1414.

The effects of various water-table depths during continuous and simulated tidal drainage on CO_2 emissions and soil Eh were examined in intact fresh, brackish, and saline marsh soil cores.

Keywords: estuarine, freshwater, sediment, nutrients, chemistry, salinity

890. Nyman, J.A., DeLaune, R.D., Roberts, H.H., and Patrick, W.H., Jr., 1993, Relationship between vegetation and soil formation in a rapidly submerging coastal marsh: Marine Ecology Progress Series, v. 96, no. 3, p. 269-279.

The purposes of this study were to determine the relative importance of organic matter and mineral matter to marsh vertical accretion and to determine if insufficient vertical accretion was a factor in land loss in a Terrebonne Basin marsh.

Keywords: estuarine, sediment, wetland loss, vascular plants

891. Obi, A., and Conner, J.V., 1986, Spring and summer macroinvertebrate drift in the Lower Mississippi River, Louisiana: Hydrobiologia, v. 139, no. 2, p. 167-175.

Keywords: macroinvertebrates, freshwater, ecology

892. Office of Nuclear Waste-Isolation, 1983, Potentiometric-level monitoring program; Mississippi and Louisiana; Annual status report for fiscal year 1982: ONWI (Battelle Memorial Institute, Office of Nuclear Waste-Isolation), v. 478, 40 p.

Keywords: groundwater, chemistry

893. Osborn, B., 1977, Geopressured-geothermal test of the Edna Delcambre no. 1 well, Vermilion Parish, Louisiana I: Proceedings – Geopressured Geothermal Energy Conference, no. 3, p. ED.1-ED.6.

Keywords: groundwater

894. Overstreet, R.M., Heard, R.W., and Lotz, J.M., 1992, *Microphallus fonti* sp. n. (Digenea : Microphallidae) from the red swamp crawfish in southern United States: Mem. Inst. Oswaldo Cruz., v. 87, no. suppl. 1, p. 175-178.

A new species of digenean, *Microphallus fonti*, is described from the red swamp crawfish in Louisiana, USA.

Keywords: macroinvertebrates, microbiology

895. Overton, E.B., Schurtz, M.H., St. Pe, K.M., and Byrne, C., 1986, Distribution of trace organics, heavy metals, and conventional pollutants in Lake Pontchartrain, Louisiana: Organic Marine Geochemistry., ACS Symposium Series, no. 305, p. 247-271.

Polynuclear aromatic hydrocarbons from urban runoff were found at elevated levels in nearshore sediment samples from Lake Pontchartrain. Concentrations decreased with distance from the New Orleans shoreline and approached background levels three to six miles offshore. Quantitative profiles for individual PAH isomers differed significantly between nearshore and offshore sediments. Similar trends were observed with

chlorocarbons and lead, but concentrations of other heavy metals did not decrease with distance from the shoreline. Salt water intrusion causes stratification over the southeastern portion of the Lake in the summer. This stratification contributes to and exacerbates bottom anoxic conditions during warm weather months.

Keywords: urban, contaminants, estuarine, trace elements, sediment, salinity

896. Owens, J.W., 1993, BMPs [best management practices] on the bayou: Water Environ. Technol., v. 5, no. 8, p. 47-50.

This report evaluates the BMPs employed in the Mermentau River basin using a 30-year monitoring program by the Louisiana Department of Environmental Quality of the area.

Keywords: surface water, freshwater, agriculture, management

897. Pace, M., and Carman, K.R., 1995, Feeding preference of a natural assemblage of meiobenthic copepods: Twenty-Third Benthic Ecology Meeting [variously paged].

The feeding behavior of a natural assemblage of meiobenthic copepods was examined to determine whether planktonic or benthic diatoms were preferred.

Keywords: surface water, freshwater, ecology, macroinvertebrates

898. Page, L.V., 1963, Water-supply characteristics of Louisiana streams: Louisiana Department of Public Works Technical Report no. 1, 109 p.

Keywords: surface water, freshwater, chemistry

899. Page, L.V., and Poole, J.L., [1958], Water, *in* West Baton Rouge Parish Resources and Facilities: Louisiana Department of Public Works and West Baton Rouge Parish Development Board, p. 26-35.

Keywords: groundwater, surface water

900. Pankow, W., Teeter, A.M., and Donnell, B.P., 1990, Atchafalaya River delta. Report 2. Field data. Section 3—Grain size analysis of selected bay sediments: Army Engineer Waterways Experiment Station., Vicksburg, MS, Hydraulics Lab., 31 p.

This report is part of a series that addresses the U.S. Army Corps of Engineers concern about how the growth of the Wax Lake outlet and lower Atchafalaya River Deltas will evolve over the next 50 years. Goals of the reports are to determine the impacts of the growth of these deltas on navigation, flood control, salinity, and sedimentation. This section emphasizes the grain size analysis of approximately 325 samples taken within the bay system and tributaries.

Keywords: estuarine, geomorphology, sediment

901. Pardue, J.H., DeLaune, R.D., and Patrick, W.H., Jr., 1988, Effect of sediment pH and oxidation-reduction potential on PCB mineralization: Water, Air, & Soil Pollution, v. 37, no. 3-4, p. 439-447.

Keywords: chemistry, contaminants, sediment, freshwater

902. Pardue, J.H., DeLaune, R.D., and Patrick, W.H., Jr., 1992, Heavy metals in the environment. Metal to aluminum correlation in Louisiana coastal wetlands: Identification of elevated metal concentrations: Journal of Environmental Quality, v. 21, no. 4, p. 539-545.

Elevated toxic metal concentrations in Louisiana coastal wetlands are obscured by natural heterogeneity in baseline levels. Normalization of heavy metal concentrations to Al is a promising method for intersite comparison and for the identification of metal-contaminated sites. The authors determined that Al significantly correlates with Pb, Cd, and Cr in sediment samples from coastal Louisiana.

Keywords: estuarine, trace elements, sediment, chemistry

903. Pardue, J.H., DeLaune, R.D., Patrick, W.H., Jr., and Nyman, J.A., 1994, Treatment of alligator farm wastewater using land application: Aquacult. Eng., v. 13, no. 2, p. 129-145.

Treatment of an aquaculture wastewater from alligator farms in Louisiana using land application was investigated. Wastewater from alligator farms resembled municipal domestic wastewater in high biological oxygen demand and P concentrations, but contained twice the N content due to the high excretion of ammonia by alligators.

Keywords: surface water, freshwater, management, nutrients, aquaculture, reptiles, contaminants

904. Parker, R.S., Hackney, C.T., and Vidrine, M.F., 1984, Ecology and reproductive strategy of a south Louisiana freshwater mussel, *Glebula rotundata* (Lamarck) (Unionidae: Lampsilini): Freshwat. Invertebr. Biol., v. 3, no. 2, p. 53-58.

Keywords: macroinvertebrates, ecology

905. Patrick, D.M., Mao, Lunjin, and Ross, S.T., 1991, Accelerated erosion in the Bayou Pierre Basin, Southwest Mississippi; characterization and causes*, in* Daniel, B.J., Proceedings; Mississippi water resources conference 1991: Proceedings--Mississippi Water Resources Conference, v. 21, p. 36-44.

Keywords: surface water, freshwater, hydrology, geomorphology

906. Patrick, W.H., Jr., Antie, D.A., Delaune, R.D., and Engler, R.M., 1971, Nitrate removal from the water-mud interface in flooded soils and marsh sediments: National Coastal and Shallow Water Research Conference, Abstracts, v. 2, p. 174.

Keywords: surface water, freshwater, nutrients, sediment

907. Patrick, W.H., Jr., and Henderson, R.E., 1981, Reduction and reoxidation cycles of manganese and iron in flooded soil and in water solution, *in* Larsen, W.E., Proceedings of the 45th annual meeting, Soil Science Society of America: Soil Science Society of America Journal, v. 45, no. 5, p. 855-859.

Keywords: freshwater, chemistry, sediment

908. Patterson, C.S., and Mendelssohn, I.A., 1991, A comparison of physicochemical variables across plant zones in a mangal/salt marsh community in Louisiana: Wetlands, v. 11, no. 1, p. 139-161.

Three vegetation zones were delineated in a mangal/salt marsh community at Bay Champagne, Louisiana--a zone dominated by *Avicennia germinans* adjacent to the bay, an inland zone dominated by *Spartina alterniflora*, and a transition zone between the two containing both species. Analysis of variance revealed highly significant zone differences for most individual variables.

Keywords: estuarine, chemistry, vascular plants, ecology, sediment

909. Patterson, C.S., Mendelssohn, I.A., and Swenson, E.M., 1993, Growth and survival of *Avicennia germinans* seedlings in a mangal/salt marsh community in Louisiana, USA: Journal of Coastal Research, v. 9, no. 3, p. 801-810.

Keywords: estuarine, vascular plants, ecology

910. Penland, S., Groat, C.G., and Williams, S.J., 1989, The geologic framework of coastal land loss in Louisiana: 1990 AAAS Annual Meeting Abstracts, p. 72.

Keywords: estuarine, geomorphology, wetland loss

911. Pennington, Karrie, 1997, An analysis of fish and sediment samples from Mississippi Delta rivers, *in* Daniel, B.J., Proceedings of the Twenty-seventh Mississippi Water Resources Conference: Proceedings--Mississippi Water Resources Conference, v. 27, p. 228-236.

Keywords: surface water, freshwater, fish, sediment, chemistry, contaminants

912. Pereira, W.E., Rostad, C.E., and Chiou, C.T., 1987, Distributions of halogenated organic compounds in estuarine water biota and sediments: Abstracts of Papers – American Chemical Society National Meeting, v. 194.

Keywords: estuarine, sediment, contaminants, ecology

913. Pereira, W.E., Rostad, C.E., and Chiou, C.T., 1988, Contamination of estuarine sediments, water, and biota by halogenated organic compounds, Calcasieu River Estuary, Louisiana: U.S. Geological Survey Open-File Report 87-0764, p. 87-97.

Keywords: estuarine, sediment, contaminants, ecology

914. Pereira, W.E., Rostad, C.E., Chiou, C.T., Brinton, T.I., Barber, L.B. II, Demcheck, D.K., and Demas, C.R., 1988, Contamination of estuarine water, biota, and sediment by halogenated organic compounds—A field study: Environmental Science and Technology, v. 22, no. 7, p. 772-778.

Studies conducted in the vicinity of an industrial outfall in the Calcasieu River estuary, Louisiana, have shown that water, bottom and suspended sediment, and four different species of biota are contaminated with halogenated organic compounds (HOC) including haloarenes. A "salting-out" effect in the estuary moderately enhanced the partitioning tendency of the contaminants into biota and sediments. Contaminant concentrations in water, suspended sediments, and biota were found to be far below the values predicted on the basis of the assumption of phase equilibria with respect to concentrations in bottom sediment.

Keywords: estuarine, contaminants, fish, sediment, surface water, macroinvertebrates, chemistry

915. Pereira, W.E., Rostad, C.E., Keck, Robert, and Chiou, C.T., 1989, Distribution of organic compounds in the lower Calcasieu River, Louisiana, with special emphasis on haloarenes: U.S. Geological Survey Water-Resources Investigations Report 88-4089, p. 35-51.

Keywords: surface water, freshwater, contaminants

916. Pereira, W.E., Rostad, C.E., and Leiker, T.J., 1990, Distribution of agrochemicals in the lower Mississippi River and its tributaries: The Science of the Total Environment, v. 97-98, p. 41-53.

Keywords: surface water, freshwater, pesticides, nutrients, contaminants

917. Perret, W.S., Bowman, P.E., and Savoie, L.B., 1996, Bycatch in the Louisiana shrimp fishery: Proceedings of the Solving Bycatch Workshop, September 25-27, 1995, Seattle, Washington, p. 137-144.

Keywords: estuarine, management, macroinvertebrates

918. Perret, W.S., Dugas, R., Roussel, J., and Boudreaux, C., 1993, Effects of Hurricane Andrew on Louisiana's oyster resources: Journal of Shellfish Research, v. 12, no. 1, p. 140.

Hurricane Andrew crossed the central Louisiana coast just east of Atchafalaya Bay in August of 1992, passing through the state's most productive oyster grounds. In July, prior to the storm, oyster density samples were taken on all of the State's public oyster grounds as part of the regular sampling program. The week following the storm, density samples were taken again to determine the extent of the oyster damage.

Keywords: estuarine, macroinvertebrates

919. Perry, W.G., and Joanen, T., 1986, Seasonal abundance and distribution of marine organisms in a semi-impounded Louisiana wildlife management area: Proceedings of the Louisiana Academy of Sciences, v. 49, p. 34-44.

Keywords: ecology, estuarine

920. Perry, W.G., Rogillio, H., Morrison, T., and Dares, I., 1985, Preliminary findings of channel catfish tagging study on the Salvador wildlife management area: Proceedings of the Louisiana Academy of Sciences, v. 48, p. 59-64.

Keywords: fish, ecology, management

921. Pettijohn, R.A., 1986, Processing water-chemistry data, Gulf Coast aquifer systems, south-central United States, with summary of dissolved-solids concentrations and water types: U.S. Geological Survey Water-Resources Investigations Report 86-4186, 42 p.

Keywords: groundwater, chemistry, freshwater

922. Pettijohn, R.A., 1988, Dissolved-solids concentrations and primary water types, Gulf Coast aquifer systems, south-central United States: U.S. Geological Survey Hydrologic Investigations Atlas HA-706, 2 sheets.

Keywords: groundwater, chemistry, freshwater

923. Pettijohn, R.A., Busby, J.F., and Backman, J.D., 1993, Properties and chemical constituents in ground water from permeable zone D (middle Miocene deposits), coastal lowlands aquifer system, south-central United States: U.S. Geological Survey Water-Resources Investigations Report 92-4105, 5 over-size sheets.

Keywords: groundwater, chemistry, freshwater

924. Pettijohn, R.A., Busby, J.F., and Cervantes, M.A., 1993, Properties and chemical constituents in ground water from the Lower Claiborne-Upper Wilcox aquifer, Gulf

Coast regional aquifer systems, south-central United States: U.S. Geological Survey Water-Resources Investigations Report 92-4102, 5 over-size sheets.

Keywords: groundwater, chemistry, freshwater

925. Pettijohn, R.A., Busby, J.F., and Cervantes, M.A., 1993, Properties and chemical constituents in ground water from the Middle Claiborne Aquifer, Gulf Coast regional aquifer systems, south-central United States: U.S. Geological Survey Water-Resources Investigations Report 92-4104, 5 over-size sheets.

Keywords: groundwater, chemistry, freshwater

926. Pettijohn, R.A., Busby, J.F., and Cervantes, M.A., 1993, Properties and chemical constituents in ground water from permeable zone C (lower Pliocene-upper Miocene deposits), coastal lowlands aquifer system, south-central United States: U.S. Geological Survey Water-Resources Investigations Report 91-4151, 5 over-size sheets.

Keywords: groundwater, chemistry, freshwater

927. Pettijohn, R.A., Busby, J.F., and Layman, T.B., 1993, Properties and chemical constituents in ground water from permeable zone B (lower Pleistocene-upper Pliocene deposits), coastal lowlands aquifer system, south-central United States: U.S. Geological Survey Water-Resources Investigations Report 91-4152, 5 over-size sheets.

Keywords: groundwater, chemistry, freshwater

928. Pettijohn, R.A., Busby, J.F., and Layman, T.B., 1993, Properties and chemical constituents in ground water from permeable zone E (lower Miocene-upper Oligocene deposits), coastal lowlands aquifer system, south-central United States: U.S. Geological Survey Water-Resources Investigations Report 92-4103, 5 over-size sheets.

Keywords: groundwater, chemistry, freshwater

929. Pettijohn, R.A., Busby, J.F., and Layman, T.B., 1993, Properties and chemical constituents in ground water from the Upper Claiborne aquifer, Gulf Coast regional aquifer systems, south-central United States: U.S. Geological Survey Water-Resources Investigations Report 91-4150, 5 over-size sheets.

Keywords: groundwater, chemistry, freshwater

930. Pettijohn, R.A., Weiss, J.S., and Williamson, A.K., 1988, Distribution of dissolved-solids concentrations and temperature in ground water of the Gulf Coast aquifer systems, south-central United States: U.S. Geological Survey Water-Resources Investigations Report 88-4082, 5 over-size sheets.

Keywords: groundwater, chemistry, freshwater

931. Pezeshki, S.R., and DeLaune, R.D., 1988, Carbon assimilation in contrasting streamside and inland *Spartina alterniflora* salt marsh: Vegetatio, v. 76, no. 1-2, p. 55-61.

Keywords: vascular plants, physiology, estuarine

932. Pezeshki, S.R., and DeLaune, R.D., 1993, Effects of soil hypoxia and salinity on gas exchange and growth of *Spartina patens*: Marine Ecology Progress Series, v. 96, no. 1, p. 75-81.

Laboratory experiments were conducted to evaluate the effects of increased soil salinity on gas exchange functioning and growth of the brackish-marsh grass, *Spartina patens*, under controlled soil redox potentials which were maintained at either aerobic or hypoxic conditions. Plants were subjected to salinities of 0, 5, 15, and 25 ppt gradually over a 7-d period and leaf tissue chlorophyll content, gas exchange and growth responses were measured.

Keywords: sediment, estuarine, chemistry, physiology

933. Pezeshki, S.R., and DeLaune, R.D., 1995, Variations in response of two U.S. Gulf Coast populations of *Spartina alterniflora* to hypersalinity: Journal of Coastal Research, v. 11, no. 1, p. 89-95.

Two populations of *Spartina alterniflora* Lois. from Louisiana Gulf Coast marshes were studied under flooded conditions and elevated salinities of 170, 510, and 850 mol/m^3.

Keywords: estuarine, vascular plants, physiology, salinity

934. Pezeshki, S.R., and DeLaune, R.D., 1996, Coastal changes and wetland losses in the Mississippi River deltaic plain: Workshop Rep. IOC, no. 105 Suppl.

In wetlands of the lower Mississippi Delta, anthropogenic factors (river diversions, navigation canals, land conversion, oil drilling activities, etc.) and natural factors (subsidence, saltwater intrusion) have resulted in considerable changes in physicochemical characteristics of wetland soils.

Keywords: estuarine, wetland loss, management

935. Pezeshki, S.R., DeLaune, R.D., and Pardue, J.H., 1992, Sediment addition enhances transpiration and growth of *Spartina alterniflora* in deteriorating Louisiana Gulf Coast salt marshes: Wetlands Ecol. Manage., v. 1, no. 4, p. 185-189.

Transpiration, leaf conductance, net photosynthesis, leaf growth, above-ground biomass, and regeneration of new culms were studied in a rapidly subsiding *Spartina alterniflora* Lois. salt marsh following the addition at 47 and 94 Kg/m^2 of new sediment.

Keywords: estuarine, sediment, vascular plants, physiology

936. Pezeshki, S.R., DeLaune, R.D., and Patrick, W.H. Jr., 1987, Effects of flooding and salinity on photosynthesis of *Sagittaria lancifolia*: Marine ecology progress series. Oldendorf, v. 41, no. 1, p. 87-91.

Sagittaria lancifolia L. plants were subjected to flooding, salinity, and combined treatments. Effects of each treatment and their interactions on stomatal conductance and net photosynthesis were evaluated after 4 weeks of acclimation to the imposed conditions. Effect of flooding on leaf conductance was not significant while the salinity effect was significant. Both flooding and salinity reduced net photosynthesis significantly. However, their interaction was not significant. The stomatal limitation of photosynthesis was relatively small ranging from 12 to 18%. Results indicated that for plants subjected to salinity or to combined salinity and flooding, photosynthetic capacity was reduced through stomatal limitations as well as non-stomatal (metabolic) factors.

Keywords: hydrology, vascular plants, physiology, productivity, salinity

937. Pezeshki, S.R., DeLaune, R.D., and Patrick, W.H. Jr., 1987, Gas exchange characteristics of Gulf of Mexico coastal marsh macrophytes: Journal of Experimental Marine Biology and Ecology, v. 111, no. 3, p. 243-253.

Gas exchange characteristics of three major Louisiana Mississippi River deltaic plain marsh species, *Spartina patens* (Ait.) Muhl., *Spartina alterniflora* Lois., and *Panicum hemitomon* Shult., was studied under controlled environment conditions.

Keywords: vascular plants, estuarine, physiology

938. Pezeshki, S.R., DeLaune, R.D., and Patrick, W.H. Jr., 1987, Response of *Spartina patens* to increasing levels of salinity in rapidly subsiding marshes of the Mississippi River deltaic plain: Estuarine, Coastal and Shelf Science, v. 24, no. 3, p. 389-399.

