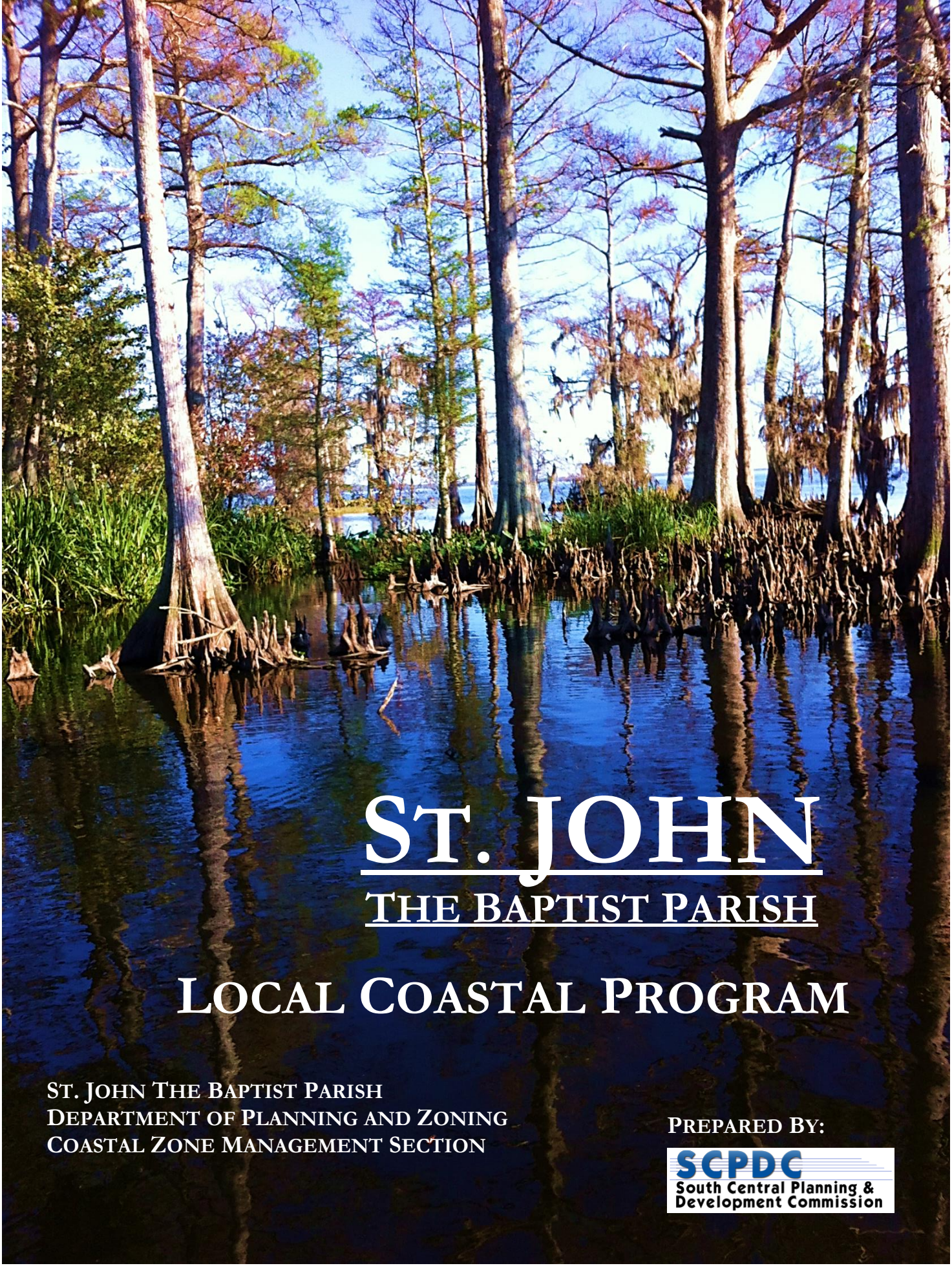


ST. JOHN
THE BAPTIST PARISH

LOCAL COASTAL PROGRAM

ST. JOHN THE BAPTIST PARISH
DEPARTMENT OF PLANNING AND ZONING
COASTAL ZONE MANAGEMENT SECTION

PREPARED BY:

SCPDC
South Central Planning & Development Commission

ACKNOWLEDGEMENTS

The updating and completion of the St. John the Baptist parish CZMP would not have been possible without the support of the **St. John the Baptist Parish Council**, **Parish President Natalie Robottom** and **Parish Administrator LaVerne Toombs**. The research, development and production of the program document comes only after years of thought and consideration lead by **St. John's Planning & Zoning Department** under the leadership of **Planning Director Alexandra Gelpi Carter** and former director **Angelic Keller**. Additional recognition goes to **Felicie (Phyl) Cornman** and **Eric Wolverton** for their coordination with the Advisory Committee, to **Planner Evelyn Campo** whose contribution rose to the level of Researcher and Co-Author, and **GIS Administrator/ IT Coordinator Rebecca Hymel**.

The **Louisiana Department of Natural Resources – Office of Coastal Management** provided invaluable input and guidance in compliance with the State and Local Coastal Resource Management Act of 1978, as amended, and with the organizational structure of the implementation ordinance. Specific acknowledgements go to **Jon Truxillo** and **Sara Krupa** of the Office of Coastal Management who provided guidance and support in the production of this document.

The production of this document required knowledge of the St. John the Baptist Parish wetlands and wetlands in general. This was accomplished via the participation, knowledge and guidance locally of the **CZM Advisory Committee Members** (and former members): **Greta Duhe (Chair), Steven Fraker, Annrose M. Guarino, Jamie LaBranche, Danny Guidry, Catherine Schons, Rickey Deslatte, Henry Sullivan**, **Brent Hession** and **Leroy St. Pierre** who participated and contributed their knowledge and review.

A special thanks goes to **LSU Coastal Oceanographer and Geologist G. Paul Kemp** who should be recognized as the Chief Researcher, Co-Author and Contributor of the document.

The following South Central Planning & Development Commission staffers/participated in the preparation of this CZMP document:

Cullen Curole	Project Manager, Co-Author/Contributor
Martha Cazaubon	Co-Author/Contributor
Dylan Landry	Researcher, Co-Author/Contributor
Brooke Bergeron	Researcher, Graphic Designer
Scott Leger	Cartographer

Some of the local photos in the document were provided by **Brooke Curole** and Advisory Committee Member **Catherine Schons.**

Table of Contents

ACRONYMS **A-1**

INTRODUCTION **I-1**
- **CHAPTER SUMMARIES** **I-3**

CHAPTER 1: ENVIRONMENTAL SETTING **1-1**
- **HYDROLOGY & HURRICANES** **1-6**
- **CANALS & ROADS** **1-12**
- **GEOLOGY** **1-13**
- **WETLANDS** **1-15**
- **CLIMATE** **1-19**
- **SOILS** **1-21**
- **VEGETATION** **1-23**
- **WILDLIFE AND FISHERIES** **1-25**
- **THREATENED AND ENDANGERED SPECIES** **1-36**
- **COASTAL RESTORATION** **1-37**

CHAPTER 2: PRINCIPAL RESOURCES **2-1**
- **ESTUARIES/ WETLANDS AS A RESOURCE** **2-2**
- **RENEWABLE RESOURCES** **2-5**
  - **BIOLOGICAL RESOURCES** **2-5**
  - **AGRICULTURAL RESOURCES** **2-7**
- **RENEWABLE/NON RENEWABLE RESOURCES** **2-7**
  - **LUMBER** **2-7**
- **NONRENEWABLE RESOURCES** **2-8**
  - **OIL AND GAS** **2-8**
  - **INDUSTRIAL RESOURCES** **2-8**
- **WATER RESOURCES** **2-8**
  - **MISSISSIPPI RIVER** **2-8**
  - **LAKE PONTCHARTRAIN** **2-9**
  - **LAKE MAUREPAS** **2-9**
  - **LAC DES ALLEMANDS** **2-9**
  - **SCENIC WATERWAYS** **2-10**
- **RECREATIONAL RESOURCES** **2-10**
- **WILDLIFE MANAGEMENT AREAS (WMA'S)** **2-11**
  - **MANCHAC** **2-11**
  - **MAUREPAS SWAMP** **2-11**

CHAPTER 3: SOCIO-ECONOMIC CHARACTERISTICS 3-1
BRIEF HISTORY OF ST. JOHN THE BAPTIST PARISH 3-1
DEMOGRAPHICS 3-4
PAST POPULATION TRENDS 3-4
EDUCATION & EMPLOYMENT 3-4
EDUCATION 3-4
EMPLOYMENT 3-5
LAND USE PROJECTIONS 3-5
FEDERAL AND STATE PROJECTS AFFECTING THE COASTAL AREA 3-7
THE USACE, WEST SHORE LAKE PONTCHARTRAIN LEVEE PROJECT 3-9
RESERVE/GLOBALPLEX INTERMODAL TERMINAL TO I-10 3-10
GROWTH EFFECTS ON MANAGEMENT UNITS 3-10
CONCLUSIONS 3-11

CHAPTER 4: ENVIRONMENTAL ISSUES 4-1
WETLAND LOSS 4-1
FLOODING 4-5
WATER QUALITY 4-7
SALTWATER INTRUSION 4-9
OIL AND GAS EXPLORATION AND PRODUCTION 4-10
WILDLIFE AND FISHERIES ASPECTS 4-12
RESOURCE USE CONFLICTS 4-12

CHAPTER 5: GOALS, OBJECTIVES AND POLICIES 5-1
ROLE OF LOCAL COASTAL PROGRAM GOALS AND OBJECTIVES 5-1
PARISH-WIDE GOALS AND OBJECTIVES 5-2
POLICIES 5-3

CHAPTER 6: EVIRONMENTAL MANAGEMENT UNITS 6-1
MANAGEMENT UNIT OVERVIEW 6-4
EAST BANK COMMUNITY 6-5
HURRICANE ISAAC 6-6
GEOMORPHOLOGY 6-7
SOILS 6-8
HYDROLOGY 6-9
VEGETATION AND WILDLIFE 6-9
LAND USE 6-10
TRANSPORTATION 6-11
GARYVILLE & RESERVE WETLANDS 6-12
GEOMORPHOLOGY 6-12
HYDROLOGY 6-13
SOILS 6-16
VEGETATION AND WILDLIFE 6-17
LAND USE 6-18
TRANSPORTATION 6-18
MANCHAC SWAMP 6-19
GEOMORPHOLOGY 6-20
HYDROLOGY 6-21
SOILS 6-22
VEGETATION AND WILDLIFE 6-22
LAND USE 6-24
TRANSPORTATION 6-24
LAKES EMUS 6-25
LAKE PONTCHARTRAIN 6-25

GEOMORPHOLOGY 6-25
WATER QUALITY 6-25
LAKE MAUREPAS 6-27
GEOMORPHOLOGY 6-27
WATER QUALITY 6-27
WEST BANK COMMUNITY 6-28
GEOMORPHOLOGY 6-29
SOILS 6-29
HYDROLOGY 6-30
VEGETATION AND WILDLIFE 6-31
LAND USE 6-31
TRANSPORTATION 6-31
WEST DES ALLEMANDS WETLANDS 6-32
GEOMORPHOLOGY 6-33
HYDROLOGY 6-34
SOILS 6-36
VEGETATION AND WILDLIFE 6-36
LAND USE 6-37
TRANSPORTATION 6-37
LAKES EMUS 6-38
LAC DES ALLEMANDS 6-38
GEOMORPHOLOGY 6-38
WATER QUALITY 6-38

CHAPTER 7: LOCAL COASTAL PROGRAM ADMINISTATION 7-1
CZM ACT AND PURPOSE 7-2
PROGRAM ADMINISTRATION ROLLS AND DUTIES 7-3
DUTIES OF THE CZM ADMINISTRATOR 7-3
DUTIES OF THE ST. JOHN COASTAL ZONE ADVISORY COMMITTEE 7-4
COASTAL USE PERMIT ADMINISTRATION 7-4
NATIONAL INTERESTS 7-5
STATE INTERESTS 7-5
USES OF STATE CONCERN 7-5
USES OF LOCAL CONCERN 7-6
STATE EXEMPTIONS 7-7
ADDITIONAL FEDERAL EXEMPTIONS 7-10
COASTAL USE PERMIT PROCESSING 7-10
USES OF STATE CONCERN 7-11
USES OF LOCAL CONCERN 7-12
ENVIROMENTAL REVIEW 7-12
MITIGATION 7-13
ADMINISTRATIVE APPEAL OF STATE & LOCAL CUP DECISIONS 7-14
NOTICE OF APPEALS 7-14
FEES FOR APPEAL 7-16
ENFORCEMENT 7-16
SPECIAL AREAS 7-17
DESIGNATION PROCEDURE 7-18
REQUIREMENTS 7-19
INTERAGENCY COORDINATION 7-20
PARISH COORDINATION 7-20
CONSISTENCY WITH STATE PROGRAM 7-20
FEDERAL ACTIVITIES CONSISTENT WITH STATE PROGRAM 7-21

CHAPTER 8: PUBLIC PARTICIPATION 8-1

APPENDIX A: DEFINITIONS A-1

APPENDIX B: ST. JOHN THE BAPTIST COASTAL ZONE MANAGEMENT IMPLEMENTATION ORDINANCE B-1

APPENDIX C: LDEQ REPORT C-1

REFERENCES R-1

ACRONYMS

ACRONYMS

B.C.:	Before Christ
BP:	British Petroleum
BRMU:	Blind River Management Unit
BTNEP:	Barataria-Terrebonne National Estuary Program
C.F.R.:	Code of Federal Regulations
CAC:	Governor's Coastal Advisory Commission
cfs:	Cubic feet per Second
CHU:	Cumulative Habitat Unit
CITES:	Convention on International Trade in Endangered Species
CPRA:	Coastal Protection and Restoration Authority
CRMA:	Coastal Resource Management Act (of 1978, Act 361, as amended)
CUG:	Coastal Use Guidelines
CUP:	Coastal Use Permit
CWPPRA:	Coastal Wetlands Planning, Protection and Restoration Act
CZAC:	Coastal Zone Advisory Committee
CZM:	Coastal Zone Management
CZMA:	Coastal Zone Management Act
CZMP:	Coastal Zone Management Program
DDT:	dichlorodiphenyltrichloroethane (Insecticide)
DPZ:	Department of Planning and Zoning
EBC:	East Bank Community
EBMZ:	East Bank Management Zone
EIS:	Environmental Impact Statement
EMU(s):	Environmental Management Unit(s)
EPA or US EPA:	United States Department of Environmental Quality
E-WMU:	Edgard-Wallace Management Unit
FEMA:	Federal Emergency Management Agency
FLUM:	Future Land Use Map
GIS:	Geographic Information Systems
GRW:	Garyville and Reserve Wetlands
HSDRRS:	Hurricane and Storm Damage Risk Reduction System

L.A.C:	Louisiana Administrative Code
L.R.S.:	Legislative Regular Session
LA DEQ or DEQ:	Louisiana Department of Environmental Quality
LA DNR or DNR:	Louisiana Department of Natural Resources
LA R.S.:	Louisiana Revised Statutes
LA:	Louisiana
LCP:	Louisiana Coastal Program
LCPRA:	Louisiana Coastal Protection and Restoration Authority
LCRP:	Louisiana Coastal Resources Program
LCUP:	Local Coastal Use Permit
LDAMU:	Lac Des Allemands Management Unit
LDEQ:	Louisiana Department of Environmental Quality
LDNR-OCM:	Louisiana Department of Natural Resources, Office of Coastal Management
LDWF:	Louisiana Department of Wildlife and Fisheries
LiDAR:	Light Detection and Ranging
LMU:	LaPlace Management Unit
LNHP:	Louisiana Natural Heritage Program
LWCRA:	Louisiana Wetlands Conservation and Restoration Authority
MGD:	Million Gallons per Day
MR&T:	Mississippi River and Tributaries
MRGO:	Mississippi River Gulf Outlet
MS:	Manchac Swamp
MSL:	Mean Sea Level
NEPA:	National Environmental Protection Act
NFIP:	National Flood Insurance Program
NMZ:	Northern Management Unit
NOAA:	National Oceanographic and Atmospheric Administration
NORCO:	New Orleans Refining Company
NRCS:	Natural Resources Conservation Service
OCM:	Office of Coastal Management (State of Louisiana)
OCS:	Outer Continental Shelf
PMU:	Peninsula Management Unit
ppm.:	Parts per Million

ppt.:	Parts per Thousand
RMU:	Reserve Management Unit
RSLR:	Relative Sea Level Rise
SAV:	Submersed Aquatic Vegetation
SCP:	St. Charles Parish
SLCRMA:	State and Local Coastal Resources Management Act
SMSA:	Standard Metropolitan Statistical Area
SMZ:	Southern Management Zone
SONRIS:	Strategic Online Natural Resource Information System
URB:	Uses of regional benefit
USACE:	U. S. Army Corps of Engineers
U.S.C.:	United States Congress
USDA:	United States Department of Agriculture
USFWS:	United States Fish and Wildlife Service
USGS:	United States Geological Survey
WBC:	West Bank Community
WBMZ:	West Bank Management Zone
WDAW:	West Des Allemands Wetlands
WMA:	Wildlife Management Area

Introduction

I

INTRODUCTION:

The St. John the Baptist Coastal Zone Management Plan sets forth guidelines and procedures for the regulation of certain uses that impact the water quality and coastal resources of the Parish. The Plan is developed in order to be consistent with the State of Louisiana Coastal Zone Management Plan (CZMP).

The Coastal Zone Management (CZM) Act of 1972 (P.L. 92-583) was passed by Congress in recognition of the national importance of coastal areas and the need to protect sensitive marine environments. The CZM Act recognizes the varieties of natural, commercial, recreational, ecological, industrial, and aesthetic resources of immediate and potential value to the present and future well-being of the nation as a whole. Further, competing uses in the coastal zone were and are causing irretrievable losses to important ecological, cultural, and historic resources. The CZM Act declared that effective management, beneficial use and protection, and development of the coastal zone was of national interest and designated policies to implement these goals. The National Oceanographic and Atmospheric Administration's (NOAA) Office of Coastal Zone Management under the U. S. Department of Commerce was designated as the Federal agency in charge of establishing coastal zone management programs in the coastal states.

Louisiana responded by passing Act 705, which officially established the Louisiana Coastal Resources Program. This evolved into Act 361 and became known as the State and Local Coastal Resource Management Act of 1978 (SLCRMA), as amended through Louisiana Revised Statutes 49:214.21-214.41. This Act charged the Office of Coastal Management of the Louisiana Department of Natural Resources with implementing the Louisiana Coastal Resources Program (LCRP) and provided the mechanism by which competing and conflicting coastal uses could be coordinated, managed, and balanced by State and local governments.

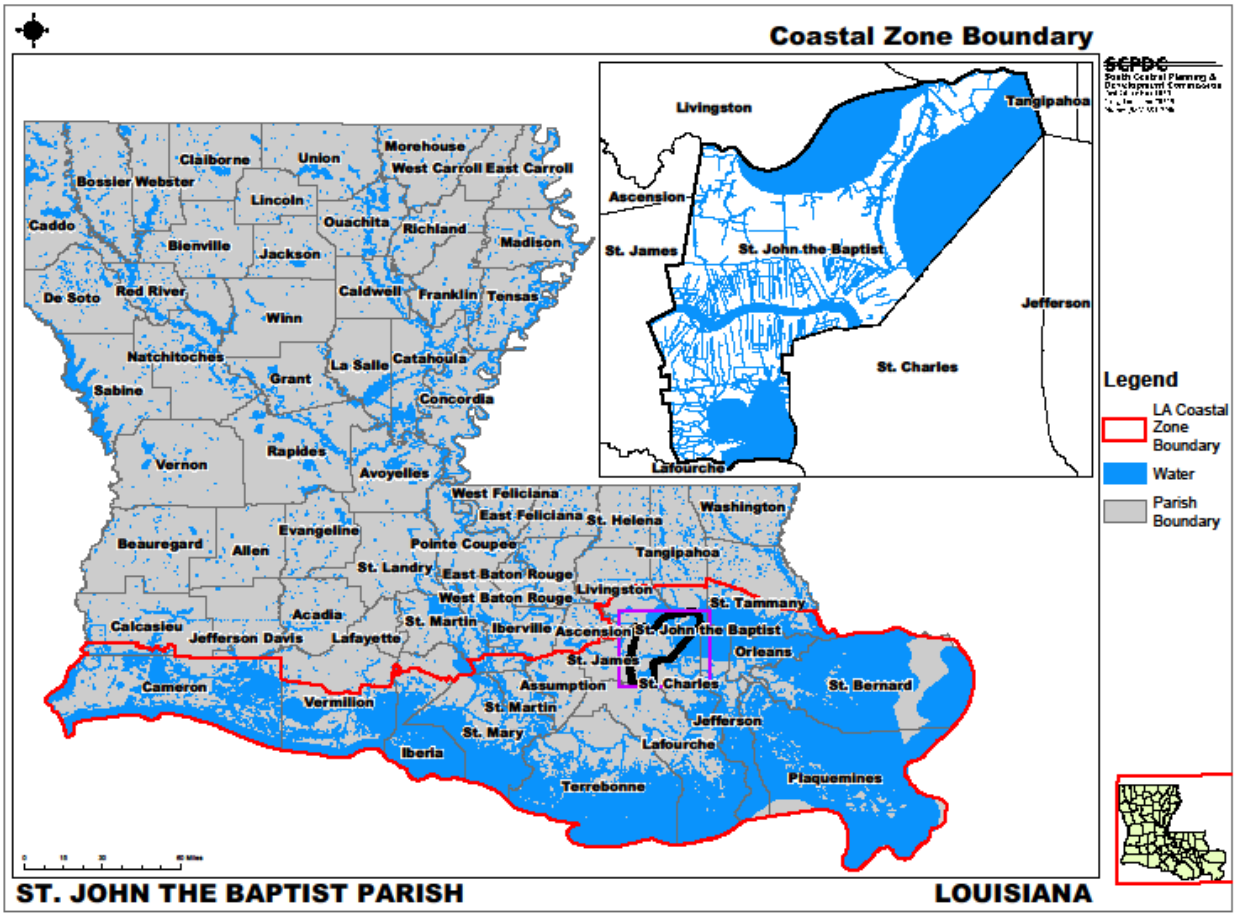


Figure I-1: St. John the Baptist Parish is located entirely within Louisiana's Coastal Zone. Red lines outline the Coastal Zone Boundary.

The St. John Local Coastal Zone Management Program has been developed for the following purposes:

1. Recognize the value in natural coastal ecosystems.
   a. Protect, restore and enhance the coastal zone as a natural storm barrier, flood control system, and water filtration system.
   b. Protect, restore and enhance the coastal zone as a habitat for wildlife, an aquatic resource, an aesthetic resource, a parish, state and national resource, and a historic cultural resource.
   c. Protect, restore and enhance the coastal zone as a legacy to future generations.
2. Recognize the value in coastal-dependent commercial activity.
   a. Promote coordinated development within the coastal zone.
   b. Promote conflict resolution arising from multiple, competing uses.
   c. Promote recreational uses and public access within the coastal zone.
3. Keep the public informed and understanding of the importance and of the need to balance these seemingly conflicting views to best allow current and future residents the opportunity to enjoy the multiple benefits and cultural values associated with a healthy coastal zone.
4. Foster the public safety, health and welfare of St. John.

CHAPTER SUMMARIES

Recognizing the resource value of this Plan document, the Coastal Zone Advisory Committee will make it available at public libraries, school libraries, and online for public access.

The St. John Coastal Zone Program's plan includes the elements identified below. Each of these items is addressed in detail in a subsequent chapter of this document.

Chapter 1: Environmental Setting contains a description of the physical and biological setting of the Parish. This provides general information on those characteristics that are to be managed through the coastal management program.

Chapter 2: Principal Resources details a process for dealing with areas that deserve special recognition and management. This Chapter explains the process by which areas with special concerns might be given special designation so that additional policies and regulatory tools might be employed to preserve or manage a unique or important natural feature.

Chapter 3: Socio-Economic Considerations is an overview of the social and economic characteristics of St. John. In so doing, the Coastal Zone Management Plan (CZMP) strives to be a document that manages natural resources to maximize their sustained use for current and future generations so that the quality of life enjoyed by the current generation will continue well into the future. Understanding the social and economic needs of St. John helps to guide growth and use of natural resources.

Chapter 4: Environmental Issues discusses existing and future environmental issues facing St. John. This discussion is important to those who need to understand the balance that must be strived for in order to achieve sustainable use of the resources of the coastal areas of Louisiana. By understanding the conflicts over the uses of these resources, choices can be made as to which uses achieve sustained community growth.

Chapter 5: Goals, Objectives and Policies describes the goals, objectives and policies established by the parish government, through the analysis of environmental and socioeconomic conditions within the parish, to be used as management guidelines that are intended to assist in proper implementation of its comprehensive plan.

Chapter 6: Environmental Management Units provides a declaration, definition and description of the environmental management units (EMUs) of St. John with specific goals, policies, and objectives established for each unit. Typically EMUs are determined based upon hydrologic characteristics of the area and water features are often used as boundaries.

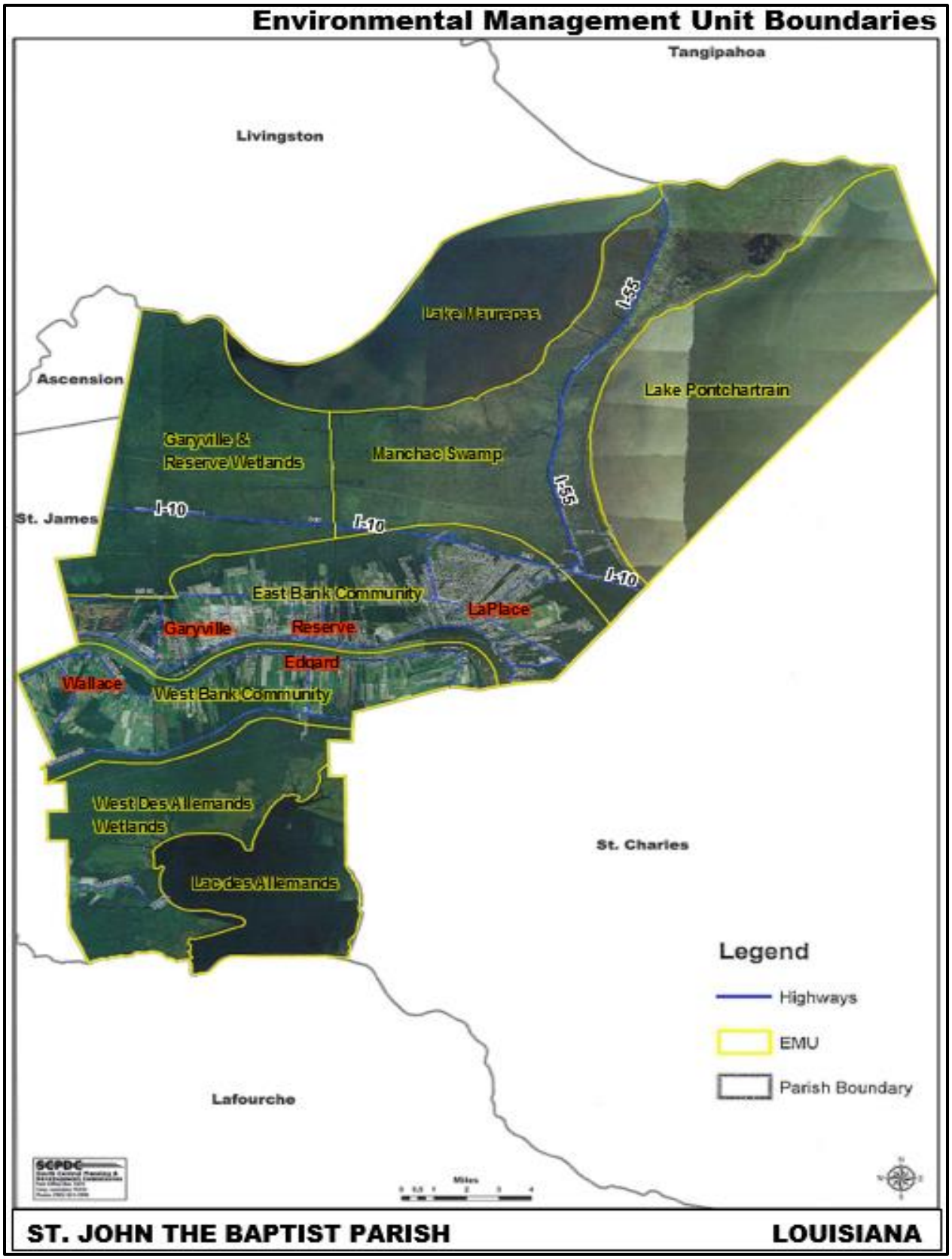


Figure I-2: St. John showing principal population centers and Environmental Management Units (EMUs).

Chapter 7: Local Coastal Program Administration provides the administrative process of St. John's local CZMP and the administrative process for implementing this plan is described. Basically, a *Parish Coastal Administrator* manages the St. John Local Program. The Parish Coastal Administrator works closely with a Local Coastal Advisory Committee (CAC). The Committee is composed of Parish residents appointed by the St. John Parish Council and the Parish President. This CAC provides the Parish Council with recommendations on all matters related to implementation of the Parish Coastal Management Plan. Final decisions on all issues related to the development and modification of the local program remains with the Parish Council. The focus of the St. John program is on issues of local concern and for such uses a local permit process has been established. Application is made to the Parish Coastal Administrator or to the State through the Office of Coastal Management (OCM) of the Louisiana Department of Natural Resources (LDNR). The Parish Coastal Administrator works closely with the State and permit applicant to ensure that uses are conducted in accordance with the goals, objectives and policies of each management unit. Public hearings and mitigation may be required for issuance of a permit. An appeal process is provided, which is more fully described in within the chapter along with other permit procedures.

The Louisiana legislation establishing the coastal management program provided for a permit system through which uses of local and state concern are regulated in order to minimize impacts on coastal waters. Specific activities, as identified in the La. R.S. 49:214.34 are exempt from this permit process. The St. John program is designed to manage those uses defined by State Law as "local" concerns. However, those uses of State concern are of interest to St. John when they impact the Parish's coastal resources and thus the Parish seeks to monitor the issuance of permits for such and provide the State with timely and relevant comments there on. An applicant for a Coastal Use Permit (CUP) may confer with the Parish Coastal Administrator to determine whether a proposed use is one of local or State concern or an exempt activity. A breakdown of State and local concerns and exempt activities, as provided in Louisiana State Law, are provided in **Chapter 7** as well.

Chapter 8: Public Participation describes the process of the general public's participation in the formation of this CZM document. It lists the meeting schedule of the CZAC which is public and advertised along with any additional meetings held in the preparation of this document. The Chapter continues to describe the public hearing process and the Committee's response to public input. The Chapter also outlines the approval process beginning with the CZAC, the Parish Council, the State and then the Federal Government represented by NOAA.

Appendix A provides frequently used definitions for common terms found throughout this document.
Appendix B includes a copy of the St. John the Baptist Parish Coastal Zone Management Implementation Ordinance.
Appendix C includes a Louisiana water quality inventory integrated report.

Chapter 1

CHAPTER 1: ENVIRONMENTAL SETTING

HYDROLOGY & HURRICANES 1-6
CANALS & ROADS 1-12
GEOLOGY 1-13
WETLANDS 1-15
CLIMATE 1-19
SOILS 1-21
VEGETATION 1-23
WILDLIFE AND FISHERIES 1-25
THREATENED AND ENDANGERED SPECIES 1-36
COASTAL RESTORATION 1-37

St. John the Baptist Parish is located in South Central Louisiana entirely within the Louisiana Coastal Zone Boundary (Figure I-1). St. John is known as the "Heart of Louisiana's River Parishes" carved out of the colonial "German Coast" (St. Charles, St. John and St. James parishes). According to the German Acadian Coast Historical and Genealogical Society, the community of Edgard, the parish Seat, was the second German settlement upstream of New Orleans established in the mid-18th century so St. John started as the "Second German Coast."

Each of the river parishes are divided by the Mississippi River. St. John has about 15 miles of river frontage on each bank, sandwiched between St. Charles Parish, downstream, and St. James Parish, upstream (Figure I-2). Because the Mississippi flows west to east toward New Orleans through the river parishes, St. John communities are distributed along what would geographically be called its north and south banks, but locally, the north bank is known as the "East Bank," while the south bank is called the "West Bank" (Figure 1-1). The U.S. Army Corps of Engineers (USACE), which manages the Mississippi River, and the legal profession compound the terminology further by taking a navigational perspective, referring to the east and west banks as the "left descending" and "right descending" banks, respectively.

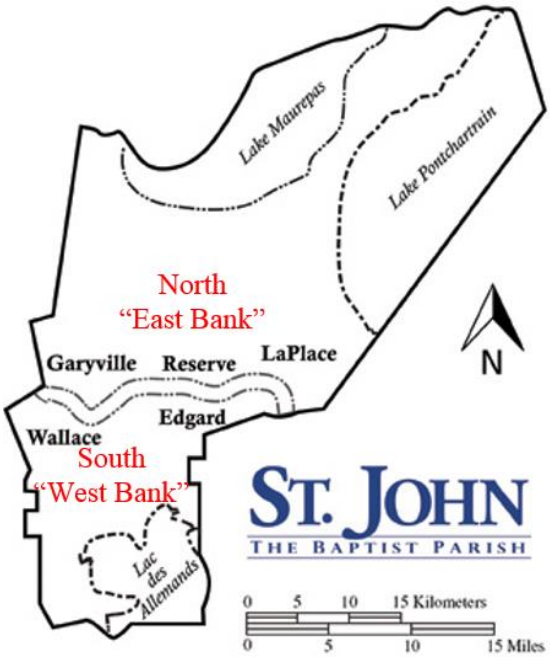


Figure 1-1. Showing the East and West banks of St. John the Baptist Parish.

St. John is accessible to New Orleans (25 miles) and Baton Rouge (35 miles), Louisiana's two largest cities, via the Interstate 10 (I-10) interstate connections. This proximity enables St. John Parish residents to commute to either city for work. They can also reach the city of Hammond (30 miles) north of Lake Maurepas on Interstate 55 (I-55), which begins at the I-10 junction in LaPlace (Figure I-2). Travel across the Mississippi is via the Veterans Memorial Bridge (LA Hwy. 3213) at the west end of the parish, or by using the Hale Boggs Memorial Bridge in St. Charles Parish to the east.

The population of St. John was 43,044 in 2000 and 45,924 in 2010, showing an increase of 6.7 percent over the decade, which included the flooding of New Orleans in 2005 during Hurricane Katrina. This disaster caused a diaspora of city residents seeking higher ground and less likelihood of future flooding, and St. John welcomed a number of new residents in the aftermath.

There is no truly "high" land in St. John, but the highest land is on natural ridges or levees built by the Mississippi River (Figure 1-3). This land is up to 16 feet high close to the River (NAVD88), and is topped by artificial flood control levees built by the USACE and maintained by the Pontchartrain Levee District. The crown of the federal levees in St. John extends up to about 32 feet on both banks (NAVD88). The land slopes away from the river where subdivisions, commercial retailers, industrial sites and port facilities are clustered on the protected side of the USACE river levees. Sugar cane fields stretch farther back from the river, sloping down to about five feet, and giving way to vast tracts of forested wetlands with elevations of less than five feet (FEMA 2010). These wetlands grade from bottomland hardwoods on the flanks of the natural levees to cypress-tupelo swamps that extend out to the shorelines of Lakes Pontchartrain and Maurepas on the north, and to Lac des Allemands to the south.

The total area of St. John is approximately 223,360 acres, but this includes 86,400 acres of open water in Lakes Pontchartrain, Maurepas and des Allemands that make up 39 percent of the parish area. While the parish includes portions of Lakes Pontchartrain and Maurepas, almost all, about 95 percent, of the 12,000 acre Lac des Allemands falls within the St. John boundary and this low-salinity lake is a focus for commercial and recreational fishing, and for a nascent ecotourism industry.

The East Bank or northern portion of St. John covers 91,444 acres of land, about 67 percent of the land area of the parish, of which 28,359 acres, 31 percent, are above five feet in elevation (Figure 1-3). Land on the West Bank adds up 44,739 acres, of which 11,556 acres, 26 percent, are higher than five feet. The five foot elevation contour is important because it separates areas in the Louisiana Coastal Zone that do require a permit ("less than five feet" from those that do not) "greater than five feet" generally require Coastal Use Permits (CUP). A few relatively small areas that were once wetlands or low-lying uplands have been ringed by levees and are now under pump or what is known as "forced drainage." Such areas are considered "fastlands," even though they may have land surface elevations below mean sea level (MSL). Fastlands are also generally exempt from permitting. Far less of the developed area of St. John is under forced drainage than in the neighboring "river parishes." The majority of the land area of the parish, 96,257 acres or 71 percent, is forested wetlands that are subject to permitting under the State Coastal Zone Management Act.

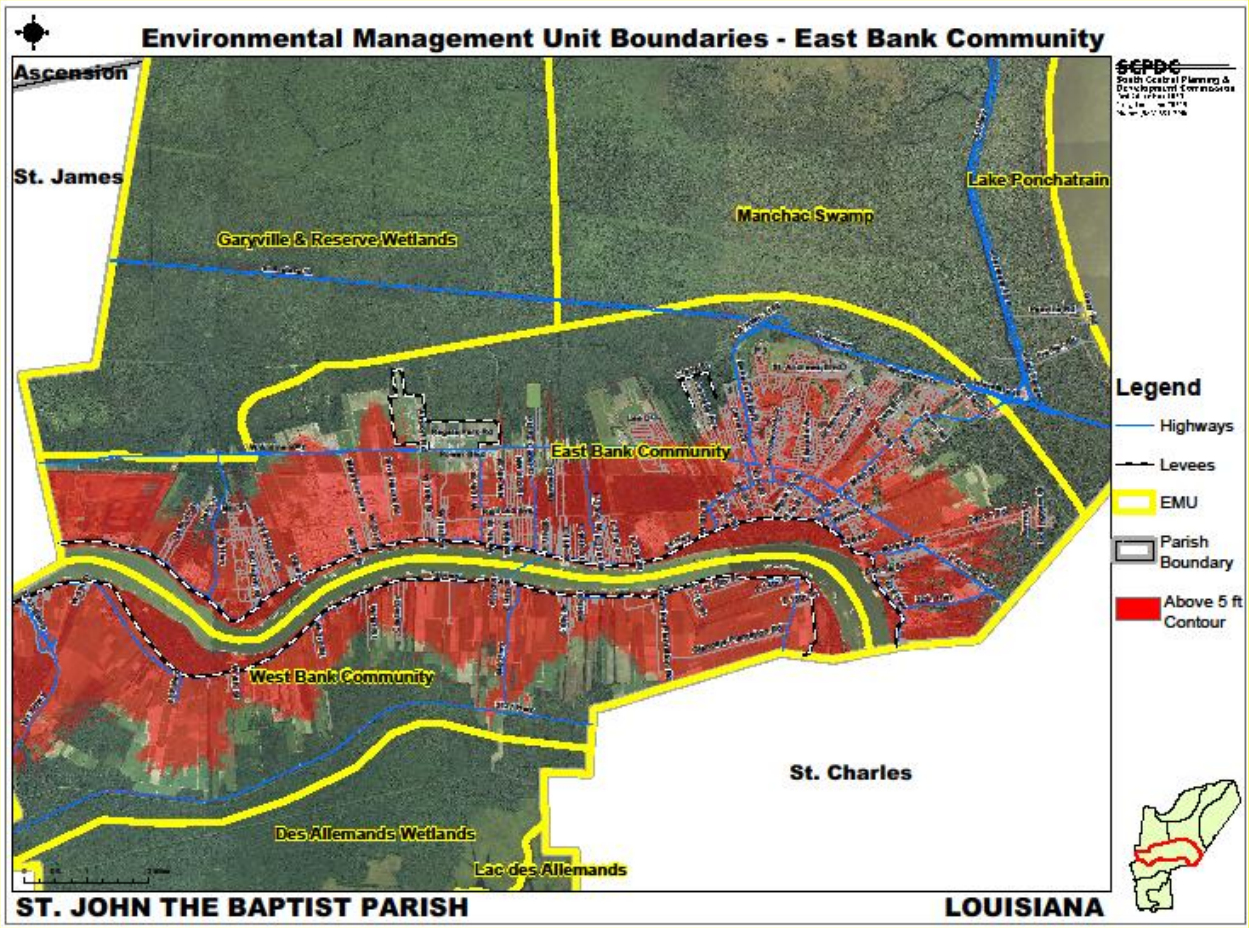


Figure 1-3. Land higher than 5 feet in St. John.

Most of the Maurepas Swamp WMA is a cypress-tupelo swamp used by the public for deer and small game hunting, fishing and trapping of alligator and nutria. The Manchac WMA along the southern bank of Pass Manchac is largely intermediate, low-salinity marsh that is favored by waterfowl hunters and fishers.

The Louisiana Department of Wildlife and Fisheries (LDWF) is the largest single landowner in St. John, with almost 50,000 acres in the Maurepas Swamp and Manchac Wildlife Management Areas (WMAs) that together incorporate 72 percent of St. John East Bank wetlands (Figure 1-2).

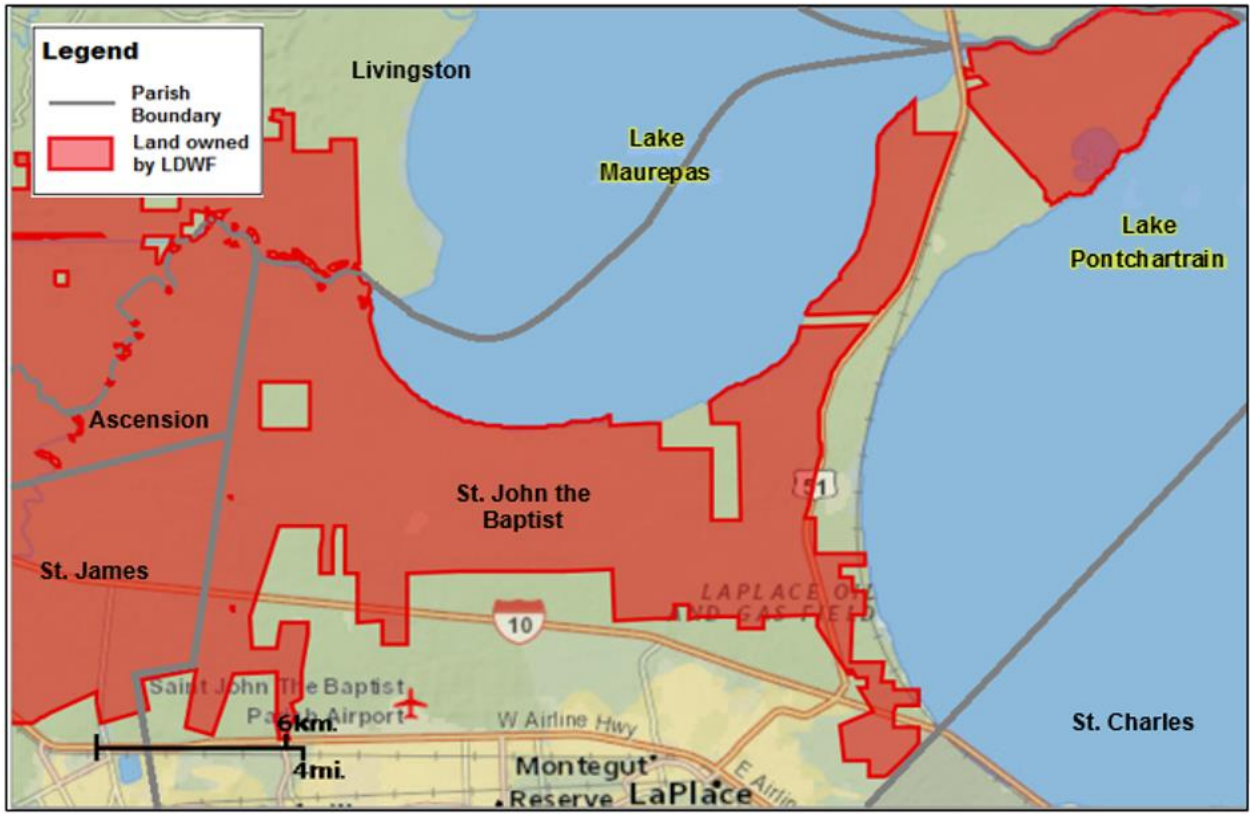


Figure 1-2. Boundaries of wetland property in the Maurepas Swamp and Manchac Wildlife Management Areas owned by the LDWF.

The major physiographic features of the parish include the following:

- The Mississippi River, which bisects the parish; and
- Batture land between the federal flood control levees of the Mississippi River; and
- The relatively high natural levee ridges that slope away from the river levees toward the swamps; and
- Blind River which is the largest waterway draining into Lake Maurepas on the western side and forms a boundary with Livingston Parish in the northwest corner of St. John; and
- Dutch Bayou/Mississippi Bayou watershed that drains into southwest Lake Maurepas and is connected to Hope Canal; and
- Manchac Pass, south shore of Lake Maurepas and southwestern shore of Lake Pontchartrain;
- The peninsula or "Manchac Land Bridge" between Lake Maurepas and Lake Pontchartrain; and
- Lac des Allemands in the southeastern area of the parish; and
- Extensive forested wetlands between the East Bank Community and Lakes Maurepas and Pontchartrain, largely state-owned WMAs; and
- Extensive forested wetlands west of Lac des Allemands.

Maximum land elevations in St. John are approximately 16 feet above MSL and are located on the natural levee banks of the Mississippi River (Figure 1-3). Almost all of the developed and developable land in the parish is located along the length of the Mississippi River levees. This developable land varies in width from one to three miles on each side of the River and was largely cleared for agriculture before 1892 (Figure 1-4). The eastern end of the Vacherie Ridge on the West Bank west of Lac des Allemands was also cleared for agriculture before 1892, and can be reached by road (LA Hwy. 643) only by travelling through St. James Parish. Frenier Landing on the western shore of Lake Pontchartrain has been destroyed by hurricanes numerous times but has been a St. John fishing community for over 120 years (Figure 1-4). Ruddock, about 10 miles north of Frenier in the isthmus between Lakes Pontchartrain and Maurepas, was a younger sawmill town with more than 700 inhabitants prior to its destruction by the "1915 New Orleans Hurricane," which killed 58 residents (Hastings 2004). Unlike Frenier, this community was not rebuilt. Ruddock remains important to current St. John residents primarily for the wells there that supply high-quality drinking water to the East Bank and for sheltered access to Lake Maurepas through the Ruddock Canal, a waterway originally dredged to bring logs to the sawmill.

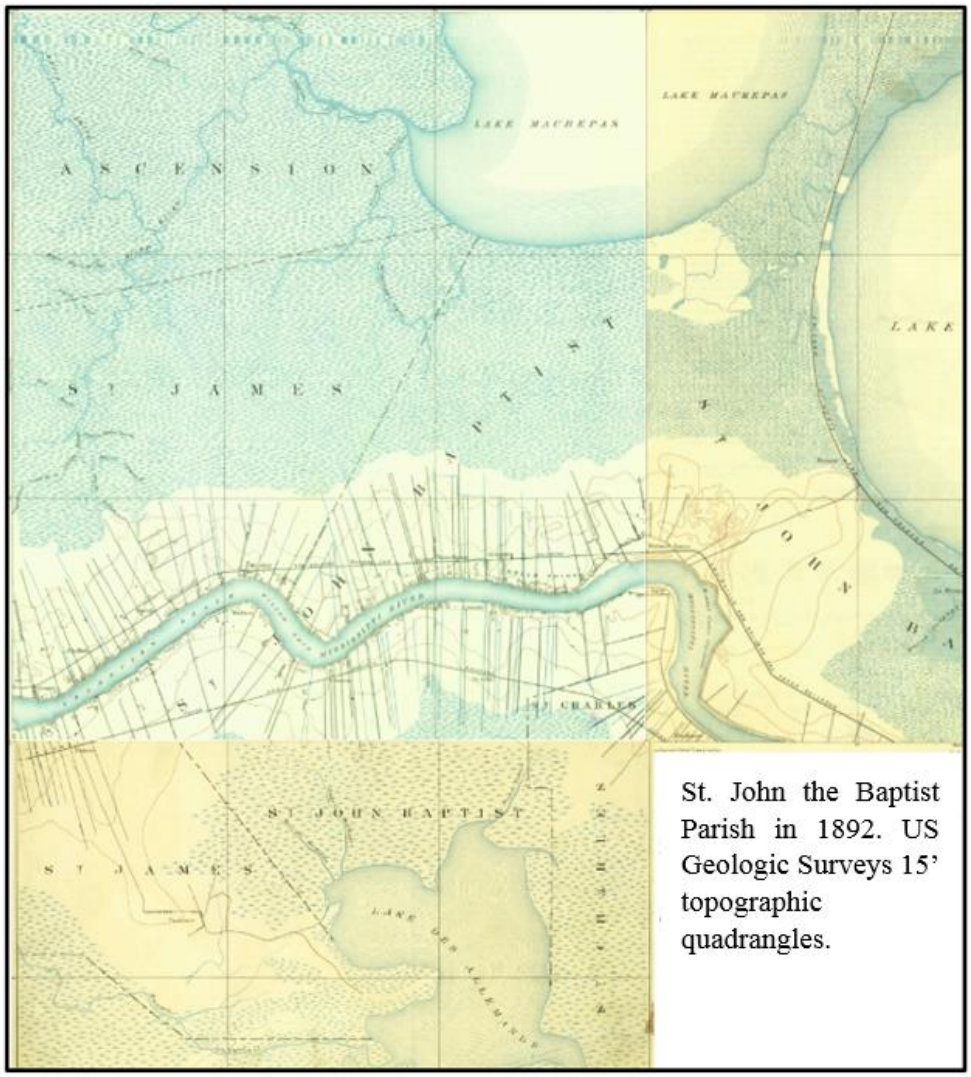


Figure 1-4. Mosaic of 1892 USGS 15-minute topographic quadrangles showing Bonnet Carré crevasse site and distribution of forested, cleared land and marsh prior to most cypress logging.

HYDROLOGY & HURRICANES

The astronomical tide range in Lakes Pontchartrain and Maurepas is less than 0.5 feet, but water levels at the boundaries of St. John are strongly influenced by winds. Strongest winds are from the south to southeast during the spring, summer and fall, but switch to northerly during frontal passages in the winter. Cold fronts pass through southeast Louisiana every five to seven days during the winter and are typically preceded by strong southerly winds that switch to strong northers. These fronts tend to push water out of all of the deltaic estuaries, leading to some of the lowest water levels experienced through the year. Because St. John has a north facing shoreline on Lake Maurepas, an east facing shoreline on Lake Pontchartrain and one facing south and east along Lac des Allemands, water levels can react differently to the same regional wind systems. This tendency is most clearly illustrated during hurricanes. Hurricanes Gustav (2008) and Isaac (2012) caused surges on the East Bank that were at least twice the magnitude of what was experienced in Lac des Allemands on the West Bank, while Hurricane Ike (2008) had a greater surge in Lac des Allemands and the Barataria estuary than in Lake Pontchartrain.

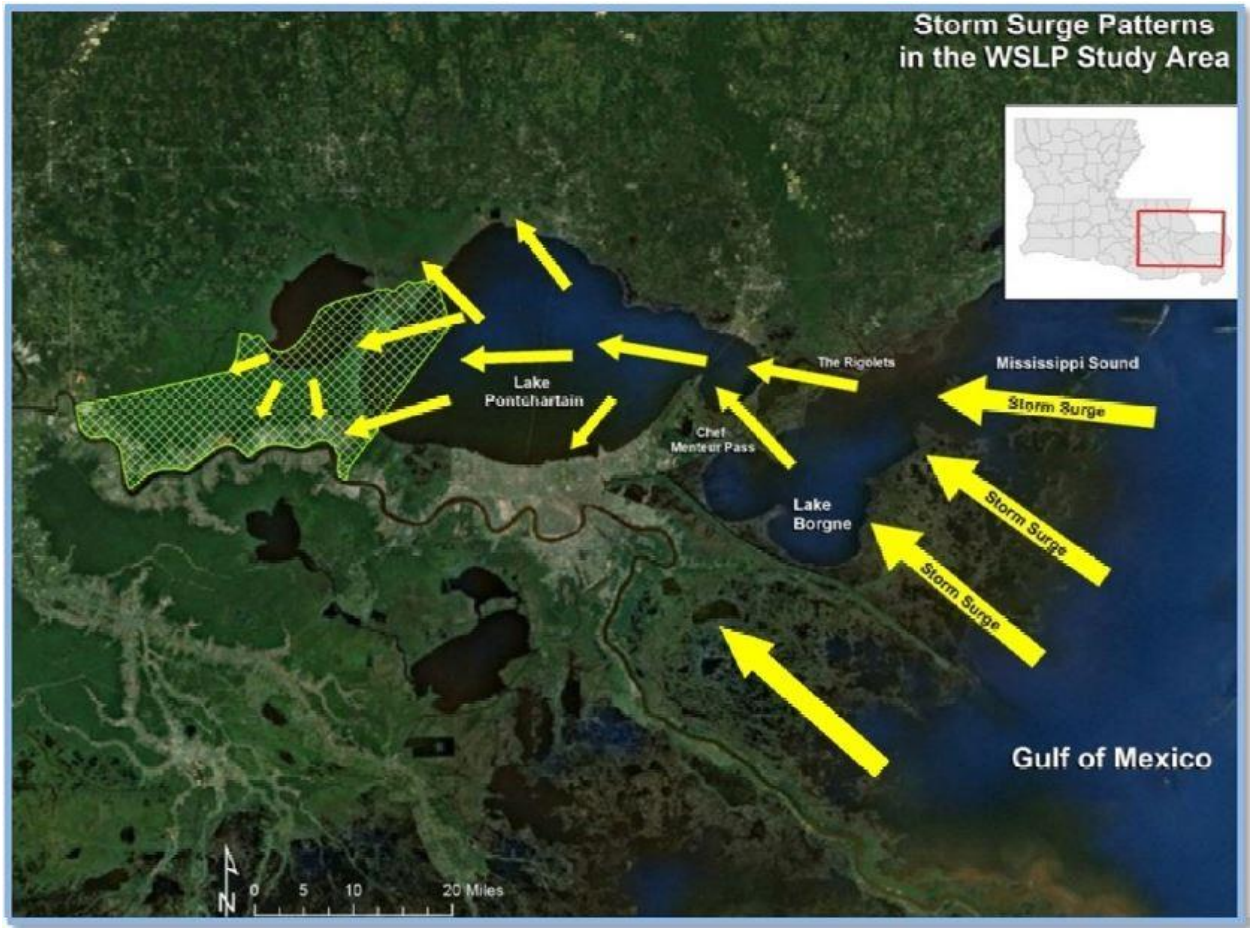


Figure 1-5: Storm Surge Patterns in Hurricane Isaac. (Image Source: USACE, 2014 http://www.mvn.usace.army.mil)

Prior to man's alteration of the Pontchartrain and Barataria estuaries, it would have been rare that any wetlands in the parish were exposed to brackish conditions. Freshwater from rainfall on the natural levees as well as the wetlands would be retained in the upper parts of the inter-distributary estuaries with little tidal exchange. Salinity rose to new levels in Lake Pontchartrain after dredging of the Mississippi River Gulf Outlet (MRGO) through St. Bernard Parish in 1963 (Shaffer et al. 2009). This deep-draft canal provided a new, artificial tidal pass connection to Lake Borgne. On the Barataria side (West Bank), peak salinities also rose through the 1980s and 1990s as wetlands disappeared and artificial channels expanded, providing more efficient connections to the Gulf. Salinity reached a peak of almost 15 parts per thousand (ppt.) during the drought of 2000 in both Lake Pontchartrain and Lake Salvador downstream of Lac des Allemands. This led to significant stress on cypress-tupelo forests on both East and West Banks, but to a greater degree in the swamps surrounding Lake Maurepas.

The salinity trend reversed in Lake Pontchartrain after 2008 when the MRGO was dammed and closed to ship traffic. Operation of the Davis Pond Freshwater Diversion in neighboring St. Charles Parish had discharges ranging from zero to 11,000 cubic feet per second (cfs), but has not prevented salinity from spiking in Lake Salvador and intruding into Lac des Allemands. During droughts in the summer and fall, however, and particularly after hurricanes, it has reduced the length of time that salinity rises above 10 ppt. This diversion can flow only when water level in the river is high enough, which is often not the case during the summer when salinities rise. Even then its discharge during the summer is lowered further for fisheries purposes.

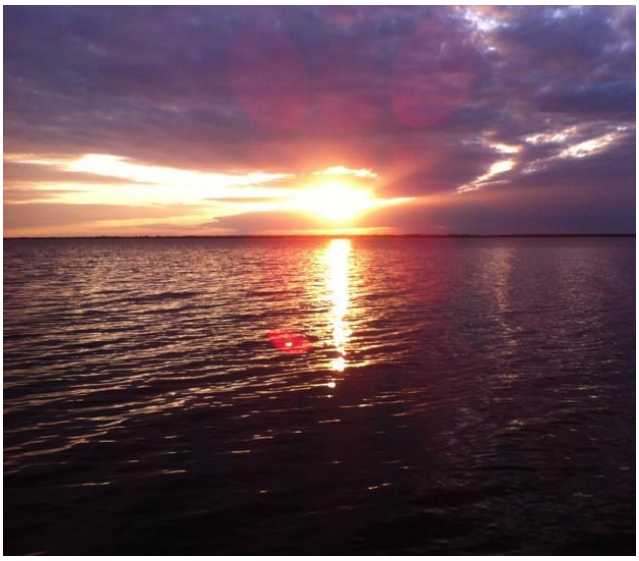


Figure 1-6: Lac des Allemands. (Photo by Catherine Schons)

The Davis Pond diversion has been run more continuously since 2006 with a base discharge of 1,000 to 2,000 cfs, and this has resulted in better control of salinity spikes in Lake Salvador and Lac des Allemands. Das et al. (2012) describes the Davis Pond diversion as the largest in the world, but note that it has limited effect on salinity in the upper and lower Barataria estuary, significantly lowering salinity only in the middle reach. This is because salinities are very low most of the time in the upper basin that includes Lac des Allemands, while the open water of Barataria Bay at the Gulf end is so strongly influenced by tidal and wind forcing that flux from Davis Pond is negligible in comparison. Salinity is also lowered drastically in Lakes Maurepas and Pontchartrain when the Bonnet Carré Spillway is opened to allow flow out of the Mississippi River, but, again this floodwater relief outlet is generally operated only during the spring, and only to prevent overtopping and other stresses on levees protecting New Orleans.

Figure 1-7: Davis Pond diversion. (Image Source: USACE - http://www.mvn.usace.army.mil)

Category	Sustained Winds
1	74-95 mph
2	96-110 mph
3	111-129 mph
4	130-156 mph
5	157 mph or Higher

Figure 1-8: Saffir-Simpson Hurricane Wind Scale.

St. John the Baptist Parish is considered a "Coastal" parish for two distinct reasons.

1. Lake Pontchartrain which includes parts of St. John is considered in law as an "Arm of the Sea"
2. For program purposes, the Louisiana Coastal Zone Act boundary has established a coastal boundary to include 20 Coastal parishes. See Figure I-1 in Introduction.

Located far inland from the Gulf of Mexico, many St. John residents did not consider the parish to be coastal. Hurricane Isaac, which came ashore in Louisiana on the morning of August 29, 2012, changed that. Isaac was a minimal Category One hurricane on the Saffir-Simpson wind speed scale (Figure 1-8) but was an extremely large and slow-moving system. While rainfall was significant, most damage resulted from storm surge initially entering from Lake Pontchartrain, and later from Lake Maurepas. Once the surge overtopped railroad tracks that parallel I-55 and I-10 on August 29, flooding of subdivisions in LaPlace took place quickly with water rising five feet in 20 minutes (USACE 2013). This flooding occurred before the onset of major rainfall. As Lake Maurepas continued to rise during the following days, flooding moved west into Reserve and Garyville. Natural drainage of existing flooded areas in LaPlace was blocked by high water in Lake Maurepas. Lake Maurepas dropped very slowly as it continued to receive flood water from rivers draining large watersheds including Baton Rouge to the west and extending north into the State of Mississippi. Lake Maurepas water continued to pour into the

swamps south of the Lake until late on August 31, reaching six feet at Hope Canal at the edge of development in Garyville. After the storm had passed the St. John East Bank communities endured not only record flood levels but prolonged flooding over several days. In testimony to the U.S. Congress (Sen. Hrg. 112-862) at a hearing on September 25, 2012, St. John President Natalie Robottom stated:

> "Search and rescue efforts began at around 9 am (Wednesday, August 29) and remained in effect for 48 hours from the east side of the parish to the west side – from LaPlace to Garyville – from the interstate (I-10) to the River Road…the evacuation routes were shut down – I-10 and Airline Hwy. were under water and portions of River Road were also blocked…Although the western edge of the parish had not yet experienced flooding (*sic*.) [in recent years,] by the afternoon of Thursday, August 30, water levels began rising in Lake Maurepas causing the homes of residents from western LaPlace toward Reserve and Garyville to flood…Search and rescue efforts resumed…some interstate highway exits did not re-open until September 2. Three days following the storm, a Disaster Recovery Center was open and operating, registering over 12,000 residents…At this point our main concern was securing a hurricane protection system like our neighbors to the east (St. Charles Parish) and preventing road closures that isolated our residents…as flood water remained several days after the storm interfering with our recovery efforts. More than 7,000 homes were damaged, but, through the grace of God, no lives were lost. St. John has never flooded (*sic*.) [to this extent] in the past, sometimes in our streets and along the interstate, but not in our homes."

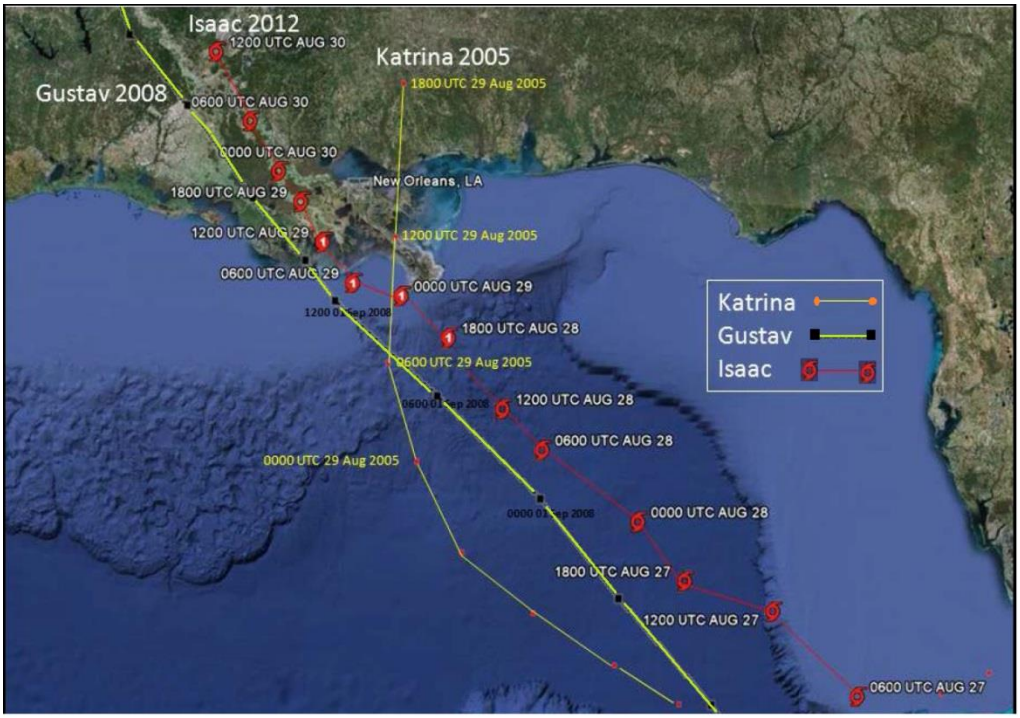


Figure 1-9. Tracks of Hurricanes Katrina (2005), Gustav (2008) and Isaac (2012). Subtract seven hours from UTC to get local time (CDT). The eye of Isaac passed slowly just south of St. John at noon on August 29, 2012, paralleling the track Gustav followed on September 2, 2008. Source: USACE 2013a.

Surge generated in Lac des Allemands on the West Bank during Isaac, despite the proximity of the storm track (Figure 1-9) was much lower than that in Lakes Pontchartrain and Maurepas, less than four feet, which was similar to surge there during Hurricanes Gustav and Katrina (USACE 2013a). Lac des Allemands is a much smaller body of water so the distance for hurricane winds to blow across the surface of the lake, the "fetch," is shorter, limiting the degree to which water can be piled up on one side (surge) or the other, and build waves during any storm. Furthermore, although the West Bank is just across the River from the East Bank communities that flooded during Hurricane Isaac, it is effectively 50 miles farther inland from the open waters of Barataria Bay, which is similar in size to Lake Pontchartrain.

The St. John President's testimony after Isaac illustrates three important points. First, East Bank communities are more vulnerable to hurricane flooding than was thought in the past, particularly from large, slow-moving storms like Isaac during which strong easterly winds are sustained over several days. Second, that the East Bank of St. John experienced two surge events, one from Lake Pontchartrain and a second from Lake Maurepas that were separated by at least 24 hours. Finally, that a primary goal of St. John government is the westward extension of the federal hurricane flood control system, referred to as the Hurricane and Storm Damage Risk Reduction System (HSDRRS), a project called the West Shore Lake Pontchartrain Hurricane Levee.

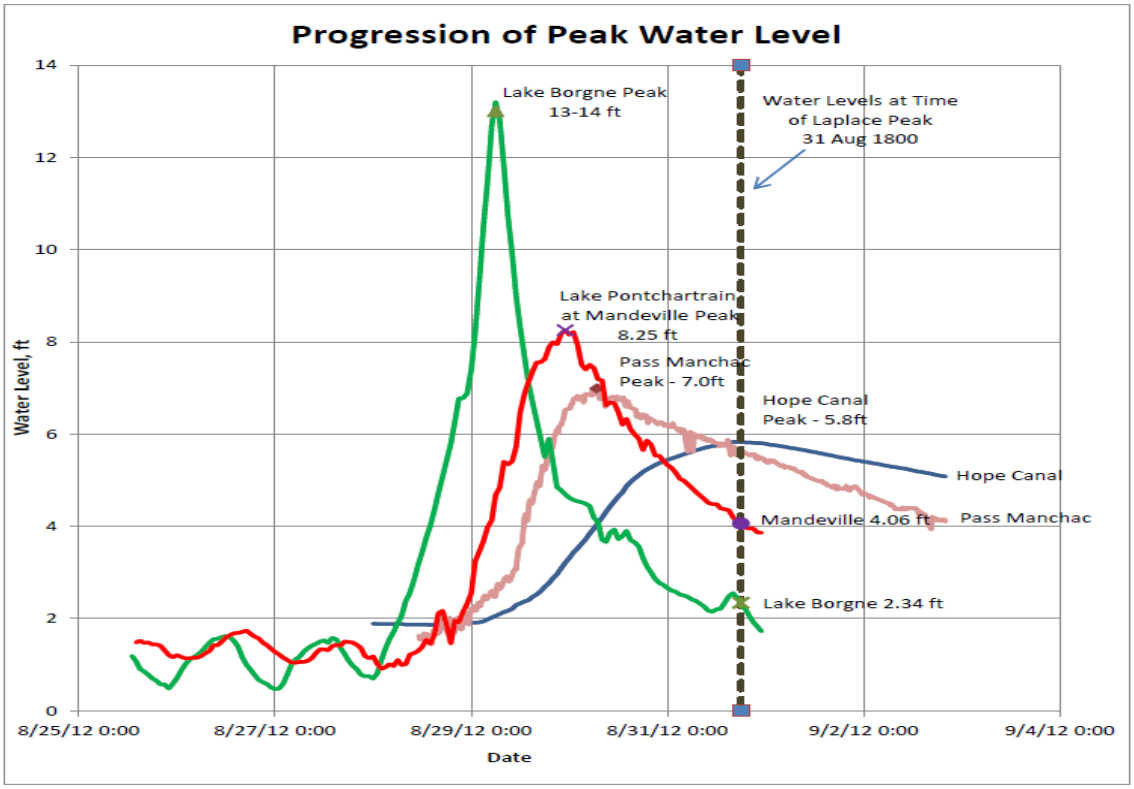


Figure 1-10. Hurricane Isaac surge hydrographs from around Lakes Borgne, Pontchartrain and Maurepas show that while surge elevation dropped relatively quickly in Lakes Borgne and Pontchartrain after peaking, it stayed high in Lake Maurepas and did not peak until late on August 31, 2012 in St. John East Bank communities (Laplace and Garyville) as shown by the Hope Canal curve. Source: USACE 2013.

The HSDRRS has been upgraded since Hurricane Katrina to provide New Orleans and its suburbs, including the East Bank of St. Charles Parish, with protection against an estimated 100 year surge/wave event (one percent likelihood of flooding in any year). Agreement was reached in June 2015, with the USACE on a $718 million 18-mile levee to protect the St. John East Bank (USACE 2013b, Bacon-Blood 2014), although federal funding has not yet been appropriated (Figure 1-11). The alignment selected is called the "environmentally preferred alternative," because it will result in less wetland destruction than other options considered. Levee protection is vital to the long-term survival and resilience of a large portion of St. John Parish, and coastal integrity plays a critical role in maintaining the integrity of levees. The construction of levees impacts wetland hydrology, and the maintenance of a healthy wetland system, as well as investment in the local drainage system, is necessary to preserve the drainage capacity of land within levee protection. Because the HSDRRS levee may not be completed before 2020, residents in East Bank subdivisions that were flooded by Isaac are taking measures to protect against future storms by building private levees and installing pumped drainage systems, thereby creating new "fastlands." No such measures, whether public or private, are planned for the West Bank.

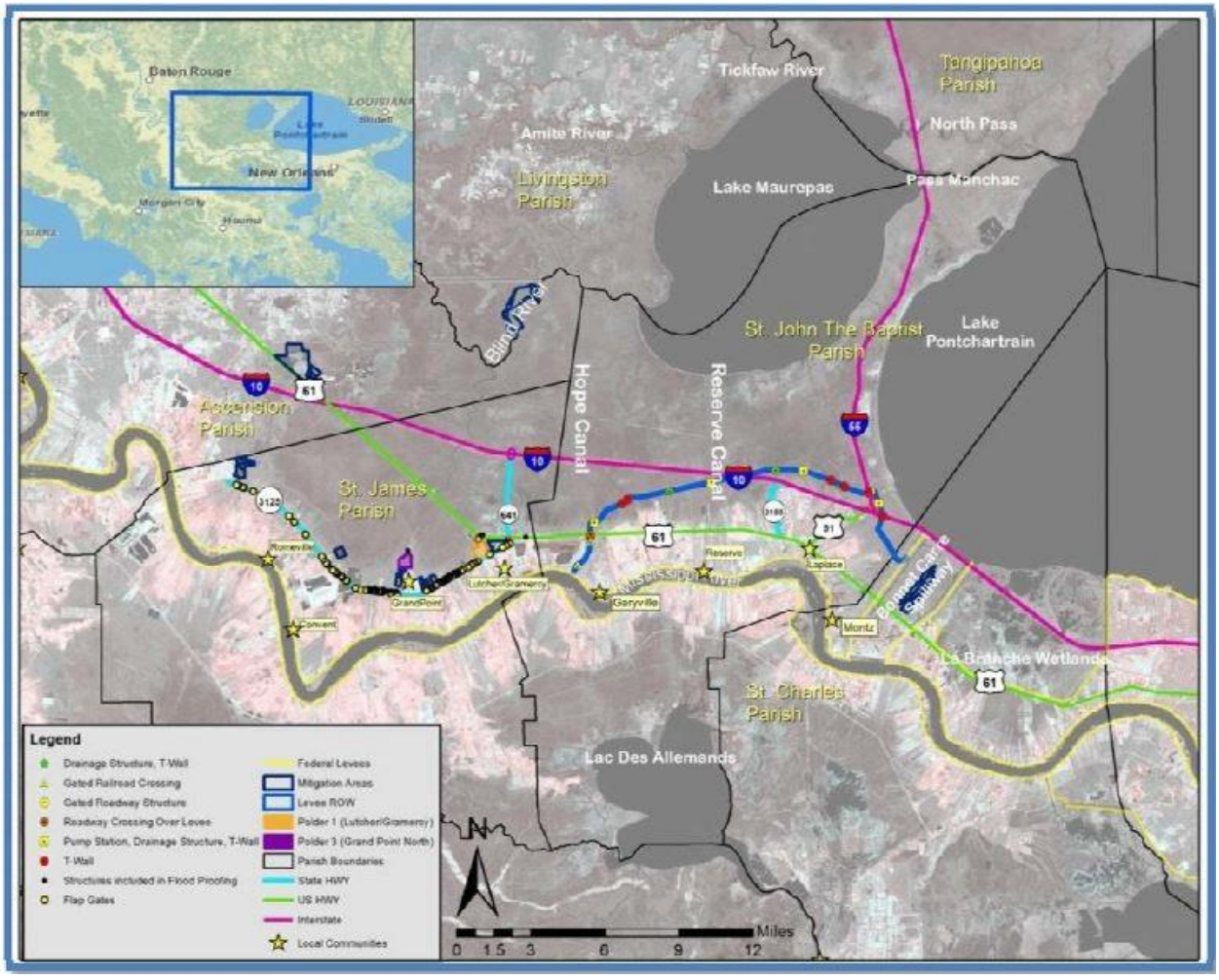


Figure 1-11. Alignment approved by USACE for new West Shore Lake Pontchartrain Hurricane Levee shown as blue line (USACE 2013b). A ring levee was also included for St. James Parish to the west.

CANALS & ROADS

As is true in many coastal Louisiana parishes, many impacts to wetlands were caused, and to a lesser degree, continue to be associated with activities necessary to explore for and extract oil and natural gas. St. John, today, produces far less oil and gas than it did in the 1970s, and little exploration has occurred in recent decades. By the 1990s, CZM guidelines required a geologic review to determine whether wells could be directionally drilled from existing canals, and permitting for new canals has dropped precipitously. Drilling in St. John did not begin until the 1950s and was initially confined to relatively high land on the East Bank (Figure 1-8). The first field developed was adjacent to the Bonnet Carré crevasse site in what is now part of LaPlace. Today, the Bonnet Carré field is one of the few in St. John that remains in production. Fields developed in the wetlands closer to Lake Maurepas were reached on board roads or roads built on dredged sediment, so few well sites required the access canals that have caused so much damage to wetlands in other parts of the coast. The same is true on the West Bank.

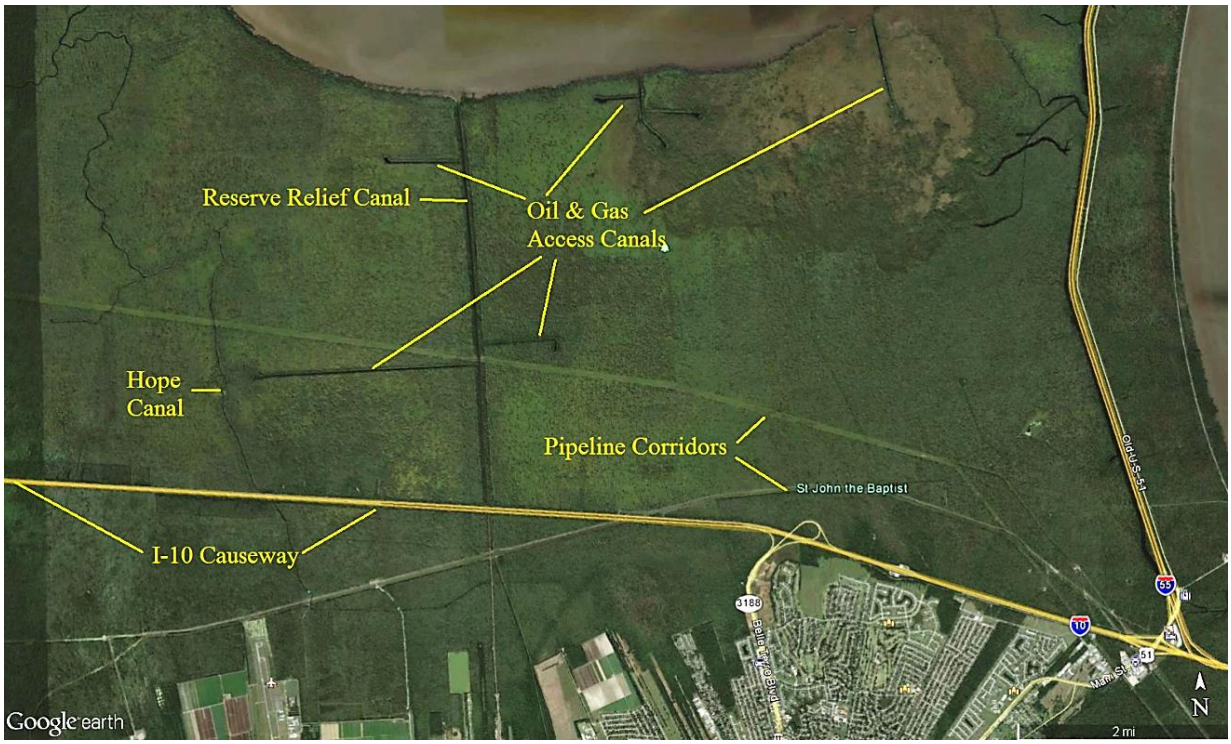


Figure 1-12. Canals and other linear features that affect hydrology in the swamp south of Lake Maurepas.

