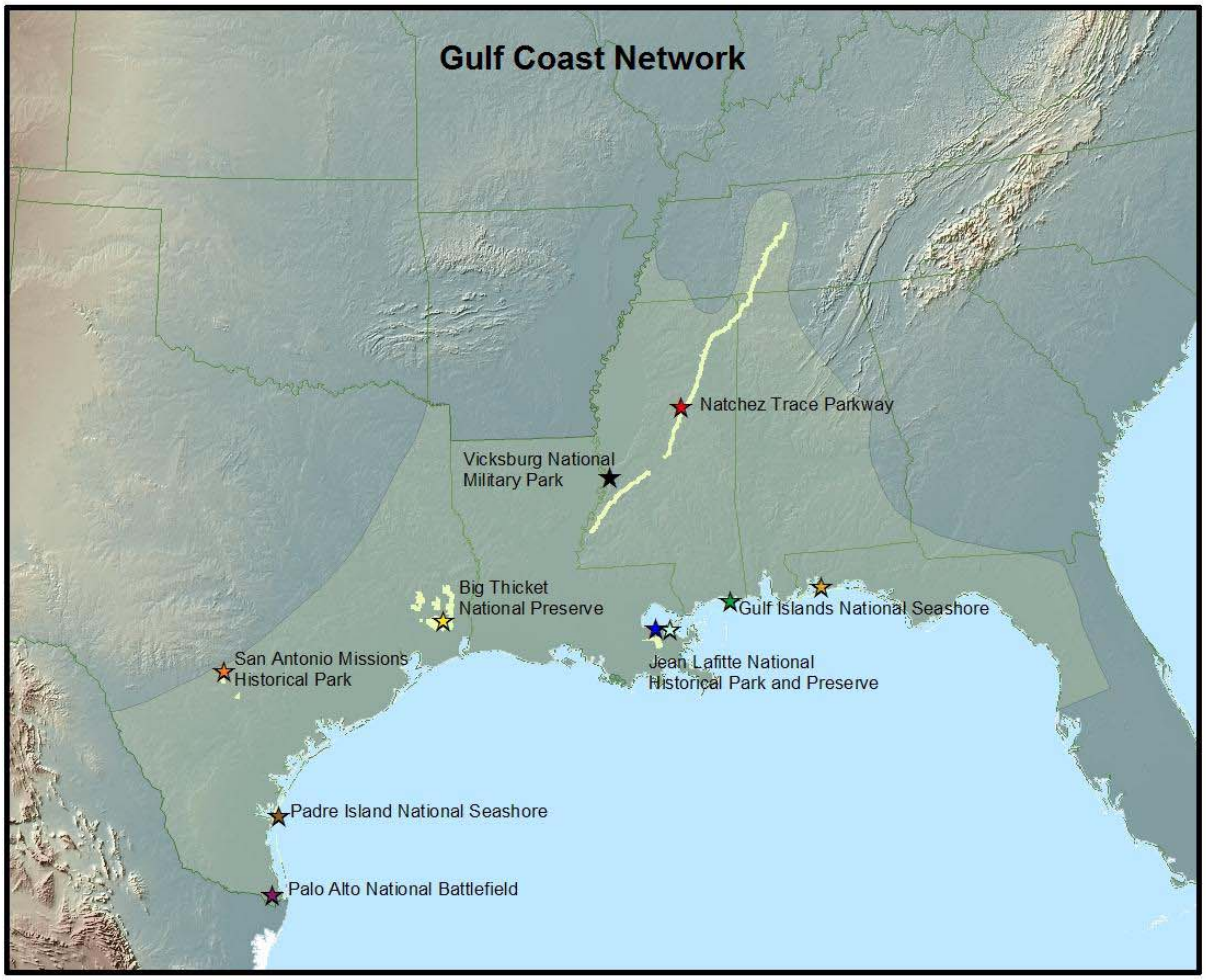
Natural Resource Summary for
Jean Lafitte National Historical Park and Preserve (JELA)
FINAL REPORT

February 2005



Prepared by

Robert J. Cooper
Sandra B. Cederbaum
and
Jill J. Gannon

Warnell School of Forest Resources
University of Georgia
Athens, GA

TABLE OF CONTENTS

List of Figures

EXECUTIVE SUMMARY

Jean Lafitte National Historical Park (JELA) was established in 1978 and consists of six separate units that lie in the Mississippi Delta region and preserve the natural and/or cultural history of the area. The Barataria Preserve (BP) and Chalmette Battlefield and National Cemetery (CBNC) are the only two JELA units in the National Park Service Inventory and Monitoring Program and have had natural resource surveys conducted. The 8000-hectare BP preserves an example of the natural environment typical of the delta region including levee forest, bayous, swamps, and marshes. The CBNC is a smaller unit that marks the site of the 1815 Battle of New Orleans in the War of 1812. Both are in close proximity to New Orleans, Louisiana.

Multiple vegetation surveys have been completed in the BP but have varied in the area covered. The first complete vegetation survey documented 328 species in 88 families, primarily in the forested habitats. A number of surveys have also been conducted on the non-forested wetland habitats of the BP (fresh marsh, intermediate marsh, and scrub/shrub wetlands). These studies examined the species diversity and variation across the park, the effects of water control structures on marsh vegetation, the change in species composition over time, and the possible effects of saltwater intrusion. Fresh marsh had the highest number of species, scrub/shrub wetlands had the highest number of individuals per square-meter, and the western portion of the park had lower species diversity and contained the only salt tolerant species. During the first 3 marsh surveys, 85 species were documented. A more recent survey examined the same habitat and found little change in the species composition. Although no federally listed species have been documented in the park, two rare plants (swamp milkweed and floating antler-weed) and one species of unknown status (creeping spike-rush) have been recorded. A recent Mycological survey documented over 94 species of fungi in the BP. Multiple surveys have also been conducted on the CBNC but have not been updated for 15 years. One hundred and thirty species have been documented on the unit, just under half of which were not native to the area. Vascular plant inventories are scheduled to be conducted for both the BP and CBNC in the near future.

Documentation of the mammal species that occur in JELA is currently incomplete or non-existent for portions of the BP and CBNC. Two surveys occurred in the BP during the 1980's but did not sufficiently sample the marsh and swamp habitats that make up two-thirds of the preserve. No surveys have occurred on the CBNC. A third survey has begun that will examine the mammalian community on both the BP and CBNC. This study will include surveys for bats, small/medium mammals, and large mammals. Particular attention will be given to the status of both bats and carnivores as their populations are of special concern.

Three inventories of the herpetofauna have occurred in the BP in the recent past and documented 32 and 18 species of reptiles and amphibians, respectively. Species richness was highest in baldcypress/tupelo swamps, intermediate in hardwood forest, and the lowest in the marsh. However, more species with restricted distributions were found in the marsh. Although chorus frogs and bullfrogs, previously found at the BP, were absent from the most recent surveys it was not necessarily indicative that these species were extirpated from the park. Future monitoring is suggested to focus, in part, on sampling for these species. These surveys have likely documented 85-90% or more of the herpetofauna on the preserve. Additional surveys have also been

conducted to estimate the density of nesting alligators within the park and to examine amphibian populations as a part of the statewide monitoring program.