Spartina patens (Ait.) Muhl. plants were collected from a Mississippi River deltaic plain brackish marsh located along the Louisiana Gulf Coast. The plants were subjected to salinity levels of 4 to 22 ppt under controlled environment conditions. Specifically, the influence of salt water influx on the stomatal behaviour and net photosynthesis of *S. patens* was studied. Stomatal conductance was reduced 54% and net photosynthesis 43% as soil salinity was increased from 0 to 22 ppt. Both responses were rapid (within 24 h) and persisted throughout the entire experiment.

Keywords: estuarine, vascular plants, salinity, physiology

939. Pezeshki S.R., DeLaune, R.D., and Patrick, W.H., Jr., 1989, Assessment of saltwater intrusion impact on gas exchange behavior of Louisiana Gulf Coast wetland species: Wetlands Ecology and Management, v. 1, no. 1, p. 21-30.

Keywords: vascular plants, physiology, freshwater, estuarine

940. Pezeshki, S.R., DeLaune, R.D., and Patrick, W.H. Jr., 1989, Effect of fluctuating rhizosphere redox potential on carbon assimilation of *Spartina alterniflora*: Oecologia, v. 80, no. 1, p. 132-135.

Keywords: physiology, vascular plants, estuarine

941. Pezeshki, S.R., DeLaune, R., Patrick, W., Jr., and Good, B., 1989, Response of Louisiana Gulf Coast marshes to saltwater intrusion, *in* Duffy, W.G., and Clark, Darryl, Marsh management in coastal Louisiana; effects and issues; proceedings of a symposium: Biological Report, no. 89(22), p. 75-85.

Keywords: estuarine, freshwater, ecology, surface water

942. Picking, L.W., Greenwood, D.F., and Smith, P.G., 1976, Determination of transmissivity and storage of a large water table aquifer from long-term pumping test data: Bulletin of the Association of Engineering Geologists, v. 13, no. 3, p. 213-232.

Keywords: groundwater, hydrology, freshwater

943. Platt, S.G., Brantley, C.G., and Hastings, R.W., 1990, Food habits of juvenile American alligators in the upper Lake Pontchartrain estuary: Northeast Gulf Sci., v. 11, no. 2, p. 123-130.

Food habits of juvenile (0.49-1.21 m total length) American alligators (*Alligator mississippiensis*) from an area in southeastern Louisiana were investigated. One-hundred and one stomach samples were obtained by stomach-pumping. Crustaceans (crayfish; blue crabs, *Callinectes sapidus*; grass shrimp, *Palaemonetes* sp.), insects (hemipterans, coleopterans), and small fish (least killifish, *Heterandria formosa*; mosquitofish, *Gambusia affinis*) constituted the majority of prey items taken. Fish consumption was significantly more frequent during April and May than during June through September ($P < 0.025$). This differential use of prey species may be due to seasonally fluctuating water levels in the study area. Comparisons of juvenile alligator food habits revealed dietary differences between Louisiana and Florida ($P < 0.001$), possibly due to the different prey available at the two areas. Prey utilization was not significantly different between larger alligators (0.9-1.2 m total length) and smaller alligators (0.3-0.9 m total length) ($P > 0.25$).

Keywords: reptiles, ecology, habitat

944. Poirrior, M.A., Rogers, J.S., Mulino, M.A., and Eisenberg, E.S., 1975, Epifaunal invertebrates as indicators of water quality in southern Lake Pontchartrain: Technical Report – Louisiana Water Resources Research Institute, no. 5, 43 p.

Keywords: estuarine, macroinvertebrates, ecology

945. Poland, J.F., 1981, Subsidence in United States due to ground water withdrawal: Journal of the Irrigation and Drainage Division, v. 107, no. IR2, p. 115-135.

Keywords: groundwater, hydrology

946. Pollard, J.E., Melancon, S.M., and Blakey, L.S., 1983, Importance of bottomland hardwoods to crawfish and fish in the Henderson Lake area, Atchafalaya Basin, Louisiana: Wetlands, v. 3, p. 1-25.

This study evaluates the importance of overflow areas to the biological productivity of a bottomland hardwood swamp in the Henderson Lake area of the Atchafalaya Basin, Louisiana. Adult fishes, young-of-year largemouth bass, crawfish, and zooplankton were monitored through a one year water cycle. The flooded woods habitat was the primary area utilized by fish and crawfish for spawning and as a nursery ground. Large concentrations of zooplankton and crawfish were available as a food resource for young-of-year and adult fish at the ephemeral edge habitat.

Keywords: freshwater, fish, macroinvertebrates, productivity, riparian, habitat, ecology

947. Poulson, S.R., Ohmoto, H., and Ross, T.P., 1995, Stable isotope geochemistry of waters and gases (CO_2 & CH_4) from the overpressured Morganza and Moore-Sams Fields, Louisiana Gulf Coast: Appl. Geochem., v. 10, no. 4, p. 407-417.

Oxygen isotope analyses of water, and carbon isotope analyses of dissolved inorganic carbon, CO_2, and CH_4 have been performed on samples from normal and overpressured horizons in the Louisiana Gulf Coast.

Keywords: groundwater, chemistry

948. Presley, B.J., Trefry, J.H., and Shokes, R.F., 1980, Heavy metal inputs to Mississippi delta sediments: Water, Air, and Soil Pollution, v. 13, no. 4, p. 481-494.

Keywords: estuarine, sediment, trace elements

949. Primeaux, A.D., 1985, Geophysical survey to investigate contaminant migration from a waste site: Proceedings; Second Canadian/American Conference on Hydrogeology; Hazardous Wastes in Ground Water; a Soluble Dilemma, p. 151-155.

Keywords: groundwater, hydrology, contaminants

950. Prytula, M.T., and Pavlostathis, S.G., 1996, Extraction of sediment-bound chlorinated organic compounds; implications on fate and hazard assessment, *in* Nyholm, N., and Jacobsen, B.N., Hazard assessment and control of environmental contaminants in water: Water Science and Technology, v. 33, no. 6, p. 247-254.

Keywords: contaminants, surface water, sediment, estuarine

951. Quisenberry, S.S., Trahan, G.B., Heagler, A.M., McManus, B., and Robinson, J.F., 1992, Effect of water management as a control strategy for rice water weevil (Coleoptera: Curculionidae): Journal of Economic Entomology, v. 85, no. 3, p. 1007-1014.

Water management (removal of water to alter the habitat necessary for larval survival) is a pest management tactic that might have potential as a substitute for the use of insecticides to control the rice water weevil.

Keywords: surface water, freshwater, management, agriculture, hydrology

952. Rafferty, P.S., Hargis, T.G., Lynch, J.C., and Twilley, R.R., 1992, Redox conditions of two Louisiana coastal watersheds as influenced by vegetation and hydrology: Wetlands; Proceedings of the 13th Annual Conference, Society of Wetland Scientists, v. 13, p. 639-643.

Keywords: surface water, freshwater, chemistry, hydrology, sediment, vascular plants

953. Rakocinski, C.F., Baltz, D.M., and Fleeger, J.W., 1992, Correspondence between environmental gradients and the community structure of marsh-edge fishes in a Louisiana estuary: Marine Ecology Progress Series, v. 80, no. 2-3, p. 135-148.

Patterns in the community structure of marsh-edge fishes occupying the ecotone between marsh surface and open water were revealed through intensive surveys with a drop sampler along two 25 km transects in a Louisiana estuary during spring and summer 1989.

Keywords: estuarine, fish, ecology, habitat

954. Ramanarayanan, T.S., Sabbagh, G.J., Reyes, M.R., Bengtson, R.L., Storm, D.E., and Fouss, J.L., 1994, Performance of transport models in predicting nitrate in runoff from high water table areas, *in* Anonymous, American Society of Agricultural Engineers; 1994 international summer meeting: International Summer Meeting--American Society of Agricultural Engineers, v. 1994, 13 p.

Keywords: model, nutrients, surface water

955. Ramelow, G.J., Biven, S.L., Zhang, Y., Beck, J.N., Young, J.C., Callahan, J.D., and Marcon, M.F., 1992, The identification of point sources of heavy metals in an industrially impacted waterway by periphyton and surface sediment monitoring: Water, Air, & Soil Pollution, v. 65, no. 1-2, p. 175-190.

Periphyton and sediment samples were collected from 12 stations along Bayou d'Inde, a very polluted waterway in southwestern Louisiana. The samples were analyzed for Zn,

Cu, Pb, Ni, Fe, Cr, Al, Cd, and Ag. Concentrations in those samples were then used to isolate a major point source along the bayou.

Keywords: surface water, freshwater, algae, sediment, contaminants, trace elements

956. Ramelow, G.J., Webre, C.L., Mueller, C.S., Beck, J.N., Young, J.C., and Langley, M.P., 1989, Variations of heavy metals and arsenic in fish and other organisms from the Calcasieu River and Lake, Louisiana: Archives of Environmental Contamination and Toxicology, v. 18, no. 6, p. 804-818.

Keywords: contaminants, trace elements, fish, estuarine, freshwater

957. Ramsey, E.W., III, Laine, S., Werle, D., Tittley, B., and Lapp, D., 1994, Monitoring Hurricane Andrew damage and recovery of the coastal Louisiana marsh using satellite remote sensing data: Coastal Zone Canada '94, Conference Proceedings, v. 4, Coastal Zone Canada Association, p. 1841-1852.

ERS-1 SAR and Landsat Thematic Mapper images were acquired of the Louisiana coastal marsh before and after Hurricane Andrew. Limited to a long-term marsh study site (*Spartina patens* marsh), a land and water boundary mask was generated for before and after hurricane conditions.

Keywords: estuarine, GIS, wetland loss

958. Randall, J.M., and Day, J.W., Jr., 1987, Effects of river discharge and vertical circulation on aquatic primary production in a turbid Louisiana (USA) estuary: Neth. J. Sea Res., v. 21, no. 3, p. 231-242.

Keywords: production, ecology, estuarine, hydrology

959. Ranganathan, V., 1990, Hydrodynamics of brine formation around salt domes in the South Louisiana Gulf Coast: V.M. Goldschmidt Conference; Program and Abstracts, p. 76.

Keywords: groundwater, geology

960. Ranganathan, V., and Hanor, J.S., 1988, Density-driven groundwater flow near salt domes: Eos, Transactions, American Geophysical Union, v. 69, no. 16, p. 356.

Keywords: groundwater, hydrology, geology

961. Ranganathan, Vishnu, 1989, Basin dewatering along the flanks of salt domes, *in* Dymek, R.F., and Shelton, K.L., Geological Society of America, 1989 annual meeting: Abstracts with Programs--Geological Society of America, v. 21, no. 6, p. 317.

Keywords: groundwater, geology

962. Rao, G.N., Beck, J.N., Murray, H.E., and Nyman, D.J., 1991, Estimating transmissivity and hydraulic conductivity of Chicot Aquifer from specific capacity data: Water Resources Bulletin, v. 27, no. 1, p. 47-58.

Keywords: groundwater, chemistry, freshwater

963. Rapp, T.R., 1993, The effect of the Baton Rouge Fault on flow in the Abita Aquifer of southeastern Louisiana, *in* Anonymous, Geological Society of America, Southeastern Section, 42nd annual meeting: Abstracts with Programs--Geological Society of America, v. 25, no. 4, p. 63.

Keywords: groundwater, geology, hydrology

964. Rapp, T.R., 1994, Ground-water resources of southern Tangipahoa Parish and adjacent areas, Louisiana: U.S. Geological Survey Water-Resources Investigations Report 92-4182, 47 p.

Keywords: groundwater

965. Rathbun, R.E., 1995, Trihalomethane and nonpurgeable total organic-halide formation potentials for the Mississippi River and some of its tributaries, March-April 1992: U.S. Geological Survey Open-File Report 94-0336, p. 55.

Keywords: surface water, freshwater, contaminants, chemistry

966. Rathbun, R.E., and Bishop, L.M., 1994, Trihalomethane and nonpurgeable total organic-halide formation potentials for the Mississippi River and some of its tributaries, September-October 1991: U.S. Geological Survey Open-File Report 94-0036, p. 53.

Keywords: surface water, freshwater, contaminants, chemistry

967. Raymond, L.R., and Hardy, L.M., 1991, Effects of a clearcut on a population of the mole salamander, Ambystoma talpoideum, in an adjacent unaltered forest: Journal of Herpetology, v. 25, no. 4, p. 509-512.

Keywords: reptiles, ecology, habitat

968. Raymond, W.H., Rabin, R.M., and Wade, G.S., 1994, Evidence of an agricultural heat island in the lower Mississippi River floodplain: Bulletin of the American Meteorological Society, v. 75, p. 1019-1025.

The Mississippi River floodplain in the states of Arkansas, Tennessee, Mississippi, and Louisiana presents a readily discernible feature in weather satellite images. This floodplain appears in the spring and early summer as a daytime warm anomaly at infrared (IR) wavelengths and as a bright reflective area at visible wavelengths. Remnants of this

feature can occasionally be identified at nighttime in the IR satellite images. During June the normalized difference vegetation index identifies major contrasts between this intense agricultural region and the surrounding mixed-forest region. This distinction and the homogeneity of the floodplain, with its alluvial soil, contrast with the encircling region, creating an agricultural region containing heat island features. Thirty years of climatological surface station data for the month of June reveal that the surface air temperatures in the floodplain experience less diurnal variation than those in the surrounding regions. This is primarily because nighttime minimums are warmer in the Mississippi River floodplain.

Keywords: climate, riparian

969. Rebich, R.A., Schreiber, J.D., and Pote, J.W., 1995, Deterministic assessment of agricultural nonpoint source pollution in Mississippi Delta Management Systems Evaluation Areas (MSEAs), *in* Daniel, B.J., Proceedings of the Twenty-fifth Mississippi water resources conference: Proceedings--Mississippi Water Resources Conference, v. 25, p. 16-23.

Keywords: surface water, freshwater, agriculture, pesticides, nutrients, contaminants

970. Reed, B.C., Kelso, W.E., and Rutherford, D.A., 1992, Growth, fecundity, and mortality of paddlefish in Louisiana: Transactions of the American Fisheries Society, v. 121, no. 3, p. 378-384.

Growth, mortality, fecundity, egg diameter, and age at maturity were determined from samples of 270 paddlefish *Polyodon spathula* collected from the Atchafalaya River basin and Lake Pontchartrain, Louisiana, during a commercial harvest moratorium from 1987 to 1989.

Keywords: freshwater, fish, physiology, ecology

971. Reed, D.J., 1989, Effects on salt-marshes and coastal wetlands: 1990 AAAS Annual Meeting Abstracts, p. 75.

Keywords: estuarine, wetland loss

972. Reed, D.J., 1992, Effect of weirs on sediment deposition in Louisiana coastal marshes: Environmental Management, v. 16, no. 1, p. 55-65.

Sediment deposition both inside and outside of fixed-crest weirs was measured for fresh/intermediate, brackish, and saline marsh areas in coastal Louisiana, USA. Sediment traps, collected on a weekly basis, were used to monitor short-term changes in sediment deposition.

Keywords: estuarine, management, sediment

973. Reed, D.J., 1995, Sediment dynamics, deposition, and erosion in temperate salt marshes: Journal of Coastal Research, v. 11, no. 2, p. 295.

Keywords: estuarine, sediment, hydrology

974. Reed, D.J., and De Luca, N., 1997, Effect of hydrologic management on marsh surface sediment deposition in coastal Louisiana: Estuaries, v. 20, no. 2, p. 301-311.

The aim of this study was to determine the effect of hydrologic management measures on marsh-surface sediment deposition in the Mississippi deltaic plain. Four impoundments, ranging in size from 50 to 177 ha and similarly sized control sites were included in the study.

Keywords: estuarine, hydrology, management, sediment

975. Reed, D.J., and Foote, A.L., 1992, Evaluating impact of marsh management of sediment deposition in brackish Louisiana coastal marshes: Wetlands; proceedings of the 13th annual conference; Society of Wetland Scientists, v. 13, p. 680.

Keywords: management, wetland loss, sediment, estuarine

976. Reed, D.J., and Rozas, L.P., 1995, An evaluation of the potential for infilling existing pipeline canals in Louisiana coastal marshes: Wetlands, v. 15, no. 2, p. 149-158.

The impact of canals and their dredged-material levees on Louisiana coastal marshes has been assessed in a number of studies. The aerial coverage by canals and associated dredged-material levees has been shown to be approximately 10% of total marsh area in coastal Louisiana, which is about the same coverage as natural channels. In addition to the direct loss of marsh habitat caused by the canals, the indirect effects of dredge material placement in levees has been associated with marsh deterioration. Geomorphic survey and analysis was used to evaluate the potential result of infilling canals and the type of habitat that may result.

Keywords: wetland loss, sediment, management, habitat

977. Reese, W.D., and Thieret, J.W., 1966, Botanical study of the five islands of Louisiana: Castanea, v. 31, p. 251-277.

Keywords: vascular plants, checklist

978. Reible, D.D., Popov, V., Valsaraj, K.T., Thibodeaux, L.J., Lin, F., Dikshit, M., Todaro, M.A., and Fleeger, J.W., 1996, Contaminant fluxes from sediment due to tubificid oligochaete bioturbation: Water Research (Oxford), v. 30, no. 3, p. 704-714.

Keywords: surface water, freshwater, contaminants, macroinvertebrates, sediment

979. Reid, J.W., 1991, The genus *Metacyclops* (Copepoda: Cyclopoida) present in North America: *M. cushae*, new species, from Louisiana: Journal of Crustacean Biology, v. 11, no. 4, p. 639-646.

The cyclopoid copepod *Metacyclops cushae*, a new species, was collected from temporarily water-filled depressions in greater New Orleans, Louisiana.

Keywords: freshwater, macroinvertebrates

980. Rejmanek, M., Sasser, C.E., and Gosselink, J.G., 1987, Modeling of vegetation dynamics in the Mississippi River deltaic plain: Vegetatio, v. 69, no. 1-3, p. 133-140.

An analysis was made of vegetation phenomena associated with cyclic river delta building and abandonment in the Mississippi River deltaic plain, Louisiana. Markov models of vegetation succession were completed for the new Atchafalaya delta and for the abandoned Lafourche delta. Transition matrices representing different flood conditions in the Atchafalaya delta (1979-1984) were used separately and in combinations based on long term river discharge data. Effect of grazing was introduced into the model as a special transition matrix. Succession during active delta building is heavily dependent on a particular sequence of flood conditions and, apparently, on the intensity of grazing. A general flow diagram of long cyclic vegetation changes in the Mississippi deltaic plain was completed.

Keywords: hydrology, ecology, vascular plants, geomorphology, model

981. Remsen, J. V., Cardiff, S. W., and Dittmann, D. L., 1996, Timing of Migration and Status of Vireos (Vireonidae) in Louisiana: Journal of Field Ornithology, v. 67, no. 1, p. 119-140.

Keywords: ecology, habitat

982. Render, J.H., Thopson, B.A., and Allen, R.L., 1994, Reproductive development of striped mullet in Louisiana estuarine waters with notes on the applicability of reproductive assessment methods for isochronal species: Transactions of the American Fisheries Society, v. 124, no. 1, p. 26-36.

The authors assessed reproductive development of striped mullet from the coastal waters of Louisiana.

Keywords: estuarine, fish, productivity

983. Reuss, Martin, 1998, Designing the bayous—The control of water in the Atchafalaya Basin, 1800-1995: Office of History, U.S. Army Corps of Engineers, Alexandria, Va., 474 p.

Keywords: hydrology, management

984. Richardson, A.L., 1963, Some monocotyledonous plants of East Baton Rouge Parish: Proceedings of the Louisiana Academy of Science, v. 26, p. 9-15.

This work lists 9 families, 16 genera and 23 spp, 20 of which are recorded for the parish for the 1st time. The largest represented family is Lilliacease with 6 spp. in 4 genera. Only *Nothoslordum fragrans* is considered rare.

Keywords: vascular plants, checklist

985. Richardson, T.D., and Brown, K.M., 1990, Wave exposure and prey size selection in an intertidal predator: Journal of Experimental Marine Biology and Ecology, v. 142, no. 1-2, p. 105-120.

Keywords: habitat, ecology, estuarine

986. Ro, K.S., and Chung, K.H., 1995, Atrazine biotransformation in wetland sediment under different nutrient conditions; II, Aerobic: Journal of Environmental Science and Health, Part A—Environmental Science and Engineering, v. 30, no. 1, p. 121-131.