Canals, however, were dredged for other reasons. They were constructed to facilitate access to the virgin cypress forests at the end of the 19th century, as at Hope Canal north of Garyville and at Ruddock (Figure 1-12). Field ditches were adequate for agricultural drainage (Figure 1-4), but when public funds became available to improve drainage in the early 1960s for residential and industrial development, many canals were dredged through the wetlands for this purpose. The Reserve Relief Canal that runs due north from Garyville to Lake Maurepas is the best St. John example (Figure 1-12). Small bayous were also dredged to increase conveyance and to facilitate navigation, such as Bayou Chevreuil, which runs into Lac des Allemands and is part of the St. John boundary with Lafourche Parish.

In more recent years, construction of east-west oriented roads and pipeline corridors through the wetlands south of Lake Maurepas have significantly affected natural south to north drainage patterns (Figure 1-12). Although the I-10 and I-55 are elevated east of the Reserve Relief Canal, I-10 is built on an earthen causeway west of this point so that drainage is confined to easily clogged culverts under the roadway for much of this reach. Pipelines are buried and electric lines suspended on towers in corridors up to 300 feet wide that are cleared of trees and mowed. Typically, the land surface is elevated above that of adjacent wetlands, again acting as a barrier to the natural drainage. West Bank wetlands have largely been spared these impacts.

GEOLOGY

During the past 10,000 years, the Mississippi River built the present southeastern coast of Louisiana through a series of overlapping delta lobes. This process is described in many excellent reports (Fisk 1944; Coleman and Gagliano 1964; Frazier 1967; Coleman 1988; Wells and Coleman 1987; Kulp et al. 2005) and will be summarized briefly here (Figure 1-10). When the Mississippi River changes its course and its flow spreads out onto a new location on the shallow shelf of the Gulf of Mexico, the reduced velocity causes the river to deposit its sediment load and a new delta lobe is built. Freshwater and brackish water plants rapidly colonized this land as soon as its elevation allowed, with forested wetlands forming on the higher, more inland portions of the estuary.

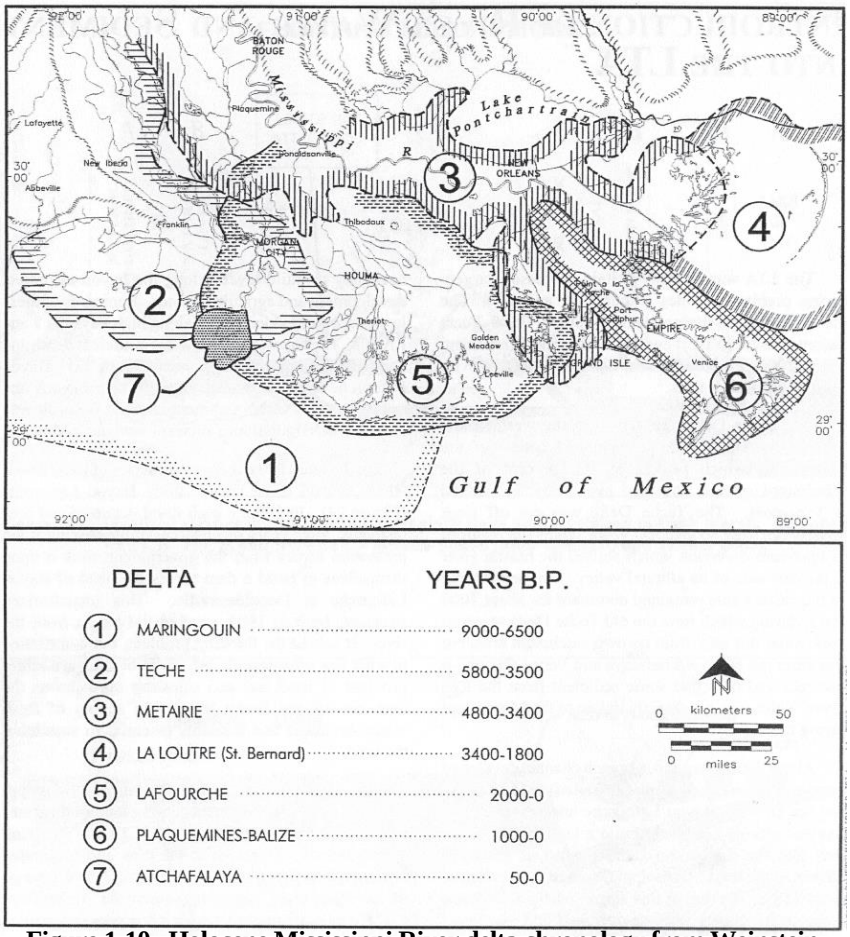


Figure 1-10. Holocene Mississippi River delta chronology from Weinstein and Gagliano (1985).

As the new delta lobe grows, the pathway of the river to the Gulf of Mexico becomes longer and less efficient. Finally, the river breaks through its banks upstream and deposition moves to another location to build a new delta lobe, a process known as "avulsion." During the transition from one delta lobe to another, river flow may occur down two or more distributaries simultaneously, particularly during high discharges (Condrey et al. 2014). Eventually, the abandoned lobe, deprived of its fluvial freshwater and sediment supply, becomes increasingly saline, starting from the seaward edges and moving inland. Marshes change from freshwater to salt-tolerant species. As the

transition occurs, less river sediment reaches the wetlands and they can no longer build upward to keep pace with natural soil consolidation and the soil surface drops below the bottom of the tide range (Day et al. 2011). Marsh vegetation is more frequently flooded, and flooded for longer periods, until the plants reach their physiological stress limits, lose vigor and die, causing a collapse of the organic soil column. The marsh soils break up, until finally the emergent delta lobe is replaced by open water as estuarine bays and lakes grow, and the stage is set for repetition of the cycle.

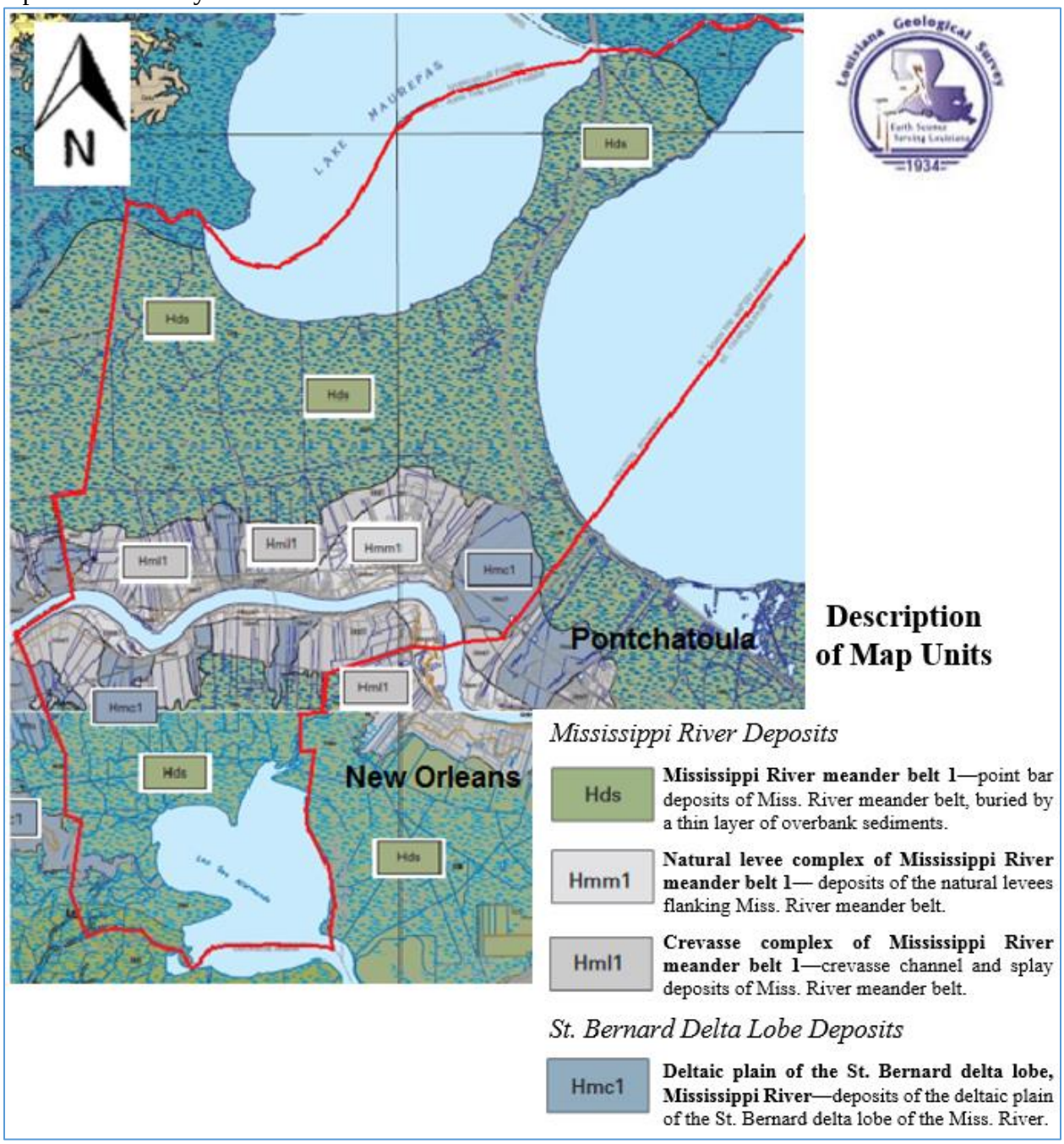


Figure 1-11. Merge of Ponchatoula and New Orleans 1:100,000 geologic quadrangle sheets prepared by the Louisiana Geologic Survey. (http://www.lgs.lsu.edu/deploy/content/PUBLI/contentpage17.php)

Most of the land that presently makes up St. John was deposited more than 3,500 years ago, during the early (Metairie) stage of the St. Bernard delta building cycle (Figure 1-10), however, the higher land of St. John river communities is much younger. It is a mix of modern Mississippi River natural levee, point bar and crevasse deposits, while the wetlands formed earlier (Figure 1-11).

WETLANDS

The youngest St. John land was built by crevasses that breached the low natural levee and provided additional elevated land radiating out from the breach points. Bonnet Carré is a historical crevasse site that was periodically active in the 18th and 19th centuries, sometimes for a decade or more, on the East Bank near the St. Charles Parish line (Figure 1-4). In the early 1930s, the USACE built a controllable overbank flood relief outlet, the Bonnet Carré Spillway, just downstream of the St. John breach site. Crevassing continued into the early years of the 20th century, until the federal levee system was constructed after 1927. Though the crevasse deposits shown on the geologic map did not develop into distributary channels or change the river course, some were open for decades and supplied much river sediment to the surrounding wetlands (Figure 1-11).

Despite the loss of a river sediment supply after crevassing ended, wetlands were still able to grow upward as the land subsided by creating organic-rich "peat" soils. It is this capacity for marshes and swamps to build upward or "aggrade" in response to "relative sea level rise" (RSLR = Subsidence + Sea Level Rise) that explains the continued presence of freshwater swamps and marshes on both banks of the parish for more than 3,000 years. RSLR in St. John averages about one centimeter per year.

Most wetlands of St. John are forested bald cypress (*Taxodium distichum*) and water tupelo (*Nyssa aquatica*) swamps, but small zones of marsh are also found adjacent to lake shorelines (Figure 1-12). An estuarine marsh surrounds the Pass Manchac tidal channel between Lakes Maurepas and Pontchartrain. Because brackish water is, at times, exchanged through this pass, the surrounding marsh supports grasses and herbaceous plants like California bulrush (*Scirpus latifolia*), Broad-leaf cattail (*Typha latifolia*) and Salt-meadow cordgrass (*Spartina patens*) that can tolerate salinity up to five parts per thousand (ppt.) for short periods. On close inspection, radial drag marks are visible on aerial photographs of this marsh testifying to its previous life as a cypress-tupelo swamp, like the rest of the wetlands that surround Lake Maurepas (Figure 1-13). All virgin or "old-growth" cypress-tupelo forests in St. John were logged over before 1930, leaving behind only hollow "cull" trees unsuited for production of saw lumber. Except in places where the salinity was too high for natural forest regeneration, a second-growth swamp forest has grown up since the initial clearing.

Lower elevation portions of the Mississippi River natural levee ridges would have supported extensive stands of bottomland hardwood forests, but these were largely cleared for plantation agriculture in the 19th century. Today, relatively small stands occur at the edges of cleared fields on both banks (Figure 1-12). Bottomland hardwood forests include a far greater variety of tree, shrub and herbaceous plant species than swamp forests. Oaks like the over-cup (*Quercus lyrata*) and nutall (*Quercus texana*), as well as swamp red maple (*Acer rubrum*), American sycamore (*Platanus occidentalis*) and cottonwood (*Populus deltoides*) are among the more common bottomland hardwood tree species.

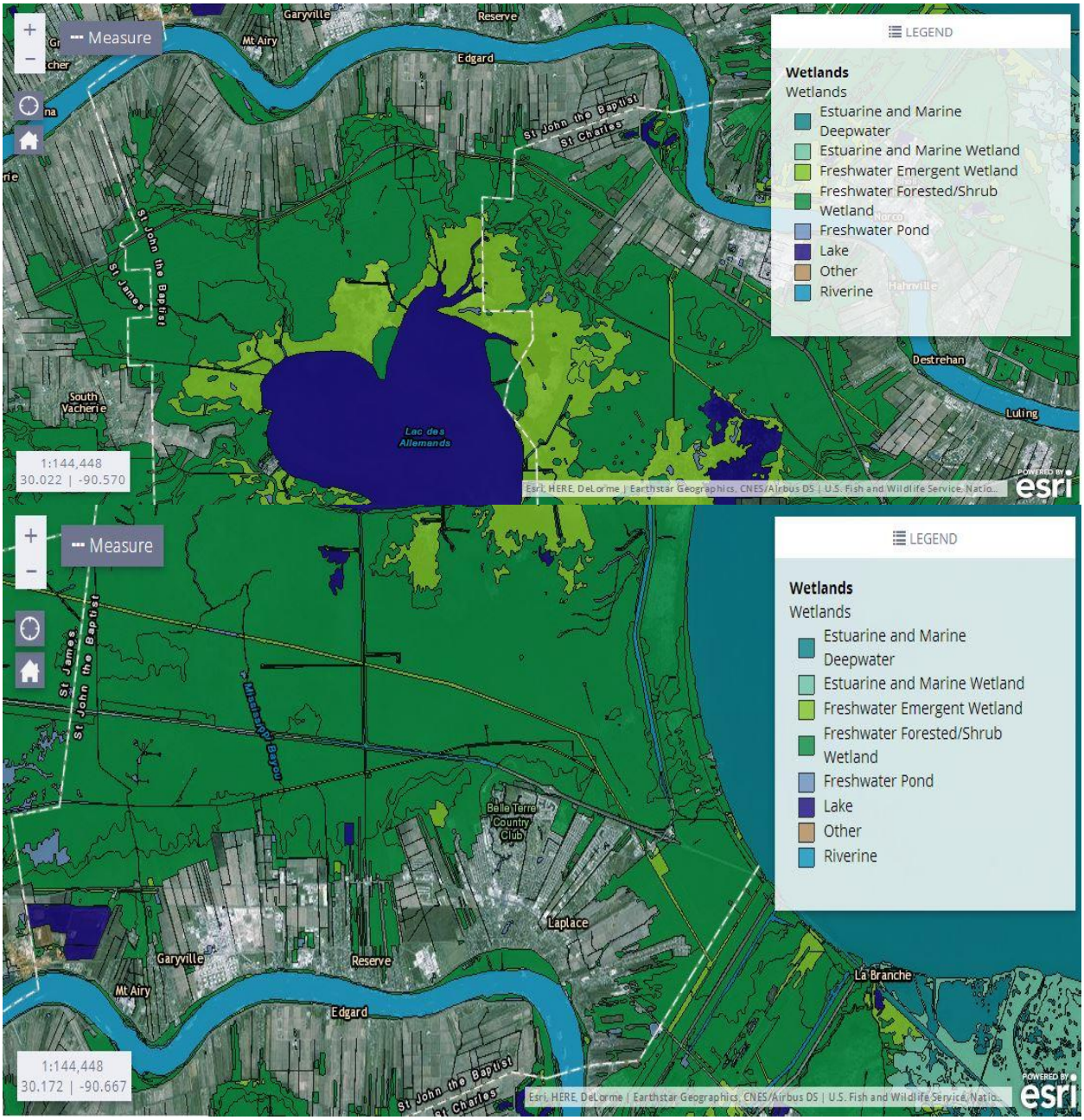


Figure 1-12. Wetlands of St. John. (U.S. Fish and Wildlife Services Wetlands Mapper V.2 at: https://www.fws.gov/wetlands/data/mapper.HTML)

Although not apparent on land-loss maps compiled by the U.S. Geological Survey (Couvillion et.al.2011), the health of forested wetlands surrounding Lake Maurepas has suffered greatly due to the leveeing of the Mississippi River, which has cut off the natural sediment supply to St. John wetlands and dredging of large navigation channels like the MRGO allowing the intrusion of salt water into Lakes Pontchartrain and Maurepas. St. John wetland loss documented on these maps is limited to that caused by shoreline erosion and retreat around the margins of the large lakes, which amounts to a few tens of acres each year. Wetland deterioration is apparent in aerial images from the Maurepas swamp (Figure 1-14) and the primary causes are:

1) subsidence (one centimeter/year),
2) lack of river sediment input, and
3) occasional episodes of salinity intrusion during droughts.

As trees die, they are not replaced, resulting in a more open forest canopy. The cypress-tupelo swamps on the West Bank appear to be much healthier, probably because of less exposure to salinity (Figure 1-15).

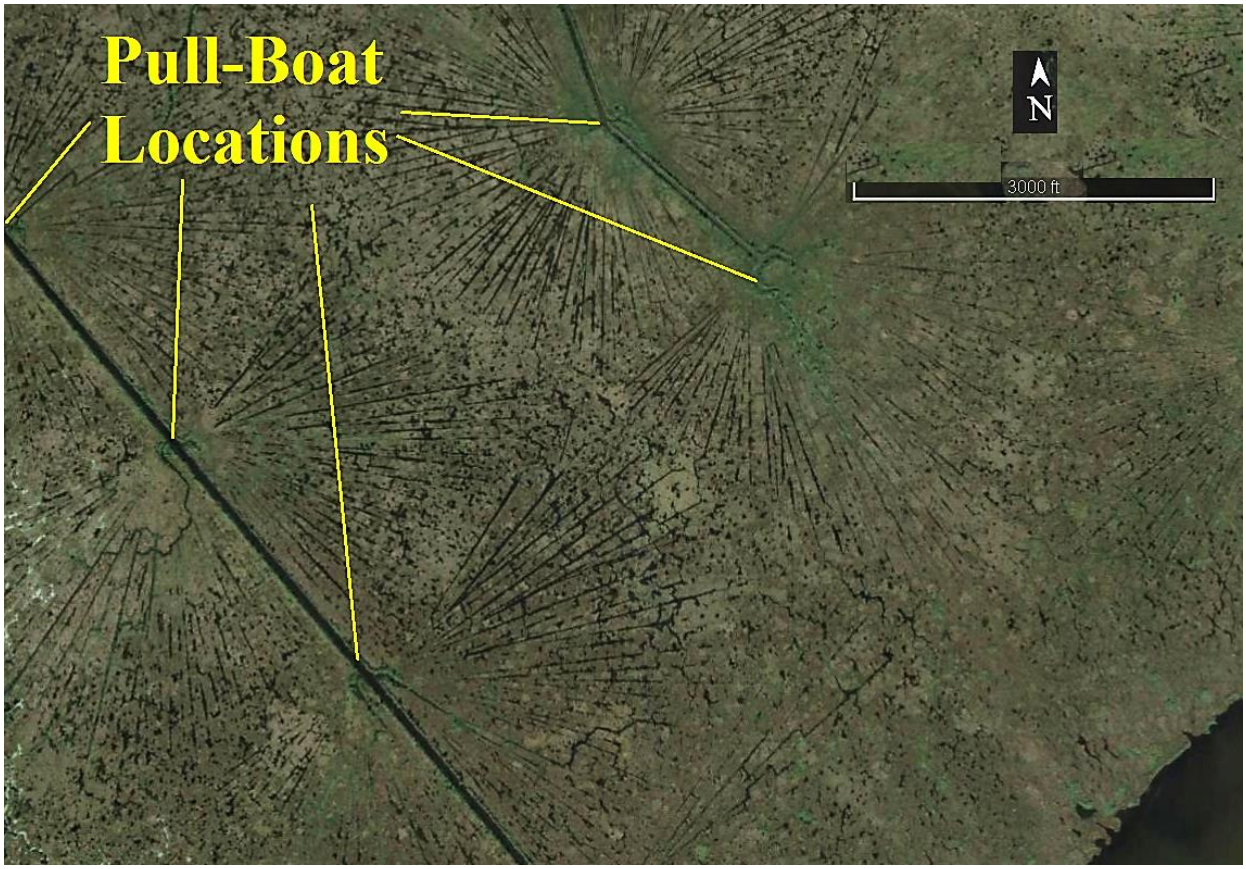


Figure 1-13. Tidal marsh south of Pass Manchac with pull marks still visible from cypress logging that occurred before 1920. Conditions for reforestation were unfavorable due to excessive salinity.

Figure 1-14. Deteriorating cypress-tupelo swamp south of Lake Maurepas. Because of subsidence leading to excessive flooding, and periodic salinity intrusion, trees that die are not replaced, thereby opening up the forest canopy and encouraging growth of floating vegetation.

Figure 1-15. Healthy cypress-tupelo swamp in St. John on the West Bank north of Lac des Allemands for comparison with dying swamp south of Lake Maurepas (Figure 1-15).

CLIMATE

St. John the Baptist Parish experiences a humid, sub-tropical climate typical of most of the Southeastern United States (Muller and Fielding 1988). This climate region is characterized by hot summers, and relatively mild winters. Precipitation is evenly distributed through the year, and exceeds the rate of evapotranspiration (Figure 1-16), a term that includes direct evaporation from lakes and moist soil as well as that evaporated off the leaves of plants (Muller and Fielding 1988).

Lower atmospheric circulation governs the general climatic regime over many years, which produces the local weather. Muller (1977) used data from New Orleans to classify the weather into eight synoptic weather types (Table 1-1). The Frontal Gulf Return, along with the Gulf Return, has its strongest influence in the spring. Frontal Overrunning, along with the Continental High, has peak occurrences during the fall and winter. The Pacific High and the Coastal Return weather types are evenly distributed throughout the year. Both the Gulf High and the Gulf Tropical Disturbance types are more frequent from early summer through the fall. The Frontal Gulf Return and the Frontal Overrunning weather systems cause the majority of precipitation on a regional scale, and they account for virtually all rainfall during the winter and continue to cause about 90 percent of spring precipitation (Muller and Willis 1983). During the summer, all of the types are capable of producing light afternoon showers, however, the presence of maritime tropical air creates instability that can result in significant amounts of rainfall during particularly severe thunderstorms.

Table 1-1. General Conditions Associated with Each of the Eight Synoptic Weather Types.
Based upon data from New Orleans (the numbers represent annual means).

TYPE	Occurrence	Precipitation		Winds	
	% of hours	Mm	%	Hours	%
Pacific High	3	1	0	117	4
Continental High	23	3	0	465	14
Frontal Overrunning	18	460	30	837	25
Coastal Return	12	84	5	48	1
Gulf Return	17	138	9	576	17
Frontal Gulf Return	13	637	41	975	29
Gulf High	11	81	5	51	2
Tropical Disturbance	3	150	10	282	8

Source: Muller and Fielding 1988

The Frontal Gulf Return is the most significant rainfall producer during the summer months of June through August (Muller and Willis 1983). The fall is a transitional period during which the frontal weather types again become dominant. This is also the time during which Gulf Tropical Disturbance rainfall becomes important. Tropical storms and hurricanes are the most significant rainfall-producing events along the Gulf Coast. Hurricanes generally occur between June and November with a peak in September.

The climate of St. John is humid subtropical (Köppen climate classification *Cfa*), as noted by the World Meteorological Organization. The monthly daily average temperature ranges from 53.4 °F (11.9 °C) in January to 83.3 °F (28.5 °C) in July and August (Figure 1-16 A). The lowest recorded temperature was 6 °F (−14 °C) on February 13, 1899. The highest temperature was a value of 104 °F (40 °C) recorded on June 24, 2009.

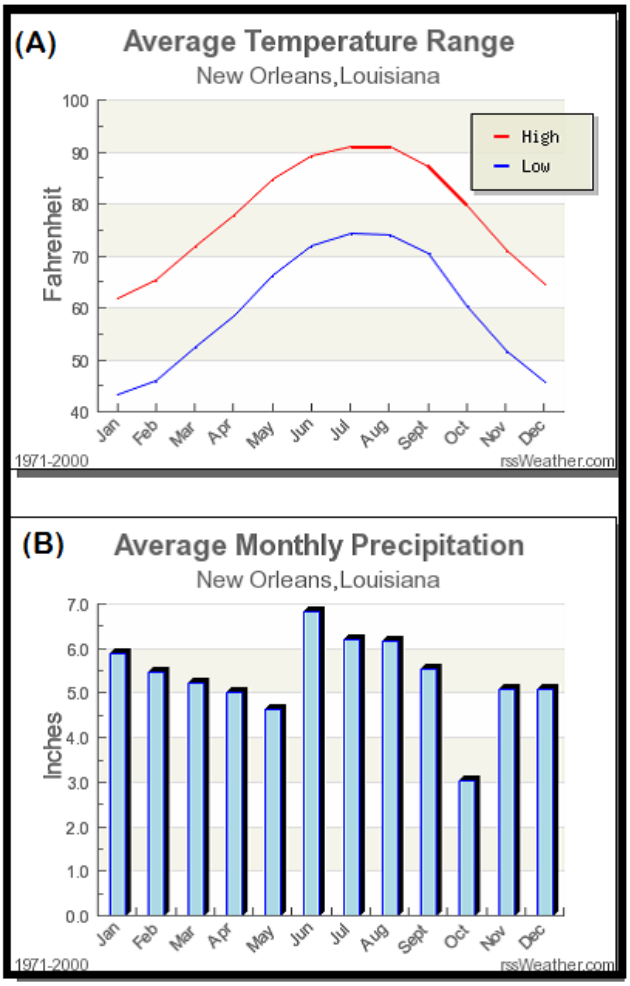


Figure 1-16. Mean monthly high and low temperatures (A), and precipitation for New Orleans and St. John.

Annual precipitation averages 62.7 inches (1,590 mm) annually. The summer months are the wettest, while October is the driest month (Figure 1-16 B). Precipitation in winter usually accompanies the passing of cold fronts every 5 to 7 days. On average, daily highs greater than 90 °F (32 °C), and less than 50 °F (10 °C), occur on 77 and 8 days, respectively. Temperature drops to freezing during only 8 nights per year. It is rare for the temperature to reach 100 °F (38 °C) or dip below 25 °F (−4 °C), or for precipitation to take the form of snow and sleet. The last significant snow fall in St. John occurred on December 11, 2008. While precipitation is relatively evenly distributed throughout the year, evaporation and transpiration by plants is much higher in the heat of the summer than at other times, so that runoff is greater during the cool months.

Hurricanes pose a severe threat to St. John because of its low elevation, and because it is surrounded by large lakes to the north, east, and south. Also, the parish is less sheltered than in the past due to wetland loss in the Lake Borgne wetlands east of Lake Pontchartrain and in the lower Barataria estuary closer to the coast. Although Hurricane Isaac in 2012 produced the most damage on record, as previously mentioned, portions of St. John were also flooded to a lesser degree by the Grand Isle Hurricane of 1909, the New Orleans Hurricane of 1915, the Fort Lauderdale Hurricane of 1947, Hurricane Flossy in 1956, Hurricane Betsy in 1965, Tropical Storm Juan in 1985, Hurricanes Katrina and Rita in 2005, and Hurricanes Gustav and Ike in 2008. Flooding occurs both because of storm surge and heavy rainfall that hurricanes can bring. Maximum storm surges experienced by St. John are up to 8 feet, with the largest surges originating in Lake Pontchartrain and having greatest effect on the East Bank (IPET 2009).

SOILS

There are six main categories of soils found in St. John (Table 1-2). Cancienne and Gramercy silty loams predominate on the natural levees of the Mississippi River, while Barbary, Kenner, Allemands and Maurepas mucks underlie wetland marshes and swamps (Figure 1-17). In general, the alluvial soils found on the natural levees of the Mississippi River are excellent for agricultural and more intensive development purposes. These soils tend to be well drained and more stable than those found in the lower lying bottomland hardwood and swamp forests that border Lac des Allemands in the South and Lakes Maurepas and Pontchartrain in the North.

Table 1-2. St. John Soils (NRCS 2009 St. John Soil Survey) with percent coverage (> one %)

Map No.	Soil Name	Acres	Coverage
Ba, BB – S2857	Barbary muck, frequently flooded	67,618	30.7 %
Ma -- 2879	Maurepas muck, frequently flooded	11,431	5.2 %
Ke – S808	Kenner-Allemands muck, v. frequently flooded	8,034	3.6 %
Cu – S2855	Allemands and Carlin Mucks, v. frequently flooded	2,949	1.3 %
S2872	Sharkey-Galvez-Barbary, frequently flooded		
AR	Allemands-Larose, frequently flooded		
S2858	Convent-Carlin-Barbary, frequently flooded		
CmA – S2863	Cancienne silt loam	11,915	5.4 %
can	Cancienne silty clay loam	1,920	0.9 %
CvA – S2888	Carville silt loam	6,534	3.0 %
CT, CR	Cancienne and Carville	6,248	2.8 %
CnA – S2890/S2867	Cancienne and Gramercy silty clay loam	9,352	4.4 %
Cm, Cn	Cancienne silty clay loam*	8,340	4.2 %
GrA	Gramercy silty clay*	7,432	3.4 %
SkA, Sm	Schriever clay	10,418	4.8 %
FA	Fausse clay		
Tu	Thibaut clay		

*Less than 0.1 percent.

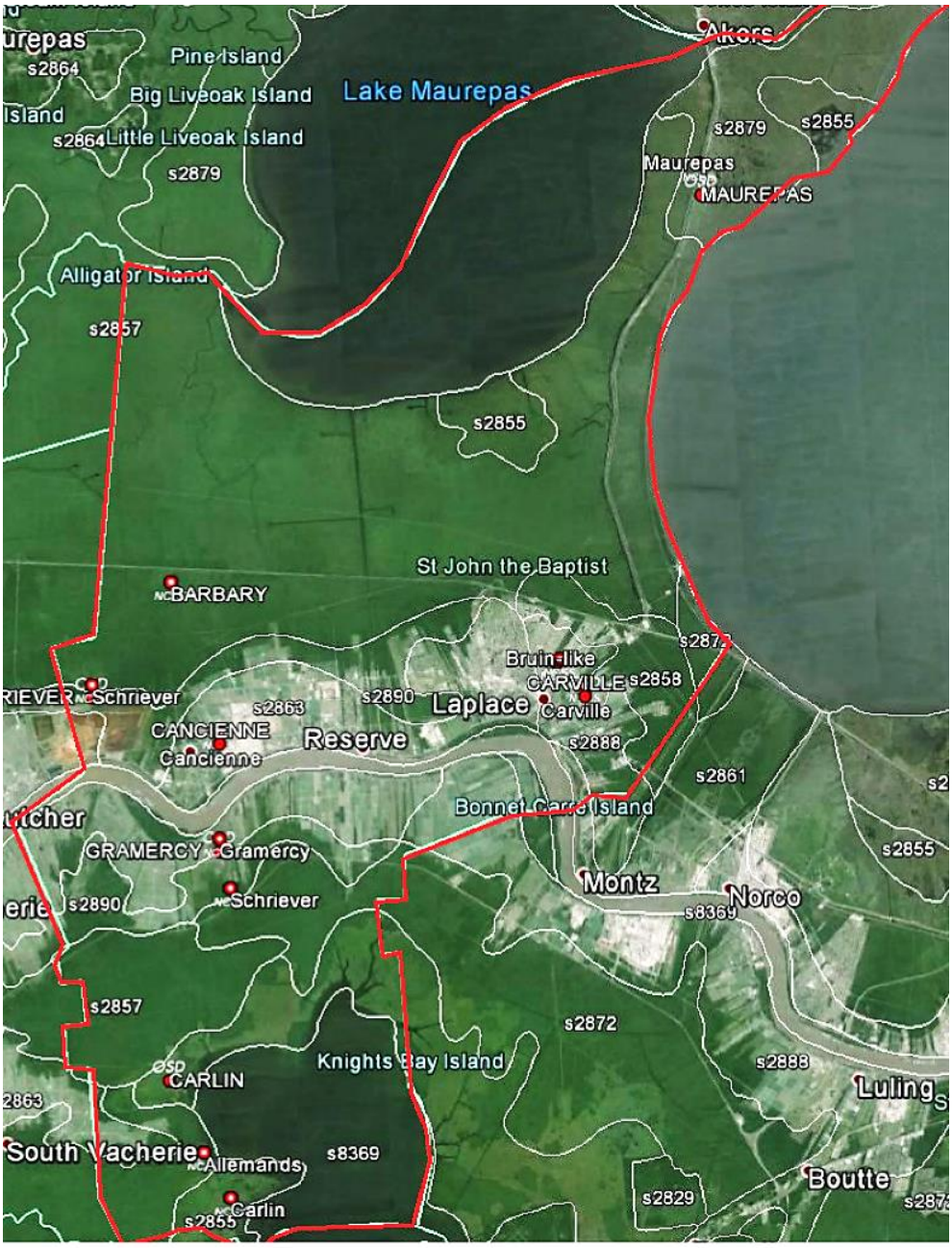


Figure 1-17. General soils map for St. John prepared by the NRCS (2014) showing points where sample profiles were acquired.

The Natural Resource Conservation Service (NRCS) classifies all wetland soils underlying St. John swamps and marshes as "mucks," and are composed of "dark, finely divided, and well-decomposed organic soil material over a fluid clay-like alluvium" (NRCS 2014). Barbary muck is most widespread soil type in St. John, covering nearly 40 percent of the land area (Table 1-2). It underlies forested wetlands, from cypress-tupelo swamps to bottomland hardwoods, depending on elevation and drainage. As elevation increases on flanks of the natural levees and crevasse deposits, soil types are more variable and contain more mineral silts and clays, grading into loams. Such details will be discussed in the descriptions of each EMU.

VEGETATION

Plant coverage in St. John the Baptist Parish has been mentioned earlier, and ranges from natural levee hardwood forests to land cultivated primarily in sugarcane to intermediate marshes and submerged aquatic vegetation. The natural distribution of plant species depends on elevation, drainage, soils and salinity (Figure 1-12). Most of the hardwood forest on the natural levees has been cleared and replaced by industrial facilities, residential developments, agricultural fields and pasture. Scattered remnants of second and third growth forest include live oak, hickory, pecan, sweetgum, American elm and green ash. For less well drained soils, water oak, sycamore and hackberry may dominate (Table 1-3). Depending on the canopy cover, the herbaceous shrub layer may or may not be well developed (Table 1-4).

Table 1-3. Trees, shrubs and woody vines of the forested natural levee of St. John (Louisiana Natural Heritage Program 2009)

Acer rubrum var. drummondii Red Maple	*Ampelopsis arborea* Peppervine	*Ampelopsis Cordata* Heartleaf peppervine	*Berchemia scandens* Rattan vine
Bignonia capreolata Cross vine	*Percea borbonia* Red bay	*Campsis radicans* Trumpet Creeper	*Carpinus caroliniana* Iron wood
Celtis laevigater Hackberry	*Planera aquatica* Water elm	*Carya ovata* Shagbark Hickory	*Carya illinoensis* Pecan
Diospyros virginiana Persimmon	*Gleditsia triacanthos* Honey Locust	*Froxinus pennsylvanica* Green ash	*Ilex decidua* Deciduous holly
Ligustrum sinensis Chinese privet	*Liquidambar styraciflua* Sweetgum	*Lonicera japonica* Japanese honeysuckle	*Crataegus viridis* Green hawthorn
Morus rubser Red mulberry	*Morella cerifera* Wax myrtle	*Platanus occidentalis* Sycamore	*Prunus serafina* Black cherry
Quercus michauxii Cow oak	*Quercus nigra* Water oak	*Quercus nutallii* Nutall oak	*Quercus falcata var. pagodaefolia* Cherrybark oak
Quercus shumardii Shumard red oak	*Quercus virginiana* Live Oak	*Rosa bracteata* Macartney rose	*Rubus SP* Blackberry
Sabal minor Dwarf palmetto	*Smilax rotundifolia* Common greenbriar	*Sambucus canadensis* Elderberry	*Sapium sebiferum* Chinese tallow tree
Rubus trivialis Dewberry	*Toxicodendron radicans* Poison Ivy	*Ulmus alata* Winged elm	*Acer negundo* Box-elder

Table 1-4. Common herbaceous plants of the forested natural levee of St. John (Louisiana Natural Heritage Program 2009)

Cocculus carolinianum Carolina Moonseed	*Tradescantia spp.* Spiderwort	*Brunnichia ovater* Ladies Ear-Drops	*Salidago sempervirens* Seaside goldenrod
Bignonia capreolata Cross vine	*Samolus verlandieri* Water pimpernel	*Sanicula cadensis* Snakeroot	*Arisaema dracontium* Green dragon
Nemophylla aphylla Baby Blue Eyes	*Geum canadensis* Geum	*Hydrocotyle spp.* Pennywort	*Eupatorium spp.* Thoroughwort
Polygonum spp. Persimmon	*Tovara virginica* Jumpseed	*Senecio glabellus* Yellow-top	*Panicum spp.* Panic-grass
Ligustrum sinensis Smartweed	*Oplismenus hirtellus* Basket grass	*Thelypteris palustris* Marsh fern	*Mikania scandens* Climbing hempvine
Tilandsia usneoides Spanish moss	*Polypodium polypodioides* Resurrection fern	*Phoradendron tomentosum* Mistle-toe	*Lygodium japonicum* Japanese climbing fern

Bottomland hardwood habitat grades into bald cypress-tupelo swamps on the lower parts of the natural levee. These swamps are not floristically diverse unless they are stressed or disturbed as in the Maurepas wetlands (Figure 1-14). If the dominant cypress-tupelo canopy is gapped or not present, then a shrub swamp develops (Louisiana Natural Heritage Program 2009). Since so many of the St. John swamps on the East Bank have subsided too low to naturally regenerate (Shaffer et al. 2009), flora of the cypress-tupelo swamps and the shrub swamps that replace them will be listed together (Table 1-5).

Table 1-5. Freshwater swamp trees and shrubs of St. John (Louisiana Natural Heritage Program 2009)

Taxodium distichum Bald cypress	*Nyssa aquatica.* Tupelo gum	*Nyssa sylvatica var biflora* Swamp black gum	*Acer rubrum var. drummondii* Red Maple
Salix nigra Black willow	*Fraxinus profunda* Pumpkin ash	*Froxinus pennsylvanica* Green ash	*Planera aquatica* Water elm
Gleditsia aquatica Water locust	*Itea virginica* Virgina willow	*Cephalanthus occidentalis.* Button bush	*Forestiera acuminata* Swamp privet
Morella cerifera Wax myrtle	*Crataegus opaca* Mayhaw	*Sabal minor* Dwarf palmetto	*Iva frutescens* Marsh elder

Freshwater marshes have the greatest floristic diversity of any of the marshes found in the Mississippi River delta. They are unique in the extent to which they build their own soil from a mix of live roots and dead plant material that is resistant to decomposition under the perpetually flooded conditions that characterize these marshes (Table 1-6).

Most wetlands in St. John are forested wetlands with relatively little fresh marsh Small fringe areas of marsh are distributed around the margins of Lakes Maurepas and des Allemands. Some of the fresh marshes on the West Bank around Lac des Allemands float occasionally, seasonally or at all times (Sasser et al. 1996). Floating marshes of southern St. John typically are dominated by bull-tongue (*Sagitaria lancifolia*), but also include spikesedge (*Eleocharis* spp.), fall panic-grass (*Panicum dichotomiflorum*), coastal water hyssop (*Bacopa monnieri*), wire grass (*Spartina patens*) with scattered stands of cattail (*Typha latifolia*).

Some marshes adjacent to Lakes Pontchartrain and Maurepas are affected by salinities between three and 10 ppt. often enough that the vegetation contains species of both brackish and fresh marshes, though it is often dominated by *Spartina patens*, saltmeadow cord grass (Table 1-7). Intermediate marsh experiences an irregular tidal regime and is dominated by narrow-leaved, persistent species (Louisiana Natural Heritage Program 2009).

This cypress on Shell Bank Bayou (St. John the Baptist Parish) is a Louisiana Purchase Cypress Legacy Tree - "Alive in 1803" (Photo Credit to Louisiana Purchase Cypress Legacy http://lapurchasecypresslegacy.blogspot.com/)

Table 1-6. Common plants of the freshwater marshes of St. John (Louisiana Natural Heritage Program 2009)			
Panicum hemitomon Maidencane	*Eleocharis spp.* Spikesedge	*Sagittaria lancifolia* Bull-tongue	*Alternanthera philoxeroides* Alligator weed
Spartina patens Wire grass	*Phragmites communis* Roseaucane	*Bacopa monnieri* Coastal water hyssop	*Ceratophyllum demursum* Coontail
Cyperus odoratus Fragrant flatsedge	*Eichhornia crassipes* Water hyacinth	*Pontederia cordata.* Pickerelweed	*Peltandra virginica* Arrow arum
Hydrocotyle spp. Pennyworts	*Lemna minor* Common duckweed	*Myriophyllum spp.* Water milfoil	*Nymphaea odorata* White waterlily
Typha latifolia Cattail	*Utricularia spp.* Bladderwort	*Vigna luteola.* Deer pea	*Zizaniopsis miliacea* Southern wild rice
Myrica cerifera Wax myrtle	*Thelypteris palustris* Marsh fern	*Leersia oryzoides* Cutgrass	*Scirpus americana* Common three-square
Panicum dichotomiflorum Fall panic-grass	*Scirpus validus* Soft stem bulrush	*Aster spp.* Marsh daisy	*Ptilimnium capillaceum* Herbwilliam

Table 1-7. Common plants of the intermediate marshes of St. John (Louisiana Natural Heritage Program 2009)			
Panicum hemitomon Maidencane	*Eleocharis spp.* Spikesedge	*Sagittaria lancifolia* Bull-tongue	*Scirpus olneyi* Three-cornered grass
Spartina patens Wire grass	*Phragmites communis* Roseaucane	*Bacopa monnieri* Coastal water hyssop	*Scirpus californicus* Giant bullrush
Scirpus americana Common three-square	*Eichhornia crassipes* Water hyacinth	*Paspalum vaginatum* Seashore paspalum	*Panicum virgatum* Switch grass
Leptochloa fascicularis. Bearded spangletop	*Pluchea camphorata* Camphor-weed	*Echinonchloa wateri* Water millet	*Cyperus odoratus* Fragrant flatsedge
Alternanthera philoxeroides Alligator weed	*Najas guadalupensis* Southern naiad	*Vigna luteola.* Deer pea	*Spartina cynosuroides* Big cordgrass

Table 1-8. Submerged aquatic plants of St. John (Louisiana Natural Heritage Program 2009)			
Valisneria americana Wild celery	*Ruppia maritima* Widgeon grass	*Najas guadalupensis* Southern naiad	*Zannichellia palustris* Horned pondweed
Cymodocea filiformis Manatee grass	*Displanthera spp.* Shoal grass	*Thalassia testudinum* Turtlegrass	*Alternanthera philoxeroides* Alligator weed

WILDLIFE AND FISHERIES

The majority of the land area of St. John the Baptist Parish is undeveloped wetlands that spread away from the natural levees of the Mississippi River to occupy the headwaters of both the Pontchartrain and Barataria estuaries. This fresh marsh and swamp habitat is extremely productive and supports a variety of resident and migratory wildlife species. Bald eagles (*Haliaeetus leucocephalus*) migrate to the parish in the winter to breed at nests that they use year after year, while other pairs are present year-round. The majority of water fowl like the Lesser scaup (*Aythya affinus*), pintail duck (*Anas gaita*) and green-winged teal (*Anas carolinensis*) are migrants, breeding in the summer far to the north and spending winters feeding in Gulf coast wetlands. Many species of colonial wading birds like the snowy egret (*Egretta thula*) and Louisiana heron (*Hydanassa tricolor*) congregate in the swamps to feed on red swamp crayfish (*Procambarus clarkii*) and breed. Small Neotropical songbirds like the prothonotary

warbler (*Prothonotaria citrea*) and American redstart (*Setophaga ruticilla*) pass through or stop to breed in St. John after flying across the Gulf of Mexico in the spring, and pass through again on the return to Central and South America in the fall (Fontenot and DeMay 2011).

Commercial hunters have trapped the American alligator (*Alligator mississippiensis*), the largest reptile in North America, for its hide and meat. Alligator hunting resumed in St. John in 1979. Alligator are sufficiently abundant in the fresh marshes and swamps of St. John that a tag is issued for every 65 acres of fresh and intermediate marsh, and for every 170 acres of swamp forest. The American alligator remains listed on Appendix II of the CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) due to the similarity of its appearance to other alligators and crocodiles listed as threatened or endanger of extinction, but alligators are not "endangered" or even "threatened" within Louisiana, and population has increased consistently under management from 1970 to the present.

Mammals like white-tailed deer (*Odocoileus virginianus*), nearctic river otter (*Lutra Canadensis*) muskrat (*Ondata zibethicus*) and North American beaver (*Castor Canadensis*) are common in the swamps and marshes as well as along the natural levees. Also, the Coyote (*Canis latrans*) has expanded its range into St. John over the past decade. Introduced species like the nutria (*Melanocaster coypus*) and feral pig (*Sus scrofa*) do much damage to marshes and artificial levees, respectively, despite bounties on both. Fur-bearers have been trapped in the marshes and swamps of St. John since settlement. With the reduced market for skins, however, current efforts now focus on the nutria which is targeted by a controlled hunt and bounty program (LDWF 2014) funded to reduce coastal land-loss (Figure 1-18). Nutria is more plentiful in the Maurepas swamp of the East Bank than in West Bank wetlands.

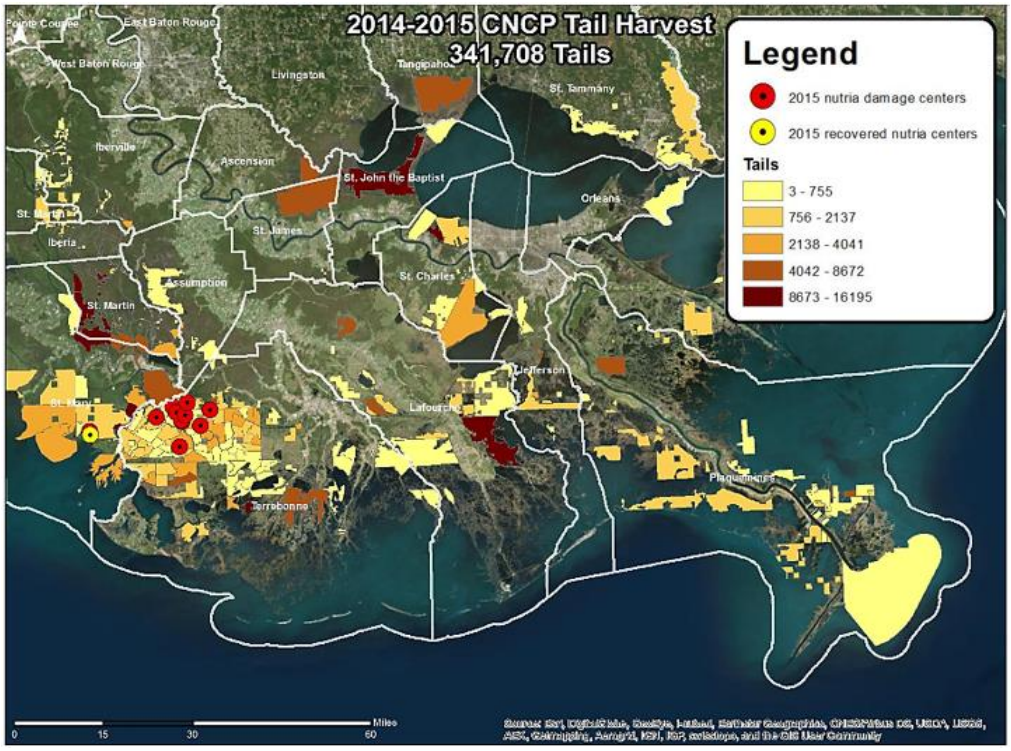


Figure 1-18. 2014-2015 Coast-wide Nutria Control Program Tail Harvest and Damage Report for southeast Louisiana (LDWF 2014).

A number of marine species are important to recreational and commercial fishermen of St. John, like brown shrimp (*Farfantepenaeus aztecus*), white shrimp (*Litopenaeus setiferus*), Gulf menhaden (*Brevoortia patronus*) and crab are also migratory (Figure 1-19). The blue crab (*Calinectes sapidus*), which are abundant in both the Pontchartrain and Barataria estuaries, mate from spring to fall in the fresh or slightly brackish waters of the parish. The females then separate from the males and extrude fertilized eggs into a "sponge" that they carry as they migrate out of the estuary into the nearshore Gulf where they spawn, releasing millions of larvae. These planktonic larvae then move with the tides and winds back into the estuaries, where they grow and molt many times in the shelter of marsh nursery grounds, finally transforming into juvenile crabs that become sexually mature in nine to 12 months. That is when the cycle starts again.

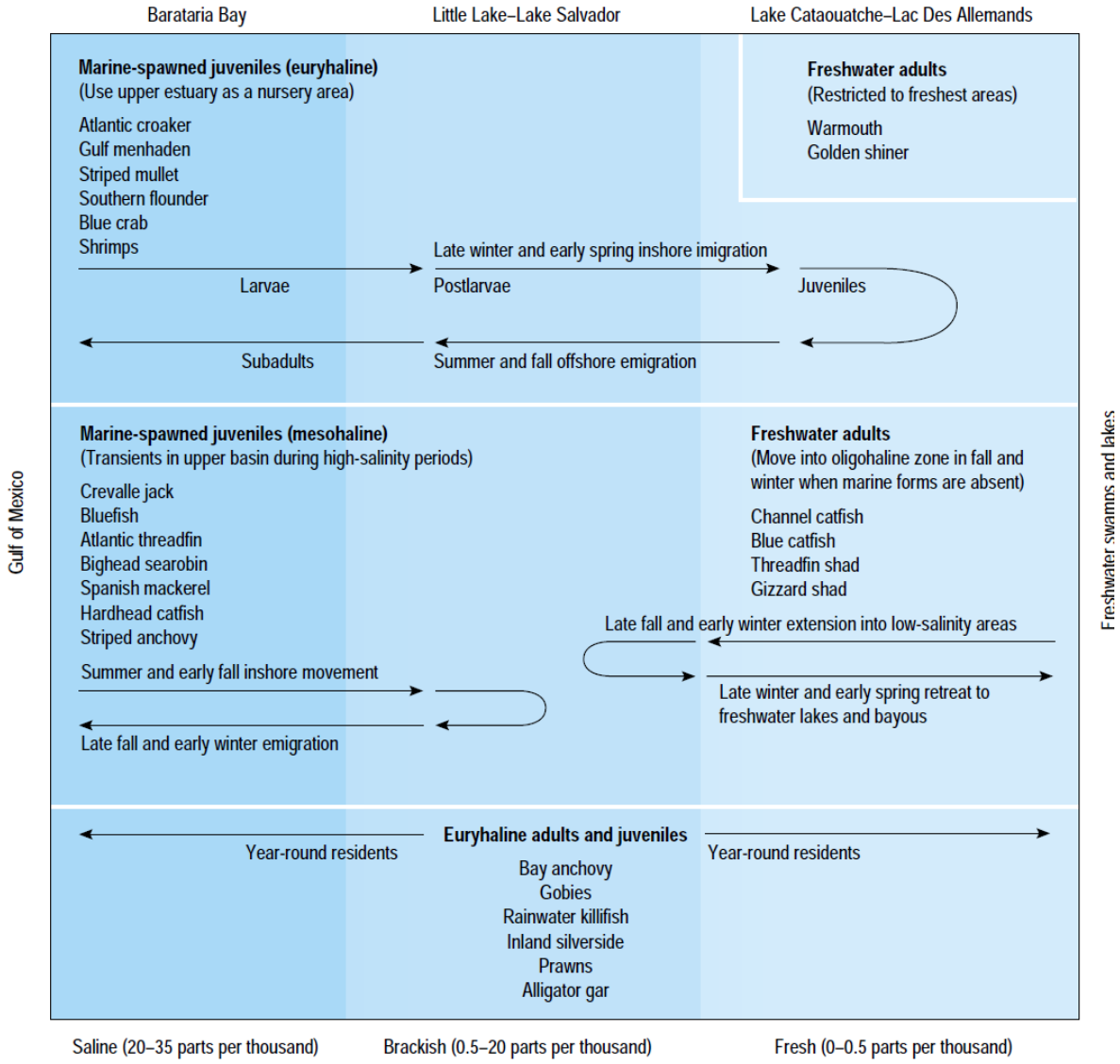


Figure 1-19. Migratory patterns of marine-spawned fish within the Barataria estuary, with the marshes and lakes of St. Charles and St. John to the right. (Chambers 1980)

Because the wetlands of St. John are almost always fresh, fishing vessels operating out of the Des Allemands area mainly catch freshwater fish like channel catfish (*Ictalurus punctatus*), largemouth bass (*Micropterus salmoides*), sac-a-lait or crappie (*Pomoxis nigromaculatus* or *P. annularis*) and bream or sunfish (*Leponis macrochirus*), however, an occasional marine species may be caught as well. When operation of the Davis Pond Freshwater Diversion caused Lake Cataoutache in neighboring St. Charles Parish to be colonized with dense stands of submerged aquatic vegetation in the 2006 to 2009 period, this previously muddy lake became one of the most productive places to fish largemouth bass. Since then, both the plant life and bass fishing have declined, but new beds of submerged aquatics are colonizing Lake Salvador to the south.

Like the Davis Pond Freshwater Diversion example above, water management and water control structures have tremendous effects on habitats, even from miles away. The following is detailed information in regards to the Bonnet Carré Spillway which is also located in neighboring St. Charles Parish. However, because of its proximity, the information is very relative to St. John's wildlife and their habitats.

St. John is fortunate to have an "eBird Hotspot" nearby in the Bonnet Carré Spillway which is just across the eastern boundary on the East Bank in St. Charles Parish. A real-time, online bird checklist (http://ebird.org/content/ebird/) is maintained by trained volunteer birders who record the species and numbers of birds sighted and report the data to the Cornell Lab of Ornithology and the National Audubon Society. The Spillway has cleared grassland, bottomland hardwood and swamp habitat and runs from the river to Lake Pontchartrain. Louisiana birders have reported sighting 283 species in the Bonnet Carré Spillway over the past decade. The Bonnet Carré Spillway checklist has 58 percent of all birds ever seen in Louisiana, which includes the extinct Carolina parakeet and Ivory-billed woodpecker.

The eBird data document the presence of species, as well as bird abundance. Nationally, eBird engages tens of thousands of participants to submit their observations to, or view results via interactive queries of the eBird database. For our purposes, Bonnet Carré Spillway records for the 2004 to 2014 decade have been grouped by types of birds that are then ranked by relative abundance. Birds are grouped into Neotropical warblers (Figure 1-20a); sparrows (Figure 1-20b); swifts, swallows and martins (Figure 1-20c); woodpeckers and kingfishers (Figure 1-20d); songbirds (Figure 1-20e); gulls, terns and skimmers (Figure 1-20f); hawks, owls and vultures (Figure 1-20g); marsh and shorebirds (Figure 1-20h); colonial water birds (Figure 1-20i); ducks and geese (Figure 1-20j).

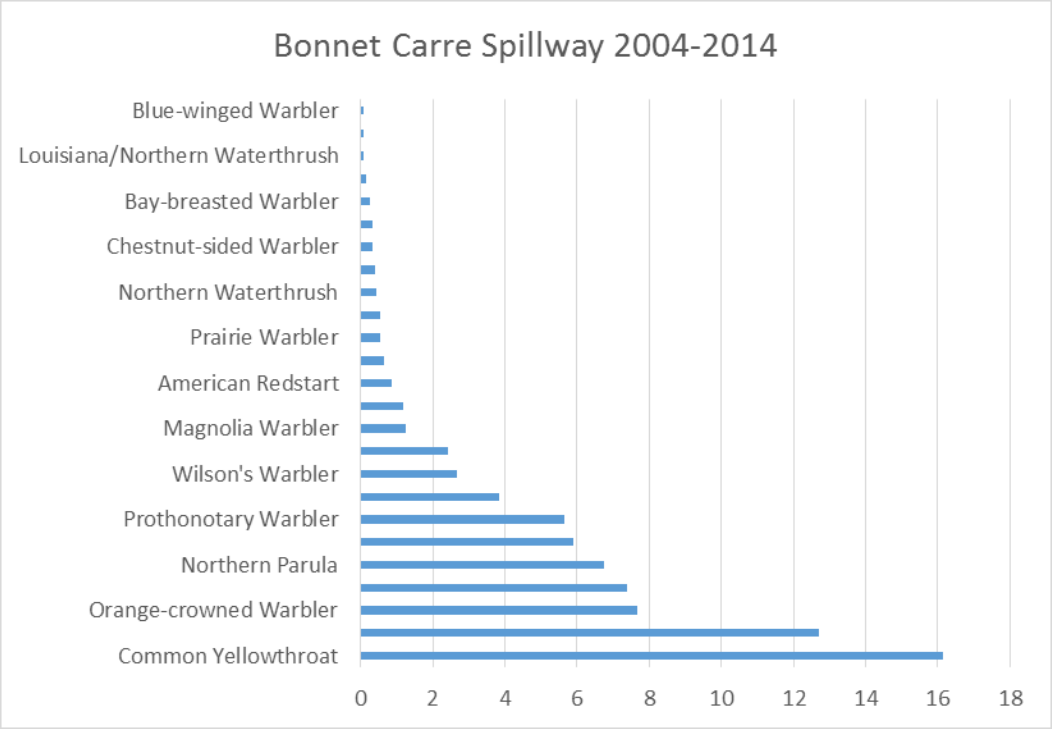


Figure 1-20a. Relative abundance of neotropical warblers in Bonnet Carré Spillway, ranked from rarest (top) to most common (bottom).

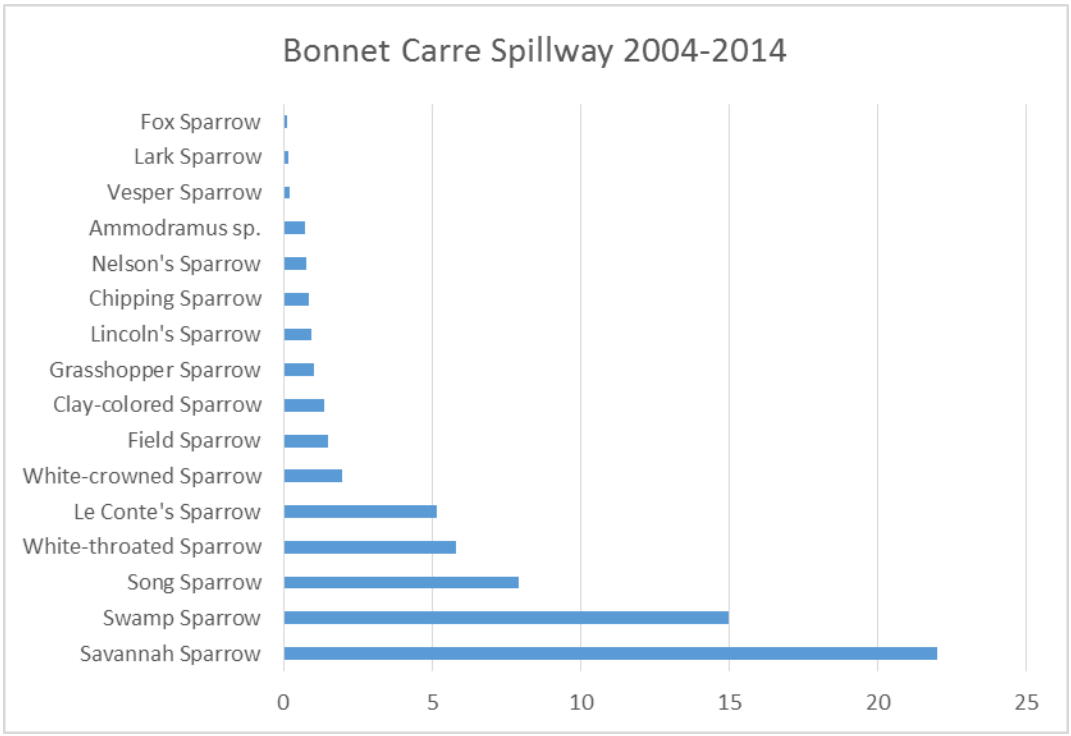


Figure 1-20b. Relative abundance of sparrows in Bonnet Carré Spillway, ranked from rarest (top) to most common (bottom).

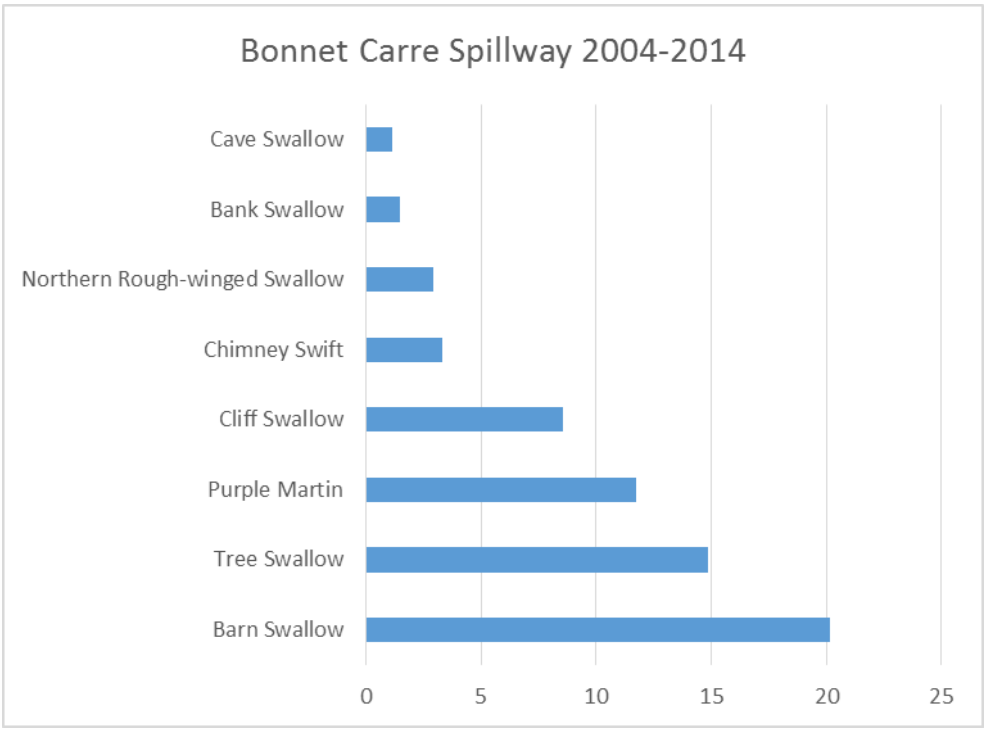


Figure 1-20c. Relative abundance of swifts, swallows and martins in Bonnet Carré Spillway, ranked from rarest (top) to most common (bottom).

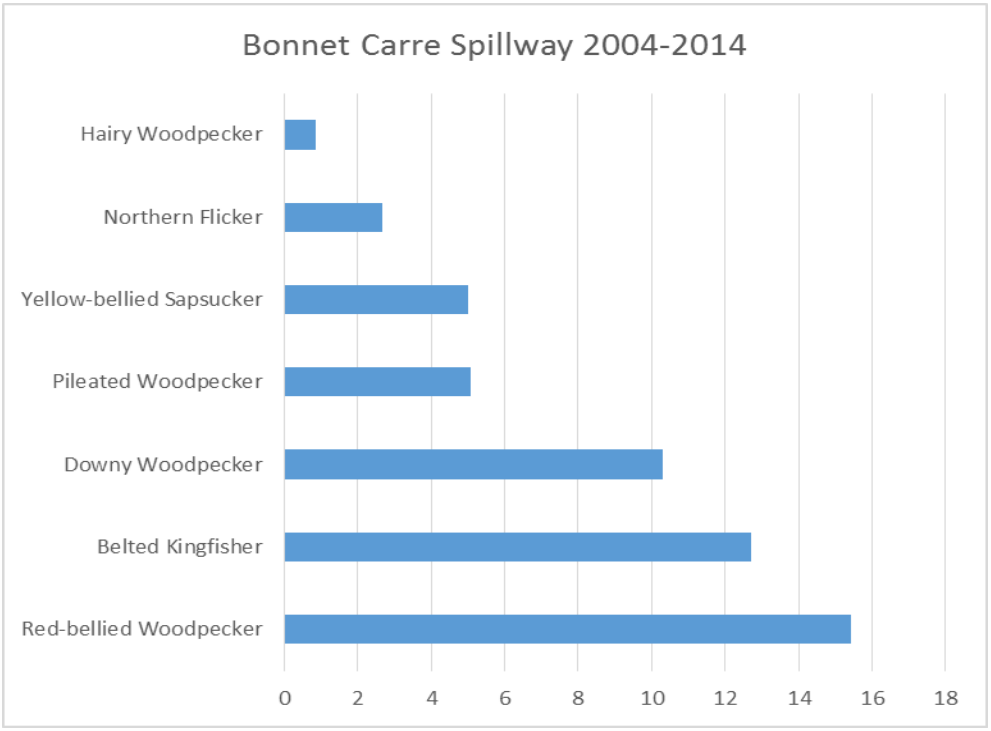


Figure 1-20d. Relative abundance of woodpeckers and kingfishers in Bonnet Carré Spillway, ranked from rarest (top) to most common (bottom).

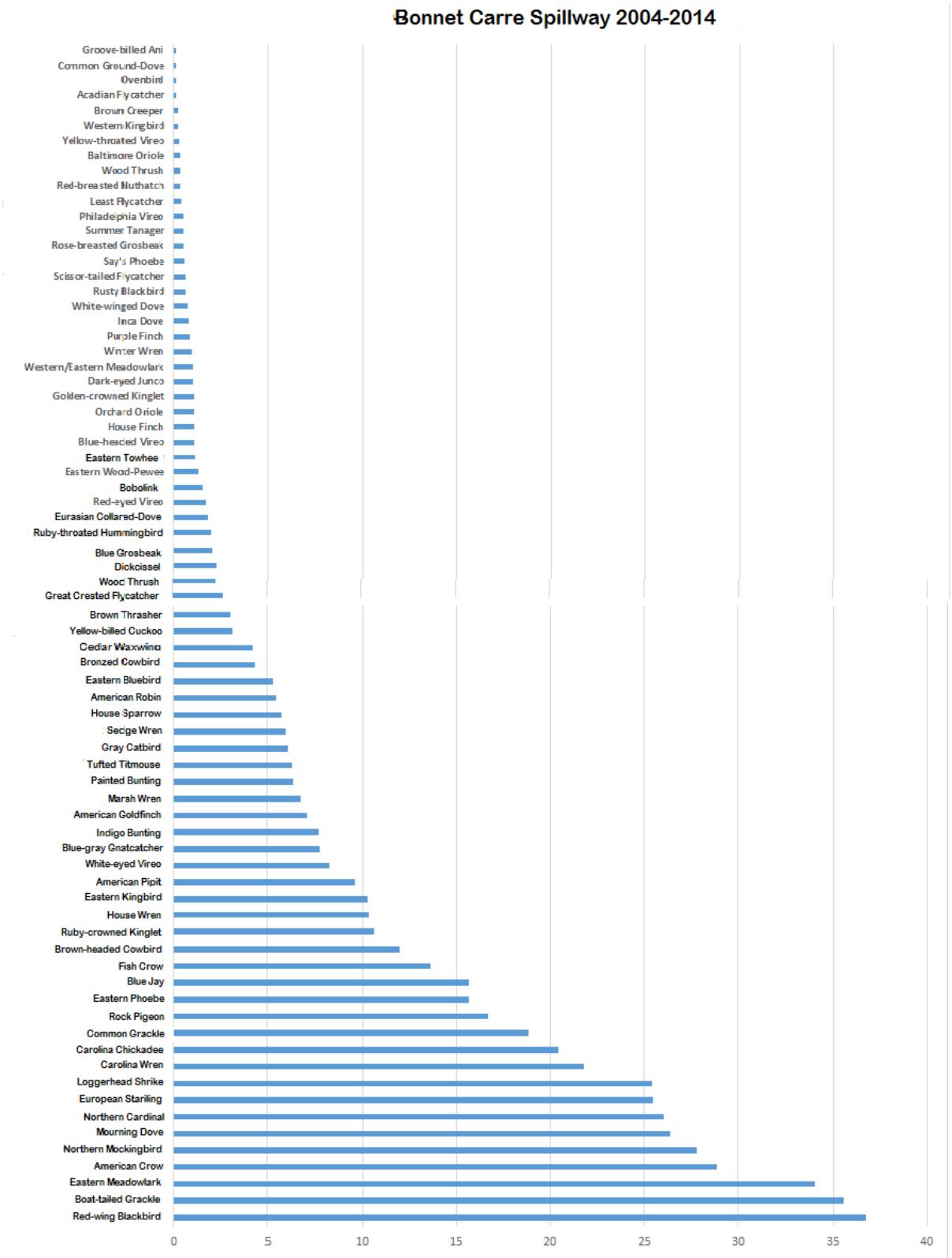


Figure 1-20e. Relative abundance of songbirds of the woods and fields in Bonnet Carré Spillway, ranked from rarest (top) to most common (bottom).

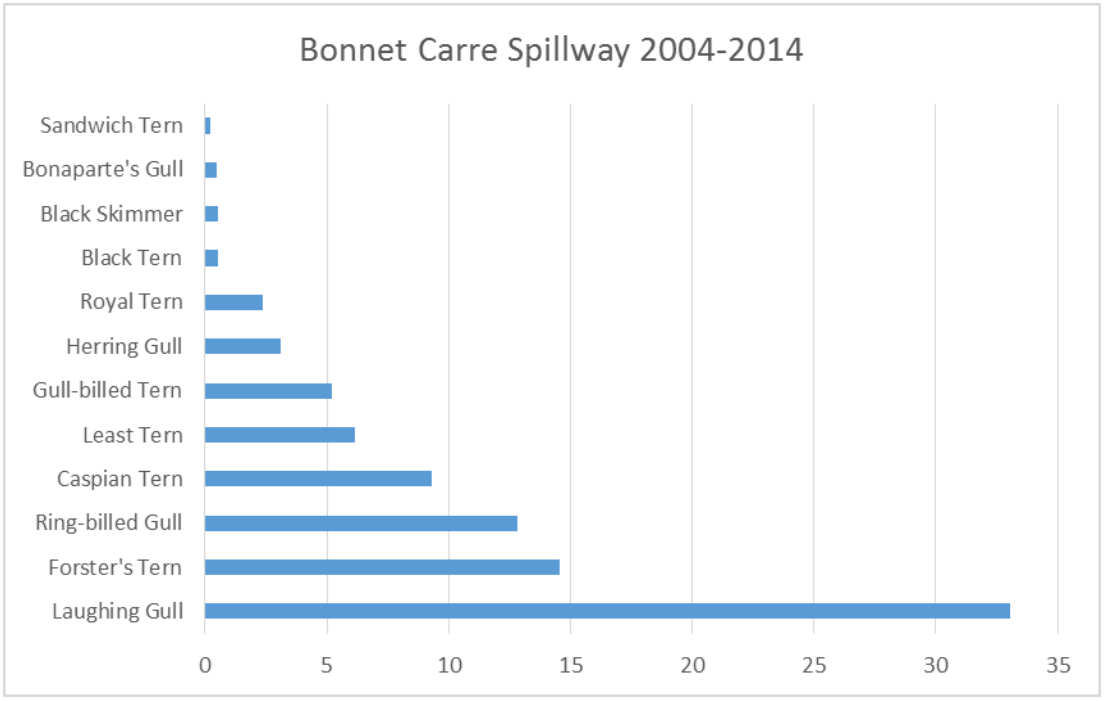
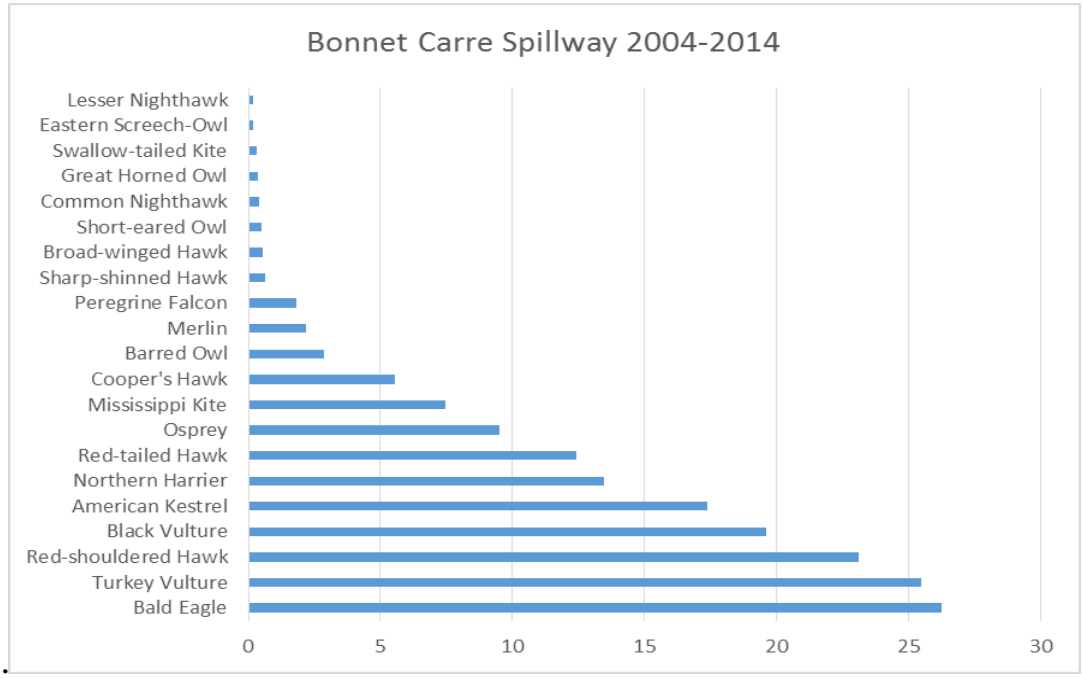


Figure 1-20f. Relative abundance of birds of gulls, terns and skimmers in Bonnet Carré Spillway, ranked from rarest (top) to most common (bottom).



.

Figure 1-20g. Relative abundance of hawks, owls and vultures in Bonnet Carré Spillway, ranked from rarest (top) to most common (bottom).

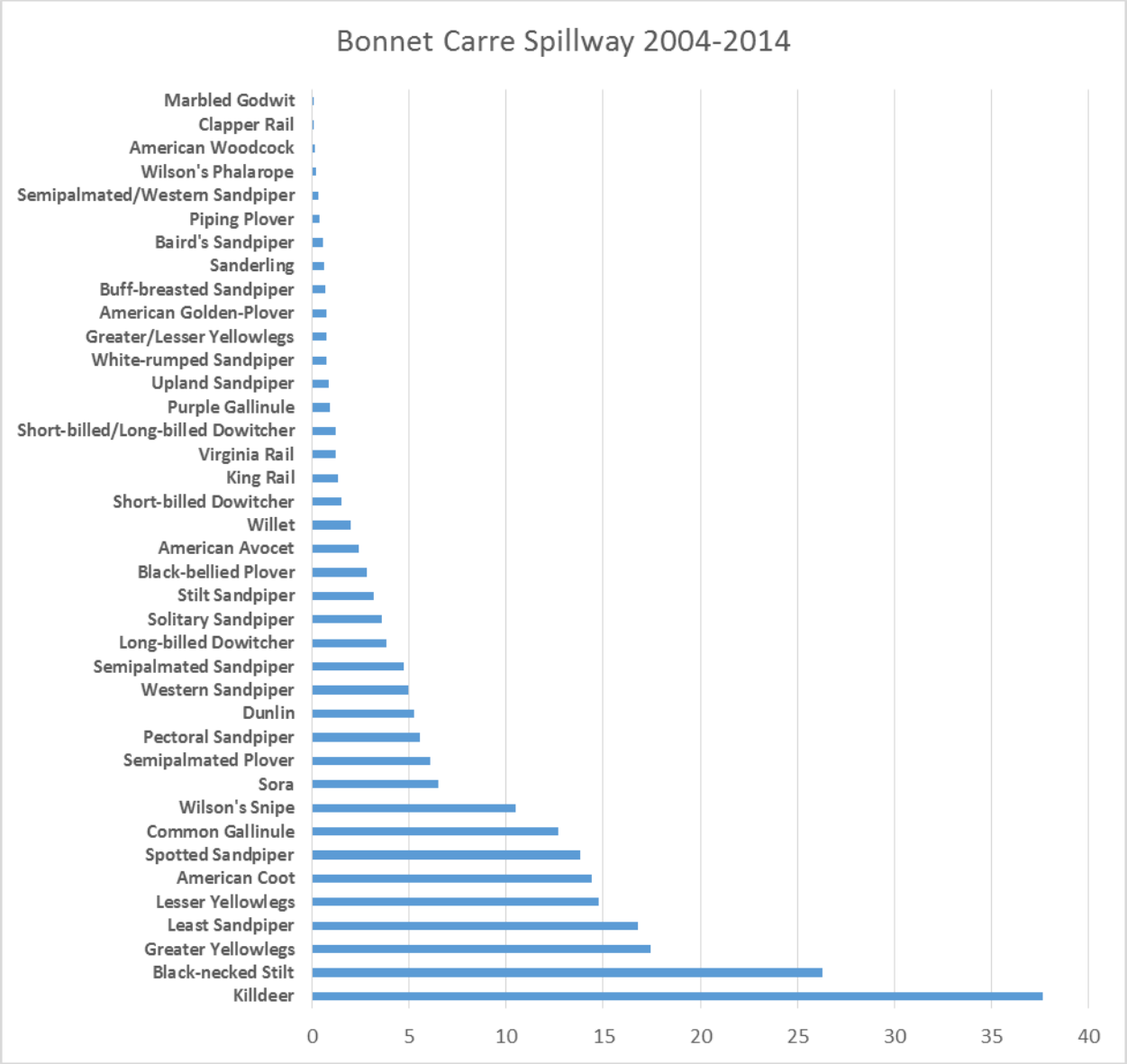


Figure 1-20h. Relative abundance of marsh and shorebirds in Bonnet Carré Spillway, ranked from rarest (top) to most common (bottom).