The bird species and their habitat use of JELA have been well studied in the BP through a variety of surveys that varied in effort and duration and have documented 247 species. Studies also have examined the species abundance and variation within different habitat types in the BP, as well as compared to other sites such as urban fragmented forests or coastal forests. More individuals and species have been found in the bottomland-hardwood forest and mean densities of obligate forest birds have been higher in JELA than the surrounding woodlots. No surveys have been conducted on the CBNC.

The limited knowledge of fish populations within the BP is based on three surveys and an annotated list by a park biologist that documented 42 species. The third of these surveys examined concentrations of selected organic compounds and heavy metals in the flesh of four fish species as well as documenting species diversity. Most of the fish detected were considered 'intermediate' in tolerance to poor water quality. Organic compounds were not detected in any of the fish samples but mercury concentrations were found in all four species with concentrations increasing with weight in the three predatory species. Mercury concentrations in larger fish could reach levels of concern for humans. A fourth survey began in late 2003 and will continue through 2005. Thirty species have been documented so far including 3 that were not detected in past studies. No surveys have been conducted on the CBNC.

In general very little is known about both the terrestrial and aquatic invertebrates within JELA. There have only been two surveys of terrestrial invertebrates conducted in the BP, one involving butterflies and the other spiders and flying insects. Butterfly counts were conducted from 1996-2001 in which a total of 43 species was detected. Fifty-one species of spiders have been documented in the BP, most of which were medium sized with a high proportion of orb spiders. Species diversity was negatively affected by forest fragment size and there was a high turnover of species in small fragments. Until recently, there had been no studies that focused on aquatic invertebrates so knowledge of populations within the park was limited. A slight amount of information had been gained during other studies due to recording of anecdotal evidence or reduced invertebrate sampling. A recent survey of the fish and invertebrate community examined floating rafts of aquatic plants and bottom material and documented 84 genera from 51 families and 7 genera from 9 families, respectively. Most individuals were freshwater species although brackish and marine species were also present. There is no information on the invertebrate community at CBNC.

The Barataria Basin was formed from three major courses of the Mississippi River. During these processes, sediment was deposited along the levees during floods and at the mouth of the active channels, creating longer channels and higher wider levees. Natural levees were formed when the heaviest particles were deposited next to the bank and the rest spread out gradually. This process created higher elevations closest to the river that sloped gradually away from the river. This variation in elevation allowed for the formation of the different habitats found in the BP. The higher grounds of the levees provide drier habitat for hardwood species. As the ground slopes away from the river, the habitat changes to freshwater swamps and finally marshes.

Two soil surveys have been conducted in Jefferson Parish, which includes the BP. Most of the soils at JELA are considered Kenner-Allemands, which are poorly drained soils with a thick mucky upper layer over a mucky clayey layer. Kenner muck, a semifluid organic soil that is flooded or ponded most of the time, dominated the soil type found at JELA. To a much smaller extent, Allemands muck, Barbary muck, Commerce silty clay loam, and Sharkey clay can be found in the park.

Information regarding groundwater on portions of the BP and CBNC is limited and has been documented in four reports between 1956 and 1988. In an investigation into the groundwater in the greater New Orleans area (which included CBNC and the northern portion of the BP), found that it existed in five aquifers; "shallow aquifer", the "200-foot" sand, the "400-foot" sand, the "700-foot" sand, and the "1,200-foot" sand. During that time, virtually all of the groundwater withdrawals came from the "700-foot" sand aquifer. More recent studies have found saltwater in the major aquifer for Northwestern Jefferson Parish and simulated a northern movement of the saltwater line and a decrease in water levels at higher groundwater withdrawal rates.

Surface water has been well studied in the park and projects have examined the change in hydrology, aquatic productivity, and water quality due to levees and canals. The hydrology of the park has changed drastically since the 1700's. Levees and canals designed to reduce the natural flooding of the Mississippi River have had a negative effect on the park's hydrology by altering the amount, rate, and type of water that enters the park. Prior to human intervention, overflow of the Mississippi levee would flow across the land through forests and marshes as well as through streams such as Bayou des Families and Bayou Coquille. This natural flow, which allowed sheeting across wetlands in the park and created deposits of new riverine sediments into the system, has been replaced by canals that funnel the water from the uplands and quickly out of the park so that, currently, very little water flows over the wetlands. Alterations to this hydrology channeled this nutrient rich overflow into waterbodies that were often unable to process these nutrient loads and eutrophication often occurred.

There is a large quantity of data regarding the surface water quality of the park. Much of the data came from specific water monitoring projects but other data were collected during studies relating to other communities in the park (e.g., fish, effect of salinity on marsh communities, etc). These studies have detected various pollutants, including fecal coliform and streptococci, manganese, mercury, multiple pesticides, high ammonia nitrogen, ammonia, ammonium, iron, CO_2 and low O_2 levels, in the park's bayous, canals, and lakes. The park contains five waterbodies that are considered impaired by the Environmental Protection Agency due to possible sources such as industry, petroleum activities, septic tanks, channelization, agriculture, and urban runoff. Multiple studies have noted increased salinity in surface water within the park. However, saltwater intrusion was not considered a serious problem as vegetation composition was changing but no significant wetland loss had occurred and the healthiest and firmest marsh occurred in areas with the highest salinity.

There has been no data collected within the park on air quality. However, there are a number of monitoring stations around the state that can be accessed to determine park air quality. National Atmospheric Deposition Program/National Trends Network (NADP) sites have documented a decrease in wet sulfate concentration and deposition, a decrease or no trend in wet ammonium concentration and deposition, but no trend in wet nitrate concentration and deposition. The mercury concentrations for the four Louisiana NADP Mercury Deposition Network (MDN) sites have had the highest maximum values of the 10 MDN sites in the Gulf Coast Network.

The BP consists of six ecological zones; natural levee live oak forest, ridge and swale bottomland hardwoods, backslope transitional red maple swamp forest, baldcypress-water tupelo swamp, fresh marsh and intermediate marshes, including large expanses of floating marsh and shrub communities, and bayous, ponds and estuarine lakes. These habitats can be grouped in more general terms into marsh and forested lands. Multiple studies have examined the vegetation, water quality, productivity, and the effects of saltwater intrusion, subsistence and water level rise on these habitats. A 1984 report described the conversion of freshwater marsh to intermediate marsh in the park and predicted the future availability of habitat with corresponding effects on wildlife populations. This concern with the effects of salinity levels continued to be an important research topic at the park. Some studies have found that salinity increased with depth and redox varies with the season. Vegetation varied depending on marsh type, which influenced the redox and along with the amount of marsh mat movement, affected the salinity and sulfide levels. Other studies have continued this research and addressed such topics as the effect of marsh movement on water circulation, the effects of salt pulses on the plant community and the link between plant and animal diversity in the marsh. In forested habitat, studies have examined the effect of water levels on the forest community. Studies have found that along an elevational gradient, water levels affected the community make-up, as well as the growth form and the ability of saplings of canopy species to regenerate. Other studies found much higher levels of CO_2 and CH_4 in swamp soils than transition and ridge soil types. These findings have lead some to hypothesize that if sea level rise and subsidence continued, the output of CH_4 in the ridge and transitional soil types could increase greatly and the ability of the hardwood habitat to perpetuate itself would also be in question.