Keywords: pesticides, chemistry, nutrients, sediment

987. Roberts, D.W., Van Beek, J.L., Fournet, Stephen, and Williams, S.J., 1992, Abatement of wetland loss in Louisiana through diversions of Mississippi River water using siphons: U.S. Geological Survey Open-File Report 92-0274, p. 52.

Keywords: surface water, freshwater, wetland loss, management, hydrology

988. Roberts, H.H., and Coleman, J.M., 1996, Holocene evolution of the deltaic plain: A perspective--From Fisk to present: Engineering Geology, v. 45, no. 1-4, p. 113-138.

Keywords: geomorphology, sediment

989. Roberts, H.H., Kuecher, G.J., and Bailey, A.M., 1994, Subsidence in the Mississippi River delta; important influences of valley filling by cyclic deposition, early diagenesis, and primary consolidation phenomena, *in* Anonymous, Gulf Coast Association of Geological Societies and Gulf Coast Section of SEPM meeting (AAPG Gulf Coast Section); abstracts: AAPG Bulletin, v. 78, no. 9, p. 1476.

Keywords: surface water, freshwater, wetland loss, hydrology, geomorphology

990. Roberts, W.H., III, 1993, Deep water discharge; key to hydrocarbon and mineral deposits: Bulletin of the South Texas Geological Society, v. 34, no. 4, p. 9-20.

Keywords: groundwater, petroleum, trace elements

991. Robertson, G.A., 1980, Point bar erosion and accretion on a meander of Little Bayou Sara, Louisiana: Abstracts, Annual Meeting – Association of American Geographers, v. 35, p. 50.

Keywords: surface water, freshwater, geomorphology

992. Robertson, J.M., and Augspurger, C.K., 1999, Geomorphic processes and spatial patterns of primary forest succession on the Bogue Chitto River, USA: Journal of Ecology, v. 87, no. 6, p. 1052-1063.

The Bogue Chitto River, Louisiana, USA, is a meandering river with 16 early successional tree species having > 1% relative dominance. We hypothesized that geomorphic processes associated with rivers promote predictable spatial patterns of tree species within each river bend by influencing the physical conditions under which the forest is initially established. We predicted that (i) species of trees differ in their location of recruitment along the point bar, and trees on older land reflect the spatial patterns of recent recruits; (ii) the location of recruitment differs among tree species in elevation, soil texture, herbaceous cover and light; and (iii) a specific pattern of elevation, soil texture and tree species in the earliest stage of forest succession characterizes multiple river bends in a reach. On the floodplain interior to one bend, we mapped all trees and sampled seedlings and saplings, elevation, soil texture, herbaceous cover and light. In newly established forest adjacent to the point bars of eight bends, we surveyed spatial patterns of tree species, elevation and soil texture.

Keywords: geomorphology, vascular plants, ecology, riparian

993. Rodgers, J.S., Coble, L.E., and Hamilton, J.R., 1985, Analysis of DOW/DOE no. 1 L.R. Sweezy Well tests: Geopressured-Geothermal Energy, p. 57-70.

Keywords: groundwater

994. Rogers, B.D., Herke, W.H., and Knudsen, E.E., 1992, Effects of three different water-control structures on the movements and standing stocks of coastal fishes and macrocrustaceans: Wetlands, v. 12, no. 2, p. 106-120.

The authors used traps and trawls to evaluate the effects on nekton of a low-elevation weir, a fixed-crest weir, and a slotted weir. Data were collected from February 15th through July 30th in 1983, 1984, and 1986.

Keywords: estuarine, management, hydrology, fish, macroinvertebrates

995. Rogers, B.D., Shaw, R.F., Herke, W.H., and Blanchet, R.H., 1993, Recruitment of postlarval and juvenile brown shrimp (*Penaeus aztecus* Ives) from offshore to estuarine waters of the northwestern Gulf of Mexico: Estuar. Coast. Shelf Sci., v. 36, no. 4, p. 377-394.

The authors use relatively rare continental shelf distribution and abundance data for postlarval brown shrimp along with marsh postlarval and juvenile data, to investigate recruitment to the Calcasieu River estuary in western Louisiana.

Keywords: estuarine, macroinvertebrates, ecology

996. Rogers, D.R., Rogers, B.D., and Herke, W.H., 1992, Effects of a marsh management plan on fishery communities in coastal Louisiana: Wetlands, v. 12, no. 1, p. 53-62.

The effectiveness of a marsh management plan, involving a seasonal drawdown of brackish and freshwater marshes, on fishery communities and salinity were examined.

Keywords: estuarine, fish, management, hydrology

997. Rogers, J.E., 1983, Preconstruction and simulated postconstruction ground-water levels at urban centers in the Red River navigation project area, Louisiana: U.S. Geological Survey Water-Resources Investigations Report 83-4154, 33 p.

Keywords: groundwater, model, urban

998. Rogers, J.E., 1988, Red River Waterway Project--Summary of ground-water studies by the U.S. Geological Survey, 1962-85: U.S. Geological Survey Water-Resources Investigations Report 87-4261, 19 p.

Keywords: groundwater

999. Rogers, J.E., and Calandro, A.J., 1965, Water resources of Vernon Parish, Louisiana: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Bulletin no. 6, 104 p.

Keywords: groundwater

1000. Rogers, J.S., and Carter, C.E., 1987, Soil core sampling for hydraulic conductivity and bulk density: Soil Science Society of America Journal, v. 51, no. 5, p. 1393-1394.

Keywords: sediment, chemistry

1001. Rohli, R.V., and Grymes, J.M., III, 1995, Differences between modeled surplus and USGS-measured discharge in Lake Pontchartrain Basin, Louisiana: Water Resources Bulletin, v. 31, no. 1, p. 97-107.

Keywords: estuarine, surface water, freshwater, model, hydrology

1002. Rollo, J.R., 1960, Ground water in Louisiana: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Bulletin no. 1, 84 p.

Keywords: groundwater

1003. Rollo, J.R., 1962, Ground water in Plaquemines Parish, Louisiana: U.S. Geological Survey Open-File Report, 8 p.

Keywords: groundwater

1004. Rollo, J.R., 1966, Ground-water resources of the greater New Orleans area, Louisiana: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Bulletin no. 9, 69 p.

Keywords: groundwater

1005. Rollo, J.R., 1969, Saltwater encroachment in aquifers of the Baton Rouge area, Louisiana: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Bulletin no. 13, 45 p.

Keywords: groundwater, freshwater, contaminants

1006. Romaire, R.P., and Lutz, C.G., 1989, Population dynamics of *Procambarus clarkii* (Girard) and *Procambarus acutus acutus* (Girard) (Decapoda: Cambaridae) in commercial ponds: Aquaculture, v. 81, no. 3-4, p. 253-274.

Populations dynamics of red swamp crayfish, *Procambarus clarkii*, and white river crayfish, *P. acutus acutus*, were studied in two commercial ponds in southern Louisiana during one production season. Recruitment, growth, mortality and reproductive development of both species were surveyed from Sep. through the following May. Young-of-the-year (YOY) recruitment of *P. clarkii* was greatest in the fall with lesser peaks in mid-winter and early spring. Recruitment of *P. a. acutus* occurred only in late fall and late winter. Yields of crayfish in both ponds were low (536 and 642 kg/ha), principally from failure of secondary recruitment classes to attain harvestable size (> 70 mm total length) and from minimal fishing effort. Slow growth of mid-winter and early spring crayfish recruitment classes of both species was attributed principally to cool water temperatures and forage deficiency.

Keywords: freshwater, macroinvertebrates, aquaculture, productivity

1007. Rootes, W.L., Chabreck, R.H., Wright, V.L., Brown, B.W., and Hess, T.J., 1991, Growth rates of American alligators in estuarine and palustrine wetlands in Louisiana: Estuaries, v. 14, no. 4, p. 489-494.

A comparative study of American alligator (*Alligator mississippiensis*) growth rates was made in estuarine and palustrine wetlands in southwestern Louisiana. In the estuarine wetlands, where characteristic salinity levels were less than or equal to 5 ppt, alligators grew faster and therefore reached sexual maturity earlier than did those in palustrine

wetlands, which are characterized by shallow, freshwater marsh vegetation. Slower growth rates in palustrine wetlands appeared to be related to prey density, indicated by previous studies to be lower than in estuarine wetlands. Males grew faster than females and therefore reached sexual maturity at an earlier age in both habitats. This study revealed a major limitation in using total lengths as an index upon which population age structure can be based even when alligators are in the same geographic region.

Keywords: reptiles, productivity, habitat, salinity, estuarine

1008. Roth, D.A., Garbarino, J.R., and Taylor, H.E., 1995, Major and trace elements, *in* Moody, J.A., Chemical data for water samples collected during four upriver cruises on the Mississippi River between New Orleans, Louisiana, and Minneapolis, Minnesota, May 1990-April 1992: U.S. Geological Survey Open-File Report 94-0523, p. 127-209.

Keywords: surface water, freshwater, chemistry, trace elements

1009. Rowland, M.A., and Hannoura, A.A., 1988, Regional groundwater modeling and aquifer characterization: Proceedings of the Second National Outdoor Action Conference on Aquifer Restoration, Ground Water Monitoring and Geophysical Methods, v. 3, p. 1471-1494.

The Martin Marietta Space Systems facility in eastern New Orleans, Louisiana conducts groundwater monitoring for a shallow aquifer underlying the site. Using information concerning aquifer characteristics derived from earlier regional studies, a computer model has been developed to simulate behavior of the shallow aquifer in response to rainfall, tidal fluctuations, groundwater withdrawals, and other influences. The model used was the SUTRA groundwater model, which can also model the movement of dissolved substances in groundwater.

Keywords: groundwater, model, freshwater, hydrology

1010. Rozas, L.P., 1992, Comparison of nekton habitats associated with pipeline canals and natural channels in Louisiana salt marshes: Wetlands, v. 12, no. 2, p. 136-146.

Nekton of Louisiana coastal marshes was sampled approximately twice monthly between June 1990 and May 1991 on marshes adjacent to canals and on natural marshes with flumes and within canals and natural channels using a small trawl.

Keywords: estuarine, algae, macroinvertebrates, habitat, hydrology

1011. Rozas, L.P., 1992, A comparison of shallow-water and marsh-surface habitats associated with pipeline canals and natural channels in Louisiana salt marshes: U.S. Dept. of the Interior, Minerals Management Service, New Orleans, La.

Keywords: management, habitat, estuarine

1012. Rozas, L.P., and Reed, D.J., 1993, Nekton use of marsh-surface habitats in Louisiana deltaic salt marshes undergoing submergence: Marine Ecology Progress Series, v. 96, no. 2, p. 147-157.

The authors used lift nets from April through November 1991 in Louisiana deltaic marshes to compare nekton densities in three marsh-surface habitats undergoing submergence and having different surface elevations.

Keywords: estuarine, fish, habitat

1013. Rozas, L.P., and Reed, D.J., 1994, Comparing nekton assemblages of subtidal habitats in pipeline canals traversing brackish and saline marshes in coastal Louisiana: Wetlands, v. 14, no. 4, p. 262-275.

Subtidal habitats of pipeline canals in Louisiana brackish and saline marshes were sampled seasonally between October 1991 and March 1993 with a 2 m^2 throw trap to identify dominant natant species and test hypotheses relating habitat selection to water depth.

Keywords: estuarine, fish, habitat, salinity

1014. Rutherford, D.A., Kelso, W.E., Bryan, C.F., and Constant, G.C., 1995, Influence of physicochemical characteristics on annual growth increments of four fishes from the lower Mississippi River: Transactions of the American Fisheries Society, v. 124, no. 5, p. 687-697.

The authors examined relationships between lower Mississippi River physicochemistry and growth of young blue catfish, channel catfish, freshwater drum, and gizzard shad collected from dike fields in September and October 1987 through 1990.

Keywords: surface water, freshwater, fish, chemistry, physiology

1015. Rutledge, P.A., and Fleeger, J.W., 1993, Abundance and seasonality of meiofauna, including harpacticoid copepod species, associated with stems of the salt-marsh cord grass, *Spartina alterniflora*: Estuaries, v. 16, no. 4, p. 760-768.

Ten *Spartina alterniflora* plants were sampled monthly in a Louisiana estuary to determine the abundance and species composition of stem-dwelling meiofauna and small macrofauna.

Keywords: macroinvertebrates, estuarine, vascular plants, ecology

1016. Sabo, M.J., Bryan, C.F., Kelso, W.E., and Rutherford, D.A., 1999, Hydrology and aquatic habitat characteristics of a riverine swamp—I. Influence of flow on water temperature and chemistry: Regulated Rivers—Research & Management, v. 15, no. 6, p. 505-523

Keywords: hydrology, habitat, ecology, management

1017. Sabo, M.J., Bryan, C.F., Kelso, W.E., and Rutherford, D.A., 1999, Hydrology and aquatic habitat characteristics of a riverine swamp—II. Hydrology and the occurrence of chronic hypoxia: Regulated Rivers—Research & Management, v. 15, no. 6, p. 525-544.

Keywords: hydrology, habitat, ecology

1018. Sabo, M.J., and Kelso, W.E., 1991, Relationship between morphometry of excavated floodplain ponds along the Mississippi River and their use as fish nurseries: Transactions of the American Fisheries Society, v. 120, no. 5, p. 552-561.

The authors sampled ichthyoplankton, zooplankton, and juvenile fish during May, August, and November 1983 from 15 excavated floodplain ponds along the Mississippi River.

Keywords: fish, habitat, riparian, freshwater, geomorphology

1019. Sabo, M.J., Kelso, W.E., Bryan, C.F., and Rutherford, D.A., 1991, Physicochemical factors affecting larval fish densities in Mississippi River floodplain ponds, Louisiana (U.S.A.)—Regulated Rivers: Research & Management, v. 6, no. 2, p. 109-116.

The authors collected water-quality data from 15 artificial floodplain ponds along the Mississippi River during May 1988 and quantified shoreline length, shoreline sinuousity, volume, and depth variation.

Keywords: surface water, freshwater, habitat, ecology, fish, chemistry

1020. Sak, P.M., Latimer, S.D., Thomas, C.E., and Stoessell, R.K., 1995, Tree-ring documentation of lead and sulfur contamination events, *in* Anonymous, Geological Society of America, 1995 annual meeting: Abstracts with Programs--Geological Society of America, v. 27, no. 6, p. 86-87.

Keywords: trace elements, contaminants, vascular plants

1021. Salinas, L.M., DeLaune, R.D., and Patrick, W.H., Jr., 1986, Changes occurring along a rapidly submerging coastal area; Louisiana, U.S.A.: Journal of Coastal Research, v. 2, no. 3, p. 269-284.

Keywords: geomorphology, sediement, wetland loss

1022. Saltus, A.R., and Pearson, C.E., 1990, Remote sensing survey of two borrow areas for the Grand Isle and vicinity project, Jefferson Parish, Louisiana: U.S. Army Corps of Engineers, COELMN/PD-90/07, 41 p.

This report presents the results of remote sensing surveys and exploratory diving operations conducted at two locations in the vicinity of Grand Isle, Louisiana. The localities surveyed are borrow areas associated with the "Emergency Erosion Control Structures and Beach Fill" project for Grand Isle.

Keywords: estuarine, GIS, sediment

1023. Sargent, B.P., and McGee, B.D., 1998, Occurrence of nitrate and selected water-quality data, Chicot aquifer system in southwestern Louisiana, July 1994 through January 1996: Louisiana Department of Transportation and Development Water Resources Technical Report no. 64, 53 p.

Keywords: groundwater, nutrients, chemistry, freshwater

1024. Sasser, C.E., Dozier, M.D., Gosselink, J.G., and Hill, J.M., 1986, Spatial and temporal changes in Louisiana's Barataria Basin marshes, 1945-1980: Environmental Management, v. 10, no. 5, p. 671-680.

The objective of this study was to document the condition of the southwestern portion of Barataria Basin in 1945, prior to most oil and gas exploration and extraction, and at three later periods (1956, 1969, and 1980). To this end, a computerized geographic information system with site-specific change-detection capabilities was developed to document amounts, rates, locations, and sequences of loss of coastal marsh to open water in the basin. Rates of marsh loss have increased from 0.36% per year in the 1945-56 period, to 1.03% per year in 1956-69, and to 1.96% per year in 1969-80. The patterns of marsh loss indicate that the combination of processes causing degradation of the marsh surface does not affect all areas uniformily. Marsh loss rates have been highest where freshwater marshes have been subject to saltwater intrusion. The increase in the wetland loss rates corresponds to accelerated rates of subsidence and canal dredging and to a cumulative increase in the area of canals and spoil deposits.

Keywords: wetland loss, geomorphology, management, estuarine

1025. Sasser, C.E., Gosselink, J.G., and Shaffer, G.P., 1991, Distribution of nitrogen and phosphorus in a Louisiana freshwater floating marsh: Aquatic Botany, v. 41, no. 4, p. 317-331.

The floating marsh surrounding Lake Boeuf, Louisiana, was sampled every ten weeks over a sixteen month period in 1982 to 1983 to quantify the concentrations of nitrogen (total Kjeldahl nitrogen, TKN) and total phosphorus (TP) contained in interstitial water from the root mat and peat layer. Measurements were taken of water from the free-water zone beneath the floating mat, the adjacent lake, and the incircling swamp. TKN and TP were analyzed in particulate samples from above-ground plants, roots, mat, peat, and sludge.

Keywords: estuarine, nutrients, vascular plants, ecology

1026. Sasser, C.E., Gosselink, J.G., Swenson, E.M., and Evers, D.E., 1995, Hydrologic, vegetation, and substrate characteristics of floating marshes in sediment-rich wetlands of the Mississippi River Delta Plain, Louisiana, USA: Wetlands Ecol. Manage., v. 3, no. 3, p. 171-187.

Keywords: estuarine, vascular plants, hydrology, sediment, ecology

1027. Sasser, C.E., Gosselink, J.G., Swenson, E.M., Swarzenski, C.M., and Leibowitz, N.C., 1996, Vegetation, substrate and hydrology in floating marshes in the Mississippi River delta plain wetlands, USA: Vegetatio, v. 122, no. 2, p. 129-142.

In the 1940s extensive floating marshes (locally called 'flotant') were reported and mapped in coastal wetlands of the Mississippi River Delta Plain. These floating marshes included large areas of *Panicum hemitomon*-dominated freshwater marshes, and *Spartina patens*/*Scirpus olneyi* brackish marshes. Today these marshes appear to be quite different in extent and type. We describe five floating habitats and one non-floating, quaking habitat based on differences in buoyancy dynamics (timing and degree of floating), substrate characteristics, and dominant vegetation.

Keywords: freshwater, vascular plants, hydrology, habitat, sediment

1028. Sasser, C.E., Visser, J.M., Evers, D.E., and Gosselink, J.G., 1995, The role of environmental variables on interannual variation in species composition and biomass in a subtropical minerotrophic floating marsh: Canadian Journal of Botany, v. 73, no. 3, p. 413-424.

Floating marshes supporting emergent vascular vegetation occur in expansive areas in many parts of the world. We analyzed the long-term variability in species composition and related plant biomass to environmental variables in a subtropical minerotrophic floating marsh, Louisiana, U.S.A. *Panicum hemitomon* was the dominant plant species, representing 76% of the total mean end of season aboveground dry weight of 840 g/m^2. Multivariate analyses showed that community structure in the Lake Boeuf floating marsh has changed little during the 11 years included in this study. Ninety-nine percent of the variation in total aboveground biomass can be predicted by environmental variables related to temperature, precipitation, evaporation, and water level. Mapping of the area for the years 1945, 1952, 1981, and 1992 show that a net loss of about 4% of marsh has occurred between 1945 and 1992.

Keywords: habitat, vascular plants, freshwater, productivity

1029. Sasser, D.C., Sturrock, A.M., Jr., and Covay, K.J., 1988, Meteorological and microlysimeter data for a rice irrigation study in southwestern Louisiana, 1985 and 1986: Louisiana Department of Transportation and Development Water Resources Basic Records Report no. 15, 24 p.

Keywords: groundwater, agriculture

1030. Sattler, A.R., 1996, Log analysis of six boreholes in conjunction with geologic characterization above and on top of the Weeks Island salt dome: SAND, no. SAND-96-0413C; CONF-9604119-1, p. 19.