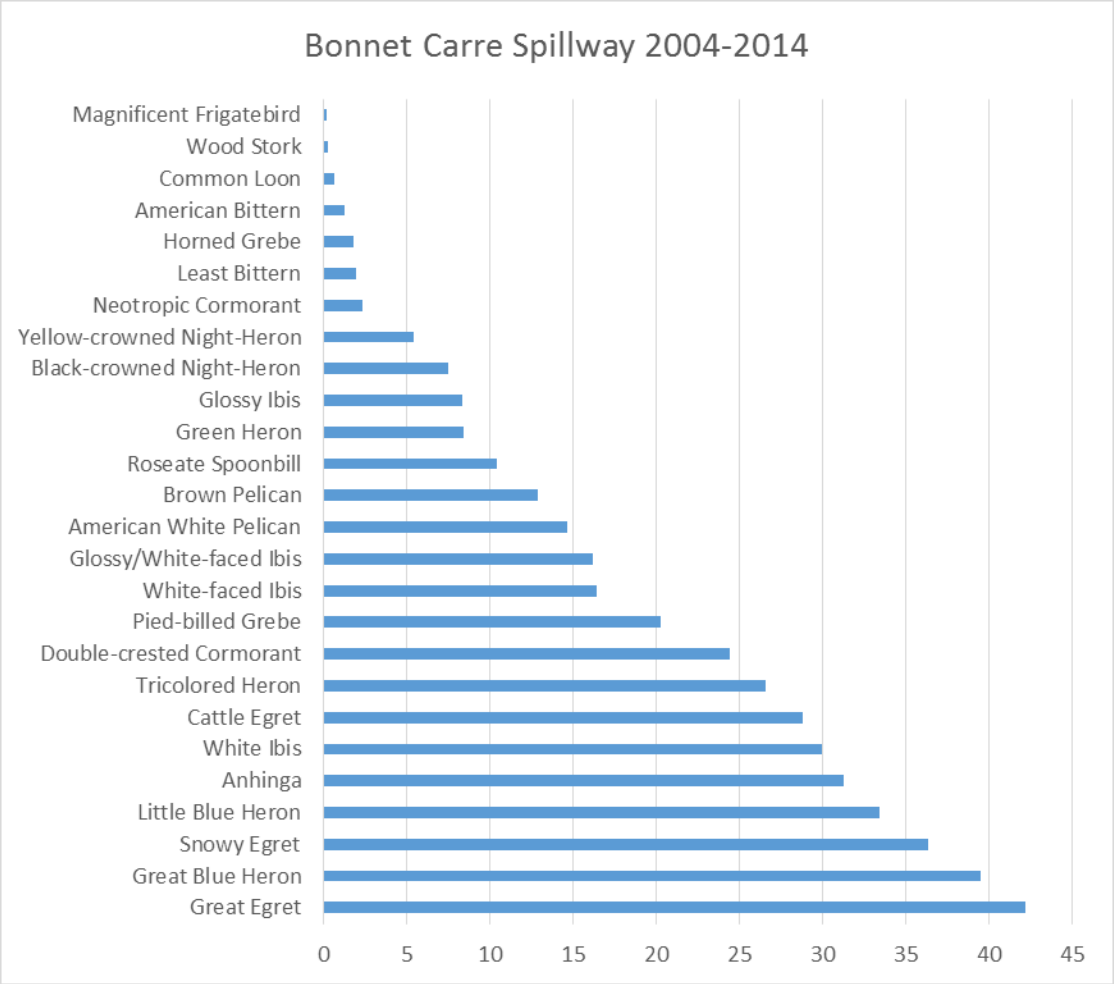


Figure 1-20i. Relative abundance of colonial water birds in Bonnet Carré Spillway, ranked from rarest (top) to most common (bottom).

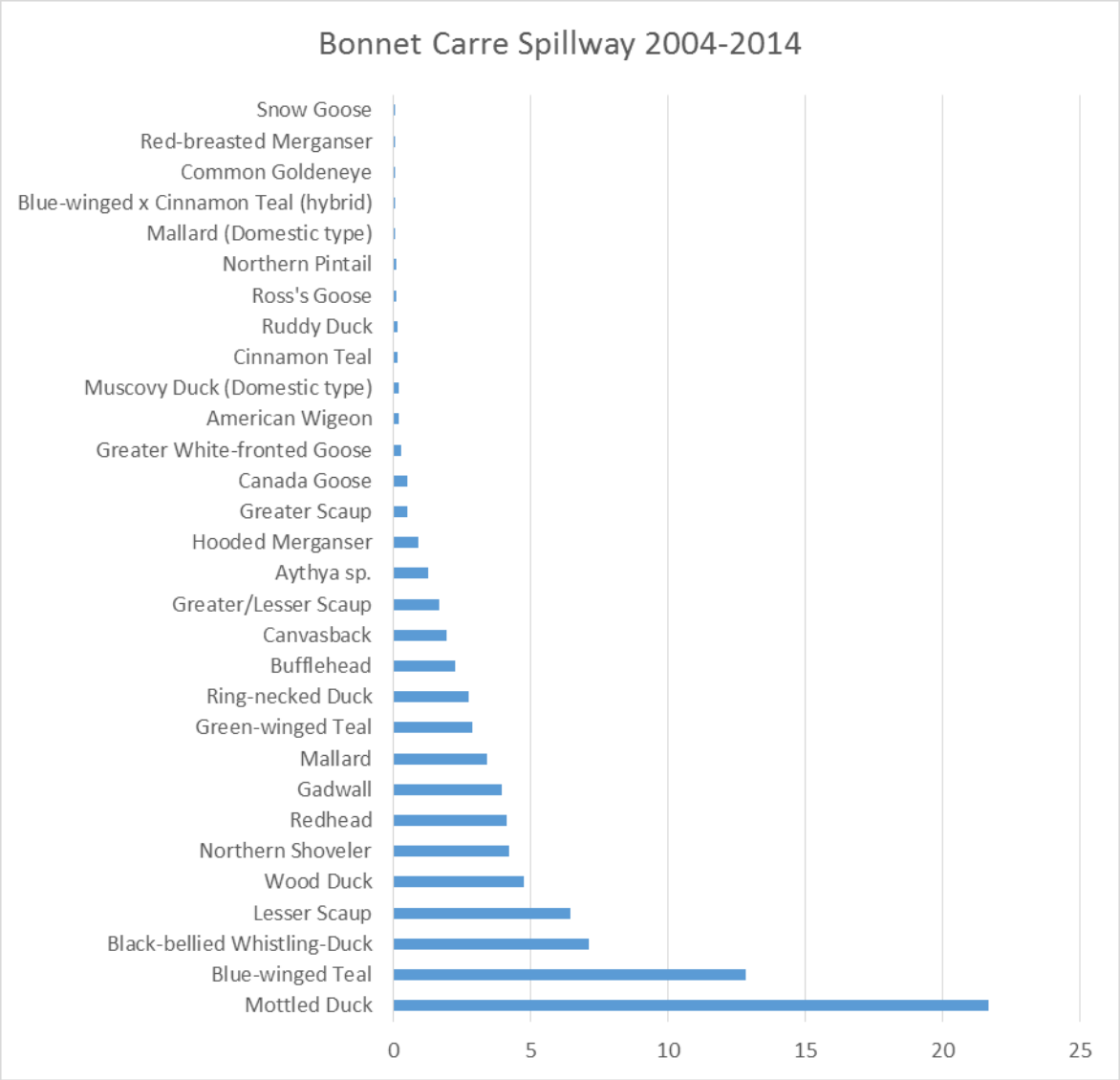


Figure 1-20j. Relative abundance of ducks and geese in Bonnet Carré Spillway, ranked from rarest (top) to most common (bottom).

THREATENED AND ENDANGERED SPECIES

No federally listed endangered or threatened plant species are known to occur in St. John the Baptist Parish, but seven rare plants (Table 1-9) are listed by the Louisiana Natural Heritage Program (LNHP) of the LDWF as being of state concern (LHNP 2014a). Only two federally listed threatened or endangered animal species have been seen in St. John but two more have "protected" status under state law (Table 1-10). The pallid sturgeon formerly inhabited large rivers throughout the southeast United States and can be found currently only in the Mississippi and Atchafalaya Rivers and, after openings of the Bonnet Carré Spillway, in the Lake Pontchartrain Basin. Threats to the pallid sturgeon include the channelization of rivers and construction of reservoirs that eliminate spawning habitat, changes in habitat and water quality, and interbreeding with shovelnose sturgeon (LNHP 2014b).

Table 1-9. Rare Plant Species of St. John (LA Natural Heritage Program 2014a)

Common Name	Scientific Name	State Status
Swamp Milkweed	*Asclepias incarnata*	S2, Imperiled
Golden Canna	*Canna flaccida*	S4, Rare but OK in LA
Floating Antlerfern	*Ceratopteris pteridoides*	S2, Imperiled
Marshland Flatsedge	*Cyperus distinctus*	S1, Critically imperiled
Western Umbrella Sedge	*Fuirena simplex var. aristulata*	S1, Critically imperiled
Square-stem Monkey Flower	*Mimulus ringens*	S2, Imperiled

The bald eagle nests primarily in the southeastern coastal parishes of Louisiana, typically in the tops of cypress trees near open water as it feeds in open lakes. The numbers for the bald eagle are increasing annually and, because of this, they have been de-listed by the USFWS but are still protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. In general, the bald eagle remains subject to threats including the loss of critical habitat, and disturbances by human activity to nesting pairs during nesting season by humans (LNHP 2014b). They have been recovering well from DDT caused eggshell thinning syndrome, and were the most common raptor sighted in the Bonnet Carré Spillway (Figure 1-20g).

Table 1-10. Rare, Threatened and Endangered Animal Species of St. John (LA Natural Heritage Program 2014b)

Common Name	Scientific Name	Federal Status*	State Status*
Pallid Sturgeon	*Scaphirhynchus albus*	E	E
Bald Eagle	*Haliaeetus leucocephalus*	D	E
Brown Pelican	*Pelecamus occidentalis*	D	E
Manatee	*Trichechus manatus*	E	E
Paddlefish	*Polyodon spathula*		Prohibited Possession

*T – Threatened; E – Endangered; D – De-listed; PS – Partial status (only on portion of its range)

The brown pelican inhabits bays and tidal estuaries along the coast and nests commonly in shrub thickets within dunes of barrier islands. This species disappeared from the parish in the early 1970s, but was restocked by the LDWF and are now common around Lake Pontchartrain (LNHP 2014b). The USFWS has de-listed the brown pelican, but the state status remains endangered.

The manatee is found in open marine waters, bays and rivers with submerged aquatic beds or floating vegetation, but is uncommon in Louisiana. It has been known to visit the Pearl, Mermentau, Calcasieu, and Sabine Rivers and waterways of the Pontchartrain and Barataria basins. Major threats to the manatee include being struck by boats and barges, habitat loss and death due to flood control structures and extended periods of below freezing temperatures (LNHP 2014b).

The paddlefish is not listed as threatened or endangered by the federal government and is believed to be present in most of Louisiana's large rivers, including the Mississippi River. The paddlefish is, however, regarded as rare by the state and harvest and possession of paddlefish are prohibited (LNHP 2014b).

COASTAL RESTORATION

In early December 2015, the Gulf Coast Ecosystem Restoration Council (GCERC) voted to approve the Initial Funded Priorities List which included a restoration project that is very important to the future of St. John. This multi-agency task force was established by the Resources and Ecosystems Sustainability, Tourist Opportunities and Revived Economies of the Gulf Coast states Act of 2012 (RESTORE Act) passed in the aftermath of the 2010 BP Deepwater Horizon oil spill. With approval of the list came an additional $14.2 million in funds for a project called the "Mississippi River Reintroduction into Maurepas Swamp Project." The purpose of this project is to enhance the "health and sustainability of the Maurepas Swamp," more specifically 45,000 acres of cypress-tupelo swamp forest south and west of Lake Maurepas (Figure 1-21), that has been targeted for freshwater, sediment and nutrient input via a modest Mississippi River diversion expected to discharge a maximum of 2,000 cubic feet per second (cfs). The diversion is planned near Garyville, and will take advantage of an existing artificial channel, known as Hope Canal, originally dredged in the early 20th century to facilitate construction of a currently abandoned narrow gage railroad that was used to carry logs out of the Maurepas Swamp (Lee Wilson and Associates 2001, URS 2007, URS 2010).

Historically, the swamp received sediment and nutrient inputs from the Mississippi River during seasonal overbank flooding. These inputs promoted vertical accretion and helped maintain wetland surface elevation in pace with relative sea level rise (RSLR). However, this process has been interrupted by flood control levees, and consequently elevation has decreased to the point where the swamp is almost constantly flooded (Figure 1-22). These conditions have been exacerbated by partial impoundment of the swamp by canal spoil banks and abandoned railroad embankments, which have reduced the flow of water through the swamp and have created oxygen-poor, stagnant water conditions. Reduced freshwater inflow has also resulted in increased salinities, as brackish water from Lake Pontchartrain has intruded into Lake Maurepas and the swamp. This has resulted in the die-off of swamp trees as previously discussed (Figure 1-14).

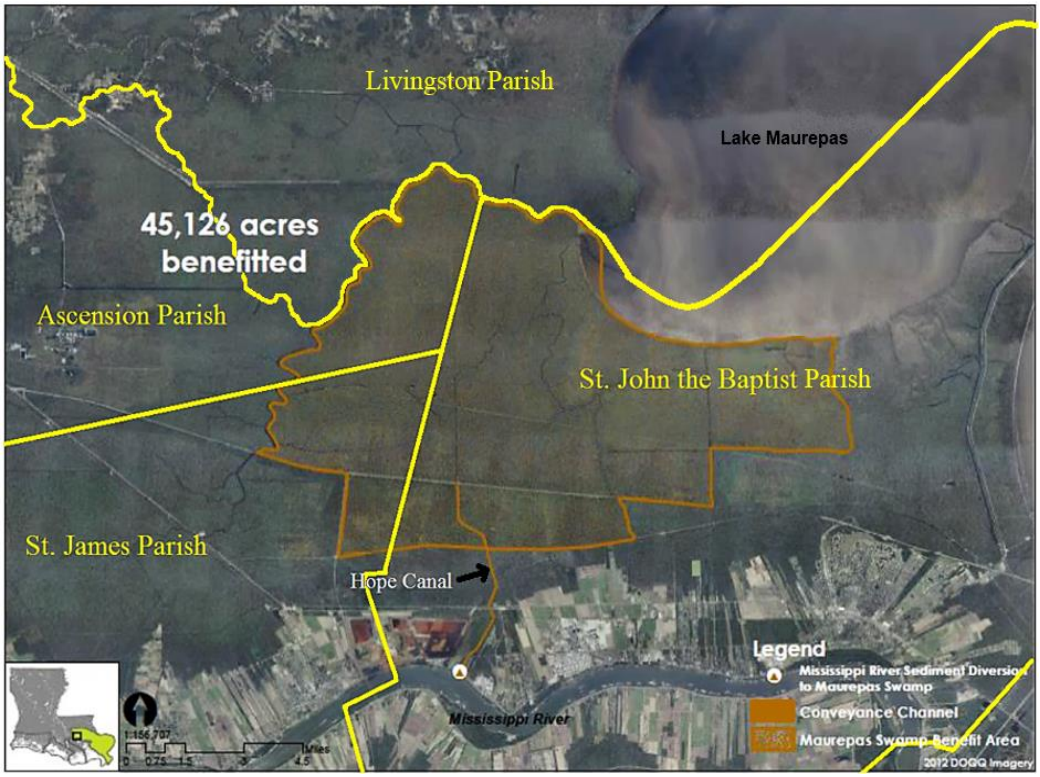


Figure 1-21. Area to benefit from Mississippi River Reintroduction into Maurepas Swamp Project.

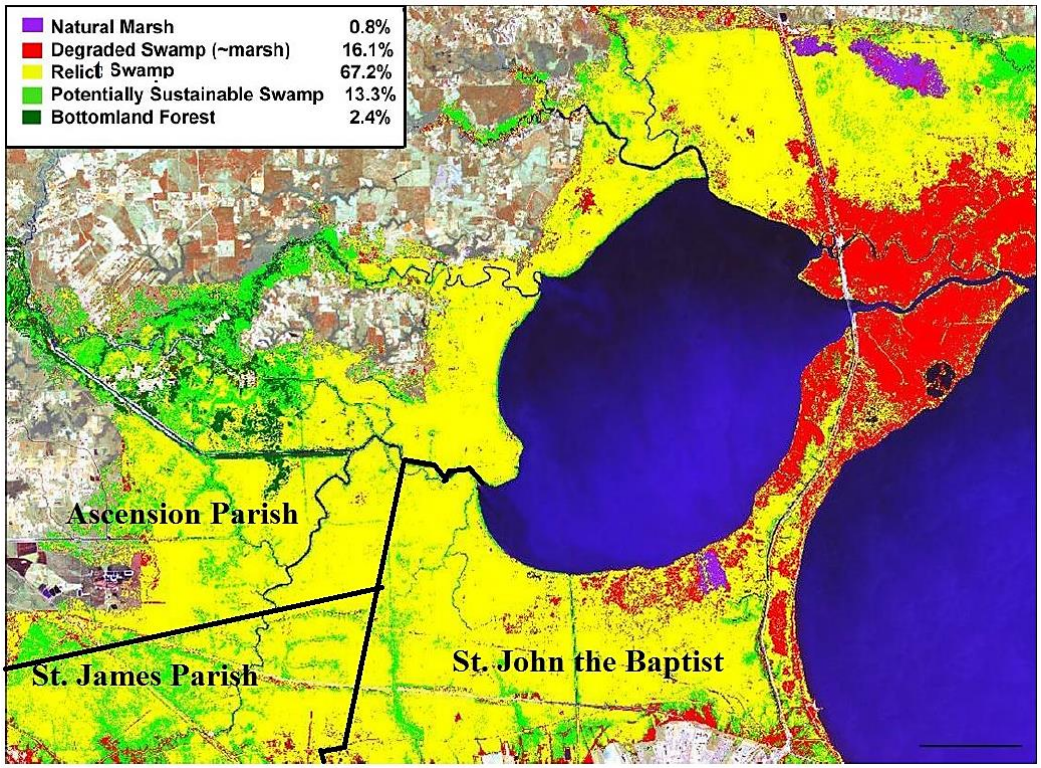


Figure 1-22. Map from Shaffer et al. (2009) showing areas in yellow and red where land elevation is too low for regeneration of cypress-tupelo swamp forest.

Reconnaissance-level hydrodynamic modeling, carried out as early as 2000 during drought conditions, showed that a discharge of 1,500 to 2,000 cfs. was sufficient to ensure that salinity in Lake Maurepas would not rise above the maximum tolerated by cypress and tupelo trees and that nutrient inputs from the Mississippi River would be largely assimilated by wetlands (Lee Wilson & Associates, Inc. 2001). A subsequent feasibility study showed that a 2,000 cfs. diversion using three 10 feet by 10 feet (10'x10') sluice-gated box culverts with a conveyance channel through Hope Canal could be constructed at a cost of $151,725,000 (URS 2007). A later analysis showed that desired results could not be achieved using an alternate proposal to siphon through pipes over the Mississippi River levee at that point (Table 1-11), and that supplementing siphons with pumps added about $10 million to construction costs and more than $1,200,000 a year in operation and maintenance to achieve performance comparable to that of the gated culvert intake (URS 2010). The Mississippi River Reintroduction to the Maurepas Swamp project was considered to be complete to the 30 percent design level in 2010, but apparently has not progressed beyond this point in the subsequent five years; though completion of the design and permitting are two of the primary objectives of the new RESTORE Act funding recently announced. The current project cost estimate is $186,900,265 (Zeringue 2014).

Table 1-11. Operating conditions during an average river year at the Garyville intake for three possible intake structures evaluated by URS in 2010.

Discharge Rate	Gated Intake Structure	Siphon System (8 pipes)	Siphon System (10 pipes)
≥ 2,000 cfs.	193 days	N/A	N/A
≥ 1,750 cfs.	215 days	80 days	117 days
≥ 1,500 cfs.	234 days	124 days	142 days
≥ 1,250 cfs.	252 days	150 days	157 days
≥ 1,000 cfs.	277 days	161 days	164 days
≥ 750 cfs.	325 days	164 days	168 days
≥ 500 cfs.	361 days	168 days	172 days
≥ 250 cfs.	365 days	168 days	172 days
Not Operational	N/A	197 days	193 days

Chapter 2

CHAPTER 2: PRINCIPAL RESOURCES

ESTUARIES/ WETLANDS AS A RESOURCE 2-2
RENEWABLE RESOURCES 2-5
BIOLOGICAL RESOURCES 2-5
AGRICULTURAL RESOURCES 2-7
RENEWABLE/NON RENEWABLE RESOURCES 2-7
LUMBER 2-7
NONRENEWABLE RESOURCES 2-8
OIL AND GAS 2-8
INDUSTRIAL RESOURCES 2-8
WATER RESOURCES 2-8
MISSISSIPPI RIVER 2-8
LAKE PONTCHARTRAIN 2-9
LAKE MAUREPAS 2-9
LAC DES ALLEMANDS 2-9
SCENIC WATERWAYS 2-10
RECREATIONAL RESOURCES 2-10
WILDLIFE MANAGEMENT AREAS (WMA'S) 2-11
MANCHAC 2-11
MAUREPAS SWAMP 2-11

Balancing the use and protection of renewable and non-renewable resources is a key variable in establishing and achieving development goals. The proper management of these resources can lead to long-term benefits for the environment as well as for the citizens of St. John the Baptist Parish. Renewable resources such as seafood, agricultural and forestry products, furs and hides, can be harvested by the residents and visitors of St. John for many years if the use of these resources is carefully managed and the environment supporting these resources is sustained. Lumber and other like renewable resources that take generations to reproduce are even more important in the balance and should be harvested sparingly and as a part of a reforestation plan. Non-renewable resources such as oil, gas, and other minerals contribute to St. John's economic base and provide a net benefit when extracted in an environmentally appropriate manner. Extraction of non-renewable resources can negatively impact renewable resources and lead to their depletion or degradation through unwise exploitation, bad management practices, or environmental damage such as pollution, habitat degradation, and land loss, which affect renewable resource productivity. In many instances, the cause of these changes can be traced directly or indirectly to human activities in the wetlands. These activities often happen independently of each other, and without coastal zone considerations their cumulative impacts are not taken into consideration. Overall policies, goals,

objectives and effective management programs and implementation procedures can help sustain renewable resources while allowing for multiple uses of St. John's resources (Coastal Environments Inc. 2013).

ESTUARIES WETLANDS AS A RESOURCE

St. John is divided by the nation's longest and largest river. The Mississippi River lies in two of the most prominent estuaries. St. John's East Bank is a part of the Pontchartrain Basin Estuary and St. John's West Bank is a part of the Barataria Basin Estuary.

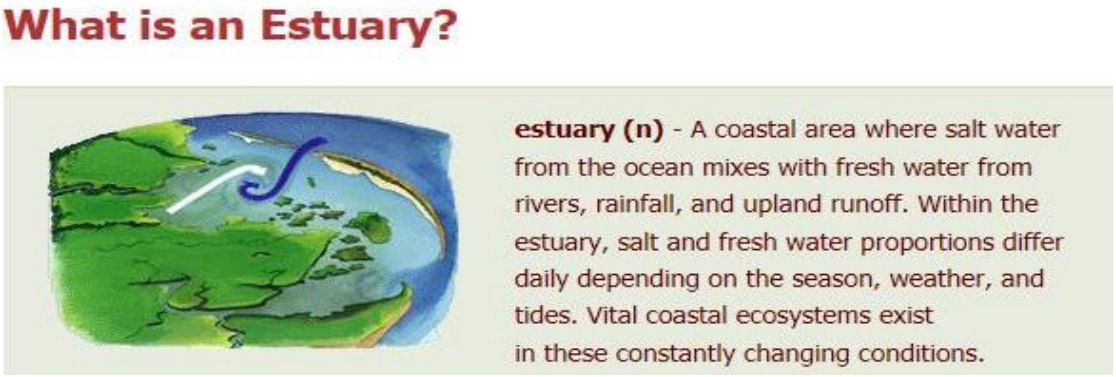


Figure 2-1: Estuary (Image Source: BTNEP http://www.btnep.org)

The East Bank is in the Upper Sub-basin of the Pontchartrain Estuary, in the Lake Maurepas region. This estuary has been recognized as a national resource and its protection falls under the Lake Pontchartrain Basin Foundation.

Figure 2-2: Lake Pontchartrain Basin Foundation Logo (www.saveourlake.org)

Figure 2-3: Lake Pontchartrain Estuary (www.saveourlake.org)

Lake Pontchartrain Basin Foundation (LPBF) was established in response to environmental concerns voiced throughout the Basin. As the public's independent voice, LPBF is dedicated to restoring and preserving the water quality, coast, and habitats of the entire Pontchartrain Basin. Through coordination of restoration activities, education, advocacy, monitoring of the regulatory process, applied scientific research, and citizen action, LPBF works in partnership with all segments of the community to reclaim the Basin for this and future generations.

The Lake Pontchartrain Basin is a 10,000 square mile watershed encompassing 16 Louisiana parishes including St. John the Baptist.

The West Bank of St. John is located in the northern reaches of the Barataria Estuary and is a part of the Barataria-Terrebonne National Estuary Program.

Figure 2-4: Barataria-Terrebonne National Estuary Program Logo (Image Source: www.btnep.org)

The Barataria-Terrebonne Estuary is "One of the most expansive and production estuaries in the world" and many of St. John's renewable and non-renewable resources are a part of this productive system.

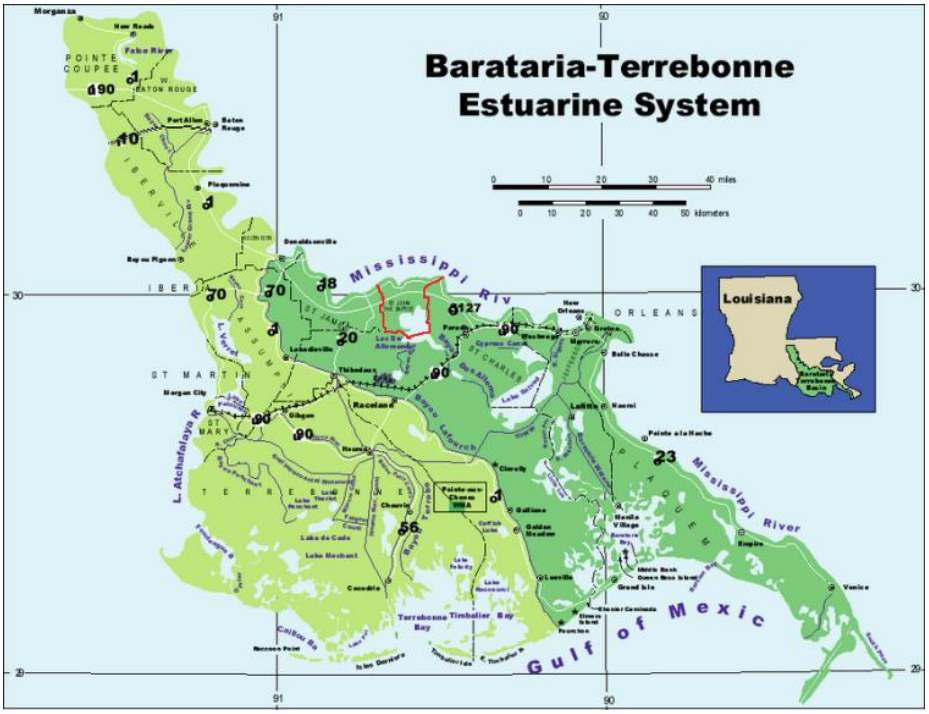


Figure 2-5: The 16 parishes included in the Barataria-Terrebonne National Estuary System with St. John outlined in red. (Image Source: Spahr Seafood www.spahrseafood.com)

The entire WBMZ is located in the Barataria Basin of the Barataria-Terrebonne National Estuarine System. The estuary is located between the Mississippi and Atchafalaya Rivers, and Bayou Lafourche, bisects the system into two basins; Barataria to the East and Terrebonne to the West. The Barataria-Terrebonne National Estuary Program (BTNEP) includes all or parts of 16 parishes (Figure 6-2). The goal of BTNEP is to recognize, preserve and restore the wetlands, and the associated biology therein, of Louisiana for the enjoyment of future generations.

The dynamic combination of physical and biological factors produces an ecosystem unrivaled in productivity and commerce. In addition to providing natural habitat and recreational resources, St. John's swamp, salt and freshwater marshes and shallow estuarine water bodies provide critical water management functions including storm buffering, water retention and water filtration (U.S. EPA, 2016; Louisiana Coastal Wetland Conservation and Restoration Task Force, 2015).

Healthy Wetlands and coastal buffers serve three very important functions for coastal populations, they are:

1. The wetland can act as a "sponge" that absorbs, stores, and filters water in time of intense rainfall or flooding, thereby reducing the impact of flood events on adjacent developed areas.
2. The wetland also acts as a natural filter that removes sediment and pollutants from the water that it receives, so that the water that is returned to streams and groundwater sources is cleaner than when it entered the wetland.
3. Wetlands and coastal buffers can also reduce the impact of storm surges and hurricane forces on flood protection structures such as levees, thereby bolstering the capacity of man-made storm protection. (U.S. EPA, 2016; Louisiana Coastal "Wetlands Conservation and "Restoration Task Force, 2015)

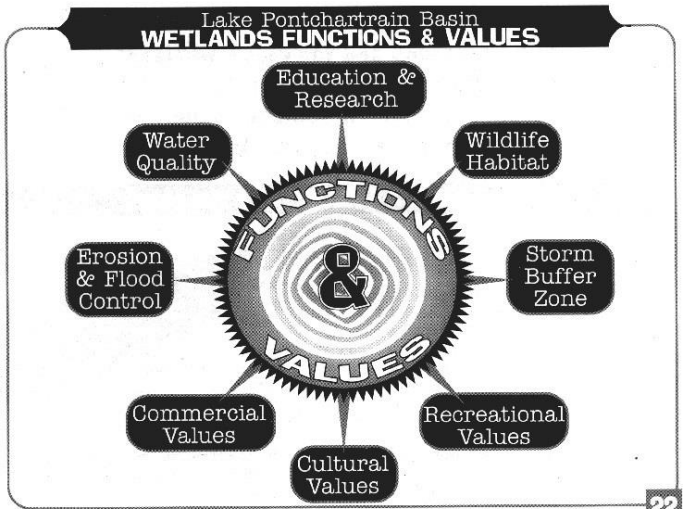


Figure 2-6: Wetland Functions and Values (Image Source: USGS http://pubs.usgs.gov)

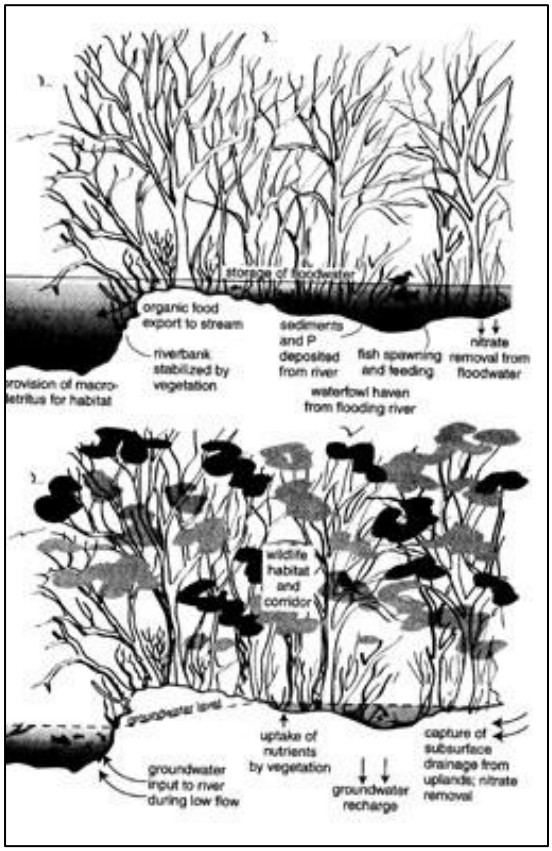


Figure 2-7: Wetland Infiltration Functions (Image Source: Mitsch and Gosselink, 2000 via www.water.ncsu.edu)

RENEWABLE RESOURCES

BIOLOGICAL RESOURCES

Louisiana's swamp, salt and freshwater marshes and shallow estuarine water bodies are among the most productive nursery grounds in the world for over 100 species. The extensive wetlands of St. John are extremely productive for commercially and recreationally harvested seafood and contribute to making Louisiana the premier state in the annual production of fisheries products (Coastal Environments Inc. 2013). While considered by most as an interior parish, the shore of Lake Pontchartrain is considered an arm of the Gulf of Mexico, and combined with resources harvested in Lake Maurepas and Lake Des Allemands, St. John Parish supports extensive seafood production. According to the LSU AgCenter, 40,647 lbs. of shrimp were harvested by St. John fishermen in 2013, and 35,100 lbs. of crab. Over the last fourteen years it can be concluded that crabs were harvested more often and usually grossed higher than shrimp. An assessment of the magnitude of commercial harvesting of renewable resources and trends in the recent past can be derived from reviewing 2000 through 2013 Wildlife and Fisheries production data in Table 2-1.

Year	Commercial Fishermen	Vessel License	Shrimp Trawl	Crab Traps
2000	204	197	155	58
2001	215	200	160	58
2002	218	216	163	69
2003	201	196	140	66
2004	181	172	109	70
2005	144	153	95	57
2006	127	131	83	54
2007	125	138	83	65
2008	112	115	72	58
2009	108	125	72	60
2010	110	125	74	62
2011	114	122	65	55
2012	107	116	64	51
2013	106	115	59	50

Table 2-1: Resident Commercial License Sales, St. John: 2000-2013 (LDWF).
http://www.wlf.louisiana.gov/licenses/statistics

Figures 2-1, 2-2, and 2-3 are used to show the relationship between fishing license sales and the amount of crabs and shrimp produced in St. John as of 2013, and the numerical data can be found on the LSU AgCenter's website. Crab trap license appear to be fluctuating normally along with production levels. Shrimping license sales, however, are decreasing steadily and the production level data does not match that trend. From 2000 to 2008 shrimp production drastically decreased, from 2010 to 2013 those numbers shot up much higher than previously recorded years, and 2004 through 2006 and again in 2009 there was no data recorded for shrimp production.

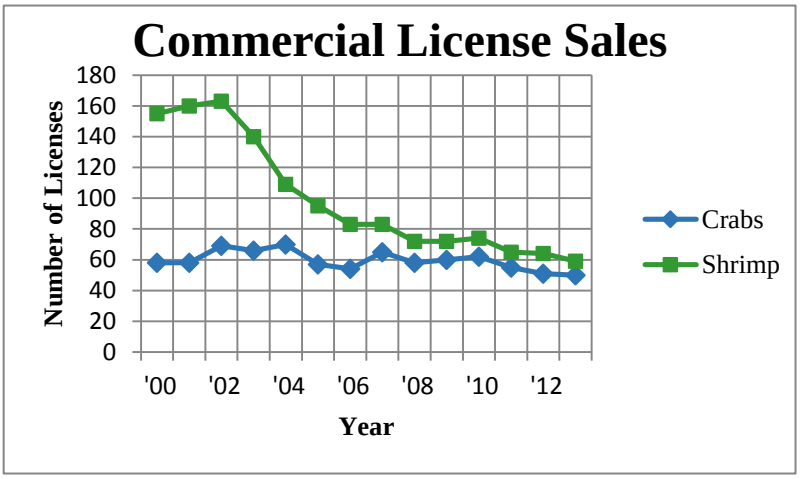


Figure 2-1. Shows the number of shrimp license compared to crab licenses sold as of 2013.

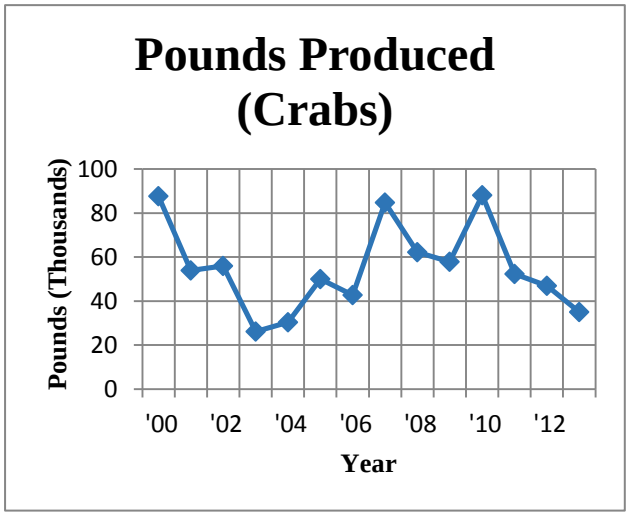


Figure 2-8: Blue crab (Image Source: Getty Images)

Figure 2-2. Shows crabs produced by the pound in thousands.

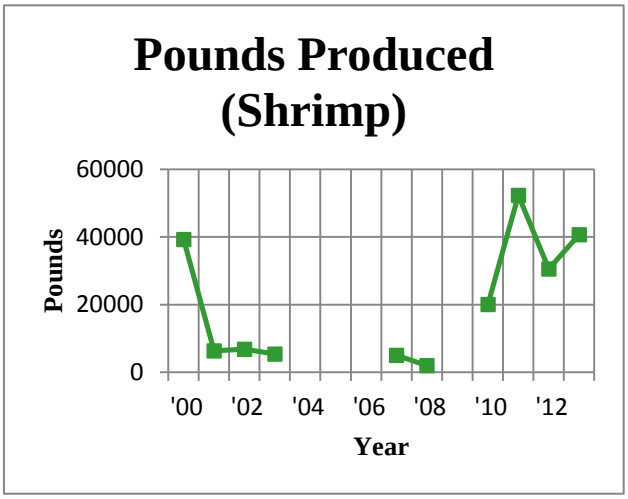


Figure 2-3. Shows shrimp produced by the pound.

AGRICULTURAL RESOURCES

After the Louisiana Purchase, American capital flowed into Louisiana, bringing about the consolidation of smaller land holdings into great plantations. However, the hard working farmers of the First German Coast did not sell their land as did their Acadian neighbors on the Second German Coast and the Acadian Coast. Settlements remained small and, through inheritance, land holdings became progressively established (Coastal Environments Inc. 2013).

Figure 2-9: Sugarcane harvest at Evergreen Plantation (Image source: www.evergreenplantation.org)

The proximity of the Port of New Orleans and the demand for sugar stimulated the rapid development of sugar production. Several sugarcane plantations were established in St. John, the earliest being Godchaux-Reserve Plantation. The other major sugar producer was Evergreen Plantation which was established around 1820, and to this day it continues to be a large, privately owned, working sugar plantation. Also, San Francisco Plantation was once a great sugar producer and was located on the East Bank near the present day Marathon Oil Refinery in Garyville.

According to the LSU AgCenter, sugar cane was the number one commodity harvested in St. John with 54,316,080 pounds of raw sugar and 1,626,498 gallons of molasses produced in 2013. Two other notable crops would be tomatoes at 252,000 pounds and soybeans at 62,176 pounds produced in 2013. Overall, plant related enterprises rank first, animal enterprises second, and fish and wildlife enterprises rank third in the St. John's agriculture summary.

RENEWABLE/NON RENEWABLE RESOURCES

LUMBER

Prior to 1880, timber production was small and only met local needs, but the lumber boom in the early 1900s put Louisiana first in the country for lumber production. St. John only had two major lumber mills; one in Ruddock, which was destroyed in 1915 by a hurricane, and the other in Garyville.

Founded in 1903, the Lyons Cypress Lumber Company, located in Garyville, was the center of cypress logging in St. John. Although the lumber mill closed down, some years later, the town itself retained enough infrastructures to grow on its own and still exists today. Also, the Garyville Timber Museum is dedicated to preserving and presenting the rich history of lumber in St. John. Today, most milling has ceased due to past over-logging and a lack of virgin forests.

NONRENEWABLE RESOURCES

OIL AND GAS

The accelerated growth of St. John can be directly linked to the explosion of Outer Continental Shelf (OCS) oil and gas exploration activity that occurred in south Louisiana. From the period of 1954 through 1974, 1,578 oil exploration leases were granted on Louisiana OCS: the total for the United States OCS was 2,384. The economic feasibility of developing a new source of raw materials stimulated industrial development. Much of the new investment in U.S. Petroleum Extraction and refining activities in the past three decades has been in Louisiana with the bulk located in the state's coastal zone. The coastal zone parishes are attractive to petrochemical industries because of water networks that allow bulk products to be removed economically.

INDUSTRIAL RESOURCES

St. John is located in the heart of Louisiana's sugarcane industry between Baton Rouge and New Orleans. Two major interstate highways (I-10 and I-55), four main-line railroads, close proximity to Louis Armstrong New Orleans International Airport and the Port of South Louisiana Executive Regional Airport, and the Globalplex Intermodal Terminal comprise St. John's superior transportation infrastructure, which opens industry to North America and the world.

WATER RESOURCES

MISSISSIPPI RIVER

St. John's most prominent waterway is the Mississippi River. The river is home to the Port of South Louisiana, which stretches 54 miles along the River and is the largest tonnage port district in the western hemisphere. As of November 2014, the port has moved almost 290 million tons of material through its facilities, and as of 2012, the facilities within St. Charles, St. John, and St. James parishes handled over 278 million short tons of cargo brought to its terminals via vessels and barges (2014 PSL). Also, the Mississippi River Corridor provides petrochemical industries efficient transportation to the national market place. Large portions of the local and regional economy depend on the Mississippi River, and both the Port of South Louisiana and the Port of New Orleans are designated a Foreign Trade Zone (Roberts 2011).

Figure 2-10: The Veterans Memorial Bridge/Gramercy Bridge crosses the Mississippi River at the parish's eastern border (Image Source: www.geocities.ws/hardyawn/LAvmb.html)

LAKE PONTCHARTRAIN

The lake was created 2,600 to 4,000 years ago as the evolving Mississippi River Delta formed its southern and eastern shorelines. It covers an area of about 403,200 acres (630 mi^2) with an average depth of 12 to 14 feet (3.7 to 4.3 m). Lake Pontchartrain is not a true lake but an estuary connected to the Gulf of Mexico via the Rigolets Strait and Chef Menteur Pass into Lake Borgne, and therefore experiences small tidal changes. It receives fresh water from the many rivers, bayous, and canals that drain into the lake. Salinity varies from negligible at the northern cusp, west of Mandeville, up to nearly half the salinity of seawater at its eastern bulge near I-10 (2014 LP). It is one of the largest wetlands along the Gulf Coast of North America, and is comprised of more than 125,000 ha (hectares) of wetland. The lake is located in parts of St. Tammany, Tangipahoa, St. John, St. Charles, Jefferson, and Orleans and parishes. The lake teems with game birds, aquatic birds, and fish, so Lake Pontchartrain provides the residents and visitors of St. John opportunities for hunting, fishing, nature study, and boating as well as other recreational activities.

LAKE MAUREPAS

Lake Maurepas is an over 59,000 acre estuarine lake located west of Lake Pontchartrain and between New Orleans and Baton Rouge. The lake is easily traveled by boat with its average depth around 10 feet and can be accessed through other water ways leading into it such as Blind River, Amite River, Tickfaw River, Natalbany River, Pass Manchac, and North Pass. The lake is connected to Lake Pontchartrain via Manchac Pass and North Pass which is why the lake sometimes contains trace amounts of salt water along its eastern shoreline, but high salinities are kept at bay by the inflow of fresh water from the Tickfaw, Amite, and Blind Rivers. Fishing and hunting, along with other recreational activities, bring residents and visitors alike to the lake every year.

Lake Maurepas in Louisiana Photo by Sean Gardner—The Conservation Fund
http://louisianaconservationist.org/2012/05/maurepas-swamp-wma/

LAC DES ALLEMANDS

Lac des Allemands is a natural 12,000-acre lake located about 25 miles west of New Orleans. Lac des Allemands is a shallow lake, with a maximum depth of 10 feet and an average depth of five feet. Lac des Allemands is located mostly in St. John and partly in Lafourche and St. Charles parishes (2014 LDA). Lac des Allemands is fed by numerous bayous in the Barataria Basin, and is full of wildlife providing excellent hunting, fishing, and recreational opportunities for the visitors and residents of St. John.

SCENIC WATERWAYS

A natural or scenic river is a river, stream or bayou that is in a free-flowing condition and has not been altered by channelization or realignment. A stream can also be classified as "scenic" if it has been altered, but contains native vegetation and has little or no man-made structures along its bank (Coastal Environments Inc. 2013). St. John has one designated scenic river in the Louisiana Natural and Scenic Rivers System. Blind River is located from its origin in St James parish to its entrance into Lake Maurepas. The LDWF administers the scenic river system and protects these streams from the effects of channelization, channel realignment, clearing and snagging projects, and reservoir construction projects.

The scenic river system is designed to protect the overall ecology of the stream including the wildlife, vegetation, and hydrology. Scenic stream designation is also designed to preserve the wilderness qualities, scenic beauty, archaeological resources, and other features of the stream or bayou. Nationally, all scenic river streams are used for recreational activities such as boating (which includes canoeing and kayaking), fishing, and nature study (Coastal Environments Inc. 2013).

RECREATIONAL RESOURCES

All across St. John there are many sources of recreation that can amuse people of any age. The many bayous, canals, and tributaries offer an endless variety of freshwater fishing, and Lakes Pontchartrain and Maurepas offer both fresh and saltwater fishing opportunities. Also, most of these areas can be accessed by the six public and private boat launches located throughout St. John. Activities like fishing, swamp tours, recreational boating, and canoeing are popular among the residents and visitors of the parish.

St. John is dotted with many exclusive sites that can be visited year-round. One of the most popular is Cajun Pride Swamp Tours in LaPlace located near the I-10, I-55, and Hwy. 51 intersection, which offers city and plantation tours as well. There are two plantation homes located in the parish that attract visitors, these are: Evergreen Plantation and San Francisco Plantation. Another major attraction is the Andouille Festival held on every third weekend in October since 1972. Also, the parish participates in the Christmas Eve Bonfire Celebration; an event where hundreds of large bonfires are lit along the Mississippi River levees to "light the way for Santa Claus" the night before Christmas.

Figure 2-11 – Cajun Pride Swamp Tour
http://www.tourlouisiana.com/content.cfm?id=18

WILDLIFE MANAGEMENT AREAS (WMA's)

Figure 2-12: Cajun Pride Swamp Tours (Image Source: Eric Wolverton, 2016)

MANCHAC

Manchac Wildlife Management Area (WMA), located in the uppermost portion of St. John about 17 miles north-northeast of LaPlace, was purchased from E.G. Schlieder in 1975. The area covers approximately 8,328 acres and entrance to the interior of the area is presently limited to various canals. The topography is characterized by flat, low marshland subject to flooding, especially with easterly winds. Major vegetation in the past was originally bald cypress, but nearly all of this has been tagged from the area leaving an open freshwater marsh. There is a shallow freshwater pond, known as the Prairie, near the Lake Pontchartrain shoreline comprising approximately 500 acres in which pirogues and mud-boats are the major means of transportation.

Predominant vegetation includes bull-tongue, smartweed, alligator weed, and spartina. Submerged aquatics are naiads, pondweeds, fanwort, and coon-tail. A strip of cypress/tupelo forest is present along the Lake Pontchartrain boundary. The canopy is generally open and the understory consists of black willow, maple, palmetto, baccharis, and assorted grasses. The most sought after game species are waterfowl including scaup, mallard, teal, gadwall, widgeon, shoveler, coot, and rail. Other species hunted include snipe and rabbits. Permit trapping for alligator, nutria, muskrat and raccoon is normally allowed each year. About 50 wood duck nesting boxes have been located at various locations to make up for the lack of mature trees with cavities in them and these man-made nesting sites have been eagerly accepted by the birds. Also, both bald eagles and ospreys have been sighted nesting in the area as well.

Bald Eagle Atop Cypress Tree - Lake Martin, Louisiana
Flickr 2010 image Hunter 1
https://www.flickr.com/photos/imagehunter1/5301978362

MAUREPAS SWAMP

Maurepas Swamp WMA is located approximately 25 miles west of New Orleans and along the south shore of Lake Maurepas west to near Sorrento. The WMA includes property in Ascension, Livingston, St. John, St. James and Tangipahoa parishes. Donations and funding to the Louisiana Department of Wildlife and Fisheries (LDWF), along with subsequent property acquisitions, have raised the WMA acreage total to 122,098. The majority of access into the area is by boat, but there are several portions that can be accessed by foot. Major

highways crossing through the area are I-10, I-55, Hwy. 61, Hwy. 51, and LA 641. Major waterways in the area are Blind River and the Reserve Flood Relief Canal.

Black-bellied Whistling Ducks Photo by: Greg Schneider
https://www.gschneiderphoto.com/gallery3/birds/ducks/Black-bellied-Whistling-Duck/black-bellied-whistling-duck-pair_7042

Major topography consists of flooded cypress tupelo swamp. Water levels in this area are influenced by rain, wind, and tides. Other vegetation found on the WMA includes bull-tongue, cattail, submerged aquatics, red maple, American elm, sugarberry, Nutall oak, water oak, and obtusa oak. Invasive species include water hyacinth, *Bidens* sp., and an aquatic fern known as common salvinia. The presence of this invasive vegetation has made much of the area unsuitable for the large numbers of waterfowl that historically overwintered in this vast swamp. The most sought after species of game are white-tailed deer, squirrels, and rabbits. Freshwater fish, such as largemouth bass, sunfish, and crappie are also pursued on the area. Contract trapping for alligators and permit trapping for nutria is allowed each year. Maurepas Swamp WMA supports numerous bird species throughout the year; bald eagles and osprey nest in and around the WMA. Numerous species of neo-tropical migrants utilize this coastal forest habitat during fall and spring migrations. Resident birds, including wood ducks, black-bellied whistling ducks, egrets, and herons can be found on the WMA year round.

Future plans for the Maurepas Swamp WMA include the placement and monitoring of additional wood duck nest boxes and cooperative freshwater reintroduction projects designed to revive the swamp and improve control of invasive plant species that have overtaken much of this important and scenic swamp.

Chapter 3

CHAPTER 3: SOCIO-ECONOMIC CHARACTERISTICS

BRIEF HISTORY OF ST. JOHN THE BAPTIST PARISH 3-1
DEMOGRAPHICS 3-4
PAST POPULATION TRENDS 3-4
EDUCATION & EMPLOYMENT 3-4
EDUCATION 3-4
EMPLOYMENT 3-5
LAND USE PROJECTIONS 3-5
FEDERAL AND STATE PROJECTS AFFECTING THE COASTAL AREA 3-7
THE USACE, WEST SHORE LAKE PONTCHARTRAIN LEVEE PROJECT 3-9
RESERVE/GLOBALPLEX INTERMODAL TERMINAL TO I-10 3-10
GROWTH EFFECTS ON MANAGEMENT UNITS 3-10
CONCLUSIONS 3-11

The parish of St. John the Baptist is located northwest of the City of New Orleans along the Mississippi River. This Chapter examines social, economic, and growth trends in the community.

BRIEF HISTORY OF ST. JOHN THE BAPTIST PARISH

The second permanent settlement in Louisiana was established in St. John the Baptist Parish approximately thirty-five miles northwest of New Orleans along the Mississippi River in the general vicinity of the place known today as Lucy.

The parish has been titled “La Cote des Allemands”, “Creole Parish”, “Golden Coast” or “Cote d’Or” and its French name, “St. Jean Baptiste”; but the term most frequently affixed to the region has been the “German Coast”, as the first European settlers to the area were primarily Germans. The governmental unit evolved from the German Coast colonial district that included the ecclesiastical parishes of St. John the Baptist and St. Charles, to the county of the German Coast, to a civil parish, which retained through the present day, the original name given to the church parish that encompassed the region.

Iberville traveled Bayou Manchac in Iberville Parish, looking for a shortcut to the Gulf. He continued through Blind River and the area that is now St. John the Baptist Parish. He named the first lake bordering the region Lake Maurepas, in honor of Count Maurepas of France, and the second lake he named Lake Pontchartrain, in honor of Count Pontchartrain of France. The connection between the lakes he named Pass Manchac, in honor of a Manchac Native American guide.

The territory was first explored by Iberville in 1699.

The date of the first settlement in today's St. John is not definitely known. However, a document known as the census of 1724 records the founding of a second German village in this area, suggesting the first village was established soon after the founding of New Orleans – likely around 1719. The exact locations of the villages are not known other than that they were set back from the Mississippi River. The two villages were destroyed and many of the inhabitants were drowned by a hurricane in September 1721. It is assumed these early settlers were the twenty-one German families, urged by John Law's Western Company to come to Louisiana, arriving in 1719 on the ship Les Deux Freres. In October 1721, another group of settlers, mostly German, arrived in Biloxi on the ship Portefaix, under the leadership of Karl Fredric D'Arensbourg, who brought news to the New World of the collapse of John Law's "Mississippi Bubble." When the group under D'Arensbourg arrived in New Orleans, they were met by the Germans from the settlements of the Arkansas River, who had abandoned their homes. With the aid of Bienville, the Arkansas River settlers were persuaded to join the new colonists, and the combined group founded a new settlement midway between the older villages. These settlements were called "bourgs" by the Germans. The new settlement was called Karlstein, the area now known as Lucy, after their leader, D'Arensbourg, who served more than forty years as commander and judge of the German Coast. D'Arensbourg's grandson, Jacques Villere, was born at Lucy and became the second governor of the State of Louisiana. He was the first Creole (Louisiana born) person to hold that office.

The area remained under the French regime until 1768, when France delivered Louisiana to the Spanish. At this time the Acadians or "Cajuns" began arriving in South Louisiana after being exiled from Nova Scotia. The first Acadian settlement was established at what is now called Wallace. The French and German cultures mixed, with French becoming the dominant language. German names were given French translations. For example, Heidel became Haydel, Ruber became Oubre, and Treagor became Tregre.

In these early years, transportation was by boat, some on the Mississippi River, which was treacherous, but mainly on the many bayous and lakes. Few roads existed. Observation posts were built along the river where women kept lookout for Native Americans.

The alluvial plain lands of St. John, with elevations of nine (9) feet or more above sea level, proved to be excellent farmland. German settlers grew crops that often fed early New Orleans, which otherwise would have fallen victim to famine when supply ships failed to arrive from Europe. These settlers would paddle their small boats filled with produce to sell at "The French Market" along the New Orleans riverfront. They were devout Catholics and the Church was the center point of most activities in these frail communities. Weddings, christenings and funerals were usually attended by the entire community.

In 1805 the territory of Orleans was divided into twelve counties. The county of the German Coast was one of these. Later this was divided into nineteen parishes, of which St. John was one. It received its name from the religious parish of St. John the Baptist. Originally the parish seat was established in the village of Lucy and was later moved in 1848 to Edgard.

Louisiana is known for interior divisions known as Parishes, but in 1805 early U.S. officials divided the newly purchased territory into counties.

The Jesuit fathers were the first religious order to settle in the area. The parish contains several ancient cemeteries. One of them, the Edgard cemetery, has been in existence since the first church was built. The church was constructed of handmade cypress lumber in the year 1722. In 1918 when the second church burned down the people of Edgard contributed $90,000 in one day to build another. This beautiful, twin-spire red brick church still stands today. It became apparent that a church was needed for the people on the east bank, so in 1869 a wooden church was built, St. Pierre. Later in 1897, the beautiful St. Peter Church was constructed and stood for almost 100 years before being destroyed by Hurricane Betsy in 1965.

Sugar was introduced by the Jesuit Fathers in 1751 and took precedence over other crops and industries. In 1758 Joseph Dubreuil was the first man to erect a sugarhouse. In 1860 Leon Godchaux, owner of Reserve Plantation and other properties, conceived the idea of centralization in processing. In 1917 a refinery was added to the factory. Godchaux Sugars remains a landmark.

There are no incorporated municipalities in St. John, On the west bank of the Mississippi River lie the communities of Lucy, Edgard and Wallace. These communities retain the rural origins and sugarcane production that dominates both the business and landscape of the area. LaPlace, Reserve, Lions, Garyville and Mt. Airy are located on the east bank. Many large industries can be found along the Mississippi River front. These include DOW Chemical in LaPlace, grain storage and shipping operations, Mount Airy Refinery, and the various businesses and industries to be found in and around the Port of South Louisiana's Globalplex site in Reserve. Approximately half of the St. John population is concentrated in LaPlace.

In 1980, St. John adopted a Home Rule Charter government. The parish currently features seven geographically-defined Council districts, as well as two At-Large districts. An elected Parish President supervises the day to day administrative activities of the parish.

DEMOGRAPHICS

Past Population Trends

Since 1960, the population and economy of St. John have undergone substantial change. Population growth in St. John during the past 60 years is attributed to industrial development in the parish, regional transportation system improvements, and growth of the New Orleans metropolitan area. Population statistics for St. John 1960 to 2010 are shown in Table 3-1.

Table 3-1: St. John the Baptist Parish Population Statistics

Year	1960	1970	1980	1990	2000	2010
Population	18,439	23,813	31,924	39,996	43,044	45,924
% Change		29.1%	34.1%	25.3%	7.6%	6.7%

County and City Data Book (years 2007, 2000 and 1972) and
http://www.sjbparish.com/ecodev_demographics.php?id=162

The parish's population growth declined through 2010 and between 2010 and 2014 it is estimated that the population has actually declined with an estimated population of 43,745 in July 2014. According to the 2000 Census, approximately 93% of the population and the housing units were on the East Bank of the River. LaPlace is by far the largest community with a 2010 population of 29,872, representing 65% of the parish population. Other communities include Reserve (9,766) and Garyville (2,811) on the East Bank of the Mississippi River, and Wallace (671), Edgard (2,441) and Lucy (no population breakdown available) on the West Bank.

EDUCATION & EMPLOYMENT

EDUCATION

St. John the Baptist Parish has over a dozen public and private schools. Total yearly enrollment is approximately 6,355 students (2015 St. John Public School Board). The South Central Louisiana Technical College has a campus in Reserve that provides Vocational-Technical Education to students in the river parish region. There are approximately nine colleges and universities located within a few hours of St. John, including schools in the Baton Rouge, New Orleans, Hammond, and Thibodaux areas.

Currently, the St. John School Board is rebuilding some of the structures in response to flood damage caused by Hurricane Isaac in 2012.

EMPLOYMENT

The largest employers in St. John are part of the petrochemical industry and include but are not limited to: ADM (Reserve), Bayou Steel, Marathon Ashland Petroleum, DuPont, Dow, Degussa (formerly Stockhausen Louisiana), Cargill, Inc., Louisiana Machinery, Diversified Well Logging LLC, NALCO, and Shell Chemical Company. The Port of South Louisiana's Globalplex Facility in Reserve is another major job center. At this location there are numerous businesses, both large and small, that serve or rely upon maritime transportation and warehousing interests on the Mississippi River.

While the local economy remains stabilized, the main components of the economy are subject to global forces. These include the cost of petroleum products and steel. Global demand and supply in these markets determine local industry outputs and need for labor and materials. The sugarcane and chemical industries are also vulnerable to international influences. Agriculture and industry dominate the West Bank landscape while efforts to continue economic diversification and promotion continue. In particular, St. John seeks to attract those businesses that encourage the sustainable use of the region's natural resources.

LAND USE PROJECTIONS

St. John the Baptist Parish regulates both the development and use of land through a variety of parish codes. These include subdivision development, floodplain management and zoning ordinances. These regulations are designed to guide development so that it is both sustainable and in an area best suited to the particular use. Through its zoning ordinance, St. John has specified areas that are best suited for residential, commercial or industrial growth.

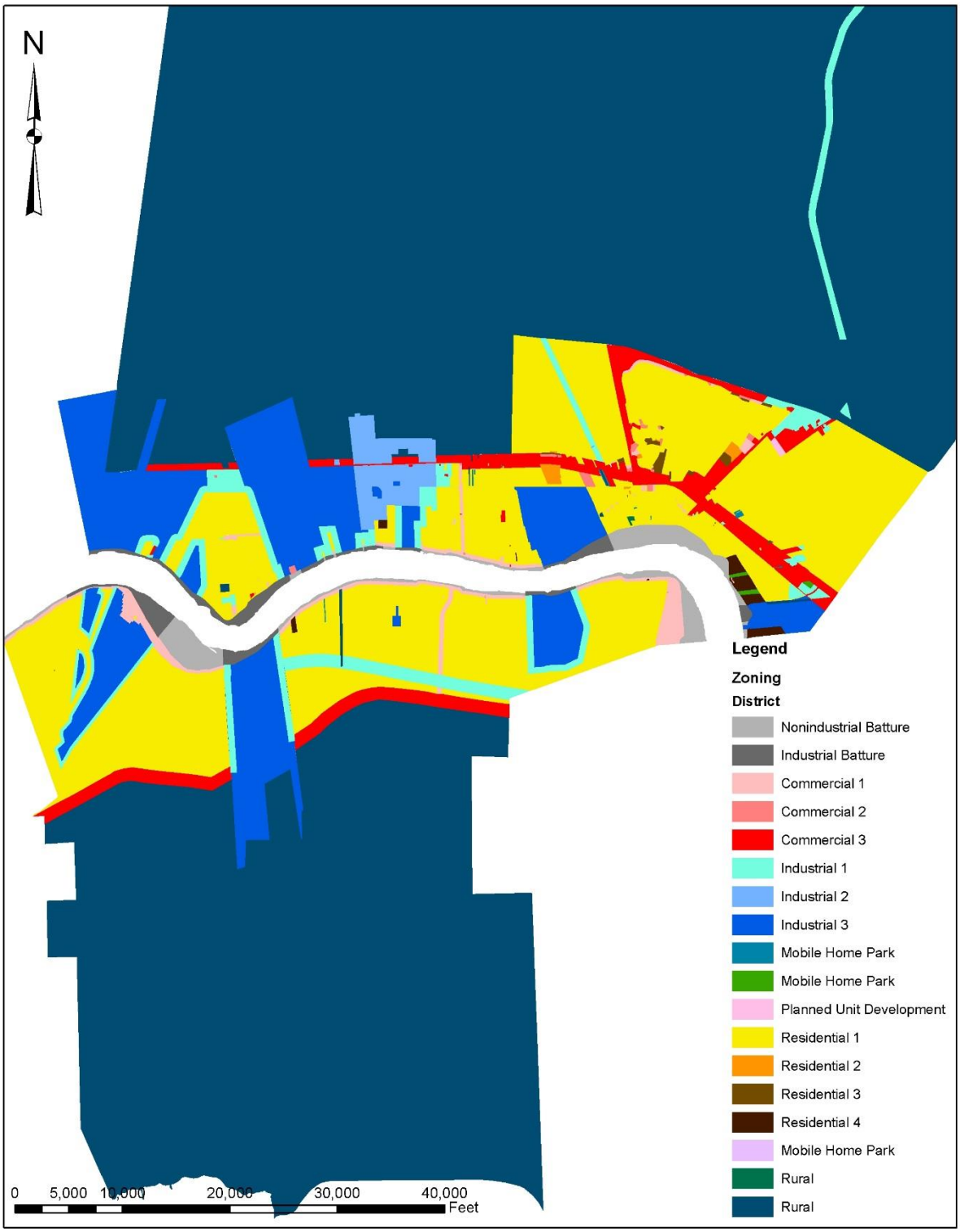


Figure 3-1: Zoning Map of St. John

The area in which land development will most likely continue is the narrow band of high land between the Mississippi River and Interstate 10 (I-10) in the East Bank Community (EBC) EMU. Some development may occur along Highway 51 (Hwy. 51) in the Pass Manchac area. This is the site of some recreational homes and it is conceivable that some infill development could be accommodated. However, the unsuitability of the soils for development and the presence of the Manchac Wildlife Management Area in this area will further limit use and growth along Hwy. 51. In the West Bank Community (WBC) EMU, development may continue in the vicinity of the Veterans Memorial Bridge in Wallace consistent with development along Hwy. 3127 near Vacherie in St. James Parish.

The Port of South Louisiana has developed a 335 acre maritime industrial park in Reserve, called the Globalplex Intermodal Terminal. This site is promoted to industries and businesses needing water frontage or proximity to it, rail side properties, and easy access to major highways and major airports in both Baton Rouge and New Orleans. Other major industrial facilities outside of the immediate Globalplex site include Marathon/Ashland Petroleum refinery in Garyville, and DOW Chemical and Bayou Steel in the LaPlace area.

FEDERAL AND STATE PROJECTS AFFECTING THE COASTAL AREA

The Veterans Memorial Bridge crosses the Mississippi River at Wallace and Gramercy. On the Gramercy (St. James Parish) side of the River, the bridge is connected directly to Interstate 10 (I-10), approximately five miles north of the River. On the South (and West) side of the River, there is access from the bridge to the River Road (Hwy. 18) and continuing to Hwy. 3127 into St. James Parish. The State of Louisiana is now conducting environmental and feasibility studies to develop a North/South connection to the bridge from Hwy. 90 in Gray, Louisiana. While the study is underway, it is a project that St. John the Baptist Parish may want to monitor for potential impacts on the northern and western swamps that fringe Lac des Allemands.

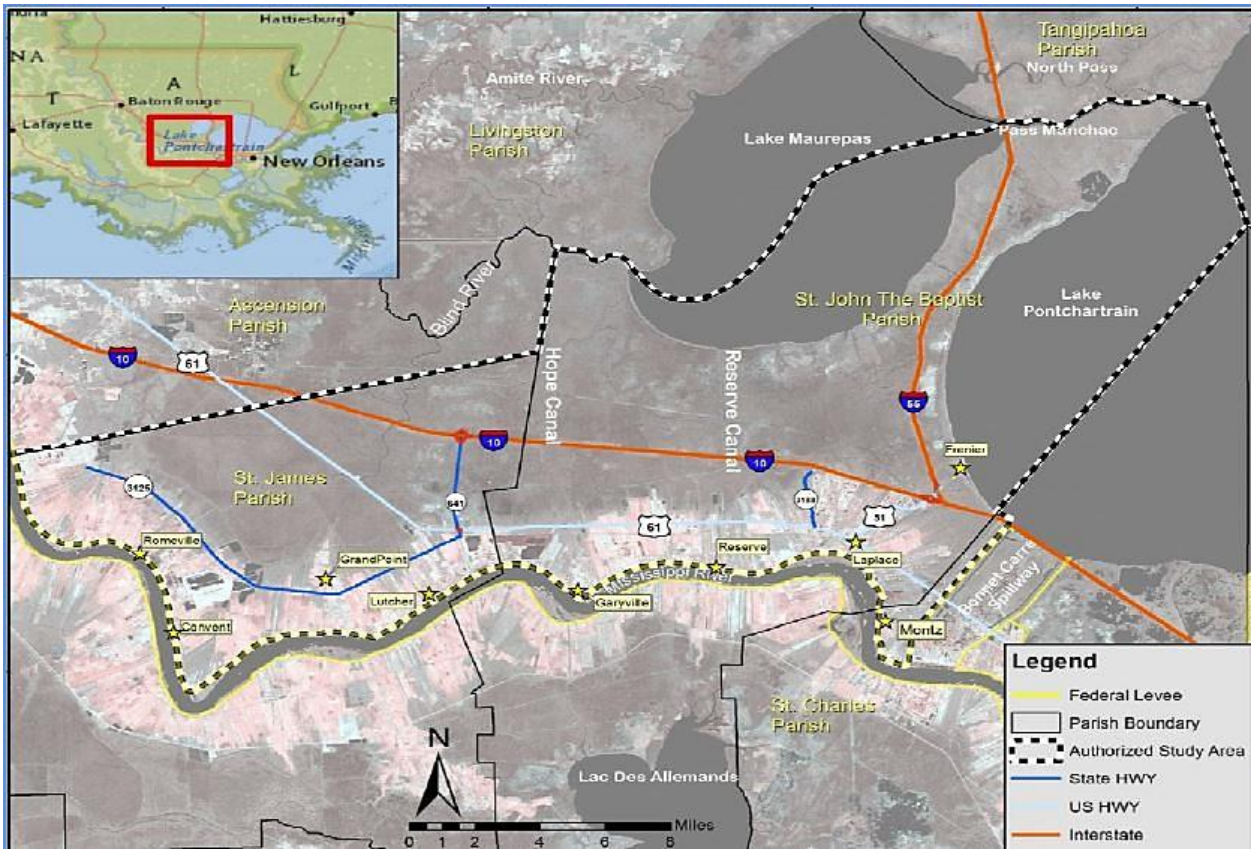


Figure 3-2: The West Shore Lake Pontchartrain Levee Project Study Area. Image Source: USACE

THE USACE, WEST SHORE LAKE PONTCHARTRAIN LEVEE PROJECT

The U.S. Army Corps of Engineers (USACE) is involved in a study to provide a recommendation for Federal participation in hurricane storm damage risk reduction for St. Charles, St. John and St. James Parishes that would be economically and environmentally justified. The study area is located west of the Bonnet Carré Spillway between the Mississippi River and Lakes Pontchartrain and Maurepas. Communities within the study area include LaPlace, Reserve, Garyville, Gramercy, Lutcher, and Grand Point (Figure 3-2).

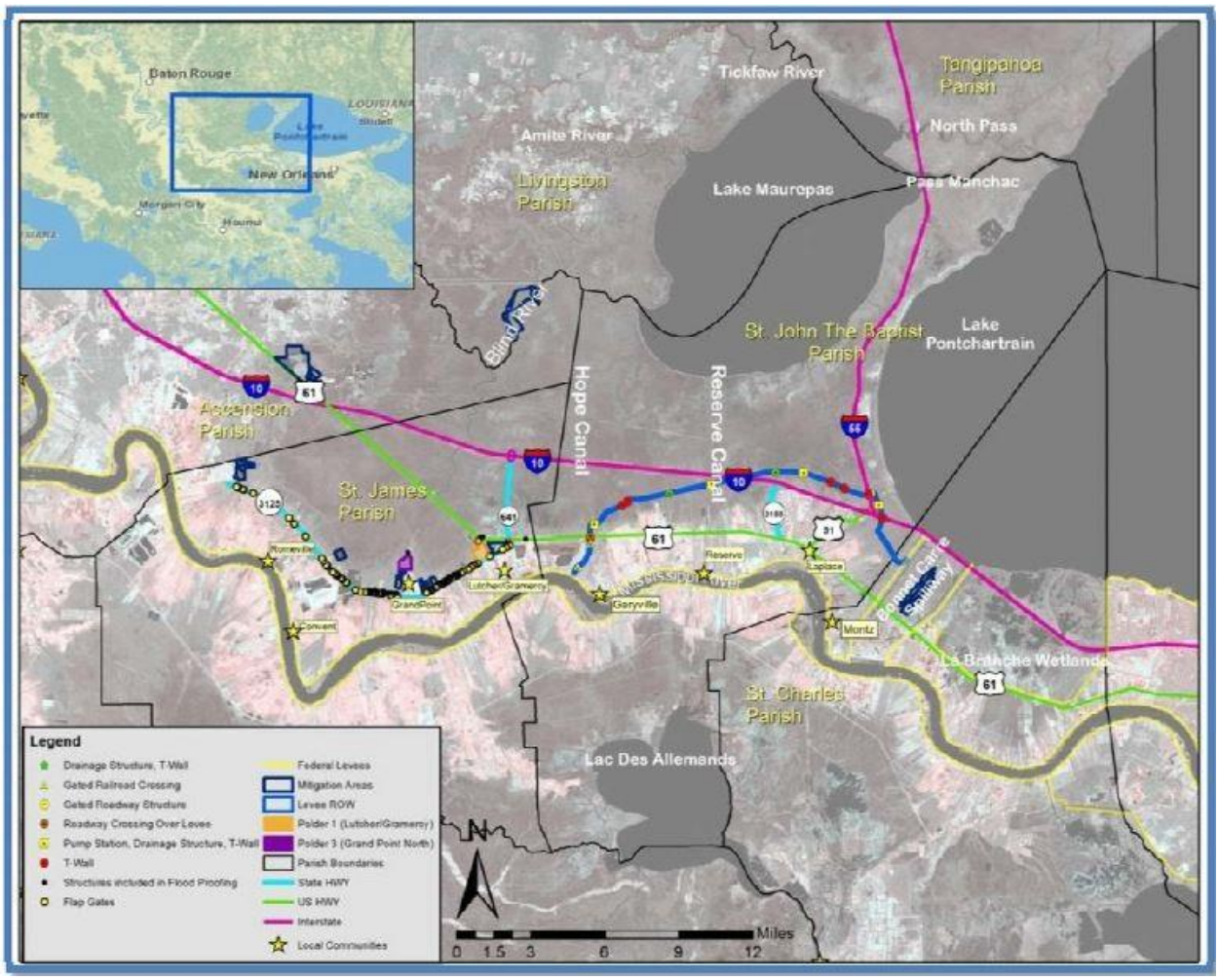


Figure 3-3: The West Shore Lake Pontchartrain Levee Project. Image Source: USACE

The study is investigating the potential to provide hurricane and storm surge risk reduction on the east-bank of the Mississippi River in St. Charles, St. John the Baptist, and St. James Parishes to nearly 18,000 residential, commercial and industrial structures as well as the I-10 hurricane evacuation corridor through both structural and non-structural measures.

Over 60,000 people in the three-parish study area currently have little to no hurricane risk reduction in place. Additionally, I-10 is the major corridor for access to and from the New Orleans metropolitan area which bisects the study area, and a large portion of the study area was inundated by storm surge. During Hurricane Isaac in 2012, the interstate was submerged for multiple days and slowed emergency response across the region. This caused considerable rerouting of traffic for days after the storm. Other major flooding problems occurred from Hurricanes Betsy (1965), Juan (1985), Katrina and Rita (2005), and Gustav and Ike (2008).

RESERVE/GLOBALPLEX INTERMODAL TERMINAL TO I-10

A public hearing was held on a proposal for a new I-10 connector road in Reserve. It would extend West 10th Street north through wetlands and offer St. John a third access route to the interstate highway system—and the first direct route between I-10 and River Road. The proposal includes a new 2.5 mile road from Airline Highway to I-10. The interchange has been requested by parish leaders for years. The proposal is a joint project of the Federal Highway Administration, the Louisiana Department of Transportation and Development and the New Orleans Regional Planning Commission. The project is currently undergoing an environmental review.

$95 million road proposed to connect I-10 with Reserve
http://www.nola.com/politics/index.ssf/2015/04/i-10_road_connect_reserve_95_million_st_john_parish.html

Also, this proposed project will be a crucial transportation corridor acting as a shortcut from the Port of South Louisiana's Globalplex Intermodal Terminal to I-10. The major benefit will be the rerouting of the Terminal's heavy truck traffic directly from I-10 to the waterfront acreage and facilities.

The proposed Reserve to I-10 connection is a great example of a project that will require careful consideration of the balance between the protection of wetlands and the use (or in this example removal) of wetlands for public infrastructure and community/economic development. The Coastal Zone Advisory Committee wants this Plan Document to be a tool and guide in future decisions that include when it is appropriate to allow permitted development in wetlands.

GROWTH EFFECTS ON MANAGEMENT UNITS

Growth will most likely continue to occur in those areas nearest the Mississippi River and along Airline Highway west of LaPlace. The proposed levee and interchange will likely enhance the increase in development demand. In addition to the direct effects of a new interchange prime concerns affecting management units will be point and nonpoint source pollution, sewage treatment, flood protection and loss of valuable habitat. Monitoring of growth in relation to St. John the Baptist Parish's EMU goals will help the parish guide growth toward sustainable areas and allow St. John to concentrate its resources into those areas.

CONCLUSIONS

St. John the Baptist Parish's Coastal Zone Management Plan (CZMP) will help guide the parish to a more sustainable future. It is one part of St. John's comprehensive planning process and will help set standards and priorities for programs and projects that will influence the community landscape

.