Because of the park's proximity to New Orleans and its surrounding suburban landscape, it is subject to many environmental problems, including decreased air and water quality, disturbed lands, hydrologic disruption, habitat loss, and an increase in exotic species and pests. Additionally, because the park is located along the coast, issues discussed earlier such as subsidence and saltwater encroachment are also a concern. Canals constructed for the transportation of oil have severely altered the hydrology of the park and surrounding areas. Urban runoff and the contamination from sewage treatment plants have caused fish kills in the park's waterways. A number of exotic species have been located within the BP or have been documented nearby. Invasion of these species affect native populations through competition and predation and are therefore a concern for the park. Exotic plant species, such as water hyacinth, alligatorweed, and common salvinia, have been documented clogging the park's waterways. Chinese tallow has invaded the bottomland hardwood forest where it competes with native species for habitat and resources. Non-native animal species such as nutria, Eurasian wild boar, and Eurasian Starling, have been detected in the park. Arial surveys of the park have documented large areas of damage caused by nutria. The wild boar has been extirpated for about 10 years but can be found in surrounding areas and could reenter the park at anytime. These impacts have affected the quality of the habitat in the park and created a greater burden on these resources due to their declining availability in the general area.

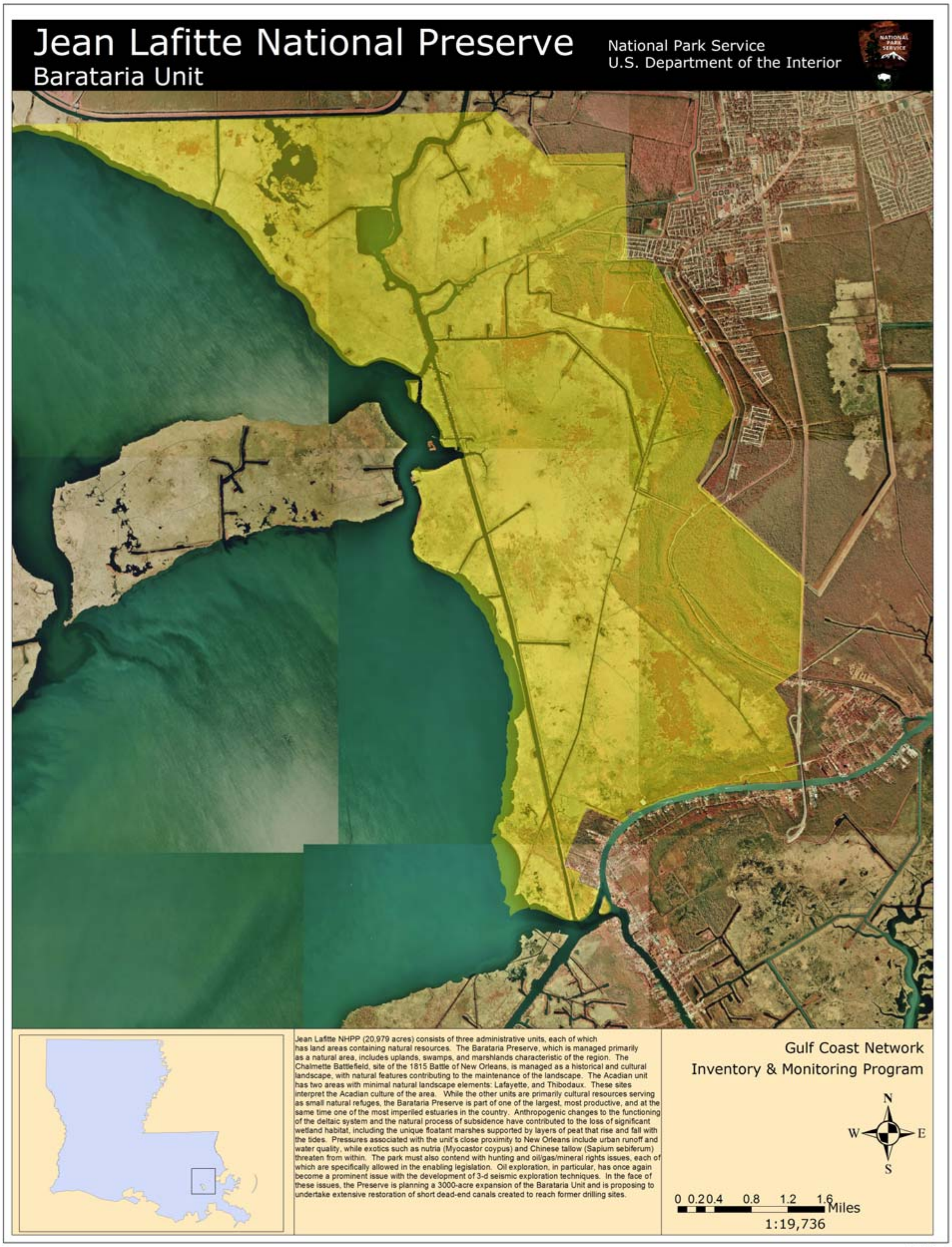


Figure 1. Location and extent of the JELA, one of eight parks in the Gulf Coast Network**.**

RESEARCH REVIEWS

BIOLOGICAL RESOURCES

Jean Lafitte National Historical Park (JELA) was established in 1978 and consists of six separate units that lie in the Mississippi Delta region and preserve the natural and/or cultural history of the area. Barataria Preserve (BP) and Chalmette Battlefield and National Cemetery (CBNC) are the only two JELA units in the Inventory and Monitoring Program and have had natural resource surveys conducted, thus are discussed in this review.

VEGETATION

Barataria Preserve

The BP is an approximately 8000-hectare area composed of natural levee live oak forest, ridge and swale bottomland hardwoods, backslope transitional red maple swamp forest, baldcypress-water tupelo swamp, fresh marsh and intermediate marshes, including large expanses of floating marsh and shrub communities, and bayous, ponds and estuarine lakes, just south of New Orleans, Louisiana (D. Muth, personal communication, 26 May 2004). Multiple vegetation surveys have been completed in the BP but have varied in the area covered.

General surveys, studies

White et al. (1983) conducted the first complete vegetation survey on what was about half of the current area of the BP. They classified the area into 4 natural habitat types; marsh, baldcypress-tupelo swamp, intermediate swamp, and hardwood bottoms, and documented 328 species in 88 families. About half of these species were typically found in roadsides and disturbed areas. Relative density, dominance, and frequency were calculated only for the forested sites. No endangered or threatened plants were found. Because the elevation affects saturation of the soil and the hydroperiod, vegetation changed drastically with slight changes (a few centimeters) in elevation.

In an effort to establish baseline data from which to monitor vegetation changes over time, Michot (1984) surveyed marsh vegetation of the three non-forested wetland habitats of the BP (fresh marsh, intermediate marsh, and scrub/shrub wetlands) during 1983. Fresh marsh had the highest number of species (55) and scrub/shrub wetlands had the highest number of individuals per square-meter. The western portion of the park had lower species diversity and contained the only salt tolerant species. Sixty-six species were detected on all transects combined, 12 of which had not been inventoried by White et al. (1983). Michot repeated these vegetation transects in 1984 and increased the samples per station from one to four for half of the transect lines (Fruge 1985). The resulting plant list included 15 species not found in the original survey. They also conducted two additional transect lines (one treatment and one control) to examine the effect of water control structures on marsh vegetation. These sites were resampled by White (1988), where he documented an additional four species. In addition to the vegetation survey, White (1988) also measured water temperature, salinity, and conductance at each plot. Michot and Doyle (1999) resurveyed the original four transects in 1993 and found little change in the species composition despite the predicted trends. Along with the 1993 surveys, the sites also were revisited with the U.S. Geological Survey (USGS) in 1994 and 1995 as part of a hydrological modeling project (USGS; Jean Lafitte National Historical Park and Preserve 1997). Wasilevich (1996) examined the flora of spoilbanks and found species richness increased with elevation and the diversity of the spoilbank was significantly higher than on control sites. Very little is known about the submerged aquatic vegetation (SAV) in the park. As of 1997, only some of the aquatic plant species had been documented and no inventories or studies had been conducted (Jean Lafitte National Historical Park and Preserve 1997).