Six boreholes were drilled during the geologic characterization and diagnostics of the Weeks Island sinkhole that is over the two-tiered salt mine which was converted for oil storage by the US Strategic Petroleum Reserve. These holes were drilled to provide for geologic characterization of the Weeks Island Salt Dome and its overburden in the immediate vicinity of the sinkhole (mainly through logs and core); to establish a crosswell configuration for seismic tomography; to establish locations for hydrocarbon detection and tracer injection; and to provide direct observations of sinkhole geometry and material properties. Specific objectives of the logging program were to: (1) identify the top of and the physical state of the salt dome; (2) identify the water table; (3) obtain a relative salinity profile in the aquifer within the alluvium, which ranges from the water table directly to the top of the Weeks Island salt dome; and (4) identify a reflecting horizon seen on seismic profiles over this salt dome. Natural gamma, neutron, density, sonic, resistivity and caliper logs were run.

Keywords: groundwater, salinity, geology

1031. Saucier, M.H., and Baltz, D.M., 1993, Spawning site selection by spotted seatrout, *Cynoscion nebulosus*, and black drum, *Pogonias cromis*, in Louisiana: Environ. Biol. Fish., v. 36, no. 3, p. 257-272.

Spawning site selection by spotted seatrout and black drum was studied by locating drumming aggregations through the use of a hydrophone. From March 1987 to October 1990, 315 sound observations were made to identify and characterize spawning seasons and environmental requirements of both species in the Barataria, Caminada, and eastern Timbalier Bay systems of Louisiana.

Keywords: estuarine, fish, ecology, habitat

1032. Sauer, V.B., 1963, Spur dikes in Louisiana: U.S. Geological Survey Open-File Report, 4 p.

Keywords: geomorphology

1033. Sauer, V.B., 1964, Floods in Louisiana, magnitude and frequency (2nd ed.): Louisiana Department of Highways, 402 p.

Keywords: surface water, freshwater, hydrology

1034. Sauer, V.B., 1964, Magnitude and frequency of storm runoff in southeastern Louisiana and southwestern Mississippi, *in* Geological Survey Research 1964: U.S. Geological Survey Professional Paper 501-D, p. D182-D184.

Keywords: surface water, freshwater, hydrology

1035. Sauer, V.B., 1967, Unit hydrographs for southeastern Louisiana and southwestern Mississippi: Louisiana Department of Public Works Technical Report no. 2b, 51 p.

Keywords: surface water, freshwater, hydrology

1036. Sauer, V.B., 1969, Unit hydrographs for southwestern Louisiana: Louisiana Department of Public Works Technical Report no. 2d, 56 p.

Keywords: surface water, freshwater, hydrology

1037. Sauer, V.B., and Fulford, J.M., 1983, Floods of December 1982 and January 1983 in central and southern Mississippi River basin: U.S. Geological Survey Open-File Report 83-213, 41 p.

Keywords: surface water, freshwater, hydrology

1038. Saxton, D.C., and Birdseye, R.U., 1987, Environmental considerations and land use planning in northern Lafayette Parish, Louisiana: Annual Meeting—Association of Engineering Geologists, v. 30, p. 48-49.

Keywords: surface water, urban, hydrology

1039. Scaife, W.W., Turner, R.E., and Costanza, R., 1983, Coastal Louisiana recent land loss and canal impacts: Environmental Management (New York), v. 7, no. 5, p. 433-442.

Annual coastal land loss in the sedimentary deltaic plain of southern Louisiana is 102 km^2, which is correlated with man-made canal surface area. The relationships between land loss and canals are both direct and indirect and are modified by the deltaic substrate, distance to the coast, and availability of new sediments.

Keywords: estuarine, wetland loss, management

1040. Scalf, M.R., Keeley, J.W., and LaFevers, C.J., 1973, Ground water pollution in the south central states: no. EPA-R2-73-268, 181 p.

Keywords: groundwater, contaminants

1041. Scarcia, Glenn, 1954, Water, *in* St. Tammany Parish Resources and Facilities: Louisiana Department of Public Works and St. Tammany Parish Planning Board, p. 37-46.

Keywords: groundwater, freshwater

1042. Schreiber, E.T., Meek, C.L., and Yates, M.M., 1988, Vertical distribution and species coexistence of tree hole mosquitoes in Louisiana: Journal of the American Mosquito Control Association, v. 4, no. 1, p. 9-14.

Keywords: macroinvertebrates, vascular plants, ecology

1043. Schreiber, J.D., Smith, S., Jr., and Cooper, C.M., 1996, The occurrence, distribution, and remediation of transient pollution events in agricultural and silvicultural environments, *in* Beck, M.B., and Schilling, W., Uncertainty, risk and transient pollution events: Water Science and Technology, v. 33, no. 2, p. 17-26.

Keywords: agriculture, pesticides, nutrients, managment

1044. Schwertz, E.L., Jr., 1975, Louisiana comprehensive planning information system; Compilation and utilization of the data base: Proceedings of the International Symposium on Remote Sensing of the Environment, v. 2, no. 10, p. 873-876.

Keywords: GIS

1045. Scott, D.B., Suter, J.R., and Kosters, E.C., 1991, Marsh foraminifera and arcellaceans of the Lower Mississippi Delta: Controls on spatial distributions: Micropaleontology, v. 37, no. 4, p. 373-392.

Foraminifera and arcellaceans ("thecamoebians") were examined from 73 surface samples collected to represent four vegetation zones that have been defined in the Mississippi Delta Plain.

Keywords: microbiology, estuarine, sediment

1046. Scott, J., Albrecht, B., Summers, K., Frithsen, J., Rubinstein, N., 1994, Sediment toxicity as an indicator of contaminant stress in EMAP-estuaries: 37th Conference of the International Association for Great Lakes Research and Estuarine Research Federation: Program and Abstracts, IAGLR, Buffalo, NY (USA), p. 166.

The 10-day sediment toxicity test with the amphipod *Amelisca abdita* is being used as one measure of the potential for sediment-associated contaminant effects on benthic communities. The relationship between toxicity and contaminant bioavailability in spiked sediment studies is well established; the EMAP data environmental gradients under natural conditions. The data base for theses analyses included four years of sampling in the Virginian province and three years from the Louisianian Province yielding over 700 samples with synoptic measured of toxicity, contaminant concentration, and community condition.

Keywords: estuarine, sediment, contaminants, macroinvertebrates

1047. Seanor, R.C., 1994, Water-level measurements, 1986-91, Red River alluvial aquifer, Red River Valley, Louisiana: U.S. Geological Survey Open-File Report 94-69, 218 p.

Keywords: groundwater, hydrology

1048. Seanor, R.C., Lovelace, J.K., and Smoot, C.W., 1996, Relation of water levels in the Red River alluvial aquifer to rainfall and stages of the Red River, pool 2, Red River waterway, Alexandria area, Louisiana, 1971-91: U.S. Geological Survey Water-Resources Investigations Report 96-4053, 38 p.

Keywords: groundwater, hydrology

1049. Shaffer, G.P., 1988, K-systems analysis for determining the factors influencing benthic microfloral productivity in a Louisiana estuary, USA: Marine ecology progress series. Oldendorf., v. 43, no. 1-2, p. 43-54.

Keywords: estuarine, ecology, productivity, algae

1050. Shaffer, G.P., Sasser, C.E., Gosselink, J.G., and Rejmanek, M., 1992, Vegetation dynamics in the emerging Atchafalaya Delta, Louisiana, USA: Journal of Ecology, v. 80, no. 4, p. 677-687.

The wetlands of the Atchafalaya Delta, Louisiana are characterized by a warm climate, highly fertile sediments, and an absence of moisture limitations. Consequently, vegetation succession (on islands that emerged in 1973) was expected to occur relatively rapidly. Community structure changed dramatically through time along the permanent transects. Because several species shifted in elevational range, ordination (using detrended correspondence analysis) only generally separated plant communities into different elevational zones. The 20 most dominant species, representing 95% of the total cover, were classified into three distinct groups according to cover pattern. Two general trends across all islands through time involved a decrease in vegetated area and a marked increase in species diversity.

Keywords: estuarine, vascular plants, ecology, herbivory, hydrology

1051. Shaffer, G.P., and Sullivan, M.J., 1988, Water column productivity attributable to displaced benthic diatoms in well-mixed shallow estuaries: Journal of Phycology, v. 24, no. 2, p. 132-140.

Keywords: algae, estuarine, hydrology, productivity

1052. Shampine, W.J., 1970, Gazetteer of Louisiana lakes and reservoirs: Louisiana Department of Public Works Basic Records Report no. 4, 31 p.

Keywords: surface water

1053. Shampine, W.J., 1971, Chemical, biological, and physical data for the major lakes and reservoirs in Louisiana: Louisiana Department of Public Works Basic Records Report no. 5, 98 p.

Keywords: chemistry, surface water, ecology

1054. Shaw, R.F., Cowan, J.H., Jr., and Tillman, T.L., 1985, Distribution and density of *Brevoortia patronus* (Gulf menhaden) eggs and larvae in the continental shelf waters of western Louisiana: Bulletin of Marine Science, v. 36, no. 1, p. 96-103.

Keywords: fish, ecology, habitat

1055. Shepard, F.P., and Lankford, R.R., Sedimentary facies from shallow borings in lower Mississippi Delta: Bulletin of the American Association of Petroleum Geologists, v. 43, no. 9, p. 2051-2067.

Detailed analyses of the marginal sediments of the Mississippi delta have permitted the development of criteria for recognizing deltaic environments. In order to test the use of these criteria as a means of improving the interpretation of older sediments, 6 borings were jetted into the lower delta to depths up to 45 ft., and the continuous samples along these borings were given intense study. The Foraminifera, the constituents of the coarse fractions, the grain-size parameters, and the sedimentary structures served to diagnose the environments in shich most of the sediments were deposited.

Keywords: groundwater, geology, sediment

1056. Shiflet, T.N., 1963, Major ecological factors controlling plant communities in Louisian marshes: Journal of Range Management, v. 16, no. 5, p. 231-235.

Louisiana has four and one-half million acres of marshlands. About 40% of this area is suitable for range livestock use. Salinity of the free soil water and fluctuating water levels are the major factors that control plant communities in these marshes. Studies of the distinct communities indicate that each has an optimum range of salinity and water level. These factors can be manipulated to change the plant composition to better fit a range livestock enterprise.

Keywords: salinity, vascular plants, estuarine, freshwater, habitat, hydrology

1057. Shiller, A.M., and Boyle, E.A., 1987, Variability of dissolved trace metals in the Mississippi River: Geochimica et Cosmochimica Acta, v. 51, no. 12, p. 3273-3277.

Keywords: surface water, freshwater, trace elements, chemistry

1058. Shirley, M.G., Linscombe, R.G., Kinler, N.W., Knaus, R.M., and Wright, V.N., 1988, Population estimates of river otters in a Louisiana coastal marshland: Journal of Wildlife Management, v. 52, no. 3, p. 512-515.

The authors estimated the population of river otters (*Lutra canadensis*) in a southwest Louisiana coastal marsh by labeling the feces of 7-9 otters with radioisotope of zinc (^{65}Zn). Collection of 1,034 scats over 5 sampling periods yielded subsamples from which to estimate the population based on the ratio of marked to unmarked scats. They estimated there were 29.5 plus or minus 3.43 (SE) otters in the study area. The corresponding density of otters was 1/86 ha of marsh.

Keywords: mammals, ecology

1059. Shively, S.H., and Jackson, J.F., 1985, Factors limiting the upstream distribution of the Sabine map turtle: American Midland Naturalist, v. 114, no. 2, p. 292-303.

Several environmental variables and population densities of *Graptemys ouachitensis sabinensis* were measured in a transect along Whisky Chitto Creek, Louisiana, from downstream localities where turtles were abundant to upstream localities without turtles. Algal density on logs, and basking site area emerged from analysis as the most important proximate determinants of turtle density. Of the variables measured, stream width appeared to be the ultimate determinant of density, and thus of the upstream limit of the distribution, with positive indirect effects of width being somewhat greater than the direct effect. A discriminant function was used to classify patches of habitat as either favorable or poor and the distribution of favorable patches along the transect was investigated.

Keywords: reptiles, ecology, habitat, freshwater

1060. Signell, R.P., and List, J.H., 1997, Modeling waves and circulation in Lake Pontchartrain, *in* Anonymous, AAPG Gulf Coast Association of Geological Societies Section meeting; abstracts: AAPG Bulletin, v. 81, no. 9, p. 1589-1590.

The U.S. Geological Survey is conducting a study of storm-driven sediment resuspension and transport in Lake Pontchartrain, LA. One hypothesis is that bottom sediments are resuspended by wind-generated storm waves and transported horizontally by the lake currents that occur during these storm events. To examine this hypothesis, sediment resuspension is being studied with the wave prediction model HISWA (HIndcasting Shallow-water WAves), which simulates local generation of waves by wind and shallow-water effects (refraction, shoaling, bottom friction, and breaking). Data obtained from three sites in the lake indicate that the model simulates wave amplitude and period remarkably well.

Keywords: estuarine, model, hydrology, sediment

1061. Simon, N.S., 1988, The effect of different methods for removal of organic matter on hydrochloric acid extraction of metals from sediment; Calcasieu River, Louisiana: U.S. Geological Survey Open File Report 87-0764, p. 73-80.

Keywords: freshwater, methods, sediment, chemistry

1062. Simon, N.S., 1989, Phase association of trace metals in sediments from the Calcasieu River, Louisiana: U.S. Geological Survey Water-Resources Investigations Report 88-4220, p. 301-308.

Keywords: freshwater, trace elements, sediment

1063. Simon, N.S., 1989, The relation of toxicity-test results to phase association and concentration of chromium, manganese, iron and ammonium in the water column and sediments of an industrially affected area of the Calcasieu River, Louisiana: U.S. Geological Survey Open-File Report 89-0409, p. 90.

Keywords: surface water, freshwater, trace elements, physiology, sediment

1064. Simon, N.S., Demas, Charles, d'Angelo, William, 1994, Geochemistry and solid-phase association of chromium in sediment from the Calcasieu River and estuary, Louisiana, U.S.A.: Chemical Geology, v. 116, no. 1-2, p. 123-135.

Sediment samples were collected from the lower Calcasieu River and estuary, Louisiana, in a study of the release of metals from sediments to the overlying water column. Whole samples were characterized by analyses that included: (1) determination of total sediment ammonium concentrations; (2) determination of total sediment Cr, Mn and Fe concentrations; (3) extraction of sediment with hydrogen peroxide followed by dilute hydrochloric acid to obtain recoverable metals, including oxides; and (4) extraction of sediment with hydrogen peroxide plus pyrophosphate at a pH of 7-8 to recover organically-bound Cr but not metal oxides. Concentrations of Cr, Mn and Fe in sediment interstitial water were determined.

Keywords: estuarine, trace elements, chemistry, sediment

1065. Simon, N.S., and Morrison, J.F., 1991, The role of bed sediments and drift in the transport and fate of metallo-organic compounds in the Calcasieu River estuary, Louisiana, *in* Mallard, G.E., and Aronson, D.E., U.S. Geological Survey Toxic Substances Hydrology Program; Proceedings of the technical meeting, Monterey, California, March 11-15, 1991: U.S. Geological Survey Water-Resources Investigations Report 91-4034, p. 579-582.

Keywords: estuarine, contaminants, sediment, hydrology

1066. Singh, V.P., 1997, Effect of spatial and temporal variability in rainfall and watershed characteristics on stream flow hydrograph: Hydrological Processes, v. 11, no. 12, p. 1649-1669

Keywords: climate, surface water, hydrology

1067. Singh, V. P., Wang, G.T., and Adrian, D.D., 1997, Flood routing based on diffusion wave equation using mixing cell method: Hydrological Processes v. 11, no. 14, p. 1881-1894.

Keywords: hydrology, model

1068. Sklar, F.H., 1985, Seasonality and community structure of the backswamp invertebrates in a Louisiana cypress-tupelo wetland: Wetlands, v. 5, p. 69-86.

Core and floating "scoop" samples were taken monthly for two years in a Louisiana hardwood swamp for the characterization and identification of the benthic habitats far removed from waterways and bayous. Most backswamp macroinvertebrates have physiological and behavorial adaptations to withstand both desiccation and anoxia. The most ubiquitous taxa included amphipods, oligochaetes, diptera larvae, isopods, and fingernail clams. The biomass and density of backswamp benthic communities were some of the highest recorded for any "unpolluted" freshwater or estuarine soft-bottom habitat. Seasonal changes in density, biomass, and diversity were bimodal with peaks occurring during spring and fall, and were a function of the seasonality of wetland flooding and temperature.

Keywords: freshwater, macroinvertebrates, riparian, habitat, climate

1069. Slack, L.J., O'Hara, C.G., and Oakley, W.T., 1996, Brine contamination of ground water in the vicinity of the Brookhaven oil field, Lincoln County, Mississippi: U.S. Geological Survey Water-Resources Investigations Report 96-4023, p. 27.

Keywords: groundwater, contaminants

1070. Sloss, Raymond, 1963, Use of ponds to measure rates of storm runoff in Louisiana: U.S. Geological Survey Open-File Report, 69 p.

Keywords: surface water, freshwater, hydrology

1071. Sloss, Raymond, 1971, Drainage area of Louisiana streams: Louisiana Department of Public Works Basic Records Report no. 6, 117 p.

Keywords: surface water, freshwater, hydrology

1072. Sloss, Raymond, Broussard, W.L., and Whitman, H.M., 1964, Water, *in* Jefferson Davis Parish Resources and Facilities: Louisiana Department of Public Works and Jefferson Davis Parish Development Board, p. 29-41.

Keywords: groundwater, freshwater

1073. Sloss, Raymond, and Garber, M.S., 1959, Water, *in* St. Bernard Parish Resources and Facilities: Louisiana Department of Public Works and St. Bernard Parish Development Board, p. 23-33.

Keywords: groundwater, freshwater

1074. Smith, B.D., and Mazzella, A.T., 1995, The effects of oil-field brines on aquifers; geophysical applications in oil field environmental studies, *in* Carter, L.M.H., Energy and the environment; application of geosciences to decision-making: U.S. Geological Survey Circular 1108, p. 114-116.

Keywords: groundwater, contaminants, freshwater

1075. Smith, B.D., Sengpiel, K.P., Plesha, J.L., and Horton, R.J., 1992, Airborne electromagnetic mapping of subsurface brine, Brookhaven oil field, Mississippi, *in* Anonymous, Society of Exploration Geophysicists, 62nd annual international meeting; technical program, expanded abstracts with authors' biographies: SEG Annual Meeting Expanded Technical Program Abstracts with Biographies, v. 62, p. 340-343.

Keywords: groundwater, GIS

1076. Smith, C.G., 1976, Saltwater-freshwater interfaces in the "2,000-" and "2,800-foot" sands in the Capital Area Ground Water Conservation District: Bulletin – Capital Area Ground Water Conservation Commission, no. 1, 23 p.

Keywords: groundwater, freshwater, contaminants

1077. Smith, C.G., 1979, A geohydrologic survey of the "1,200-foot" sand in the Capital Area Ground Water Conservation District: Bulletin – Capital Area Ground Water Conservation Commission, no. 3, 21 p.

Keywords: groundwater, hydrology, freshwater

1078. Smith, C.G., Barlow, R.A., and Hoda, B., 1977, Ground-water studies of Gulf Coast salt domes; Potential nuclear waste storage sites: Eos, Transactions, American Geophysical Union, v. 58, no. 12, 1138 p.

Keywords: groundwater, geology

1079. Smith, C.G., and Kazmann, R.G., 1978, Subsidence in the Capital Area Ground Water Conservation District; An update: Bulletin – Capital Area Ground Water Conservation Commission, no. 2, 31 p.

Keywords: groundwater, hydrology, freshwater

1080. Smith, C.G., Jr., 1969, Geohydrology of the shallow aquifers of Baton Rouge, Louisiana: Louisiana Water Resources Research Institute Bulletin, 31 p.

Keywords: groundwater, hydrology, freshwater

1081. Smith, C.G., Jr., and Hanor, J.S., 1975, Underground storage of treated water; A field test: Ground Water, v. 13, no. 5, p. 410-417.

Keywords: groundwater

1082. Smith, C.J., and DeLaune, R.D., 1983, Gaseous nitrogen losses from the Gulf Coast marshes: Northeast Gulf Sci., v. 6, no. 1, p. 1-8.