Chapter 4

CHAPTER 4: ENVIRONMENTAL ISSUES

WETLAND LOSS 4-1
FLOODING 4-5
WATER QUALITY 4-7
SALTWATER INTRUSION 4-9
OIL AND GAS EXPLORATION AND PRODUCTION 4-10
WILDLIFE AND FISHERIES ASPECTS 4-12
RESOURCE USE CONFLICTS 4-12

Chapter 4 is labelled Environmental Issues, but could also be called Environmental Challenges. Conflicts between using and preserving habitat and natural resources are inevitable.. The purpose of the Coastal Zone Management Program Plan Document, the St. John the Baptist Advisory Committee, and CZM program staff is to anticipate, manage and mitigate conflicts before the impacts are felt by our fragile wetlands.

Industrial, commercial and residential growth has built a strong local economy, but it has come at a cost to the environment. Logging and oil and gas extraction, as well as expansion of the developed footprint and introduction of nutrients and other pollutants, have affected the health of the extensive coastal wetland forests and lakes that make up so much of St. John the Baptist Parish. Sinking of the land (subsidence) and intrusion of saltwater in drought years, enhanced by navigation and drainage canals, has reduced the health and productivity of the second-growth cypress-tupelo swamps. Here, we present the principal environmental issues in St. John, with a focus on resource use conflicts.

WETLAND LOSS

As was discussed in Chapter 1, it takes a long time for a swamp forest to completely convert to marsh or open water, as cypress and tupelo trees slowly die off without replacement, gradually opening the forest canopy. Therefore, wetland loss in the parish is not as easy to visualize via comparisons of aerial and satellite imagery acquired sequentially by the U.S. Geological Survey (USGS) over time (ie. Barras et al. 2006, Couvillion et al. 2011). Remote sensing analysts interpreting the images will continue to identify wetlands as swamp even after the trees have become widely scattered (See Figures 1-15 and 1-16). While the Maurepas Swamp is undergoing severe deterioration from the

combined effects of subsidence and salt-water intrusion, wetland loss documented by the USGS in St. John has been restricted to narrow strips along the shorelines of Lakes Pontchartrain and Maurepas, and conversion of relatively small marsh areas in the land bridge between Pontchartrain and Maurepas to open water. For the most part, the interior thinning of the trees and loss to shoreline retreat are natural processes typical of a sinking delta landscape now isolated from Mississippi River sediment and freshwater inputs. The loss is further compounded by canals dredged long ago, some for cypress logging at the beginning of the 20th century, that modified natural drainage patterns and serve as conduits for inland movement of saltwater and storm surge. While some dredging took place as late as the 1970s for oil and gas exploration, pipelines and highway construction, St. John has experienced far less damage from oil and gas dredging activities than most other coastal parishes. An important goal of the Local CZM program is to ensure that future damage will be kept to a minimum.

Figure 4-1 Cypress trees growing in Lake Pontchartrain as the shoreline retreats past them. Photo by Catherine Schons

Shoreline erosion and retreat is most rapid on the Lake Pontchartrain shoreline of the parish where easterly and northeasterly winds blowing across 40 miles of open water (fetch) can build large waves that at times break violently on this east-facing coast. Lake Maurepas and Lac des Allemands are much smaller circular waterbodies. This limits the size of waves that can be generated within them, resulting in less shoreline erosion, but the tell-tale sign of scattered trees standing in the surf zone is typical for all of the lakes shorelines of the parish (Figure 4-1). There is little sand to build beaches, but the shells of small *Rangia* clams that grow in the mud of the lake bottoms are moved landward by waves to form beach-like berms.

The swamps between the lakes and developed areas play an important role in slowing hurricane surge and reducing storm wave energy, thereby providng flood protection to inland assets. Periodically loggers have sought permits to clear-cut the second-growth cypress swamps to make garden mulch. This type of use compromises storm protection and is an example of a conflict between private and public interests that the Local CZM program may be asked to resolve. This particular issue is, however, less likely to come up in the future because most of the Maurepas Swamp is now public land, owned and managed by the LDWF.

Lakes Pontchartrain and Maurepas are part of the Pontchartrain Basin estuary, meaning that they are coastal waterbodies in which saltwater from the Gulf of Mexicoe mixes with freshwater derived from local rivers, and at times from the Mississippi River via the Bonnet Carre Spillway in neighboring St. Charles Parish. Two natural tidal passes connect Lake Pontchartrain with Lake Borgne, Mississippi Sound and ultimately the Gulf of Mexico east of New Orleans. The 2009 damming of the Mississippi River-Gulf Outlet (MRGO), a third, artificial tidal pass into Lake Pontchartrain built in 1963 as a navigation channel, has decreased the amount of saltwater entering the estuary and lowered the salinity, or salt content, of the water in and around Lake Maurepas. But a great deal of damage was done to these swamps during the seven (7) decades that the MRGO was open, when salinities at times reached more than 10 parts-per-thousand (ppt) during droughts, given that the tolerance for salinity by cypress is only three (3) ppt. Salinity stress is believed to have played a major role in the thinning of the cypress-tupelo swamp surrounding Lake Maurepas.

On the west bank, Lac des Allemands is in the freshwater headwaters of another huge estuary, the Barataria Basin. Even though it is also connected to the Gulf of Mexico, water with a measureable salinity rarely enters Lac des Allemands. As a result, it is surrounded by a far healthier swamp than that around Lake Maurepas. Completion of the Davis Pond Freshwater Diversion about 20 miles downriver, that discharges Mississippi River water into the Barataria Basin swamps of neighboring St. Charles Parish now offers added assurance that the swamps and marshes around Lac des Allemands will continue to be a freshwater system.

Relative Sea level rise (RSLR) is a term used by coastal scientists to discuss the combined effect of land sinking and global sea level rise. This is the “apparent” sea level rise that threatens all tidal wetland plant species with eventual submergence. Global sea level rise is about 3 millimeters per year now but is expected to increase as a consequence of climate warming. Subsidence or land sinking rates vary from place to place but are naturally higher in the Mississippi River delta compared to other coasts. Subsidence at any location is typically caused by multiple processes operating on different spatial scales:

1. Down warping of deep geological strata caused by loading and salt movement (natural).
2. Relaxing (lowering of elevation) at the edge of the continent associated with melting of continental ice sheet, called glacial isostatic rebound (natural)
3. Differential consolidation associated with textural variability and water content in recently deposited deltaic sediments (natural).
4. Consolidation from weight of features, such as levees (natural and man-made).
5. Drying, oxidation of organic soils, marsh burning and compaction by tracked or wheeled marsh buggies (natural and man-made).

6. Artificial lowering of water table through "reclamation" practices that employ diking, water control structures, and drainage of lands for agricultural and residential development (man-made).
7. Groundwater pumping for industrial or residential use (man-made and preventable).
8. Extraction of minerals, hydrocarbons and water from salt domes and other subterranean reservoirs (man-made).
9. Leveeing that eliminates the direct supply of sediment from the Mississippi River, which has historically offset the effect of subsidence, allowing wetlands to continue to grow upward (man-made).

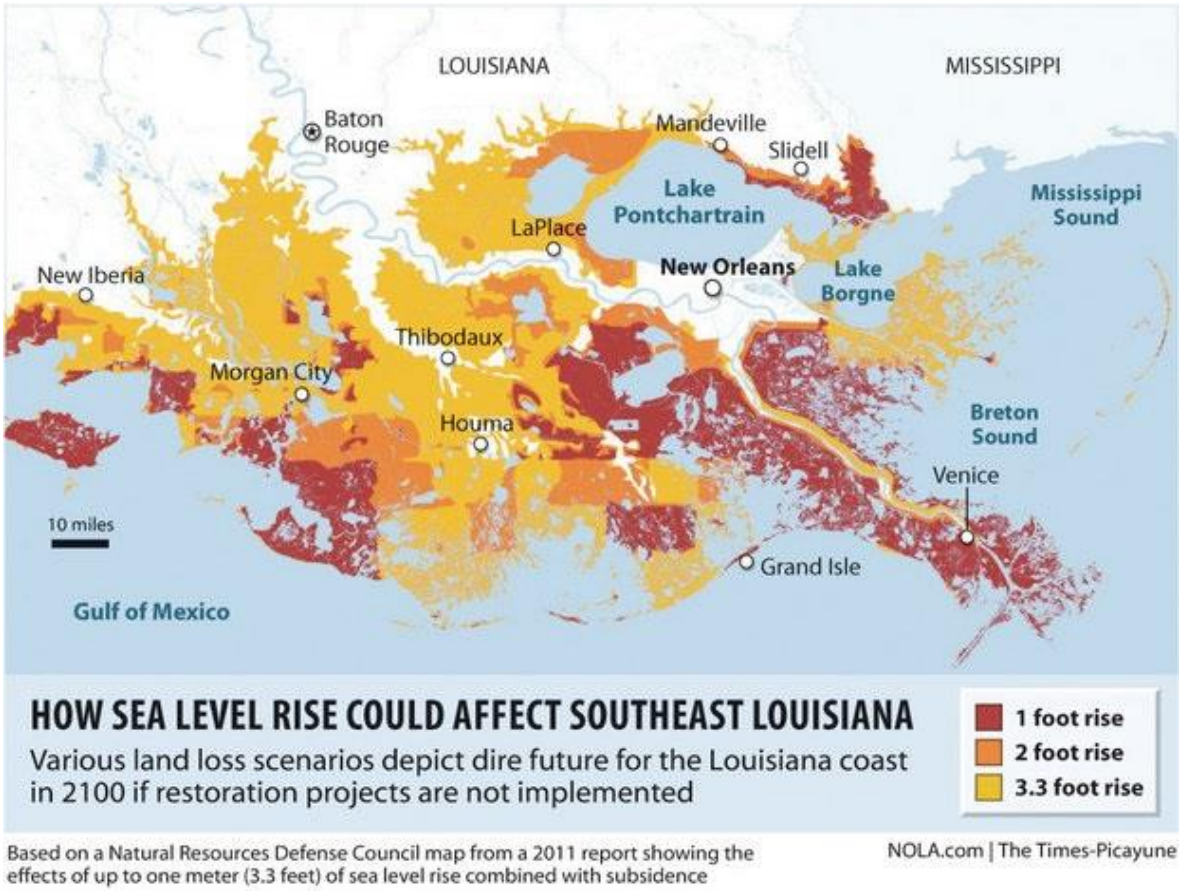


Figure 4-2: Projected Relative Sea Level Rise in Coastal Louisiana (Image Credit: Times-Picayune/NOLA.com)

Based on the most recent analysis available, the subsidence component of RSLR for the parish is estimated at seven (7) millimeters per year (Jones et al. 2016). Combining this value with the global sea level rise yields an RSLR estimate of about 10 millimeters per year, or a little less than half an inch a year. The swamps of St. John are in a race for survival against RSLR. Getting freshwater and sediment from the Mississippi River to the swamp is critical to counteract this land loss. Some of this sediment may be sand dredged from the bed of the Mississippi River and distributed via pipelines to raise elevation in the wetlands. Other sediment, mainly clay and silt (mud) may come suspended in river water through gates in the river bank that open into diversion channels leading into the swamp, as occurs today at Davis Pond, Caernarvon and, on a much larger scale, at the Bonnet Carre Spillway.

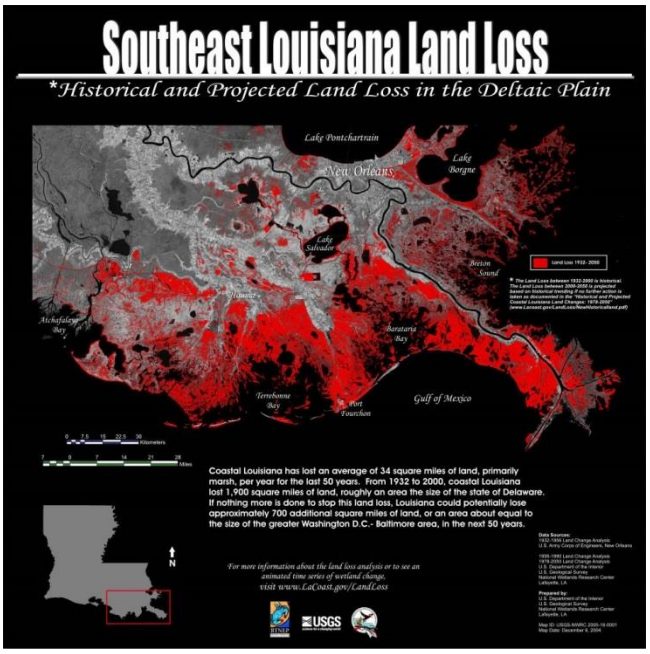


Figure 4-3: Projected coastal land loss (Image Source: LACoast.gov)

The 2012 Comprehensive Master Plan for a Sustainable Coast (Master Plan) calls for construction of a freshwater diversion project titled the "West Maurepas Diversion in the vicinity of Convent/Blind River or Hope Canal" at a cost of $127 million (Coastal Protection and Restoration Authority 2012). The West Maurepas Diversion project is intended to "restore and enhance the health and sustainability of the Maurepas Swamp through the reintroduction of seasonal Mississippi River inflow." (Coastal Protection and Restoration Authority, 2014)." Operations of the existing diversion structures at Davis Pond and Caernarvon, two other freshwater diversion sites have not been without controversy. Some fishermen think they increase fishery productivity while others are dubious and worry that too much freshwater may itself contribute to land loss in the marsh. The freshening of a basin does cause a transition of habitat. To those who view the habitat changes it can appear to be habitat loss when in fact it is a changing of species from marsh to swamp. The Local CZM program will play an important role in controlling preventable subsidence and seeking to protect fishing interests while also increasing fresh water and sediment supply to the wetlands.

FLOODING

Initially, residents of St. John worried most about flooding from the Mississippi River. Since the 1930s, when the U.S. Army Corps of Engineers (USACE) built the Mississippi River & Tributaries Project (MR&T) that tamed the river behind massive levees, however, the greatest concern has been about flooding by storm surge coming from the lakes. Flooding in St. John the Baptist Parish is both locally caused by ponding of heavy rain, or more regionally, by hurricane generated storm surges from Lakes Pontchartrain and Maurepas, as was discussed in Chapter 1. Storm surge is a far greater problem on the East Bank than it is on the West Bank, because the West Bank is better protected by a more intact wetland buffer. The St. John gravity drainage system does a remarkable job in preventing property damage considering the low elevation and gentle slopes within the area, however localized flooding may occur during any season of the year when the ground is saturated and

rainfall is intense. Some developed land is located in Special Flood Hazard Areas marked on the Flood Insurance Rate Maps (FIRMs) drawn up by the Federal Emergency Management Agency (FEMA) which are available online from the St. John Parish Government. The expense of participation in the National Flood Insurance Program (NFIP) is greater in Special Flood Hazard Areas.

As RSLR raises local sea level, gravity drainage of developed areas will become less efficient, predictably increasing calls for new, larger and more expensive levees and pumps. Pumped drainage of developed lands ringed with levees increases the rate of subsidence within them, ironically leading to greater damage if the perimeter levee is breached.

The USACE ("the Corps") West Shore Lake Pontchartrain Hurricane Risk Reduction Plan described in Chapter 1 includes a proposed levee protecting more than 7,000 structures on the East Bank from storm surge and waves with a combined height that has a one percent chance of occurring in any year, also called the 100-year design storm event (Figure 4-2). The Corps-proposed alignment would enclose 47 square miles of land between the new levee and the Mississippi River, providing protection to Montz, Laplace, Reserve and Garyville, as well as

Figure 4-4. Wetlands (green) affected by the USACE West Shore Lake Pontchartrain Hurricane Risk Reduction Plan levee (shown in purple). Image Source: USACE

four miles of Interstate 10 (I-10). Approximately 16 square miles of wetlands, mostly cypress swamp, would be enclosed by the levee. In the past, wetlands in other coastal parishes inside a new flood protection levee have been targeted for drainage and development, even if subject to permitting under the CZMA. That is not the intent in St. John, but this is another example of a conflict that the Local CZM program could be called upon to referee.

Although the construction of levees in St. John is critical to combatting the property damage and extensive flooding presented by RSLR and significant rain events, St. John recognizes the importance of the "multiple lines of defense" strategy to optimally reduce flood losses (Lake Pontchartrain Basin Foundation, 2016). The preservation of coastal integrity and wetlands is a critical component of this strategy, as these areas provide protection against storms and flooding in the form of natural drainage capacity and buffers to storm surge. Through a combined approach of coastal protection and restoration and structural flood protection, St. John aims to enhance its long-term resilience to flooding and coastal hazards. The St. John Local CZM program will play a vital role in flood protection and hazard mitigation for the parish.

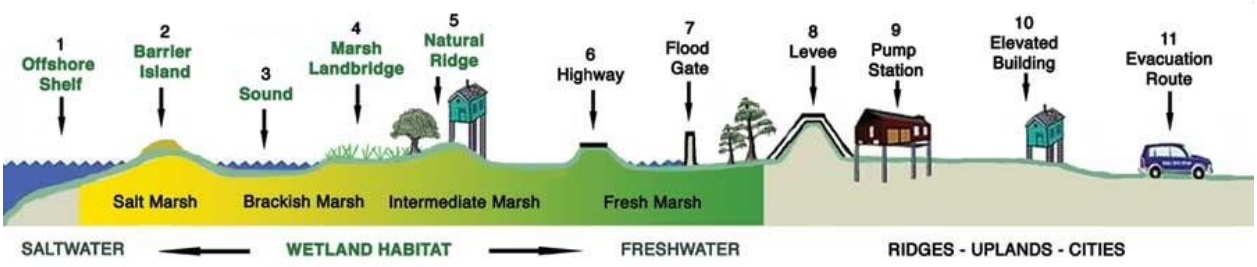


Figure 4-5: "Multiple lines of defense." (Image Source: Lake Pontchartrain Basin Foundation http://www.saveourlake.org/)

WATER QUALITY

The St. John Local CZM program will have a role in reducing damage to the coastal zone from pollutants that are carried by water out of the higher, developed areas of the parish into the wetlands. This is called non-point source (NPS) pollution to distinguish it from discharges permitted for specific industrial or municipal sources by the Louisiana Department of Environmental Quality (LDEQ). Such point source discharges must be treated and monitored to be sure concentrations remain below standard concentration thresholds, and are generally pumped to the river.

The LDEQ has classified two stream segments in St. John the Baptist Parish as "impaired," in that they do not meet water quality standards in Section 303(d) of the Clean Water Act for one or more "designated uses" that include swimming, boating or fishing. A 3-mile reach of the Blind River extending upstream from its mouth on the southwestern shore of Lake Maurepas is part of Sub segment LA040401_01. It forms the boundary with Livingston Parish at the northern end of SJBP. While it is called Blind River, this sub-segment also carries most of the flow of the Amite River which drains the City of Baton Rouge. It is on the 303(d) list as impaired for swimming and fishing because of mercury contamination of fish tissue. A Fish Consumption Advisory for Blind River was issued in 1998, and has not been withdrawn. The Advisory states that "women of childbearing age and children less than seven years of age should consume no more than one meal per month of bowfin (Amia calva)." Older children and other adults should eat no more than four meals per month of any fish from the Blind River.

The second impaired stream sub-segment, Bayou Chevreuil (LA020101_00), is on the west bank and forms part of the southern boundary of the parish. The last 3.4-miles of Bayou Chevreuil to where it empties into southwestern Lac des Allemands. Bayou Chevreuil is on the 303(d) list for not supporting the designated use of fish and wildlife propagation because of high concentrations of inorganic nitrogen and phosphorus, low oxygen levels and an abundance of non-native aquatic plants like water hyacinth. It should be noted that both the Blind River and Bayou Chevreuil impaired sub-segments enter St. John the Baptist with the pollutants and other characteristics that led to their listing. The pollutants identified as causing the impairments are derived from NPS runoff. The mercury that contaminates Blind River fish is washed off the land in Baton Rouge where it falls after atmospheric releases from industrial combustion. The nutrients that are stimulating algal production and causing low oxygen levels in Bayou Chevreuil come primarily from fertilizer applied to sugarcane fields.

NPS pollution is not monitored, but can be quite detrimental to water quality, as it contains everything that storm water runoff picks up from streets, lawns, industrial yards, agricultural fields and from leaking or malfunctioning sanitary sewer systems. NPS runoff may also carry fecal coliforms derived from incompletely treated sewage. These are bacteria that can cause illness if swallowed either while swimming or eating contaminated clams or oysters, but has not been reported to be a problem in St. John Parish. NPS runoff is, however, usually rich in organic matter that uses up oxygen as it decomposes in receiving lakes and bayous, sometimes leading to fish kills.

Runoff from suburban lawns and agricultural fields often contains high concentrations of nitrogen and phosphorus applied in fertilizers, as well as pesticide and herbicide residues, some of which can be bio-accumulated by estuarine biota. The effect of nitrogen and phosphorus, both essential plant nutrients, is to stimulate growth of single- and multi-celled algae, called phytoplankton, as well as invasive aquatic plants like water hyacinth (*Eichhornia crassipes*) and hydrilla (*Hydrilla vericillata*) in receiving water bodies. Over-enrichment of water bodies like Bayou Chevreuil and Lac des Allemands with plant nutrients leads to a condition that scientists call "eutrophication," in which algae build up to very high numbers during hot, windless summer days, turning the water green, while decomposition of dead cells uses up oxygen, at times causing respiratory distress for fish and crabs.

The Local CZM Program will be concerned about NPS pollution that originates in areas above 5 feet but runs into coastal wetlands, lakes and waterways. So, the mandate to protect coastal waters can extend the reach of the program into uplands or fast lands that are normally excluded from the permitting requirement, which can result in conflicts. A sizable percentage of the land surface in suburban areas on the East Bank is rendered impermeable to rainwater by expanses of roofs and concrete in the form of roadways, driveways and parking lots. These impervious surfaces do not allow natural infiltration, so the volume of runoff is increased compared to more natural areas.

Agriculture in St. John is concentrated on sugarcane. It is heavily mechanized and reliant on a vast array of chemical products that reduce the labor and expense of raising a crop. The nitrogen and phosphorus that escapes from fertilized fields can cause over-enrichment or eutrophication of water bodies like Lac des Allemands, as has been discussed. Herbicide and pesticide residues either run off directly into canals, bayous and marshes, or seep into the water table through natural processes. Some of these substances bio-accumulate in estuarine biota but little is known about effects on the ecosystem. Nationwide, much research has been directed toward reducing both the volume and pollutant content of storm water runoff, including the use of constructed or adapted wetlands and bio-swales to retain and filter runoff before it enters coastal waters.

SALTWATER INTRUSION

An estuary is a place where seawater and freshwater mix, so occasional, low level seasonal pulses of salinity are natural in the headwaters of the two estuarine basins straddled by St. John. Louisiana's estuaries have always been characterized by a salinity gradient, with higher salinities at the coast decreasing with distance inland. Saltwater intrusion describes a situation in which higher salinities occur more frequently and persist longer in the inland parts of the estuary, leading to habitat changes as freshwater plants and animals are replaced by more salt-tolerant species. The change adds stress to wetland vegetation that may already be threatened with submergence by RSLR, sometimes leading to land loss rather than transition to a new marsh type.

Several factors have contributed to saltwater intrusion in all of the estuaries of the Mississippi River deltaic plain except those receiving freshwater from the Atchafalaya River branch (distributary). First among these is both the leveeing of the Mississippi River and the closure of crevasses and other natural river outlets that once conveyed freshwater into adjacent wetland basins. A second man-made impact has been the dredging of a vast number of waterways through the marsh and swamp that extend tidal exchange and mixing farther into the estuary. Finally, as RSLR progresses without any compensating increase in freshwater entering the estuary, salinity will naturally increase over time.

As previously discussed saltwater intrusion affects the die-off of cypress and tupelo trees in the Maurepas Swamp. Saltwater also intrusion affects fish and wildlife resources as well by causing contraction or loss of freshwater wetland habitat favored by overwintering migratory waterfowl, and required for portions of the life-cycle of some estuarine species, as was discussed in Chapter 1.

Saltwater intrusion is most effectively addressed by increasing the volume of freshwater added to the estuary to maintain a beneficial salinity gradient. Experience with the Caernarvon and Davis Pond Freshwater Diversion projects over the past three decades has shown that it takes far less river water to address saltwater intrusion than to introduce enough sediment to build significant amounts of new land. But monitoring has shown that river diversions are not a panacea for salinity intrusion when low discharges on the Mississippi during the summer coincide with local drought conditions. Then, there may be so little elevation difference between water level in the river and the receiving estuary to drive flow through the diversion channel.

Saltwater intrusion increased throughout the 20th century, largely as a consequence of man's activities, changing salinity gradients in both the Pontchartrain and Barataria estuaries. Commercial and sports fishers adapted to the "new normal," becoming accustomed to taking offshore and coastal species within the estuary and closer to home. When the Caernarvon and Davis Pond Freshwater Diversions began operations, lines of equal salinity (isohalines) moved seaward once more, causing shifts in the location and availability of target fishery species, including oysters. Today, while most scientists and the 2012 Master Plan tout river diversions as the best available tool to restore coastal wetlands (CPRA 2012), many fishermen have questioned the benefits as they have been forced to burn more fuel to fish farther from port as more freshwater has been diverted into the Barataria and Breton Sound estuaries. Increases in the cost to fish, particularly for shrimp which is Louisiana's most valuable fishery, have in recent years combined with lower dockside prices to reduce the number of boats and jobs associated with the commercial and recreational fishing industries. Lower dockside prices for Louisiana seafood can be attributed, at least in part, to importation of low-cost shrimp from Asia. When the "West Maurepas Diversion" discussed above is built, St. John's Local CZM program can expect to be thrust into the middle of this user group conflict.

OIL AND GAS EXPLORATION AND PRODUCTION

Canals dredged for the oil and gas industry were discussed in Chapter 1 where it was noted that this industry is less developed in St. John than in most coastal parishes. But oil and gas exploration activity tends to rise and fall in response to prices and the advent of new technology like 3D seismic and hydraulic fracking. So, despite the low level of production in the parish now, it is still likely that more than half of all coastal use permits that will be handled by the Local CZM program will be in some way connected to oil and gas activities.

Dredging for drilling access prior to the 1990s produced the hodgepodge of canals that characterize many of Louisiana's coastal marshes. Since the widespread adoption of directional drilling, however, dredging of new waterways has dropped precipitously. Even so, the old canals, with associated spoil banks, continue to disrupt the natural wetland hydrology and cause stresses that contribute to wetland vegetation death and land loss (Figure 4-3). Eventually, as subsidence occurs, canals and the natural waterways they traverse begin to coalesce, producing new or enlarged lakes and bays. The end effect is an accelerated increase in open water habitats at the expense of marsh, swamp, or other productive wetlands.

Canals facilitate additional and more rapid exchange of water but limit overland flow necessary for sediment introduction. Deeper channels used by service vessels and other boats that are aligned with the long axis of the estuary allow more rapid removal of water from the freshwater swamps and marshes, and enhance saltwater intrusion into the estuarine headwaters. This also limits the opportunity for natural treatment of upland runoff and reduces the effectiveness of the swamps as a storm buffer. Because of reduced retention time and bypassing of wetlands, exchange between the water and wetland systems that can remove nutrients is reduced, resulting in eutrophication and algal blooms in open waterbodies like Lac des Allemands.

Figure 4-6. Vegetation on higher elevation spoil banks can include trees that are killed by salt water when the bank subsides.

Where production has ceased, some limited restoration success has been achieved by backfilling oil and gas access canals with material scraped from the spoil banks. Use of this technique could be expanded to offset future permitted losses. More recently it has been found that withdrawal of subsurface fluids including oil and brine and depressurization of gas reservoirs has locally enhanced subsidence, accelerating wetland loss in Louisiana's coastal marshes. This phenomenon has been well documented on other coasts caused by both oil and gas and groundwater withdrawal, but the full extent of this type of damage is still being investigated here. In some cases, subsidence has been reversed by pumping water into shallow aquifers.

Additional water quality impacts occur as a consequence of low level releases of oil, brine (produced water), drilling mud, or other pollutants from normal oil and gas operations over many decades. Such chronic releases have been shown to affect the diversity and productivity of the animals living in bottom sediments, called the benthic community, which is an important source of food for estuarine crabs and fish.

Accidental larger releases of oil can have devastating effects on wetlands. The largest accidental discharge of all time occurred in 2010 with the blow-out and explosion of the Deepwater Horizon drilling platform 30 miles offshore of the Mississippi River mouth. While coastal marshes and barrier islands of the Pontchartrain and Barataria estuaries were oiled, the affected zone did not extend inland as far as the swamps and waterways of St. John the Baptist Parish. The spill did create a crisis for most fishers, however, as vast estuarine and coastal areas important to the shrimp fishery were closed for almost a year. Much of the oil that is still produced in St. John comes from the large lakes, so there is always a potential for a spill, and poorly organized attempts to clean up oil in marshes can cause as much damage as the oil itself.

WILDLIFE AND FISHIERIES ASPECTS

Direct impacts on wildlife from oil spills have been most frequently studied in birds. Seabirds, such as diving ducks, cormorants and pelicans are among the most frequent casualties because they congregate in large flocks, spend a high percentage of time on the water, and must dive to feed. The response of birds to oiling of marshes, beaches and breeding islands varies with the species, ranging from no effect to complete abandonment or exclusion of the habitat. If nesting sites closest to the most reliable sources of food are oiled, nesting success may be compromised at sites farther from the food resource as foraging may be too costly in a caloric sense to support reproduction. Pelicans, herons, and cormorants show such responses.

The hydrocarbon extraction and fishing industries have a long history of co-existence in St. John, as in all of coastal Louisiana, but conflicts are inevitable when spills and other damaging events occur. The St. John's Local CZM program will be responsible for anticipating and reducing such conflicts through planning and appropriate management.

RESOURCE USE CONFLICTS

We have described a range of potentially conflicting coastal activities, including fishing and oil and gas extraction, flood protection and wetland restoration, drainage efficiency and water quality improvement. Many of these activities take place on private lands that support wildlife and fish managed by the state. Finding fair and effective local resolution of conflicts like those described above is a major goal of the Local CZMP. The goals and policies described in Chapter 5 provide a framework for resolving such conflicts in a way that supports the public interest in sustainable coastal resource use. In cases where parish interests may conflict with a proposed state or federal action or project, the CZMP also provides a mechanism whereby the parish can make its position known and propose alternatives.

Chapter 5

CHAPTER 5: GOALS, OBJECTIVES AND POLICIES

ROLE OF LOCAL COASTAL PROGRAM GOALS AND OBJECTIVES 5-1
PARISH-WIDE GOALS AND OBJECTIVES 5-2
POLICIES 5-3

St. John the Baptist Parish developed Coastal Zone Management goals, objectives and policies in 2015 and 2016 through monthly iterative exchanges between the Local Coastal Zone Advisory Committee (CZAC) and staff at the South Central Planning and Economic Development Commission responsible for drafting the Local Coastal Zone Management Program (CZMP). Broad, long-term, parish-wide goals give rise to more limited objectives that lead to specific policies that may apply only to one or more of the Environmental Management Units (EMUs) described in Chapter 6.

ROLE OF LOCAL COASTAL PROGRAM GOALS AND OBJECTIVES

CZMP goals, objectives and policies are written to clarify Parish priorities for coastal management within the framework of the state Coastal Use Guidelines (CUG). They do not supersede state authority, and should not individually be construed as regulatory or binding on either Coastal Use Permit (CUP) applicants or the Office of Coastal Management (OCM) of the Louisiana Department of Natural Resources (LDNR). They do provide a useful reference for permit applicants of the likely contents of parish environmental review comments to the state on applications addressing uses of primarily local interest and concern. CZMP adopted policies are advisory only, and should be treated as such by St. John, the OCM, and permit applicants, particularly if they contain prohibitions, restrictions or performance standards beyond the scope of the state CUG.

The Local Parish Administrator of the CZMP may recommend that the OCM consider including specific project alternatives and conditions in a CUP of greater than local concern that are based on CZMP policies. These recommendations are local adaptations of CUGs and weigh most in state decision. The gambit of CZMP permitting authority will be greater with respect to uses resulting in a strictly local impact. A listing of CZMP goals, objectives and policies is offered below.

PARISH-WIDE GOALS AND OBJECTIVES

The CZAC created parish-wide goals around the five primary coastal environmental issues discussed in Chapter 4, namely, flooding, wetland loss and deterioration, water quality, saltwater intrusion and oil and gas impacts. Another goal addresses the need for education and outreach to Parish residents. Virtually all Coastal Use Guidelines and policies approved under the Coastal Zone Management Act include the modifying phrase "to the maximum extent practicable." It should be understood that this phrase is implicit in every goal, objective or policy listed below.

Goal 1: Enhance the environmental quality of St. John the Baptist Parish by reducing hurricane flood risk to developed areas, while also promoting wetland protection and restoration.

Objective 1-1. Maintain or re-establish natural wetland hydrology.
Objective 1-2. Maintain or restore natural wetland salinity levels.
Objective 1-3. Improve or restore wetland areas being lost to rapid erosion or subsidence.
Objective 1-4. Link construction of new levees and other flood protection structures with measures to improve the integrity of the wetland buffer around the lakes.

Goal 2: Improve the quality of all waters and wetlands in St. John the Baptist Parish to support designated uses, including swimming and boating, but particularly propagation of fish and wildlife for fishing and hunting.

Objective 2-1. Identify and minimize all sources of point, and non-point source pollution.
Objective 2-2. Find funding for projects to improve water quality in bayous and lakes by routing non-point source runoff to wetlands first, for removal of nutrients and other pollutants.
Objective 2-3: Require any permitted development within or adjacent to a wetland area to be designed, constructed, and maintained to minimize adverse impacts.

Goal 3. Protect and enhance the productivity and sustainable use of renewable resources in St. John the Baptist Parish.

Objective 3-1. Encourage sustainable commercial and recreational fishing
Objective 3-2. Protect and enhance critical wildlife habitat and corridors.
Objective 3-3: Enhance parish-wide opportunities for public recreational use of suitable coastal lands and waters.
Objective 3-3. Protect and conserve forested wetlands that provide hurricane protection benefits.

Goal 4: Reduce damage to wetlands and water quality caused by oil and gas exploration and production activities, and promote effective mitigation of unavoidable impacts.

Objective 4-1. Minimize and fully mitigate detrimental impacts of oil and gas exploration.
Objective 4-2: Minimize and fully mitigate detrimental effects of oil and gas extraction and production.
Objective 4-3: Call for removal of unused or obsolete oil and gas facilities located in lakes or wetlands with restoration to the natural condition.

Goal 5: Educate and assist residents to understand the balancing role of the CZMP to promote sustainable development while protecting the coastal resource base.

Objective 5-1. Encourage sustainable recreational use of the Parish coastal zone.
Objective 5-2. Develop a CZM education and outreach program.
Objective 5-3. Enhance economic development in St. John the Baptist Parish through construction of more coastal restoration projects, and through promotion of ecotourism.
Objective 5-4. Protect and promote conservation of unique wetland areas.

Goal 6: Encourage and propose projects in St. John that preserve, improve and restore the coastal zone.

Objective 6-1. Develop a list of priority coastal restoration projects to be maintained in the Planning and Zoning Department of St. John.

POLICIES

CZMP policies are listed below each numbered objective below.

Objective 1-1: Maintain or re-establish natural wetland hydrology.

Policies:

1. Promote the overall conservation of wetlands and the habitats to which they are hydrologically connected (e.g. lakes and bayous).
2. Reduce or reverse inland intrusion of saltwater into the swamps of the Barataria and Pontchartrain Basin estuaries by supporting projects that restore water flow to a more natural pattern and increase the volume of freshwater introduced from the Mississippi River.
3. Design, build, operate and maintain hurricane and other flood protection levee systems to minimize permanent disruptions of natural wetland hydrology, and otherwise encourage the interchange of water, beneficial nutrients, and aquatic organisms between enclosed wetlands and those outside the levee system.
4. Minimize dredging or filling of wetlands.

5. Permit access to worksites in wetlands only through existing canals, streams, and roads to minimize adverse impacts to natural areas and habitat.
6. When dredging to maintain existing canals is required, place spoil using the best practical techniques to avoid disruption of water movement, flow, circulation, and quality, particularly impoundment.
7. Manage runoff from developed areas to simulate natural water patterns, quantity, quality, and rate of flow.
8. Minimize transport of soil in runoff from agricultural lands using best practical techniques for soil conservation.
9. Ensure that all new mineral exploration and production facilities are designed, constructed and maintained to support natural water flow regimes, avoid blocking surface drainage, and reduce potential for erosion and wetland loss.
10. Encourage timely removal of mineral exploration and production facilities that are no longer in service using best practical techniques to restore sites.
11. Encourage installation and frequent cleaning of channels, culverts or other conveyance structures where streams, sloughs, and wetlands are crossed by new or existing road and railroad embankments to promote or maintain hydrologic connectivity.
12. Encourage use of surface effect vehicles (air-cushion vehicles and hovercraft) and helicopters to transport oil field equipment and personnel through wetlands.
13. Remove ring levees around drill sites in wetlands, or replace them with smaller production levees when drilling ceases.

Objective 1-2: Maintain or restore natural wetland salinity levels

Policies:

1. Identify, maintain and protect natural drainage systems supplying freshwater to wetlands.
2. Encourage diversion of freshwater from the Mississippi River into wetlands through siphons, controlled channels, and overbank spillways to offset saltwater intrusion whenever such diversion will enhance the viability and productivity of coastal wetlands. Such diversions shall incorporate a plan for monitoring, treating and reducing any adverse impacts of pollutants present in the freshwater source.
3. Reduce pumping of surface or ground water that results in saltwater intrusion or land subsidence.
4. Plug canals upon abandonment of oil and gas activities using earthen plugs, rip-rap, or other stabilizing material.
5. Require beneficial use of all dredged material to build or restore wetlands when dredging of existing canals and/or slips is required.
6. Require protective measures to prevent discharge of brines from mineral exploration or extraction in open water or wetland areas.
7. Design and build weirs and other water control structures using the best practical techniques to prevent erosion and allow for tidal exchange, while minimizing obstruction of channels used by migrating aquatic organisms and fishers.

Objective 1-3: Improve or restore wetland areas being lost to rapid erosion or subsidence.

Policies:

1. Encourage measures to reduce erosion and expansion of canals.
2. Use dredged material from permitted dredging operations to restore natural grade level conditions to subsided areas of the wetlands.
3. Select suitable sites for wetland restoration including abandoned well access canals, rapidly sinking areas, and freshwater marsh areas where saltwater intrusion has impacted the natural vegetation.
4. Encourage the diversion of freshwater and sediment from the Mississippi River as a tool for wetland restoration.
5. Plant appropriate native plants to hasten restoration of wetlands created using dredged sediment.
6. Design and build appropriate shoreline protection structures using best practical techniques to minimize adverse environmental impacts.
7. Require shoreline protection or modification structures to be lighted or marked in accordance with U.S. Coast Guard regulations to avoid interfering with navigation, while providing opportunities for fishing and other recreational opportunities.
8. Minimize destruction or damage to streams, wetlands, tidal passes, reefs, beaches, islands, and other natural, biologically valuable areas or protective coastal features.
9. Minimize disruption of the sand transport on beaches that maintains bars, beaches, berms and other ecologically important habitat along lake shorelines.
10. Encourage backfilling of canals or otherwise restoring them to the pre-existing condition upon cessation of use for oilfield navigation or well access.
11. Identify and use the best practical techniques of site restoration and re-vegetation for all linear facilities (e.g. pipelines and temporary roads).
12. Use dredged spoil beneficially to improve productivity or create new habitat, reduce or mitigate environmental damage from dredging, or prevent foreseeable future environmental damage. Otherwise, use existing spoil disposal areas or upland disposal to avoid destroying existing wetlands when creating new disposal sites.
13. Design, construct and maintain dredged spoil disposal areas using the best practical techniques to retain the spoil at the site, reduce turbidity, and reduce shoreline erosion.
14. Support use of controlled diversions of sediment-laden waters to initiate new cycles of marsh building and sediment nourishment and to enhance the viability and productivity of the outfall area. Such diversions should incorporate a plan for monitoring, treating or reduction of any adverse impacts of pollutants present in the freshwater source.
15. Encourage use of structures and techniques to manage sediment to offset land loss, and to create or restore wetlands as part of the state Comprehensive Master Plan (CPRA 2012).

Objective 1-4: Link construction of new levees and other flood protection structures with measures to improve the integrity of the wetland surge and wave buffer around the lakes.

Policies:

1. Minimize destruction of existing wetlands during levee construction.

2. Fully mitigate unavoidable damage to wetlands caused by levee construction by supporting wetland restoration and creation projects outside the levee protected area to reduce hurricane surge and wave impacts on levees.

Objective 1-5. Strengthen and fortify wetlands and coastal buffers to improve resilience to flood events, storm surge and relative sea level rise.

Policies:

1. Focus coastal Restoration funding toward project that improve the long-term local resilience to flood events, storm surge and relative sea level rise.
2. Consider coastal protection and restoration goals when prioritizing project funding.

Objective 2-1. Identify and minimize all sources of point, and non-point source pollution directly entering bayous and lakes of the coastal zone.

Policies:

1. Request maximum surveillance and enforcement of all water quality standards of the Environmental Protection Agency (EPA), Louisiana Department of Environmental Quality (DEQ), and the Louisiana Department of Health and Hospitals (DHH).
2. Minimize discharges of suspended sediment directly into coastal waters, including sediments from dredging, using turbidity screens where practicable, except where required as part of an approved project to restore the elevation and health of sinking wetlands.
3. Apply best practical techniques to prevent the release of pollutants or toxic substances into coastal waters.
4. Avoid creation of low dissolved oxygen conditions in waters of the Parish by minimizing nutrient-rich and high biological oxygen demand (BOD) discharges to open water bodies.
5. Avoid dredging of new canals and extensions of existing ones, but if permitted, ensure that they are designed and constructed using the best practical techniques to preclude water stagnation, eutrophication and modification of the natural flow regime.
6. Require strict adherence to sanitary health codes regarding adequate treatment of sewage discharged from boats or camps.

Objective 2-2. Develop funding for projects to improve water quality in bayous and lakes by routing runoff to wetlands first, for removal of nutrients and other pollutants.

Policies:

1. Encourage the controlled and monitored introduction of freshwater and sediment from the Mississippi River through gates, siphons, spillways and channels into wetlands to offset saltwater intrusion and enhance the sustainability, productivity and hurricane protection capacity of swamps and marshes.
2. Encourage and promote use of overland flow wetland wastewater treatment systems for treatment of non-toxic, disinfected wastewater, and to keep nutrients and other pollutants from reaching open waterbodies.
3. Modify existing and proposed drainage channels and networks discharging into coastal waters to improve water quality and simulate natural water routing and volume.
4. Minimize runoff and erosion from agricultural lands to coastal bayous and lakes using the best practical soil conservation techniques.

Objective 2-3: Require any permitted development within or adjacent to a wetland area to be designed, constructed, and maintained to minimize adverse impacts to wetlands.

Policies:

1. Encourage use of vegetated buffer and setbacks ordinances to protect wetlands and water quality in channels.
2. Encourage storm-water management practices that minimize impacts on surface water, groundwater, and other natural resources.
3. If damage to wetlands occurs or cannot be avoided, require mitigation at least equivalent to the damage, as determined by the Local Administrator in accordance with state and federal guidelines.
4. Preserve forested wetlands in existing urban or industrial settings for recreational green spaces and wildlife habitat.

Objective 3-1. Encourage sustainable commercial and recreational fishing, and waterfowl hunting.

Policies:

1. Factor in the seasonal habitat needs of shrimp, oyster and finfish, as well as potential effects on fishing, when planning new diversions and other water management structures.
2. Factor in the seasonal habitat needs of migratory waterfowl, as well as potential effects on waterfowl hunting when planning new diversions and other water management structures.

Objective 3-2: Protect and enhance critical wildlife habitats.

Policies:

1. Restrict permitted uses near eagle nests and breeding/roosting habitat for colonial wading and shore birds, particularly during breeding season.
2. Encourage planting and other techniques to enhance food sources and habitat for wildlife by re-establishing native plant stands.

Objective 3-3: Enhance parish-wide opportunities for recreational use of suitable coastal lands.

Policy:

1. Develop funding sources for land acquisition and operation of facilities like boat launches to improve access to coastal wetlands and waterways.

Objective 3-4: Protect and conserve swamp forests that provide hurricane protection benefits.

Policies:

1. Discourage clear-cutting of bottomland hardwood and swamp trees that provide hurricane protection services, and limit more selective harvesting.
2. Protect existing swamp stands from saltwater stress.

Objective 4-1: Minimize detrimental impacts of oil and gas exploration.

Policies:

1. Use best practical techniques to minimize disturbance or damage to wetlands, fish and wildlife and other coastal resources during geophysical surveying as follows:
   a. Plan pre-exploration activities to take place during times of minimum waterfowl or wildlife activity.
   b. Fill shot holes drilled during seismic surveys so as not to cause drainage problems.
   c. Use vibrating equipment rather than dynamite for seismic measurements, particularly in areas of wildlife concentration.
   d. Do not allow seismic activities in critical wildlife nesting and feeding areas.
   e. Travel by foot or helicopter to minimize physical damage to wetlands.
   f. Use existing roadways whenever possible, minimizing the total number of trips, staying on naturally high ground.
   g. If possible, keep marsh vehicles from causing damage by crossing unprotected earthen levees.
   h. Avoid unnecessary retracing of trails in the marsh with any vehicle.
   i. Use balloon-tired vehicles in preference to tracked vehicles.
   j. Use airboats in preference to either tracked or wheeled vehicles.
   k. Plan and conduct geophysical surveys to avoid wildlife and waterfowl concentrations.

l. Avoid small water bodies that serve as nesting and feeding areas for wildlife and waterfowl in laying out seismic lines.

Objective 4-2: Minimize detrimental effects of oil and gas extraction and production.

Policies:

1. Design and construct mineral exploration and production facilities to maintain natural water flow regimes, avoid blocking surface drainage and limit erosion.
2. Plan access routes to mineral exploration, production and refining sites to avoid adverse impacts on wetland and wildlife habitat, considering the following criteria:
   a. Set up rights-of-way to avoid critical wildlife areas and sensitive vegetation; develop mitigation measures where possible and keep vehicles within these rights of way.
   b. Avoid crossing drainage ways where possible, and include adequate culverts, bridges, and bulk-heading to maintain water flow and prevent erosion.
   c. Minimize area affected by keeping materials, vehicles, and activities within the right-of-way.
   d. Incorporate present and future land uses in the design and alignment of access routes.
   e. Incorporate a preference for directional drilling when planning alignments and access routes.
   f. Minimize disruption of water regimes and disturbance of wildlife and waterfowl by judicious alignment of roads.
   g. Stagger borrow pits to prevent formation of long continuous ditches along roadways; care must be taken to keep staggered pits from joining.
   h. Design any unavoidable channels to prevent water stagnation where possible and avoid natural creeks and swales.
   i. Plan spoil-disposal sites and techniques to reduce wetland impacts.
   j. Minimize marsh surface traffic and keep speed low to reduce erosion.
3. Drilling and production sites should be prepared, constructed, and operated using the best practical techniques to prevent the release of pollutants or toxic substances into the environment.
4. Replace drilling ring levees with smaller production levees or remove them entirely once drilling ceases.
5. Design, construct and maintain drilling and production equipment, structures, and storage facilities to withstand hurricane storm surge and waves without releasing pollutants. Ensure that pre-storm preparations to prevent releases are adequate.
6. Well-site construction should adhere to the following criteria:
   a. Locate well-site so as to avoid critical wildlife areas and sensitive vegetation; consider directional drilling and mitigation measures.
   b. Avoid blocking surface drainage and employ adequate erosion control measures.
   c. Minimize area affected by restricting all equipment and activities to within the right-of-way or easement; construct pits and storage areas to use space efficiently.
   d. Directional drilling should be considered on all applications.

e. Require removal of surface vegetation prior to construction of ring levees to help prevent seepage at the base of the levee.
f. Excavate surface vegetation separately for replanting on fresh spoil to prevent subsequent erosion.
g. Restrict noise and activity as necessary to avoid displacing sensitive wildlife.

7. Require review and approval of environmental protection, emergency and contingency plans prior to initiation of any permitted work.
8. Drilling activities should adhere to the following criteria:
   a. Store supplies, drilling mud, cuttings, and wastes in impervious containers or lined pits; dispose of all harmful wastes offsite.
   b. If possible, confine supplies and equipment to barges; care must be taken to avoid practices that result in materials entering the water.
   c. Minimize release of pollutants to the environment. Skim oil from wash water and sump water; replace worn, faulty, or leaking equipment.
   d. Drilling activities should be performed during times of minimum waterfowl and wildlife activity.
   e. Booms may be strategically placed to control flotsam.
   f. Volume and speed of boat traffic should be minimized to avoid erosion of marsh channels.
   h. Drill cuttings and other by-products discarded in the area should be removed unless they can be cleaned and rendered pollution-free on-site.
9. Production facilities and activities should adhere to the following criteria:
   a. These facilities should be located in less ecologically desirable or previously disturbed areas when possible to reduce the footprint of cumulative impacts.
   b. Avoid blocking surface drainage and employ adequate erosion-control measures.
   c. Space should be used efficiently to minimize disturbed area; dangerous and heavy construction equipment should be fenced in.
   d. Petroleum wastes (scrapings of paraffin and tar) should be properly stored while on-site and properly removed and transported to a suitable disposal site.
   e. Care should be taken to prevent discharge of saltwater brine into coastal waters and wetlands.
   f. Breach, degrade or remove any ring levees constructed for drilling after rig removal.
   g. Properly maintain any permitted access road and restore it to the pre-existing condition when no longer needed.
   h. Use re-vegetation and other erosion-control techniques to protect functional ring levees.
10. Pipeline installation techniques should adhere to the following criteria:
   a. Avoid permanently blocking surface drainage during installation.
   b. Locate pipelines in ecologically less desirable areas; attempt to confine cumulative installations to a "pipeline corridor".
   c. Restrict all equipment and activities to the right-of-way easement.
   d. Start site restoration at the earliest opportunity to minimize erosion and improve use by wildlife; vegetative cover can be manipulated to favor preferred species; only approved herbicides should be used for vegetation control; right-of-way should be mowed or bush hogged in preference to using herbicides.

e. The "double-ditching" technique (topsoil and vegetation removed first and replaced last) should be used wherever practicable. This promotes more rapid restoration of vegetation.
f. Following installation, the pipeline right-of-way should be restricted to the width of the pipeline.
g. Flow lines should be adequately supported when crossing water bodies; burial of flow lines should begin well before the canal or waterway to be crossed.
h. Containment of large pipelines in a "pipeline corridor" is preferred; light-impact excavation equipment should be used.
i. Use the push rather than flotation method of pipeline installation wherever possible to reduce wetland and wildlife disturbance.
j. Any pipeline ditch should be backfilled as soon as possible.
k. Plugs should be placed at intersections with natural waterways and designed and maintained to withstand hurricane forces and resist vandalism.

11. In the event of spills, the following precautions and techniques apply:
    a. All parties involved in oil and gas operations must be knowledgeable and trained on primary actions to contain materials and prevent introduction of pollutants into wetlands and waterways before beginning work.
    b. Low-impact, clean-up techniques should be used, avoiding use of dispersants, emulsifiers, and other chemical agents whenever possible.
    c. Use warning techniques like gas-operated horns to discourage use of areas fouled with oil or other produced fluids by wildlife and waterfowl.
    d. Use best site restoration techniques to accelerate habitat recovery and the return of wildlife and waterfowl to the area.
    e. Low-impact vehicles (e.g. skiffs, boats, airboats) and cleanup techniques should be used to avoid alteration of land surfaces which can sometimes be more persistent than spill impacts alone.
    f. To avoid additional damage, cleanup efforts may be limited to seeding and planting, or postponed until dry conditions prevail, recognizing that artificial restoration is difficult or impossible in some marsh types.

Objective 4-3: Restore unused or obsolete oil and gas sites to a natural condition.

Policies

1. Mineral exploration and production sites should be cleared, re-vegetated, detoxified, and otherwise restored to their original condition upon termination of operations, and should adhere to the following criteria:
    a. Avoid burial of drilling mud and other wastes.
    b. Encourage restoration of land contours, water-flow, and soil characteristics to speed recovery.
    c. Construct artificial nesting or denning sites if necessary to encourage wildlife to return.
    d. Remove concrete or other impervious materials.
    e. Evaluate mineral exploration sites to see if it is possible to enhance waterfowl and wildlife usage of restored areas by creating ponds and scattered high areas.

f. Completely backfill borrow pits to restore natural hydrology.
g. Re-vegetate exposed soil to speed restoration and reduce erosion.
h. Use turbidity-control techniques during cleanup and restoration.
i. Out-of-use or abandoned structures related to mineral exploration and production should be clearly marked to reduce hazards to marine navigation or recreation.

Objective 5-1. Encourage sustainable recreational use of coastal wetlands

Policies:

1. Develop funding sources for wetland acquisition and to construct facilities such as interpretive centers, trails, boardwalks and boat launches that allow Parish residents to more freely access, enjoy and learn about their wetland heritage.
2. Limit power boat access to some small streams to enhance usage by canoers and kayakers.
3. Ensure adherence to sanitary health codes related to sewage and solid waste disposal from camps and boats.
4. Provide trash containers and regular removal at all launches to reduce littering.
5. Ensure that permitted weirs and docks will not interfere with navigation or adversely impact the natural environment.

Objective 5-2. Develop a CZM education and outreach program in St. John the Baptist Parish.

Policies:

1. Train CZM staff and CZAC members to speak to civic organizations and at local schools about the CZM program.
2. Make educational materials and training from the National Oceanic and Atmospheric Administration (NOAA) Sea Grant and other private and public agencies available to K-12 teachers.
3. Create opportunities for volunteers to participate in restoration projects, trash cleanups and wetland plantings.
4. Make information, maps and other tools used in the CZMP program available to citizens and organizations seeking information on permitting, restoration opportunities and coastal management policy.
5. Provide assistance and coaching to residents applying for Coastal Use Permits.

Objective 5-3. Enhance economic development in St. John the Baptist Parish through construction of more coastal restoration projects.

Policies:

1. Encourage CZM staff and interested citizens to participate in coastal project planning meetings held by the Coastal Protection and Restoration Authority (CPRA) and by the federal and state agencies under the Coastal Wetlands Planning Protection and Restoration Act (CWPPRA).

2. Ensure that interested local residents have access to training and are ready to take jobs provided by the coastal restoration industry.

Objective 5-4: Protect and promote conservation of unique wetland areas.

Policies:

1. Identify and develop conservation plans for unique or particularly threatened areas that may include incorporation within federal or state parks and wildlife management areas, or creation of a local special area designation.

Chapter 6

CHAPTER 6: ENVIRONMENTAL MANAGEMENT UNITS

MANAGEMENT UNIT OVERVIEW 6-4
EAST BANK COMMUNITY 6-5
HURRICANE ISAAC 6-6
GEOMORPHOLOGY 6-7
SOILS 6-8
HYDROLOGY 6-9
VEGETATION AND WILDLIFE 6-9
LAND USE 6-10
TRANSPORTATION 6-11
GARYVILLE & RESERVE WETLANDS 6-12
GEOMORPHOLOGY 6-12
HYDROLOGY 6-13
SOILS 6-16
VEGETATION AND WILDLIFE 6-17
LAND USE 6-18
TRANSPORTATION 6-18
MANCHAC SWAMP 6-19
GEOMORPHOLOGY 6-20
HYDROLOGY 6-21
SOILS 6-22
VEGETATION AND WILDLIFE 6-22
LAND USE 6-24
TRANSPORTATION 6-24
LAKES EMUS 6-25
LAKE PONTCHARTRAIN 6-25
GEOMORPHOLOGY 6-25
WATER QUALITY 6-25
LAKE MAUREPAS 6-27
GEOMORPHOLOGY 6-27
WATER QUALITY 6-27
WEST BANK COMMUNITY 6-28
GEOMORPHOLOGY 6-29
SOILS 6-29
HYDROLOGY 6-30
VEGETATION AND WILDLIFE 6-31
LAND USE 6-31
TRANSPORTATION 6-31
WEST DES ALLEMANDS WETLANDS 6-32
GEOMORPHOLOGY 6-33
HYDROLOGY 6-34

SOILS 6-36
VEGETATION AND WILDLIFE 6-36
LAND USE 6-37
TRANSPORTATION 6-37
LAKES EMUS 6-38
LAC DES ALLEMANDS 6-38
GEOMORPHOLOGY 6-38
WATER QUALITY 6-38

Designation of Environmental Management Units (EMUs) is central to setting up and operating a parish-level Coastal Resources Program (Figure 6-1). The St. John the Baptist Parish EMUs were first identified during the public engagement effort that accompanied ***Coast 2050: Toward a Sustainable Coastal Louisiana***, a plan released by the Louisiana Wetlands Conservation and Restoration Authority (LWCRA) in 1998. This was the first strategic plan for restoring and sustaining Louisiana's coastal ecosystem that was approved by the state legislature and St. John the Baptist Parish government. The number of EMUs has been reduced to five land-based and three lake-based areas, but the ***Coastal 2050*** strategies and objectives continue to be important. After Hurricane Katrina surge and waves breached levees protecting New Orleans in 2005, the LWCRA was replaced by the Louisiana Coastal Protection and Restoration Authority (LCPRA) to oversee community flood protection as well as coastal restoration. In 2012, the LCPRA released the ***Master Plan for a Sustainable Coast*** which lays out a $50 billion, 50-year program for saving the coast and protecting the people in St. John and other coastal parishes that are threatened by flooding (CPRA 2012). This document, along with the CZMA guidelines, provides policy "guardrails" to help ensure consistency among local programs.

An EMU is a designated area with common physical, cultural and political characteristics, such as geology, vegetation, communities, drainage patterns, and natural resources. Each EMU has unique goals, objectives, and policies for planning, management, and regulatory functions because the environment differs between EMUs. An analyst must recognize these differences when evaluating activities proposed for the wetlands of St. John.

EMUs are useful for the following reasons:

1. EMU descriptions serve as a source of detailed information for the Local CZM Administrator, permit applicants, local officials and the public in understanding the local effects of environmental stressors.

2. The Local Coastal Administrator can set up long-term data collection and monitoring programs tailored to each EMU to allow detection of problems caused by one or more activities. This allows recommendation of permit conditions and project modifiers within specific EMUs, rather than the entire coastal zone.

3. Creating a data-rich record linking environmental impacts to permitted activities within each EMU aids successive Local Coastal Administrators in forecasting and ameliorating cumulative impacts of numerous small activities.
4. EMUs are at an appropriate landscape level to track progress on many area-specific goals.

EMUs are intended to be flexible and open to modification. The boundaries and management concepts applicable to the EMUs can change as information is gained or conditions evolve. New requirements in specific EMUs can be written into the CZMP after notice to, and approval by the Secretary of LDNR to meet current as well as future program needs. Like all local policy statements, policies developed for particular EMUs policies are recognized as guides, not as procedural mandates, to guide both permit applicants and St. John government.

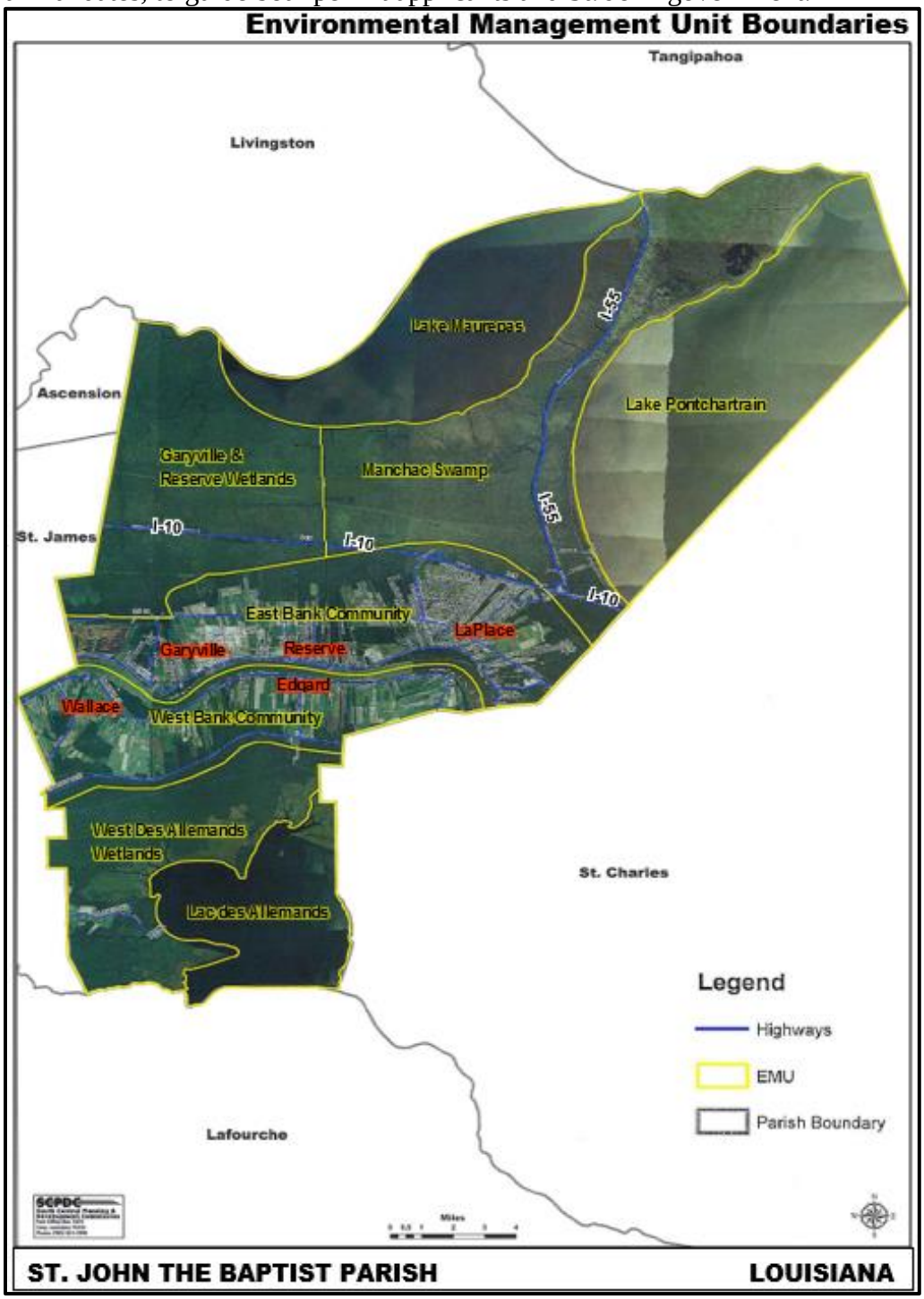


Figure 6-1. St. John the Baptist Parish with principal population centers and Environmental Management Units (EMUs).

MANAGEMENT UNIT OVERVIEW

For the purpose of the Coastal Zone Management Program (CZMP), St. John the Baptist Parish has been divided into East and West Bank Management Zones, EBMZ and WBMZ, respectively, which reflect environmental, economic and cultural differences (Figure 6-1). A total of eight EMUs have been designated within these two zones, including five in the EBMZ and three in the WBMZ (Table 6-1). Except where truncated by political boundaries, each EMU is a distinct hydrologic unit with boundaries defined by shorelines, drainage or flood protection levee systems.

For the most part, the East and West Bank Communities incorporate the developed lands located along, and parallel to the Mississippi River (Figure 6-3). A Coastal Use Permit (CUP) for activities occurring wholly within these higher (less than five (5) feet) developed lands is not required unless an upland activity is expected to have "a direct and significant impact" on wetlands below the five (5) foot contour. Activities that may have a negative impact on any EMU must still be permitted by the parish. The management of developed lands above the five (5)-foot contour will follow the St. John Master Land Use Plan and Parish Zoning Ordinances, rather than the CZMP except where activities occurring above the five (5) foot contour and in fastlands have a direct and significant impact on adjacent wetlands and waters below this elevation and outside of fastlands.

Table 6-1. St. John the Baptist Parish Environmental Management Units (EMUs) and Size (acres)

EAST BANK MANAGEMENT ZONE		**WEST BANK MANAGEMENT ZONE**	
Developed EMU	*Acres*	*Developed EMU*	*Acres*
East Bank Community	29,269	West Bank Community	18,171
Wetland EMUs		*Wetland EMU*	
Garyville & Reserve Wetlands	28,142	West des Allemands Wetlands	21,649
Manchac Swamp	40,297		
		Lake EMU (not currently active)	
Lake EMUs (not currently active)		Lac des Allemands	14,415
Lake Pontchartrain	36,655		
Lake Maurepas	24,797		
Total EBMZ Area:	*159, 160*	*Total WBMZ Area:*	*54,235*
Total EBMZ Land Area:	*97,708*	*Total WBMZ Land Area:*	*39,820*

As previously noted, the Manchac Swamp and West des Allemands Wetlands EMUs each include a small fishing village. Frenier Landing is on the west shore of Lake Pontchartrain and Pleasure Bend is on the west shore of Lac des Allemands (Figure 6-1). Pleasure Bend sits at the eastern end of the Vacherie ridge and can be reached by road through St. James Parish via Louisiana Highway 643. Users can also access Pleasure Bend and Lac des Allemands via the Molle canal off of Hwy 3127.

EAST BANK COMMUNITY

The East Bank Community (EBC) EMU covers 30 percent of the 100,000 acre EBMZ land area. About half of this 30,000 acre EMU (16,800 acres) has an elevation of five feet or higher, and most development has taken place in this swath of higher land closest to the Mississippi River (Figure 6-3). The EBC is the most intensively developed part of St. John the Baptist Parish, primarily because it includes LaPlace which is home to 65 percent of St. John residents. Overall, the EBC houses 98 percent of St. John residents with population centers in Reserve and Garyville in addition to LaPlace (Figure 6-1). The EBC is protected against flooding from the Mississippi River by levees constructed as part of the USACE Mississippi River & Tributaries (MR&T) Project. The West Guide Levee of the Bonnet Carré Floodway is a part of that federal system and parallels the eastern boundary of the EBC just east of the SJBP line in neighboring St. Charles Parish. No other federal or state levees provide protection against hurricane flooding from Lake Maurepas to the north and Lake Pontchartrain to the east.

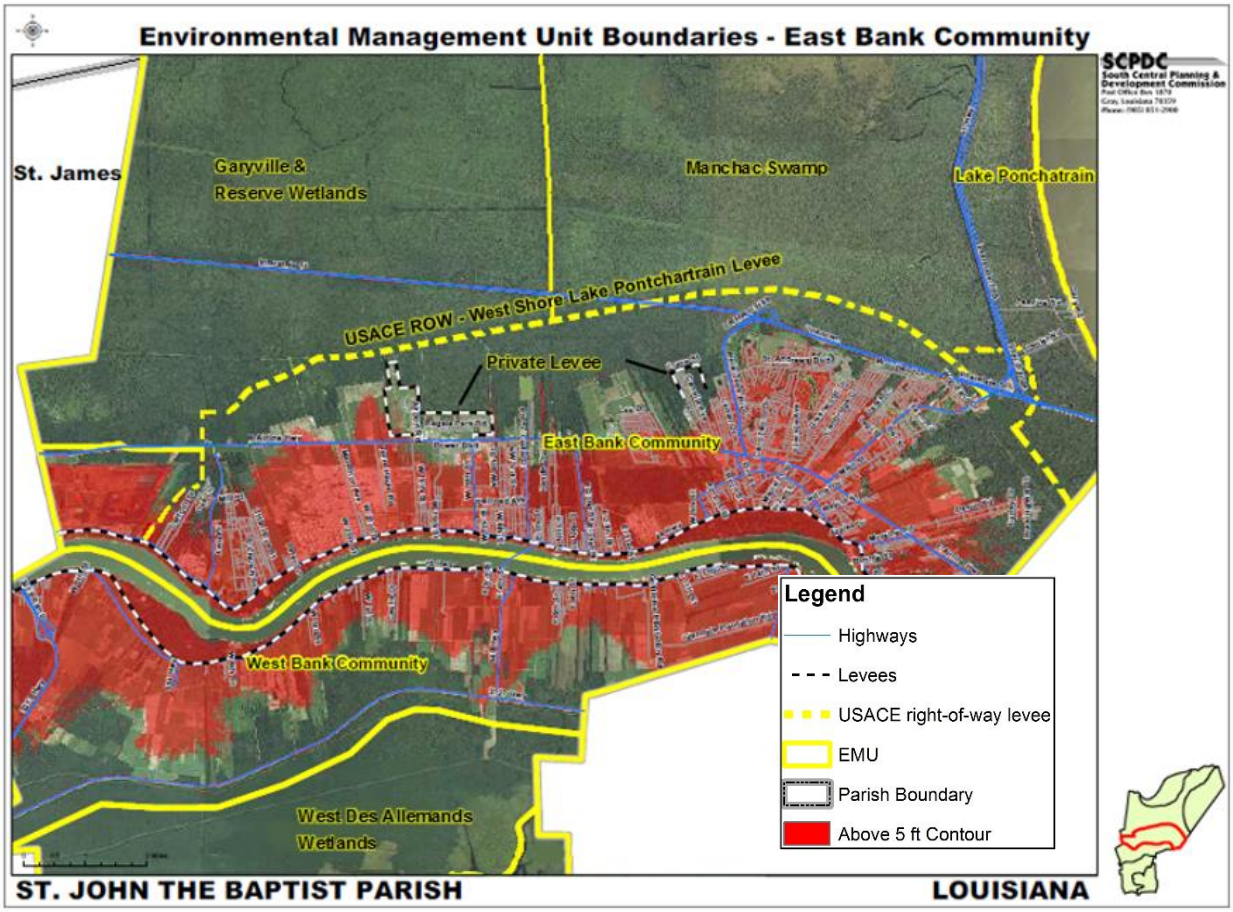


Figure 6-3. Land higher than five feet in St. John the Baptist Parish shown in red (East Bank 16,800 acres – West Bank 11,556 acres). Authorized federal hurricane protection levee right-of-way indicated in dashed yellow line, though not yet built. Mississippi River levees and private drainage levees in black and white dashed lines.

Hurricane Isaac

Due to flooding from Hurricane Isaac in 2012 (Figure 6-4), some private levees have been built or improved along the northern limit of development within the EBC to help protect vulnerable subdivisions (Figure 6-3). After nearly 40 years of planning, on June 12, 2015, the Chief of the USACE approved a federal levee that will bring a 100-year level of surge and wave protection, also called the "one percent probability storm level of risk reduction," to the EBC. The scope of this project which is summarized inthe "Chief's Report," reads as follows (USACE 2015):

> The reporting officers recommend authorization of a plan to provide hurricane and storm-damage risk reduction in St. Charles and St. John the Baptist Parishes through the construction of structural measures. The recommended plan includes the construction of an approximate 18 mile levee system around the communities of Montz, Laplace, Reserve and Garyville based on the one percent probability storm level of risk reduction. The initial construction of the levee will be to 15 feet (ft.) North American Vertical Datum (NAVO) 88 at the west upper guide levee of the Bonnet Carré Spillway and will taper down to 8.5 ft. NAVO 88 at the Mississippi River Levee (MRL). The 2070 design elevation will be a maximum of 19.5 ft. NAVO 88 at the west upper guide levee and will taper down to 16 ft. NAVO 88 at the MRL. The system would consist of approximately 18 miles of earthen levees and floodwalls, four floodgates, a drainage canal running parallel to the levee, a flood-side ditch to maintain hydraulic connectivity between wetlands north and south of the system, two drainage structures, and four pump stations along the alignment. Structures through the levee would be built to the 2070 design elevation which incorporates the intermediate sea level rise condition.
>
> Unavoidable direct and indirect environmental impacts to 9,757 acres of forested wetlands/swamp and bottom land hardwoods would be fully compensated by the implementation of the mitigation plan. Monitoring and adaptive management, if needed, of the on-site mitigation area are included as part of the recommended plan, and will be conducted to ensure that forested wetland/swamp and bottom land hardwoods benefits are realized. Monitoring will be conducted for five years to ensure success of mitigation features.

The projected cost of this levee is $718 million (see Figure 1-8), of which the state CPRA will be responsible for 35 percent ($251 million). It should be noted that the recommendation in the Chief's Report is just another step in the process:Congress must act to appropriate funding for this project, and the state must find the required cost-share. Locally, St. John's adoption of a CZMP will be another measure of preparation. As is stated in the Chief's Report, the proposed levee will have a significant effect on nearly 10,000 acres of coastal wetlands, primarily due to clearing and impoundment of cypress swamp. Because of these anticipated impacts, St. John must be prepared to ensure wetland recovery and rehabilitation during and after construction.

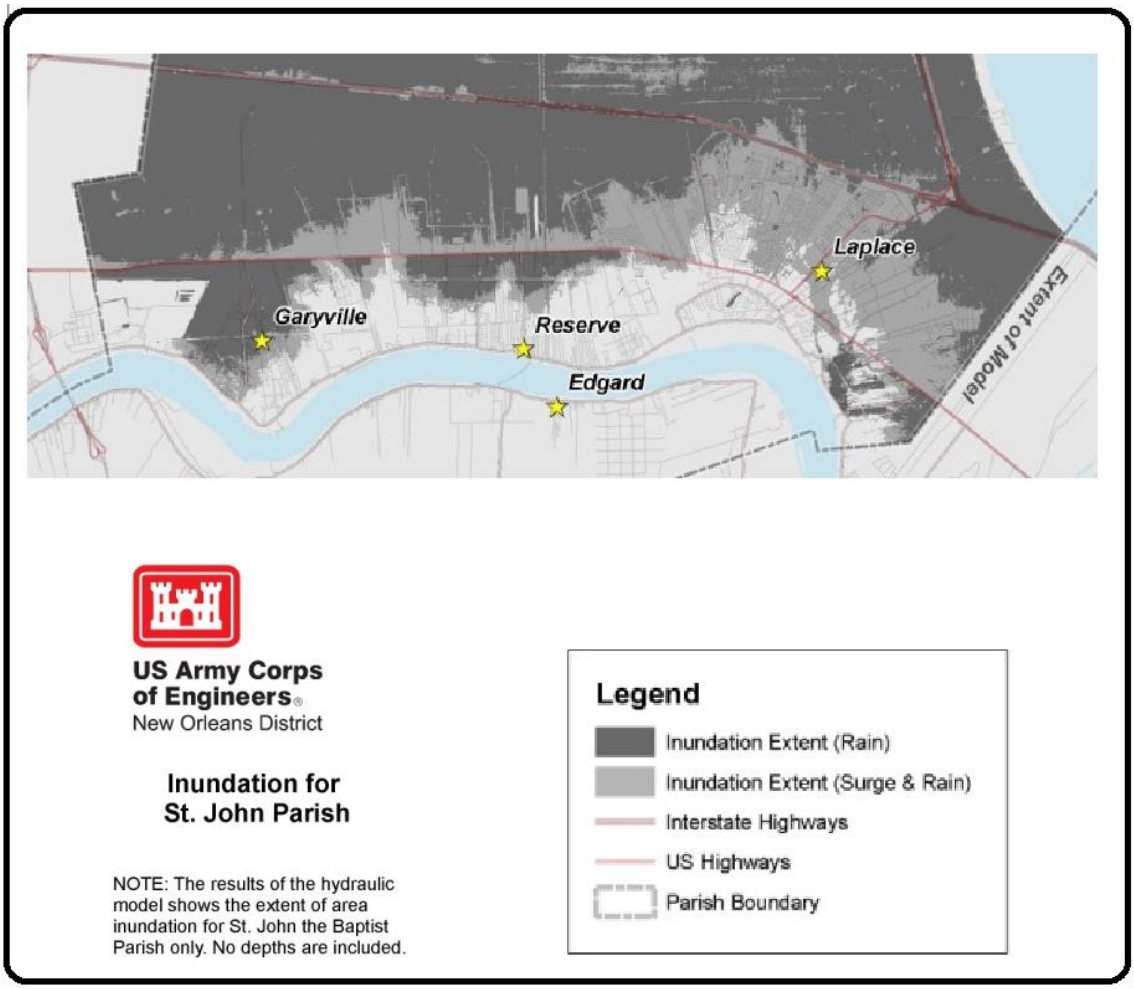


Figure 6-4. USACE modeled inundation from all sources in East Bank Community EMU

Geomorphology

EBC follows the natural levee ridge of the Mississippi River for 15 miles, from river mile 127 upstream to mile 142 above Head of Passes. It was created by overbank flooding during St. Bernard delta progradation and during later crevasses and large floods when layers of sediment were deposited adjacent to the main channel. Natural levee elevations reach about 16 feet along the southern boundary of the unit closest to the man-made MR&T levee, but elevation drops off to the north, away from the river. This EMU also contains periodically exposed "batture" land between the Mississippi River channel and the MR&T levee. Farming, industrial, port and residential development is generally confined to the space between the river levee and the plus-five foot contour line (Figure 6-3). That contour extends north 3.3 miles to the Interstate-10 (I-10) corridor in the LaPlace area where the land was built up by multiple crevasses including several just upstream of the USACE Bonnet Carré Spillway, but the width of the natural levee narrows to about two miles for the rest of the EBC area.

Soils

The EBC EMU contains a wider variety of soil types than most other areas of St. John, because the river deposited sediments ranging from the smallest clay particles up to fine sand size. The exposed tops of these deposits were subsequently modified into "soils" by natural addition of organic matter from plants over many years, and by a range of drainage conditions that ultimately determined how they could be used by man, from fertile, well-drained upland loams to frequently inundated marsh mucks (Figure 6-5). Six soil types are found on the natural levee, namely Cancienne silt loam (CmA), Carville silt loam (CvA), Gramercy silty clay (GrA), Cancienne silty clay loam (CnA), and Schriever clay (SkA). Historically, the loams were well suited for sugarcane, cotton and other row crops, while soils with higher clay content were often used to produce rice. Large areas of the loams that once were farmed in the EBC are now incorporated in industrial sites, while some more recent development is occurring on lower-lying soils like Allemand and Carlin mucks (CU) that once supported bottomland hardwood wetlands.