In addition to structured surveys, the Resource Management Division of the park maintains a list of species documented in the park, many of which were not detected by the previous studies. These species have been entered into the NPSpecies database (Jean Lafitte National Historical Park and Preserve 1997). A small number of vascular plants also have been collected for a University of New Orleans, Southeast Louisiana voucher series (Jean Lafitte National Historical Park and Preserve 1997).

Although no federally listed species have been documented in the park, two rare plants (swamp milkweed, *Asclepias incarnata* and floating antler-weed, *Ceratopteris pteridoides*) and one species of unknown status (creeping spike-rush, *Eleocharis fallax*) have been recorded (Jean Lafitte National Historical Park and Preserve 1997).

Vascular plant inventories are scheduled to be conducted for both the BP and CBNC in the near future (D. Muth, personal communication, 17 March 2004).

Plant community studies

During his marsh study, Michot (1984) found an increase in open water on the western portion of the park that he attributed to saltwater intrusion. This intrusion was believed to have occurred relatively recently because freshwater species were killed off but these areas had not yet recolonized with saltwater species. Further support for the timeframe in which the intrusion occurred was seen in the variation of classifications for the area prior to 1970, which had classified the area as fresh marsh (Chabreck et al. 1968; O'Neil 1949; Wicker et al. 1980). The 1971 general soils map and 1978 vegetation map showed intermediate marsh east of the Bayou Segnette Waterway (Chabreck & Linscombe 1978; U.S. Department of Agriculture 1971). Michot (1984) named Lake Salvador and Bayous Segnette and Bordeaux as possible sources for the saltwater intrusion. Maintenance of the spoilbanks of Bayou Segnette and weirs on Pipeline Canal were mentioned as possible controls for the intrusion.

In a study examining the hydrology, salinity, and soils in the BP, Taylor (1988) disagreed with Michot (1984) on the cause of the recent development of open water in the western portion of the park, instead stating that the 1983 U.S. Fish and Wildlife maps show that very few open water areas have developed since the 1950’s. She found the mean salinity of the wetlands in the park had increased 1.2 ppt (parts per thousand) since the late 1950’s and this increase had resulted in a slight vegetation change on the western portion of the park. The increase in salt-tolerant plant species detected was indicative of a change from fresh to intermediate marsh. Taylor argued that this was not a serious intrusion because there had been no wetland loss; the vegetation composition was changing in response to the increased salinity and the areas with the highest salinity were the healthiest and firmest soils. Additionally she found regional subsidence was higher than local accretion rates for soil. Accretion rates were lowest if there was no sediment source and were highest in areas with mineral sediment sources. Most of the park was a quaking marsh while this accretion deficit was leading to the development of floating marsh in the park.

White and Thien (n.d.) also examined the vegetation in the BP. Despite showing indications of past anthropogenic activities (e.g., logging, cattle ranching, and oil exploration), they described the vegetation as relatively undisturbed. They found that elevation was the greatest factor influencing plant communities as it dictated soil moisture and salinity. The presence of plant species were, however, affected by severity of winter temperature.

Saso-Ostendorf and Lynn (1993) conducted a study to evaluate the use of infrared and normal aerial photographs and microwave data to classify vegetation and habitat types in the BP, but focused more on the use of the methods rather than vegetation in the park.

Species surveys, studies

Harper (1995, 1999) conducted a study examining the invasion of Chinese tallow (*Sapium sebiferum*) into a bottomland hardwood forest and found that there was no difference in the amount of treefall-gap between old-growth and second-growth forests. However, she found that palmetto trees (*Sabal minor*), a native palm in the area, were more abundant in the old-growth forest. A detailed study of *Sabal minor* was conducted in the park and found that the species grew slowly and may live for hundreds of years (Ramp 1989).

Williams (1999) examined the growth rate and pattern, and net above ground production of the sedge, *Carex luplina*. He found that shoot growth occurred though out the annual cycle but the highest rates were from March to June. Seed germination occurred during the fall. He concluded that the growth patterns exhibited by *C. luplina* and the canopy trees of the wet woods system indicated a climax community.

Fungi

Welden (2000) conducted a survey of the fungi of JELA. He documented 94 species, mostly Basidiomycetes, although there were also Ascomycetes, Myxomycetes, and Fungus Imperfectus. One species of lichen was also recorded. This was only a partial list as there were other specimens that had not yet been identified. Welden (2000) also suggested that the number of species would increase with repeated visits after more regular, frequent rains. Since this publication, an updated 2003 list has been created that has additional species listed (D. Muth, personal communication, 17 March 2004).

Chalmette Battlefield and National Cemetery

General surveys, studies

Bretting (1975) conducted the first analysis of the vegetation at the CBNC during the fall of 1974 and spring of 1975. He found 130 species from 40 angiosperm families with almost half of the species members of the Compositae, Graminae, Cyperaceae, and Leguminosae families. Fifty-two percent of the species were native. Plants were grouped into six habitats: ditch, field and pasture, batture, thicket, levee, and lawn. Bretting (1975) suggested that the high floral diversity was caused by mowing and the standing water in the park as well as the existence of large number of non-indigenous species. A subsequent inventory (Jean Lafitte National Historical Park and Preserve 1987) listed the forbs and gramminoids found on CBNC and compared the results with those found by Bretting (1975).

Rangers Pauyat and Moss conducted an inventory of the forest adjacent to the CBNC in 1989. The resulting list documented 16 existing species that they believed were part of the original swamp. They made recommendations for burning, thinning, buffers, and preserving live trees and snags to promote desired tree species and provide wildlife habitat (Jean Lafitte National Historical Park and Preserve 1989). A 1990 amendment to the general management plan states that this baldcypress swamp, which covers the northern portion of the park and Pauyat and Moss thought was original habitat, was instead likely a sugar cane field at one time. The moist soils were a result of the railroad grade and improper drainage (Jean Lafitte National Historical Park and Preserve 1990). Additional information regarding the location of the battlefield now suggests that this swamp was not in existence during the historic battle (D. Muth, personal communication, 26 May 2004).

Experts: Chalmette: Bretting (unknown location); BP: Michot, White, Doyle, Denslow, Battaglia

GENERAL FAUNA

General surveys, studies

An inventory of biological elements of the New Orleans-Baton Rouge Metropolitan Area was created by the U.S. Army Corps of Engineers (1975) and gives general information about the animals of the area and their habitats in the form of maps and tables.