Keywords: nutrients, estuarine, vascular plants

1083. Smith, C.J., and DeLaune, R.D., 1986, Fate of ammonium in a Gulf Coast estuarine sediment: Journal of Environmental Quality, v. 15, no. 3, p. 293-297.

Keywords: nutrients, estuarine, sediment

1084. Smith, C.J., DeLaune, R.D., and Patrick, W.H., Jr., 1983, Carbon dioxide emission and carbon accumulation in coastal wetlands: Estuarine, Coastal, and Shelf Science, v. 17, no. 1, p. 21-29.

Keywords: estuarine, sediment, microbiology, physiology

1085. Smith, C.J., DeLaune, R.D., and Patrick, W.H., Jr., 1985, Fate of riverine nitrate entering an estuary—1. Denitrification and nitrogen burial: Estuaries, v. 8, no. 1, p. 15-21.

Keywords: nutrients, estuarine, physiology, chemistry, sediment

1086. Smith, D.G., 1988, Notes on the biology and morphology of *Margaritifera hembeli* (Conrad, 1838) (Unionacea: Margaritiferidae): Nautilus, v. 102, no. 4, p. 159-163.

Keywords: macroinvertebrates, ecology

1087. Smith, R.P., 1964, Floods of April-May 1958 in Louisiana and adjacent states: U.S. Geological Survey Water-Supply Paper 1660-A, p. A1-A149.

Keywords: surface water, freshwater, hydrology

1088. Smith, Sammie, Jr., Cooper, C.M., and Knight, S.S., 1997, Farming systems for improved water quality/ecology for a Mississippi Delta Management Systems

Evaluation: WRRI, Program report; September 1, 1996-August 31, 1997, no. 11434-HQ-96, p. 30.

Keywords: agriculture, chemistry, surface water, ecology, management

1089. Smoot, C.W., 1983, Records of water-level measurements and lithologic logs, Red River Valley, Louisiana, 1975-80: Louisiana Department of Transportation and Development, Office of Public Works Water Resources Basic Records Report no. 12, 197 p.

Keywords: groundwater, hydrology, freshwater

1090. Smoot, C.W., 1986, Louisiana hydrologic atlas map no. 2—Areal extent of freshwater in major aquifers of Louisiana: U.S. Geological Survey Water-Resources Investigations Report 86-4150, 1 sheet.

Keywords: groundwater, hydrology, freshwater

1091. Smoot, C.W., 1988, Louisiana hydrologic atlas map no. 3—Altitude of the base of freshwater in Louisiana: U.S. Geological Survey Water-Resources Investigations Report 86-4314, 1 sheet.

Keywords: groundwater, hydrology, freshwater

1092. Smoot, C.W., 1989, Louisiana hydrologic atlas map no. 4—Geohydrologic sections of Louisiana: U.S. Geological Survey Water-Resources Investigations Report 87-4288, 1 sheet.

Keywords: groundwater, hydrology

1093. Smoot, C.W., and Fendick, R.B., Jr., 1998, Hydrogeology and water resources of the Alexandria area, Rapides Parish, Louisiana: Louisiana Department of Transportation and Development Water Resources Technical Report no. 63, 36 p., 1 pl.

Keywords: groundwater, hydrology, freshwater

1094. Smoot, C.W., and Guillot, J.R., 1988, Water-level measurements 1981-85 and chemical analyses 1978-85, Red River alluvial aquifer, Red River Valley, Louisiana: U.S. Geological Survey Open-File Report 87-541, 261 p.

Keywords: groundwater, hydrology, freshwater

1095. Smoot, C.W., and Martin, Angel, Jr., 1991, Generalized potentiometric surfaces of the Red River alluvial aquifer, pool 1, Red River waterway area, central Louisiana: U.S. Geological Survey Water-Resources Investigations Report 91-4109, 7 sheets.

Keywords: groundwater, hydrology, freshwater

1096. Smoot, C.W., Seanor, R.C., and Huff, G.F., 1994, Quality of water in the Red River alluvial aquifer, pool 1, Red River waterway area, Vick, Louisiana: U.S. Geological Survey Water-Resources Investigations Report 93-4184, 49 p.

Keywords: groundwater, chemistry, freshwater

1097. Smoot, C.W., Seanor, R.C., and Huff, G.F., 1994, Quality of water in the Red River alluvial aquifer, pool 2, Red River waterway area, Ruby, Louisiana: U.S. Geological Survey Water-Resources Investigations Report 94-4228, 35 p.

Keywords: groundwater, freshwater, chemistry

1098. Smothers, D.M., and Martin, W.C., 1992, Water-resources activities in Louisiana, fiscal years 1990-92: U.S. Geological Survey Open-File Report 92-492, 58 p.

Keywords: surface water, groundwater

1099. Snedden, G.A., Kelso, W.E., and Rutherford, D.A., 1999, Diel and seasonal patterns of spotted gar movement and habitat use in the Lower Atchafalaya River Basin, Louisiana: Transactions of the American Fisheries Society, v. 128, no. 1, p. 144–154.

Keywords: fish, ecology, habitat, freshwater

1100. Snider, J.L., 1969, Data from test drilling for public water supplies in Louisiana--July 1966 through June 1967: U.S. Geological Survey Open-File Report, 133 p.

Keywords: groundwater, freshwater, chemistry

1101. Snider, J.L., and Forbes, M.J., Jr., 1961, Pumpage of water in Louisiana, 1960: Louisiana Department of Public Works, Department of Conservation, and Louisiana Geological Survey, 6 p.

Keywords: groundwater, freshwater, management

1102. Snider, J.L., and Ryals, G.N., 1988, Radiochemical analyses of ground water in Louisiana: Louisiana Department of Transportation and Development Water Resources Technical Report no. 44, 52 p.

Keywords: groundwater, chemistry

1103. Snider, J.L., Winner, M.D., Jr., and Epstein, J.B., 1962, Ground water for Louisiana's public supplies: Louisiana Department of Public Works, 267 p.

Keywords: groundwater, freshwater

1104. Snowden, J.O., and Otvos, E.G., 1971, Chemical water quality and sediment-water reactions in Louisiana and Mississippi estuaries: National Coastal and Shallow Water Research Conference, Abstracts, v. 2, p. 215.

Keywords: chemistry, sediment, estuarine, surface water

1105. Snowden, J.O., Zarinski, K., and Otvos, E.G., 1972, Relationship between chemical changes in interstitial sediment water and clay mineralogy in Louisiana and Mississippi estuaries: Annual Clay Minerals Conference – Program and Abstracts, v. 21, 16 p.

Keywords: chemistry, sediment, estuarine

1106. Society of Professional Well Log Analysts, 1969, Formation water resistivity data; South Louisiana, offshore and adjacent areas: Lafayette Chapter, Lafayette, La., 10 p. body, 67 p. data.

Keywords: groundwater, chemistry

1107. Soil Conservation Service, U.S. Dept. of Agriculture, 1984, Changes in vegetation in the Cameron-Creole Marshes over a thirty-two year period: Soil Conservation Service., Baton Rouge, LA.

Keywords: estuarine, vascular plants, ecology

1108. Soniat, T.M., Mire, G.A., Robichaux, R.J., and Dortch, Q., 1995, Temporal changes in phytoplankton in a Louisiana estuary: Trophic and dystrophic effects on the eastern oyster, *Crassostrea virginica*: Journal of Shellfish Research, v. 14, no. 1, p. 278.

Phytoplankton populations over oyster reefs in the Terrebonne Basin of Louisiana were sampled weekly through an annual cycle. Identification of phytoplankton has provided important qualitative information on possible available food for the eastern oyster and has revealed that potentially toxic species are present in the low salinity, high turbidity estuaries of Louisiana.

Keywords: estuarine, algae, macroinvertebrates, ecology, salinity

1109. Soniat, T.M., and Powell, E.N., 1994, The effects of temperature, salinity, and food supply on oyster production in Louisiana: Model predictions versus field data: J. Shellfish Res., v. 13, no. 1, p. 290.

Environmental variables, seston composition, and oyster population parameters were sampled from April 1992 to March 1993 at three sites in the Terrebonne Basin of Louisiana. Environmental measurements included water temperature, salinity, and transparency. The seston was characterized by dry weight, particulate organic matter, particulate inorganic matter, and chlorophyll A concentration. Oyster population

parameters were size-frequency distribution, condition index, gonadal index, and weighted incidence and percent infection of *Perkinsus marinus*.

Keywords: estuarine, habitat, macroinvertebrates, model

1110. Southwick, L.M., Willis, G.H., Fouss, J.L., Rogers, J.S., and Carter, C.E., 1996, Effect of controlled water table on runoff losses of soil-applied chemicals, *in* Daniel, B.J., Twenty-sixth Mississippi water resources conference: Proceedings--Mississippi Water Resources Conference, v. 26, p. 196-201.

Keywords: pesticides, nutrients, hydrology, surface water

1111. Southwick, L.M., Willis, G.H., Fouss, J.L., Rogers, J.S., and Carter, C.E., 1997, Influence of water table management on runoff losses of soil-applied pesticides, *in* Daniel, B.J., Proceedings of the Twenty-seventh Mississippi water resources conference: Proceedings--Mississippi Water Resources Conference, v. 27, p. 239-246.

Keywords: management, pesticides, nutrients, hydrology, surface water

1112. Southwick, L.M., Willis, G.H., Johnson, D.C., and Selim, H.M., 1995, Leaching of nitrate, atrazine, and metribuzin from sugarcane in southern Louisiana: Journal of Environmental Quality, v. 24, no. 4, p. 684-690.

The authors have studied the leaching losses of NO_3, atrazine, and metribuzin applied to sugarcane planted in Mississippi River alluvial soil in southern Louisiana. Nitrogen (122 kg/ha) and atrazine (2.24 kg/ha) were applied in June, and atrazine (2.24 kg/ha) and metribuzin (1.12 kg/ha) were applied in December; losses through a Sharkey clay into subsurface drains were measured for about 100 days in both seasons.

Keywords: surface water, freshwater, agriculture, nutrients, pesticides, contaminants

1113. Southwick, L.M., Willis, G.H., and Selim, H.M., 1992, Leaching of atrazine from sugarcane in southern Louisiana: Journal of Agricultural and Food Chemistry, v. 40, no. 7, p. 1264-1268.

Atrazine was applied to sugarcane at 4.48 or 2.24 kg/ha and leaching into subsurface drains 1 meter deep was measured for three months.

Keywords: surface water, freshwater, agriculture, pesticides, contaminants

1114. Sproul, C.R., Holloway, J.S., Campbell, S.J., Goodman, G.L., and Griswold, R.M., 1989, Pilot groundwater remediation system at Superfund creosote site: Proceedings of the National Outdoor Action Conference on Aquifer Restoration, Ground Water Monitoring and Geophysical Methods, v. 3, p. 643-644.

Keywords: groundwater, contaminants

1115. Stallworth, G.R., and Jordan, H.F., 1980, Analyses of water and dredged material from selected southern Louisiana waterways and selected areas in the Gulf of Mexico, 1976-78: U.S. Geological Survey Open-File Report 80-694, 141 p.

Keywords: surface water, freshwater, sediment, contaminants, chemistry

1116. Stallworth, G.R., and Martin, Angel, Jr., 1988, U.S. Geological Survey ground-water studies in Louisiana: U.S. Geological Survey Open-File Report 88-115, 2 p.

Keywords: groundwater

1117. Stanley, T.B., Jr., and Maher, J.C., 1944, Ground-water resources of Jefferson Davis and Acadia Parishes, Louisiana: Louisiana Department of Public Works, 93 p.

Keywords: groundwater, freshwater

1118. Steinheimer, T. R., Pereira, W.E., and Johnson, S.M., 1981, Application of capillary gas chromatography mass spectrometry/computer techniques to synoptic survey of organic material in bed sediment: Analytica Chimica Acta, v. 129, p. 57-67.

Keywords: methods, sediment, chemistry

1119. Steller, D.L., 1991, Christmas tree fences: Their use in marsh erosion control: Proceedings of the 18th Annual Conference on Wetlands Restoration and Creation, Hillsborough Community Coll., Tampa, FL, p. 143-153.

Information learned from past and current projects has been compiled to determine relative success of the various fence designs, placement, and construction materials.

Keywords: estuarine, wetland loss, management

1120. Stephens, J.W., 1976, Records of wells, water-level measurements, and drillers' logs, Red River Valley, Louisiana: U.S. Geological Survey Open-File Report 76-759, 335 p.

Keywords: groundwater, freshwater

1121. Stern, D.H., and Stern, M.S., 1969, Physical, chemical, bacterial, and plankton dynamics of Lake Pontchartrain, Louisiana: Louisiana Water Resources Research Institute Technical Report, no. 4, 60 p.

Keywords: estuarine, ecology, chemistry, algae, microbiology

1122. Stern, M.K., Day, J.W., Jr., and Teague, K.G., 1991, Nutrient transport in a riverine-influenced, tidal freshwater bayou in Louisiana: Estuaries, v. 14, no. 4, p. 382-394.

Transport of ammonium (NH_4^+), nitrate + nitrite (NO_3^-), total Kjeldahl nitrogen (TKN), soluble reactive phosphate (SRP), and total suspended solids (TSS) was measured in a freshwater tidal bayou located in a marsh system near the mouth of the Atchafalaya River in Louisiana. Sampling was conducted six times over one year and was timed to assess effects of seasonal variation in river flow and mean sea level of the Gulf of Mexico on material fluxes. Net fluxes of all materials were large and ebb directed in all seasons except fall, when net transport was 2 to 3 orders-of-magnitude smaller than in any other season. These results demonstrate that riverine forcing was the primary influence on materials transport in all seasons except fall when tidal forcing was most important.

Keywords: nutrients, hydrology, freshwater

1123. Stevenson, D.A., John, C.J., and Groat, C.G., 1990, A decade of environmental monitoring at geopressured-geothermal well test sites along the Texas-Louisiana Gulf Coast, *in* Anonymous, AAPG annual convention with DPA/EMD divisions and SEPM, an associated society; technical program with abstracts: AAPG Bulletin, v. 74, no. 5, p. 772.

Keywords: groundwater, geology

1124. Stevenson, John, 1980, Log evaluation of wells in the Tuscaloosa trend of South Louisiana, *in* Transactions of the 30th annual meeting of the Gulf Association of Geological Societies; AAPG regional meeting and the Twenty-seventh annual meeting of the Gulf Coast Section of the Society of Economic Paleontologists and Mineralogists: Transactions--Gulf Coast Association of Geological Societies, v. 30, p. 229.

Keywords: groundwater

1125. Stewart, M.R., 1967, Time of travel of solutes in Mississippi River from Baton Rouge to New Orleans, Louisiana: U.S. Geological Survey Hydrologic Investigations Atlas HA-260, 1 sheet.

Keywords: surface water, freshwater, chemistry, hydrology

1126. Steyer, G.D., 1991, Wetland restoration utilizing real-time data collection along Louisiana's coastal zone, *in* Dhamotharau, Dhamo, Resource development of the Lower Mississippi River; symposium papers: American Water Resources Association Technical Publication Series TPS, v. 91-3, p. 101-108.

Keywords: estuarine, wetland loss, management

1127. Stoessell, R.K., 1997, Delineating the chemical composition of the salinity source for saline ground water—An example from east-central Concordia Parish, Louisiana: Ground Water, v. 35, no. 3, p. 409-417.

In the absence of significant water-rock interaction, the chemical composition of a saline brine polluting a ground-water aquifer can be delineated from conservative-mixing relations. An example is the Mississippi River Alluvium Aquifer, within Angelina Plantation in east-central Concordia Parish, Louisiana, which has high ground-water salinities of unknown origin.

Keywords: groundwater, chemistry, salinity

1128. Stone, G.W., Grymes, J.M., Dingler, J.R., and others, 1997, Overview and significance of hurricanes on the Louisiana coast, USA: Journal of Coastal Research, v. 13, no. 3, p. 656-669.

Hurricanes have played a critical role in the transgressive evolution of Louisiana's barrier islands and may account for up to 90 percent of shoreline retreat measured within the historic time frame. Since 1901, some 55 tropical storms or hurricanes have made landfall along the Louisiana coast.

Keywords: climate, estuarine, geomorphology, sediment

1129. Stone, G.W., Williams, S.J., and Burruss, A.E., 1997, Louisiana's barrier islands: An evaluation of their geological evolution, morphodynamics, and rapid deterioration: Journal of Coastal Research, v. 13, no. 3, p. 591-592.

In April 1995, a workshop was held in New Orleans to address the Louisiana barrier island erosion and wetland loss issue. Some 15 presentations were made and 5 panel sessions held which combined, included over 30 scientists, engineers, and coastal managers from Louisiana and elsewhere in the United States.

Keywords: wetland loss, geomorphology, sediment, management

1130. Stone, J.H., Bahr, L.M., Jr., Day, J.W., Jr., and Darnell, R.M., 1982, Ecological effects of urbanization on Lake Pontchartrain, Louisiana, between 1953 and 1978, with implications for management: European Ecological Symposium, Berlin (FRG), 8-12 September 1980, Urban Ecology, p. 243-253.

Keywords: urban, ecology, management

1131. Stone, J.H., 1977, Environmental impacts of crude oil storage in the Clovelly Salt Dome for Louisiana Offshore Oil Port, Inc.: Salt Dome Utilization and Environmental Considerations; Proceedings of a Symposium, p. 232-266.

Keywords: groundwater, contamination

1132. Strickland, D.J., Bednar, G.A., Everett, D.E., and Fendick, R.B., 1986, Quality of water and nature of contamination of shallow aquifers in the Gulf Coastal Plain of Louisiana and Mississippi: Proceedings – Mississippi Water Resources Conference, v. 16, p. 59-62.

Keywords: groundwater, chemistry, contaminants, freshwater

1133. Strickland, D.J., Fendick, R,.B., Jr., Bednar, G.A., and Everett, D.E., 1987, A reconnaissance study to relate land use and ground-water quality in the Gulf Coastal Plain of Louisiana and Mississippi: U.S. Geological Survey Water-Resources Investigations Report 86-4325, 20 p.

Keywords: groundwater, contaminants, freshwater, chemistry

1134. Stringfield, V.T., and Maher, J.C., 1939, Investigation of ground-water supplies in Louisiana*, in* Louisiana Conservation Review, spring 1939: Louisiana Department of Conservation, p. 35-38.

Keywords: groundwater, hydrology, freshwater

1135. Stuart, C.G., and Demas, C.R., 1990, Organic chemical analyses of ground water in Louisiana, water years 1984-88: Louisiana Department of Transportation and Development Water Resources Basic Records Report no. 18, 80 p.

Keywords: groundwater, contaminants

1136. Stuart, C.G., Knochenmus, Darwin, and McGee, B.D., 1994, Guide to Louisiana's ground-water resources: U.S. Geological Survey Water-Resources Investigations Report 94-4085, 55 p.

Keywords: groundwater, freshwater

1137. Stuart, C.G., and Lurry, D.L., 1988, Public water supplies in Louisiana, volume 2—Southern Louisiana: Louisiana Department of Transportation and Development Water Resources Basic Records Report no. 16, 206 p.

Keywords: groundwater, freshwater

1138. Stubblefield, C.L., Lascara, C.M., and Vecchione, M., 1984, Vertical distribution of zooplankton in a shallow turbid estuary: Contrib. Mar. Sci., Univ. Texas, v. 27, p. 93-104.

Keywords: estuarine, ecology

1139. Stubblefield, C.L., and Vecchione, M., 1985, Zooplankton distribution in a wind-driven estuary before and after a major storm: Contributions in Marine Science, v. 28, p. 55-67.

Keywords: microbiology, estuarine, climate

1140. Suchecki, R.K., 1983, Isotopic evidence for large-scale interaction between formation waters and clastic rocks: The Geological Society of America, 96th Annual Meeting, v. 15, no. 6, p. 701.

Keywords: groundwater, geology, chemistry

1141. Suhayda, J.N., 1997, Modeling impacts of Louisiana barrier islands on wetland hydrology: Journal of Coastal Research, v. 13, no. 3, p. 686-693.

This paper provides a description of the methodology being used in Louisiana to evaluate the role of barrier islands in influencing wetland hydrology and some preliminary results. The objective of the evaluation was to determine the effect of barrier island geometry on the duration and depth of inundation of coastal wetlands under average and extreme conditions.

Keywords: estuarine, model, hydrology

1142. Suhayda, J.N., Bailey, A.M., Roberts, H.H., Penland, Shea, and Kuecher, G.J., 1994, Subsidence properties of Holocene sediments; S. LA, *in* Williams, S.J., and Cichon, H.A., Processes of coastal wetlands loss in Louisiana: U.S. Geological Survey Open-File Report 94-0275, p. 193-207.