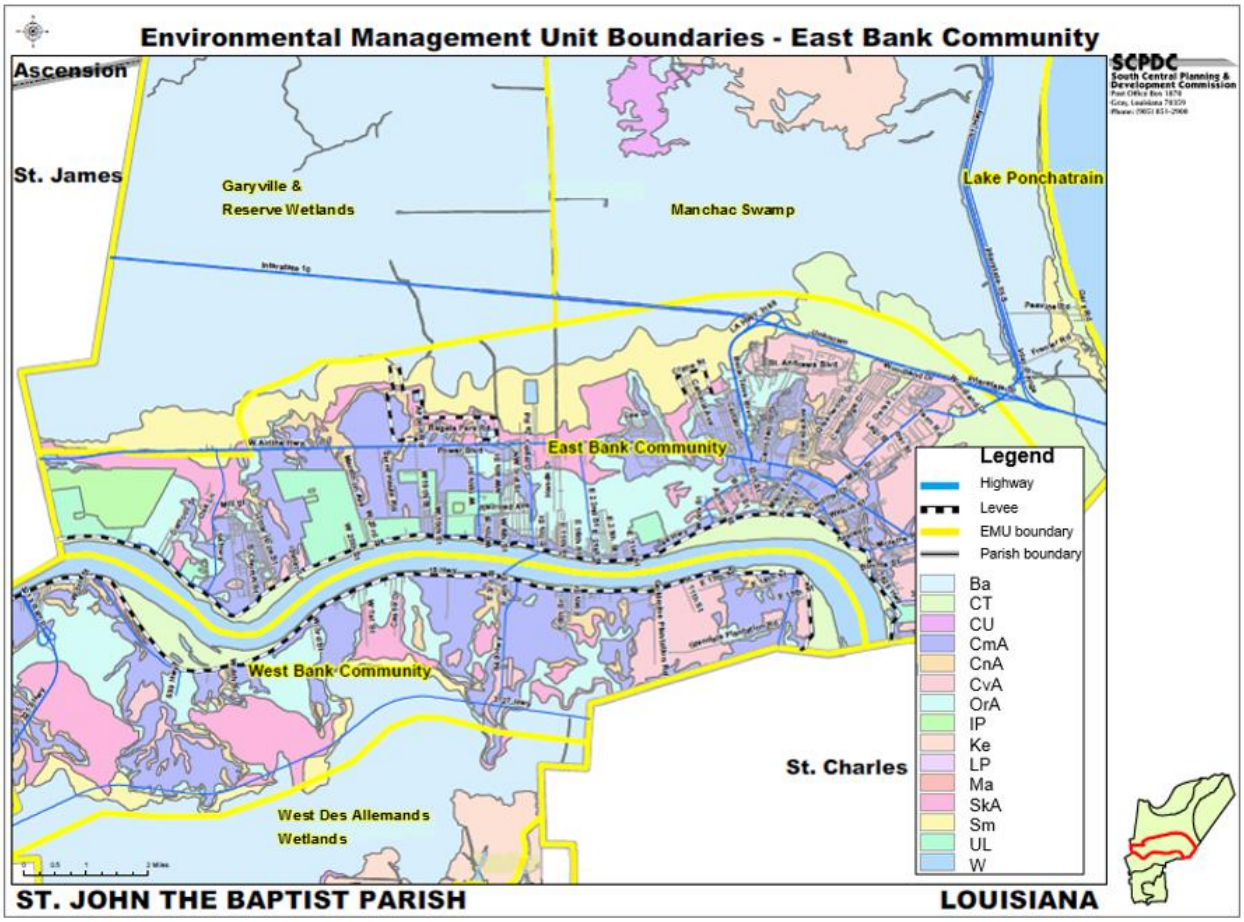


Figure 6-5. East Bank Community showing soil types.

Hydrology

Historically, gravity drainage in EBC followed the slope of the natural levee away from the Mississippi River north to Lake Maurepas. High water on the Mississippi River frequently caused flow over low spots in the natural levee, while driving subsurface seepage to recharge the shallow natural levee aquifer. During major flood events, crevasses breached the natural levee, building channels to Lake Pontchartrain. Much of LaPlace is built on crevasse deposits associated with the historical Bonnet Carré Crevasse.

To enhance drainage of rainwater from cropland, multiple linear ditches were dug in the 19th century from the River levee to about the four (4)-foot contour (See Figure 1-5). In the early 1960s these field drains were augmented by construction of the much larger Reserve Relief Canal that extended to Lake Maurepas (See Figure 1-10). A series of raised east-west transportation arteries with limited openings have been constructed over time that have channelized sheet runoff from the natural levee (See Figure 1-10). Each was built along an upland/wetland boundary that was gradually pushed north, away from the River.

The first railroad was built on high ground to serve the communities clustered along the Mississippi River in the mid-19th century, but the second line and U.S. Highway 61 (Hwy. 61), or Airline Highway, were subsequently built on earth causeways raised above lower land farther from the River in the first decades of the 20th century. A third rail line of the same vintage, again on a raised causeway, runs north through the swamp following the western shore of Lake Pontchartrain, paralleling Interstate-55 (I-55). All of these causeways are high enough to impound water but are overtopped by storm surges. They extended the duration of flooding in parts of the EBC after Hurricane Isaac, when they slowed drainage of floodwaters that entered LaPlace from Lake Pontchartrain.

The interstate highways were built in the late 1960's and are raised on concrete pilings (bents) above the highest surge levels expected and do not impede surface flow like the older roads and railroads. I-10 descends onto a much lower earthen causeway west of the Reserve Relief Canal which did impeded outflow of water introduced by Isaac in the Garyville area (see Figure 1-10). The USACE hurricane protection levee authorized for the East Bank is a large ring that will gradually convert the entire EBC from gravity to pumped drainage as sea level rises, though initially the sluice gates through the federal levee will be closed only about eight days per year. Because the gates will be open most of the time, the federal levee is not expected to enhance development of enclosed wetland areas (see Figure 1-8).

Vegetation and Wildlife

Hardwood forests that once covered the natural levee were cleared first for crops and pasture, and later for residential or industrial development. Remaining forests are on the lower-lying, poorly drained base of the natural levee and consist of trees such as live oak, pecan, American elm, hickory, and green ash. Fauna native to this habitat include deer; small mammals such as Virginia opossum, squirrels, and raccoons; and a variety of song birds and wading birds (See Figures 1-21a-j).

The USACE Chief's Report cited above identifies 9,757 acres of forested wetlands and bottomland hardwood forest that is expected to be impacted by construction of the proposed levee (Figure 6-3). About 856 acres of swamp would be lost to the levee itself while 8,424 acres within the EBC enclosed by the levee would be affected by changes in the hydrology. Enclosed wetlands are not expected to be lost because sluice gates will allow flow through the levee under normal conditions. These gates will be closed only when water level outside rises too high to permit gravity drainage. It is expected that these gates will be closed and pumps operated for only about eight days per year (USACE 2013a, b). Plans for on-site mitigation and five years of monitoring are currently being developed and will be put in place at an estimated cost of $10 million. The SJBP CZMP will play a role in working out the details of how this funding will be expended to compensate for ecosystem damage caused by the new levee.

Land Use

As noted above, land within the EBC was largely cleared of the natural levee forest for plantation agriculture in the 18th century, while wetland forests were cut in the first two decades of the 20th century. Until the 1960s, sugarcane occupied more than half the 16,800 acre upland area. Analysis of 2014 imagery shows, however, that only 3500 acres, or about 20 percent of the non-wetland area (greater than five feet (5)-feet) is today in crops of any type (Figure 6-6). Heavy industry occupies another 3,000 acres (18 percent) of the highest land adjacent to the Mississippi River. Suburban residential and light commercial development now covers about 6,500 acres, just under 40 percent of the ECU. So, about 13,000 acres, or 77 percent of the 16,800 acres above five feet has been cleared and developed, while the remainder, 3,800 acres is second growth forest. So, the EBC, which also includes about 13,000 acres of swamp forest below five feet, has a total of almost 17,000 acres of forested land.

The St. John Planning and Economic Development teams published a report in 2014 titled *One Parish, One Future: the St. John the Baptist Comprehensive Plan*. This plan projects that large-scale, commercial agriculture will continue to shrink on the East Bank, while the heavy industry footprint will grow slightly, and most expansion in land use will be for residential, office parks, retail establishments, and Port of South Louisiana facilities like the Port of South Louisiana Executive Airport . The economic development study on which these projections for 2020 are based was completed before the alignment of the West Lake Pontchartrain levee alignment was known (Dufour and Jackson 2006). More recent information indicates that the earlier assumption that development in St. John will largely stay within the 2000 footprint, and in the EBC, has been correct, with new development infilling vacant areas and converting remaining agricultural land above the 5-foot contour. Once the new levee is in place and the capacity for pumped drainage is installed, there will be an incentive for development to continue to spread north into what is now cypress-tupelo swamp even if that is not contemplated in the future land use map in the *One Parish, One*

> The "land use" of a property refers to the activity or structure that is currently on the property. Some examples are: a house (residential use), or property used for sugarcane harvesting (agricultural use). The "land use" designation of a property is based on current data, and is generally collected through observational survey.

Future: the St. John the Baptist Comprehensive Plan. Unless land enclosed by the levee were at some time designated as fastland, development below the five (5)foot contour will continue to require a Coastal Use Permit (CUP) whether inside or outside of the West Lake Pontchartrain Levee.

Transportation

There are four main roadways traversing the EBC. U.S. Highway 61, also known as Airline Highway is within the strip of alluvial developed land parallel to the Mississippi River. Airline Highway is the major transportation artery for the EBC communities. I-10 runs approximately four miles north of and parallel to Highway 61. I-55 follows a north-south direction from its point of beginning at I-10 just north of Laplace, at the edge of the management unit. A railroad line runs parallel to and in the corridor area as Airline Highway.

The Port of South Louisiana Executive Regional Airport, formerly the St. John the Baptist Airport, is a small, general aviation and cargo services airport owned and operated by the Port of South Louisiana in Reserve. The Airport is situated between Airline Highway and I-10. It can accommodate corporate and private aircraft on its 5,100 foot runway, and is used for shipping cargo as well as for business and leisure travel.

The Port of South Louisiana Commission is headquartered in LaPlace, and oversees five port-owned facilities, as well as a larger number of private terminals, ranging from grain elevators to general cargo facilities along 54 miles of the Mississippi River from the Jefferson Parish line to the upstream boundary of St. James Parish. Port-owned facilities are leased to companies such as Occidental Chemical and Archer Daniels Midland. The Port purchased the Globalplex Intermodal Terminal at River Mile 138.5 in Reserve in 1992 and is developing berthing and warehouse facilities into a complex that will accommodate a variety of dry bulk and breakbulk cargo. The private and public facilities of the Port of South Louisiana cumulatively handle more tonnage than any other U.S. port.

GARYVILLE & RESERVE WETLANDS

The Garyville and Reserve Wetlands (GRW) EMU covers 28,000 acres, an area similar to that of the EBC. It lies west of the Reserve Relief Canal and between the East Bank Community (EBC) and the south shore of Lake Maurepas (Figure 6-6). From a hydrologic standpoint, the western boundary of the GRW is the east bank of Blind River, which traverses St. James and Ascension Parishes west of the St. John the Baptist Parish line. Blind River separates St. John from Livingston Parish to the north for a short three mile reach above its mouth at Lake Maurepas (Figure 6-7). The natural watershed of Dutch Bayou lies almost entirely within the GRW, and is connected via Bayou Tent with Hope Canal, the proposed conveyance channel for the Mississippi River Reintroduction into Maurepas Swamp project now being designed by the CPRA (see Figure 1-22).

Geomorphology

The GRW EMU is extremely flat, with an average swamp elevation between 0.5-1.0 feet (NAVD88), which is lower than the average water elevation (+1.5 ft.) in Lake Maurepas (URS 2007), so that the swamp floor is flooded most the time, which prevents germination of young cypress and tupelo trees to replace those killed by lightning and salt water. The natural bayous and Lake Maurepas have bank or lake rim elevations of one to two feet. The only features higher than two feet are the interstate embankments, artificial spoil banks along oilfield canals, the interstate construction canal, and the old railroad causeway on the west side of Hope Canal. This wetland landscape has been subsiding about one centimeter per year (0.4 inch) in the absence of sediment introduction from the Mississippi River (Lee Wilson & Assoc. 2001). Global sea level rise is adding about three (3) millimeters per year, or an inch every decade, for a combined rate of five (5) inches per decade of "relative sea level rise." Swamps and marshes can successfully build up the land beneath them in places receiving river sediment, but the Maurepas Swamp is largely isolated from sediment input.

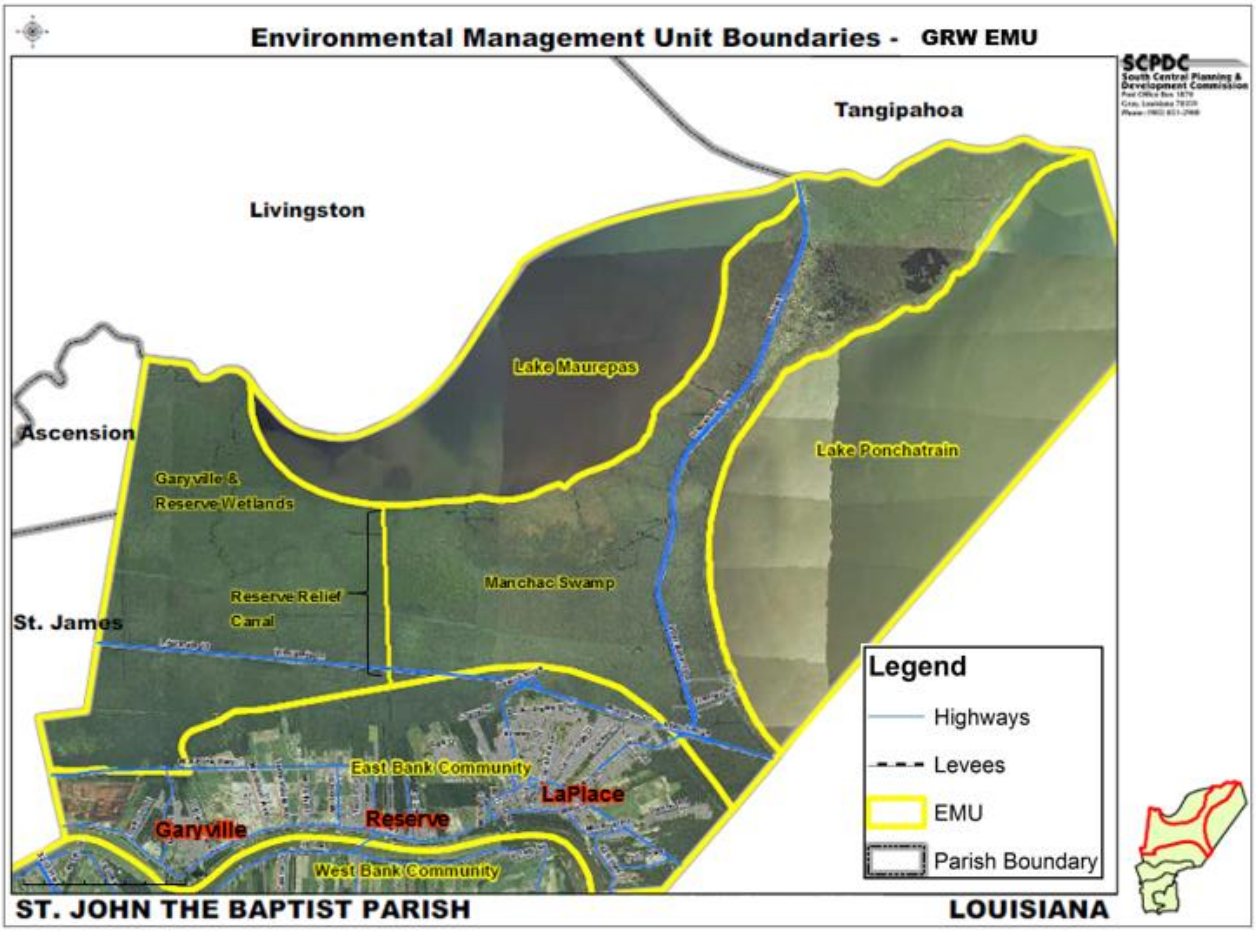


Figure 6-6. Garyville and Reserve Wetlands EMU between Lake Maurepas and the East Bank Community EMU, and west of the Manchac Wetlands EMU.

Hydrology

Natural drainage in the GRW followed the slope of the natural levee away from the Mississippi River north to Lake Maurepas through small, tidally influenced channels with maximum depths less than five feet. During the greatest floods, crevasses breached the natural levee and eroded additional channels in a dendritic pattern that coalesced to form the Dutch Bayou system (Figure 6-7). In the early 1960's the natural channels were augmented by construction of the much larger and deeper, linear Reserve Relief Canal on the eastern boundary of the GRW, extending from the natural levee to Lake Maurepas.

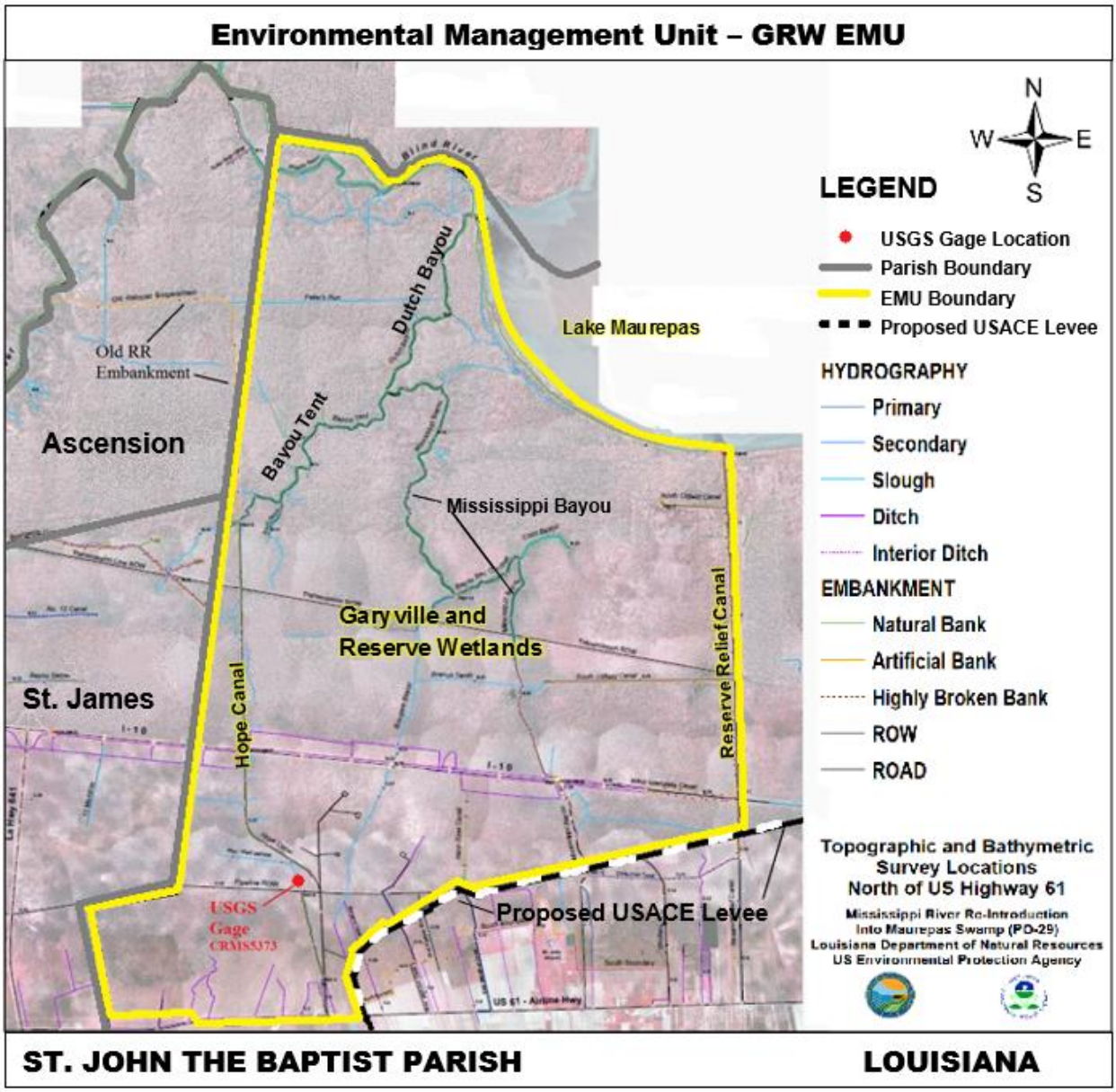


Figure 6-7. Landscape and water features of the GRW, showing Hope Canal and the connection to the Dutch Bayou watershed flowing north to Lake Maurepas from URS (2007), and USGS water level gage location.

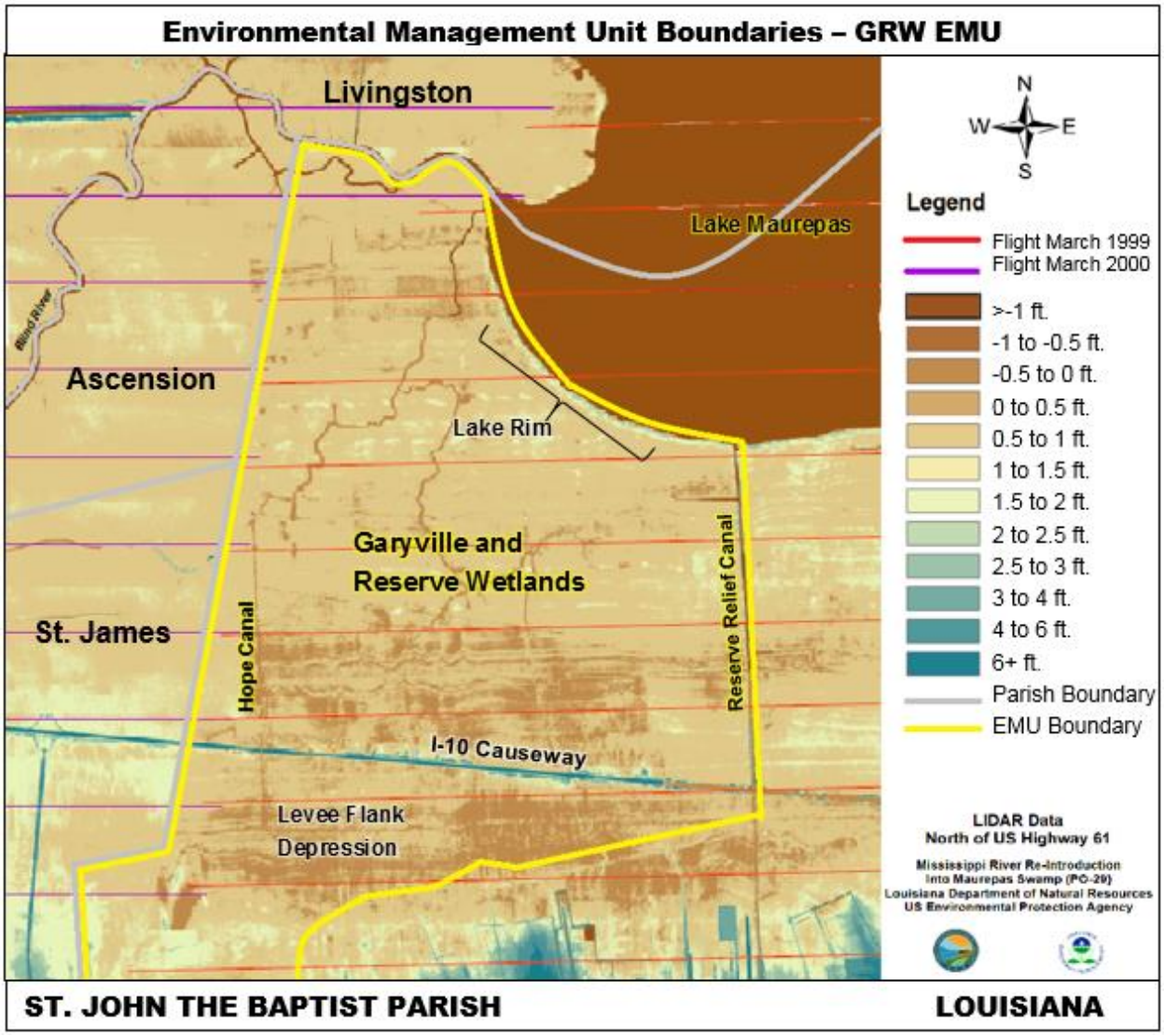


Figure 6-8. Wetland elevations in the GRW EMU ranges from zero to 1.5 feet (NAVD88) except on I-10 causeway, with lowest elevation near the EBC EMU boundary, and slightly higher elevations near Lake Maurepas (URS 2007).

LiDAR mapping shows that the highest land in the GRW EMU is the artificial causeway on which Interstate-10 (I-10) was constructed in the late 1960's (Figure 6-8). Traveling west, the I-10 transitions to a causeway built up to 7.5 to 8.3 feet (NAVD88) starting about 4,000 feet past the Reserve Relief Canal crossing from the elevated, pile-supported roadbed above a canal used for construction (URS 2007). This elevated reach extends east to the Jefferson and St. Charles Parish lines. While the interstate crosses sizeable waterways like Hope Canal on bridges, lesser drainage channels running from south to north are blocked or confined to culverts passing through the causeway. Water level in the GRW EMU is determined by the level of Lake Maurepas which responds to both hurricane-driven storm surges affecting the entire Pontchartrain Basin, and to rainfall-runoff events from uplands to the north and west of the Lake, particularly from the suburbs of the Baton Rouge that enter via the Amite River (USACE 2013a).

Water level and salinity records for 2014 and 2015 from a USGS gage in the swamp near Hope Canal (location, Figure 6-7) shows that water elevation ranged from just below zero to almost four feet (NAVD88), with a mean value of 1.6 feet (Figure 6-9), while salinity remained below 0.5 parts-per-thousand (ppt.) for this period. This is within the salinity tolerance for cypress-tupelo swamp tree species, but the swamp floor elevation between 0.5 and 1.0 feet was never dry for a sufficient period in the spring to allow for successful germination of cypress. Instead, water level was low enough to initiate germination only during the winter and fall, outside of the normal growing season.

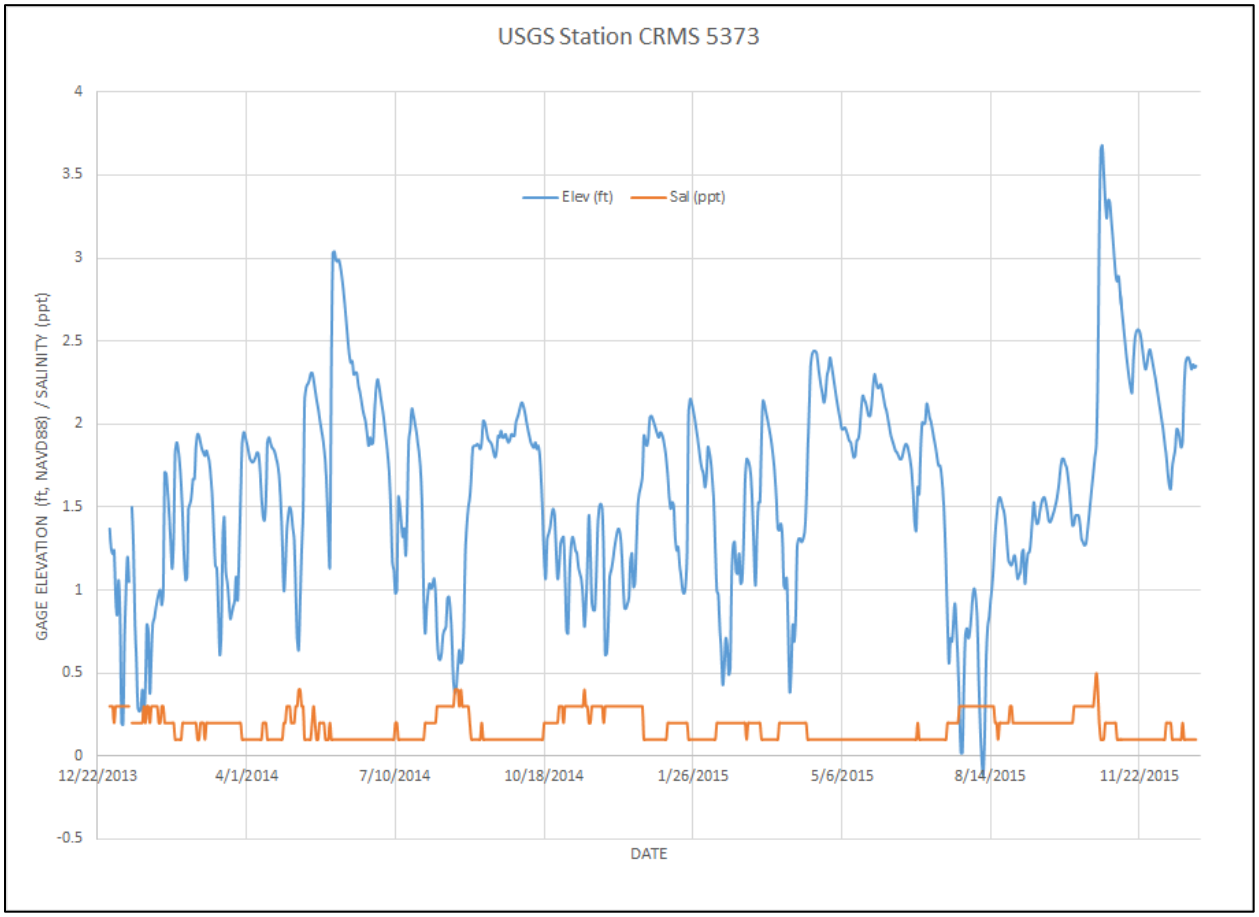


Figure 6-9. Daily water level and salinity in the swamp near Hope Canal from January 1, 2014 to December 30, 2015 showing water level ranging from below zero to 3.6 feet (NAVD88) and salinity below 0.5 parts per thousand (ppt.). Station location is given in Figure 6-6.

Soils

Barbary muck (Ba) is the primary soil type in the GRW, with a small area of Schriever clay (SkA) at the southern margin where the EMU takes in some of the lowest part of the natural levee (Figure 6-10). The Barbary series consists of fluid, very poorly drained, very slowly permeable soils formed under flooded swamps. Although they include some clay, they are dark, grayish brown in color and consist of about 60 percent partially decomposed organic matter and discernable wood and Spanish moss fragments.

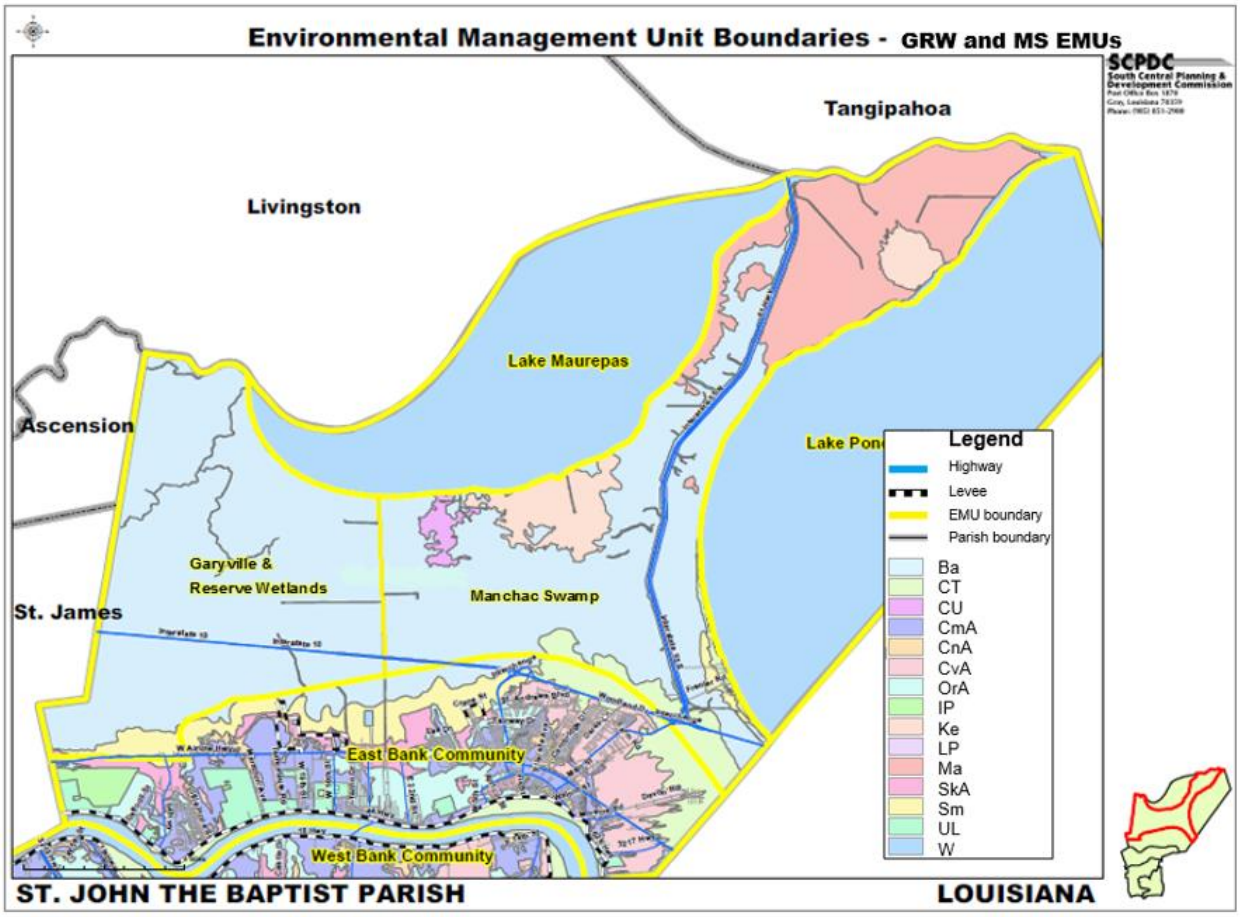


Figure 6-10. Wetland soils in the Garyville & Reserve Wetlands and Manchac Swamp EMUs.

Vegetation and Wildlife

About 20,000 acres of the GRW EMU (72 percent) is included in the 122,000 acre Maurepas Swamp WMA and is currently under LDWF management for its wildlife and fisheries resources. The LDWF has acquired this land through donations and targeted acquisitions largely since 2001. Oil and gas exploration and development has been limited in this area compared to many parts of the Louisiana coast. Although the GRW is not in a pristine condition because of clear-cutting that removed the virgin cypress and tupelo trees in the early part of the 20th century, it is road-less, and includes relatively few camps or other development. Despite its proximity to the population centers of New Orleans and Baton Rouge, the GRW qualifies as a wilderness area accessible only by boat. A public boat launch is maintained by the parish on the north shoulder of Airline Highway where it crosses the Reserve Canal.

Freshwater swamp vegetation described in Chapter 1 characterizes the GRW, but bull-tongue, cattail, cutgrass, smartweeds, submerged aquatics are found under the open canopy along with a host of invasive species like water hyacinth and an aquatic fern called common salvinia. The LDWF reports that the presence of this invasive vegetation has reduced the suitability of the area for the overwintering of large numbers of waterfowl that once used this vast swamp (LDWF 2014). American elm, Nutall oak, obtuse oak and sugarberry are found on the higher banks.

White-tailed deer, squirrels and rabbits are the primary game sought by hunters in the GRW, while fishers target largemouth bass, sunfish (bream), crappie (sac-au-lait) and catfish. A total of 57 species of finfish were collected in the area during the mid-1970's (USACE 2013). Virtually all of the bird species counted in the Bonnet Carré Spillway are also present in the GRW (see Figures 1-21a-j), including nesting bald eagles and osprey.

LDWF survey data between 1996 and 2006 showed alligator nest densities in the Maurepas Swamp WMA, which includes a portion of the GRW EMU, to average approximately one nest for each 250 acres, and that the largest alligators were found close to Lake Maurepas. At least four lizard, 16 snake and nine turtle species occur or are expected to occur on the WMA (USACE 2013b).

Degradation of the GRW swamp, and its gradual conversion to marsh and submerged aquatic vegetation (SAV), continues due to subsidence, but actual land-loss is limited to that caused by the slow retreat of the southern shore of Lake Maurepas. This retreat, which averages about three feet per year is clearly shown by the presence of trees standing in shallow water seaward of the current lakeshore (USACE 2013b).

The West Maurepas Diversion project is listed in the 2012 Coastal Master Plan (CPRA 2012) with a price of $127 million. This diversion may be sited on the east bank of the Mississippi in the vicinity of Convent or at Hope Canal near Garyville. It is expected to benefit the entire GRW by (1) reducing intrusion of salt water during droughts, (2) providing nutrients, primarily nitrogen, and (3) fine-grained (clay) sediments to the swamp soil surface that will enhance the growth and vigor of swamp vegetation and offset relative sea level rise. This diversion may be sited in the vicinity of Convent or at Hope Canal near Garyville. This combination will, over decades, create new, higher-elevation zones for cypress and tupelo regeneration, and reduce long-term subsidence by stimulating the build-up of organic swamp soils. While protection from salinity intrusion will be widespread, other diversion benefits will be greatest adjacent to Hope Canal and the tributaries to Dutch Bayou (Day et al. 2001).

Land Use

The GRW EMU is not expected to be subject to any development beyond that necessary to construct the USACE West Shore Lake Pontchartrain Hurricane Levee (see Figure 1-8), and the Hope Canal diversion project (URS 2007). The limitation on wetland development is assured by the inclusion of most of the GRW in the Maurepas Swamp WMA, and by anticipated construction of the USACE levee which will create a barrier to further expansion of East Bank communities to the north. These two projects are expected to move forward in tandem, as the new federal levee will provide additional protection to East Bank communities that might otherwise be affected by local water level rises associated with diversion operation.

Transportation

I-10 is the only road that passes through the GRW, as has been discussed (Figure 6-7). If the pipeline corridor followed by the proposed USACE hurricane protection levee falls on the protected side, it will be contained in the EBC EMU. The only other linear facility that crosses the GRW is a cleared utility right-of-way with power transmission lines suspended from towers.

MANCHAC SWAMP

The Manchac Swamp (MS) EMU is the largest in St. John the Baptist Parish, covering more than 40,000 acres. It lies east of the Reserve Relief Canal, west of Lake Pontchartrain, and south of Lake Maurepas and Pass Manchac (Figure 6-11). It makes up the south half of what coastal planners have called the Pontchartrain-Maurepas Land Bridge. While the terrain is similar in many ways to the Garyville and Reserve Wetlands (GRW) EMU, it has been influenced to a greater degree by the higher salinities, bigger waves and greater storm surges that are generated in Lake Pontchartrain.

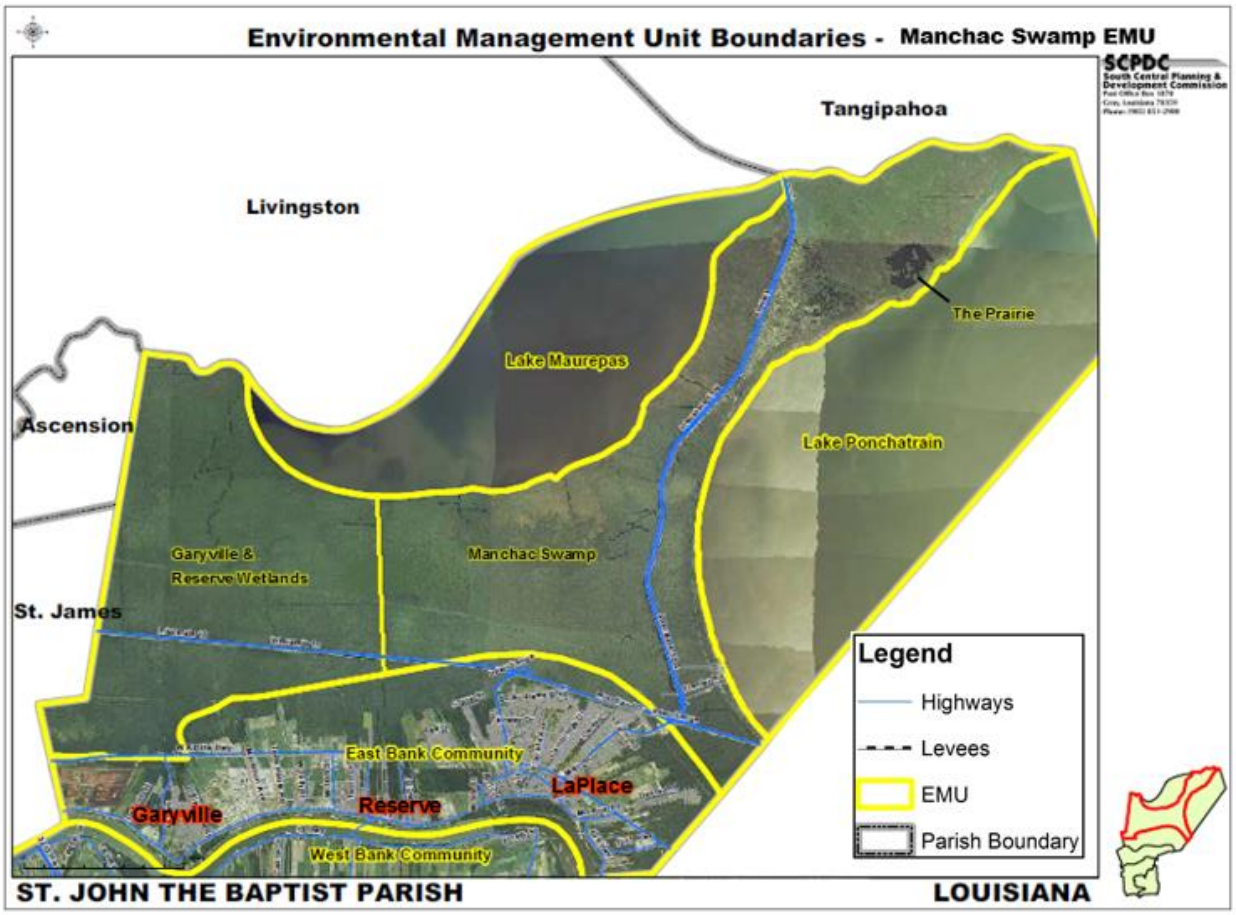


Figure 6-11. MS EMU between Lake Maurepas, Lake Pontchartrain, and East Bank Community EMU.

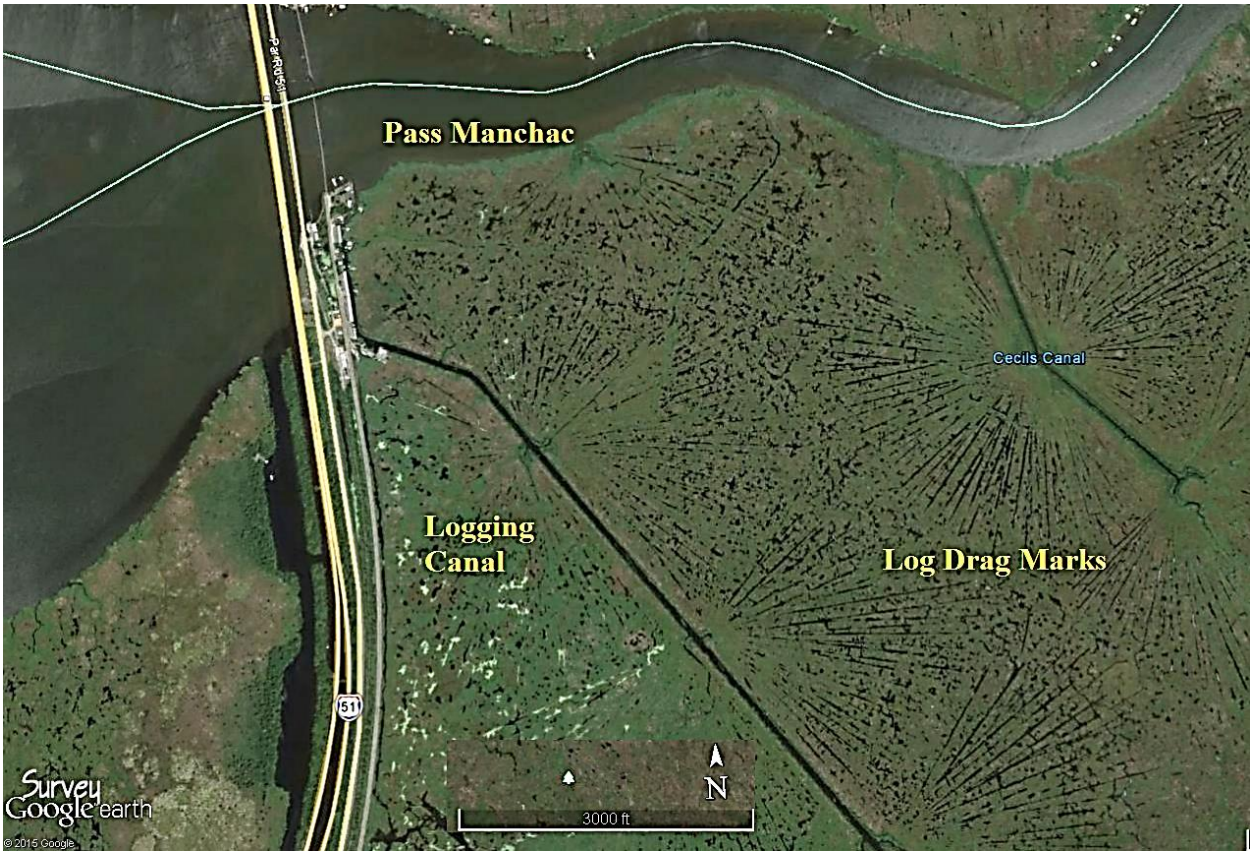


Figure 6-12. Logging canals and drag marks in the MS EMU south remain visible in marsh south of Pass Manchac 100 years after they were created. The swamp never regrew in this area. The railroad and Hwy. 51 are built on earthen causeways that parallel the I-55 elevated highway visible to the left near the east shore of Lake Maurepas.

Geomorphology

Like the GRW, the MS EMU is extremely flat, with an average swamp elevation between 0.5 to 1.0 feet (NAVD88), which is lower than the average water elevation (+1.5 ft.) in Lake Maurepas (URS 2007), so that the swamp floor is flooded most the time, which prevents germination of young cypress and tupelo trees to replace those killed by lightning and salt water. Unlike the GRW EMU to the west, the MS EMU has never had a system of natural waterways leading to Lake Maurepas. Virtually all of the waterways present today are canals dredged for oil/gas and timber extraction, or narrow pirogue trains (tranasses) dug by trappers. The MS has more than 12,000 acres of un-forested, fresh to intermediate marsh. Some of this marsh along the southeast shore of Lake Maurepas shows up in the 1892 USGS topographic quadrangles (see Figure 1-5), but the majority of the MS marsh was created when the swamp was logged in the first decades of the 20th century, and the second growth swamp did not re-establish. Canals constructed for logging as well as the characteristic log drag marks are most visible in these marshes close to Pass Manchac (Figure 6-12).

The shorelines of Lakes Maurepas and Pontchartrain have bank or lake rim elevations of one to two feet. Interstates 10 and 55 are supported on pile elevated structures in the MS EMU, but Hwy. 51 and a rail line both parallel I-55 and are built on embankments about six feet above the surrounding swamp or marsh surface. These linear features impounded the storm surge entering from Lake Pontchartrain during Hurricane Isaac, slowing drainage. Most of the timber and oilfield canals in the MS are so old that the artificial spoil banks lining them have settled almost to marsh level, but some are still high enough that camps have been built on them. This wetland landscape has been subsiding about one centimeter per year (0.4 inch) in the absence of sediment introduction from the Mississippi River (Lee Wilson & Assoc. 2001).

Hydrology

Drainage in the MS followed the slope of the natural levee away from the Mississippi River north to Lake Maurepas, but this must have occurred almost as a sheet flow because there were few natural channels. During the greatest floods, crevasses breached the natural levee, eroding additional channels but these followed a shorter path to Lake Pontchartrain. In the early 1960's, the Reserve Relief Canal that forms the western boundary of the MS was added to improve gravity drainage of the East Bank.

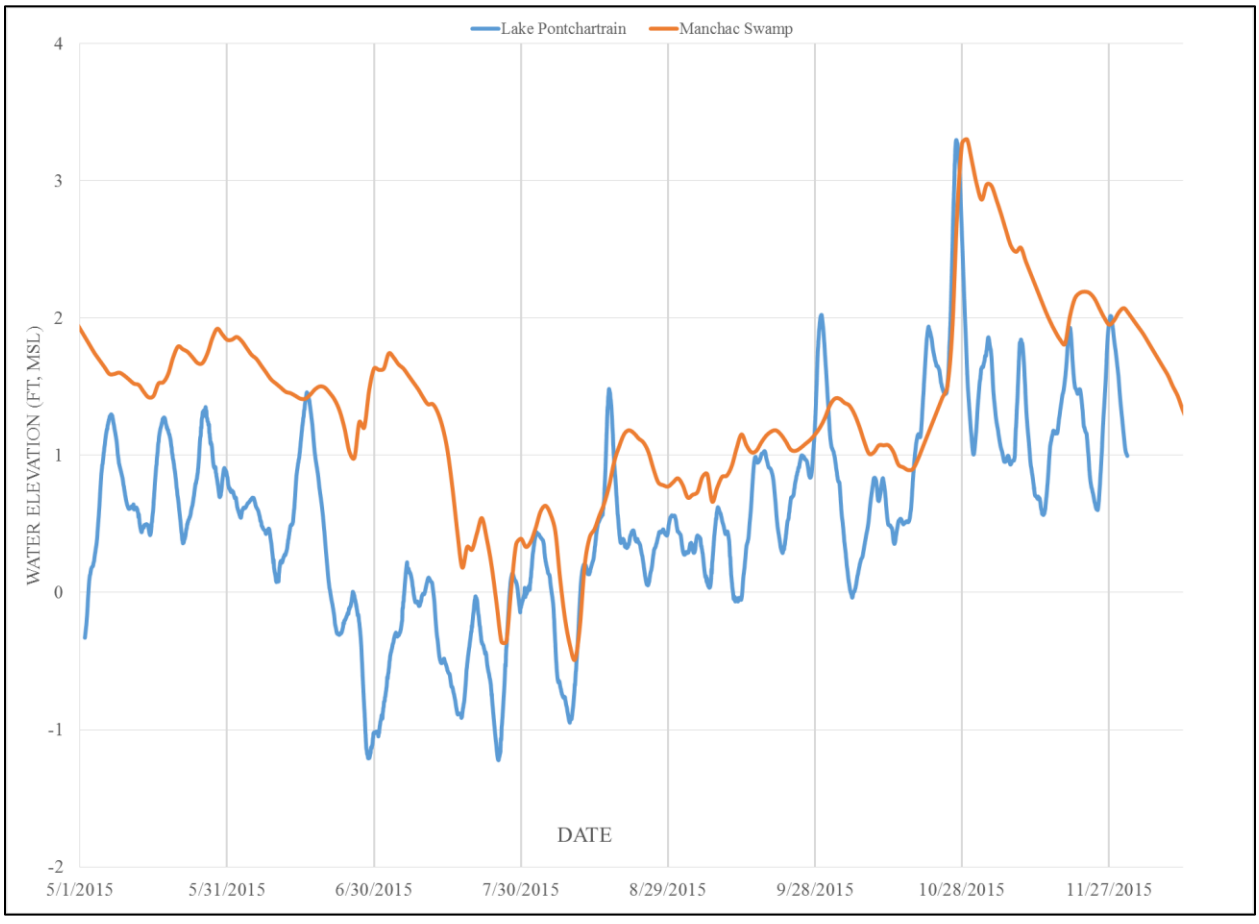


Figure 6-13. Comparison of daily mean water level in Lake Pontchartrain (I-10, Bonnet Carré Spillway) and Maurepas Swamp (CRMS 5373) from May 1 to November 30, 2015.

Mapping shows that the highest land in the MS EMU are the artificial causeways on which the north-south railroad and Hwy. 51 were constructed (Figure 6-12). I-10 and I-55 are elevated on concrete piles above canal used during construction (USACE 2013a, b). Water level in the MS EMU is determined primarily by the level of Lake Maurepas which responds to both hurricane-driven storm surges affecting the entire Pontchartrain Basin, and to rainfall-runoff events from uplands to the north and west of the Lake, particularly from the suburbs of Baton Rouge that enter via the Amite River.

No water level gages are active in the MS EMU but stage and salinity records for 2014 and 2015 from a USGS gage in the swamp near Hope Canal (GRW EMU) should be similar (Figure 6-7). This record shows that water elevation ranged from just below zero to almost four (4) feet (NAVD88), with a mean value of 1.6 feet (Figure 6-9), while salinity remained below 0.5 parts-per-thousand (ppt.) for the entire period. This is within the salinity tolerance for cypress-tupelo swamp tree species, but the swamp floor elevation between 0.5 and 1.0 feet was never dry for a sufficient period in the spring to allow for successful germination of cypress. Instead, water level was low enough to initiate germination only during the winter and fall, outside of the normal growing season.

Comparison of Lake Maurepas swamp water level (CRMS 5373) with Lake Pontchartrain level at I-10 in the Bonnet Carré Spillway (NOAA CO-OPS 8762483) shows after a datum adjustment that Maurepas swamp water level was generally higher than that at the Lake Pontchartrain shoreline for at least the last half of 2015, when both gages were active (Figure 6-13). The average difference for this period was 0.8 feet. When Lake Pontchartrain rose above plus three (+3)-feet (MSL) at the end of October, 2015, the Maurepas swamp also flooded to this level, and then drained slowly. Conversely, the Maurepas swamp water level remained high in June, 2015, for a month after it dropped below zero (0)-feet (MSL) in Lake Pontchartrain due to high runoff from surrounding uplands into Lake Maurepas. Generally, flooding of the swamp occurs rapidly during periods of southerly and easterly winds when the lakes are high, while water level in the swamp drops more slowly than in the lakes.

Soils

Similar to the GRW EMU, Barbary muck (Ba) is the primary soil type in the MS EMU, with a small area of Schriever clay (Sm) at the southern margin where the EMU takes in some of the lowest part of the natural levee (Figure 6-10). The Barbary series consists of fluid, very poorly drained, very slowly permeable soils formed under flooded swamps. Although they include some clay, they are dark, grayish brown in color and consist of about 60 percent partially decomposed organic matter and discernable wood and Spanish moss fragments. Soils found in the fresh marsh areas are Allemands and Carlin mucks (Cu) and Maurepas muck (Ma) in the saltier marshes adjacent to Pass Manchac.

Vegetation and Wildlife

About 29,000 acres of the MS EMU (71 percent) is included in the 122,000 acres covered by the Maurepas Swamp and Manchac Wildlife Management Areas (WMAs) that are currently under LDWF management for its wildlife and fisheries resources. The LDWF has acquired this land

through donations and targeted acquisitions largely since 2001. Oil and gas exploration and development has been limited in this area compared to many parts of the Louisiana coast. Although the MS is not in a pristine condition because of clear-cutting that removed the virgin cypress and tupelo trees in the early part of the 20th century, it is road-less with the exception of the elevated interstates and Highway 61, and includes few camps or other structures. The MS is accessed from 4 boat launches and from Peninsula and Sunset Parks off U.S. Highway 51. US 51 runs north from Laplace paralleling I-55.

Freshwater swamp vegetation described in Chapter 1 characterizes the MS EMU, but bull-tongue, cattail, cutgrass, smartweeds, and submerged aquatics are found under the open canopy along with a host of invasive species like water hyacinth and an aquatic fern called common salvinia. The LDWF reports that the presence of this invasive vegetation has reduced the suitability of the area for the overwintering of large numbers of waterfowl that once used this vast swamp (LDWF 2014). American elm, Nutall oak, obtuse oak and sugarberry are found on the higher banks.

The intermediate marsh adjacent to Pass Manchac and the Lake Pontchartrain shore is included in the Manchac WMA and is managed primarily for waterfowl hunting. It has some vegetation types that are not found elsewhere in the MS including leafy three-square and cattail. Submerged aquatic vegetation (SAV) that can tolerate low levels of salinity include southern naiad, sago pondweed, fanwort and coontail. A 700 acre, shallow pond near the Lake Pontchartrain shoreline is locally called "the prairie," and is heavily used by waterfowl hunters (Figure 6-11). LDWF has established this pond as a "limited access area," meaning that boats with engines are prohibited from September through January, though it is accessible by "mud-boats" during the rest of the year. These are specialized skiffs equipped with air-cooled engines and large, direct-drive propellers that can pass in water almost as shallow as is possible with an airboat.

White-tailed deer, squirrels and rabbits are the primary game sought by hunters in the MS, while fishers target largemouth bass, sunfish (bream), crappie (sac-au-lait) and catfish. A total of 57 species of finfish were collected in the area during the mid-1970s (USACE 2013). Virtually all of the bird species counted in the nearby Bonnet Carré Spillway are also present in the MS (see Figures 1-21a-j), including nesting bald eagles and osprey. Migratory waterfowl commonly hunted in the Manchac marsh include gadwall, teal, wigeon, mallard and shoveler ducks, while wood ducks, mottled ducks, hooded mergansers and black-bellied whistling ducks are resident year round.

Similarly to the LDWF survey, previously mentioned for the Garyville and Reserve Wetlands EMU, alligator nest densities in the MS EMU averaged about one nest for each 250 acres. The largest alligators in the Manchac/Maurepas area were found closest to Lake Maurepas. The same reptilian species located in the Garyville and Reserve Wetlands can be found in the MS EMU as well. Controlled trapping for alligators and nutria also takes place in the MS, while non-consumptive uses like sightseeing and birdwatching are also becoming more popular.

Degradation of the MS swamp, and its gradual conversion to marsh and SAV, continues due to subsidence, but actual land loss is limited to that caused by the slow retreat of the shorelines of

Lakes Pontchartrain and Maurepas. This retreat averages nine to three feet per year for Lakes Pontchartrain and Maurepas, respectively, and is clearly shown by the presence of trees standing in shallow water seaward of the current lakeshore (USACE 2013b).

The West Maurepas Diversion project in the 2012 Coastal Master Plan will benefit the entire MS by reducing intrusion of salt water into Lake Maurepas during droughts, but is expected to have little additional benefit on the MS as the proposed introduction points at Convent or Hope Canal are too far to the west. Diverted water will be hydrologically isolated from the MS by the spoil banks of the Reserve Relief Canal (Lee Wilson and Associates, Inc. 2001)

Land Use

Like the GRW EMU, the MS EMU is not expected to be subject to any development beyond that necessary to construct the USACE West Shore Lake Pontchartrain Hurricane Levee (see Figure 1-8). The limitation on wetland development is assured by the inclusion of most of the MS in the Maurepas Swamp and Manchac WMAs, and by anticipated construction of the USACE levee which will create a barrier to further expansion of East Bank communities to the north.

Transportation

I-10, I-55 and Hwy. 51 pass through the MS, but Hwy. 51 is the only one that is not elevated (Figure 6-12). If the pipeline corridor followed by the proposed USACE hurricane protection levee falls on the protected side, it will be contained in the EBC EMU. The only additional linear facility that crosses the MS EMU is a cleared utility right-of-way with power transmission lines suspended from towers.

LAKE EMUs

LAKE PONTCHARTRAIN

The Lake Pontchartrain (LP) EMU covers 10 percent of the surface area of Lake Pontchartrain (63 square miles) at its southwestern margin. Lake Pontchartrain is called a lake but it might be more accurately described as a bay because it is connected to the Gulf of Mexico through two narrow tidal passes at the eastern end. It is estuarine because saltwater from the Gulf mixes with freshwater from rivers and from pumps in the Greater New Orleans metropolitan area. The Lake Pontchartrain shoreline in St. John Parish is undeveloped except for a small settlement at Frenier Beach with a boat launch, some elevated camps and a crab processing facility. Elsewhere, cypress-tupelo swamp extends to the shoreline. It is a retreating shore with small accumulations of shells on the beach face among the standing cypress trees and dead stumps.

Geomorphology

Lake Pontchartrain became an enclosed water body first about 5,000 years B.P. as a chain of barrier islands (Pine Island Trend) extended west from the mouth of the Pearl River. Second, about 3,000 years B.P., the Mississippi River built a channel to the east over and through the sandy islands toward what is now St. Bernard Parish, separating what had been an open bay from the Gulf of Mexico. Many crevasses like those at Bonnet Carre during the second half of the 19th century deposited sediment in what is now Laplace, and also pushed the shoreline to the north out into the Lake. Once the crevassing was stopped, however, waves began to shape this coast once more, causing up to 12 feet of shoreline retreat each year (Saucier 1963). Water depths reach 12 feet out in the Lake along the parish line. Shoal areas extend lakeward from Frenier Beach south to the Bonnet Carre Spillway and in the vicinity of Pass Manchac. Pass Manchac is a tidal channel connecting Lake Pontchartrain with Pass Manchac. Water is deeper in this Pass than anywhere else in St. John Parish, reaching more than 50 feet in places.

Water Quality

The water quality of LP EMU has been an environmental success story over the past two decades. Much of this improvement is the result of scientific and advocacy work carried out by scientists and volunteers with the Lake Pontchartrain Basin Foundation (LPBF, **http://www.saveourlake.org/**). In the late 1980s, LP was often very muddy and submerged sea grass beds had disappeared because giant dredges were continually resuspending bottom sediments as they sieved out the shells of Rangia clams that were used for gravel and cement. This was banned in 1990. A moratorium on new drilling for oil and gas in the Lake was enacted for the first time in 1991, and has since been made permanent. Use of volunteers to take regular water quality measurements began in 1993, along with programs to address a variety of pollution sources. In 2006, the LDEQ removed Lake Pontchartrain from its 303(d) list of impaired waterbodies, and in 2008, the Tangipahoa and Bogue Falaya Rivers that enter the Lake on the north shore were also removed because of much improved water quality. Finally, in 2009, local

residents were successful in getting the Mississippi River Gulf Outlet (MRGO), a deep navigation channel dredged through the St. Bernard marshes in the early 1960s, deauthorized and dammed after much evidence that it had caused a significant part of the flooding of New Orleans. This has reduced salinity in the Lake to pre-MRGO levels.

Every week the LPBF publishes a "Hydrocoast Map" online that summarizes a week of water quality findings in and around Lake Pontchartrain and Lake Maurepas (Figure 6-14). The LPBF is an example of an organization that has been very effective in improving water quality over a very large watershed within relatively few years, turning Lake Pontchartrain from an environmental embarrassment to a touted civic and recreational asset. This is a model that the St. John Parish CZAC could follow to raise awareness about issues and opportunities to improve water quality in Lac des Allemands on the west bank.

It is possible that St. John may partner in the future with LPBF or with state or federal agencies to build restoration projects stabilizing the LP shoreline or improving water quality or public access. The Southeastern Louisiana University (SLU) research facility at Turtle Cove on the south shore of Lake Maurepas offers great opportunities for environmental education for students of all ages. It is reached by boat from the SLU facility at Ruddock.

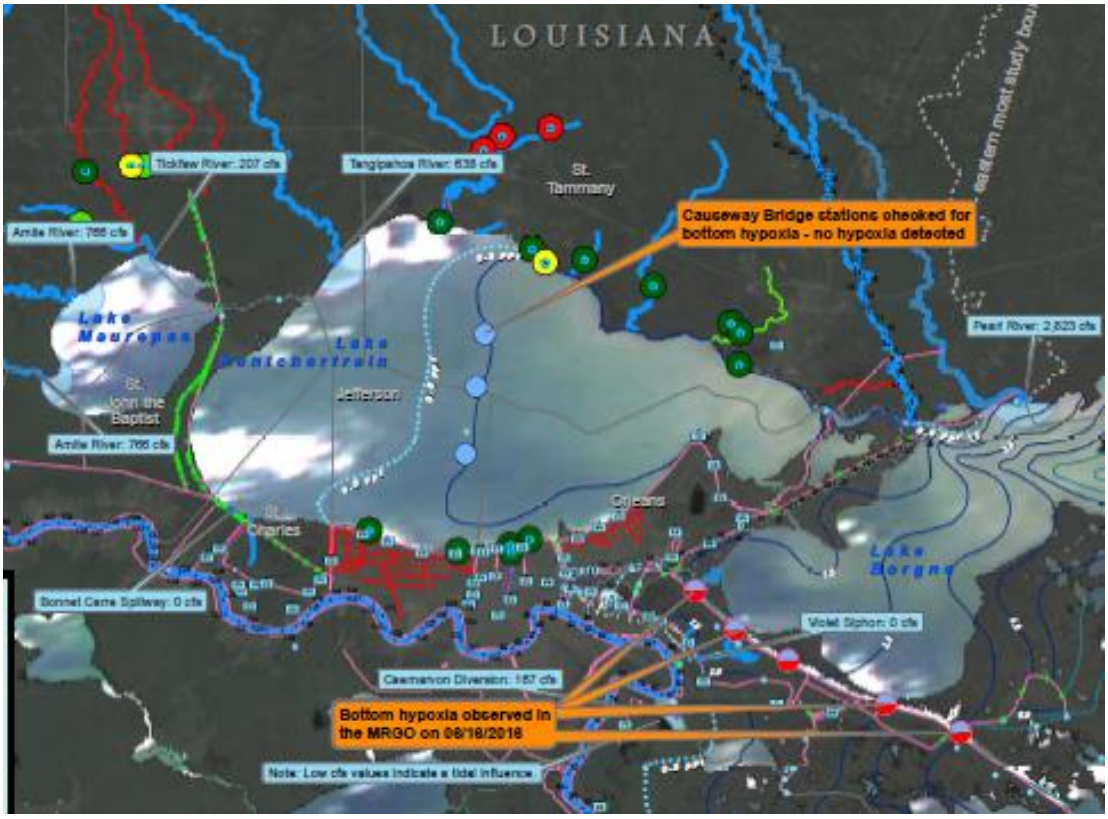


Figure 6-14. Portion of LPBF Hydrocoast Map providing a summary of water quality results obtained at a number of points around Lake Pontchartrain during the week starting June 13, 2016. The light blue dotted line is the 0.5 ppt isohaline which essentially divides the Lake in half, and shows that the western half of the LP EMU as well as Lake Maurepas were freshwater. Rivers and streams denoted in blue did not exceed any water quality criteria, while those in red, including drainage canals in New Orleans, registered unacceptable levels of fecal coliforms. Weekly Hydrocoast Maps can be downloaded at http://www.saveourlake.org/PDF-documents/our-coast/Hydrocoast/PBHC19Jun2016wq.pdf

LAKE MAUREPAS

The Lake Maurepas (LM) EMU covers the 42 percent of Lake Maurepas, essentially the southern half, that falls in St. John Parish (37 square miles). It is a part of the Lake Pontchartrain estuary because saltwater from the Gulf mixes with freshwater from rivers and from pumps in the Greater New Orleans metropolitan area. The Lake Maurepas shoreline in St. John Parish is almost completely undeveloped except for the Southeastern Louisiana University (SLU) research facility at Turtle Cove that can be reached from Ruddock. Except for a few places where marsh can be seen along the lake edge, standing cypress trees and dead stumps characterize the shoreline. It is a retreating shore with small accumulations of shells on the beach face.

Geomorphology

The geologic history of the LM EMU is closely entwined with that of Lake Pontchartrain. It is believed to have been part of the same bay and barrier island complex that included what is now Lake Pontchartrain 5,000 years B.P., and that it was later affected by the extension of the St. Bernard Mississippi River channel to the east. It is not known, however, whether Lake Pontchartrain and Lake Maurepas were originally one lake that was subsequently divided by the Manchac land bridge, or whether what is now Lake Maurepas was previously swamp that subsided to form a lake (Saucier 1963). Many crevasses like those at Bonnet Carre during the second half of the 19th century deposited sediment in what is now Laplace, but there is no evidence that these crevasses flowed as far north as Lake Maurepas. Water depths reach 9 feet in the middle of the Lake. Sandy shoal areas occur on the western side of the Lake between the mouths of the Amite and Blind Rivers. Shoreline retreat characterizes the entire perimeter of Lake Maurepas but is greatest at the south end where it reaches 5 feet per year. Pass Manchac is a deep tidal channel (>50 ft) through the Manchac land bridge connecting Lake Maurepas with Lake Pontchartrain. Water is deeper in this Pass than anywhere else in St. John Parish, reaching more than 50 feet in places.

Water Quality

Improving the water quality of LM EMU has received less attention from state agencies and the Lake Pontchartrain Basin Foundation (LPBF) than has Lake Pontchartrain. Lake Maurepas receives all of the stormwater runoff from the Baton Rouge Metro Area through the Amite and Blind Rivers. These rivers are affected by a seafood consumption advisory related to bioaccumulation of mercury as is discussed in Chapter 4. Because it is shallow, LM is often very muddy and when the water is high some of this sediment gets into the cypress-tupelo swamp that surrounds the Lake. Lake Maurepas is included in the moratorium on new drilling for oil and gas that was enacted for the first time in 1991, and has since been made permanent. Lake Maurepas has never been considered impaired by the LDEQ, but the Tchefuncte River that enters the Lake on the northwest side was impaired because of the presence of fecal coliform bacteria. This designation was removed in 2008 after significant work in the watershed to reduce contamination at the sources. Finally, in 2009, local residents were successful in getting the Mississippi River Gulf Outlet (MRGO), a deep navigation channel dredged through the St. Bernard marshes in the early 1960s, deauthorized and dammed after much evidence that it had caused a significant part of the flooding of New Orleans. This has reduced salinity in the Lake to pre-MRGO levels. The reduction in salinity has reduced stress on the cypress forests but they are already in such poor condition that long-term recovery may not be possible without the planned new diversion from the Mississippi River.

WEST BANK COMMUNITY

The West Bank Community (WBC) EMU constitutes about half of the total WBMZ land area of about 40,000 acres (Figure 6-14). About 64 percent of this 18,000 acre EMU (11,556 acres) has an elevation of five feet or higher, and most development has taken place in this swath of higher land closest to the River, though agricultural fields extend to elevations as low as four feet (Figure 6-3). As previously noted, the WBC is essentially rural, housing only two percent of St. John the Baptist Parish residents in small, historic communities, including Edgard, the parish seat. Residences are clustered along LA 18 (River Road) on some of the highest land in St. John. The Gramercy Bridge, completed in 1995, provides a connection across the River near Wallace at the western edge of the WBC. Louisiana Highway 3127 (LA 3127) has been constructed as an east-west alternative to River Road along the development boundary, and the southern edge of the WBC has been placed in the wetlands just beyond this point (Figure 6-14).

The WBC is protected against flooding from the Mississippi River by levees constructed as part of the USACE Mississippi River & Tributaries Project (MR&T). There are currently no other federal or state levees in the WBC. Gravity drainage is effective enough for agricultural purposes, and the West Bank is well sheltered against hurricane surge due to its location behind a large swath of healthy swamp forest in the upper Barataria Basin. Unlike the East Bank, which is surrounded on two sides by large lakes, Lac des Allemands is the closest water body to the West Bank and is too small in diameter for storm winds to generate a surge of more than a few feet.

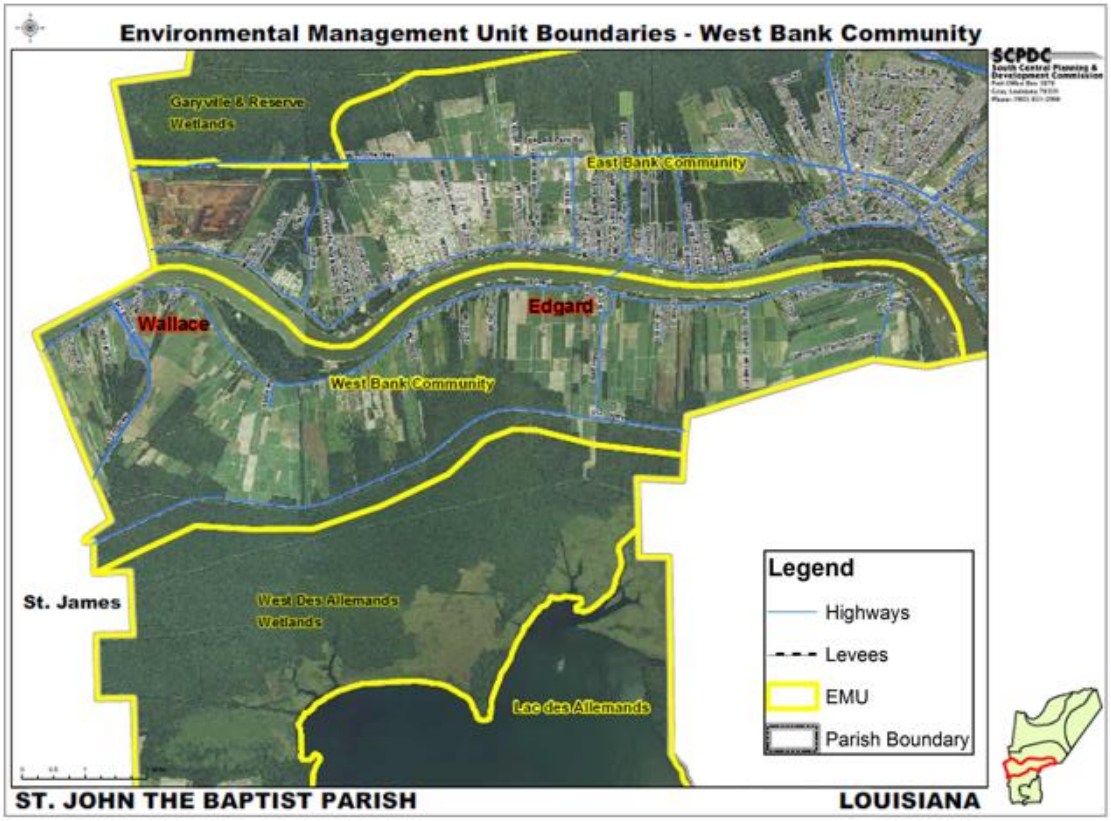


Figure 6-14. West Bank Community EMU

Geomorphology

The WBC follows the natural levee ridge of the Mississippi River for 15 miles, from river mile 127 upstream to mile 142 above Head of Passes. It was created by overbank flooding during St. Bernard delta progradation and during later crevasses and large floods when layers of sediment were deposited adjacent to the main channel. Natural levee elevations reach about 16 feet along the northern boundary of the unit closest to the man-made MR&T levee, but elevation drops off to the south, away from the river. This EMU also contains periodically exposed "batture" land between the Mississippi River channel and the MR&T levee. Farming and residential development is generally confined to the space between the river levee and the plus five foot contour line (Figure 6-3). That contour extends 0.7 to two miles away from the toe of the Mississippi River levee, making the WBC somewhat narrower than the East Bank natural levee. The widest portions of the Mississippi River natural levee are associated with crevasse deposits that show up most clearly on the soils map (Figure 6-15).

Soils

The WBC EMU contains a wider variety of soil types than most other areas of St. John. The river brought in sediments ranging up to sand size, and these soils experienced a range of drainage conditions once they were deposited, from fertile, well-drained upland loams to frequently inundated marsh mucks (Figure 6-15). Seven soil types are found on the WBC natural levee, namely Cancienne silt loam (CmA), Carville silt loam (CvA), Gramercy silty clay (GrA), Cancienne silty clay loam (CnA), Schriever clay (SkA and Sm) and Barbary muck (Ba) in low areas. Historically, the loams were well suited for sugarcane, cotton and other row crops, while soils with higher clay content were often used to produce rice (Davis et al. 1982). Virtually all of the loams are in use for sugarcane agriculture, while the Barbary muck soils remain in bottomland hardwood wetlands.

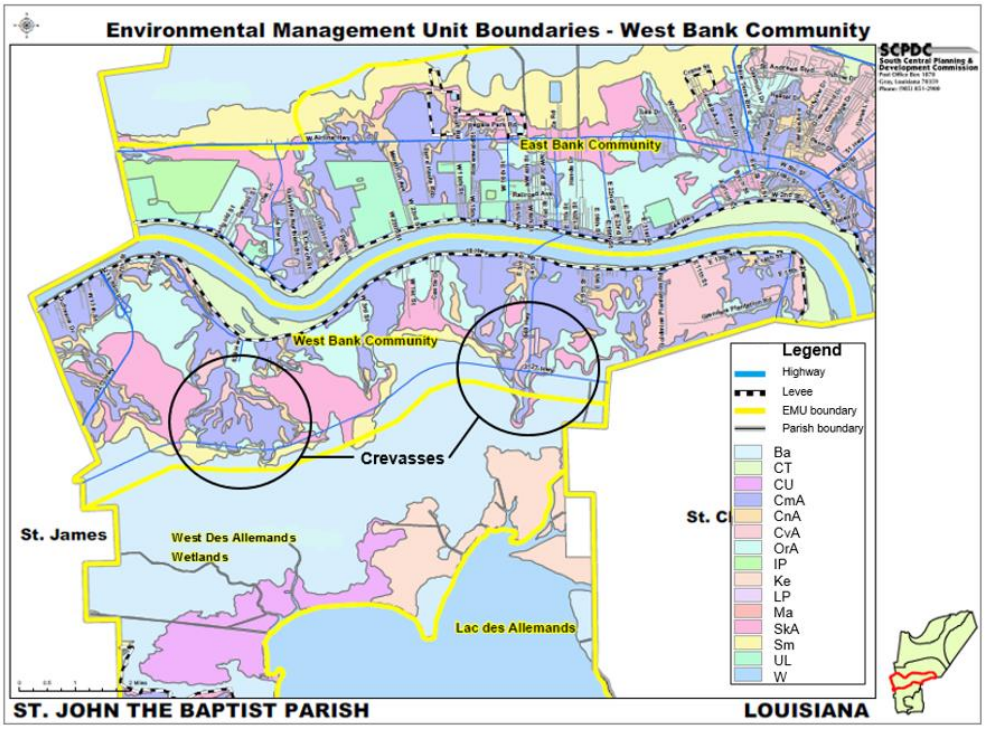


Figure 6-15. West Bank Community showing soil types and crevasse locations.