In 1984, the U.S. Fish and Wildlife Service (USFWS) used Habitat Evaluation Procedures (HEP) to qualify and quantify available habitat for representative species of the major wildlife guilds in the various habitat types within the park (Michot 1984). The nine representative species consisted of five mammals, three birds and one reptile. Based on historical habitat acreage trends from 1956 to 1983, they predicted a decrease in total marsh acreage with a related increase in open water between 1983 and 2035. The composition of the remaining marsh would show a conversion of fresh marsh to intermediate. Following the same trends, 88% of the total marsh acreage could be considered intermediate by 2035. Wooded swamp and bottomland hardwood areas also were predicted to decline while shrub-scrub wetlands would increase. Upland forests (spoilbank) and upland developed areas were not predicted to change. Of the representative species, the Mottled Duck (*Anas fulvigula*), muskrat (*Ondotra zibethicus*), mink (*Mustela vison*) and Wood Duck (*Aix sponsa*) were expected to suffer significant habitat loss by 2035.

Muth (1991) discussed the natural history of the flora and fauna within the BP along with possible explanations for the presence or absence of particular species. Reasons ranged from natural (subsistence, relative age of land) to anthropogenic (hunted to extinction, introduced exotics). A list of known species with corresponding habitat also was included.

MAMMALS

General surveys, studies

Documentation of the mammal species that occur in JELA is currently incomplete or non-existent for portions of the BP. Two surveys occurred in the BP during the 1980's but did not sufficiently sample the marsh and swamp habitats that make up two-thirds of the preserve. No surveys have occurred on the CBNC. Smalley (1982) sampled mammals as part of a larger study that included amphibians, reptiles, mammals, and birds. Nine species were documented in the park through direct observation (both live and dead). No threatened or endangered species were detected. Rossman and Demastes (1989) conducted a survey of the larger mammals, small mammals, and bats. Using a variety of traps (live, snap, pitfall), mist-nets, visual observations, signs (tracks, scat, road kill, etc), and previous observations from reputable sources, they documented 15 species, including one bat, in the park. The habitats in which species were detected also were listed. In addition, they formulated a list of the park's probable species based on range maps. A third survey has begun that will examine the mammalian community on both the BP and CBNC. This study will include surveys for bats, small/medium mammals, and large mammals. Particular attention will be given to the status of both bats and carnivores as their populations are of special concern. Hood (2004) initiated surveys for the BP during fall 2003 and will begin surveys on the CBNC during 2004. This will be the first study documenting the mammal species on the CBNC.

Species surveys, studies

In addition to general surveys, a number of studies have been conducted on species or groups of species within the BP. Linscombe et al. (1989) described studies conducted on white-tailed deer (*Odocoileus virginanus*), furbearers, and American alligator (*Alligator mississippiensis*) populations. Deer populations exceeded carrying capacities in all areas surveyed and preferred browse showed signs of overuse. Populations were estimated at 300 individuals for the park. Linscombe et al. (1989) also examined furbearer populations and harvest records. None of the furbearer species were thought to be over-harvested. In fact, vegetation surveys indicated high nutria (*Myocastor coypus)* densities, particularly in areas with their preferred food, three-cornered grass (*Scirpus olneyi*). Recommendations for a furbearer-monitoring plan were outlined for nutria only, due to their high numbers and harvest rates. Management recommendations for deer and furbearers were discussed. A database of hunting records was established in 1997 to provide data for a 1998 white-tailed deer trend analysis study (Jean Lafitte National Historical Park and Preserve 1997). Nyman and Bordelon (2003) began a study to estimate the density of white-tailed deer within the portion of the BP where hunting was prohibited. Vegetation will also be surveyed to determine if the population has had any adverse affects on the flora. Data collection was scheduled to conclude during 2004.

Experts: C. Hood and L. Nolfo (Loyola University), J. Nyman and S. Bordelon (Louisiana State University), R. Linscombe and N. Kinler (The Louisiana Department of Wildlife and Fisheries)

HERPETOFAUNA

Conner and Day (1987) reported that over 60 species of herpetofauna have been recorded in the Barataria Basin, including 22 snakes, 15 turtles, 11 frogs, 6 salamanders, 6 lizards, 4 sea turtles, 3 toads, and the alligator. Highest species diversity has been reported along the ridges and levees in the baldcypress swamps, followed by the spoil banks and levees in fresh and intermediate swamps.

Reptiles

General Surveys, studies

Three inventories of the herpetofauna have occurred in the BP in the recent past and documented 32 species of reptiles. In 1980 and 1981, Smalley (1982) surveyed the fauna of the BP on what was about half the current area of the preserve and documented 11 reptilian species. Documentation was likely through direct observation only, as there was no mention of traps or nocturnal audial sampling. Rossman and Demates (1989) conducted the second herpetofaunal survey and recorded 20 species of reptiles. They conducted a mostly observational survey, walking diurnal-transects searching under logs and debris with the occasional use of dip-nets. Audial transects were conducted in the evenings. The use of funnel- and tilt-traps was recommended for future surveys to more accurately sample the turtle community. They also included accounts from historical records of species captured on or near park lands and commented on the probability of existence in the park as well as the habitat in which they would likely be found. During the last survey, Anderson and Seigel (2003) captured and observed 1107 individuals from 32 species of reptiles. The increase in species captured over Smalley (1982) and Rossman and Demates (1989) may reflect the variety of sampling methods used in this survey attempt. Species richness was highest in baldcypress/tupelo swamps, intermediate in hardwood forest, and the lowest in the marsh. However, more species with restricted distributions were found in the marsh. Anderson and Seigel (2003) caution that these numbers may be affected by the difficulty in sampling some of these habitats (primarily marsh) and the short period in which the data were collected.

Species surveys, studies

Linscombe et al. (1989) described a 1988 survey to estimate the density of nesting alligators. Aerial transects sampled 6.7% of the marsh in the BP. Nest densities were estimated at 1 per 131 acres. They recommended continued monitoring of populations through the use of nest counts, night counts, and analysis of harvest data, and use of this data to determine harvest limits. During 1990, park staff conducted an alligator survey of four of the park’s waterways (D. Muth, personal communication, 17 March 2004).

Cambre described the release of 26 turtles from 2 species that were released into the park at known locations during 1988 (Cambre 1988).

Experts: N. Anderson and R. Seigel (Southeastern Louisiana University)

Amphibians

General surveys, studies

Amphibian inventories were performed in the BP by Smalley (1982), Rossman and Demastes (1989) and Anderson and Seigel (2003), which together documented a total of 18 species within the preserve. Smalley (1982) performed a survey of vertebrates in the BP from March of 1980 to October of 1981 and found 3 species of amphibians. Dry weather and the resulting lack of standing water likely affected the low number of species detected. Additional genera were mentioned but the author apparently did not detect these smaller frog species. Rossman and Demastes (1989) detected an increased species diversity including 11 new species. Historical accounts and available habitat were also included. Anderson and Seigel (2003) completed a year long survey in 2003 and recorded 16 species from 1504 individual amphibians. Chorus frogs and bullfrogs previously found at BP were absent from these surveys. Although the authors caution that, due to the limited sampling period, this was not necessarily indicative that these species were extirpated from the park, but they did urge future monitoring to focus, in part, on sampling for these species. Both the 1983 and 2003 studies recommend the use of newts for ecological studies due to their high abundance (Anderson & Seigel 2003; Rossman & Demastes 1989). Although Anderson and Seigel (2003) considered the three surveys incomplete, they claimed that it was likely that 85-90% or more of the herpetofauna of the preserve had been recorded. Although they found hand searching to be the most effective way to sample both salamander and reptiles, they recommended coverboards and minnow traps for use in a long-term monitoring program because these methods rely less on the skill of the surveyor and would provide less variable results. They created an annotated list of all amphibians and reptiles documented in the BP that detailed basic biological information as well as the effectiveness of possible capture methods. They also noted the pressure from human disturbance on the park's herpetofauna due to collecting, outside landuses, and feral animals, and recommended a regular monitoring program to continually assess populations.