Keywords: groundwater, hydrology, wetland loss, geology, sediments

1143. Summers, J.K., Paul, J.F., and Robertson, A., 1995, Monitoring the ecological condition of estuaries in the United States: Toxicol. Environ. Chem., v. 49, no.1-2, p. 93-108.

The purpose of the Environmental Monitoring and Assessment Program/Estuaries component (EMAP) is to determine the current status, extent, changes, and trends in ecological indicators of the condition of the nation's estuarine resources on a regional and national basis. Monitoring activities in the Louisianian Provinces focus on measurements describing the benthic community, and seagrasses extent/condition.

Keywords: estuarine, ecology, macroinvertebrates, vascular plants

1144. Summers, K., Latimer, R., and Robertson, A., 1994, An overview of estuarine monitoring in environmental monitoring and assessment program: 1990-1994: 37th Conference of the International Association for Great Lakes Research and Estuarine Research Federation: Program and Abstracts., IAGLR, Buffalo, NY (USA), 166 p.

The purpose of the Environmental Monitoring and Assessment Program/ Estuaries (EMAP-E) is to estimate the current status, condition of the nation's estuarine resources on a regional and national basis. Monitoring activities in the Louisianian Province focus on suite of ecological measurements describing the benthic community, the fish community, water quality, levels of sediment and tissue contamination, sediment toxicity, and SAV extent/condition.

Keywords: management, estuarine, ecology, vascular plants, surface water, contaminants

1145. Sun, B., and Fleeger, J.W., 1991, Spatial and temporal patterns of dispersion in meiobenthic copepods: Marine ecology progress series. Oldendorf, v. 71, no. 1, p. 1-11.

Small-scale spatial pattern (dispersion) of meiobenthic harpacticoid copepods was surveyed in 2 tidal habitats, a shallow pond and a mudflat, in Louisiana, USA. For all abundant harpacticoids, significant small-scale aggregations were remarkably consistent across different collecting dates and habitats although patch size was somewhat variable. Two spatial patterns were common among the 66 species and replicate combinations.

Keywords: macroinvertebrates, estuarine, habitat, ecology

1146. Sun, B., Fleeger, J.W., and Carney, R.S., 1993, Sediment microtopography and the small-scale spatial distribution of meiofauna: Journal of Experimental Marine Biology and Ecology, v. 167, no. 1, p. 73-90.

Direct comparisons between sediment microtopography and the distribution of chlorophyll-a (Chl-a) and meiofauna were examined by contiguous coring (with a 10 by 10 array of small cores, 6.3 mm i.d.) and image analysis of photographs taken on a intertidal saltmarsh mudflat. We discovered a statistically significant correlation between microtopographic features (depressions that range from 0.5 to few cm in diameter) and the abundance of harpacticoid copepods. Harpacticoids were about twice as abundant inside depressions relative to non-depressions. No relationship was found for nematodes, nor were Chl-a and harpacticoids associated.

Keywords: estuarine, macroinvertebrates, microbiology, ecology

1147. Swain, F.M., Johnson, B.D., and Pittman, J.J., 1977, Environmental aspects of marsh gases: Microform Publication--Geological Society of America, no. 7, p. 142-159.

Keywords: chemistry, estuarine

1148. Swarzenski, C.M., and Swenson, E.M., 1994, Effect of mat movement on soil salinity fluctuations in some coastal Louisiana marshes: Estuar. Coast. Shelf Sci., v. 39, no. 2, p. 143-156.

The authors studied patterns of interstitial soil salinities in relation to adjacent surface-water salinity fluctuations in two floating marshes (in which the upper 50 cm of substrate move vertically in response to water level fluctuations) and one firmly rooted marsh occurring in close proximity to each other in a low-salinity (0.5-5) region of coastal Louisiana.

Keywords: estuarine, vascular plants, chemistry, salinity

1149. Swarzenski, C.M., Swenson, E.M., Sasser, C.E., and Gosselink, J.G., 1991, Marsh mat flotation in the Louisiana Delta Plain: Journal of Ecology, v. 79, no. 4, p. 999-1011.

Vertical mat movement in relation to surface-water fluctuation was measured for 1 year at three marshes differing in dominant emergent vegetation and location in the Mississippi River delta plain of coastal Louisiana, U.S.A.

Keywords: freshwater, estuarine, vascular plants, hydrology

1150. Swarzenski, C.M., Leventhal, Joel, and Doyle, Thomas, 1995, Dynamics of porewater methane and methane emissions in some rooted and buoyant coastal Louisiana marshes, *in* Anonymous, Geological Society of America, 1995 annual meeting: Abstracts with Programs--Geological Society of America, v. 27, no. 6, p. 257.

Keywords: estuarine, microbiology, physiology, chemistry

1151. Swenson, E.M., and Turner, R.E., 1983, Marsh water level response to coastal forcing; A comparison of a natural and a semi-impounded site: Eos, Transactions, American Geophysical Union, v. 64, no. 52, p. 1067.

Keywords: hydrology, estuarine, geomorphology

1152. Swenson, E.M., and Wiseman, W.J., Jr., 1987, Saltwater movement between the marsh and adjacent bayous: Proceedings – Gulf of Mexico Information Transfer Meeting, no. 88-0035, p. 178-179.

Keywords: salinity, hydrology, estuarine

1153. Swindel, G.W., and Hodges, A.L., Jr., 1962, Emergency ground-water supplies in Calcasieu Parish, Louisiana: Louisiana Department of Conservation and Louisiana Department of Public Works, text on reverse of map.

Keywords: groundwater, freshwater

1154. Tanner, J.T., 1986, Distribution of tree species in Louisiana bottomland forests: Castanea, v. 51, no. 3, p. 168-174.

Keywords: checklist, freshwater, vascular plants

1155. Tanner, W.F., 1993, Louisiana cheniers; settling from high water, *in* Anonymous, Gulf Coast Association of Geological Societies and Gulf Coast Section of SEPM meeting (AAPG Gulf Coast Section): AAPG Bulletin, v. 77, no. 9, p. 1601.

Keywords: geomorphology, surface water, geology

1156. Taylor, H.E., Garbarino, J.R., and Brinton, T.I., 1990, The occurrence and distribution of trace metals in the Mississippi River and its tributaries: The Science of the Total Environment, v. 97-98, p. 369-384.

Keywords: surface water, freshwater, trace elements

1157. Taylor, H.E., Shiller, A.M., Garbarino, J.R., and Brinton, T.I., 1995, Intercomparison experiments on dissolved trace-metal data from the Mississippi River and some of its tributaries, 1989-90: U.S. Geological Survey Open-File Report 93-0628, p. 28.

Keywords: surface water, freshwater, trace elements

1158. Taylor, K.L., and Grace, J.B., 1995, The effects of vertebrate herbivory on plant community structure in the coastal marshes of the Pearl River, Louisiana, USA: Wetlands, v. 15, no. 1, p. 68-73.

In this study, the authors investigated the impacts of herbivory by the introduced aquatic herbivore, nutria, on three marsh communities of the Pearl River using fenced exclosures and control plots.

Keywords: estuarine, ecology, vascular plants

1159. Taylor, K.L., Grace, J.B., Guntenspergen, G.R., and Foote, A.L., 1994, The interactive effects of herbivory and fire on an oligohaline marsh, Little Lake, Louisiana, USA: Wetlands, v. 14, no. 2, p. 82-87.

Herbivory and fire had been shown to affect the structure and composition of marsh communities. Because fire may alter plant species composition and cover, and these alterations may have an effect on herbivore populations or foraging patterns, an interactive effect of herbivory and fire may be expected. In this study, the effects of fire and vertebrate herbivory in a Louisiana oligohaline marsh were studied using small, controlled burns and animal exclosures. Although both herbivory and fire were found to cause significant changes in the vegetation, the interaction between herbivory and fire was not found to produce any significant effects in any test conducted.

Keywords: estuarine, vascular plants, ecology, habitat, productivity, herbivory

1160. Templet, P.H., and Meyer-Arendt, K.J., 1988, Louisiana wetland loss: A regional water management approach to the problem: Environmental Management, v. 12, no. 1, p. 181-192.

Keywords: management, hydrology, wetland loss, estuarine

1161. Thibodeaux, B.J., and Grimwood, Charles, 1980, Lake Pontchartrain water quality studies: Proceedings of a seminar on Water quality evaluation, U.S. Army Corps of Engineers, Committee on Water Quality, Washington, D.C., Paper 9, 6 p.

Keywords: surface water, chemistry, estuarine

1162. Thieret, J.A., 1968, Additions to the vascular flora of Louisiana: Proceedings of the Louisiana Academy of Science, v. 31, p. 91-97.

Brief mention is made of the unsatisfactory state of knowledge of the Louisiana flora. Accomplishments of the Louisiana Flora Project are reviewed. 17 species are reported as new to the state's flora.

Keywords: vascular plants, checklist

1163. Thieret, J.W., 1980, Louisiana ferns and fern allies: Lafayette Natural History Museum and University of Southwestern Louisiana., Lafayette, LA, 124 p.

Keywords: vascular plants, checklist

1164. Thiyagarajah, A., Hartley, W.R., Major, S.E., and Broxson, M.W., 1996, Gill histopathology of two species of buffalo fish from a contaminated swamp: Mar. Environ. Res., v. 42, no. 1-4, p. 261-266.

Two species of buffalo fish, smallmouth and bigmouth, were collected from a contaminated Mississippi River Basin ecosystem, Devil's Swamp, and a control site. The buffalo fish were examined for general health and histopathological effects. This research consists of an analysis of the prevalence of infectious and non-infectious disease from the contaminated vs. the relatively uncontanimated control site. Tissue burdens were also determined by chemical analysis of buffalo fish muscle samples.

Keywords: freshwater, fish, ecology, contaminants

1165. Thoma, G.J., Koulermos, A.C., Valsaraj, K.T., Reible, D.D., and Thibodeaux, L.J., 1991, The effects of pore-water colloids on the transport of hydrophobic organic compounds from bed sediments: Organic substances and sediments in water; v. 1, Humics and soils, p. 231-250.

Keywords: contaminants, chemistry, sediment

1166. Thomann, G.C., 1973, Remote measurement of salinity in an estuarine environment: Remote Sensing of Earth Resources, v. 2, p. 327-344.

Keywords: GIS, salinity, estuarine

1167. Thomas, R.D., 1985, A newly discovered habitat for *Isoetes melanopoda* in Louisiana: American Fern Journal, v. 75, no. 3, p. 77-79.

The new habitat for *I. melanopoda* in Louisiana was discovered on 8 May 1984. A low wet area in an unplowed soybean field in Richland Parish provided the first find. All the surrounding parts of the field had been treated with herbicides to kill the winter weeds in preparation for spring planting. The low area was too wet for tractors to negotiate so it had been left unsprayed. Close examination of the area revealed that literally tens of thousands of plants of *I. melanopoda* were thriving in the field. Many plants in the treated areas showed no ill effects of the herbicide, although all seed plants were dead. A week later the entire field, including the low area, was disced and planted in soybeans.

Keywords: freshwater, vascular plants

1168. Thomasson, J.A., Bennett, C.W., Jackson, B.D., and Mailander, M.P., 1994, Differentiating bottomland tree species with multispectral videography: Photogram. Eng. Remote Sens., v. 60, no. 1, p. 55-60.

Large-scale multispectral, multitemporal aerial video images were evaluated for speciation of bald-cypress and several species of bottomland hardwoods. Images were acquired with a multispectral video system, including three bandpass filters centered at 550, 800, and 1000 nm, from an altitude of 305 m. The ground-level dimension of the video image pixels was 0.329 m. Images were statistically analyzed with two supervised classification methods (minimum distance and maximum likelihood). The minimum-distance classifier yielded statistically similar results to the maximum likelihood classifier while requiring much less time. Multitemporal imagery increased classification accuracies on the order of 10 percent. Average classification accuracy for individual trees on all plots was 70 percent.

Keywords: GIS, vascular plants, methods

1169. Thompson, B.A., and Deegan, L.A., 1982, Distribution of ladyfish (*Elops saurus*) and bonefish (*Albula vulpes*) leptocephali in Louisiana: Bulletin of Marine Science, v. 32, no. 4, p. 936-939.

Keywords: fish, ecology, estuarine

1170. Thompson, R.A., Quisenberry, S.S., Trahan, G.B., Heagler, A.M., and Giesler, G., 1994, Water management as a cultural control tactic for the rice water weevil (Coleoptera: Curculionidae) in southwest Louisiana: Journal of Economic Entomology, v. 87, no. 1, p. 223-230.

A field experiment was conducted in 1991 and repeated in 1992 to compare the use of carbofuran and field drainage as tactics for control of rice water weevil and to examine the effect on yield of rice caused by a one to three day delay in reflooding after drainage.

Keywords: surface water, freshwater, hydrology, management, agriculture

1171. Thompson, R.L., Ramelow, G.J., Beck, J.N., Langley, M.P., Young, J.C., and Casserly, D.M., 1987, A study of airborne metals in Calcasieu Parish, Louisiana using the lichens, *Parmelia praesorediosa* and *Ramalina stenospora*: Water, Air, & Soil Pollution, v. 36, no. 3-4, p. 295-309.

Keywords: trace elements, contaminants, physiology, climate

1172. Toepfer, C., and Fleeger, J.W., 1995, Effects of marsh-edge habitat variables on feeding success by juvenile bay whiff, *Citharichthys spilopterus* (Teleostei: Bothidae): Southwestern Naturalist, v. 40, no. 3, p. 297-300.

The authors utilized exploratory regression models to examine the influence of marsh-edge characteristics on feeding by two size classes of juvenile bay whiff, *Citharichthys spilopterus*. The model for smaller juveniles (less than or equal to 29 mm SL) indicated that salinity, current velocity, standard length, and median depth were the primary influences on feeding success. A model for larger juveniles (30 to 50 mm SL) incorporated only two independent variables, time of capture and current velocity.

Keywords: estuarine, fish, ecology, habitat

1173. Toepfer, C.S., and Fleeger, J.W., 1995, Diet of juvenile fishes *Citharichthys spilopterus*, *Symphurus plagiusa* and *Gobionellus boleosoma*: Bulletin of Marine Science, v. 56, no. 1, p. 238-249.

The gut contents of juvenile *Citharichthys spilopterus*, *Symphurus plagiusa*, and *Gobionellus boleosoma* from a Louisiana estuary were quantified.

Keywords: estuarine, fish, ecology

1174. Tomaszewski, D.J., 1988, Ground-water hydrology of Livingston, St. Helena, and parts of Ascension and Tangipahoa Parishes, southeastern Louisiana: Louisiana Department of Transportation and Development Water Resources Technical Report no. 43, 54 p.

Keywords: groundwater, hydrology

1175. Tomaszewski, D.J., 1992, Louisiana hydrologic atlas map no. 5: Quality of freshwater in aquifers of Louisiana: U.S. Geological Survey Water-Resources Investigations Report 90-4119, 7 sheets.

Keywords: groundwater, chemistry, freshwater, contaminants

1176. Tomaszewski, D.J., 1996, Distribution and movement of saltwater in aquifers in the Baton Rouge area, Louisiana, 1990-92: Louisiana Department of Transportation and Development Water Resources Technical Report no. 59, 44 p.

Keywords: groundwater, freshwater, contaminants, salinity

1177. Tomaszewski, D.J., 1998, Hydrogeology and the effects of pumpage on the “1,500-foot” sand south of the Baton Rouge fault, near Brusly, Louisiana, 1996: Louisiana Department of Transportation and Development Water Resources Technical Report no. 65, 22 p.

Keywords: groundwater, hydrology

1178. Tomaszewski, D.J., and Anderson, M.L., 1995, Data from wells in a chloride monitoring network, Baton Rouge area, Louisiana, 1965-94: Louisiana Department of Transportation and Development Water Resources Basic Records Report no. 19, 40 p.

Keywords: groundwater, chemistry, freshwater

1179. Tomson, M.B., Curran, Carol, Hutchins, S.R., Lee, M.D., Waggett, Gordon, West, C.C., and Ward, C.H., 1985, Land applications of municipal waste water: Ground Water Quality, p. 188-215.

Keywords: urban, nutrients, management, contaminants

1180. Torak, L.J., and Whiteman, C.D., Jr., 1982, Applications of digital modeling for evaluating the ground-water resources of the "2,000-foot" sand of the Baton Rouge area, Louisiana: Louisiana Department of Transportation and Development, Office of Public Works Water Resources Technical Report no. 27, 87 p.

Keywords: groundwater, model, freshwater

1181. Torak, L.J., Whiteman, C.D., Jr., and Tracy, J.V., 1981, Model study of the "2,000-Foot" sand, Baton Rouge, Louisiana: U.S. Geological Survey Professional Paper 1275, p. 180-181.

Keywords: groundwater, freshwater, model

1182. Trahan, D.B., 1995, Source and plume investigation of chlorinated compounds in groundwater at a chemical plant, *in* Anonymous, AAPG Gulf Coast Section meeting; abstracts: AAPG Bulletin, v. 79, no. 10, p. 1568.

Keywords: groundwater, contaminants

1183. Traughber, E.B., Snowden, J.O., and Simmons, W.B., 1978, Differential subsidence reclaimed marshland peat in metropolitan New Orleans, Louisiana: Evaluation and Prediction of Subsidence, p. 479-499.

Keywords: groundwater, hydrology

1184. Trefry, J.H., and Klinkhammer, G.P., 1988, Remobilization of barium in sulfate-reducing interstitial waters: Eos, Transactions, American Geophysical Union, v. 69, no. 44, p. 1234.

Keywords: trace elements, chemistry, sediment

1185. Trefry, J.H., and Klinkhammer, G.P., 1990, Barium enrichment in sulfate-reducing interstitial waters: V.M. Goldschmidt Conference; Hunt Valley, Baltimore, May 2-4, 1990, Program and Abstracts, p. 87.

Keywords: trace elements, chemistry, sediment

1186. Trefry, J.H., Metz, S., Trocine, R.P., and Nelsen, T.A., 1985, A decline in lead transport by the Mississippi River: Science, v. 230, no. 4724, p. 439-441.

Keywords: surface water, freshwater, trace elements

1187. Trefry, J.H., and Presley, B.J., 1982, Manganese fluxes from Mississippi Delta sediments: Geochimica et Cosmochimica Acta, v. 46, no. 10, p. 1715-1726.

Keywords: nutrients, sediment

1188. Trepagnier, C.M., Kogas, M.A., and Turner, R.E., 1994, Evaluation of wetland gain and loss of abandoned agricultural impoundments in south Louisiana, 1978-1988: Restoration Ecology, v. 3, no. 4, p. 299-303.

Ten failed or abandoned coastal agricultural impoundments (22,680 ha) were examined to determine recent wetland restoration or regression rates from 1978 to 1988. Wetland area and levee length were determined from aerial photography for 1978, 1983, 1985, and 1988.

Keywords: estuarine, wetland loss, management, agriculture, geomorphology, hydrology

1189. Trudeau, D.A., 1994, Geohydrology and the occurrence of selected chemical contaminants at a hazardous-waste disposal site, Calcasieu Parish, Louisiana, 1984-85: Louisiana Department of Transportation and Development Water Resources Technical Report no. 53, 54 p.

Keywords: groundwater, hydrology, contaminants

1190. Tucker, Shirley, 1970, Langlois collection sites of Louisiana lichen: Bryologist, v. 73, no. 1, p. 137-142.

Parish locations are indicated for about 50 of the sites in Louisiana where A.B. Langlois (1832-1900) collected lichens in the late 1800's.

Keywords: algae, checklist

1191. Turcan, A.N., Jr., 1948, Ground water in Evangeline Parish, Louisiana: U.S. Geological Survey Open-File Report, 1 p.

Keywords: groundwater, freshwater

1192. Turcan, A.N., Jr., 1949, Water, *in* St. Mary Parish Resources and Facilities: Louisiana Department of Public Works and St. Mary Parish Planning Board, p. 28-32.

Keywords: groundwater, freshwater, surface water

1193. Turcan, A.N., Jr., 1950, Water, *in* St. Martin Parish Resources and Facilities: Louisiana Department of Public Works and St. Martin Parish Development Board, p. 42-47.

Keywords: groundwater, freshwater, surface water

1194. Turcan, A.N., Jr., 1952, Industrial use of ground water, Louisiana: Louisiana State University Eng. Expt. Sta. Bull., v. 31, p. 1-16.