Hydrology

Drainage in WBC followed the slope of the natural levee away from the Mississippi River south to Lac des Allemands. During floods with higher than average stages, overtopping would have caused flow over low spots in the natural levee, while subsurface seepage would recharge the shallow natural levee aquifer. During the greatest floods, crevasses breached the natural levee, building elevated splays that are now farmed. To enhance drainage of rainwater from croplands, multiple linear ditches were dug in the 19th century from the River levee to about the four foot contour (see Figure 1-5). This agricultural drainage system has changed little over the past century.

East-west transportation arteries raised on earthen causeways with limited openings have been constructed over time that have channelized sheet runoff from the natural levee (Figure 6-16). Each was built along an upland/wetland boundary that was gradually pushed south, away from the River. The railroad was built in the mid-19th century, but Louisiana Highway 3127 was not built until 1975. The LA 3127 embankment serves as a *de facto* hurricane protection levee for the WBC.

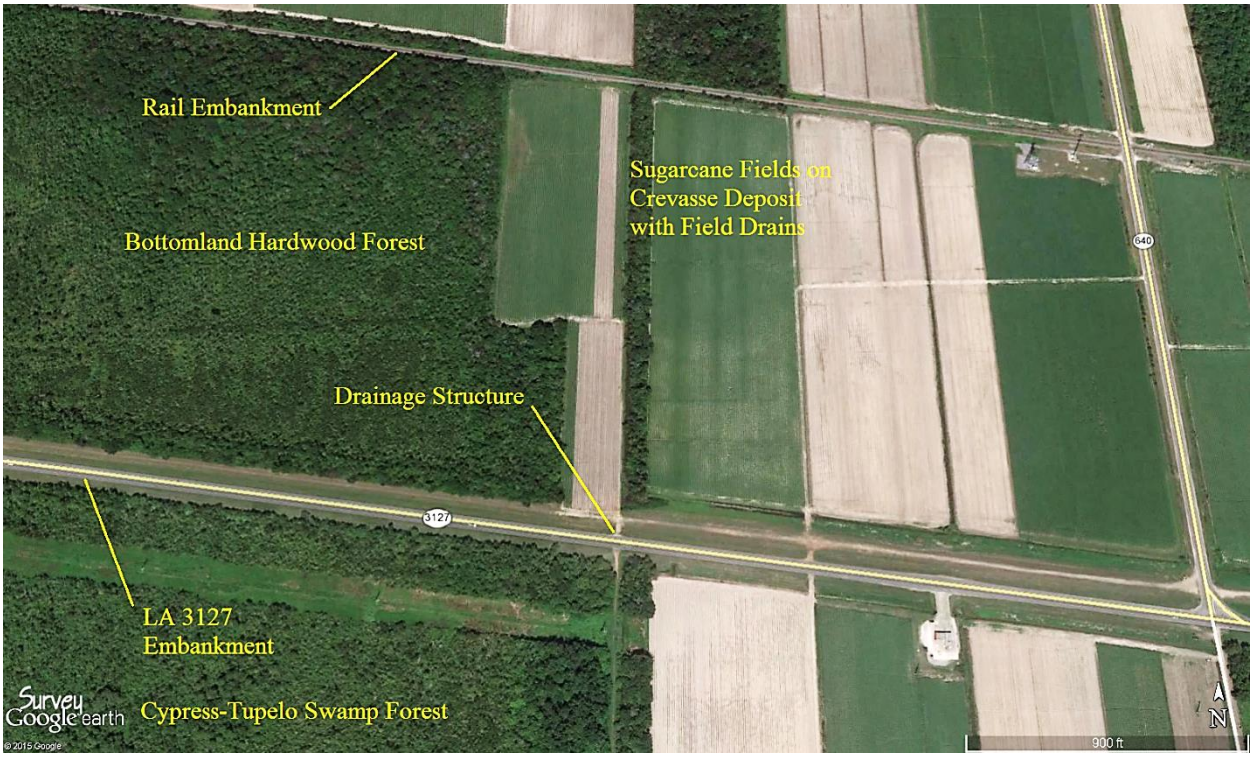


Figure 6-16. Detail of boundary between agriculture and wetlands south of Edgard in the WBC EMU, showing east-west transportation embankments and field drains.

Vegetation and Wildlife

All of the hardwood forests that once covered the natural levee were cleared for crops before the 20th century (see Figure 1-5). Patches of bottomland hardwood forests remain in lower areas of the WBC north of the LA 3127 corridor and consist of trees such as live oak, pecan, American elm, hickory, and green ash. Fauna native to this habitat include deer; small mammals such as Virginia opossum, squirrels, and raccoons; and a variety of song birds and wading birds (see Figures 1-21a-j).

Land Use

Land within the WBC EMU was largely cleared of the natural levee forest for plantation agriculture in the 18th century, while wetland forests were cut in the first two decades of the 20th century. Sugarcane fields today occupy 11,400 acres or more than 66 percent of the EMU, which has probably been the case for the past century. All other development for retail, municipal, education and residential purposes covers less than 900 acres based on analysis of 2014 Future Land Use map in the St. John the Baptist Parish Comprehensive Planning Project, Phase II, Task II, Land Use Plan Report. There is no manufacturing or industry in the WBC. So, about 5,700 acres, or 32 percent of the 18,000 acres in the WBC EMU is second growth forest, largely bottomland hardwood wetlands.

The St. John government economic management team expects that large-scale commercial agriculture will continue to dominate the WBC landscape in 2020, but that an estimated 2,000 acres, half forested and half now in agriculture, will be converted to manufacturing in two large industrial parks east and west of Edgard (Dufour and Jackson 2006, St. John the Baptist Parish 2014). These zones will be connected by a new road paralleling the railroad. Parts of the right of way for this road are now in bottomland hardwood wetlands. It is expected that this road will be flanked by commercial and retail development, some of which will also be in areas that are now wetlands. Another 2,000 acres, currently forested wetlands, is projected for residential development north of the LA 3127 corridor. One cluster of new residential development will be in the Wallace area, near the Gramercy Bridge approach and the other will be near Edgard. Much of the land proposed for development by 2020 is lower than the five foot contour and will require Coastal Use Permit (CUP), Needs, Alternatives and Justification Analysis (NAJ) and Compensatory Mitigation (CM) requirements.

Transportation

There are two roadways traversing the WBC. River Road follows the toe of the artificial Mississippi River levee, while Hwy. 3127 generally follows the line separating developed portions of the natural levee from the swamp. The railroad right-of-way is generally within the strip of developed land parallel to the Mississippi River, though it does cross some wetland. The Port of South Louisiana Commission is headquartered in LaPlace in the EBC, and oversees five first-rate port-owned facilities, as well as a larger number of private terminals, ranging from grain elevators to general cargo facilities along 54 miles of the Mississippi River from the Jefferson Parish line to the upstream boundary of St. James Parish. One (1) barge terminal is located on the West Bank near Edgard.

WEST DES ALLEMANDS WETLANDS

The West Des Allemands Wetlands (WDAW) EMU constitutes about half of the total WBMZ land area (Figure 6-17). About 68 percent of this 21,650 acre EMU (14,656 acres) is permanently or semi-permanently flooded cypress-tupelo swamp with an elevation of one to two feet (NAVD88), slightly higher than the swamps on the East Bank. Another 29 percent of the WDAW is freshwater marsh (6,300 acres) with elevation below one foot. An unknown portion of the freshwater marsh is a flotant that lifts off the bottom and floats when water level is high (Sasser et al. 1996).

A 630 acre portion of the Lower Vacherie Ridge extends east into the WDAW EMU across the St. James Parish boundary. The ridge, which was formed by a large crevasse, has an elevation of less than five feet in St. John the Baptist Parish. It is intensively cultivated for sugarcane and is surrounded by the only levee on the St. John West Bank (Figure 6-18). The only year-round community in the WDAW EMU is at the end of LA Highway 643 (Hwy. 643), the road that follows the Lower Vacherie Ridge, and is called Pleasure Bend by its residents. It is a fishing village, built in a finger-fill style during the late 1970's, with dredged channels alternating with roads built up using dredged sediment (Figure 6-19).

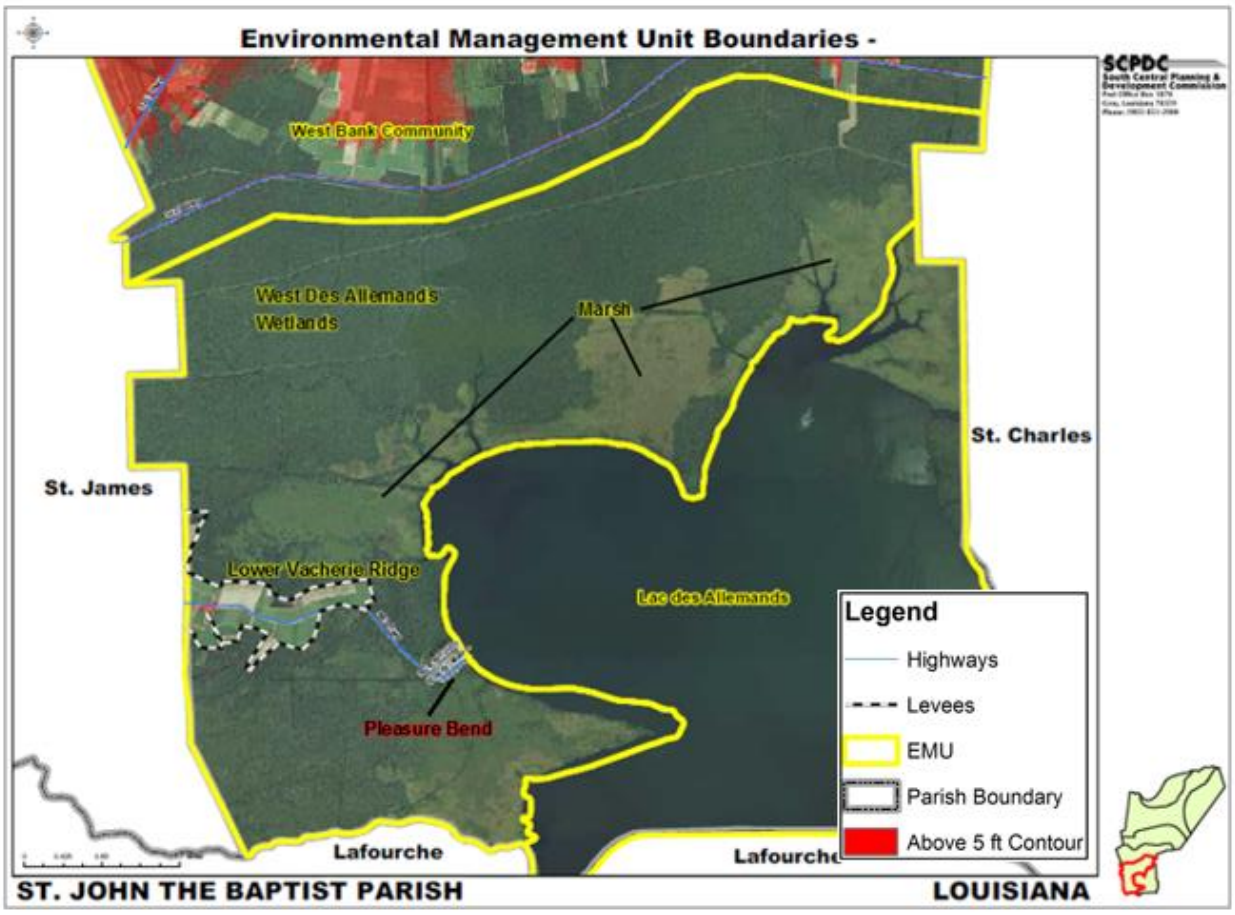


Figure 6-17. West des Allemands Wetlands (WDAW) EMU showing the Lower Vacherie Ridge and the Pleasure Bend community.

Geomorphology

The WDAW EMU is composed of forested wetlands around the edge of the upper, freshwater reach of the Barataria estuary, and it is called an "inter-distributary" deltaic basin because it formed between Mississippi River distributary channels. The center of such basins is distant from sources of river sediment and so fills with more organic-rich sediment derived from the wetlands at the surface, or a lake like Lac des Allemands may remain if the center of the basin does not fill completely. When marsh or swamp vegetation becomes established, it can build up or aggrade its own soil fast enough offset subsidence. Alternatively, mid-basin lakes may form because subsidence is most rapid in the interior of the basin and build up, through vegetative soil formation, is too slow to prevent submergence. It is not clear which alternative best describes the formation of Lac des Allemands (Kosters 1988). It has changed shape little over the past century (see Figure 1-5) though some shoreline erosion has occurred, particularly on the large point south of Pleasure Bend (Figure 6-17).

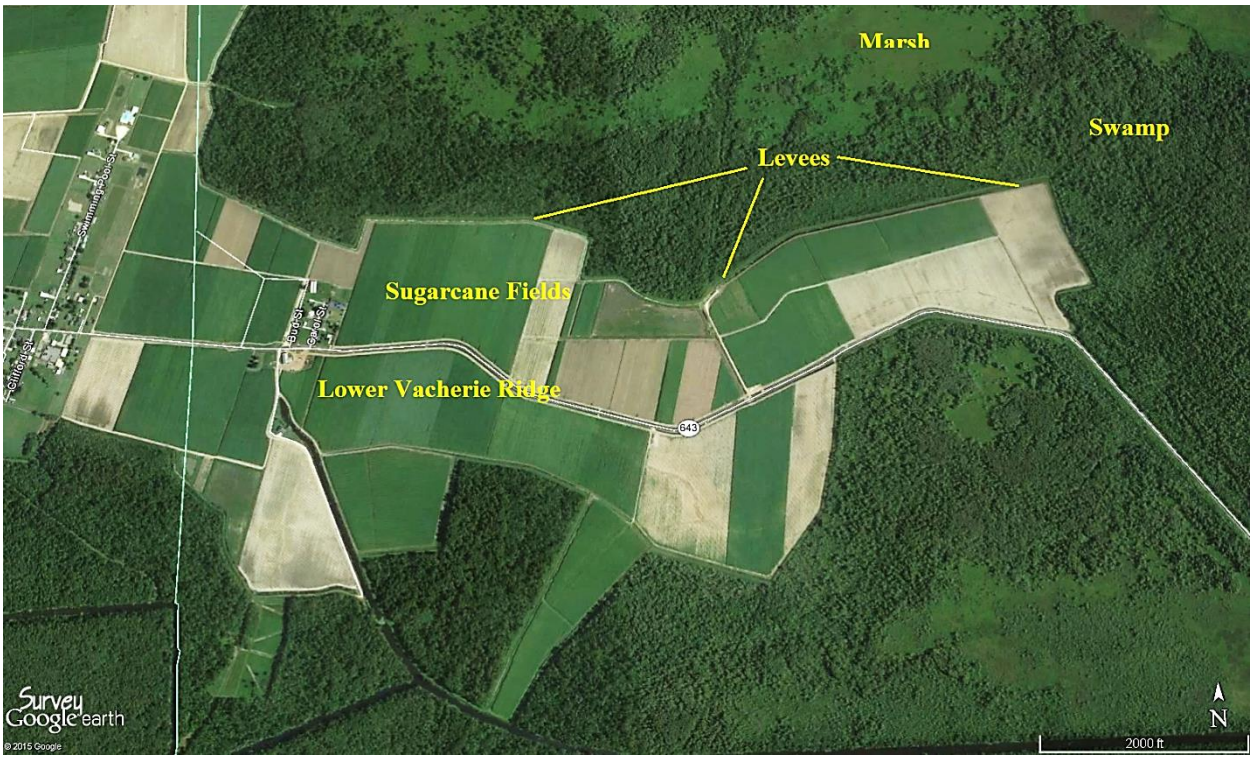


Figure 6-18. Leveed sugarcane fields on the Lower Vacherie crevasse ridge in the WDAW EMU.

One feature that does not show up in the 1892 USGS topographic quadrangles is the amount of freshwater marsh that now exists around the margins of Lac des Allemands (see Figure 1-5). Usually, the cartographers of that time would be careful to call out the difference between forested swamp and marshes. Certainly, by the early 1930's, the marshes were present and had much of the same configuration as they do today (Figure 6-17). Since the WDAW swamp was logged in the first decades of the 20th century, it is probable that second growth swamp did not re-establish in these marsh areas, probably because the land surface was too low. Elsewhere, the cypress-tupelo swamp became successfully re-established and the tree stem densities are much higher than in the salt affected swamps of the East Bank (compare Figures 1-15 and 1-16).

The WDAW has been affected by crevasses that have introduced sand and silt beyond the usual width of the Mississippi River natural levee. These crevasse splays extend south from the current river course but also include a portion of a much larger crevasse that formed the Vacherie Ridge and enters the WDAW from the west. The channel associated with this crevasse, which has reached Lac des Allemands and its natural levees, are responsible for the large point that extends into the lake south of Pleasure Bend (Figure 6-17).

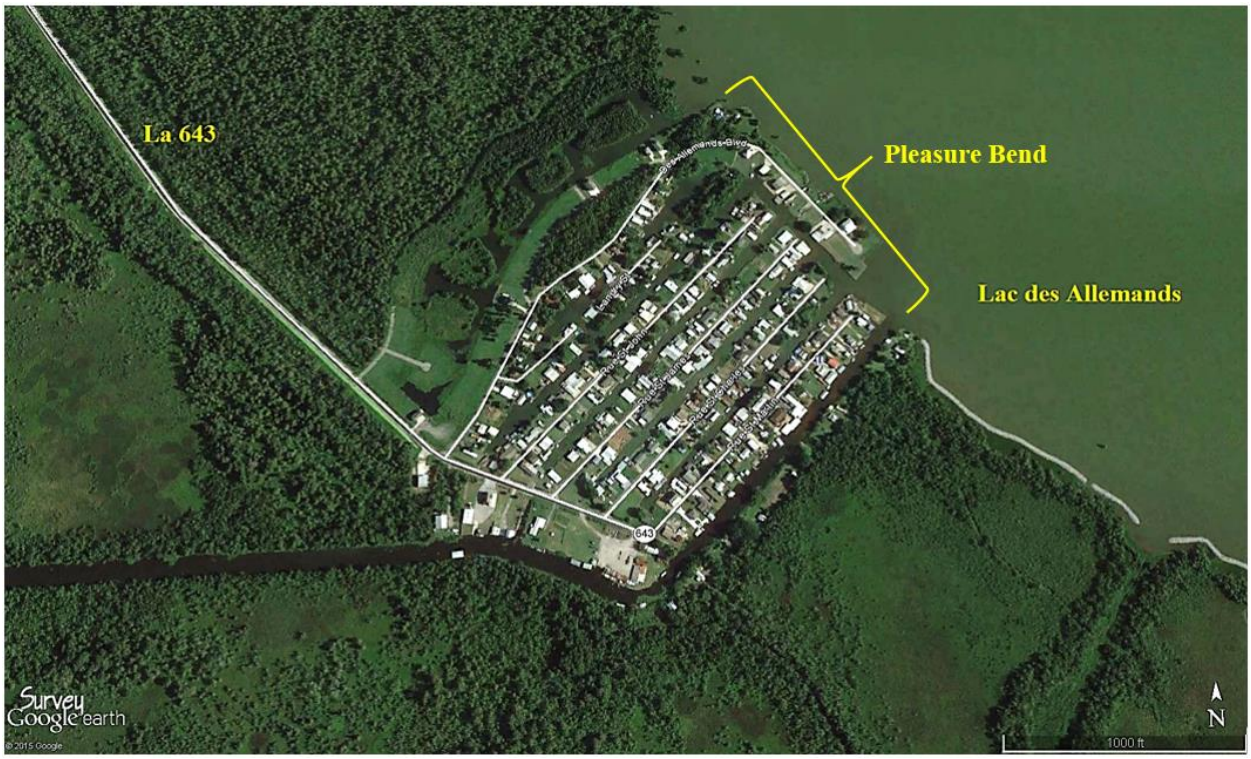


Figure 6-19. Pleasure Bend finger-fill development on west shore of Lac des Allemands in the WDAW EMU.

Hydrology

Natural drainage in the WDAW followed the slope of the natural levee away from the Mississippi River south to Lac des Allemands which it entered through a number of short channels around the north end of the lake. During the greatest floods, crevasses breached the natural levee, enlarging the channels into the lake. During the first two decades of the 20th century, a number of these channels were connected to extensions of the field drain system to facilitate cypress logging. Later, these channels served as starting points for access canals dredged for oil and gas drilling. In the early 1960s, Bayou Chevreuil, a large waterway that enters the south end of Lac des Allemands and forms the St. John-Lafourche Parish boundary, was enlarged to improve both drainage and navigability. Pirogue trails (tranasses) were dug by trappers seeking nutria, muskrat and other furbearers. All of these alterations affected hydrology, but do not seem to have changed it enough to cause much wetland loss. Today, a number of the artificial channels with higher spoil banks that traverse the marshes have become sites for recreational camps.

Water level in the WDAW is affected by winds and storm tides in the lower Barataria Basin and the Gulf of Mexico, but these influences are muted by the wetland buffer. There are no long-term water level gages in the WDAW, but a NOAA station is available at Bayou Gauche on Bayou des Allemands about halfway between Lake Salvador and Lac des Allemands. Water levels are typically lowest in the winter and highest in the spring except during hurricanes. Hurricanes Gustav and Ike in 2008 produced surges of 1.7 and 2.9 feet (MSL), while Hurricane Isaac generated a surge of 2.7 feet in 2012 (Figure 6-20). Drainage following hurricanes typically is slow, taking a month or more.

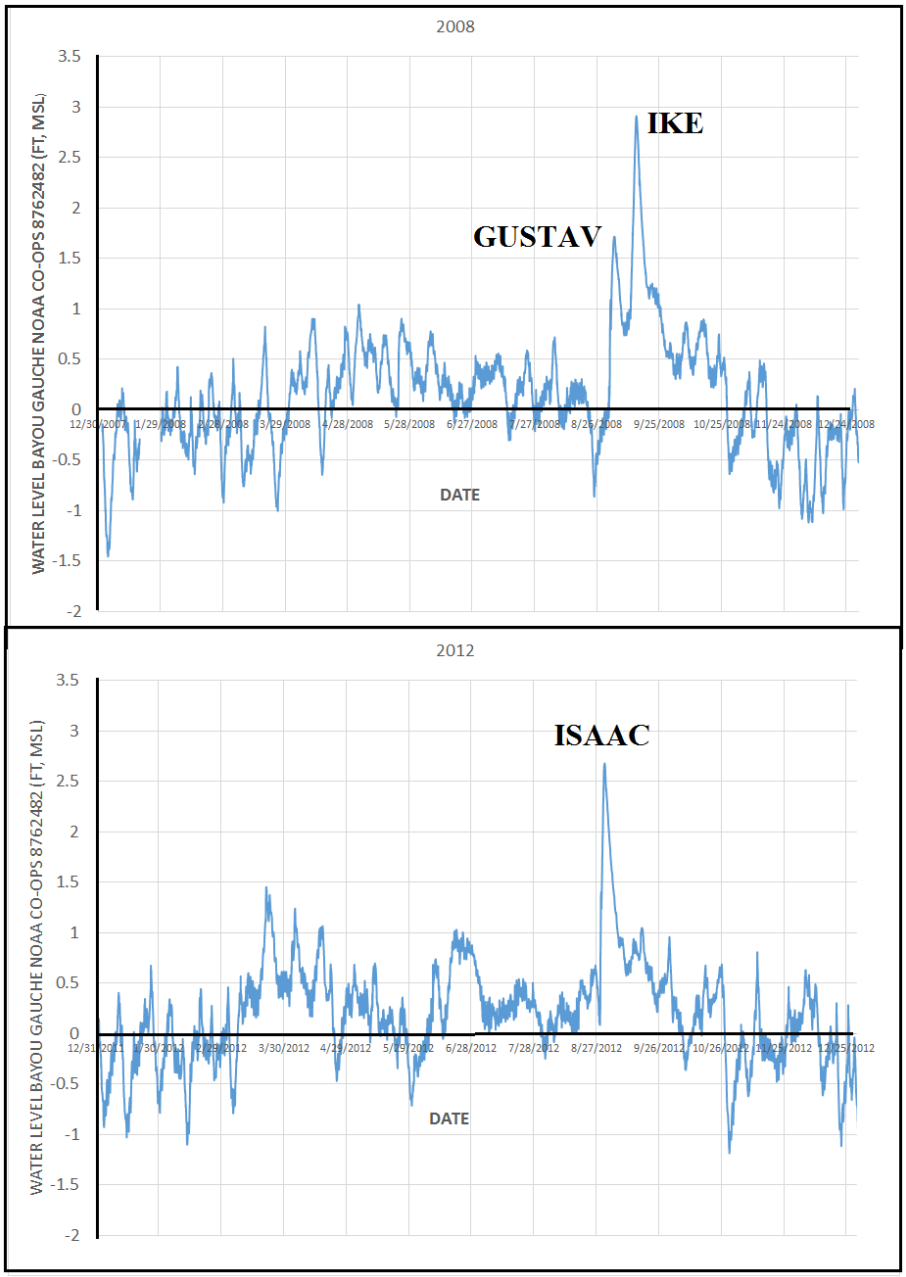


Figure 6-20. Plots of water level relative to MSL at the Bayou Gauche NOAA gage showing normal levels and extremes for Hurricanes Gustav and Ike in 2008 (top) and Isaac in 2012 (bottom).

Soils

Barbary muck (Ba) is the primary soil type in the WDAW, with significant areas of Allemands and Carlin mucks in the freshwater marsh (Figure 6-21). The Barbary series consists of fluid, very poorly drained, very slowly permeable soils formed under flooded swamps. Although they include some clay, they are dark, grayish brown in color and consist of about 60 percent partially decomposed organic matter and discernable wood and Spanish moss fragments. The Vacherie Ridge soils are Cancienne silt loam (CmA) that are well suited for agriculture.

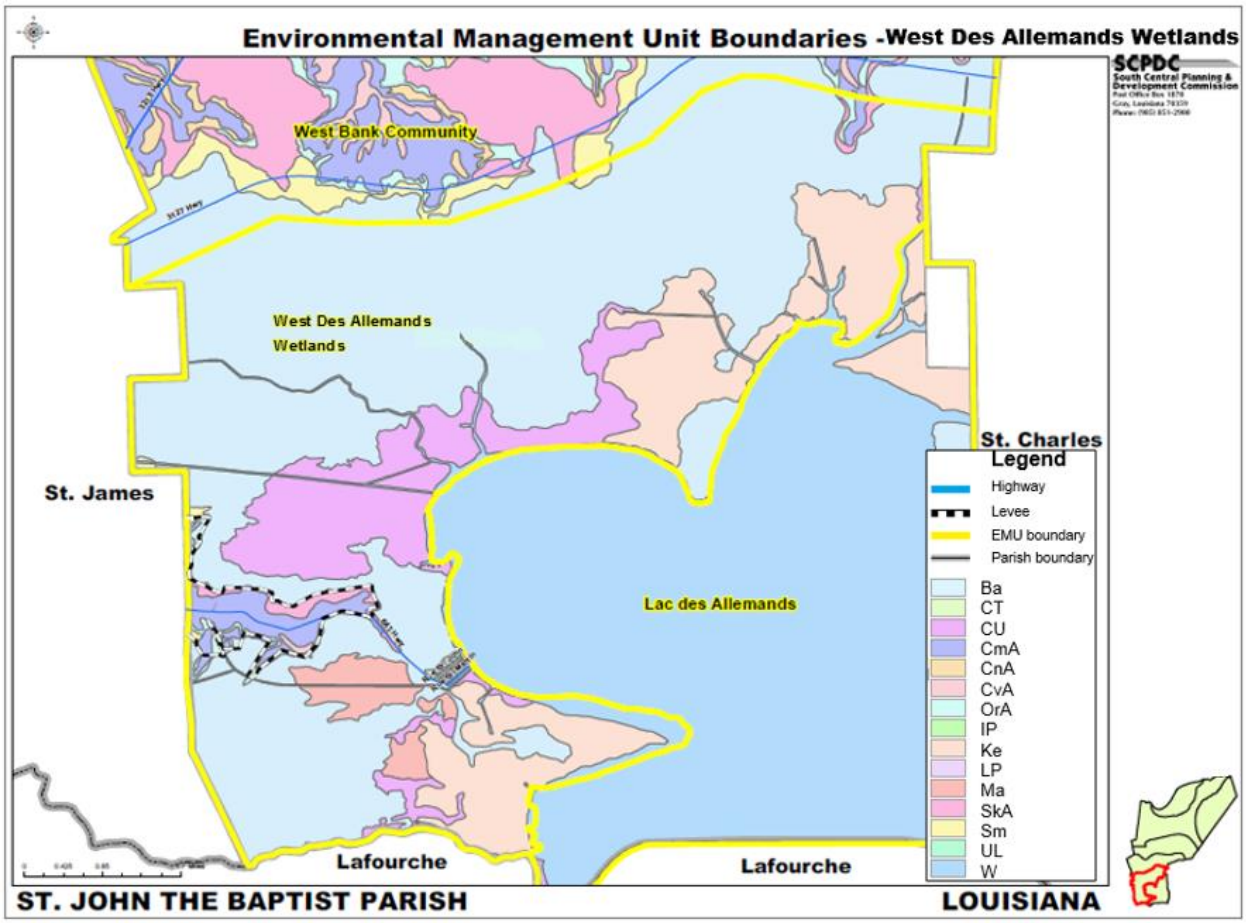


Figure 6-21. Soils of the WDAW EMU.

Vegetation and Wildlife

Oil and gas exploration and development has been limited in the WDAW EMU compared to many parts of the Mississippi delta. Although the WDAW is not in a pristine condition because of clear-cutting that removed the virgin cypress and tupelo trees in the early part of the 20th century, it is road-less with the exception of LA 643 that provides access via the Vacherie Ridge to Pleasure Island. Users can also access Pleasure Bend and Lac des Allemands via the Molle canal off of Hwy 3127. Few camps or other development are found elsewhere in the WDAW.

Freshwater swamp vegetation described in Chapter 1 characterizes the WDAW EMU, but the freshwater marsh is far more diverse, with bull-tongue, maiden cane, cattail, cutgrass, smartweed and wax myrtle, along with a variety of submerged aquatics in marsh ponds (see Table 1-6).

White-tailed deer, squirrels and rabbits are the primary game sought by hunters in the WDAW, while fishers target largemouth bass, sunfish (bream), crappie (sac-au-lait) and catfish. Virtually all of the bird species counted in the nearby Bonnet Carré Spillway are also present in the WDAW (see Figures 1-21a-j), including nesting bald eagles and osprey. Migratory waterfowl commonly hunted in the WDAW marsh include gadwall, teal, wigeon, mallard and shoveler ducks, while wood ducks, mottled ducks, hooded mergansers and black-bellied whistling ducks are resident year round.

On the WDAW EMU, the same varieties of reptile species found here are very much the same as found on the Garyville and Reserve, and the Maurepas Swamp EMUs. Trapping for alligators and nutria also takes place in the WDAW, while non-consumptive uses like sightseeing and birdwatching are also becoming more popular. Both the marsh and cypress-tupelo forest of the WDAW EMU are of very high quality for the Mississippi delta plain which is prone to high rates of subsidence.

Land Use

Although virtually all of the land in the WDAW EMU is in private hands, it is not expected to be subject to any significant development beyond construction of recreational camp buildings on some of the higher spoil banks. Oil and gas activities will continue, though dredging of existing and new canals has largely ceased. The St. John economic development team has identified the WDAW as a target for enhanced ecotourism activities that might use LA 3127 as a launching point. Today, the main public boat launch is off the shoulder of LA 3127 into the Moll Canal.

Transportation

All the east-west transportation routes on the West Bank are in the West Bank Community, north of the WDAW. The only linear transportation corridors that cross the WDAW are for pipelines. There are no north to south transportation routes other than by small boat through the canal network, and none are currently planned in the WDAW EMU.

LAKE EMUs

LAC DES ALLEMANDS

The Lac des Allemands (LDA) EMU covers 92 percent of the surface area of Lac des Allemands (34 square miles), leaving only a sliver at the south end in Lafourche Parish. LDA is a part of the Barataria estuary but has not experienced salinity above 1 ppt since 2005. Like Lake Maurepas in the Pontchartrain Basin, LDA is at the inland end of a chain of connected waterbodies that ends in the Gulf of Mexico. Similarly, LDA supports both marine and freshwater fisheries. The most important commercially are for blue crab (*Callinectes sapidus*) and catfish, particularly the channel (*Ictalurus punctatus*) and blue (*Ictalurus furcatus*) species, but it is possible to catch redfish (Scianops ocellatus) and largemouth bass (*Micropterus salmoides*) on successive casts during the summer. The Lac des Allemands shoreline is undeveloped except for Pleasure Bend, the small fishing village on the west side. Elsewhere, cypress-tupelo swamp or freshwater marsh extends to the shoreline.

Geomorphology

Lac des Allemands became a shallow, enclosed water body within the last 1,000 years, as a result of subsidence of the central portion of the Barataria Basin, but the shoreline has historically been quite stable. Though LDA is now isolated from Mississippi River influence, it would periodically receive flow from west bank crevasses through the 19th century. Water depths average 5 feet with some mud deposition at the south end where Bayou Chevreuil enters the lake and leaves as Bayou des Allemands.

Water Quality

The LDEQ and EPA report that water quality of the LDA EMU has improved since the Davis Pond Diversion began conveying fresh water from the Mississippi River to Lakes Cataouatche and Salvador farther downstream in the Barataria Basin. The main effect in LDA has been to lessen the intrusion of brackish conditions into the lake. LDA is considered to fully support primary (swimming) and secondary (fishing) contact recreation but is still included on the 303(d) list as impaired for fish and wildlife propagation because of the abundance of non-native nuisance floating plants.

Because it is so shallow, LDA is often very muddy but is biologically productive, supporting substantial commercial and recreational fisheries. During the early 2000s, LDA was investigated for its potential to receive discharge from a Mississippi River diversion. That diversion was built farther downstream at Davis Pond, but the idea of another diversion that would discharge higher in the Basin upstream of LDA continues to be considered (CPRA 2012).

Recently, the Lake Pontchartrain Basin Foundation (LPBF) has begun publishing a "Hydrocoast Map" online that summarizes a week of water quality findings in the Barataria Basin (Figure 6-22). The LPBF and the Barataria-Terrebonne National Estuary Program are examples of

organizations that has been effective in improving water quality over a very large watershed. These are models that the St. John Parish CZAC could follow to raise awareness about issues and opportunities to improve water quality in Lac des Allemands.

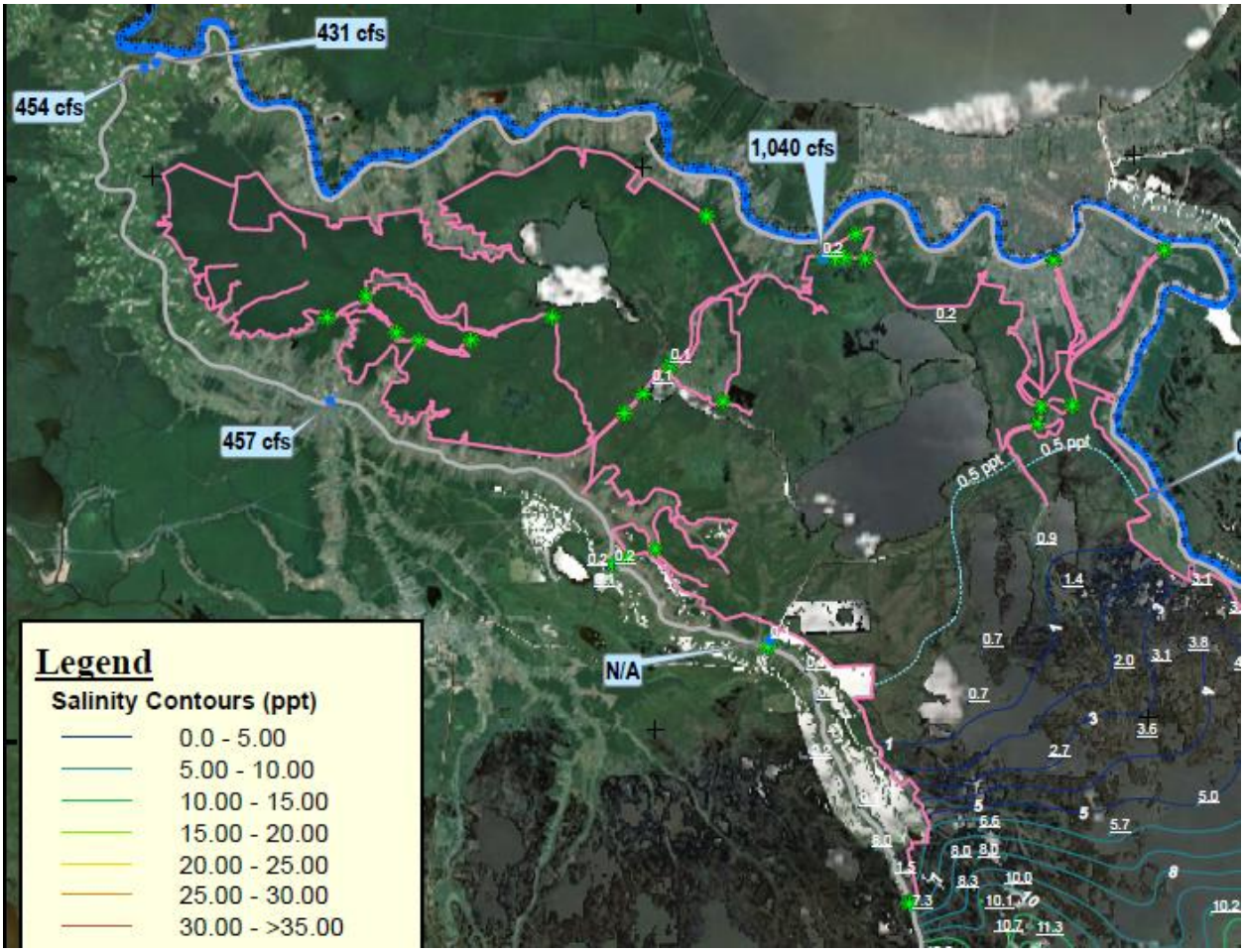


Figure 6-22. Portion of LPBF Hydrocoast Map providing a summary of water quality results obtained at a number of points around Lake Pontchartrain during the week starting May 23, 2016. The light blue line south of Lake Salvador is the 0.5 ppt isohaline showing that the LDA EMU as well as Lake Salvador were freshwater at this time. Weekly Hydrocoast Maps for the Barataria Basin can be downloaded at file:///C:/Users/gpkemp/Documents/EstCoastShelfSci/Revisions/HcBb29May2016psu.pdf.

Chapter 7

CHAPTER 7: LOCAL COASTAL PROGRAM ADMINISTRATION

CZM ACT AND PURPOSE 7-2
PROGRAM ADMINISTRATION ROLLS AND DUTIES 7-3
GENERAL – STATE AND PARISH ADMINISTRATION 7-3
DUTIES OF THE CZM ADMINISTRATOR 7-3
DUTIES OF THE CZM ADVISORY COMMITTEE 7-4
COASTAL USE PERMIT ADMINISTRATION 7-4
- NATIONAL INTERESTS 7-5
- STATE INTERESTS 7-5
- USES OF STATE CONCERN 7-5
- USES OF LOCAL CONCERN 7-6
- STATE EXEMPTIONS 7-7
- ADDITIONAL FEDERAL EXEMPTIONS 7-10

COASTAL USE PERMIT PROCESSING 7-10
- USES OF STATE CONCERN 7-11
- USES OF LOCAL CONCERN 7-12
- ENVIROMENTAL REVIEW 7-12

MITIGATION 7-13
ADMINISTRATION APPEAL OF STATE & LOCAL COASTAL USE PERMIT DECISIONS 7-14
- NOTICE OF APPEALS 7-14
- FEES FOR APPEAL 7-16

ENFORCEMENT 7-17
SPECIAL AREAS 7-17
- DESIGNATION PROCEDURE 7-18
- REQUIREMENTS 7-19

INTERAGENCY COORDINATION 7-20
- PARISH COORDINATION 7-20
- CONSISTENCY WITH STATE PROGRAM 7-20
- CONSISTENCY WITH FEDERAL PROGRAM 7-21
- FEDERAL ACTIVITIES CONSISTENT WITH STATE/LOCAL PROGRAM 7-22

The St. John the Baptist Parish Coastal Zone Management Plan (CZMP) recognizes the value of the natural coastal ecosystems. The purpose of the CZMP is to protect, preserve, restore and enhance the parish coastal zone.

Many coastal-dependent commercial, residential, and recreational activities requiring public access occur in St. John. To overcome these sometimes potentially conflicting uses, the plan promotes coordinated development through permitting where interested parties and the public can have open discussion. Balancing the diverse values allows current and future residents the opportunity to enjoy the multiple benefits and cultural values associated with a healthy coastal zone while fostering the public safety, health and welfare of its residents.

COASTAL ZONE MANAGEMENT ACT

The Federal Coastal Zone Management Act of 1972 (the "Act") (16 U.S.C. 33 § 1451, 1989) was enacted to promote coastal wetland protection and restoration within the United States coastal zone and to encourage states to be proactive in managing natural resources for their benefit and the benefit of the nation. The Act enables states and local governments (i.e., parishes) to develop their own coastal zone management program, subject to federal approval.

The Act states that "any coastal state which has completed the development of its management program shall submit such program to the Secretary for review and approval pursuant to section 1455 of this title" (16 U.S.C. 33 § 1454, 1989). In 1978, Louisiana enacted the State and Local Coastal Resources Management Act (SLCRMA), and created the Louisiana Coastal Zone Management Program (CZMP), which received federal approval in 1980.

Parishes also have authority to create a coastal zone management plan pursuant to the Act (16 U.S.C. 33 § 1455, 1989). Plans created by local governments must be approved by a federally authorized state program, and the local plan is subject to periodic review to ensure that its procedures are consistent with the state plan.

In the event that sections of this plan may be subject to multiple interpretations, they must be read to further the purposes stated above utilizing fair and impartial judgement to all parties. Should any provision of this process be deemed contrary to law, it shall be severed from the remainder and shall not affect other provisions that may remain applicable, irrespective of the invalid provision. This process shall be read and construed as a whole and in accord with the Louisiana Coastal Zone Management Program (CZMP) and words and phrases in this process shall be read as commonly used to give this process its most reasonable application except where words are specifically defined in this document and in the St. John Coastal Zone Management Ordinance. The goals, objectives and policies of the St. John Local CZMP are consistent with the goals, objectives and policies of the State and Local Coastal Resources Management Act (SLCRMA), amended, and the state guidelines; the local program shall be interpreted and administered consistently with such goals, objectives, policies, and guidelines specifically, Louisiana Revised Statutes Sections 49:214:21 to 214:42 and Louisiana Administrative Code, Title 43, NATURAL RESOURCES, Part I, Office of the Secretary, Subpart 1, Chapter 7, Coastal Management.

PROGRAM ADMINISTRATION ROLLS AND DUTIES

Within the Revised Statutes at Sections 49:214:26, Louisiana's coastal management program is established within the Department of Natural Resources. "The Secretary of the Department or his designee shall administer the coastal management program." Together with his staff, the Secretary carries out the duties listed in R.S. 49:214:26 and specifically at R.S.49:214:26B(6), they "[p]rovide advice and technical assistance to … local governments." Within the document the Secretary is otherwise known as the State Administrator.

Within St. John, the Coastal Zone Management Program administration is the responsibility of the Department of Planning and Zoning. Within the Department the Coastal Zone Management Administrator (Local CZM Administrator or CZM Administrator) together with staff handle the daily business of administering the overall CZMP including grant matters, developing and negotiating contracts, accounting for expenditures, and, in general, performing such duties as are necessary for the efficient implementation of the program. The local CZM Administrator processes applications for local coastal use permits (CUP) and serves as a liaison between St. John and all state and federal coastal wetlands regulatory agencies.

DUTIES OF THE CZM ADMINISTRATOR

Within St. John, the local CZM Administrator is the professional charged with implementing and administering the local CZMP in accordance with the conditions specified in the CZMP and Chapter 109 of the St. John the Baptist Parish Code of Ordinance (Appendix B). The responsibilities of the local CZM Administrator include assisting applicants, where necessary, to submit CUP applications to the Louisiana Department of Natural Resources, Office of Coastal Management (LDNR-OCM) for determination if the activity or "use is of local concern" (See page 7-6), processing the CUP applications at the local level, presenting the applications to the Coastal Zone Advisory Committee (CZAC), notifying applicants of decisions, and monitoring permitted activities for compliance. Monitoring of permitted activities is performed by the local CZM Administrator and staff during the course of their normal duties. Monitoring helps ensure that permit conditions are being followed and that the conditions actually result in lowered adverse environmental impacts. A detailed itemization of the duties of the local CZM Administrator is included in the Ordinance (Appendix B).

Figure 7-1 Photo by Brooke Curole

DUTIES OF THE ST. JOHN COASTAL ZONE ADVISORY COMMITTEE

The St. John the Baptist Parish Coastal Zone Advisory Committee (CZAC) is a group of designated individuals representing coastal area user groups and possessing knowledge of the parish's coastal resources, environmental conditions and potential conflicts. The CZAC members are appointed by the St. John the Baptist Parish Council. Term limits for the CZAC shall be dictated by Section 109 of the Code of Ordinance.

Local CUP applications are advertised and presented to the CZAC for comment. The CZAC, in its advisory capacity, provides assistance to the St. John CZM Administrator by reviewing and commenting on CUP applications and other matters of concern to the parish's CZMP. The CZAC may recommend additional performance standards for the purpose of placing special conditions on local permits.

While the CZM administrator is not legally bound to strictly adhere to the CZAC's recommendations or decisions, the committee's purpose is to serve as a sounding board for, and provide input to, the administrator particularly on complex or technical issues.

Local CUP decisions and recommendations are ultimately made by the local CZM Administrator, but are guided by CZAC advice and support. The duties of the CZAC are presented in detail in the Ordinance for Implementation of the CZMP (Appendix B). Related but not specific to the CZMP is an addition Advisory role. The committee shall assist in the development of projects and programs that will enhance wetland areas both within the parish and around the region. When necessary, the committee shall advise the Administration regarding the priorities when resources limit the use of resources.

COASTAL USE PERMIT ADMINISTRATION

It is important to recognize the limits of state and local jurisdiction. Coastal use activities are regulated by the state or local government depending on the type of activity. Uses or activities occurring in areas five feet or more above mean sea level or in fastlands do not require a coastal use permit unless it is determined that the uses or activities have a direct and significant impact on coastal waters. These exceptions must be described in a completed permit application to allow a determination of whether they have a direct and significant impact on coastal waters.

Many activities and uses that occur in St. John the Baptist Parish are of a magnitude such that they are of interest and concern to regional, state, and federal governmental entities. These activities have benefits or impacts which extend beyond St. John boundaries and which may have overlapping local, regional, state, and/or federal jurisdiction and responsibilities.

While St. John governing bodies will be given full consultation and consideration in the implementation of such uses and activities, they recognize other agency responsibilities and jurisdictions.

The uses being discussed here generally fall into three categories: National Interest, State Interest, and Uses of Regional Benefit (URB).

NATIONAL INTERESTS are expressed in congressional legislation and are thoroughly defined in Chapter VI of the Louisiana Coastal Resources Program (LCRP) Final Environmental Impact Statement (EIS). These interests are generally expressed in terms of the affected resource and are:

- Air and Water Quality
- Wetlands and Endangered Species
- Flood Plains and Barrier Islands
- Historic and Cultural Resources
- Fisheries and Other Living Marine Resources

STATE INTERESTS, or "Uses of State Concern", are clearly expressed Louisiana's State and Local Coastal Resource Management Act (Act 361 of 1978, as amended). Examples of uses of state concern are presented in a previous subsection on "Uses of State Concern."

USES OF STATE CONCERN

State governments have jurisdiction over, "Uses of state concern" (R.S. 49:214.25(A)(l)), which include, but are not limited to:

a) Any dredge or fill activity which intersects with more than one water body;
b) Projects involving use of state owned lands or water bottoms;
c) State publicly funded projects;
d) National interest projects;
e) Projects occurring in more than one parish;
f) All mineral activities, including exploration for, and production of oil, gas, and other minerals;
g) All dredge and fill uses associated therewith, and all other associated uses;
h) All pipelines for the gathering, transportation or transmission of oil, gas and other minerals;
i) Energy facility siting and development; and
j) Uses of local concern which may significantly affect interests of regional, state or national concern.

Uses of Regional Benefit are those that affect more than one parish or state and generally include the following facilities or activities:

- Flood Control Projects
- Interstate natural gas transmission pipelines
- Major state or federal transportation facilities such as highways and expressways
- Major state or federal transportation facilities such as deep-water ports and navigation projects
- Public wildlife and fisheries management projects
- Public utility or cooperative energy generating plants
- State parks and beaches and other state-owned recreational facilities

Permits are required for uses of local concern that occur in areas below the five-foot topographic contour, and certain activities inside leveed areas and/or above the five-foot contour if they are deemed to have impacts to coastal waters outside of the upland or fastland area as defined in the State and Local Coastal Resources Management Act of 1978 (Act 361 as amended) and by the state program (See Appendix A for "Definitions"). These exceptions must be described in a completed permit application to allow a determination of whether they have a direct and significant impact on coastal waters.

USES OF LOCAL CONCERN

Local governments have jurisdiction over, "Uses of local concern" (R.S. 49:214.25(A)(2)) which include, but are not limited to:

a) Privately funded projects which are not uses of state concern;
b) Publicly funded projects which are not uses of state concern;
c) Maintenance of uses of local concern;
d) Jetties or breakwaters;
e) Dredge or fill projects not intersecting more than one water body;
f) Bulkheads;
g) Piers;
h) Camps and cattle walks;
i) Maintenance dredging;
j) Private water control structures of less than fifteen thousand dollars in cost; and
k) Uses on cheniers, salt domes, or similar land forms.

Any other coastal uses which directly and significantly affect coastal waters and are in need of coastal management but are not uses of state concern should be regulated primarily at the local level. The St. John Council shall have the power to add other coastal uses to this list as recommended by the Advisory Committee and the CZM Administrator, subject to the approval of the Secretary.

Figure 7-2 – Cypress Knee in Maurepas Swamp (Photo Credit: Brooke Curole)

STATE EXEMPTIONS (Exempted Uses)

Activities listed under L.A.C. 43:I,723(B) et.seq. and LA R.S. 49:214.34(A) are exempt from this ordinance, except when that particular activity would have direct and significant impact on coastal waters.

L.A.C. 43:I,723(B)

B. Activities Not Requiring Permits
1. General
   a. The following activities normally do not have direct and significant impacts on coastal waters; hence, a coastal use permit is not required, except as set forth in the following clauses:
      i. agricultural, forestry, and aquaculture activities on lands consistently used in the past for such activities;
      ii. hunting, fishing, trapping, and the preservation of scenic historic, and scientific areas and wildlife preserves;
      iii. normal maintenance or repair of existing structures including emergency repairs of damage caused by accident, fire, or the elements;
      iv. construction of a residence or camp;
      v. construction and modification of navigational aids such as channel markers and anchor buoys;
      vi. activities which do not have a direct and significant impact on coastal waters.
   b. Uses and activities within the special area established by R.S. 49:214.29(c) which have been permitted by the Offshore Terminal Authority in keeping with its environmental protection plan shall not require a coastal use permit.

2. Activities on Lands 5 Feet or More above Sea Level or within Fastlands
   a. Activities occurring wholly on lands 5 feet or more above sea level or within fastlands do not normally have direct and significant impacts on coastal waters. Consequently, a coastal use permit for such uses generally need not be applied for.
   b. However, if a proposed activity exempted from permitting in Subparagraph a, above, will result in discharges into coastal waters, or significantly change existing water flow into coastal waters, then the person proposing the activity shall notify the secretary and provide such information regarding the proposed activity as may be required by the secretary in deciding whether the activity is a use subject to a coastal permit.
   c. Should it be found that a particular activity exempted by Subparagraph a, above, may have a direct and significant impact on coastal waters, the department may conduct such investigation as may be appropriate to ascertain the facts and may require the persons conducting such activity to provide appropriate factual information regarding the activity so that a determination may be made as to whether the activity is a use subject to a permit.
   d. The secretary shall determine whether a coastal use permit is required for a particular activity. A coastal use permit will be required only for those elements of the activity which have direct and significant impacts on coastal waters.

e. The exemption described in this Section shall not refer to activities occurring on cheniers, salt domes, barrier islands, beaches, and similar isolated, raised land forms in the coastal zone. It does refer to natural ridges and levees.

3. Emergency Uses
   a. Coastal use permits are not required in advance for conducting uses necessary to correct emergency situations.
      i. Emergency situations are those brought about by natural or man-made causes, such as storms, floods, fires, wrecks, explosions, spills, which would result in hazard to life, loss of property, or damage to the environment if immediate corrective action were not taken.
      ii. This exemption applies only to those corrective actions which are immediately required for the protection of lives, property, or the environment necessitated by the emergency situation.
   b. Prior to undertaking such emergency uses, or as soon as possible thereafter, the person carrying out the use shall notify the secretary and the local government, if the use is conducted in a parish with an approved local program, and give a brief description of the emergency use and the necessity for carrying it out without a coastal use permit.
   c. As soon as possible after the emergency situation arises, any person who has conducted an emergency use shall report on the emergency use to the approved local program or to the administrator. A determination shall be made as to whether the emergency use will continue to have direct and significant impacts on coastal waters. If so, the user shall apply for an after-the-fact permit. The removal of any structure or works occasioned by the emergency and the restoration of the condition existing prior to the emergency use may be ordered if the permit is denied in whole or in part.

4. Normal Maintenance and Repair
   a. Normal repairs and the rehabilitation, replacement, or maintenance of existing structures shall not require a coastal use permit provided that:
      i. the structure or work was lawfully in existence, currently serviceable, and in active use during the year preceding the repair, replacement or maintenance; and
      ii. the repair or maintenance does not result in an encroachment into a wetland area greater than that of the previous structure or work; and
      iii. the repair or maintenance does not involve dredge or fill activities; and
      iv. the repair or maintenance does not result in a structure or facility that is significantly different in magnitude or function from the original.
   b. This exemption shall not apply to the repair or maintenance of any structure or facility built or maintained in violation of the coastal management program.
   c. Coastal use permits will normally authorize periodic maintenance including maintenance dredging. All maintenance activities authorized by coastal use permits shall be conducted pursuant to the conditions established for that permit. Where maintenance is performed which is not described in an applicable coastal use permit, it shall conform to this Section.

5. Construction of a Residence or Camp
   a. The construction of a residence or a camp shall not require a coastal use permit provided that:

i. the terms shall refer solely to structures used for noncommercial and nonprofit purposes and which are commonly referred to as "single family" and not multiple family dwellings;
ii. the terms shall refer solely to the construction of one such structure by or for the owner of the land for the owner's use and not to practices involving the building of more than one such structure as in subdividing, tract development, speculative building, or recreational community development.

b. The exemption shall apply only to the construction of the structure and appurtenances such as septic fields, outbuildings, walk-ways, gazebos, small wharves, landings, boathouses, private driveways, and similar works, but not to any bulkheading or any dredging or filling activity except for small amounts of fill necessary for the structure itself and for the installation and maintenance of septic or sewerage facilities.

Figure 7-3 – Structure over Lake Pontchartrain (Photo Credit: Brooke Curole)

6. Navigational Aids
   a. The construction and modification of navigational aids shall not require a coastal use permit.
   b. The term shall include channel markers, buoys, marker piles, dolphins, piling, pile clusters, etc.; provided that the exemption does not apply to associated dredge or fill uses or the construction of mooring structures, advertising signs, platforms, or similar structures associated with such facilities. All navigational aids constructed pursuant to this section shall conform to United State Coast Guard standards and requirements.

7. Agricultural, Forestry and Aquacultural Activities
   a. Agricultural, forestry and aquacultural activities on lands consistently used in the past for such activities shall not require a coastal use permit provided that:

i. the activity is located on lands or in waters which have been used on an ongoing basis for such purposes, consistent with normal practices, prior to the effective date of SLCRMA (Act 361 of 1978);
ii. the activity does not require a permit from the U.S. Army Corps of Engineers and meets federal requirements for such exempted activities; and
iii. the activity is not intended to, nor will it result in, changing the agricultural, forestry, or aquacultural use for which the land has been consistently used for in the past to another use.

b. The exemption includes but is not limited to normal agricultural, forestry, and aquacultural activities such as:
i. plowing;
ii. seeding;
iii. grazing;
iv. cultivating;
v. insect control;
vi. fence building and repair;
vii. thinning;
viii. harvesting for the production of food, fiber and forest products;
ix. maintenance and drainage of existing farm, stock, or fish ponds;
x. digging of small drainage ditches; or
xi. maintenance of existing drainage ditches and farm or forest roads carried out in accordance with good management practices.

8. Blanket Exemption. No use or activity shall require a coastal use permit if:
a. the use or activity was lawfully commenced or established prior to the implementation of the coastal use permit process;
b. the Secretary determines that it does not have a direct or significant impact on coastal waters; or
c. the Secretary determines one is not required pursuant to §723.G of these rules.

ADDITIONAL FEDERAL EXEMPTIONS

In accordance with Section 304(a) of the Coastal Zone Management Act of 1972, all federal lands owned, leased, held in trust or whose use is otherwise subject solely to the discretion of the federal government are excluded from the Louisiana coastal zone. However, any activities or projects which are conducted within these excluded lands that have direct effects on the lands or water of Louisiana is coastal zone are subject to the consistency provisions of the federal Coastal Zone Management Act (CZMA).

COASTAL USE PERMIT PROCESSING

An applicant can apply for a local CUP online using the LDNR SONRIS online permit application system or equivalent application system in place at the time of the permit application. Currently, the LDNR SONRIS online permit application system serves as a Joint Permit Application with the U.S. Army Corps of

Engineers 404 Permitting requirement. The CZM Administrator can advise the applicant on how to apply for the local CUP and what information is required for the "Joint Permit Application" form.

Applications may be submitted to either the local CZM Administrator or the State Administrator. Applications must include material required by L.A.C. title 43, section 723(C)(2), including, but not limited to, the following:

Applications may be submitted to either the local CZM Administrator or the State Administrator.

a. Maps showing actual location, size and dimensions of the real property proposed as the use site. Maps shall be the latest available (e.g., earth imaging infrared, coast and geodetic survey maps or equivalent).
b. Plans showing the exact location, size, and height of the buildings or structures to be developed;
c. A list of all applications, approvals and/or denials already made concerning the development by federal, state or local agencies;
d. A description of the extent to which any watercourse or natural drainage will be altered or relocated as a result of the proposed coastal use;
e. A description of how the projects impacts may be tracked in the future;
f. If the development involves dredging, a description of the type, quantity and composition of the dredged material, the method of dredging and disposal;

The information on total project cost and wetland acreage impacted is also required for processing a local CUP because this information determines the permit application fee which shall be established, prepared and posted by the CZM Administrator. The local CUP fee is assessed by the CZM Administrator at the time of their review of the permit application. Applicants may be requested to provide supplemental material upon determination of need by the local CZM Administrator.

USES OF STATE CONCERN – (Review)

Upon receipt of a CUP application from the Secretary (i.e., State Administrator) for a use of state concern, the local CZM Administrator will review the proposed activity for consistency with the parish's CZMP, including the goals, objectives and policies on a parish-wide basis and within the environmental management unit where the proposed activity is located. The local CZM Administrator may solicit additional input from appropriate parish officials. The local CZM Administrator may forward copies of permit applications to members of the local CZAC. The local CZM Administrator may also request that the State Administrator hold a public hearing where there is significant opposition to a proposed activity, the elective representatives or other local authorities request a hearing or where there are significant economic, social or environmental issues. Based on the results of the permit application review with regard to the local program and comments received, the local CZM Administrator may submit comments to

The local CZM Administrator may also request that the State Administrator hold a public hearing where there is significant opposition to a proposed activity, the elective representatives or other local authorities request a hearing or where there are significant economic, social or environmental issues.

the State Administrator on behalf of St. John. These actions will constitute a basis for determination of consistency with the approved St. John CZMP as required by Act 361 as amended.

USES OF LOCAL CONCERN – (Actual processing)

The administration of the local CUP process is a major element of the state and local CZMP and is detailed in the Ordinance. It includes the timely review and evaluation of local CUP applications and determination that proposed activities are consistent with the goals and objectives of EMU's in which they are located. The local CZM Administrator must also determine the appropriateness of special conditions being added to the permit and the possible after-the-fact permit authorizations as described in the Ordinance (Appendix B).

The CUP application is reviewed by the State Administrator (LDNR-OCM) who works with the permit applicant to ensure that the application is substantially complete pursuant to the Ordinance. If the State Administrator determines that the proposed activity or use is of local concern, the substantially complete application is forwarded to the local CZM Administrator for processing at the local level and to the U.S. Army Corps of Engineers (USACE), New Orleans District. The local CZM Administrator notifies the applicant upon receipt of the local CUP application and publishes the notice of the application in the local official newspaper. There is a 25-day comment period for local CUP applications.

A local CUP shall contain conditions described in L.A.C. 43:I.723(C)(9) and any other conditions designated in the Ordinance and by the local CZM Administrator in compliance with the local CZMP, the guidelines and the Act. The permit holder has two (2) years to initiate the non-continuing use from the date of issuance with five (5) years for completion from date of issuance. The local CZM Administrator may extend the permit term for initiation for an additional two (2) years. The term for a CUP for a continuing use shall be five (5) years from the date of issuance. Renewal of the permit will require a new application. The terms of compliance for a local CUP are described in the Ordinance.

ENVIRONMENTAL REVIEW

For uses of local concern, the local CZM Administrator and staff will conduct an environmental review of the permit application and process the permit application. The permit review procedure, pursuant to the Ordinance, requires actions to be taken within specified time frames:

- Publish notice of pending local CUP within 10 days of receipt of complete application from State Administrator;
- Determine whether there is a need for a public hearing on the application and if so, holding Public Hearing within 30 days of publication of public hearing notice in official journal publication;
- Review of application by local CZM Administrator, and the CZAC and allow the public to comment on the proposal for 25 days;
- Assess mitigation consistent with Louisiana Coastal Resources Programs and the attendant regulations and guidelines;

- Notify the Secretary of the Louisiana Department of Natural Resources of the local Administrator's decision along with relevant mitigation considerations;
- Notify permit applicant and adjacent landowners within 100 feet of project site of the decision, within 30 days of notice of the public hearing or 15 days of closing of record of public hearing;

The permit review will also be in accordance with the local CZMP and will ensure that the activity represented by the permit application is consistent with all pertinent parish policies, goals (including environmental management unit goals for the site of the proposed activity or use), and performance standards. Within appropriate timelines, the CZAC reviews and makes recommendations on local CUP applications to the local CZM Administrator. The local CZM Administrator shall then grant, deny, or grant with conditions, the permit based on the recommendations of the staff and CZAC when available. Authority for the issuance of local CUP derives from the Ordinance (Appendix B) and the State and Local Coastal Resources Management Act of 1978 (Act 361 of 1978 as amended).

Once a local coastal program has been approved by the Secretary of the Louisiana Department of Natural Resources, uses of local concern within St. John Parish's coastal zone must be consistent with the parish coastal zone management plan and shall be subject to the issuance of coastal use permits by the local government (R.S. 49:214.28[H]). This oversight authority enables parishes to modify, suspend, revoke, or enforce (civil or criminal relief) coastal use permits for activities deemed local use (L.A.C. 43:1.723D). Such control enables a parish to only permit activities it deems beneficial, so long as it is in harmony with its CZMP. Parishes with a state approved CZMP can significantly impact how activities occurring within the parish boundaries affect St. John's economy, natural resource conservation, development, and stability. With this approved document, St. John has an opportunity to shape and modify its own coastal resources, social and economic identity, and direction for economic development and growth.

In general, a local CUP permit application can be processed within 40 to 50 days. Having a public hearing on the application can add 50 to 70 days to the time required to obtain a decision on the application.

An appeal of the final decision to approve, approve with conditions, or deny a permit application for use of local concern can be made by any person adversely affected by the decision, any landowner in, or resident of St. John and any government authority may request an administrative appeal of the local CZM Administrator's decision.

MITIGATION

Mitigation is an additional element associated with issuance of a CUP.

Mitigation is defined as "all actions taken by a permittee to avoid, minimize, restore, and compensate for ecological values lost due to a permitted activity."

St. John the Baptist Parish will require mitigation for coastal wetland losses, caused by permitted activities, consistent with the requirements of the Louisiana Coastal Resources

Program (LCRP) and the attendant regulations and guidelines. The St. John CZMP requires that the determination of mitigation requirements for permitted activities, as well as the appropriateness of mitigation proposals to offset losses, be based on loses/gains of wetland habitat values, measured by the same method utilized by the Louisiana Department of Natural Resources. The CZM Administrator shall advise the applicant that the U.S. Army Corps of Engineers also has a mitigation requirement and that the applicant will be required to comply with both the Corps requirement and the state/local requirement. The CZM administrator will advise the applicant to coordinate their compensatory mitigation with the Corps to ensure that both program's requirements are met. The St. John CZM will work diligently with Corps to identify mitigation options that will satisfy both programs to prevent the burden of assigning two distinct and separate compensatory mitigation requirements to any applicant for the same activity.

ADMINISTRATIVE APPEAL OF STATE AND LOCAL COASTAL USE PERMIT DECISIONS

Decisions of the State Administrator regarding Permit Applications for "Uses of State Concern" shall be subject to appeal pursuant to the provisions of Act 361 as amended (LA R.S. 49.214.35(B)), and the regulations adopted pursuant thereto.

The regulations given in this section, and detailed in the Ordinance, shall govern the administrative appeals process for decisions of the local CZM Administrator regarding Permit Applications for uses of local concern. The appeals process provided for herein is limited to uses of local concern regulated by St. John the Baptist Parish's approved CZMP.

NOTICE OF APPEAL

The applicant for a local coastal use permit; the owner of the property affected by a local coastal use permit decision; any affected federal, state, or local agency; or any other person who perceives himself or herself to be adversely affected by a local coastal use permit decision may request an Administrative Appeal of a permit decision made by the local CZM Administrator. A permit decision shall be subject to appeal/reconsideration by the St. John Coastal Zone Management Program Appeals Committee (hereafter referred to as the CZMP Appeals Committee), if Notice of Appeal is filed in writing within ten (10) calendar days following public notice of a permit decision by the local CZM Administrator. The Appeals Committee shall consist of at least three members of the CZAC called to a special meeting for the purpose of reviewing the decision of the local CZM Administrator.

The party requesting any appeal shall provide to all parties of record and to the local CZM Administrator a copy of the notice. The party requesting an appeal shall include in the submission to the local CZM Administrator a copy of the permit decision being appealed and a copy of the permit application.

An appellant may appeal a notice by:

- identifying how the permit decision of the CZM Administrator is contrary to law and any issues providing grounds for appeal;
- stating sufficient facts regarding the proposed project to allow adequate analysis of whether or not the local CZM Administrator's decision was supported by fact;
- including the name, address, and phone number of the party requesting review and, if applicable, the party's legal representative;
- providing a short statement indicating how the party requesting the appeal would like the appeals panel to remedy the situation;
- including a statement that the party requesting an appeal has read the notice and believes the contents to be true, followed by the party's signature and that of the party's representative, if any;
- stating that issues raised during the application process constitute the sole grounds for appeal, except for allegations of any of the following:
    - providing new evidence pertinent to the key issues upon which the permit decision was based that may not have been discovered before or during the application review process by using due diligence; or
    - alleging fraud, as defined by state law, or corruption in the application process; or
    - presenting other good grounds for further consideration in the public interest. Good grounds include, but are not limited to, a failure to consider pertinent issues or facts in the initial review process.

Upon receipt of a completed appeals packet, containing proper notice as defined above, a copy of the decision, and a copy of the application, the local CZM Administrator shall notify the appellant and applicant of its receipt by mail.

The local CZM Administrator shall schedule an appeal within 10 working days of receiving a completed appeals packet. The local CZM Administrator shall promptly send each party of record the date, time, and location of the appeal by registered mail. The local CZM Administrator shall publish the date, time, and location of any appeal in the official journal of St. John of the proposed site for the project at issue.

The local CZM Administrator shall require the applicant to post notification of the upcoming appeal on the proposed site of the activity at issue. Interested parties may appear personally or be represented by counsel at the appeal to produce any competent evidence on their behalf.

An appeals panel may administer oaths, examine witnesses, and issue notices of hearings or subpoenas requiring the testimony of witnesses and production of books, records or other relevant documents. An appeals panel may admit and give probative effect to evidence that possesses probative value commonly accepted by reasonably prudent men in the conduct of their affairs. An appeals panel may exclude evidence they find incompetent, irrelevant, immaterial, or unduly repetitive. The appeals panel shall give effect to the rules of privilege recognized by law. Objections may be made and considered, and shall be noted in the record.

An appeals panel may take notice of judicially cognizable facts, as requested by interested parties. Such facts include, but are not limited to, recognized technical or scientific facts. Depositions may be taken in accordance with provisions governing the taking of depositions for civil court proceedings and admitted in the appeal. Discovery may occur in accordance with provisions governing discovery for civil court proceedings in the fortieth (40th) District Court of St. John. A verbatim transcript of testimony at the appeal shall be prepared and, in addition to exhibits and documents introduced, constitute the record.

An appeals panel shall make findings of fact and a decision based upon the record and on any of the following:

- written submissions from interested parties prepared for purposes of appeal;
- the original permit application and associated documentation, and any legislative filets (such as scientific studies); or
- documented communications the panel deems trenchant relative to material issues in the permit.

An appeals panel shall issue a written decision of a length and depth to enable a court to evaluate the rationale and fundamental facts underlying the decision. A copy of the appeals panel's decision shall be provided to each of the interested parties by the local CZM Administrator.

Interested parties may review the documentation prepared for and by the appeals panel upon written request to the local CZM Administrator. The party requesting an appeal bears the burden of presenting a prima facie case, as state law for civil trials determines that standard. The standard for review of the local CZM Administrator's decision by the appeals panel is whether the decision on the permit application was supported by substantial evidence, as defined in state law (see L.R.S. 49:964). Appeals panel decisions are subject to judicial review. Nothing in this provision shall impede other authorized means for review.

FEES FOR APPEAL

The CZM Administrator may establish a fee system to cover administrative costs associated with implementing the appeals process, including, but not limited to, reasonable charges for copies and postage.

ENFORCEMENT

Chapter 109, Article II, Division 4. - Enforcement of the Ordinance details the procedures for monitoring and enforcement of the conditions of a permitted activity of local concern and for notifying the State Administrator regarding actions of state concern. Enforcement of permit requirements under the local CZMP would also include activities that are being undertaken without the required permit or that are in violation of the conditions of the permit. The local CZM Administrator has primary authority under the ordinance for monitoring and enforcement of uses of local concern and strives to correct deficiencies in site compliance whenever possible through this procedure. Inspectors from St. John the Baptist Parish inspect permitted operations to determine that the activity is being conducted in accordance with the permit and any conditions that are part of the permit.

The St. John Department of Planning and Zoning (DPZ) staff assists by reviewing activities encountered during the course of their normal duties. Observations regarding activities that directly impact coastal waters are reported to the CZM Administrator for verification as to whether the activity is permitted and whether it is a state or local concern. Possible violations may also be reported to the CZM Administrator by other agencies, individuals or groups.

If the observed activity affecting coastal waters is a suspected state concern, the violation is reported to state and federal agencies for action. A non-permitted activity of local concern or a local CUP non-compliance issue is addressed by the CZM Administrator as defined in 109:50 (Generally) and then 109:42 (After the fact Permits) of the Ordinance. The CZM Administrator is required to issue warnings as outlined within the Ordinance and when warranted has the authority, to issue a cease and desist orders. The CZM Administrator may revoke or suspend permits; order a permittee to cease all activities; and may assess any and all appropriate fines for violations of a local CUP.

The recipient of a cease and desist order may challenge the validity of the order in the St. John District Court. The CZM Administrator, the Parish President, the Parish Council or the CZM Committee can refer violations to the parish's District Attorney for prosecution. Consequences for violating the State and Local Coastal Zone Management Programs are set forth in La. R.S. 49:214.36(E)-(N).

SPECIAL AREAS

Special Areas are defined by the Louisiana Coastal Zone Management Program in section R.S 49:214.29(A) as:

> "...areas within the coastal zone which have unique and valuable characteristics requiring special management procedures. Special areas may include important geological formations, such as beaches, barrier islands, shell deposits, salt domes, or formations containing deposits of oil, gas or other minerals; historical or archaeological sites; corridors for transportation, industrialization or urbanization; areas subject to flooding, subsidence, salt water intrusion or the like; unique, scarce, fragile, vulnerable, highly productive or essential habitat for living resources; ports or other developments or facilities dependent upon access to water; recreational areas; freshwater storage areas; and such other areas as may be determined pursuant to this Section."

Guidelines provide that any person or government body can nominate a Special Area in the coastal zone providing that it can be demonstrated that the area has unique and valuable characteristics that require special management procedures (NOAA & LA Coastal Resources Program-LDNR 1980: Appendix C4). These guidelines allow for an administrative review of proposed Special Areas by the local CZM Administrator. At the request of the CZAC, the St. John the Baptist Parish Council may, after public hearings, determine whether or not to designate an area as a Special Area. The guidelines and priorities of uses adopted by the CZM Administrator for a designated Special Area must be sent to the LDNR-OCM for review. In the event the Parish Council and the LDNR-OCM are unable to agree on a set of guidelines and priorities of uses for a designated Special Area, final resolution will be determined by the Louisiana Governor.

An incentive for the designation of Special Areas lies in Section 214.29(E) of the Act that states:

> "The Secretary is authorized to assist approved local programs and state and local agencies carrying out projects consistent with the guidelines, related to the management, development, preservation, or restoration of specific sites in the coastal zone or to the development of greater use and enjoyment of the resources of the coastal zone by financial, technical, or other means, including aid in obtaining federal funds."

Figure 7-4 – Photo by Catherine Schons

DESIGNATION PROCEDURE

Any person, organization, political subdivision or agency may nominate an area for designation as a Special Area by sending to the CZM Administrator a statement in writing giving the area to be nominated, along with a map, the reasons for nomination, and how the area should be managed. The Local CZM Administrator or CZMP may also nominate an area.

Upon receipt of a nomination, the CZAC will determine the following:

- Is the area in the coastal zone?
- Does the area have unique and valuable characteristics?
- Does the area require special management procedures different from the normal coastal management process?; and
- Is the area to be managed for a purpose of regional, state, or national importance?

If the responses to the questions listed above are affirmative, the local CZM Administrator will develop a concise statement containing the following:

- Discussion of the area nominated; including, for example, its unique and valuable characteristics; its existing uses; the environmental setting; its history; and the surrounding area;
- Reasons for the nomination; such as any problems needing correction, anticipated results, need for special management, and need for protection or development;
- Social, economic, and environmental impacts of the nomination;
- A map showing the area nominated;
- Reasons why the area nominated was delineated as proposed and not greater or lesser in size or not in another location;
- Proposed guidelines and procedures for management of the area, including priorities of uses;
- Explanation of how and why the proposed management program would achieve the desired results;
- How and why the designation of the area would be consistent with the state coastal management program and any affected local programs; and
- Why and how the designation would be in the best interest of the state.

The statement on the proposed Special Area, with nomination and the recommendation of the local CZM Committee, will be sent to the Parish Council for their consideration. Notice of the Parish Council's consideration of the nomination will be published ten (10) days prior to the Parish Council meeting. If the Parish Council approves the nomination, it will be to Special Area Guidelines (Appendix C4 of the Louisiana Coastal Resources Program Final EIS) by the local CZM Administrator.

St. John does not have any designated Special Areas at this time. The parish reserves the right to nominate a Special Area in the future.

REQUIREMENTS

Act 361, as amended, requires that local programs have "special procedures and methods for considering uses within special areas, uses of greater than local benefit, and uses affecting the state and national interest" (Section 214.28C(3)(c)). The purpose of the requirement can be traced to a goal of the Act, "...to ensure that appropriate consideration is given to uses of regional, state, or national importance, energy facility siting and the national interest in coastal resources" (Section 214.27C(12)). The requirement also has roots in the Federal Coastal Zone Management Act (CZMA) which states, "Prior to granting approval, the Secretary will also find that the program provides...for a method of assuring that local land and water use regulations within the coastal zone do not unreasonably restrict or exclude land and water uses of regional benefit" (Section 306(d)(12)).

The intent of this requirement is to ensure that local programs have procedures that give adequate consideration to regional, state, and federal activities and not arbitrarily restrict such uses. This does not mean that local governments must acquiesce to regional, state, or federal entities, but rather they give objective and comprehensive consideration to the proposed activities or use before arriving at a decision.