Park surveys have also been conducted as a part of the statewide Louisiana Amphibian Monitoring Program (LAMP). Data has been collected from 2000 to 2003 although the data has not yet been summarized (D. Muth, personal communication, 17 March 2004; Louisiana Department of Wildlife & Fisheries 2004)

Experts: N. Anderson and R. Seigel (Southeastern Louisiana University)

BIRDS

General surveys, studies

A number of volunteer based surveys that are at least partially within the park's boundaries have been conducted periodically. The Breeding Bird Survey, a long-term monitoring program designed to monitor the status and trends of avian populations in North America, had a route that cut north through the middle of the BP but the route is no longer active. The route was sampled periodically for 14 years from the late 1960's through the early 1990's (USGS Patuxent Wildlife Research Center 2004). A nearby route on the Mississippi River began surveys in 1991 and is still active. Christmas Bird Counts, another type of long-term monitoring project, were only conducted during December of 1982 and counted over ten thousand birds of 83 species (National Audubon Society 2004).

The bird species and their habitat use of JELA have been well studied in the BP through a variety of surveys that varied in effort and duration. No surveys have been conducted on the CBNC. Smalley (1982) conducted a general faunal inventory and developed a list of bird species seen in the BP. The survey was a non-standardized observational study that was conducted during 38 trips to the park. There have also been numerous individual surveys completed since the middle 1980's, including one by David Muth, the Natural Resource Manager of the park and an acknowledged authority, that documented a massive fall migration fallout. A fallout consists of birds that are forced to the ground normally due to adverse weather conditions. Based on crude surveys, he approximated 7.44 Magnolia Warblers (*Dendroica magnolia*; the most common species) per acre or 59,000 Magnolia Warblers when extrapolated to the park and surrounding forest. Aerial waterfowl surveys also were conducted during fiscal years 1983, 1984, and 1985 by David Muth. Mid-winter eagle surveys were conducted during 1984 (Isenogle 1984). Mid-winter bird surveys were conducted by volunteers and park staff 2 February 1986 and 8 February 1987. In 1986, 10,073 individuals of 89 species were counted by 13 observers in 4 parties, for approximately 48 party hours; in 1987 21,904 individuals of 102 species were counted by 15 observers in 4 parties, for about 48 party hours. The combined species total for the two years was 106 species (D. Muth, personal communication, 26 May 2004). Nest monitoring also occurred in the park from 1985-1991 and a mist-netting effort was conducted during 1990. Muth also maintained daily checklists over a ten-year period for birds detected at the BP. These data were compiled into a checklist of 203 species for the BP and the adjacent lakes (D. Muth, personal communication, 17 March 2004). A more recent checklist has been completed and contains approximately 247 species. No reports have been written to summarize any of the findings from these surveys or monitoring projects.

Woodrey and Moore (1990) discussed avian use of Ft. Morgan and JELA during the 1990 fall migration. The density of migrants at JELA was much lower than that of Ft. Morgan, likely due to the habitat structure and location. JELA has taller more dense trees than does Ft. Morgan, and is located 30 miles inland compared to Ft. Morgan's coastal location.

Kratter (1994) conducted a survey of fall migrant landbirds in two habitats, bottomland hardwood forest (BLH) and baldcypress-tupelo forest (CT), in the BP during 1994. He documented a total of 54 species, 31 migrants and 23 non-migrants, in both habitat types. When examining habitat usage, Kratter found that more individuals and more species were found in the BLH forest and that these increases were due entirely to the migrating birds. During the following May and June, Dunn (1995) conducted avian surveys in four habitat types in the BP. He detected 54 species in the park and recommended that future surveys include at least 100 5-minute surveys, stratified by habitat or particular areas of interest.

Breeding bird and Neotropical migrant surveys were conducted during the 1990's on permanent point count stations established in the park (D. Muth, personal communication, 17 March 2004; Jean Lafitte National Historical Park and Preserve 1997). Although no federally threatened or endangered resident species exist within the park, there have been a number of listed species documented in the park.

Yaukey (1999, n.d.) compared the forest bird communities between urban forest fragments around New Orleans and those within forested hardwood habitat in the BP during 1995 through 1997. He found mean densities of obligate forest birds were higher in the JELA than the surrounding woodlots. He also found low Brown-headed Cowbird (*Molothrus ater*) parasitism both within JELA and in the urban woodlots.

Experts: D. Muth, P. Yaukey, M. Woodrey

FISH

General surveys, studies

The limited knowledge of fish populations within the BP is based on three surveys and an annotated list by a park biologist. The first two surveys had difficulties sampling in the park and this may have affected the species documented. A fourth survey began in late 2003 and will continue through 2005. No surveys have been conducted on the CBNC.

Using gill nets, minnow seine, minnow nets, and observation during a three-day sampling period, Kucera (1984) detected 19 freshwater species and 6 euryhaline species of fish. Samples were taken at 14 locations within the park, including Marsh Pond, Bayou des Familles, and a number of canals. Kucera (1984) noted the number and location of the fish captured and found mosquitofish (*Gambusia affinis*), least killifish (*Heterandria formasa*), sailfin molly (*Poecilia latipinna*), and golden topminnow (*Fundulus chrysotus*) were the most abundant in the park. Two problems associated with sampling methods were that small fish swam through the larger gill nets and the soft mud bottoms made seine sampling difficult. Two fish and two sediment samples were tested for organochlorine compounds resulting in no reportable residues.

A Louisiana Wildlife and Fisheries Department (LWFD) survey (unpublished as described in Seale 1999), also conducted in 1984, sampled fish within the adjacent Lake Salvador waterway. This survey used netting and application of rotenone in three one-acre stations and documented 20 species of fish, including 8 species not detected inside the park.

During 1998 and 1999 LWFD and Seale sampled fish outside and within the park, respectively. Seale (1999) summarized her data and that of LWFD and found a total of 28 species within or just outside the park boundaries. When including all sites LWFD sampled, the total species count rose to 47. During the first survey period, hoop nets, minnow traps, and dip nets proved ineffective in the densely vegetated waterways within the park so Seale switched to electrofishing for the next two surveys. Data from water samples taken within the park showed low dissolved oxygen levels during the summer, which were considered stressful for fish.

Swarzenski et al. (2004) conducted a survey of the fish community in the waterways of the BP during 1999 and 2000. They documented 32 species within the park, most of which were considered 'intermediate' in tolerance to poor water quality. In addition to examining the species make-up of the fish community, they examined concentrations of selected organic compounds and heavy metals in the flesh of four fish species. Organic compounds were not detected in any of the fish samples but mercury concentrations were found in all four species with concentrations increasing with weight in the three predatory species. Mercury concentrations in larger fish could reach levels of concern for humans.

Barnes (personal communication, May 2004), an NPS Ranger and ichthyologist, created a list of 42 species that had been caught by fishermen or researchers and verified.