Keywords: groundwater, freshwater

1195. Turcan, A.N., Jr., 1952, Water, *in* St. Charles Parish Resources and Facilities: Louisiana Department of Public Works and St. Charles Parish Development Board, p. 29-35.

Keywords: groundwater, freshwater, surface water

1196. Turcan, A.N., Jr., 1953, Water, *in* Lafayette Parish Resources and Facilities: Louisiana Department of Public Works and Lafayette Parish Development Board, p. 45-55.

Keywords: groundwater, freshwater, surface water

1197. Turcan, A.N., Jr., 1953, Water, *in* Terrebonne Parish Resources and Facilities: Louisiana Department of Public Works and Terrebonne Parish Development Board, p. 42-44.

Keywords: groundwater, freshwater, surface water

1198. Turcan, A.N., Jr., 1954, Water, *in* St. James Parish Resources and Facilities: St. James Parish Planning and Development Board and Louisiana Department of Public Works, p. 27-33.

Keywords: groundwater, freshwater, surface water

1199. Turcan, A.N., Jr., 1962, Estimating water quality from electrical logs, *in* Geological Survey Research 1962, Short papers in geology and hydrology, articles 60-119: U.S. Geological Survey Professional Paper 450-C, article 116, p. C135-C136.

Keywords: groundwater, chemistry, contaminants

1200. Turcan, A.N., Jr., 1963, Estimating the specific capacity of a well, *in* Geological Survey Research 1962, Short papers in geology, hydrology and topography, articles 180-239: U.S. Geological Survey Professional Paper 450-E, article 222, p. E145-E148.

Keywords: groundwater, hydrology

1201. Turcan, A.N., Jr., and Fader, S.W., 1959, Summary of ground-water conditions in southwestern Louisiana, 1957 and 1958, with a discussion of iron in water from the Chicot aquifer: Louisiana Department of Public Works Water Resources Pamphlet no. 6, 29 p.

Keywords: groundwater, freshwater, chemistry

1202. Turcan, A.N., Jr., Wesselman, J.B., and Kilburn, Chabot, 1966, Interstate correlation of aquifers, southwestern Louisiana and southeastern Texas, *in* Geological Survey research 1966, Chapter D: U.S. Geological Survey Professional Paper 550-D, p. D231-D236.

Keywords: groundwater, freshwater

1203. Turcan, A.N., Jr., and Winslow, A.G., 1970, Quantitative mapping of salinity, volume, and yield of saline aquifers using borehole geophysical logs: Water Resources Research, v. 6, no. 5, p. 1478-1481.

Keywords: groundwater, salinity

1204. Turner, R.E., 1987, Relationship between canal and levee density and coastal land loss in Louisiana: U.S. Fish and Wildlife Service, Biological Report 85(14). 58 p.

Keywords: wetland loss, hydrology, management, geomorphology

1205. Turner, R.E., 1990, Managing wetlands in coastal Louisiana for plants, waterfowl, fish, and other animals: Bulletin of Ecology, v. 21, no. 3, p. 21-24.

Keywords: vascular plants, fish, birds, management

1206. Turner, R.E., 1991, Tide-guage records, water level rise, and subsidence in the Northern Gulf of Mexico: Estuaries, v. 14, no. 2, p. 139-147.

Long-term water level changes in the northern Gulf of Mexico were examined using tide gauge records for this century. Strong coherence exists between the annual mean water changes at Galveston, Texas, and (1) the relatively geologically-stable west coast of Florida, (2) global mean sea level, and (3) the subsiding Louisiana coast. Water levels at the Galveston gauge, one of the longest records (81 yr), have risen steadily, but not

accelerated over the long-term. The apparent acceleration of water rise in the recent two decades is within the historical pattern, and is probably driven by regional or global, but not local climatic factors. Because eustatic sea level has risen steadily this century, the analysis supports the conclusion that regional geologic subsidence has not varied significantly over the tide gauge record (1909-1988). Variations in the estimates of subsidence in the surface layers are generally consistent with the generally accepted understanding of the geology of deltaic processes on this coast.

Keywords: sediment, wetland loss, hydrology, climate, geomorphology

1207. Turner, R.E., 1993, Carbon, nitrogen, and phosphorus leaching rates from *Spartina alterniflora* salt marshes: Marine Ecology Progress Series, v. 92, no. 1-2, p. 135-140.

Annual carbon, nitrogen, and phosphorus leachate rates from live *Spartina alterniflora* in a Louisiana salt marsh were estimated.

Keywords: estuarine, nutrients, vascular plants, physiology

1208. Turner, R.E., 1994, Backfilling canals as a wetland restoration technique in coastal Louisiana: U.S. Dept. of the Interior, Minerals Management Service, New Orleans, La.

Keywords: management, sediment, hydrology

1209. Turner, R.E., 1997, Wetland loss in the northern Gulf of Mexico: Multiple working hypotheses: Estuaries, v. 20, no. 1, p. 1-13.

The author examined four hypotheses about causes for the dramatically high coastal wetland losses in the northern Gulf of Mexico: an extensive dredged canal and spoil bank network, a decline in sediments in the Mississippi River during the 1950's, Mississippi River navigation and flood protection levees, and salinity changes. These four hypotheses were tested using data on land-to-water changes in 15-min quadrangle maps inventoried for four intervals between the 1930's and 1990.

Keywords: estuarine, wetland loss, management, sediment

1210. Turner, R.E., and Boyer, M.E., 1997, Mississippi River diversions, coastal wetland restoration/creation and an economy of scale: Ecological Engineering, v. 8, no. 2, p. 117-128.

We tested the hypothesis that there is an economy of scale in ecological engineering projects designed to create or restore wetlands by using examples of coastal restoration/creation projects in the Louisiana coastal zone. Land gain and project cost are directly related to the amount of riverflow diverted from the main channel, as expected. However, the $/ha gained was dramatically and directly related to project size. A 1000 fold increase in project size is matched by a 100 fold increase in the cost/ha gained. The smallest river diversion projects ($20,000 each) create land at slow rates (at 5 ha/year)

and tend to be very cost effective ($20-$533/ha). These low cost/ha gained are in sharp contrast to that of the larger river diversion projects and most other local wetland restoration/creation projects funded by state/federal sponsored programs ($1000 to $100,000/ha) on this coast. There is a 15 fold increase in $/ha gained as project size increases by a factor of 10.

Keywords: wetland loss, hydrology, geomorphology, methods, management, sediment

1211. Turner, R.E., Lee, J.M., and Neill, C., 1994, Backfilling canals to restore wetlands: Empirical results in coastal Louisiana: Wetlands Ecol. Manage., v. 3, no. 1, p. 63-78.

The purpose of this study was to (1) examine how backfilled canals changed over 10 years, (2) examine factors influencing success with multiple regression statistical models, and, (3) compare costs of backfilling with other Louisiana marsh restoration projects.

Keywords: management, sediment, wetland loss, hydrology, model

1212. Turner, R.E., and Rabalais, N.N., 1991, Changes in Mississippi River water quality this century—Implications for coastal food webs: BioScience – American Institute of Biological Sciences, v. 41(3), p. 140-147.

Keywords: surface water, freshwater, chemistry, ecology

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The rationale and outline of an implementation plan for restoring coastal wetlands in Louisiana is presented. The rationale for the plan is based on reversing the consequences of documented cause-and-effect relationships between wetland loss and hydrologic change.

Keywords: wetland loss, management, hydrology, geomorphology

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Keywords: estuarine, hydrology

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Nutrient regeneration is compared between two distributaries of the Mississippi River that discharge sediment and nutrients to the coastal regions of Louisiana: the Atchafalaya River empties into shallow bays while Southwest Pass flows into the continental shelf.

Keywords: estuarine, nutrients, hydrology

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Marine Shale Processors, Inc. (MSP), Morgan City, LA, processes solid and hazardous wastes in a large industrial kiln to ultimately produce an aggregate. This public health assessment is an evaluation of existing environmental data, both on and off site, local health outcome data, and community health concerns. The contaminants of concern identified in this assessment include lead and cadmium associated with the aggregate.

Keywords: trace elements, contaminants

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Keywords: estuarine, hydrology, model, groundwater

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Keywords: surface water, management

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Keywords: geomorphology, climate, hydrology, sediment, model, estuarine

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Keywords: surface water, freshwater, groundwater, contaminants

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Keywords: surface water, freshwater, contaminants, groundwater

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Keywords: birds, checklist

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Keywords: groundwater, freshwater

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Keywords: groundwater, freshwater

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Keywords: surface water, freshwater, hydrology

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Keywords: surface water, freshwater, hydrology, chemistry

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Keywords: surface water, freshwater, hydrology, chemistry

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Keywords: surface water, freshwater, hydrology, chemistry

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Keywords: surface water, freshwater, hydrology, chemistry

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Keywords: surface water, freshwater, hydrology, chemistry

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Keywords: surface water, freshwater, hydrology, chemistry

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Keywords: surface water, freshwater, hydrology, chemistry

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Keywords: surface water, freshwater, hydrology, chemistry

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Keywords: surface water, freshwater, hydrology, chemistry

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Keywords: surface water, freshwater, hydrology, chemistry

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Keywords: surface water, freshwater, hydrology, chemistry

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Keywords: groundwater, hydrology

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Keywords: surface water, groundwater, hydrology, chemistry, freshwater

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Keywords: surface water, freshwater, hydrology, chemistry, groundwater

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Keywords: surface water, groundwater, hydrology, chemistry, freshwater

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Keywords: surface water, freshwater, hydrology, chemistry, groundwater

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Keywords: surface water, freshwater, hydrology, chemistry, groundwater

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Keywords: surface water, groundwater, hydrology, chemistry, freshwater

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Keywords: surface water, freshwater, hydrology, chemistry, groundwater

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Keywords: surface water, freshwater, hydrology, chemistry, groundwater

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Keywords: surface water, groundwater, hydrology, chemistry, freshwater

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Keywords: surface water, freshwater, hydrology, chemistry, groundwater

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Keywords: surface water, freshwater, hydrology, chemistry, groundwater

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Keywords: surface water, freshwater, hydrology, chemistry, groundwater

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Keywords: surface water, freshwater, hydrology, chemistry, groundwater

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Keywords: surface water, groundwater, hydrology, chemistry, freshwater

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Keywords: surface water, freshwater, hydrology, chemistry, groundwater

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Keywords: surface water, freshwater, hydrology, chemistry, groundwater

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Keywords: surface water, freshwater, hydrology, chemistry, groundwater

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Keywords: surface water, freshwater, hydrology, chemistry, groundwater

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Keywords: surface water, freshwater, hydrology

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Keywords: groundwater, chemistry, hydrology

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Keywords: surface water, freshwater, hydrology, groundwater

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Keywords: surface water, freshwater, hydrology

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Keywords: surface water, freshwater, hydrology, chemistry

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Keywords: surface water, groundwater, estuarine, wetland loss, freshwater, chemistry, geology, climate, fish, salinity, hydrology, contaminants

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An innovative technique for marsh creation, combining several existing proven concepts, was implemented at Sabine National Wildlife Refuge, Cameron, Louisiana. Approximately 128 shallow bay bottom terraces, oriented in an open checkerboard

pattern, were constructed with *Spartina alterniflora* planted on both sides of each of the terraces. Data collection platforms measured biological and physical parameters such as dissolved oxygen, salinity, conductivity, temperature, water level, water velocity, and rainfall.

Keywords: wetland loss, management, vascular plants, habitat, salinity, estuarine

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Keywords: surface water, freshwater, microbiology, sediment

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Keywords: surface water, freshwater, sediment, chemistry

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Keywords: surface water, freshwater, management, estuarine

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Keywords: surface water, freshwater, wetland loss, hydrology, management

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Keywords: hydrology, surface water, freshwater

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Keywords: estuarine, wetland loss, management

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Keywords: estuarine, wetland loss, ecology

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Keywords: estuarine, microbiology, urban

1280. Vecchione, M., 1991, Long-term trends in the abundance of the Copepod *Acartia tonsa* in the Calcasieu Estuary: Contrib. Mar. Sci., v. 32, p. 89-101.

Data on the abundance of adult *Acartia tonsa* are combined from three data sets collected at two stations in Calcasieu Lake between 1975 and 1986.

Keywords: estuarine, macroinvertebrates

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The impact of floodplain mining of sand and gravel has been identified as a contributing cause of modern flooding in the Amite River basin of southeastern Louisiana. Changes in land use in areas of active sand and gravel mining coincide with basin-wide land-use changes associated with urban growth, forest management, and agricultural activity. Modern land use changes have induced adverse environmental impacts to the riverine system through alteration of the natural landscape and surface-water hydrology.

Keywords: surface water, freshwater, management, sediment, urban, hydrology, geomorphology

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Keywords: microbiology, agriculture

1283. Vidrine, M.F., 1993, The historical distributions of freshwater mussels in Louisiana: Gail Q. Vidrine Collectables, Eunice, LA, 225 p.

Keywords: macroinvertebrates, checklist

1284. Visser, J.M., Sasser, C.E., Chabreck, R.H., and Linscombe, R.G., 1999, Long-term vegetation change in Louisiana tidal marshes, 1968-1992: Wetlands, v. 19, no. 1, p. 168-175.

The Louisiana coastal marshes form some of the most extensive wetlands within the continental United States. The problem of land loss in these coastal marshes is well-documented, but very little is known about possible changes in vegetation composition that might be associated with this loss. We analyzed vegetation data collected from 1968 to 1992 in the tidal wetlands of Terrebonne parish and described five vegetation types that occur in this region.

Keywords: vascular plants, hydrology, herbivory, ecology

1285. Visser, J.M., Sasser, C.E., Chabreck, R.H., and others, 1998, Marsh vegetation types of the Mississippi River Deltaic Plain: Estuaries, v. 21, no. 4B, p. 818-828.

Marshes of the Mississippi River Deltaic Plain represent 17% of the coastal marshes in the continental United States. However, only a few detailed descriptions of the diverse plant communities that occur in this large expanse of wetlands exist and none are based on detailed vegetation analysis. The objective of this study was to quantitatively analyze the vegetation data collected in the wetlands of the Barataria and Terrebonne estuary to determine naturally occurring vegetation associations. Two-way indicator species analyses (TWINSPAN) revealed nine vegetation types: polyhaline mangrove, polyhaline oystergrass, mesohaline mix, mesohaline wiregrass, oligohaline wiregrass, oligohaline mix, fresh bulltongue, fresh maidencane, and fresh cutgrass. These nine types form a logical expansion on the four salinity zones described for the region by previous studies and form a basis to compare the vegetation types of the Mississippi River Delta region with other regions of the Atlantic and Gulf coasts.

Keywords: vascular plants, checklist, estuarine

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Earliest known list of Lepidoptera in New Orleans.

Keywords: macroinvertebrates, checklist

1287. Wade, T., Brooks, J., Macauley, J., Summer, K., and Rubinstein, N., 1994, Monitoring sediment contaminants as stressors of estuarine condition: 37th Conference of the International Association for Great Lakes Research and Estuarine Research Federation; Program and abstracts, IAGLR, Buffalo, NY (USA), 166 p.

Concentrations of selected organic contaminants and metals have been monitored in sediments by the EMAP–Estuaries program for the Virginian and Louisianian Provinces since 1990 and 1991, respectively. Conclusions regarding extents of organic and metal

contamination of the Gulf Coast and Mid-Atlantic Coast are discussed in terms of concentration levels estimated to be of biological significance.

Keywords: estuarine, contaminants, sediment, trace elements, ecology

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Keywords: urban, ecology, estuarine

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Keywords: macroinvertebrates, ecology, agriculture

1290. Wall, D.P., and Darwin, S.P., 1999, Vegetation and elevational gradients within a bottomland hardwood forest of southeastern Louisiana: American Midland Naturalist, v. 142, no. 1, p. 17-30.

Twelve belt transects were used to sample woody vegetation in a 110-y-old regrowth forest on a natural levee ridge bordering Bayou Sauvage, Orleans Parish, Louisiana. Elevation was measured along each transect and species flood tolerances, based upon measured elevational ranges, were assessed. The analysis tentatively resolved species associations within the ridge-forest community into "low-" and "high-ridge" subcommunities though insufficient data existed for their formal recognition. Elevational distributions of individual species compared reasonably well with published regional assessments of their flood tolerances and value as wetland indicators.

Keywords: vascular plants, geomorphology, checklist, ecology

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Keywords: groundwater, geology

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Keywords: groundwater, geology

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Keywords: groundwater, contaminants

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Keywords: groundwater, freshwater

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Keywords: groundwater, hydrology, freshwater

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Keywords: groundwater, hydrology, freshwater

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Keywords: groundwater, hydrology

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Keywords: groundwater, hydrology, freshwater

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Keywords: groundwater, chemistry

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Keywords: estuarine, sediment, hydrology, nutrients

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Keywords: hydrology, geomorphology, salinity

1302. Wang, F.C., 1994, Effects of man-made channels on surface flow regime*, in* Anonymous, AGU 1994 spring meeting: Eos, Transactions, American Geophysical Union, v. 75, no. 16 (suppl.), p. 183.

Keywords: surface water, hydrology, geomorphology

1303. Wang, F.C., Lu, T., and Sikora, W.B., 1993, Intertidal marsh suspended sediment transport processes, Terrebonne Bay, Louisiana, U.S.A.: Journal of Coastal Research, v. 9, no. 1, p. 209-220.

This study examines the transport processes of suspended sediment from a tidal creek / bayou onto its adjacent salt marsh in a shallow estuary with negligible freshwater inflow near Terrebonne Bay, Louisiana. Water depth, flow velocity, water temperature and salinity in a tidal bayou, and wind speed and direction nearby were measured. Water samples were collected from the bayou bank to the marsh interior at eight locations 8.5 meters apart over a tidal cycle during normal spring tides.

Keywords: estuarine, sediment, hydrology

1304. Wang, F.C., Ransibrahmanakul, V., Tuen, K.L., Wang, M.L., and Zhang. F., 1995, Hydrodynamics of a tidal inlet in Fourleague Bay/Atchafalaya Bay, Louisiana: Journal of Coastal Research, v. 11, no. 3, p. 733-743.

Field measurements of hourly water level, flow velocity, suspended sediment, and water salinity were performed simultaneously during two spring tides (in a low and a high river flow season) with two stations (a bay and a gulf station) at each end of the Oyster Bayou, a tidal inlet connecting Fourleague Bay/Atchafalaya Bay and the Gulf of Mexico in south Louisiana. The objective of this study was to examine the patterns of sediment transport through Oyster Bayou from the Bay to the Gulf and vice versa.

Keywords: estuarine, hydrology, sediment, salinity

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A hydrologic study of a meandering channel and its adjacent marshes on the south-central Louisiana coast has revealed a Bow pattern different from that expected for a

natural tidal channel. A network of constructed channels, ranging in size from the small trapper's channels 1.5 meter wide to 30 meter wide petroleum-well access canals, has altered the hydrology of the natural bayou and the tidal regime of the adjacent marshes along the upper reaches of the bayou. Hourly water-level data, recorded at a marsh site in the upper reaches of the bayou, show that the pattern of marsh inundation is characterized by sporadic flooding interspersed by long draining periods. The purpose of this study is to interpret the different Bow circulation patterns observed in the bayou during two extensive field trips. These trips were in September and October 1991, during which strong continuous north and east winds prevailed. Those data are augmented by additional data sets taken in May and August 1992 and by other field observations showing the effects of man-made canals which have induced hydrologic changes in the area. These results indicate that the surface Bow patterns in the upper reaches of the bayou have been decoupled from the lower reaches of the bayou because of the Bow interception by man-made canals. The upper reaches of the bayou have then been filled in with sediments because of the reduction in Bow velocity.

Keywords: hydrology, management, geomorphology

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Keywords: groundwater, salinity

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Keywords: groundwater, petroleum

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Keywords: surface water, freshwater, fish

1309. Wascom, M.W., 1997, Environmental regulation of land use; a growing area of federal and Louisiana environmental law: Environmental Geosciences, v. 4, no. 1, p. 41-46.

Keywords: management

1310. Webb, E.C., Mendelssohn, I.A., and Wilsey, B.J., 1995, Causes for vegetation dieback in a Louisiana salt marsh—A bioassay approach: Aquatic Botany, v. 51, no. 3-4, p. 281-289.