INTERAGENCY COORDINATION

PARISH COORDINATION

Another means for CZMP implementation lies in the use of consistency (as contained in the state and federal CZM Acts) to require that state activities and projects, as well as proposed activities under permit review by state agencies, be consistent with the goals, objectives and policies of the LCRP. Consistency review will require notice to the Local CZM Administrator by the state agency as to how the proposed project or activity has achieved consistency. A copy of consistency statements submitted to the state will be forwarded by the State Administrator to the local CZM Administrator.

The appropriate local public agencies review public works and other projects proposed by St. John the Baptist Parish prior to issuance of the appropriate regulatory authorizations. It is the intent of the St. John CZMP to coordinate, as early as possible, in agency planning to ensure that parish concerns are addressed at an early stage of project planning. In this manner, consistency of an agency's proposed activity with the St. John Coastal Zone Management Program will be much easier to achieve than later in the review process.

To achieve this goal of early coordination of multi-agency jurisdictions and projects, the Local CZM Administrator hereby requests that all agencies undertaking activities which may affect or impact St. John notify the CZM Administrator of their intentions, uses, or projects, and actively involve the parish in agency planning.

CONSISTENCY WITH STATE PROGRAMS

The St. John the Baptist Parish Coastal Zone Management Program is designed to enable St. John and its CZAC to review projects of local concern that could negatively impact wetlands and water bodies in St. John, as well as comment on permit applications for projects of greater than local concern (e.g., state and federal projects). Activities in wetland EMUs and fastlands/uplands and transition EMUs that have the potential to impact wetlands and coastal waters are reviewed under the local CZMP. St. John relies on federal, state, and local laws and regulations to achieve its goals and objectives.

Continued implementation of the St. John CZMP will be consistent with the policies and objectives of the Louisiana State and Local Coastal Resources Management Act (SLCRMA), as amended, and the state guidelines and the local program shall be interpreted and administered consistently with such policies, objectives and guidelines.

FEDERAL ACTIVITIES CONSISTENCY WITH STATE PROGRAMS

The Federal CZM Act also allows a state, pursuant to its federally approved CZMP, to regulate "federal agency activity within or outside the coastal zone that affects any land or water use or natural resource of the coastal zone" and such activity "shall be carried out in a manner which is consistent to the maximum extent practicable with the enforceable policies of approved state management programs" (16 U.S.C. 33 §1456 (c)(l)(A), 1989).

States with approved coastal management plans may, within their respective jurisdictions, approve or disapprove the issuance of federal permits and agree or disagree with a federal agency's determination that their activity is consistent with the state program. Notwithstanding certain exceptions to this general rule, this grant of authority to the states from the federal government gives them a position from which to strongly influence the activities that will be allowed within their coastal zone.

Chapter 8

CHAPTER 8: PUBLIC PARTICIPATION

The public has been invited and actively involved in the preparation of the St. John the Baptist Parish Local Coastal Zone Management Program Ordinance and Plan Document. After attempts in the 1980s and in 2000s the St. John the Baptist Parish Administration revived the idea in the summer of 2014 to prepare and complete a Local Coastal Zone Management Program. The first steps in the process involved the Parish President, Council and public organizations who were directed by old ordinance to create a committee of members of the community that could guide the development of the Program and Plan Document. After consideration and updating, the Coastal Zone Advisory Committee was appointed and first met in July 2015. July 2015 also marked the official notice to the Louisiana Department of Natural Resources of the Parish's intent to prepare and present for approval a program plan document and update the existing dated ordinance. The St. John Coastal Zone Advisory Committee (CZAC) met ___ times in open forum between July 2015 and ____ 2016. Meetings were held at the Percy Hebert Building at Laplace, Louisiana. They were duly posted in advance in the Public Notices as per St. John Parish Council policy and procedure. Agendas and minutes of the regular meetings are available from the St. John Parish Council.

The following list gives the dates of the St. John CZAC meetings and the more important issues related to the preparation of the St. John Local Coastal Management Program:

July 2015	President Robottom informs LA DNR Secretary Steven Chustz of St. John the Baptist Parish's intention to prepare and approve a Local Coastal Zone Management program
July 2015	The St. John Coastal Zone Management Advisory Committee meets for the first time meeting with LA DNR representatives Sara Krupa and Jon Truxillo, Cullen Curole of South Central Planning & Development Commission (SCPDC) who will be preparing the plan document, LSU Coastal Scientist G.Paul Kemp and Planning Dept. Staff.
August 2015	Dr. Kemp and Curole introduce the concept of Environmental Management Units (EMUs) and Discuss St. John's Principal Resources.
September 2015	Curole introduces and discusses Goals, Objectives and Policies in General and the concept of later application to EMUs.

October 2015	Discussion continues on Environmental Management Units
November 2015	Dr. Kemp and Curole present parish-wide Environmental Settings and continue discussion on Environmental Management Units
January 2016	Curole presents Socio-Economic considerations and Dr. Kemp continues discussion on Environmental Management Units
April 2016	Curole presents the Chapter on Environmental Challenges/Issues and is joined by LA DNR representatives to discuss present and discuss the Chapter on Program Administration and accompanying Ordinance. Also presented are the Introduction, Acronyms and Definitions Sections
April/May 2016	Draft Document is presented to LA DNR for informal Review
May/June 2016	After LA DNR comments are received, discussed and applied, the CZM Advisory Committee calls/advertises for a Public Comment Period and Hearing. Advertising and making Draft Copies available for public review/comment at Public Libraries, Courthouse and online.
May/June 2016	Public Hearing Held
June/July 2016	With Comments considered and possible Edits made, CZM Advisory Committee Recommends Approval of Plan Document and Proposed Ordinance.
June/July 2016	Parish Council Introduces the Ordinance(s) for Program and Plan Document and Announces Public Hearing Opportunity in advance of voting on Approval
July/August 2016	Final/Signed Ordinance and Plan Document are submitted to LA DNR who reviews, hopefully approves and presents to NOAA for consideration and approval.

APPENDIX A: DEFINITIONS

DEFINITIONS

The following words, terms, and phrases when used in the St. John the Baptist Parish Coastal Zone Management Plan Shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

Act means the Louisiana State and Local Coastal Resource Management Act (SLCRMA) R.S. 49:214.21 et seq.

Administrator (See also **State Administrator)** means the administrator of the Coastal Management section within the Louisiana Department of Natural Resources.

Affected Landowner means the owner of the land on which a proposed activity, which would result in an unavoidable net loss of ecological value, is to occur.

Affected Parish means the parish in which a proposed activity, which would result in an unavoidable net loss of ecological value, is to occur.

After-the-fact Permit means a coastal use permit issued after the commencement of an activity or use.

Aggrieved Party means any person who receives a decision adverse to their interests or proposed objectives.

Agricultural, Forestry and Aquaculture Activities means those activities:

1. That are common practice and incident to agriculture, forestry and aquaculture, provided that the activity is one of an on-going basis for a period of at least ten years, including the year previous to the activity in question;
2. That do not require a permit from the U.S. Army Corps of Engineers; and
3. That do not result in a new or changed use of the land.

Examples include seeding, fence building and harvesting.

Alterations of Waters Draining in Coastal Waters means those uses or activities that would alter, change, or introduce polluting substances into runoff and thereby modify the quality of coastal waters. Examples include water control impoundments, upland and water management programs, and drainage projects from urban, agricultural and industrial developments.

Alternative access: Methods of gaining access, ingress and egress, other than by the dredging of canals into the wetlands for drilling, servicing, work over, or any other production of minerals activity.

Alternative access vehicle: Any hover craft, helicopter, air cushion vehicle, or any other vehicle which does not require dredging.

Applicant means the owner of the property for which a use requiring a Coastal Use Permit is requested, an agent, or someone specifically authorized in writing by the owner to make an application.

Approved Local Program (or Local Program) means a local coastal management program which has been and continues to be approved by the secretary pursuant to 214.28 of the State and Local Coastal Resources Management Act (SLCRMA).

Average Annual Habitat Unit is a unit of measure of ecological value; average annual habitat units are calculated by the formula: (sum of cumulative habitat units for a given project scenario)/ (project years).

Beneficial Use of Dredged Material means use of dredged material excavated and not replaced pursuant to a proposed activity for which a coastal use permit is required, so as to protect, create, or enhance wetlands; use of material dredged pursuant to an alternative dredging activity to protect, create, or enhance wetlands, so as to offset failure to use the dredged material from the proposed activity to protect, create, or enhance wetlands; or contribution to the Coastal Resources Trust Fund to replace, substitute, enhance, or protect ecological values, so as to offset failure to use the dredged material from the proposed activity to protect, create, or enhance wetlands.

Beneficial Use of Dredged Material Plan (BUDM Plan) a document submitted to the secretary for approval as part of an application, specifying the beneficial use of dredged material proposed by the applicant.

Best Practical Techniques means those methods or techniques which would result in the greatest possible minimization of the adverse impacts listed in §701.0 and in specific guidelines applicable to the proposed use. Those methods or techniques shall be the best methods or techniques which are in use in the industry or trade or among practitioners of the use, and which are feasible and practical for utilization.

Buffer zone means a strip of land adjoining a wetland mitigation site to protect the wetland habitat and wildlife within the bank from the impact of an activity outside the buffer zone. The term includes a strip of land composed primarily of water or a strip of land that includes a fence, wall, or screen of vegetation when these visual barriers also provide functional protection for the wetland.

Camp means a structure built and used for non-commercial and non-profit purposes and commonly referred to as single family. It does not include multiple family dwellings and shall apply only to such structure built singly, by and for the owner of the land for the owner's use and not to practices involving the building of more than one such structure as in subdividing, tract development, speculative building, or recreational community development and intended for periodic occupancy.

Closely-related actions means those actions that:

1. Automatically trigger other actions which may require permits;
2. Cannot proceed unless other actions are taken previously or simultaneously; or
3. Are interdependent parts of a larger action and depend upon the larger action for their justification.

Coastal Use Permit (CUP) or permit means those permits required by La R.S. 49:214.30. The term does not mean or refer to, and is in addition to, any other permit or approval required or established pursuant to any other constitutional provision or statute.

Coastal Waters means bays, lakes, inlets, estuaries, rivers, bayous and other bodies of water within the boundaries of the coastal zone.

Coastal Water Dependent Uses means those which must be carried out on, in or adjacent to coastal water areas or wetlands because the use requires access to the water body or wetland or requires the consumption, harvesting or other direct use of coastal resources, or requires the use of coastal water in the manufacturing or transportation of goods. Examples include surface and subsurface mineral extraction, fishing, ports and necessary supporting commercial and industrial facilities, facilities for the construction, repair and maintenance of vessels, navigation projects, and fishery processing plants.

Coastal Zone means the area described in La. R.S. 49:214.24. The entire geographic extent of St. John the Baptist Parish is in the coastal zone.

Coastal Zone Management Act the definition is the same as for "Act" above.

Coastal Zone Management Program means the applicable laws, regulations, policies and guidelines developed by federal, state, and local government to implement the Coastal Zone Management Act.

Compensatory mitigation means replacement, substitution, enhancement, or protection of ecological values to offset anticipated losses of those values caused by a permitted activity.

Conservation Plan means the Louisiana Coastal Wetlands Conservation Plan which details the comprehensive effort of the state to offset losses of wetlands from development activity.

Conservation Servitude as defined at R.S. 9:1272(1), means a non-possessory interest of a holder in immovable property imposing limitations or affirmative obligations the purposes of which include retaining or protecting natural, scenic, or open-space values of immovable property, assuring its availability for agricultural, forest, recreational, or open-space use, protecting natural resources, maintaining or enhancing air or water quality, or preserving the historical, archaeological, or cultural aspects of unimproved immovable property.

Contaminant means an element causing pollution of the environment that would have detrimental effects on air or water quality or on native floral or faunal species.

Continuing Uses are activities which by nature are carried out on an uninterrupted basis; examples include shell dredging and surface mining, activities, projects involving maintenance dredging of existing waterways, and maintenance and repair of existing levees.

Corps means the U.S. Army Corps of Engineers (USACE).

Council means the St. John the Baptist Parish Council, the authority of general jurisdiction and operation at the parish level.

CRMA (see also **SLCRMA**) the Coastal Resource Management Act (of 1978, Act 361, as amended)

Cumulative Habitat Unit CHUs represent the total number of habitat units gained or lost over the life of a project, where net gain or net loss of coastal resources ecological value = (sum of CHUs produced in a future with project scenario) – (sum of CHUs produced in a future without project scenario).

Cumulative Impacts means the influence on the environment resulting from the incremental effects of the activity when added to other past, present, and reasonably foreseeable future activities regardless of what agency or person undertakes those activities. Cumulative impacts may result from individually minor but collectively significant activity taking place over a period of time. Secondary impacts caused or enabled by a particular project are considered cumulative; including, but not limited to, increased development in an area where new sewers, roads, and other infrastructure have been built whether plans exist for this area at the time the infrastructure is built or not. Cumulative impacts to coastal zone resources may result from activity outside the coastal zone or from activity exempt under coastal zone permitting.

CZM Administrator (See also **Local Administrator**) means the parish professional charged with implementing and administering this article and the local coastal zone management plan.

Department or DNR means the Louisiana Department of Natural Resources.

Development Levees means those levees and associated water control structures whose purpose is to allow control of water levels within the area enclosed by the levees to facilitate drainage or development within the leveed areas. Such levee systems also commonly serve for hurricane or flood protection, but are not so defined for purposes of these guidelines.

Direct and Significant Impact means an impact that alters the physical, hydrological, chemical, or biological characteristics of coastal waters as a result of an action or series of actions undertaken by man.

Dredge or Dredging (verb) means the removal by excavation or any other means of native material, including soil, sand, mud, clay, and semi-solid sediment, regardless of whether the material supports or is supporting vegetation, from any lands or water bottoms in the coastal zone of Louisiana.

Dredged Material means soil, mud, and/or other sediment that will be dredged pursuant to a proposed activity for which a coastal use permit or other authorization is required.

Ecological Value means the ability of an area to support vegetation and fish and wildlife populations.

Emergency means a situation that poses an immediate threat to public safety, life, health or property and action in response to the threat cannot await the permitting process. Declaration of an emergency must come from a governmental body with authority to make such declarations and continues for the time that body specifies.

Endangered Species as defined in the Endangered Species Act, as amended, any species which is in danger of extinction throughout all or a significant portion of its range other than a species of the Class *Insecta* determined by the Secretary of the U.S. Department of Interior to constitute a pest whose protection under the provisions of the Endangered Species Act, as amended, would present an overwhelming and overriding risk to man.

Environmental Management Unit or EMU means an area with certain distinguishing physical, hydrological, chemical, biological or cultural characteristics.

Exempted Use shall mean any use specifically listed in this Chapter as not requiring a permit.

Expectable Adverse Conditions means natural or man-made hazardous conditions which can be expected or predicted to occur at regular intervals. Included are such events as 125 mile per hour hurricanes and associated tides, 100 year floods and reasonably probable accidents.

Fastlands means lands surrounded by publicly owned, maintained, or otherwise validly existing levees, or natural formations, as of January 1, 1979, or as may be lawfully constructed in the future, which levees or natural formations would normally prevent activities, not to include the pumping of water for drainage purposes, within the surrounded area from having direct and significant impacts on coastal waters.

Feasible and Practical means those locations, methods and/or practices which are of established usefulness and efficiency and allow the use or activity to be carried out successfully.

Federal Advisory Agencies include, but are not limited to, the U.S. Fish and Wildlife Service, the U.S. National Marine Fisheries Service, the U.S. Environmental Protection Agency, and the U.S. Natural Resources Conservation Service.

Force Majeure means an act of God, war, blockade, lightning, fire, storm, flood, and any other cause which is not within the control of the party claiming force majeure.

Future with Project Scenario means a portrayal of anticipated changes to ecological values (i.e., habitat values and wetland acreage) throughout the project years in a situation where a given project would be implemented.

Future without Project Scenario means a portrayal of anticipated changes to ecological values (i.e., habitat values and wetland acreage) throughout the project years in a situation where a given project would not be implemented.

Geologic Review Procedure a process by which alternative methods, including alternative locations, for oil and gas exploration are evaluated on their environmental, technical, and economic merits on an individual basis; alternative methods, including alternative locations, of oil and gas production and transmission activities which are specifically associated with the proposed exploration activity shall also be evaluated in this process. These alternative methods, including alternative locations, are presented and evaluated at a meeting by a group of representatives of the involved parties. A geologic review group is composed, at a minimum, of representatives of the applicant, a petroleum geologist and a petroleum engineer representing the Office of Coastal Management and/or the New Orleans District Corps of Engineers, and a representative of the Office of Coastal Management Permit Section, and may include, but is not limited to, representatives of the Louisiana Department of Wildlife and Fisheries, the Louisiana Department of Environmental Quality, the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, the U.S. National Marine Fisheries Service, and the U.S. Environmental Protection Agency.

Governmental Body any public department, agency, bureau, authority, or subdivision of the government of the United States or the state of Louisiana and shall include parishes and municipalities and subdivisions thereof and those governmental agencies constitutionally established.

Guidelines means Louisiana Administrative Code (L.A.C.) Title 43, Chapter 7 entitled Coastal Management adopted pursuant to 214.27 of the act.

Habitat means the natural environment where a plant or animal population lives.

Habitat Types means the general wetland vegetative communities which exist in the Louisiana Coastal Zone, including fresh marsh, intermediate marsh, brackish marsh, saline marsh, fresh swamp, and bottomland hardwoods.

Hurricane or Flood Protection Levees means those levees and associated water control structures whose primary purpose is to prevent occasional surges of flood or storm generated high water. Such levee systems do not include those built to permit drainage or development of enclosed wetland areas.

Hydrologic and Sediment Transport Modifications means those uses and activities intended to change water circulation, direction of flow, velocity, level, or quality or quantity of transported sediment. Examples include locks, water gates, impoundments, jetties, groins, fixed and variable weirs, dams, diversion pipes, siphons, canals, and surface and groundwater withdrawals.

Hydrologic Basin means one of the nine general drainage areas within the Louisiana Coastal Zone as delineated on pages A-2 and A-3 of the Louisiana Coastal Wetlands Conservation and Restoration Plan, April 1990.

Impoundment Levees means those levees and associated water control structures whose primary purpose is to contain water within the levee system either for the prevention of the release of pollutants, to create fresh water reservoirs, or for management offish or wildlife resources.

Infrastructure means those systems which provide needed support for human social institutions and developments, including transportation systems, public utilities, water and sewerage systems, communications, educational facilities, health services, law enforcement and emergency preparedness.

In-kind mitigation means providing goods, services, or funds in an amount valued equally to the fair market value of creating a mitigation site; it is similar in concept to barter trade.

In-Lieu Permit means those permits issued in-lieu of coastal use permits pursuant to 214.31 of the SLCRMA.

Interested person means any of the following:

1. Any applicant, an agent or an employee of the applicant, or a person receiving consideration for representing the applicant, or a participant in a proceeding on the matter.
2. Any person with a financial interest in a matter before the appeals panel, or an agent or employee of the person with a financial interest, or a person representing the person with a financial interest.
3. A representative acting on behalf of any civic, environmental, neighborhood, business, labor, trade, or similar organization who intends to influence the decision of the appeals panel on a matter before the appeals panel.

Levee means an embankment to control or prevent movement of water or other material.

Linear Facilities means those uses and activities which result in creation of structures or works which are primarily linear in nature. Examples include pipelines, roads, canals, channels, and power lines.

Local administrator (See also **CZM Administrator**).

Local Coastal Advisory Committee or Committee means the St. John the Baptist Parish Utility Board.

Local government means the St. John the Baptist Parish Council.

Local uses or uses of Local Concern means those uses which directly and significantly affect coastal waters and are in need of coastal management but are not uses of state concern and which should be regulated primarily at the local level if the local government has an approved program. Uses of local concern include, but are not limited to:

1. Privately funded projects, which are not uses of state concern.
2. Publicly funded projects, which are not uses of state concern.
3. Maintenance of uses of local concern.
4. Jetties or breakwaters.
5. Dredge or fill projects not intersecting more than one water body.
6. Bulkheads.
7. Piers.
8. Camps and cattle-walks.
9. Maintenance dredging.
10. Private water control structures of less than $15,000 in cost.
11. Uses of cheniers, salt domes, or similar landforms.

Louisiana Coastal Resources Program (LCRP) means the compendium of laws, regulations and enforceable policies that comprise the State's Coastal Management Program.

Marsh means wetlands subject to frequent inundation in which the dominant vegetation consists of reeds, sedges, grasses, cattails, and other low growth.

Master Plan means Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast promulgated by the Coastal Protection and Restoration Authority pursuant to R.S. 49:213.1, et seq., as in effect on the date of submission of a complete application.

Minerals oil, gas, sulfur, geothermal, geopressure, salt, or other naturally occurring energy or chemical resources which are produced from below the surface in the coastal zone. Not included are such surface resources as clam or oyster shells, dirt, sand, or gravel.

Mitigation means all actions taken by a permittee to avoid, minimize, restore and compensate for ecological value lost due to a permitted activity.

Mitigation bank means a parcel of land that has undergone or is proposed to undergo a physical change necessary to enhance, restore or create wetland habitat on the parcel expressly to offset an adverse impact to another wetland caused by an approved or future projects. Timing distinguishes a bank from off-site mitigation. Off-site mitigation is usually created concurrent with or subsequent to the project rather than before a project. Mitigation credits, as valued under L.A.C. title 43, part I, section 724(E)(6) and defined in this section, may be donated, sold, traded, or otherwise used for the purpose of compensating for ecological values lost due to a permitted activity.

Mitigation credit means a unit of measured area that supports wetland habitat, wetland habitat value, and wetland function that did not exist at the mitigation bank site before the bank was developed. Credits are determined in accordance with L.A.C. title 43, part I, section 724.

Navigational Aids means buoys, marker piles, dolphins, piling, and/or pile clusters when in conformance with U.S. Coast Guard standards and do not involve dredge and fill activity.

Non-Continuing Uses are activities which by nature are done on a one-time basis; examples include dredging access canals for oil and gas well drilling, implementing an approved land use alteration plan and constructing new port or marina facilities.

Normal Maintenance and Repair means activity taken to reasonably preserve the utility of a lawfully existing structure in active use for the year preceding the proposed activity. It does not include expanding an existing structure, dredging and filling, or altering the magnitude or function of the original structure.

Off-Site meaning not within or adjoining the area directly modified by the permitted activity and not directly related to implementation of the permitted activity.

Oil, Gas and Other Mineral Activities means those uses and activities which are directly involved in the exploration, production, and refining of oil, gas, and other minerals. Examples include geophysical surveying, establishment of drill sites and access to them, drilling, on site storage of supplies, products and waste materials, production, refining, and spill cleanup.

On-site mitigation means all measures that may be taken to offset or eliminate damage or destruction to the functional characteristics and processes of a wetland, changing the operational characteristics of the proposed activity, or creating or enhancing wetland functions or values at the project site.

Out-of-kind mitigation means the creation of habitat functions and types at the mitigation site substantially different from those that existed at the project site; restoration of a bottomland hardwood site as mitigation for a project in a salt marsh is one example.

Overriding public interest means that the public interest benefits of a given activity clearly outweigh the public interest benefits of compensating for wetland values lost as a result of the activity, as in the case of the construction of flood protection facilities critical for protection of existing infrastructure.

Parish coastal administrator means the Director of the St. John the Baptist Parish Department of Code Enforcement/Planning and Zoning or his/her duly authorized representative.

Parish Council means the legislative authority of general jurisdiction at the parish level.

Particular Areas are areas within the coastal zone of a parish with an approved local program which have unique and valuable characteristics requiring special management procedures. Such areas shall be identified, designated, and managed by the local government following procedures consistent with those for special areas.

Permit means a coastal use permit.

Permitting Body means either the Department of Natural Resources or a local government with an approved local program with authority to issue, or that has issued, a coastal use permit authorized by the SLCRMA.

Person Any individual, partnership, association, trust, corporation, or government body.

Project years mean the anticipated number of years that the proposed activity would have a negative or positive impact on the ecological value of the site. Project years shall be 20 years for marsh habitats and 50 years for forested habitats, unless it is clearly demonstrated by the applicant and accepted by the secretary to be shorter in duration.

Public Hearing means any hearing announced to the public at least 30 and no more than 60 days in at least two newspapers covering the parish. Hearings will be held in the closest available site to the permit site or local community. All interested persons shall be afforded a reasonable opportunity to make written or oral submissions on the subject of the meeting

Residence means structure built and used for non-commercial and non-profit purposes and commonly referred to as single family. It does not include multiple family dwellings and shall apply only to such structures built singly, by and for the owner of the land for the owner's use and not to practices involving the building of more than one such structure as in subdividing, tract development, speculative building, or recreational community development and intended as a primary residence.

Residential Coastal Use means any coastal use associated with the construction or modification of one single family, duplex, or triplex residence or camp. It shall also include the construction or modification to any outbuilding, bulkhead, pier, or appurtenance on a lot on which there exists a single-family, duplex, or triplex residence or camp or on a water body which is immediately adjacent to such lot.

Residents mean both real persons and entities whose occupancy in St. John the Baptist Parish is intended to be of an on-going, primary nature. These include, but are not limited to, civic, environmental, neighborhood, business, labor, trade, or similar organizations or a legally recognized business entity.

Same-kind mitigation means the creation of habitat functions and types at the mitigation site substantially similar to those that existed at the project site; restoration of a bottomland hardwood site as mitigation for a project in a bottomland hardwood site is one example.

Secondary impact means an impact which would:

1. Result from the proposed activity;
2. Causing significant modifications or alterations to the physical characteristics of acreage beyond the limit of the area depicted as being altered in the accepted permit application drawings; and
3. Be identified and quantified by the secretary based on an evaluation of similar and previously implemented activities.

Secretary means the Secretary of the Department of Natural Resources or his or her designee.

Sediment Deposition Systems means controlled diversions of sediment-laden water in order to initiate land building or sediment nourishment or to minimize undesirable deposition of sediment in navigation channels or habitat areas. Typical activities include diversion channels, jetties, groins, or sediment pumps.

Shoreline Modifications means those uses and activities planned or constructed with the intention of directly or indirectly changing or preventing change of a shoreline. Examples include bulk-heading, piers, docks, wharves, slips, short canals, and jetties.

SLCRMA the State and Local Coastal Resources Management Act of 1978, Act 361 of 1978 as amended, R.S. 49:214.21-49:214.42.

Special Areas means those portions of the coastal zone within St. John the Baptist Parish that require special management procedures due to certain unique and valuable characteristics. Examples include barrier islands, shell deposits, salt domes, archaeological sites, transportation corridors, endangered species habitat, ports, and recreational sites among others. These areas may be designated by the Parish Council.

Spoil Deposition-the deposition of any excavated or dredged material.

State Administrator (See aslo **Administrator**)

State Advisory Agencies include, but are not limited to, the Louisiana Department of Wildlife and Fisheries and the Louisiana Department of Environmental Quality.

State Uses or uses of State Concern means those uses which directly and significantly affect coastal waters, and which are in need of coastal management, and which have impacts of greater than local significance or which significantly affect interest of regional, state, or national concern. Uses of state concern include but are not limited to:

1. Any dredge of fill activity, which intersects with more than one water body.
2. Projects involving use of state owned lands or water bottoms.
3. State publicly funded projects.
4. National interest projects.
5. Projects occurring in more than one parish.
6. All mineral activities, including exploration for and production of oil, gas, and other minerals, all dredge and fill associated therewith, and all other associated uses.
7. All pipelines for the gathering, transportation, or transmission of oil, gas, and other minerals.
8. Energy facility siting and development.
9. Uses of local concern, which may significantly affect interests of regional, state, or national concern.

Supplemental material means any of the following or other, unlisted material deemed appropriate by the local administrator:

1. A description of the physical, chemical, hydrological, biological and cultural environment in which the activity is proposed to take place;
2. A list of alternatives to the proposed activity including a status quo alternative;
3. A complete description of expected consequences to the physical, chemical, hydrological, biological and cultural environment;
4. How any such impacts will be mitigated or offset including when these environmental benefits will be achieved, evidence to support the proposal's intended results and how the projected results, both positive and negative, may be monitored in the future.

Surface Alterations means those uses and activities which change the surface or usability of a land area or water bottom. Examples include fill deposition, land reclamation, beach nourishment, dredging (primarily areal), clearing, draining, surface mining, construction and operation of transportation, mineral, energy and industrial facilities, and industrial, commercial, and urban developments.

Third Party Right of Enforcement as defined at R.S. 9:1272.(3), means a right provided in a conservation servitude to enforce any of the terms granted to a governmental body, charitable corporation, charitable association, or charitable trust, which, although eligible to be a holder, is not a holder.

Toxic Substances means those substances which, by their chemical, biological or radioactive properties, have the potential to endanger human health or other living organisms or ecosystems, by means of acute or chronic adverse effects, including poisoning, mutagenic, teratogenic, or carcinogenic effect.

Unavoidable Net Loss of Ecological Values means the net loss of ecological value that is anticipated to occur as the result of a permitted/authorized activity, despite all efforts, required by the guidelines, to avoid, minimize, and restore the permitted/authorized impacts.

Uplands land that is five feet or more above sea level, fastlands, or all lands outside the coastal zone.

Use means any use or activity within the coastal zone which has a direct and significant impact on coastal waters.

Waste means any material for which no use or reuse is intended and which is to be discarded.

Waste Disposal means those uses and activities which involve the collections, storage and discarding or disposing of any solid or liquid material. Examples include littering; landfill; open dumping; incineration; industrial waste treatment facilities; sewage treatment; storage in pits, ponds, or lagoons; ocean dumping and subsurface disposal.

Water or Marsh Management Plan a systematic development and control plan to improve and increase biological productivity, or to minimize land loss, saltwater intrusion, erosion or other such environmental problems, or to enhance recreation.

Wetland means land that:

1. Has a predominance of hydric soil;
2. Is inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support a prevalence of hydrophytic vegetation typically adapted for life in saturated soil conditions; and
3. Under normal circumstances, does support a prevalence of that vegetation.

Wetland functions means a service that wetlands perform, including flood water storage, flood water conveyance, ground water discharge, erosion control, wave attenuation, water quality protection, scenic and aesthetic use, food chain support, and habitat for fish, wildlife, invertebrates, and plants, among others.

APPENDIX B: ST. JOHN THE BAPTIST COASTAL ZONE MANAGEMENT IMPLEMENTATION ORDINANCE

ST. JOHN THE BAPTIST PARISH COUNCIL
STATE OF LOUISIANA

ORDINANCE
16-

Parish President Robottom introduced the following ordinance. _____ proposes and _____ seconds the following ordinance:

An ordinance amending the text of Chapter 109 – Natural Resource and Environmental Preservation and Protection, Article II. – Coastal Zone Management with the intent of the adoption of the St. John the Baptist Parish Coastal Management Plan (CMP) and the establishment of a local coastal management program in accordance with The Coastal Zone Management Act of 1972 (CZMA) and The Louisiana State and Local Coastal Resources Management Act of 1978 (SLCRMA) as amended and in accordance with Louisiana Revised Statutes 49:214.21-214.42 and the Louisiana Administrative Code, Title 43, Natural Resources, Part I, Office of the Secretary, Subpart 1, Chapter 7, Coastal Management (Parishwide).

WHEREAS, the development and implementation of an approved local coastal management program will allow St. John the Baptist to take a more active role in coastal protection and restoration efforts; and

WHEREAS, efforts to balance growth with the conservation of natural resources and enhance coastal protection and restoration are critical to promoting the health, safety, and welfare of residents and business-owners in St. John the Baptist; and

WHEREAS, the St. John the Baptist Parish Coastal Zone Advisory Committee was established by ordinance in 1982, was reorganized in 2015, and began meeting in July 2015, at which point the committee reviewed and proposed amendments to the draft St. John the Baptist Parish Coastal Management Plan (CMP}; and

WHEREAS, the public was invited to participate and was engaged throughout the development of the Program Document (the Plan); and

WHEREAS, the Local Coastal Program Ordinance is a part of the Local Coastal Plan and—if adopted-- will be presented to the Louisiana Department of Natural Resources and U.S. Department of Commerce's National Oceanic Atmospheric Administration for their approval, which would formally create the program in St. John the Baptist Parish; and

WHEREAS, the Local Coastal Program Ordinance was presented to the Coastal Zone Advisory Committee on December 7, 2016, as a part of the CMP document and is hereby forwarded to the St. John the Baptist Parish Council with a recommendation to be approved as amended. Now, therefore,

THE ST. JOHN THE BAPTIST PARISH COUNCIL HEREBY ORDAINS:

SECTION I. That the St. John the Baptist Parish Council does hereby adopt the St. John the Baptist Parish Coastal Management Plan (CMP), subject to final approval and acceptance by the Louisiana Department of Natural Resources and U.S. Department of Commerce's National Oceanic Atmospheric Administration in accordance with The Coastal Zone Management Act of 1972 (CZMA) and The Louisiana State and Local Coastal Resources Management Act of 1978 (SLCRMA) as amended and in accordance with Louisiana Revised Statutes 49:214.21-214.42 and the Louisiana Administrative Code, Title 43, Natural Resources, Part I, Office of the Secretary, Subpart 1, Chapter 7, Coastal Management. The St. John the Baptist Parish Coastal Management Plan shall be kept on file by the St. John the Baptist Parish Department of Planning and Zoning.

SECTION II. That Chapter 109, Article II. - Coastal Zone Management be revoked in its entirety and replaced, in accordance with The Coastal Zone

Management Act of 1972 (CZMA) and The Louisiana State and Local Coastal Resources Management Act of 1978 (SLCRMA) as amended and in accordance with Louisiana Revised Statutes and the Louisiana Administrative Code, as follows:

Article II. Coastal Zone Management.

DIVISON 1. – Generally.

Section 109-20. – Purposes and construction.

This Article is hereby enacted for the purpose of:

(a) Recognizing the value in natural coastal ecosystems.
  (1) Protect, restore and enhance the coastal zone as a natural storm barrier, flood control system, and water infiltration system;
  (2) Protect, restore and enhance the coastal zone as a habitat for wildlife, an aquatic resource, an aesthetic resource, a parish, state and national resource, and a historic cultural resource;
  (3) Protect, restore and enhance the coastal zone as a legacy to future generations.

(b) Recognizing the value in coastal-dependent commercial activity.
  (1) Promote coordinated development within the coastal zone.
  (2) Promote conflict resolution arising from multiple, competing uses.
  (3) Promote recreational uses (respect private property) and monitor public access within the coastal zone.

(c) Balancing these values in the parish to allow current and future residents the opportunity to enjoy the multiple benefits and cultural values associated with a healthy coastal zone.

(d) Fostering the public safety, health and welfare of parish residents.

(e) In the event that Sections of this Article may be subject to multiple interpretations, they must be read to further the purposes stated above and to be consistent with the state coastal resources program.

(f) All exceptions shall be construed narrowly.

(g) This Article applies to all local uses defined in R.S. 49:214.25A (2).

(h) Should any provision herein be deemed contrary to law, it shall be severed from the remainder and shall not affect other provisions that may remain applicable, irrespective of the invalid provision.

(i) This Article shall be read and construed as a whole and in accordance with this Chapter.

Section 109-21.—Definitions.

The following words, terms and phrases, when used in this Article, shall have the meanings ascribed to them in this Section, except where the context clearly indicates a different meaning:

Act means the State and Local Coastal Resource Management Act of 1978, Act 361 of 1978 as amended (SLCRMA) La. R.S. 49:214.21 et seq.

Administrator (See also *State Administrator*) means the administrator of the Office of Coastal Management within the Louisiana Department of Natural Resources.

After-the-fact permit means a coastal use permit issued after the commencement of an activity or use.

Aggrieved Party means any person who receives a decision adverse to their interests or proposed objectives.

Agricultural, forestry and aquaculture activities means those activities:
  (1) That are common practice and incidental to agriculture, forestry and aquaculture, provided that the activity is one of an on-going basis for a period of at least ten years, including the year previous to the activity in question;
  (2) That do not require a permit from the U.S. Army Corps of Engineers; and
  (3) That do not result in a new or changed use of the land. Examples include seeding, fence building and harvesting.

Alternative access means methods of gaining access, ingress and egress, other than by the dredging of canals into the wetlands for drilling, servicing, work over, or any other production of minerals activity.

Alternative access vehicle means any hover craft, helicopter, air cushion vehicle, or any other vehicle which does not require dredging.

Applicant means the owner of the property for which a use requiring a Coastal Use Permit is requested, an agent, or someone specifically authorized in writing by the owner to make an application.

Buffer zone means a strip of land adjoining a wetland mitigation site to protect the wetland habitat and wildlife within the bank from the impact of an activity outside the buffer zone. The term includes a strip of land composed primarily of water or a strip of land that includes a fence, wall, or screen of vegetation when these visual barriers also provide functional protection for the wetland.

Camp means a structure built and used for non-commercial and non-profit purposes and commonly referred to as single family. It does not include multiple family dwellings and shall apply only to such structure built singly, by and for the owner of the land for the owner's use and not to practices involving the building of more than one such structure as in subdividing, tract development, speculative building, or recreational community development and intended for periodic occupancy.

Closely-related actions means those actions that:

(1) Automatically trigger other actions which may require permits;
(2) Cannot proceed unless other actions are taken previously or simultaneously; or
(3) Are interdependent parts of a larger action and depend upon the larger action for their justification.

Coastal Use Permit (CUP), or permit means those permits required by La R.S. 49:214.30. The term does not mean or refer to, and is in addition to, any other permit or approval required or established pursuant to any other constitutional provision or statute.

Coastal waters means bays, lakes, inlets, estuaries, rivers, bayous and other bodies of water within the boundaries of the coastal zone.

Coastal zone means the area described in La. R.S. 49:214.24. The entire geographic extent of St. John the Baptist Parish is in the coastal zone.

Coastal Zone Management Act the definition is the same as for "Act" above.

Coastal Zone Management Program means the applicable laws, regulations, policies and guidelines developed by federal, state, and local government to implement the Coastal Zone Management Act.

Compensatory mitigation means replacement, substitution, enhancement, or protection of ecological values to offset anticipated losses of those values caused by a permitted activity.

Conservation plan means the Louisiana Coastal Wetlands Conservation Plan which details the comprehensive effort of the state to offset losses of wetlands from development activity.

Continuing uses are activities which by nature are carried out on an uninterrupted basis; examples include shell dredging and surface mining, activities, projects involving maintenance dredging of existing waterways, and maintenance and repair of existing levees.

Council means the St. John the Baptist Parish Council, the authority of general jurisdiction and operation at the parish level.

Cumulative impacts means the influence on the environment resulting from the incremental effects of the activity when added to other past, present, and reasonably foreseeable future activities regardless of what agency or person undertakes those activities. Cumulative impacts may result from individually minor but collectively significant activity taking place over a period of time. Secondary impacts caused or enabled by a

particular project are considered cumulative; including, but not limited to, increased development in an area where new sewers, roads, and other infrastructure have been built whether plans exist for this area at the time the infrastructure is built or not. Cumulative impacts to coastal zone resources may result from activity outside the coastal zone or from activity exempt under coastal zone permitting.

CZM Administrator (See also *Local Administrator*) means the parish professional charged with implementing and administering this Article and the local coastal zone management plan.

Department or DNR means the Louisiana Department of Natural Resources.

Direct and significant impact means an impact that alters the physical, hydrological, chemical, or biological characteristics of coastal waters as a result of an action or series of actions undertaken by man.

Ecological value means the ability of an area to support vegetation and fish and wildlife populations.

Emergency means a situation that poses an immediate threat to public safety, life, health or property and action in response to the threat cannot await the permitting process. Declaration of an emergency must come from a governmental body with authority to make such declarations and continues for the time that body specifies.

Environmental Management Unit or EMU means an area with certain distinguishing physical, hydrological, chemical, biological or cultural characteristics.

Exempted use shall mean any use specifically listed in this Chapter as not requiring a permit.

Fastlands means lands surrounded by publicly owned, maintained, or otherwise validly existing levees, or natural formations, as of January 1, 1979, or as may be lawfully constructed in the future, which levees or natural formations would normally prevent activities, not to include the pumping of water for drainage purposes, within the surrounded area from having direct and significant impacts on coastal waters.

Guidelines means Louisiana Administrative Code (L.A.C.) Title 43, Chapter 7 entitled "Coastal Management" adopted pursuant to 214.27 of the Act.

Habitat means the natural environment where a plant or animal population lives.

In-kind mitigation means providing goods, services, or funds in an amount valued equally to the fair market value of creating a mitigation site; e.g. similar in concept to barter trade.

Interested person means any of the following:

(1) Any applicant, an agent or an employee of the applicant, or a person receiving consideration for representing the applicant, or a participant in a proceeding on the matter.

(2) Any person with a financial interest in a matter before the appeals panel, or an agent or employee of the person with a financial interest, or a person representing the person with a financial interest.

(3) A representative acting on behalf of any civic, environmental, neighborhood, business, labor, trade, or similar organization who intends to influence the decision of the appeals panel on a matter before the appeals panel.

Levee means an embankment to control or prevent movement of water or other material

Local Administrator (See also *CZM Administrator*).

Local Coastal Advisory Committee or Committee means the St. John the Baptist Parish Coastal Zone Management Advisory Committee.

Louisiana Coastal Resources Program (LCRP) means the compendium of laws, regulations and enforceable policies that comprise the State's Coastal Management Program.

Local government means the St. John the Baptist Parish Council.

Local uses or uses of local concern means those uses which directly and significantly affect coastal waters and are in need of coastal management but are not uses of state concern and which should be regulated primarily at the local level if the local government has an approved program. Uses of local concern include, but are not limited to:

(1) Privately funded projects, which are not uses of state concern.
(2) Publicly funded projects, which are not uses of state concern.
(3) Maintenance of uses of local concern.
(4) Jetties or breakwaters.
(5) Dredge or fill projects not intersecting more than one water body.
(6) Bulkheads.
(7) Piers.
(8) Camps and cattlewalks.
(9) Maintenance dredging.
(10) Private water control structures of less than $15,000 in cost.
(11) Uses of cheniers, salt domes, or similar landforms.

Mitigation means all actions taken by a permittee to avoid, minimize, restore and compensate for loss of an area's ability to support vegetation, fish and wildlife populations due to a permitted activity.

Mitigation bank means a parcel of land that has undergone or is proposed to undergo a physical change necessary to enhance, restore or create wetland habitat on the parcel expressly to offset an adverse impact to another wetland caused by an approved or future projects. Timing distinguishes a bank from off-site mitigation. Off-site mitigation is usually created concurrent with or subsequent to the project rather than before a project. Mitigation credits, as valued under L.A.C. title 43, part I, section 724E.1.b. et al. and defined in this section, may be donated, sold, traded, or otherwise used for the purpose of compensating for ecological values lost due to a permitted activity.

Mitigation credit means a unit of measured area that supports wetland habitat, wetland habitat value, and wetland function that did not exist at the mitigation bank site before the bank was developed. Credits are determined in accordance with L.A.C. title 43, part I, section 724.

Navigational aids means buoys, marker piles, dolphins, piling, and/or pile clusters when in conformance with U.S. Coast Guard standards and do not involve dredge and fill activity.

Non-continuing uses are activities which by nature are done on a one-time basis; examples include dredging access canals for oil and gas well drilling, implementing an approved land use alteration plan and constructing new port or marina facilities.

Noncompliance means the subject violation is of a minor nature or can be remedied without significant hardship.

Normal maintenance and repair means activity taken to reasonably preserve the utility of a lawfully existing structure in active use for the year preceding the proposed activity. It does not include expanding an existing structure, dredging and filling, or altering the magnitude or function of the original structure.

On-site mitigation means all measures that may be taken to offset or eliminate damage or destruction to the functional characteristics and processes of a wetland, changing the operational characteristics of the proposed activity, or creating or enhancing wetland functions or values at the project site.

Out-of-kind mitigation means the creation of habitat functions and types at the mitigation site substantially different from those that existed at the project site; restoration of a bottomland hardwood site as mitigation for a project in a salt marsh is one example.

Overriding public interest means that the public interest benefits of a given activity clearly outweigh the public interest benefits of compensating for wetland values lost as a result of the activity, as in the case of the construction of flood protection facilities critical for protection of existing infrastructure.

Parish coastal administrator means the Director of the St. John the Baptist Parish Department of Code Enforcement/Planning and Zoning or his/her duly authorized representative.

Parish Council means the legislative authority of general jurisdiction at the parish level.

Particular areas means areas within the coastal zone of a parish with an approved local program which have unique and valuable characteristics requiring special management procedures. Such areas shall be identified, designated, and managed by the local government following procedures consistent with those for special areas.

Permit (See also *Coastal Use Permit (CUP)*).

Person means any individual, partnership, association, trust, corporation, or government body.

Residence means structures built and used for non-commercial and non-profit purposes. It does not include multiple family dwellings and shall apply only to such structures built singly, by and for the owner of the land for the owner's use and not to practices involving the building of more than one such structure as in subdividing, tract development, speculative building, or recreational community development and intended as a primary residence.

Residents mean both real persons and entities whose occupancy in St. John the Baptist Parish is intended to be of an on-going, primary nature. These include, but are not limited to, civic, environmental, neighborhood, business, labor, trade, or similar organizations or a legally recognized business entity.

Same-kind mitigation means the creation of habitat functions and types at the mitigation site substantially similar to those that existed at the project site; restoration of a bottomland hardwood site as mitigation for a project in a bottomland hardwood site is one example.

Secretary means the Secretary of the Department of Natural Resources or his/her designee.

Significant noncompliance means the subject violation poses an imminent threat to the public welfare, is egregious in nature, or results from action by a person that has been in violation of this Article within the preceding two years from the date the violation is documented by the Parish or the State.

Special areas means those portions of the coastal zone within St. John the Baptist Parish that require special management procedures due to certain unique and valuable characteristics. Examples include barrier islands, shell deposits, salt domes, archaeological sites, transportation corridors, endangered species habitat, ports, and recreational sites among others. The Parish may request this designation by the State of Louisiana.

State Administrator (See also *Administrator*).

State uses or uses of State concern means those uses which directly and significantly affect coastal waters, and which are in need of coastal management, and which have impacts of greater than local significance

or which significantly affect interest of regional, state, or national concern. Uses of state concern include, but are not limited to:

(1) Any dredge or fill activity, which intersects with more than one water body.
(2) Projects involving use of state owned lands or water bottoms.
(3) State publicly funded projects.
(4) National interest projects.
(5) Projects occurring in more than one parish.
(6) All mineral activities, including exploration for and production of oil, gas, and other minerals, all dredge and fill associated therewith, and all other associated uses.
(7) All pipelines for the gathering, transportation, or transmission of oil, gas, and other minerals.
(8) Energy facility siting and development.
(9) Uses of local concern, which may significantly affect interests of regional, state, or national concern.

Supplemental material means any material deemed appropriate by the local administrator:

Uplands mean land that is five feet or more above sea level.

Use means any activity within the coastal zone which has a direct and significant impact on coastal waters.

Wetland means

(1) for the purpose of this Ordinance except for Section 724 of SLCRMA open water areas or areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances, do support a prevalence of vegetation typically adapted for life in saturated soil conditions;
(2) for the purpose of Section 724 (as defined in R.S. 49:214.41), an open water area or an area that is inundated or saturated by surface or ground water at a frequency and duration to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions, but specifically excluding fastlands and lands more than 5 feet above sea level which occur in the designated coastal zone of the state. Wetlands generally include swamps, marshes, bogs, and similar areas.

Wetland functions means a service that wetlands perform, including flood water storage, flood water conveyance, ground water discharge, erosion control, wave attenuation, water quality protection, scenic and aesthetic use, food chain support, and habitat for fish, wildlife, invertebrates, and plants, among others.

Sections 109-22. – 109-29. – Reserved.

DIVISION 2. – Duties and Administration.

Section 109-30.—Local Coastal Zone Management Administrator.

The local Coastal Zone Management (CZM) Administrator shall manage the local coastal zone management program based upon the local coastal management plan, as adopted by the Parish Council and perform the following duties:

(a) Manage the local Coastal Zone Management Program based upon the approved Local Coastal Management Plan (CMP).
(b) Issue, deny or modify CUPs consistent with the coastal zone management plan for Parish.
(c) Advise and guide in the adoption of any rules and regulations that are reasonable and necessary to carry out this Article in conformance with the generally established procedures for Parish rulemaking.
(d) Conduct any investigation necessary to ascertain compliance with this Article.

(e) Act as liaison for Parish to the U.S. Army Corps of Engineers, other parishes, and other state and local governmental entities relative to projects governed by this Article or the Act which are proposed to take place in or impact the coastal zone of Parish.
(f) Review and comment upon uses of state concern, as defined in R.S. 49:214.25A(1).
(g) Determine whether a proposed project has direct and significant impacts and whether a proposed project is a local use.
(h) Maintain and hold open for public inspection records pertaining to this Article and activities governed by this Article.
(i) Regularly update the committee on actions taken by the local administrator and seek their advice on future actions.
(j) Enforce this ordinance/Code Article and the Act.
(k) Request and receive the assistance of other officers and employees of the Parish when necessary to carry out these duties.
(l) Consider written requests from parish residents to add, modify, or delete local rules implementing this Article.

Section 109-31. – Local Coastal Zone Management Advisory Committee.

(a) The Parish Coastal Zone Management Committee shall be composed of nine members. Six of these members shall represent specific interests of the parish community. Three of the members of the committee shall be at large positions representing no specific group or interest. Eight of these members shall be chosen and ratified by the Parish Council from submitted nominations. One of the committee members shall be directly appointed by the Parish President. The Parish President and the Parish Council shall attempt to select members for the Parish Coastal Zone Management Committee so that as great a variety of the geographic and socioeconomic interests of the citizens of the Parish are represented on the committee as possible. The Parish Coastal Zone Management committee shall be composed of the following nine members:
    (1) A member representing the commercial fishing or shrimping industry chosen and ratified by the Parish Council from at least two nominations submitted from the state commercial fisherman's association and/or members of the Parish Council.
    (2) A member representing the recreational fishing industry chosen and ratified by the Parish Council from at least two nominations submitted from the various fishing clubs and/or the Sportsman's League and/or members of the Parish Council.
    (3) A member representing the residential property owners and/or developers of the Parish chosen and ratified by the Parish Council from at least two nominations submitted by the board of realtors and/or members of the Parish Council.
    (4) A member representing the oil industry of the Parish chosen and ratified by the Parish Council from at least two nominations submitted by the Chamber of Commerce and/or members of the Parish Council.
    (5) An at-large member representing the Parish Chamber of Commerce chosen and ratified by the Parish Council from at least two nominations submitted by the Parish Chamber of Commerce.
    (6) An at-large member chosen and ratified by the Parish Council from at least two nominations submitted by members of the Parish Council.
    (7) An at-large member chosen and appointed by the Parish President.
    (8) A member representing flood protection for the Parish chosen by the Parish President and ratified by the Parish Council.
    (9) A member representing economic development for the Parish chosen by the Parish President and ratified by the Parish Council.

(b) If vacancies exist on the Local Coastal Zone Management Advisory Committee, a majority (50 percent or more) of the appointed members shall constitute a quorum.
(c) Committee activities shall be coordinated by the CZM Administrator.
(d) The committee shall review and comment upon any proposed rules and regulations impacting the coastal zone.
(e) The committee shall recommend to the Parish Council any modifications to this ordinance.
(f) The committee may review and comment upon any coastal use permit at the request of the local CZM administrator.
(g) The CZC committee Chair shall serve as the non-voting head of the CAC appeals committee in implementation of the appeals process. The chair shall also select three current members of the CAC committee to serve on the appeals committee. This selection process shall occur each time an appeal is requested and they shall serve through the process of the appeal.
(h) The committee shall assist the CZM Administrator in submitting a regular report describing the activity of parish's coastal zone management program to the DNR secretary as required and make copies available to the public. The report shall include the number, type and characteristics of the CUP applications, decisions, appeals, variances, enforcement actions, and problem areas in the Parish Coastal Zone Management program for the past year and proposed changes in the state or local coastal zone management program.
(i) The committee shall assist in the development of projects and programs that will enhance wetland areas both within the Parish and around the region. When necessary, the committee shall advise the Administration regarding priorities when resources limit the use of resources.

Section 109-32. – Terms and removal of Coastal Zone Management Advisory Committee members.

Members of the Parish Coastal Zone Management Advisory Committee shall be appointed for a two-year term. There shall be no limit on the number of consecutive terms served by Coastal Zone Management Advisory Committee members. Odd-numbered committee members shall be replaced in odd numbered calendar years. Except for its first year, even-numbered committee members shall be replaced in even numbered calendar years. The first even-numbered committee members shall have a three-year term. Any member of the Parish Coastal Zone Management Committee may be removed at any time by a vote of the Parish Council, where at least two-thirds of the Councilmembers vote for removal of the Parish Coastal Zone Management Advisory Committee member.

Sections 109-33. – 109-39. – Reserved.

DIVISION 3. – Coastal Use Permits.

Section 109-40. – Coastal Use Permit applications.

Undertaking a local or state use in the St. John the Baptist Parish coastal zone without a Coastal Use Permit or in violation of permit terms is unlawful. Activities listed under L.A.C. 43:1,723(B) et al. and LA R.S. 49:214.34(A) are exempt from this ordinance, except when that particular activity would have direct and significant impact on coastal waters. These exceptions noted in the revised statutes must be described in a completed permit application to allow a determination of whether they have a direct and significant impact on coastal waters. The following procedure shall be followed in applying for a coastal zone use permit:

(a) All applications shall be made on the forms prescribed by the secretary, available at the Planning and Zoning Department or online at the Louisiana Department of Natural Resources, Office of Coastal Zone Management’s Website.

(b) Applications may be submitted to either the local CZM Administrator or the State Administrator.
(c) Applicable fees are addressed as per Chapter 14-109.
(d) Applications must include material required by L.A.C. title 43, Section 723(C)(2), including, but not limited to, the following:
    (1) Maps showing actual location, size and dimensions of the real property proposed as the use site. Maps must be the latest available (e.g., earth imaging infrared, coast and geodetic survey maps or equivalent);
    (2) Plans showing the exact location, size, and height of the buildings or structures to be developed;
    (3) A list of all applications, approvals and/or denials already made concerning the development by federal, state or local agencies;
    (4) A description of the extent to which any watercourse or natural drainage will be altered or relocated as a result of the proposed coastal use;
    (5) A description of how the projects impacts may be tracked in the future;
    (6) If the development involves dredging, a description of the type, quantity and composition of the dredged material, the method of dredging and disposal;
(e) Applicants may be requested to provide supplemental material upon determination of need by the local CZM Administrator. If after 45 days an applicant should fail to respond to the request for supplemental material, the application will be deemed withdrawn. The local administrator will notify the applicant in writing of the withdrawal and include a copy of the request for supplemental material;
    (1) Processing will be stopped pending receipt of necessary changes or information from the applicant and the processing periods will be interrupted.
    (2) If the applicant fails to respond within 30 days to any request or inquiry of the local CZM Administrator or the State Administrator, the permitting body may advise the applicant that his application will be considered as having been withdrawn unless and until the applicant responds within 15 days of the receipt of the letter requesting changes or information.
    (3) Upon receipt of the required changes or information a new processing period will begin.
(f) Assistance and consultation will be provided to any applicant so requesting;
(g) Separate applications shall be made for each unrelated, single action. Actions that are closely related should be included in a single permit application;
(h) Application fees may be assessed according to a schedule prepared and posted by the local CZM Administrator;
(i) Each application may be required to include an acceptable surety bond of $5,000.00 to ensure adjustment, alteration or removal should the CZM administrator or the committee determine it to be appropriate for compliance with this Article, the guidelines, and the Act.
    (1) If required, the bond shall be returned to the applicant promptly when:
        a. The applicant withdraws the application;
        b. The permit application is denied; or
        c. The completed project has been inspected and determined to be in compliance with the terms of the permit.

(2) After demonstrating repeatedly the good faith compliance with all permit terms and conditions, an applicant may request that the local CZM Administrator waive the bond requirement or reduce the amount.

(j) After following due notice to comply with all permit terms and conditions in the past six months, the local CZM Administrator may enhance the bond requirement or cause the forfeiture of the bond by the owner.

Section 109-41. – Permit review process.

(a) Upon receipt of a complete application packet, the local CZM Administrator shall make an initial review to determine whether the activity fits within the exempted activities or whether the activity would not have a direct and significant impact on the coastal waters.

(b) If the activity is exempt or upon a finding of no impact(s), the local CZM Administrator will forward this information to the OCM for an authoritative concurrence. If the activity is not exempt or upon a finding that direct and significant impacts(s) will result from the proposed activity, the CZM Administrator shall assign it a number, acknowledge receipt, and ascertain whether the application is for a state or local use in accordance with R.S. 49:214.25 et. al.

(c) Application processing will begin when an application that is apparently complete is accepted by the local CZM Administrator or the State Administrator. When received by the local CZM Administrator, the local CZM Administrator shall assign it a number, acknowledge its receipt and make an initial determination of whether the proposed activity is a state or local concern in accordance with La R.S. 49;214.25(A). Copies of all applications submitted to St. John the Baptist Parish CZM Administrator along with the local CZM Administrator's initial determination shall be submitted to the Secretary within two days of receipt for an authoritative determination.

(d) When it is determined to be a local use/concern:

(1) Upon the determination that a permit application is a local concern by the State Administrator, the local CZM Administrator shall make public notice of the pending local use application made in accordance with LAC 43:I,723(C)(5).

(2) Notice of a pending application shall include the permit number, the location of the proposed activity, and information allowing members of the public to comment on the proposal for 25 days.

(3) Before expiration of the applicable public comment period, the local CZM Administrator shall:

a. Forward copies of the local concern application to the local Coastal Zone Committee and appropriate parish officials.

b. Solicit comment(s) from the Coastal Zone Committee, appropriate parish officials, and–as appropriate–other agencies with expertise.

c. Make a determination regarding the appropriateness of calling a public hearing on the proposed local use based on the same requirements noted for state concerns or at the request of the applicant or a majority of the coastal advisory committee. To be considered, the request must be received within 25 days of the official journal publication. A decision to call a public hearing shall interrupt the timeline for deciding the appropriateness of issuing or denying the permit application; however, the hearing shall be scheduled in a prudent manner. Any documents, studies or other data in the applicant's possession relevant to the proposed use must be made available to the public for review, study, and duplication at least five days prior to the hearing. As additional materials are

developed, they must also be made available. When appropriate, the local CZM Administrator shall hold a public hearing in accordance with the St. John the Baptist Parish's procedures governing public hearing. After expiration of the applicable public comment period, the local CZM Administrator shall take one of the following actions:

1. Consider and address in writing each comment received on the application in the final permit decision.
2. Include a short, plain statement explaining the basis for decision on each final permit decision.
3. Either:
    i. Issue the local use permit, based on this Article, the guidelines and the Act; or
    ii. Issue the local use permit with conditions, based on the parish coastal zone management plan, the guidelines and the Act.

b. Send a draft permit to the applicant for acceptance and signature or send notice of denial to the applicant within 30 days of the giving of public notice or within 15 days after the closing of the record of a public hearing, if held, whichever is later and in accordance with LAC 43:I.723(C)(8); or

c. Deny the local use permit, based upon the parish coastal zone management plan, the guidelines, and the Act.

(e) When it is determined to be a state use/concern:

(1) Upon the determination that a permit application is a use of state concern, the local administrator shall review the proposed activity for consistency with their program guidelines and with the goals, objectives and policies developed for the environmental management units(s) in which the proposed activity would take place. Based on this review the local administrator shall:

a. Forward copies of the state concern application to appropriate Parish officials;

b. Solicit comments from the local program committee and Parish officials;

c. Request a public hearing when there is significant public opposition to a proposed use, or when there have been requests from legislators or local governments or other local authorities, or in controversial cases involving significant economic, social, or environmental issues;

d. Follow the guidelines for public hearing for a local concern and then after expiration of the applicable public comment period, the local CZM Administrator shall take one of the following actions:

1. Comment upon a state use application.
2. Solicit comment upon a state use application from the committee.

e. The local CZM Administrator may submit comments to the State Administrator regarding the application within 25 days from the date of the official journal publication of the notice.

(2) Note: General permits have a shorter window of review time and the local administrator should forward comments in accordance with the general permit timelines.

(d) Any person may obtain a copy of the permit application and supporting documents by making a request to Parish Planning and Zoning Department and providing reasonable costs of copying, postage, and handling.

(e) Terms and acceptance of permits.

(1) *Term of issued permits*. A CUP shall remain valid for two years after the date of issuance. Should a project proponent desire more time, they may seek to either:
   a. Have the permit renewed based on a demonstration that diligent efforts have been made to complete the project within the allotted time but that events beyond the proponent control delayed completion; or
   b. Have the permit issued for a longer period up to three years based upon conclusive evidence demonstrating that the use will extend beyond a year under ordinary circumstances. After three years, a new permit application must be made.

(2) The local CZM Administrator has discretion to grant an applicant more time under either of the circumstances in subsection 6.6.1. of this Section.

(3) By accepting the permit, the applicant agrees to the following:
   a. To act in accordance with the plans and specifications as contained in the approved application;
   b. To comply with permit conditions imposed to ensure compliance with this Article;
   c. To adjust, alter or remove any structure or physical alteration if the local CZM Administrator and a majority of the committee determine such action is necessary to achieve compliance with this Article;
   d. To provide an acceptable surety bond, in an appropriate amount as posted by the CZM Administrator, to ensure adjustment, alteration, or removal should the applicant fail to take such action when requested;
   e. To hold the State, the Parish and all officers and employees thereof harmless from any injury to persons or property resulting from actions undertaken to carry out the permit;
   f. To certify that the permitted activity has been completed in accord with permit or, upon request of the local administrator, provide certification from a licensed professional to that effect;
   g. To allow reasonable inspection of the project for purposes of monitoring and compliance inspections.

Section 109-42. – "After-the-fact" permits.

(a) A CUP may be issued as an "after-the-fact" permit under one of the following circumstances:
   (1) The activity taken was undertaken in response to an emergency and the parish official was notified of the activity;
   (2) The activity taken was in violation of this Article but would likely have been permitted if the applicant had applied for a permit;
   (3) The activity taken was in violation of this Article but would likely have been permitted if the applicant had accurately described the project as completed in the application materials.

(b) An "after-the-fact" permit may be limited in duration at the discretion of the local administrator, but shall not exceed the time allocated for issuance of similar CUPs obtained through the normal process.

(c) An "after-the-fact" permit requested within 15 days of the activity subject to permitting, will proceed as any other application.

(d) When an "after-the-fact" permit is issued as part of an enforcement action, additional terms and conditions may be included at the discretion of the local administrator or committee as consideration of circumstances unique to the particular applicant, including, but not limited to fines, posting of larger bonds to assure compliance and reporting requirements to monitor the project. Increased mitigation

requirements may be required on- or off-site over normal permit requirements.

(e) An applicant for an "after-the-fact" permit may be required to fulfill conditions in the permit despite completion of the activity or return the area to its pre-emergency state if the application is denied.

(f) For purposes of this Article, an "after-the-fact" permit shall be treated as any other permit, if issued.

Section 109-43. – Mitigation.

(a) Applicability; requirements.

(1) Provisions on mitigation shall be read and construed as a whole and in accordance with applicable State regulations, L.A.C. Title 43, Part I, Chapter 7, Section 724, which designate the secretary of the Louisiana Department of Natural Resources (LDNR) as the authority responsible for all decisions respecting mitigation.

a. In accordance with R.S. 49:214.41(C), compensatory mitigation is not required in a CUP for an activity that does not have direct and significant coastal zone impacts:

1. In a wetland existing in a fastland;
2. In a wetland more than five feet above mean sea level; or
3. When an applicant has satisfactorily demonstrated to the secretary that the required mitigation would render impracticable an activity proposed to be permitted and that such activity serves a clearly overriding public interest, and the provisions of R.S. 49:214.41(C) are met.

b. Projects exempt from the compensatory mitigation requirements may still be required to include other forms of mitigation or to mitigate for other types of impacts under regulations promulgated in accordance with R.S. 49:214.41, such as L.A.C. Title 43, Section 724(B)(1)(a) and (b).

(2) The local CZM Administrator shall implement mitigation activities in accordance with the directives of Louisiana's Coastal Resources Program (LCRP).

(3) *Actions of the local administrator respecting mitigation*. Actions by the local administrator respecting wetlands mitigation may include the following:

a. Authorizing or making a continuing study of wetland areas and wetland mitigation programs;

b. Consulting with, providing information to, and entering into an agreement with a federal agency, state agency, or private entity to identify and publish information about wetland areas; and

c. Cooperating with a federal or state agency in connection with a study or investigation regarding the adequacy of a local measure with respect to a federal or state wetland program.

Section 109-44. - Appeals.

(a) Any person adversely affected by a permit decision, any landowner in, or resident of Parish and any government authority may request an administrative appeal of the local CZM Administrator's decision by filing a written notice to the local CZM appeals panel within 15 days from the date the decision was issued. The party requesting any appeal shall provide:

(1) A copy of the notice to all parties of record and to the local CZM Administrator by the party requesting any appeal.

(2) A copy of the permit decision being appealed and a copy of the permit application.

(b) Notice of appeal shall:
    (1) Identify how the permit decision of the local CZM Administrator is contrary to law and any issues providing grounds for appeal;
    (2) State sufficient facts regarding the proposed project to allow adequate analysis of whether or not the local administrator's decision was supported by fact;
    (3) Include the name, address, and phone number of the party requesting review and, if applicable, the party's legal representative;
    (4) Provide a short statement indicating how the party requesting the appeal would like the appeals panel to remedy the situation;
    (5) Include a statement that the party requesting an appeal has read the notice and believes the contents to be true, followed by the party's signature and that of the party's representative, if any;
    (6) Not include new information unaddressed during the application process, except allegations of any of the following:
        a. New evidence pertinent to the key issues upon which the permit decision was based that may not have been discovered before or during the application review process by using due diligence;
        b. Fraud, as defined by state law, or corruption in the application process; or
        c. Other good grounds for further consideration in the public interest. The term "good grounds" includes, but is not limited to a failure to consider pertinent issues or facts in the initial review process.

(c) Upon receipt of a completed appeals packet, containing proper notice as defined above, a copy of the decision and a copy of the application, the local CZM Administrator shall notify the appellant of its receipt by mail.

(d) A public appeal may be held upon the request of ten or more residents of the Parish or any parish in which impacts of the project may be realized or a combination thereof.
    (1) The request for public appeal must be made in writing to the local CZM Administrator:
        a. Within ten days of the notice for administrative appeal or within ten days of the local administrator's decision; and
        b. Contain the names, signatures, address of legal residence, and phone numbers of each resident requesting a public appeal and of their legal representative, if any.
    (2) The public appeal shall replace the form of the administrative appeal described in this Article, when properly requested. All provisions applicable to the administrative appeal shall be equally applicable to the public appeal unless clearly contradictory, impossible, or specifically expected.

(e) The local CZM administrator shall schedule an administrative appeal or public appeal within ten days of receiving a completed administrative appeals packet or proper request for a public appeal.
    (1) The local CZM Administrator shall promptly send each party of record the date, time, and location of the administrative appeal by registered mail.
    (2) The local CZM Administrator shall publish the date, time and location of any public appeal in a newspaper of general circulation in the Parish of the proposed site for the project at issue.
    (3) The local CZM Administrator shall require the applicant to post notification of the upcoming appeal on the proposed site of the activity at issue.

(f) Interested parties may appear personally or be represented by counsel at the public appeal to produce any competent evidence on their behalf.

(g) The panel may administer oaths, examine witnesses, and issue notices of hearings or subpoenas requiring the testimony of witnesses and production of books, records or other relevant documents.
  (1) The appeals panel may admit and give probative effect to evidence that possesses probative value commonly accepted by reasonably prudent men in the conduct of their affairs. The appeals panel may exclude evidence they find incompetent, irrelevant, immaterial or unduly repetitive.
  (2) The appeals panel shall give effect to the rules of privilege recognized by law.
  (3) Objections may be made and considered, and shall be noted in the record.
  (4) The appeals panel may take notice of judicially cognizable facts, as requested by interested parties. Such facts include, but are not limited to, recognized technical or scientific facts.
  (5) Depositions may be taken in accordance with provisions governing the taking of depositions for civil court proceedings and admitted in the public appeal or administrative appeal.
  (6) Discovery may occur in accordance with provisions governing discovery for civil court proceedings in the district court of the Parish.

(h) A verbatim transcript of testimony at the public appeal shall be prepared and, in addition to exhibits and documents introduced, shall constitute the record.

(i) The appeals panel shall make findings of fact and a decision based upon the record when a public appeal is held. When an administrative appeal is held, the findings of fact and decision shall be based upon the following:
  (1) Written submissions from interested parties prepared for purposes of administrative appeal;
  (2) The original permit application and associated documentation; and
  (3) Any legislative facts (such as scientific studies) or documented communications the panel deems trenchant relative to material issues in the permit.

(j) The appeals panel shall issue a written decision of a length and depth to enable a court to evaluate the rationale and fundamental facts underlying the decision. A copy of the appeals panel's decision shall be provided to each of the interested parties by the local administrator.

(k) The appeals panel hearing appeals of permit decisions on applications for a CUP in parish shall be composed of three, unbiased members as follows:
  (1) The Parish Council shall appoint three local representatives to an ad hoc hearing panel.
  (2) The Parish Council shall appoint a local representative from the committee to serve as an appeals officer for purposes of this Section. This representative can be removed only for cause. Local representatives shall be available on a rotating basis to hear administrative appeals and public appeals.
  (3) In addition to definition by pertinent state law, bias may include, but is not limited to interest in the outcome of the appeal, prior commitment, or individual prejudice towards an interested party.
  (4) Each member of the appeals panel has an equal vote and decisions shall be determined by majority rule.
  (5) The three member composition shall be used for both administrative appeals and public appeals.

(l) Members of the appeals panel shall have no outside contact with any interested party regarding a fact in issue without prior notice to the other interested parties.

(m) Members of the appeals panel shall not communicate privately with anyone outside the Department of Natural Resources regarding the merits of the appeal without documenting such communication.
  (1) Documentation shall include:
    a. The date, time, form and location of the communication;
    b. The identity of the persons initiating and receiving the communication; and
    c. A description of the content of the communication.
  (2) Interested parties may review the documentation upon written request to the appeals panel.

(n) No appeals panel member shall make, participate in making, or attempt to use in any other way, the position of appeals panel member to influence a decision about which he has knowingly had communications required to be documented but that were not documented. In addition to any other applicable penalty, an appeals panel member who violates this provision shall be subject to a civil fine and be barred from participation in the current appeal and all future appeal decisions.

(o) Any appeals panel member shall withdraw from any adjudicative proceeding in which he cannot accord a fair and impartial hearing or consideration.
  (1) The Parish President may request the disqualification of an appeals panel member based on the inability of the member to make a fair and impartial decision by filing an affidavit, upon discovery of the alleged grounds for disqualifications. The affidavit shall state with particularity the grounds upon which it is claimed that a fair and impartial hearing cannot be accorded.
  (2) The issue of disqualification shall be heard and determined promptly by the Parish President or a designee.
  (3) Upon the disqualification of a member of the appeals panel, a substitute shall be obtained from the pool of local representatives in accord with the rotation schedule when the disqualified member is a local representative.

(p) The party requesting an appeal bears the burden of presenting a prima facie case, as that standard is determined by state law for civil trails.

(q) The standard for review of the local administrator's decision by the appeals panel is whether the decision on the permit application was supported by substantial evidence, as defined in state law. (See R.S. 49:964.)

(r) Review of the decision of the appeals panel by a competent court shall be provided if the following criteria are met:
  (1) Written request is made;
  (2) The request is filled within 15 days of the appeals panel's final decision in the district court in the Parish of the proposed project location;
  (3) The request is made by any interested party who participated in the process before the appeals panel.

(s) Judicial review of the appeals panel's decision shall be based on the substantial evidence standard, as defined by state law. (See R.S. 49:964.)

(t) Nothing in this provision shall impede other authorized means for review.

(u) The local CZM Administrator may establish a fee system to cover administrative costs associated with implementing the appeals process,

including, but not limited to reasonable charges for copies, postage, and staff time.

(v) Good faith efforts to reach a resolution through mediation or another alternative dispute resolution process recognized by the state shall stop the running of the timeline for filing a request for either an administrative appeal or a public appeal.
  (1) Using an alternative dispute resolution process as a delay tactic constitutes bad faith and may subject that party to a penalty equal to five percent of the cost of the proposed project for each calendar day of delay.
  (2) Any interested party who believes alternative dispute resolution processes are being used in bad faith, as defined above and in state law, may request a determination by the district court in which the proposed project site exists.
    a. The court will determine whether bad faith exists and may issue penalties.
    b. Finding of bad faith by a court begins the running of the time for filing a request for an administrative or a public appeal, among such other consequences defined by state law and that the judge may find appropriate.

(w) Reconsiderations, judicial review.
  (1) A decision or determination shall be subject to reconsideration if a petition for reconsideration is filed in writing with the CZM Administrator within ten days following public notice of a final coastal use permit or receipt of written notice of a determination.
  (2) Any person authorized by the Subpart to appeal a coastal use permit decision or any local government aggrieved by a final decision on approval of a local program may seek judicial review of that decision whether or not a petition for reconsideration has been filed under this Section. A preliminary, procedural, or intermediate action by the secretary or a determination of local or state concern under R.S. 49:214.30(C)(1) or of direct and significant impact under R.S. 49:214.34 is immediately reviewable if review of the secretary's final permit decision or action would not provide an adequate remedy or would inflict irreparable injury.
  (3) Proceedings for review may be instituted by filing a petition in the district court of the Parish in which the proposed use is to be situated within 30 days after mailing of notice of the final decision by the secretary or, if reconsideration is requested, within 30 days after the decision thereon.
  (4) Judicial review shall otherwise be pursuant to the Louisiana Administrative Procedure Act, provided that all such cases be tried with preference and priority. Trial de novo shall be held upon request of any party.

Sections 109-45. – 109-49. – Reserved.

DIVISION 4. – Enforcement

Section 109-50. – Generally.

(a) Enforcement may be initiated in any of three ways:
  (1) Enforcement notice as a result of an investigation or monitoring as a matter of course under R.S. 49:214.36(A);
  (2) Referrals from other agencies; or
  (3) Complaints from individuals or groups.

(b) If within 15 days of receipt by the local administrator of an enforcement notice, referral or complaint upon which no action is taken any person may commence a civil action on his/her own behalf to enforce this Article:

(1) Against any person (including Parish officials in their capacity as government agents and the Parish government) who is alleged to be in violation of this Article or an order issued pursuant to this Article; or
(2) Against the local administrator where there is alleged a failure of the local CZM Administrator to perform any act or duty under this Article which is not discretionary.

(c) Upon a prima facie showing of a violation of this Article, the person shall be granted preliminary equitable relief to restrain any further violation.

(d) Each violation of an individually named condition of a permit or order and each day a violation continues shall constitutes a separate violation. A fine of $2,000.00 per offense per day may be assessed by the Parish Coastal Zone Management Administrator, subject to Coastal Zone Management Committee approval. Such fines will be in addition to fines imposed by other government agencies.

(e) Every effort is made to use the investigation and monitoring to correct deficiencies in site compliance whenever possible.
(1) The inspection shall include a routine check-list, examination of specialized provisions in the permit, photographs, and notes or other documentation developed during the permit process.
(2) Should compliance fail to be achieved or if the inspecting official deems a violation serious enough to warrant enforcement; considering the gravity of the violation and the actor's compliance history; the violation may be deemed either noncompliance or significant noncompliance:
a. In the case of significant noncompliance, a cease and desist order shall be issued promptly by the local CZM Administrator.
b. In the case of noncompliance, a letter of warning shall be issued promptly by the local CZM Administrator.
1. A letter of warning must describe the observations of the inspector, identify the corrective actions that may be taken to come into compliance, provide a date by which the actions must be made, identify the provisions of this Article in violation, and be signed by the inspector.
2. A letter of warning must be sent by certified mail to the permit applicant or record owner of the property when no permit exists.
(3) The inspector shall investigate the response. After examining the timeliness, completeness, documents, and any meetings or interviews necessary, the inspector determines whether or not compliance has been achieved.
(4) When compliance has not been achieved, the local CZM Administrator shall issue a cease and desist order or, when a cease and desist order has been issued previously, undertake proceedings to enforce the cease and desist order.

Section 109-51. – Referrals from other agency officials.

(a) When state or local officials become aware of a possible violation of this Article, they are to contact the local CZM administrator.

(b) After receiving a referral, the local CZM Administrator shall promptly take whatever investigatory actions are necessary in order to ascertain whether or not a violation does in fact exist.

(c) When a violation does not exist, the local administrator informs the agency official who made the referral of such in writing.

(d) If the inspecting official deems a violation serious enough to warrant enforcement considering the gravity of the violation and the actor's compliance history, the violation may be deemed either noncompliance or

significant noncompliance, and the inspecting official must issue notice and process the violation in consistency with Sec. 109-50(e)(2).

(e) The inspector shall investigate the response to any notice of violation. After examining the timeliness, completeness, documents, and any meetings or interviews necessary, the inspector determines whether or not compliance exists.

(f) When compliance does not exist, the local CZM Administrator shall issue a cease and desist order. If a cease and desist order has already been issued, the local administrator may suspend, revoke, or modify a coastal use permit or bring injunctive, declaratory or other actions necessary to enforce the ordinance.

Section 109-52. – Complaints.

(a) All complaints will be directed to a Parish official to determine whether or not a violation exists or make a referral.