Inventories for a two-year study in the BP began during September 2003. The initial surveys (6 days of sampling) focused on the Pipeline Canal, Tarpaper Canal, the Twin Canals, and near the shoreline of Lake Salvador and found a total of 30 species, three of which have never been detected on previous surveys near the BP (Schultz 2003). Fifteen of the 42 species collected in past surveys have not yet been found. An analysis of the relationship between species distributions and habitat parameters also will be conducted with a final report expected in 2005.

Experts: Schultz, Swarzenski

INVERTEBRATES

Terrestrial Invertebrates

Research on the terrestrial invertebrates on BP is sparse. There have only been two surveys of terrestrial invertebrates conducted in the park, one involving butterflies and the other spiders and flying insects (Hulslander 2001; Valderrama-Ardila 2004).

Butterfly surveys

Butterfly counts were conducted from 1996-2001 in which an average of 22 species was detected each year and a total of 43 species was detected throughout the coarse of the study (Hulslander 2001). The study continued through 2003 although there has been no updated summary done.

Spider and flying insect surveys, studies

There is currently no systematic list of the spiders for the state of Louisiana. Hurbert (1923) documented 186 species of spiders from various habitats mainly around the city of New Orleans and surrounding cities; 33 of these species were found in bottomland hardwood forests. Valderrama-Ardila (2004) conducted a study on the effects of fragmentation of hardwood forests on the spider communities in Southeastern Louisiana. One of the eleven sites was located on the northern portion of the Plantation Trail at the BP. Valderrama-Ardila (2004) captured 514 individuals from 51 species (plus 2 unknown) in the BP during the 1999, 2000, and 2002 sampling periods. These spiders were mostly medium sized with a high proportion of orb spiders. Overall he found that forest fragment size did negatively affect species diversity and there was a high turnover of species in small fragments. During this study, Valderrama-Ardila (2004) also used malaise traps to capture insects, which he identified to order. He found that dipterans were more abundant in smaller fragments while hymenopterans had the reverse trend.

Aquatic Invertebrates

Until recently, there had been no studies that focused on aquatic invertebrates so knowledge of populations within the park was limited. A limited amount of information had been gained during other studies due to recording of anecdotal evidence or limited invertebrate sampling. In addition to the ancillary information from these projects, a recent survey of the fish and invertebrate community was conducted by USGS personnel in the park (Swarzenski et al. 2004).

During a 1981-1982 water quality study, Garrison (1982) sampled benthic macroinvertebrates from six sites in the BP. All sites contained members of biting midge larvae (*Bezzia* and *Probezzia*), phantom midge larvae (*Chaoborus*), amphipods (*Gammarus*), and midge larvae (*Goeldichironomus* and *Chironomus*). Other sites had tubificid worms (*Limnodrilus*), midge larvae (*Clinotanypus*), polychaetes (*Streblospio*), and amphipods (*Corophium*). The dominant species at half of the sites were considered tolerant to decomposable organic wastes.

Kucera noted large numbers of grass shrimp (*Palaemonetes spp.*), crawfish (*Procambarus spp.*), and blue crabs (*Callinectes sapidus*) during a fish collection trip in 1984. Blue crabs are found along the northern coastline of Lake Salvador and throughout Lake Cataouatche during their maturation period (Bahr & Hebrard 1976). Bahr and Hebrard (1976) discussed the negative effects that saltwater encroachment would have on the blue crab. Declining populations in Lake Salvador have been detected as far back as the early 1960's, which Jaworski (1972) attributed to increased pollution.

Swarzenski et al. (2004) conducted a survey of the invertebrate community in the waterways of the BP during 1999 and 2000. They examined floating rafts of aquatic plants and bottom material and documented 84 genera from 51 families and 7 genera from 9 families, respectively. Most individuals were freshwater species although brackish and marine species were also present.

Experts: Valderrama-Ardila (spiders), C. Swarzenski (aquatic)

THREATENED AND ENDANGERED SPECIES

A number of federal and state listed threatened or endangered species have been documented or have ranges that may allow them to exist on either portion of JELA. A list of these species was adapted from the JELA 1997 Resource Management Plan (hereafter RMP 1997) using current park research (where available) and exists in Appendix A (Jean Lafitte National Historical Park and Preserve 1997).

PHYSICAL PROPERTIES

Several general overviews have described the ecology, hydrology, geology, and habitats of the Barataria or Terrebonne-Barataria Basins but few have detailed information regarding the JELA (e.g., Bahr & Hebrard 1976; Conner & Day 1987; Gosselink & Sasser 1991). The U.S. Army Corps of Engineers (1975) created an atlas containing maps and a large amount of data on the physical properties, such as the mineral resources, groundwater, surface water, coastal processes, and climate, of the New Orleans-Baton Rouge Metropolitan Area.

GEOLOGY

General geomorphology

In her historical resources study, Holmes (1986) described the formation of the Barataria Basin from three major courses of the Mississippi River. The western boundary of the BP was formed by the Bayou Lafourche Lobe, which formed from 4,500 B.C. to 3,900 B.C. The river shifted to the west for a short period to form the Terrebonne Lobe, then shifted to channel most of the river water through Bayous des Familles and Barataria (3,300 B.C. to 1,800 B.C.). The levees formed by Lafourche and des Familles Barataria began to form what is now known as the Barataria Basin. During these processes, sediment was deposited along the levees during floods and at the mouth of the active channels creating longer channels and higher wider levees. Natural levees were formed when the heaviest particles were deposited next to the bank and the rest spread out gradually. This process created higher elevations closest to the river that sloped gradually away from the river (White et al. 1983). This variation in elevation allowed for the formation of the different habitats found in the BP. The higher grounds of the levees provide drier habitat for hardwood species. As the ground slopes away from the river, the habitat changes to freshwater swamps and finally marshes.

Once a channel was abandoned, forces from the Gulf of Mexico began to erode the edges of the lobe (Holmes 1986). Seale (1999) estimated the shoreline erosion rates on the shore of Lake Salvador vary from 33 to 65 ft/year. Sediments from erosion by the gulf deltaic lobes have formed the barrier islands. Boyd and Penland (1992) described the evolution of the Mississippi Delta following abandonment and detailed the erosion of the headlands and formation of flanking barrier islands, barrier island arcs and an inner shelf shoal. In addition to the erosion of the shoreline, the area was also experiencing subsidence. The compaction of the previously deposited sediment in addition to the slanting trend of the coastal shelf below caused the land to sink. Taylor (1988) and Denslow and Battaglia (2002) also listed oxidation, canal and levee construction, the resulting disruption of freshwater and reduction in new sediment, saltwater intrusion, and extraction of gas, water, or other minerals as reasons for subsidence of the land. Penland and Ramsey (1990) found that the Holocene deltaic deposits were subsiding at about 1 cm yr^{-1}.