In order to determine the factors causing vegetation dieback in a Louisiana coastal marsh, a manipulative field experiment was conducted where four native salt marsh plant species

with different salinity and flooding tolerances were placed at two elevations within a deteriorating marsh: (1) ambient elevation of the deteriorating marsh and (2) 20 cm above the marsh surface.

Keywords: estuarine, vascular plants, physiology

1311. Wee, J.L., Booth, D.J., and Bossier, M.A., 1993, Synurophyceae from the southern Atlantic Coastal Plain of North America—A preliminary survey in Louisiana, USA: Nordic Journal of Botany, v. 13, no. 1, p. 95-106.

Forty-three taxa of Synurophyceae were identified by means of transmission electron microscopy of samples from ten different localities in southeastern Louisiana, on the southern portion of the Atlantic Coastal Plain Province of North America.

Keywords: algae, checklist

1312. Weisberg, S., Summer, K., Holland, F., Gaston, G., Heard, R., and Frithsen, J., 1994, The use of benthic community measures as indicators of estuarine condition: 37th Conference of the International Association for Great Lakes Research and Estuarine Research Federation—Program and abstract, IAGLR, Buffalo, NY (USA), 166 p.

Benthic indices, based on structural community parameters, were constructed from benthic community information collected during the period 1990 through 1993 EMAP sampling efforts in the Virginian, Louisianian, and Carolinian Provinces. All three indices were constructed using the same methodology. In addition, a national benthic index was constructed using the information from all three provinces. Although different in their exact components, these indices have variables relating to proportion of expected member of species or taxonomic groups.

Keywords: estuarine, macroinvertebrates, ecology

1313. Weiss, J.S., 1987, Determining dissolved-solids concentrations in mineralized ground water of the Gulf Coast aquifer systems using electric logs *in* Vecchioli, John and Johnson, A.I., Regional aquifer systems of the United States; aquifers of the Atlantic and Gulf Coastal Plain: AWRA Monograph Series, v. 9, p. 139-150.

Keywords: groundwater, chemistry

1314. Weiss, J.S., 1990, Geohydrologic units of the Coastal Lowlands aquifer system, south-central United States: U.S. Geological Survey Open-File Report 90-0173, p. 44, 34 oversize sheets.

Keywords: groundwater, hydrology

1315. Weiss, J.S., 1992, Geohydrologic units of the coastal lowlands aquifer system, south-central United States: U.S. Geological Survey Professional Paper 1416-C, p. C1-C32, 16 pl.

The coastal lowlands aquifer system underlies about 160,000 square miles in parts of Texas, Louisiana, Mississippi, Alabama, and westernmost Florida, and nearby offshore areas. The coastal lowlands aquifer system, one of three regional aquifer systems that has been identified in the coastal plain of the south-central United States, extends from the Rio Grande in South Texas to westernmost Florida. The sediments of the coastal lowlands aquifer system have been subdivided into geohydrologic units by using a combination of lithologic and hydraulic data.

Keywords: groundwater, hydrology

1316. Wells, F.C., 1980, Hydrology and water quality of the lower Mississippi River: Louisiana Department of Transportation and Development, Office of Public Works Water Resources Technical Report no. 21, 83 p.

Keywords: surface water, freshwater, hydrology, chemistry

1317. Wells, F.C., and Demas, C.R., 1977, Hydrology and water quality of the Atchafalaya River basin: Louisiana Department of Transportation and Development, Office of Public Works Water Resources Technical Report no. 14, 53 p.

Keywords: surface water, freshwater, hydrology, chemistry

1318. Wells, F.C., and Gogel, A.J., 1975, Analyses of selected constituents in native water and soil in the Bayou Boeuf-Chene-Black area near Morgan City, Louisiana, including a modified standard elutriate test: U.S. Geological Survey Open-File Report 75-176, 23 p.

Keywords: surface water, estuarine, chemistry, sediment

1319. Wells, J.T., 1996, Subsidence, sea-level rise, and wetland loss in the lower Mississippi River delta*, in* Milliman, J.D., and Haq, B.U., Sea-level rise and coastal subsidence; causes, consequences, and strategies: Coastal Systems and Continental Margins, v. 2, p. 281-311.

Keywords: geomorphology, sediment, wetland loss

1320. West, E.M., 1938, The vegetation of Grand Isle: The Louisiana Academy of Sciences, v. 4, p. 214-217.

Grand Isle presents bare areas of brackish water, a changing sand dune topography, sandymeadow, forest and marsh areas. The work was carried out during the summer of 1937.

Keywords: vascular plants, checklist

1321. Whatley, E.C., 1969, A study of *Syngnathus scovelli* in fresh water of Louisiana and salt water of Mississippi: Gulf Research Reports, v. 2, no. 4, p. 437-474.

Keywords: fish, ecology

1322. Whelan, T., 1974, Methane, carbon dioxide, and dissolved sulfate from interstitial water of coastal marsh sediments: Estuarine and Coastal Marine Science, v. 2, no. 4, p. 407-415.

Keywords: nutrients, sediment, chemistry, surface water

1323. Whipple, S.A., Fleeger, J.W., and Cook, L.L., 1981, The influence of tidal flushing, light exposure and natant on edaphic chlorophyll-a in a Louisiana salt marsh: Estuarine, Coastal and Shelf Science, v. 13, no. 6, p. 637-643.

Keywords: hydrology, vascular plants, estuarine, algae

1324. White, D.A., 1987, An American beech-dominated original growth forest in southeast Louisiana: Bull. Torrey Bot. Club, v. 114, no. 2, p. 127-133.

Keywords: checklist, ecology, vascular plants

1325. White, D.A., 1993, Vascular plant community development on mudflats in the Mississippi River delta, Louisiana, USA: Aquatic Botany, v. 45, no. 2-3, p. 171-194.

Plant community development and phytosociology on mudflats on two inner deltaic splays in the Mississippi River delta, Louisiana, are described. The splays supported three communities based upon plant species occurrence, soil, and plant biomass data collected over seven growing seasons.

Keywords: vascular plants, ecology, freshwater, estuarine, salinity, sediment

1326. White, D.A., and Simmons, M.J., 1988, Productivity of the marshes at the mouth of the Pearl River, Louisiana: Castanea, v. 53, no. 3, p. 215-224.

Keywords: vascular plants, productivity, estuarine

1327. White, J.R., and Dagg, M.J., 1989, Effects of suspended sediments on egg production of the calanoid copepod *Acartia tonsa*: Marine Biology. Berlin, Heidelberg, v. 102, no. 3, p. 315-319.

Keywords: estuarine, sediment, ecology, habitat, macroinvertebrates

1328. Whiteman, C.D., Jr., 1972, Ground water in the Plaquemine-White Castle area, Iberville Parish, Louisiana: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Bulletin no. 16, 69 p.

Keywords: groundwater

1329. Whiteman, C.D., Jr., 1979, Saltwater encroachment in the "600-foot" and "1,500-foot" sands of the Baton Rouge area, Louisiana, 1966-78, including a discussion of saltwater in other sands: Louisiana Department of Transportation and Development, Office of Public Works Water Resources Technical Report no. 19, 49 p.

Keywords: groundwater, freshwater, contaminants

1330. Whiteman, C.D., Jr., 1980, Measuring local subsidence with extensometers in the Baton Rouge area, Louisiana, 1975-79: Louisiana Department of Transportation and Development, Office of Public Works Water Resources Technical Report no. 20, 18 p.

Keywords: groundwater, hydrology

1331. Whitfield, M.S., Jr., 1974, Water supply, *in* Soil survey of Evangeline Parish, Louisiana: U.S. Department of Agriculture, Soil Conservation Service, p. 65-66.

Keywords: groundwater, freshwater

1332. Whitfield, M.S., Jr., 1975, Geohydrology of the Evangeline and Jasper aquifers of southwestern Louisiana: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Bulletin no. 20, 72 p.

Keywords: groundwater, hydrology, freshwater

1333. Whitfield, M.S., Jr., 1980, Chemical character of water in the Red River alluvial aquifer, Louisiana: U.S. Geological Survey Water-Resources Investigations Open-File Report 80-1018, 95 p.

Keywords: groundwater, chemistry, freshwater

1334. Whitman, H.M., 1965, Estimating water quality from electrical logs in southwestern Louisiana: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Pamphlet no. 16, 13 p.

Keywords: groundwater, chemistry

1335. Whitman, H.M., and Kilburn, Chabot, 1963, Ground-water conditions in southwestern Louisiana, 1961 and 1962, with a discussion of the Chicot aquifer in the coastal area: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Pamphlet no. 12, 32 p.

Keywords: groundwater, freshwater, chemistry

1336. Wieland, D.R., 1977, Geopressured-geothermal test of the Edna Delcambre no. 1 well, Vermilion Parish, Louisiana II: Proceedings – Geopressured Geothermal Energy Conference, no. 3, p. ED.7-ED.40.

Keywords: groundwater, geology

1337. Williams, C.B., and Duex, T.W., 1995, A hydrogeological study of the Chicot aquifer in Lafayette Parish, Louisiana, *in* John, C.J., and Byrnes, M.R., Transactions of the forty-fifth annual convention of the Gulf Coast Association of Geological Societies, a section of the American Association of Petroleum Geologists regional meeting and the forty-second annual convention of the Gulf Coast Section of the Society of Economic Paleontologists and Mineralogists: Transactions--Gulf Coast Association of Geological Societies, v. 45, p. 165-172.

Keywords: groundwater, hydrology, freshwater

1338. Williams, L.B., Ferrell, R.E., Jr., Hutcheon, I., Bakel, A.J., Walsh, M.M., and Krouse, H.R., 1995, Nitrogen isotope geochemistry of organic matter and minerals during diagenesis and hydrocarbon migration: Geochim. Cosmochim. ACTA, v. 59, no. 4, p. 765-779.

The magnitude of isotopic variations between organic and inorganic nitrogen was examined in samples from three staked hydrocarbon reservoirs in the Fordoche Field (Louisiana Gulf Coast Basin). Measurements were made of delta ^{15}N in kerogen, bitumen, oil, formation water, and fixed-NH_4 extracted from mudstones, nonproductive sandstones, and productive sandstones.

Keywords: groundwater, chemistry

1339. Williams, S.J., and Sallenger, A.H., 1990, Loss of coastal wetlands in Louisiana: Cooperative research to assess the critical processes: Fish and Wildlife Service Biological Report 90 (18), p. 139-144.

As a result of natural and human-induced factors, the coastal plain of Louisiana, which contains 40% of the tidal wetlands in the counterminous 48 states, is undergoing the greatest amount of coastal erosion and wetland loss of any state in the nation. In response to this problem and the lack of scientific understanding of the processes causing erosion and land loss, the U.S. Geological Survey has, since 1986, conducted field investigations in Louisiana, working closely with the U.S. Fish and Wildlife Service and other Federal and State agencies. Research elements included in the studies of Louisiana's coastal barriers and wetlands are: (1) the shallow geologic framework; (2) documentation by maps and aerial photographs of the physical changes that have occurred during the past 135 years; (3) measurements of several critical processes in the coastal zone and in a

typical sediment-starved or sediment-rich basins; and (4) transfer of the results and findings to coastal resource managers.

Keywords: wetland loss, sediment, management

1340. Williamson, A.K., Grubb, H.F., and Weiss, J.S., 1990, Ground-water flow in the Gulf Coast aquifer systems, south-central United States; a preliminary analysis: U.S. Geological Survey Water-Resources Investigations Report 89-4071, p. 124.

Keywords: groundwater, hydrology

1341. Willis, F.S., and Nasci, R.S., 1994, *Aedes albopictus* (Diptera: Culicidae) population density and structure in southwest Louisiana: Journal of Medical Entomology, v. 31, no. 4, p. 594-599.

Pupal density, wing length at emergence, host-seeking female abundance, and host-seeking female wing length and parity were determined monthly for a population of *Aedes albopictus* (Skuse) in a southwestern Louisiana tire dump from January 1988 through January 1989.

Keywords: macroinvertebrates, habitat, ecology

1342. Willis, G.H., Fouss, J.L., Rogers, J.S., Carter, C.E., and Southwick, L.M., 1992, Status of the Water Table Management-Water Quality Research Project in the Lower Mississippi Valley, *in* Anonymous, Drainage and water table control; proceedings of the Sixth international drainage symposium: ASAE Publication, no. 13-92, p. 210-218.

Keywords: groundwater, management

1343. Willits, M.H., McCoy, R.L., Dobson, R.J., and Hartsock, J.H., 1979, Investigation and evaluation of geopressured-geothermal wells; Final report; Fairfax Foster Sutter no. 2 well, St. Mary Parish, Louisiana: Department of Energy, Washington, D.C., no. DOE/ET/28460-1, 116 p.

Keywords: groundwater, geology

1344. Wilsey, B.J., and Chabreck, R.H., 1991, Nutritional quality of nutria diets in three Louisiana wetland habitats: Northeast Gulf Sci., v. 12, no. 1, p. 67-72.

This report describes a study of the nutritional quality of the nutria's diet as this could be a major factor controlling nutria abundance and distribution.

Keywords: mammals, herbivory, ecology, vascular plants

1345. Wilsey, B.J., Chabreck, R.H., and Linscombe, R.G., 1991, Variation in nutria diets in selected freshwater forested wetlands of Louisiana: Wetlands, v. 11, no. 2, p. 263-278.

Nutria diets and food preferences in selected freshwater forested wetlands of Louisiana were determined by microhistological examination of fecal pellets and stomach contents.

Keywords: mammals, herbivory, ecology, freshwater

1346. Wilsey, B.J., McKee, K.L., and Mendelssohn, I.A., 1992, Effects of increased elevation and macro- and micronutrient additions on *Spartina alterniflora* transplant success in salt-marsh dieback areas in Louisiana: Environmental Management, v. 16, no. 4, p. 505-511.

Spartina alterniflora was transplanted into die-back areas of a salt marsh in southeast Louisiana at two elevations (ambient and +30 cm) with and without macro- (N, P, and K) and micronutrient (Fe, Mn, Cu, and Zn) additions to determine if transplant success is dependent on increasing elevation or nutrients.

Keywords: nutrients, hydrology, vascular plants, estuarine, geomorphology

1347. Wilson, T.A., and Hosman, R.L., 1987, Geophysical well-log data base for the gulf coast aquifer systems, south-central United States: U.S. Geological Survey, Open-File Report 87-677, 213 p.

Keywords: groundwater, chemistry

1348. Winger, P.V., and Andreasen, J.K., 1985, Contaminant residues in fish and sediments from lakes in the Atchafalaya River basin (Louisiana): Archives of Environmental Contamination and Toxicology, v. 14, no. 5, p. 579-586.

Conversion of bottomland hardwood forests to agricultural land has reduced habitat and water quality in many lakes in the floodplain of the lower Mississippi River. The objectives of this study were to ascertain current contaminant residue concentrations in fish and sediment from lakes in the Atchafalaya River basin and to determine the influence of overflow and agricultural land use on contaminant levels. Residue analysis of 24 sediment and 82 fish samples collected from the study lakes showed that contaminant residues were uniformly low. Total DDT concentrations, consisting mainly of DDE, were found in 98% of the fish samples and generally were the highest residues though they rarely exceeded 0.50 mu g/g. Dieldrin, alpha -BHC and gamma -BHC, in concentrations rarely exceeding 0.05 mu g/g, were detected in about 50% of the fish samples. Total organochlorine pesticide and PCB residues were less than 2.00 mu g/g in all fish from all lakes, except for 3.46 mu g/g total in spotted gar (*Lepisosteus oculatus*) from one lake.

Keywords: contaminants, freshwater, fish, pesticides, sediment, agriculture

1349. Winner, M.D., Jr., 1963, The Florida Parishes--an area of large, undeveloped ground-water potential in southeastern Louisiana: Louisiana Department of Public Works, 50 p.

Keywords: groundwater, freshwater

1350. Winner, M.D., Jr., Forbes, M.J., Jr., and Broussard, W.L., 1968, Water resources of Pointe Coupee Parish, Louisiana: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Bulletin no. 11, 110 p.

Keywords: groundwater, freshwater

1351. Winslow, A.G., Hillier, D.E., and Turcan, A.N., Jr., 1968, Saline ground water in Louisiana: U.S. Geological Survey Hydrologic Investigations Atlas HA-310, 4 sheets.

Keywords: groundwater, salinity

1352. Wintz, W.A., Jr., Kazmann, R.G., and Smith, C.G., Jr., 1970, Subsidence and ground-water offtake in the Baton Rouge area: Louisiana Water Resources Research Institute Bulletin, v. 6, 20 p.

Keywords: groundwater, hydrology

1353. Wiseman, W.J., and Inoue, Masamichi, 1994, Salinity variations in two Louisiana estuaries, *in* Williams, S.J., and Cichon, H.A., Processes of coastal wetlands loss in Louisiana: U.S. Geological Survey Open-File Report 94-0275, p. 209-221.

Keywords: estuarine, wetland loss

1354. Wolfe, J.L., Bradshaw, D.K., and Chabreck, R,H., 1987, Alligator feeding habits—New data and a review: Northeast Gulf Sci., v. 9, no. 1, p. 1-8.

Keywords: ecology, reptiles

1355. Workman, A.L., and Hanor, J.S., 1985, Evidence for large-scale vertical migration of dissolved fatty acids in Louisiana oil field brines; Iberia Field, south-central Louisiana: Transactions – Gulf Coast Association of Geological Societies, v. 35, p. 293-300.

Keywords: groundwater, petroleum

1356. Yeung, A.T., Viswanathan, Rajan, and Briaud, Jean-Louis, 1996, Field investigation of potential contamination by bitumen-coated piles: Journal of Geotechnical Engineering, v. 122, no. 9, p. 736-744.

Keywords: groundwater, contaminants

1357. Yhip, K.C., Scott, M.R., and Rotter, R., 1983, ^{234}Th, $^{239-240}$Pu, and ^{210}Pb in Mississippi River salinity gradient and delta sediments: Eos, Transactions, American Geophysical Union, v. 64, no. 52, p. 1021.

Keywords: surface water, sediment, trace elements, contaminants

1358. Youngquist, L.W., 1945, Water, *in* Lafayette Parish Resources and Facilities: Louisiana Department of Public Works and Lafayette Parish Planning Board, p. 24-27.

Keywords: groundwater, surface water

1359. Zachritz, W.H., and Fuller, J.W., 1993, Performance of an artificial wetlands filter treating facultative lagoon effluent at Carville, Louisiana: Water Environment Research, v. 65, no. 1, p. 46-52.

This study was initiated in the spring of 1988 and samples were collected twice a week from seven sampling stations and analyzed for BOD, flow rates, temperature, pH, TSS, and volatile suspended solids.

Keywords: surface water, freshwater, nutrients, physiology, management

1360. Zachritz, W.H., and Malone, R.F., 1991, Wastewater treatment—Options for Louisiana seafood processors: Louisiana Sea Grant Coll. Program, Baton Rouge, 78 p.

The objectives of the report are to identify the major categories of Louisiana seafood processors by species, to define the environmental regulatory requirements that apply to seafood processors, to catalog available historical data for describing the wastewaters of major Louisiana seafood processors, and to develop treatment recommendations for the nontoxic biodegradable wastes produced by these facilities for each processing category.

Keywords: nutrients, management, estuarine

1361. Zack, A.L., 1971, Ground-water pumpage and related effects, southwestern Louisiana, 1970, with a section on surface-water withdrawals: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Pamphlet no. 27, 33 p.

Keywords: groundwater, hydrology

1362. Zenero, R.R., Seng, D.L., Byrnes, M.R., and McBride, R.A., 1995, Geophysical techniques for evaluating the internal structure of cheniers, southwestern Louisiana, *in* Anonymous, AAPG Gulf Coast Section meeting; abstracts: AAPG Bulletin, v. 79, no. 10, p. 1569.

Keywords: geology, geomorphology

1363. Zhang, Xiaowei and Feagley, S.E., 1994, Restoring a dying swamp with treated municipal wastewater: Louisiana Agric., v. 37, no. 4, p. 5-7.

Since March 1992, the city of Thibodaux has discharged secondary-treated municipal wastewater into the Pointe au Chene Swamp as part of the city's system for tertiary wastewater treatment. The purpose of this research was to determine the efficiency of the swamp to remove nitrogen from wastewater and the impact of the effluent on the swamp.

Keywords: surface water, freshwater, nutrients, management

1364. Zwank, P.J., McKenzie, P.M., and Moser, E.B., 1989, Mottled duck habitat use and density indices in agricultural lands: Journal of Wildlife Management, v. 53, no. 1, p. 110-114.

Keywords: habitat, agriculture, surface water