(b) If the inspecting official deems a violation serious enough to warrant enforcement; considering the gravity of the violation and the actor's compliance history, the violation may be deemed either noncompliance or significant noncompliance, and the inspecting official must issue notice and process the violation in consistency with Sec. 109-50(e)(2).

(c) The inspector shall investigate the response. After examining the timeliness, completeness, documents, and any meetings or interviews necessary, the inspector determines whether or not compliance exists.

(d) When compliance does not exist, the local administrator shall issue a cease and desist order. If a cease and desist order has already been issued, the local administrator may suspend, revoke, or modify a coastal use permit or bring injunctive, declaratory or other actions necessary to enforce the ordinance.

Section 109-53. – Contents of cease and desist order

(a) In addition to any other information required by Parish or state law, a cease and desist order shall contain the following:

(1) A concise statement of the facts alleged to constitute a violation;

(2) A statement of the amount of the potential penalties for violating the cease and desist order;

(3) A copy of the regulation, permit, order, statute or other legal provision applicable;

(4) Information enabling the recipient to contact the local administrator; and

(5) Information on how the recipient may obtain a hearing to contest the cease and desist order.

(b) A recipient of a cease and desist order may challenge the validity of the order in the parish district court.

Section 109-54. – Conditions for entering property for examination

To perform the duties required under this Article, Parish personnel may enter upon any land and make examinations in accordance with R.S. 49:214.36(A) and SECTION 19-60 et. Seq. provided that:

(a) A warrant is obtained or the examinations do not interfere with the use of the land by its owners or possessors; and

(b) Prior to inspection, the owner or possessor of the land is informed that an inspection is to take place and allowed to accompany the inspector if he so desires.

Section 109-55. – Severability.

That if any provision of this Ordinance shall be held to be invalid, such invalidity shall not affect other provisions herein which can be given effect without the invalid provision and to this end the provisions of this Ordinance are hereby declared to be severable.

Sections 109-56. – 109-59. – Reserved.

DIVISION 5. – Use of Funds.

Section 109-60. – Use of funds collected for violations.

Funds collected for violations in the Parish shall be maintained in a coastal monitoring enforcement fund. These monies, including interest accruing thereon, shall be used by the Parish for the cost of coastal monitoring and similar surveillance and enforcement activities conducted by the Parish.

Section 109-61. – Mitigation trust fund.

(a) A mitigation trust fund has been created as the depository of monies collected in accordance with R.S. 49:214.36(J), which states that 25 percent of the monies collected for violations relating to minimal wetland impacts shall be forwarded to local government whereby 100 percent of the monies received shall be placed in local government mitigation bank and can only be used for mitigation projects. All monies to be spent on mitigation projects will be for coastal restoration projects as approved by the governing authority.

(b) If the coastal parishes do not have a local mitigation bank, the 25 percent of the monies collected are placed into the Wetland Conservation and Restoration Fund (WCRF).

Sections 109-62. – 109-70. – Reserved.

Unless specified, this ordinance becomes effective five (5) days after publication in the Official Journal.

BE IT ORDAINED, that the St. John the Baptist Parish Council is acting as the governing authority for said parish.

The above ordinance having been submitted to a vote; the vote thereon was as follows:

YEAS:

NAYS: **ABSENT:** **ABSTAINING:**

The result of the vote on the ordinance was ___YEAS, ___**NAYS**, ___**ABSENT**, **ABSTAINING**, and this ordinance was declared adopted on the __ day of __, 2016.

_____	_____	_____
COUNCIL CHAIRMAN	SECRETARY	PARISH PRESIDENT
_____	_____	_____
Date signed	Date signed	Date signed

CERTIFIED, to be a true and correct copy of an ordinance adopted by the St. John the Baptist Parish Council on the ____day of _____, 2016.

_____
SECRETARY

APPENDIX C: LDEQ INTEGRATED REPORT

2016
LOUISIANA WATER QUALITY INVENTORY: INTEGRATED REPORT

FULFILLING REQUIREMENTS OF THE FEDERAL CLEAN WATER ACT, SECTIONS 305(b) AND 303(d)

http://www.deq.louisiana.gov/portal/DIVISIONS/WaterPermits/WaterQualityStandardsAssessment/WaterQualityInventorySection305b/2016IntegratedReport.aspx

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF ENVIRONMENTAL SERVICES
WATER PERMITS DIVISION
P.O. BOX 4313
BATON ROUGE, LOUISIANA 70821-4313

Chapter 2: Water Quality Assessment Method and Integrated Report Rationale

Introduction

Statutes and Regulations

The LDEQ prepared reports to meet the requirements outlined in §303(d) and §305(b) of the federal Water Pollution Control Act (United States Code, Title 33, §1251 et seq., 1972) (commonly known as the Clean Water Act) and supporting federal regulations found in Title 40 of the Code of Federal Regulations (CFR), Parts 130.7 and 130.10 (40 CFR 130.7, 130.10). Section 303(d) of the CWA and supporting regulations require each state to identify water quality-limited segments (i.e., Louisiana subsegments that do not meet water quality standards) requiring development of TMDLs and to prioritize the water quality-limited segments for TMDL development. States are required to assemble and evaluate existing and readily available water quality-related data and information to develop the list. Additionally, each state must provide documentation to support listing decisions, including: a description of the method used to develop the list; a description of the data and information used to identify (i.e., list) waters; a rationale for any decision not to use existing and readily available data and information; and other information to demonstrate "good cause" for not including waters on the §303(d) list pursuant to 40 CFR 130.7(b)(6).

Section 305(b) of the CWA and supporting regulations require states to report on the quality of state waters every two years; the biennial reports are due April 1 of even-numbered years. Section 305(b) requires a description of all navigable waters in each state and the extent to which these waters provide for the protection and propagation of fish and wildlife and allow for recreational activities in and on the water.

Guidance

The United States Environmental Protection Agency (USEPA) issues guidance for the assessment, listing, and reporting of states' water quality to meet the requirements of CWA §303(d) (impaired waters list) and §305(b) (water quality inventory) (USEPA various dates). USEPA guidance outlines the compilation and reporting of state water quality in a combined report—the Integrated Report (IR). USEPA's guidance further outlines the use of categories to classify the quality of watersheds in each state. Integrated Report categories are outlined in Table 3.2.1.

Integrated Report Development

The 2016 IR contains new assessments for subsegments in all 12 Louisiana basins: Atchafalaya (01), Barataria (02), Calcasieu (03), Pontchartrain (04), Mermentau (05), Vermilion/Teche (06), Mississippi (07), Ouachita (08), Pearl (09), Red (10), Sabine (11), and Terrebonne (12). Due to the four-year cyclical nature of LDEQ's Ambient Water Quality Network (AWQN) approximately ½ of the assessments for the 2016 IR will be new, while the remaining ½ will be carried forward from the 2014 IR. Data from October 1, 2011 through September 30, 2015 were used for the 2016 IR.

Table 3.2.1.

U.S. Environmental Protection Agency Integrated Report Methodology guidance categories used to categorize water body/impairment combinations for the *Louisiana 2016 Integrated Report*; includes IRC 5RC and IRC 5-Alt developed by LDEQ and approved by U.S. Environmental Protection Agency.

IR Category (IRC)	IR Category Description
IRC 1	*Specific Water body Impairment Combination* (WIC) cited on a *previous* §303(d) list is now attaining all uses and standards. Also used for water bodies fully supporting all designated uses.
IRC 2	Water body is meeting some uses and standards but there is insufficient data and/or information to determine if uses and standards *associated with the specific WIC* cited are being attained.
IRC 3	There is insufficient data and/or information to determine if uses and standards *associated with the specific WIC* cited are being attained.
IRC 4a	WIC exists and a TMDL was completed for the *specific WIC* cited.
IRC 4b	WIC exists and control measures other than a TMDL are expected to result in attainment of designated uses *associated with the specific WIC* cited.
IRC 4c	WIC exists and a pollutant (anthropogenic source) does not cause the *specific WIC* cited.
IRC 5	WIC exists for one or more uses and a TMDL is required for the *specific WIC* cited. **IRC 5 and its subcategories represent Louisiana's §303(d) list.**
IRC 5RC (Revise Criteria)	WIC exists for one or more uses and a TMDL is required for the *specific WIC* cited; however, LDEQ will investigate revising criteria due to the possibility that natural conditions may be the source of the water quality criteria impairments.
IRC 5- Alt (5-Alternative)	WIC exists for one or more uses and a TMDL is required for the *specific WIC* cited; however, LDEQ will implement alternative strategies under its 303(d)/Vision process to ensure the water body will meet water quality standards in the future.

Water Quality Assessment Methods

The following outlines the methods LDEQ used to develop the CWA §303(d) list and water body categorizations found in the 2016 IR. LDEQ used assessment procedures developed and updated over a number of years. Procedures followed USEPA guidance documents for §305(b) reports and §303(d) lists and USEPA's Consolidated Assessment and Listing Methodology (CALM) guidance (USEPA various dates). LDEQ based water quality assessments and §303(d) listings on specific water body subsegments as defined in Louisiana's Surface Water Quality Standards (Louisiana Administrative Code (LAC) 33:IX.1101-1123). Louisiana surface water quality standards define eight designated uses for surface waters: primary contact recreation (PCR), secondary contact recreation (SCR), fish and wildlife propagation (FWP) (with "subcategory" of limited aquatic and wildlife use (LAL)), drinking water supply (DWS), oyster propagation (OYS), agriculture (AGR), and outstanding natural resource waters (ONR). Designated uses have specific suites of ambient water quality parameters used to assess their support. Links between designated uses and water quality parameters, as well as water quality assessment procedures, can be found in Table 3.2.2. Additional details of Louisiana's IR assessment process can be found in Louisiana's Standard Operating Procedures for Production of Water Quality IR (LDEQ 2015b).

Table 3.2.2.

Decision process for evaluating use support, showing measured parameters for each designated use; Louisiana's *2016 Integrated Report.*[1]

Designated Use	Measured Parameter	Support Classification for Measured Parameter		
		Fully Supporting	Partially Supporting[2]	Not Supporting
Primary Contact Recreation (PCR) (Designated swimming months of May-October, only)	Fecal coliform[3]	0-25% do not meet criteria	-	>25% do not meet criteria
	Enterococci[4]	0-10% of single exceedances do not meet criteria; Overall geometric mean ≤ 35 cfu/100 mL	-	>10% of single exceedances do not meet criteria; overall geometric mean > 35 cfu/100 mL
	Temperature	0-30% do not meet criteria	>30-75% do not meet criteria	>75% do not meet criteria
	Metals[5,6,7] and Toxics	<2 exceedances of chronic or acute criteria in most recent consecutive 3-year period, or 1-year period for newly tested waters	-	≥2 exceedances of chronic or acute criteria in most recent consecutive 3-year period, or 1-year period for newly tested waters
Secondary Contact Recreation (SCR) (All months)	Fecal coliform[3]	0-25% do not meet criteria	-	>25 % do not meet criteria
	Metals[5,6,7] and Toxics	<2 exceedances of chronic or acute criteria in most recent consecutive 3-year period, or 1-year period for newly tested waters	-	≥2 exceedances of chronic or acute criteria in most recent consecutive 3-year period, or 1-year period for newly tested waters

Table 3.2.2.

Decision process for evaluating use support, showing measured parameters for each designated use; Louisiana's *2016 Integrated Report.*[1]

Designated Use	Measured Parameter	Support Classification for Measured Parameter		
		Fully Supporting	**Partially Supporting[2]**	**Not Supporting**
Fish and Wildlife Propagation (FWP)	Dissolved oxygen (routine ambient monitoring data)[8]	0-10% do not meet criteria	>10-25% do not meet criteria	>25% do not meet criteria
	Dissolved oxygen (follow-up continuous monitoring data, if needed)[8]	0-10% do not meet criteria	>10-25% do not meet criteria	>25% do not meet criteria
	Temperature, pH, chloride, sulfate, TDS, turbidity	0-30% do not meet criteria	>30-75% do not meet criteria	>75% do not meet criteria
	Metals[5,6,7] and Toxics	<2 exceedances of chronic or acute criteria in most recent consecutive 3-year period, or 1-year period for newly tested waters	-	≥2 exceedances of chronic or acute criteria in most recent consecutive 3-year period, or 1-year period for newly tested waters

Table 3.2.2.

Decision process for evaluating use support, showing measured parameters for each designated use; Louisiana's *2016 Integrated Report.*[1]

Designated Use	Measured Parameter	Support Classification for Measured Parameter		
		Fully Supporting	Partially Supporting[2]	Not Supporting
Drinking Water Source (DWS)	Color	0-30% do not meet criteria	>30-75% do not meet criteria	>75% do not meet criteria
	Fecal coliform[3]	0-30% do not meet criteria	-	>30 % do not meet criteria
	Metals[5,6,7] and Toxics	<2 exceedances of drinking water criteria in most recent consecutive three-year period, or one-year period for newly tested waters	-	≥2 exceedances of drinking water criteria in the most recent consecutive three-year period, or one-year period for newly tested waters
Outstanding Natural Resource Waters (ONR)	Turbidity	0-10% do not meet criteria	>10-25% do not meet criteria	>25% do not meet criteria
Agriculture (AGR)	None	-	-	-
Oyster Propagation (OYS)	Fecal coliform[3]	Median fecal coliform ≤ 14 MPN/100 mL; and ≤ 10% of samples > 43 MPN/100 mL	-	Median fecal coliform > 14 MPN/100 mL; and > 10% of samples > 43 MPN/100 mL
Limited Aquatic and Wildlife (LAL)	Dissolved oxygen[8]	0-10% do not meet criteria	>10-25% do not meet criteria	>25% do not meet criteria

Table 3.2.2.

Decision process for evaluating use support, showing measured parameters for each designated use; Louisiana's *2016 Integrated Report.*[1]

Designated Use	Measured Parameter	Support Classification for Measured Parameter		
		Fully Supporting	Partially Supporting[2]	Not Supporting

Footnotes

1. Where deviations from the decision process described in Table 2 occur, detailed information will be given to account for and justify those deviations. For instance, circumstances that may not be accounted for in the plain electronic analysis of the data will be explored and may be used to either not list the water body or to put the Water body Impairment Combination (WIC) into a different category. Those circumstances will be fully articulated.
2. While the assessment category of "Partially Supporting" is included in the statistical programming, any use support failures will be recorded in the Assessment Database (ADB) as "Not Supporting." This procedure was first adopted for the 2002 §305(b) cycle because "partially supported" uses receive the same TMDL treatment as "not supported" uses.
3. For most water bodies, criteria are as follows: PCR, 400 colonies/100 mL; SCR, 2,000 colonies/100 mL; DWS, 2,000 colonies/100 mL; OYS, 43 colonies/100 mL (see LAC 33:IX.1123).
4. For enterococci, Louisiana Department of Health and Hospitals (LDHH's) single sample criterion for beach monitoring is 130 colony forming units (cfu)/100 mL. For marine waters, the geometric mean criterion over the period of record is 35 cfu/100 mL. LDHH beach data only applies to the LDHH monitored beaches. Refer to page 15 for details.
5. Determination of the application of marine or freshwater metals criteria is made based on LAC 33:IX.1113.C.6.d.
6. Parameters collected quarterly (metals and organics) required a minimum of three samples.
7. Beginning in April 2013, LDEQ resumed ultra-clean metals sampling at selected sites across the state. Sites were selected based on previous Water Quality IR assessments showing impairment for one or more metals. Ultra-clean metals sampling is conducted by the Water Surveys Section under Quality Assurance Project Plan (QAPP)_1031_03 (LDEQ 2015c). The QAPP is available through LDEQ's Electronic Document Management System (EDMS) as document # 9626986. EDMS can be found at: http://www.deq.louisiana.gov/portal/ONLINESERVICES/ElectronicDocumentManagementSystem.aspx.
8. In the event that analysis of routine ambient monitoring data for dissolved oxygen results in partial- or non-support, continuous monitoring (CM) data, where available, was used for follow-up assessment. CM data runs were approximately 48-72 hours in duration. CM data was evaluated as follows: All of the 15-minute interval dissolved oxygen observations from a CM sample run were analyzed to determine if more than 10% of the data points were below minimum criteria. Water bodies that fell below the criteria greater than 10% of the time were reported as IRC 5 and are therefore on the §303(d) list. Water bodies that fell below the criteria less than or equal to 10% of the time were placed in IRC 1, fully supported. If ambient monitoring indicated impairment and CM data was not available for analysis, the water body was placed in IRC 5 until CM data can be collected during the critical season of May 1 through October 31. In some cases, CM data was not collected because it was determined by LDEQ headquarters and regional staff that CM data collection efforts were not warranted due to conditions in the field.

Appendix G:

Louisiana's 2016 Section 303(d) List

May 20, 2016

Description of Codes and Acronyms:

Water Body Types: R = Rivers; L = Lakes; E = Estuaries; W = Wetlands; C = Coastal Waters

Water Body Sizes: R = Miles; L = Acres; E = Square Miles; W = Acres; C = Miles

Designated Use Descriptions:
PCR = Primary Contact Recreation (swimming)
SCR = Secondary Contact Recreation (boating)
FWP = Fish and Wildlife Propagation (fishing)
DWS = Drinking Water Supply
ONR = Outstanding Natural Resource
OYS = Oyster Propagation
AGR = Agriculture
LAL = Limited Aquatic Life and Wildlife

Use Support Codes for Designated Uses:
F = Fully supporting designated use
N = Not supporting designated use
I = Insufficient data to make reliable determination
X = No data

Follow-up Data Comments: CTM Full: Lead = Follow-up ultra-clean metals sampling indicates full support

IR Category for Suspected Causes:
IRC 5 = 303(d) List
IRC 5-Alt = 303(d) List but LDEQ will implement alternative corrective strategies
IRC 5RC = 303(d) List but criteria revisions (Revise Criteria (RC)) are planned
IRC 4a = TMDL completed
IRC 4b = Other corrective actions in place
IRC 3 = Insufficient data to make a reliable determination
IRC 1 = No impairment, fully supporting all uses

Subsegment Numb	Subsegment Description	Body	Size	l Wat	olu	Colum	olur	olu	olu	olu	olu	w-t	d Us	of Impairment	Suspected Cause	Priority	Suspected Sources of Impairment
				PCR	SCR	FWP	DWS	ONR	OYS	AGR	LAL						
WEST BANK																	
LA020101_00	Bayou Verret, Bayou Chevreuil, Bayou Citamon, and Grand Bayou	R	53	N	F	N				F			PCR	Fecal Coliform	IRC 5	L	Sewage Discharges
LA020101_00	Bayou Verret, Bayou Chevreuil, Bayou Citamon, and Grand Bayou	R	53	N	F	N				F			PCR	Fecal Coliform	IRC 5	L	Waterfowl
LA020101_00	Bayou Verret, Bayou Chevreuil, Bayou Citamon, and Grand Bayou	R	53	N	F	N				F			PCR	Fecal Coliform	IRC 5	L	Wildlife Other than Waterfowl
LA020201_00	Bayou Des Allemands-From Lac Des Allemands to old US-90 (Scenic)	R	7	F	F	N		N					FWP	Turbidity	IRC 5RC	L	Infrastructure (New Construction)
LA020201_00	Bayou Des Allemands-From Lac Des Allemands to old US-90 (Scenic)	R	7	F	F	N		N					FWP	Turbidity	IRC 5RC	L	Natural Sources
LA020201_00	Bayou Des Allemands-From Lac Des Allemands to old US-90 (Scenic)	R	7	F	F	N		N					FWP	Turbidity	IRC 5RC	L	Sediment Suspension (Clean Sediment)
LA020201_00	Bayou Des Allemands-From Lac Des Allemands to old US-90 (Scenic)	R	7	F	F	N		N					ONR	Turbidity	IRC 5RC	L	Infrastructure (New Construction)
LA020201_00	Bayou Des Allemands-From Lac Des Allemands to old US-90 (Scenic)	R	7	F	F	N		N					ONR	Turbidity	IRC 5RC	L	Natural Sources
LA020201_00	Bayou Des Allemands-From Lac Des Allemands to old US-90 (Scenic)	R	7	F	F	N		N					ONR	Turbidity	IRC 5RC	L	Sediment Suspension (Clean Sediment)
LA020301_00	Bayou Des Allemands-From US-90 to Lake Salvador (Scenic)	R	14	N	F	N		N					FWP	Turbidity	IRC 5	L	Forced Drainage Pumping
LA020301_00	Bayou Des Allemands-From US-90 to Lake Salvador (Scenic)	R	14	N	F	N		N					FWP	Turbidity	IRC 5	L	Sediment Suspension (Clean Sediment)
LA020301_00	Bayou Des Allemands-From US-90 to Lake Salvador (Scenic)	R	14	N	F	N		N					ONR	Turbidity	IRC 5	L	Forced Drainage Pumping
LA020301_00	Bayou Des Allemands-From US-90 to Lake Salvador (Scenic)	R	14	N	F	N		N					ONR	Turbidity	IRC 5	L	Sediment Suspension (Clean Sediment)
LA020301_00	Bayou Des Allemands-From US-90 to Lake Salvador (Scenic)	R	14	N	F	N		N					PCR	Fecal Coliform	IRC 5	L	On-site Treatment (Septic Systems)
LA020301_00	Bayou Des Allemands-From US-90 to Lake Salvador (Scenic)	R	14	N	F	N		N					PCR	Fecal Coliform	IRC 5	L	Package Plant Discharges
LA020301_00	Bayou Des Allemands-From US-90 to Lake Salvador (Scenic)	R	14	N	F	N		N					PCR	Fecal Coliform	IRC 5	L	Wildlife Other than Waterfowl
EAST BANK																	
LA040401_00	Blind River-From Amite River Diversion Canal to mouth at Lake Maurepas (	R	5	F	F	N		N					FWP	Oxygen, Dissolved	IRC 5-Alt	L	Natural Sources
LA040402_00	Amite River Diversion Canal-From Amite River to Blind River	R	10	F	F	N							FWP	Mercury in Fish Tissue	IRC 5	L	Atmospheric Deposition - Toxics
LA040402_00	Amite River Diversion Canal-From Amite River to Blind River	R	10	F	F	N							FWP	Mercury in Fish Tissue	IRC 5	L	Source Unknown
LA040402_00	Amite River Diversion Canal-From Amite River to Blind River	R	10	F	F	N							FWP	Oxygen, Dissolved	IRC 5	L	Natural Sources
LA040403_00	Blind River-From headwaters to Amite River Diversion Canal (Scenic)	R	20	F	F	N		F					FWP	Oxygen, Dissolved	IRC 5-Alt	L	Natural Sources
LA040602_00	Lake Maurepas	E	91	F	F	N							FWP	Oxygen, Dissolved	IRC 5	L	Source Unknown

BARATARIA BASIN (02)

The Barataria Basin lies in the eastern coastal region of the state. This basin is bounded on the north and east by the lower Mississippi River, on the west by Bayou Lafourche, and on the south by the Gulf of Mexico. The major receiving water body in this basin is Barataria Bay. The Barataria Basin consists largely of wooded lowlands and fresh to brackish marshes, having some saline marsh on the fringes of Barataria Bay. Elevations in this basin range from minus two feet to four feet above sea level.

Maps showing use support for the three most significant designated uses of primary contact recreation (swimming), secondary contact recreation (boating), and fish and wildlife propagation (fishing) are on the following three pages.

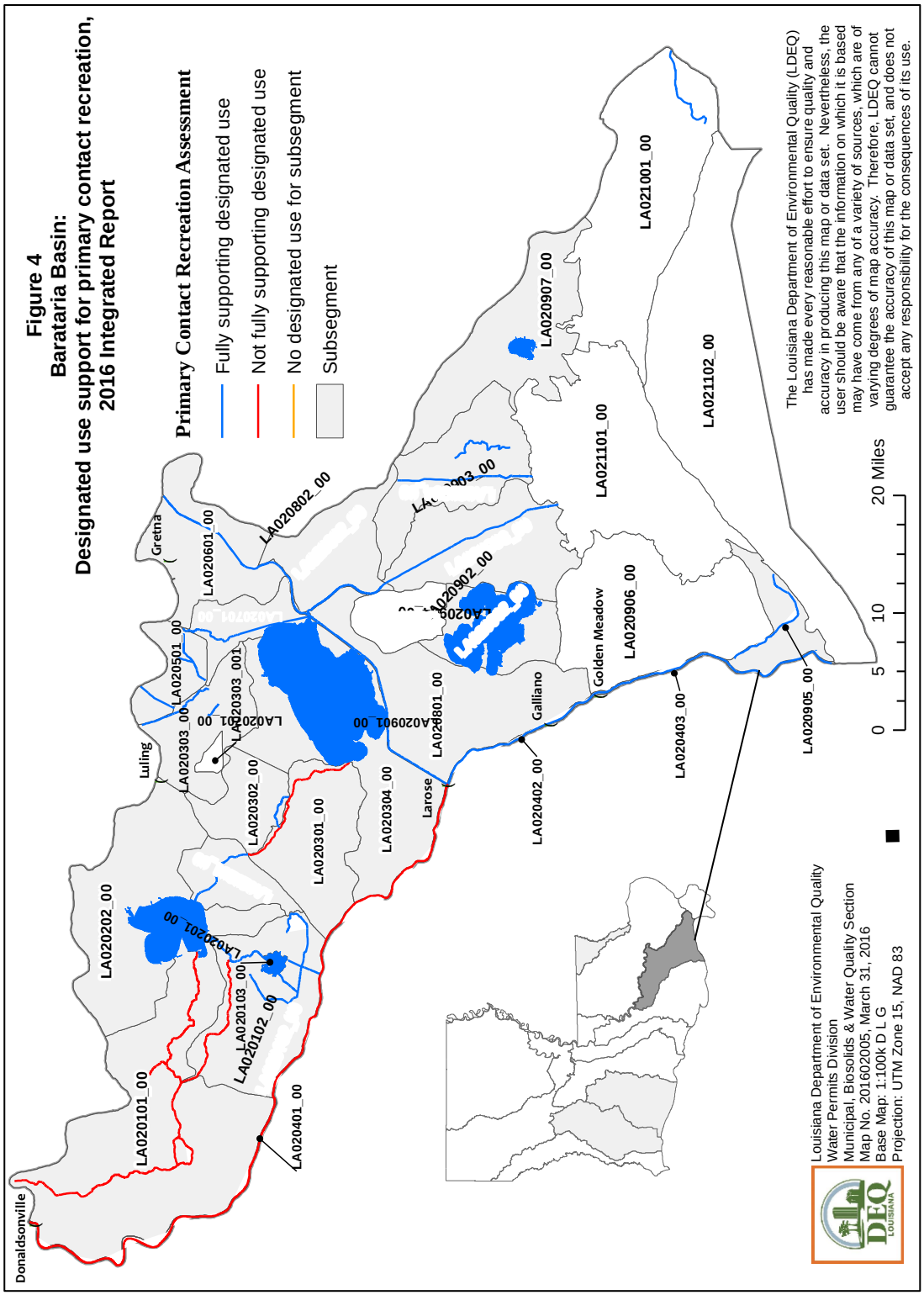


Figure 4
Barataria Basin:
Designated use support for primary contact recreation,
2016 Integrated Report
Primary Contact Recreation Assessment
Fully supporting designated use
Not fully supporting designated use
No designated use for subsegment
Subsegment
Donaldsonville
Gretna
Luling
Larose
Galliano
Golden Meadow
LA020101_00
LA020202_00
LA020401_00
LA020103_00
LA020102_00
LA020201_00
LA020301_00
LA020302_00
LA020303_00
LA020303_001
LA020501_00
LA020601_00
LA020802_00
LA020304_00
LA020801_00
LA020901_00
LA020902_00
LA020402_00
LA020403_00
LA020905_00
LA020906_00
LA020907_00
LA021101_00
LA021102_00
LA021001_00
0
5
10
20 Miles
The Louisiana Department of Environmental Quality (LDEQ) has made every reasonable effort to ensure quality and accuracy in producing this map or data set. Nevertheless, the user should be aware that the information on which it is based may have come from any of a variety of sources, which are of varying degrees of map accuracy. Therefore, LDEQ cannot guarantee the accuracy of this map or data set, and does not accept any responsibility for the consequences of its use.
Louisiana Department of Environmental Quality
Water Permits Division
Municipal, Biosolids & Water Quality Section
Map No. 20160205, March 31, 2016
Base Map: 1:100k D L G
Projection: UTM Zone 15, NAD 83
DEQ
LOUISIANA

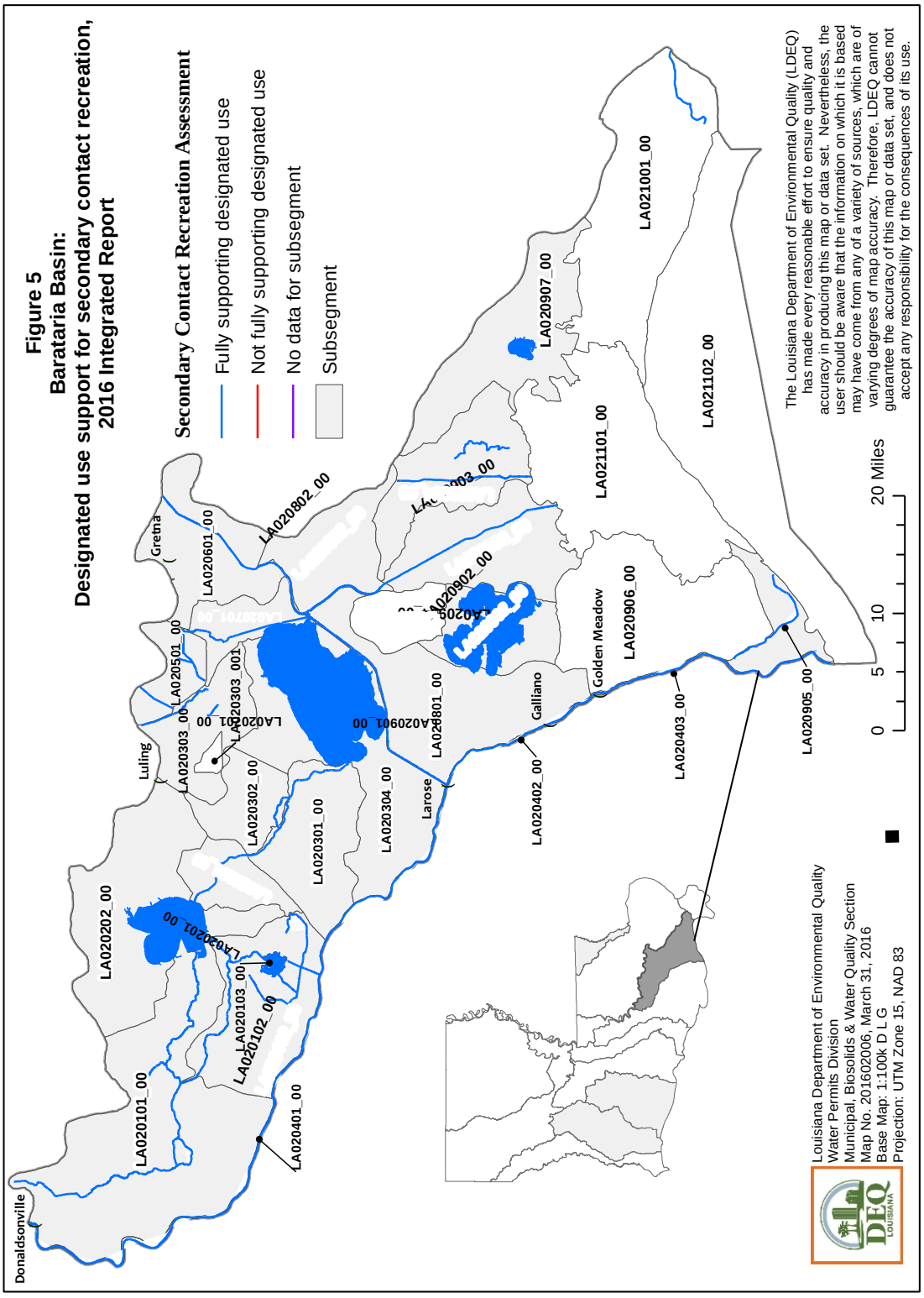


Figure 5
Barataria Basin:
Designated use support for secondary contact recreation,
2016 Integrated Report
Secondary Contact Recreation Assessment
Fully supporting designated use
Not fully supporting designated use
No data for subsegment
Subsegment
Donaldsonville
Gretna
Luling
Larose
Galliano
Golden Meadow
LA020202_00
LA020101_00
LA020401_00
LA020102_00
LA020103_00
LA020201_00
LA020301_00
LA020302_00
LA020303_00
LA020303_001
LA020304_00
LA020501_00
LA020601_00
LA020802_00
LA020801_00
LA020901_00
LA020902_00
LA020402_00
LA020403_00
LA020905_00
LA020906_00
LA020907_00
LA021101_00
LA021001_00
LA021102_00
0
5
10
20 Miles
The Louisiana Department of Environmental Quality (LDEQ) has made every reasonable effort to ensure quality and accuracy in producing this map or data set. Nevertheless, the user should be aware that the information on which it is based may have come from any of a variety of sources, which are of varying degrees of map accuracy. Therefore, LDEQ cannot guarantee the accuracy of this map or data set, and does not accept any responsibility for the consequences of its use.
Louisiana Department of Environmental Quality
Water Permits Division
Municipal, Biosolids & Water Quality Section
Map No. 20160206, March 31, 2016
Base Map: 1:100k D L G
Projection: UTM Zone 15, NAD 83

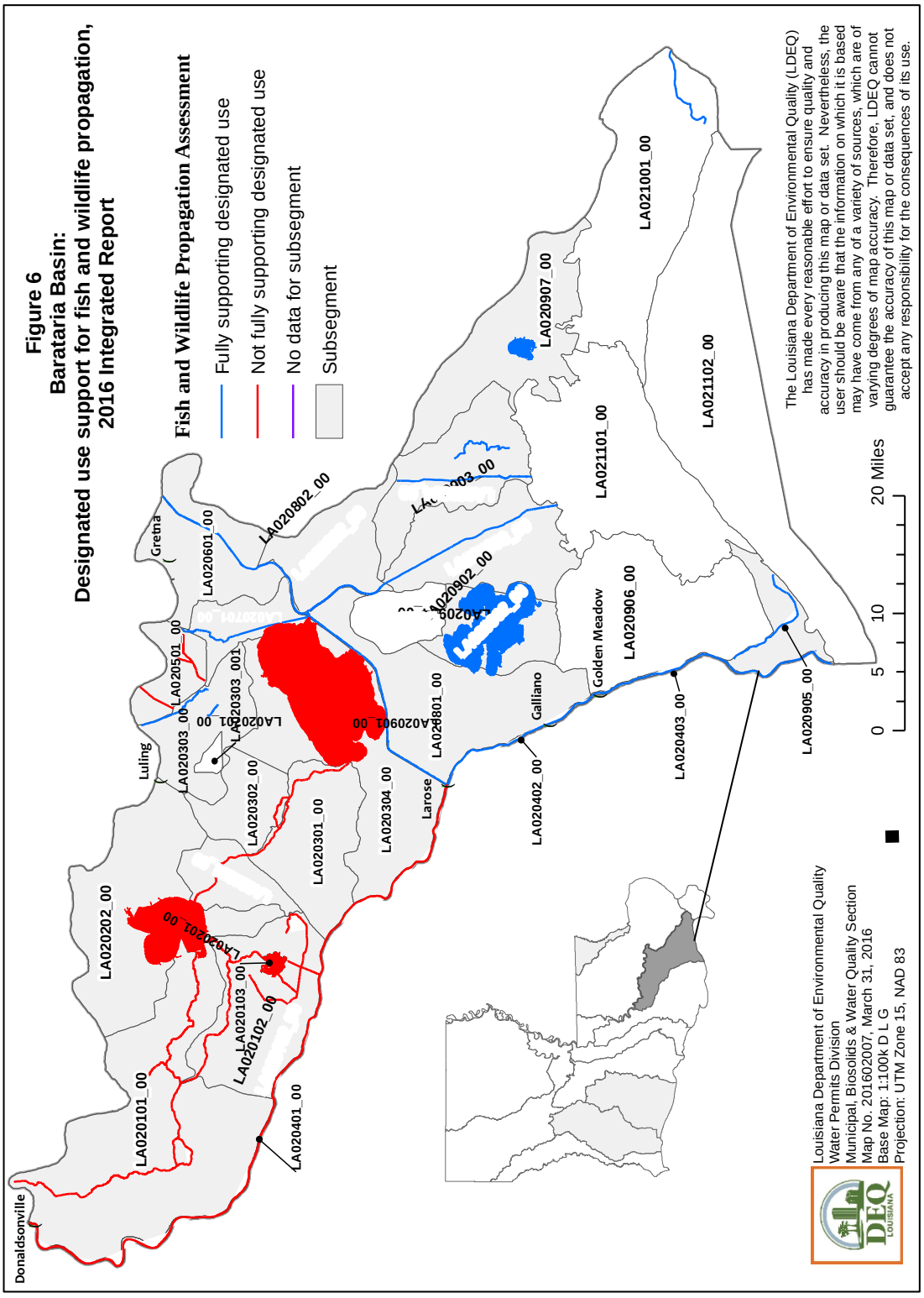


Figure 6
Barataria Basin:
Designated use support for fish and wildlife propagation,
2016 Integrated Report
Fish and Wildlife Propagation Assessment
Fully supporting designated use
Not fully supporting designated use
No data for subsegment
Subsegment
Donaldsonville
Gretna
Luling
Larose
Galliano
Golden Meadow
LA020202_00
LA020101_00
LA020401_00
LA020102_00
LA020103_00
LA020201_00
LA020301_00
LA020302_00
LA020303_00
LA020303_001
LA020304_00
LA020501_00
LA020601_00
LA020802_00
LA020801_00
LA020902_00
LA020402_00
LA020403_00
LA020905_00
LA020906_00
LA020907_00
LA021101_00
LA021102_00
LA021001_00
0
5
10
20 Miles
The Louisiana Department of Environmental Quality (LDEQ) has made every reasonable effort to ensure quality and accuracy in producing this map or data set. Nevertheless, the user should be aware that the information on which it is based may have come from any of a variety of sources, which are of varying degrees of map accuracy. Therefore, LDEQ cannot guarantee the accuracy of this map or data set, and does not accept any responsibility for the consequences of its use.
Louisiana Department of Environmental Quality
Water Permits Division
Municipal, Biosolids & Water Quality Section
Map No. 20160207, March 31, 2016
Base Map: 1:100k D L G
Projection: UTM Zone 15, NAD 83

LAKE PONTCHARTRAIN BASIN (04)

The Lake Pontchartrain Basin, located in southeastern Louisiana, consists of the tributaries and distributaries of Lake Pontchartrain, a large estuarine lake. The basin is bounded on the north by the Mississippi state line, on the west and south by the east bank Mississippi River levee, on the east by the Pearl River Basin, and on the southeast by Breton and Chandeleur Sounds. This basin includes Lake Borgne, Breton Sound, Chandeleur Sound, and the Chandeleur Islands. The northern part of the basin consists of wooded uplands, both pine and hardwood forests. The southern portions of the basin consist of cypress-tupelo swamps, lowlands, and both brackish and saline marshes. The marshes of the southeastern part of the basin constitute the most rapidly eroding area along the Louisiana coast. Elevations in this basin range from minus five feet at New Orleans to over 200 feet near the Mississippi border.

Maps showing use support for the three most significant designated uses of primary contact recreation (swimming), secondary contact recreation (boating), and fish and wildlife propagation (fishing) are on the following three pages.

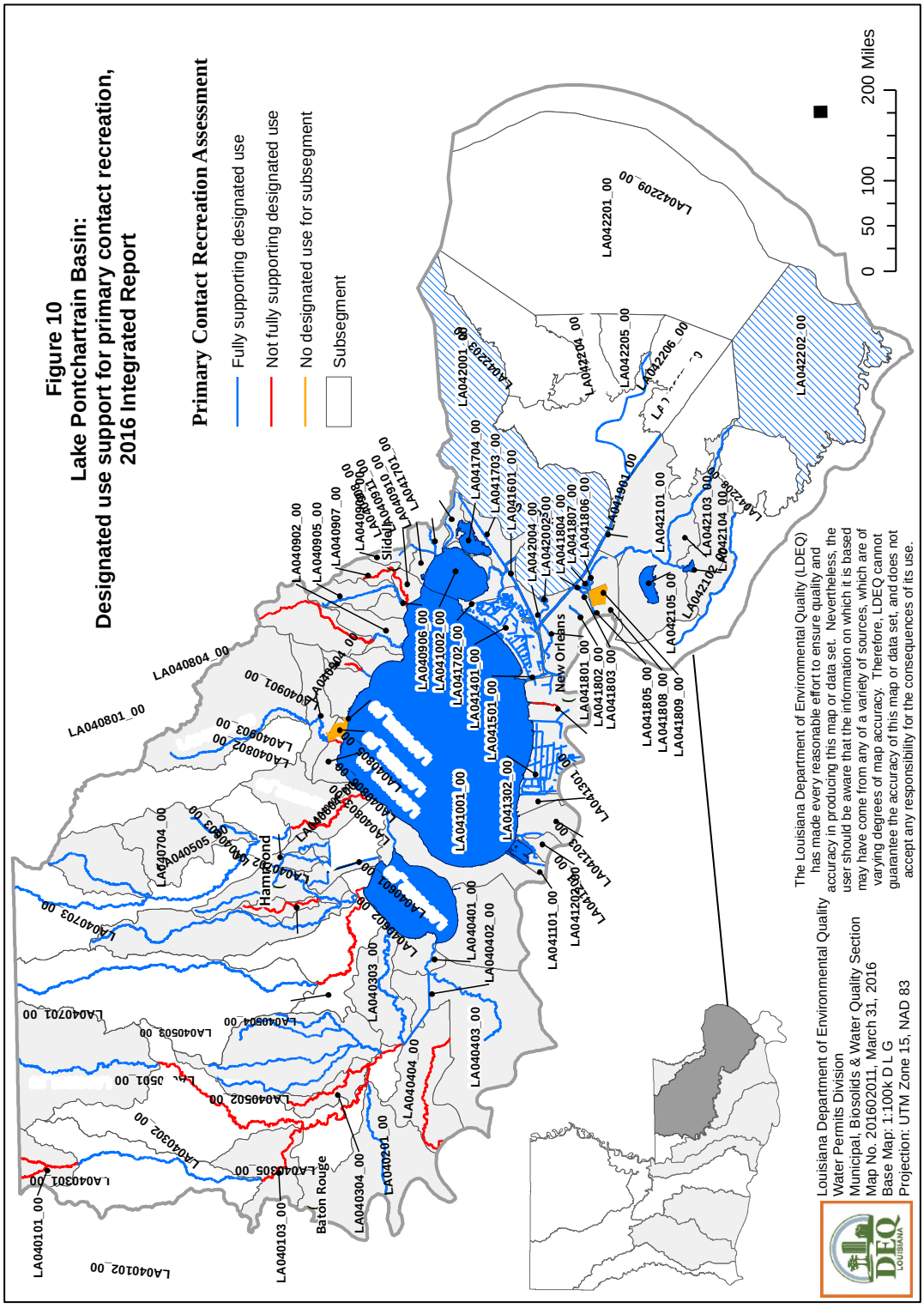


Figure 10
Lake Pontchartrain Basin:
Designated use support for primary contact recreation,
2016 Integrated Report
Primary Contact Recreation Assessment
Fully supporting designated use
Not fully supporting designated use
No designated use for subsegment
Subsegment
0 50 100 200 Miles
Hammond
Baton Rouge
New Orleans
Slidell
The Louisiana Department of Environmental Quality (LDEQ) has made every reasonable effort to ensure quality and accuracy in producing this map or data set. Nevertheless, the user should be aware that the information on which it is based may have come from any of a variety of sources, which are of varying degrees of map accuracy. Therefore, LDEQ cannot guarantee the accuracy of this map or data set, and does not accept any responsibility for the consequences of its use.
Louisiana Department of Environmental Quality
Water Permits Division
Municipal, Biosolids & Water Quality Section
Map No. 20160201l, March 31, 2016
Base Map: 1:100k D L G
Projection: UTM Zone 15, NAD 83

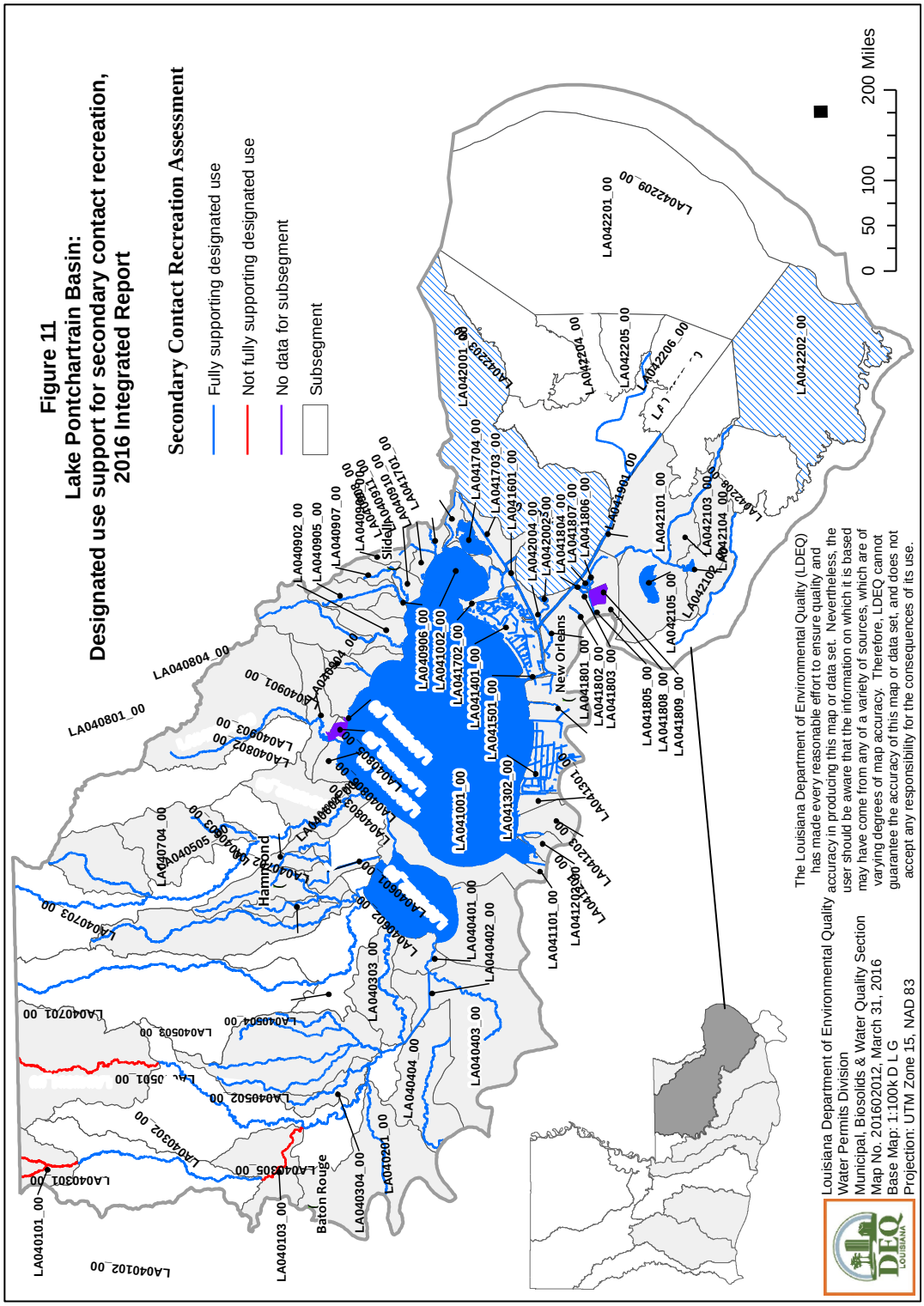


Figure 11
Lake Pontchartrain Basin:
Designated use support for secondary contact recreation,
2016 Integrated Report
Secondary Contact Recreation Assessment
Fully supporting designated use
Not fully supporting designated use
No data for subsegment
Subsegment
0 50 100 200 Miles
New Orleans
Hammond
Slidell
Baton Rouge
LA040101_00
LA040102_00
LA040103_00
LA040201_00
LA040301_00
LA040302_00
LA040303_00
LA040304_00
LA040305_00
LA040401_00
LA040402_00
LA040403_00
LA040404_00
LA040501_00
LA040502_00
LA040503_00
LA040504_00
LA040505_00
LA040701_00
LA040702_00
LA040703_00
LA040704_00
LA040801_00
LA040802_00
LA040803_00
LA040804_00
LA040805_00
LA040806_00
LA040807_00
LA040808_00
LA040809_00
LA040810_00
LA040811_00
LA040901_00
LA040902_00
LA040903_00
LA040904_00
LA040905_00
LA040906_00
LA040907_00
LA041001_00
LA041002_00
LA041101_00
LA041201_00
LA041301_00
LA041302_00
LA041303_00
LA041401_00
LA041501_00
LA041601_00
LA041701_00
LA041702_00
LA041703_00
LA041704_00
LA041801_00
LA041802_00
LA041803_00
LA041804_00
LA041805_00
LA041806_00
LA041807_00
LA041808_00
LA041809_00
LA041901_00
LA042001_00
LA042002_00
LA042003_00
LA042004_00
LA042101_00
LA042102_00
LA042103_00
LA042104_00
LA042105_00
LA042106_00
LA042201_00
LA042202_00
LA042203_00
LA042204_00
LA042205_00
LA042206_00
LA042209_00
The Louisiana Department of Environmental Quality (LDEQ) has made every reasonable effort to ensure quality and accuracy in producing this map or data set. Nevertheless, the user should be aware that the information on which it is based may have come from any of a variety of sources, which are of varying degrees of map accuracy. Therefore, LDEQ cannot guarantee the accuracy of this map or data set, and does not accept any responsibility for the consequences of its use.
Louisiana Department of Environmental Quality
Water Permits Division
Municipal, Biosolids & Water Quality Section
Map No. 20160201, March 31, 2016
Base Map: 1:100k D L G
Projection: UTM Zone 15, NAD 83

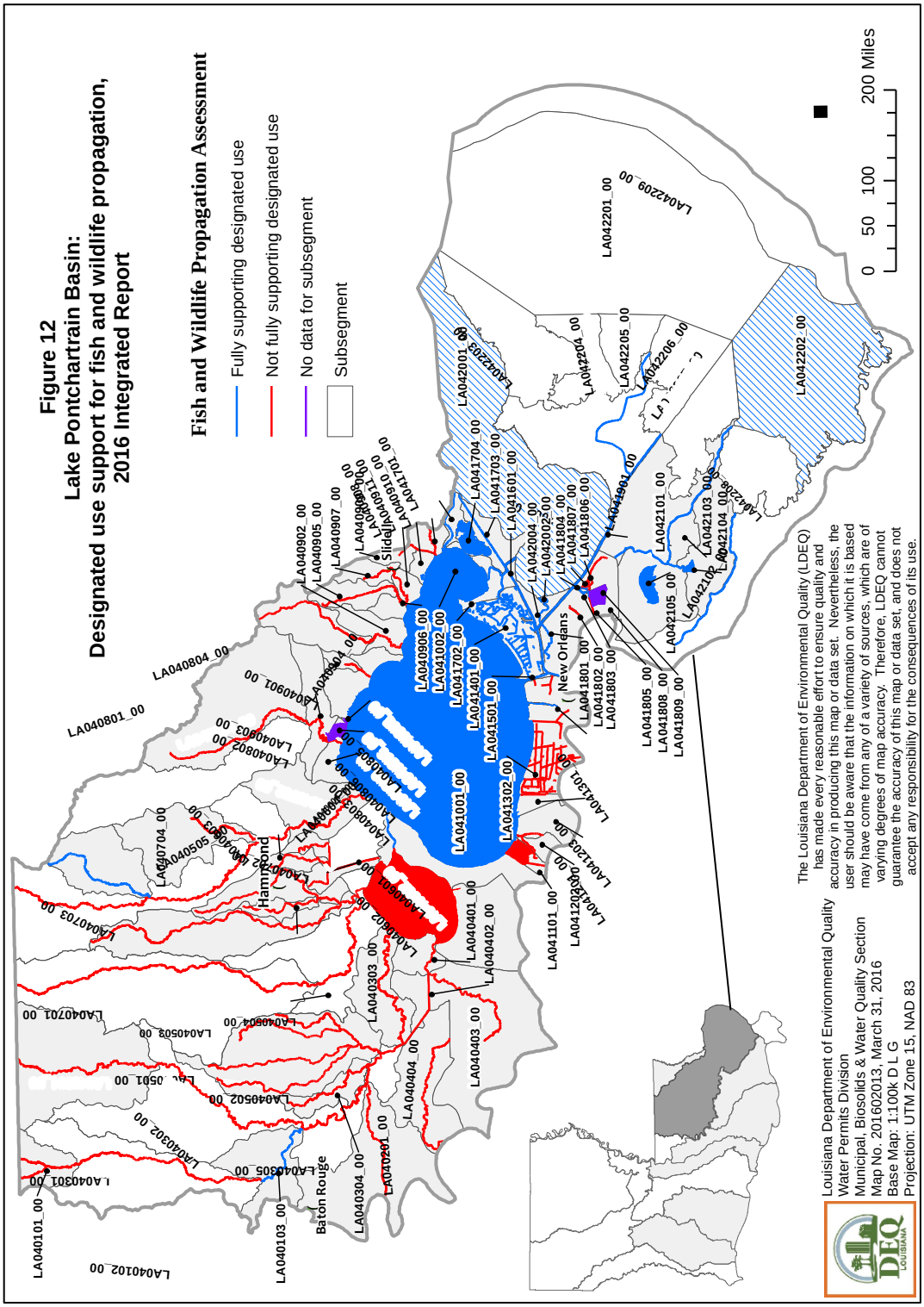


Figure 12
Lake Pontchartrain Basin:
Designated use support for fish and wildlife propagation,
2016 Integrated Report
Fish and Wildlife Propagation Assessment
Fully supporting designated use
Not fully supporting designated use
No data for subsegment
Subsegment
0 50 100 200 Miles
Lake Pontchartrain
Lake Maurepas
Lake Borgne
Mississippi River
New Orleans
Slidell
Hammond
Baton Rouge
LA040101_00
LA040102_00
LA040103_00
LA040201_00
LA040301_00
LA040302_00
LA040303_00
LA040304_00
LA040401_00
LA040402_00
LA040403_00
LA040404_00
LA040501_00
LA040502_00
LA040503_00
LA040504_00
LA040505_00
LA040506_00
LA040507_00
LA040601_00
LA040602_00
LA040603_00
LA040701_00
LA040702_00
LA040703_00
LA040704_00
LA040801_00
LA040802_00
LA040803_00
LA040804_00
LA040805_00
LA040806_00
LA040807_00
LA040808_00
LA040809_00
LA040810_00
LA040901_00
LA040902_00
LA040903_00
LA040904_00
LA040905_00
LA040906_00
LA040907_00
LA041001_00
LA041002_00
LA041101_00
LA041201_00
LA041202_00
LA041203_00
LA041204_00
LA041301_00
LA041302_00
LA041401_00
LA041501_00
LA041601_00
LA041702_00
LA041703_00
LA041704_00
LA041801_00
LA041802_00
LA041803_00
LA041804_00
LA041805_00
LA041806_00
LA041807_00
LA041808_00
LA041809_00
LA041901_00
LA042001_00
LA042002_00
LA042003_00
LA042004_00
LA042101_00
LA042102_00
LA042103_00
LA042104_00
LA042105_00
LA042201_00
LA042202_00
LA042203_00
LA042204_00
LA042205_00
LA042206_00
LA042208_00
LA042209_00
The Louisiana Department of Environmental Quality (LDEQ) has made every reasonable effort to ensure quality and accuracy in producing this map or data set. Nevertheless, the user should be aware that the information on which it is based may have come from any of a variety of sources, which are of varying degrees of map accuracy. Therefore, LDEQ cannot guarantee the accuracy of this map or data set, and does not accept any responsibility for the consequences of its use.
Louisiana Department of Environmental Quality
Water Permits Division
Municipal, Biosolids & Water Quality Section
Map No. 201602013, March 31, 2016
Base Map: 1:100k D L G
Projection: UTM Zone 15, NAD 83
DEQ
LOUISIANA

REFERENCES

REFERENCES CITED

Bacon-Blood, L., (2014) St. John Parish Levee Proposal Approved by Corps of Engineers Review Panel. The Times-Picayune. [Online]. Available: http://www.nola.com/environment/index.ssf/2014/12/federal_review_panel_approves.html [2014, December 19].

Barras JA, Bernier JC, Morton RA (Cartographers). (2008). Land Area Change in Coastal Louisiana: a Multidecadal Perspective from 1956 to 2006. U.S. Geologic Survey Scientific Investigations Map 3019. Washington D.C.

Chambers DG. (1980). *An Analysis of Nekton Communities in the Upper Barataria Basin.* Unpublished MS Thesis, Louisiana State University, Baton Rouge. 286 pp.

Coastal Enviroments Inc. (2013*). St. Bernard Parish Coastal Zone Management Program.* Chapter 3, Principle Resources. pp 3.1-3.8

Coastal Enviroments Inc. (2013*). St. Bernard Parish Coastal Zone Management Program.* Chapter 7, Program Administration. pp 7.1-7.31

Coastal Protection and Restoration Authority, 2012. Louisiana's Comprehensive Master Plan for a Sustainable Coast. State of Louisiana, Baton Rouge, 190 pp. [Online] Accessed May 2015 at http://www.coastalmasterplan.louisiana.gov/.

Coastal Protection and Restoration Authority, 2014. Mississi River Reintroduction into Maurepas Swamp RESTORE Proposal.

Condrey, R.E., Hoffman, P.E., Evers, D.E., (2014) The last naturally active delta complexes of the Mississippi River (LNDM): discovery and implications. In: Day, J.W., Kemp, G.P., Freeman, A.M., Muth, D.P., (Eds.) Perspectives on the Restoration of the Mississippi Delta, Estuaries of the World Series, Springer Science+Business Media, Dordrecht, The Netherlands, 33-50.

Conner, W.H., J.R. Toliver, and F.H. Sklar 1986 Natural regeneration of bald cypress (Taxodium distichum (L.) Rich.) in a Louisiana Swamp. Forest Ecology and Management, Vol. 14,pp. 305-317.

Colemen, J.M. 1988 Dynamic changes and processes in the Mississippi River Delta. Geological Society of America, Vol. 100, No. 7, pp. 589-596.

Coleman, J.M., and Gagliano, S.M., (1964) Cyclic sedimentation in the Mississippi River deltaic plain. Gulf Coast Assn. Geol. Soc., Trans, 14: 67-80.

Coleman, J.M., Roberts, H.H., Stone, G.W., (1998). Mississippi River delta: an overview. *Journal of Coastal Research,* 14(3), 699-716.

Conner WH, Gosselink JG, Parrondo RT. (1981). Comparison of the vegetation of three Louisiana swamp sites with different flooding regimes. *American Journal of Botany, 68*, 320-331.

Couvillion, B.R., Barras, J.A., Steyer, G.D., Sleavin, W., Fischer, M., Beck, H., Trahan, N., Griffin, B., Heckman, D., 2011. Area Change in Coastal Louisisana from 1932 to 2010. U.S. Geological Survey Scientific Investigations Map 3164, Scale 1:265,000, Reston, VA., 12 pp.

Cowardin LM, Carter V, Golet FC, LaRoe ET. (1979). *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Department of the Interior, Fish and Wildlife Service. Washington D.C.

Curran, Rob. "After BP's Disaster, a Massive Plan to Revive the Gulf of Mexico." *Fortune*. N.p., 12 Nov. 2014. Web. 30 Oct. 2016. <http://fortune.com/2014/11/12/bp-gulf-mexico-coast/>.

Das A, Justic D, Inoue M, Hoda A, Huang H, Park D. (2012). Impacts of Mississippi River diversions on salinity gradients in a deltaic Louisiana estuary: ecological and management implications. *Estuarine, Coastal and Shelf Science, 111*(1 October 2012), 17-26.

Davis Pond Freshwater Diversions. U.S. Army Corps of Engineers. [Online]. Available:http://www.mvn.usace.army.mil/About/Projects/DavishPondFreshwaterDiversion.aspx.[2014, December 15].

Day, John W., Jr., Paul Kemp, Hassan S. Mashriqui, Robert R. Lane, Dane Dartez, and Robert Cunningham, (September 2004). Development Plan for a Diversion into Maurepas Swamp Water: Quality & Hydrologic Modeling Components. Prepared for: the U.S. Environmental Protection Agency, Region 6, Under Cooperative Agreement X-986946-01. Louisiana State University, Baton Rouge, La.

Day, J.W., Boesch, D.F., Clairain, E.J., Kemp, G.P., Laska, S.B., Mitsch, W.J., Orth, K., Mashriqui, H., Reed, D.J., Shabman, L., Simenstad, C.A., 2007. Restoration of the Mississippi Delta: lessons from Hurricanes Katrina and Rita. Science 315(5819), 1679-1684.

Day, J.W., Kemp, G.P., Reed, D.J., Cahoon, D.R., Boumans, R.M., Suhayda, J.M., Gambrell, R., 2011. Vegetation death and rapid loss of surface elevation in two contrasting Mississippi delta salt marshes: the role of sedimentation, autocompaction and sea-level rise. Ecological Engineering 37, 229-240.

Dufour, W., and Jackson, T., (2006) St. John the Baptist Parish Comprehensive Planning Project, Phase II, Task II, Land Use Plan Report. University of New Orleans, Division of Planning, New Orleans, LA., 48 pp.

eBird. (2014). Bird Observations in the Bonnet Carre Spillway Hotspot near Laplace, Louisiana. Retrieved 12/10/2014, http://ebird.org/ebird/GuideMe?cmd=decisionPage&getLocations=hotspots&hotspots=L727205&yr=all& m=

"Estuary Issues." *Estuary Issues*. Barataria Terrebonne National Est, n.d. Web. 27 May 2016. http://www.btnep.org/BTNEP/estuaryissues.aspx

"Evergreen Plantation." *Evergreen Plantation*. Evergreen Plantation, 2003. Web. 20 Nov. 2015. http://www.evergreenplantation.org/tour/tt13.htm#

Federal Emergency Management Agency (November 30, 2005) Flood Recovery Guidance, St. John the Baptist Parish. https://www.fema.gov/pdf/hazard/flood/recoverydata/stjohnthebaptist_parish11-30-05nh.pdf

Federal Emergency Management Agency (2010) *Flood Insurance Study: St. John the Baptist Parish, Louisiana, and Incorporated Areas (November 4, 2010)* Flood Insurance Study Number 22095CV000A. U.S. Department of Homeland Security, Washington DC. 80 pp. [Online] Retrieved January 10, 2016, at http://www.sjbparish.com/pdfs/floodmaps/22095CV000Anewsize.pdf.

Fisk, H. N. (1944). *Geological investigation of the alluvial valley of the lower Mississippi River*. War Department, Corps of Engineers. 78 pp.

Fisk, H.N. and E. McFarland 1955 Late Quaternary Deltaic Deposits of the Mississippi River. Crust of the Earth. Geological Society of America Special Paper 62, pp. 279-302.

Fontenot W, DeMay R. (2011). *Louisiana Breeding Wood Warblers.* Barataria-Terrebonne National Estuary Program, Thibodaux, LA. 50 pp. Retrieved 12/10/2014 from http://birds.btnep.org/Libraries/Publications/LouisianaBreedingWoodWarblers LowRes.sflb.ashx.

Frazier, D.E., (1967). Recent deltaic deposits of the Mississippi River: their development and chronology. Gulf Coast Assn. Geol. Soc., Trans, 17: 287-315.

FTN Associates, Ltd. (October 14, 2004) Bayou Des Allemands TMDLS For Dissolved Oxygen And Nutrients; Subsegment 020201. Prepared for US EPA Region 6 Water Quality Protection Division Permits, Oversight, and TMDL Team Contract No. 68-C-02-108 Task Order #0012. Little Rock, AR

Hastings, R.W., (2004) History of the Turtle Cove Environmental Research Station: the first two decades. Proc. Louisiana Acad. Sci. 65: 30-47.

Interagency Performance Evaluation Task Force. (2009). *A General Description of Vulnerability*

to Flooding and Risk for New Orleans and Vicinity: Past, Present and Future. U.S. Army Corps of Engineers, New Orleans, Louisiana [Online], Retrieved January 10, 2016, from http://biotech.law.lsu.edu/katrina/ipet/Si mpleRisk%20FINAL%2023jun09%20mh.pdf.

Jones, C. E., An, K., Blom, R. G., Kent, J. D., Ivins, E. R., & Bekaert, D. (2016). Anthropogenic and geologic influences on subsidence in the vicinity of New Orleans, Louisiana. *Journal of Geophysical Research: Solid Earth*. 121(5), 3867-3887.

Kuecher, G.J. 1994 Geological framework and consolidation settlement potential of the Lafourche delta topstratum valley fill sequence: Implications for wetland loss in Terrebonne and Lafourche Parishes, Louisiana. Ph.D. Dissertation, Louisiana State University, LA.

Kuecher, G.J., N. Chandra, H.H. Roberts, J/N. Suhayda, S.J. Williams, S. Penland , and W.J. Autin 1993 Consolidation settlement potential in south Louisiana . In: Proceedings of Coastal Zone ’93, Eighth Symposium on Coastal and Ocean Management. American Society of Civil Engineers, New Orleans, LA. Pp. 1197-1214

Kulp, M., Penland, S., Williams, S. J., Jenkins, C., Flocks, J., Kindinger, J., (2005). Geologic framework, evolution, and sediment resources for restoration of the Louisiana coastal zone. *Journal of Coastal Research*, SI No. 44: 56-71.

"Lake Pontchartrain Basin Foundation." *Lake Pontchartrain Basin Foundation*. Lake Pontchartrain Basin Foundation, 2016. Web. 21 June 2016. http://www.saveourlake.org/

Lee Wilson & Associates. 2001. Diversion into the Maurepas Swamps: A Complex Project under the Coastal Wetlands Planning, Protection and Restoration Act. Final Report to U.S. Environmental Protection Agency, Region 6, Contract No. 68-06-0067. Dallas, TX. 66 pp.

Louisiana Coastal Wetlands Conservation and Restoration Task Force. 2015. The 2015 Evaluation Report to the U.S. Congress on the Effectiveness of Coastal Wetlands Planning, Protection and Restoration Act Projects.

Louisiana Department of Environmental Quality (2005) Fish consumption and swimming advisories, January 11, 2005. www.deq.state.la.us/surveillance/mercury/fishadvi.htm.

Louisiana Department of Natural Resources. (2014). Significant Oil and Gas Fields of St. John the Baptist Parish. *SONRIS.* Retrieved 12/10/2014 from http://sonris.com/dataaccess.asp.

Louisiana Department of Wildlife and Fisheries (2005) Manchac Wildlife Management Area http://www.wlf.state.la.us/apps/netgear/index.asp?cn=lawlf&pid=358

Louisiana Department of Wildlife and Fisheries. (2013). Louisiana's Alligator Management Program: 2012-2013 Annual Report. Baton Rouge, Louisiana. 29 pp. [Online] Retrieved 12/10/2014 at http://www.wlf.louisiana.gov/sites/default/files/pdf/page_wildlife/32693-

Alligator%20Program%20Annual%20Reports/ldwf_-_la.s_alligator_mgmt_program_-_dec_2013.pdf

Louisiana Department of Wildlife and Fisheries. (2014). Louisiana Coastwide Nutria Control Program. Baton Rouge, Louisiana. [Online] Retrieved December 10, 2014, from http://nutria.com/site10.php

"Louisiana Geological Survey." *Louisiana Geological Survey*. Louisiana State University, 2008. Web. 27 Oct. 2015. http://www.lgs.lsu.edu/deploy/content/PUBLI/contentpage17.php

Louisiana Geologic Survey (Cartographer). (2011). New Orleans 30 x 60 Minute Geologic Quadrangle. Baton Rouge, Louisiana

Louisiana Natural Heritage Program. (2009). *The Natural Communities of Louisiana.* [Online] Retrieved 12/10/2014 from http://www.wlf.louisiana.gov/sites/default/files/pdf/page_wildlife/6776-Rare%20Natural%20Communities/LA_NAT_COM.pdf. 46pp.

Louisiana Natural Heritage Program. (2014a). *Rare Animal Species*. [Online] Retrieved 12/10/ 2014 from http://www.wlf.louisiana.gov/wildlife/species-parish-list?tid=256&type_1=fact_sheet_animal.

Louisiana Natural Heritage Program. (2014b). *Rare Plant Species*. [Online] Retrieved 12/10 2014, from http://www.wlf.louisiana.gov/wildlife/species-parish-list?tid=256&type_1=fact_sheet_plant

"Louisiana Travel Directory Printer-Friendly Page View Page as a PDF Add to Favorites Send This Page to a Friend Order Free Visitor Brochure New Orleans Plantation Country View Video Book Now Newsletter New Orleans Plantation Country Journey into the Past." *Tour Louisiana*. New Orleans Plantation Country, n.d. Web. 31 Oct. 2016. <http://www.tourlouisiana.com/content.cfm?id=18>.

Muller, R. A. (1977). A synoptic climatology for environmental baseline analysis: New Orleans. *Journal of Applied Meteorology*, *16*(1), 20-33.

Muller, R.A. 1977 Freshwater potential in the Louisiana coastal marshes and estuaries. Geosciences and Man. Vol. 12, pp. 1-7.

Muller, R.A. and B.V. Fielding 1988 Coastal Climate of Louisiana. In: R.E. Turner and D.R. Cahoon (eds.). Causes of loss in the Coastal Central Gulf of Mexico. Volume II: Technical Narrative. Final report submitted to Minerals Management Service, New Orleans, LA> Contract No. 14-12-0001-30252. OCS Study/MMS 87-0120. pp. 13-29.

Muller, R.A., Willis, J.E., (1983). *New Orleans Weather, 1961-1980: A Climatology by Means of Synoptic Weather Types* (). Louisiana State University, School of Geoscience. Vol. 83, No. 1.

Muller, R. A., Keim, B. D., & Hoff, J. L. (1990). Application of climatic divisional data to flood interpretations: an example from Louisiana. *Physical Geography*, *11*(4), 353-362.

Natural Resources Conservation Service. (2014) *Web Soil Survey*. U.S. Department of Agriculture, Washington D.C. Accessed 12/10/2014 at http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

Natural Resources Conservation Service. (2009). Soil Survey of St. John the Baptist Parish. 203 pp. [Online] Retrieved on January 10, 2016 at http://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/louisiana/LA095/0/stjohn.pdf.

Penland, S., H.H. Roberts, G.J. Kuechere, J.N. Suhayda, P.C. Connor, and K.E. Ramsey 1994 Geologic framework, processes, and rates of subsidence in the Mississippi River delta plain. In: H.H. Roberts (ed.) Critical Physical Processes of Wetland Loss, 1988-1994. Final Report. Louisiana State University. Baton Rouge, LA. Prepared for the U.S. Geological Survey, Reston, VA.

"Research, Extension & Education Water Resource Management Programs through the Land Grant University System." *SERA43*. Department of Soil Science - North Carolina State University, 2016. Web. 21 June 2016. http://sera43.soil.ncsu.edu/index.html

Sasser, C.E., E.M. Swenson, D.E. Evers, J.M. Visser, G.W. Holm, & J.G. Gosselink 1994 Floating Marshes in the Barataria and Terrebonne Basins, Louisiana. Louisiana State University, Coastal Ecology Institute. Baton Rouge, LA. Prepared for the U.S. Environmental Protection Agency, Dallas, Texas. LSU-CEI-94-02.

Sasser CE, Gosselink JG, Swenson EM, Swarzenski CM, Leibowitz NC. (1996). Vegetation, substrate and hydrology in floating marshes in the Mississippi River delta plain wetlands, USA. *Vegetatio, 122*, 129-142.

Saucier, RT. (1963). *Recent Geomorphic History of the Pontchartrain Basin, Louisiana*. Coastal Studies Institute, *Technical Report No. 16*. Louisiana State University, Baton Rouge, Louisiana.

Shaffer, Gary P., Thais E. Perkins, Susanne Hoeppner, Susan Howell, Heath Benard, and A. Carol Parsons (June 2003) Ecosystem Health of the Maurepas Swamp: Feasibility and Projected Benefits of a Freshwater Diversion. Prepared for the Environmental Protection Agency, Region 6, 1445 Ross Avenue, Suite 1200, Dallas, Texas, 75202-2733.

Shaffer GP, Day JW Jr., Mack S, Kemp GP, van Heerden ILl, Poirrier MA, Westphal KA, Fitzgerald D, Milanes A, Morris CA, Bea RG, Penland PS. (2009). The MRGO navigation project: a massive human-induced environmental, economic and storm disaster. *Journal of Coastal Research, Special Issue 54*, 225-243.

State of Louisiana (2005) http//www.state.la.us/census/97proj/stjohnthebaptist.htm

"Statistics." *Louisiana Department of Wildlife and Fisheries*. Louisiana Department of Wildlife and Fisheries, n.d. Web. 20 Nov. 2015. http://www.wlf.louisiana.gov/licenses/statistics

URS Corporation (2007) Mississippi River Reintroduction in Maurepas Swamp Project. Volume I of VII, Executive Summary. Final Report to Louisiana Department of Natural Resources, Baton Rouge, LA. 34 pp. [Online] Retrieved January 10, 2016 from http://lacoast.gov/reports/project/3890654~1.pdf

URS Corporation (2010) Mississippi River Reintroduction in Maurepas Swamp Project. Assessment of an Alternative Siphon System Intake, Final Report to Louisiana Office of Coastal Protection and Restoration, Contract No. 2503-10-56, Baton Rouge, LA. 53 pp. [Online] Retrieved January 10, 2016 from http://lacoast.gov/reports/project/3890685~1.pdf.

U.S. Army Corps of Engineers (2013a) Hurricane Isaac, With and Without 2012 100-Year HSDRRS Evaluation. New Orleans District Final Report, New Orleans, LA. [Online]. Available: http://www.mvn.usace.army.mil/Portals/56/docs/PAO/20130208HurrIsaacW-WO2012HSDRRS.pdf.
January 10, 2016.

U.S. Army Corps of Engineers (2013b) West Shore Lake Pontchartrain Hurricane and Storm Damage Risk Reduction Study. New Orleans District, New Orleans, LA., 96 pp. [Online] Retrieved January 10, 2016 at http://www.mvn.usace.army.mil/Portals/56/docs/PD/Projects/WSLP/WSLPFINAL.pdf.

U.S. Army Corps of Engineers (2015) Report of Lieutenant General Thomas P. Bostick, Chief of Engineers, on West Shore Lake Pontchartrain, Louisiana, Hurricane and Storm Damage Risk Reduction Study. [Online] Retrieved January 10, 2016, from http://media.nola.com/politics/other/West%20Shore%20Lake%20Pontchartrain%20Chiefs%20Report_signed_12June2015.pdf.

U. S. Bureau of the Census (2000) Census 2000 Summary Files for St. John the Baptist Parish http://factfinder.census.gov/servlet/AdvSearchByPlacenameServlet?_command=getResults&_keyword=st.%20john%20the%20baptist%20parish&_programYear=50&_placename=05000US22095&_geoBucketId=50&_treeId=4001&_state=22&_lang=en.

"US Environmental Protection Agency." *EPA*. Environmental Protection Agency, n.d. Web. 21 June 2016. https://www3.epa.gov/

U.S. Fish and Wildlife Service (2014). *Wetlands Mapper*. Washington D.C. [Online]. Available: http://www.fws.gov/wetlands/data/mapper.HTML. December 10, 2015

U.S. Fish and Wildlife Service (2014). *National Wetland Inventory*. Washington D.C. [Online]. Available: http://www.fws.gov/wetlands/data/mapper.HTML. December 10, 2015

"USGS Publications Warehouse." *RSS*. U.S. Department of the Interior, 2016. Web. 21 June 2016. https://pubs.er.usgs.gov/

U.S. Soil Conversation Service 1973 Soil Survey St. James and St. John the Baptist Parishes, Louisiana. Louisiana Agriculture Experiment Station. Washington, D.C.

Visser JM, Sasser CE, Chabreck RH, Linscombe RG. (2002) The impact of a severe drought on the vegetation of a subtropical estuary. *Estuaries* 25(6A): 1184-1195.

Weinstein RA, Gagliano SM. (1985). The Shifting Deltaic Coast of the Lafourche Country and its Prehistoric Settlement. In Uzee PD. (Ed.), *The Lafourche Country: The People and the Land* (pp. 122-149). Center for Louisiana Studies, University of Southwestern Louisiana, Lafayette, Louisiana

Wells, J. T., & Coleman, J. M. (1987). Wetland loss and the subdelta life cycle. *Estuarine, Coastal and Shelf Science, 25*(1), 111-125.

"What Is an Estuary?" *What Is an Estuary?* Barataria Terrebonne National Est, n.d. Web. 27 May 2016. http://www.btnep.org/BTNEP/about/whatisestuary.aspx

World Meteorological Organization. (2014). *New Orleans, Louisiana, Climatological Information*. Retrieved 12/10/2014, from http://worldweather.wmo.int/en/city.html?cityId=795

Zilkoski, David B., John H. Richards, and Gary M. Young. "Results of the General Adjustment of the North American Vertical Datum of 1988." *Results of the General Adjustment of the North American Vertical Datum of 1988* 52 (1992): 133-49. *Results of the General Adjustment of the North American Vertical Datum of 1988*. American Congress on Surveying and Mapping Surveying and Land Information Systems. Web. 27 Oct. 2015.