Taylor (1988) described how the BP, like much of the Louisiana coast, was greatly affected by the impoundment of natural waterflow. Flood protection levees and canal levees have disrupted the natural waterflow that once allowed floodwater to flow from the Mississippi River through the forest and marshes, depositing sediment and nutrients into the park. Excess water no longer sheets across the swamps and marshes but instead bypasses these wetlands and is channeled through bayous and channels to open water. Some areas behind spoilbanks retain water for extended periods and cause a reduction in productivity and changes in species composition. Currently the resuspension of bay bottom sediments caused by winter storms is only source of sediments for the park. Taylor et al. (1988) found that the vertical soil accretion within the park's wetlands was significantly less than the apparent water level rise. Based on the documentation of Zilkoski and Reese (1986), Conner and Day (1988) and Bourne (2000), Denslow and Battaglia (2002) estimated sea-level rise at Barataria Bay to be about 12 mm/yr. The vertical accretion varied according to access to sediment sources with those wetlands behind spoils having significantly lower accretion rates than those near sources such as lakes. Mineral content of vertical accretion was highest near the lake. Most soils were characteristic of those in fresh or intermediate marsh, with low bulk densities, high water content and high organic matter. Taylor (1988) found most of the park was a quaking marsh but the accretion deficit was leading to a development of floating marsh in the park.

Soils

Two surveys have been conducted on the soils of Jefferson Parish, which includes the BP. The first survey was conducted by the USDA and Louisiana Agricultural Experiment Station; it found the soils in the park consisted of Kenner muck, Allemands peat, Barbary soils, Sharkey clay, and commerce silty clay loam (U.S. Department of Agriculture & Louisiana Agricultural Experimental Station 1978). The formation of soil types depended on a number of factors including the source material, climate, living organisms, topography, and how long the soil had been developing. In the second survey, Matthews (1983) described most of the soils at JELA as Kenner-Allemands, which are poorly drained soils with a thick mucky upper layer over a mucky clayey layer. Kenner muck dominated the soil type found at JELA. It was a semifluid organic soil that was flooded or ponded most of the time. To a much smaller extent, Allemands muck, Barbary muck, Commerce silty clay loam, and Sharkey clay can be found in the park.

Additional descriptions of soils found in portions of the park have been included in a number of other studies. In her ecological description of the BP, Taylor (1988) described the soils in the park as highly organic Holocene soil series including Allemand, Kenner, Lafitte, and Larose. White et al. (1983) found two 'distinct' soil classes during their vegetation survey; alluvial soils of the Inceptisols type and Histosols, which supported the hardwood bottom and marsh vegetation, respectively. The East Central Barataria Cooperative River Basin Study Report highlighted spatial distribution of environmentally sensitive soils (erosive or otherwise fragile) as well as other ecologically important zones (Jean Lafitte National Historical Park and Preserve 1997). A report by Eustis Engineering (1992) examined the subsurface soil (to 70 ft below the surface of the lake) along the east side of Lake Salvador. The soil was broken into three classes that coincided with depth. A short discussion of the encroachment of lake's edge on the Bayou Segnette preceded a description of two possible wave-breaking structures that could be constructed to reduce further erosion.

Experts: Natural Resource Conservation Service

<u>Hydrology</u>

According to the RMP 1997, the BP was located within the 100-year floodplain with more than 95 % of the park considered wetlands (predominately palustrine, plus palustrine scrub-shrub and estuarine intertidal emergent; Jean Lafitte National Historical Park and Preserve 1997).

Groundwater

Information regarding groundwater in JELA is limited. Groundwater supplies for the greater New Orleans area were first detailed by Eddards et al. (1956). Cardwell et al. (1963) compiled data for the Baton Rouge-New Orleans area, and a 1966 Water Resource Bulletin studied the groundwater of the greater New Orleans area. A 1983 report updated the New Orleans information and a 1988 report gave more specific information for the Jefferson Parish.

Surveys, studies

Eddards et al. (1956) covered an extensive area surrounding New Orleans and summarized previous groundwater data for the area. In his investigation into the groundwater in the greater New Orleans area (which included CBNC and the northern portion of the BP), Rollo (1966) found that it existed in five aquifers; “shallow aquifer”, the “200-foot” sand, the “400-foot” sand, the “700-foot” sand and the “1,200-foot” sand. During that time, virtually all of the ground-water withdrawals came from the “700-foot” sand aquifer. Water from this aquifer had a yellow color due to the leaching of water through decaying vegetation but was not harmful. Extensive pumping from this aquifer caused a northward movement of saltwater. Rollo suggested a restriction in increased water use and recharging the “700-foot” aquifer with recycled water in order to maintain a reliable supply for the future and to avoid contamination of the supply by saltwater encroachment.

Dial (1983) examined groundwater data and compared it to the previous reports and found that the water levels had not declined as was predicted, likely due to a reduction in pumpage and better water conservation measures. He found that the water levels had in fact increased during the last few years. He also found that the saltwater line had been drawn from an area near downtown out to the north and eastern parts of the city due to the reduction in pumping at the downtown site and increased pumping in the other areas. Dial and Tomaszewski (1988) studied the groundwater of New Orleans and found that the major aquifer for Northwestern Jefferson Parish contained saltwater. Simulations of groundwater withdrawals from northeast Jefferson Parish show a northern movement of the saltwater line at higher withdrawal rates as well as a decrease in water levels.

Taylor (1988) reported the average annual precipitation in the Barataria Basin was 156 cm/yr but only 61 cm/yr was available for runoff and groundwater recharge because much was lost to evaporation. Most of the freshwater input available to JELA was through precipitation.

The USGS maintains a searchable database for historic and current water levels, quality and flow measurements (USGS 2004).

Surface water

General hydrology

A water quality inventory report listed the surface water resources for JELA as coastal wetlands, canals, bayous, lakes (Salvador and Cataouatche), the Mississippi River, and the Intracoastal Waterway (Horizon Systems Corp. 1994). Gorin (1989) described the history (natural vs. manmade, age, reason for creation, etc.) of 17 canals and waterways in the BP.

Taylor (1988) and Taylor et al. (1988) found that the hydrology of the park has changed drastically since the 1700's. Levees and canals designed to reduce the natural flooding of the Mississippi River have had a negative effect on the park's hydrology by altering the amount, rate, and type of water that enters the park. Prior to human intervention, overflow of the Mississippi levee would flow both across the land through forests and marshes and through streams such as Bayou des Families and Bayou Coquille. This natural flow, which allowed sheeting across wetlands in the park and created deposits of new riverine sediments into the system, has been replaced by canals that funnel the water from the uplands and quickly out of the park so that, currently, very little water flows over the wetlands. Alterations to this hydrology channeled this nutrient rich overflow into waterbodies that were often unable to process these nutrient loads and eutrophication often occurred (Taylor et al. 1988). They also found that the spoils, which line the canals, retain drainage in some areas resulting in portions of the park under 0.5 meter of water throughout the year, leading to lower productivity and seedling regeneration. In a marsh vegetation study of the BP, White (1988) also measured water depth, temperature, salinity, and conductance at each plot. Average water depth varied between the eastern and western portions of the park but was likely due to the slower drainage of abnormally high tides on the eastern portion.

A 1985 Environmental Protection Agency's (EPA) report investigated rainfall and wind effects on water levels and storage capacity, tides of the neighboring Bayou aux Carpes swamp, and the water transport, salinity, macroinvertebrates, and nutrient exchange in the Barataria Waterway (EPA 1985).

Water Quality

There is a large quantity of data regarding the surface water quality of the park. Much of the data came from specific water monitoring projects, such as Garrison (1982) and Baron (1992), but other data were collected during studies relating to other communities in the park (e.g., fish, effect of salinity on marsh communities, etc).

Alterations to the natural waterflow and increased development within the area have affected the water quality within the park. Hopkinson and Day (1979) analyzed aquatic productivity and water quality in waterbodies in the Barataria Basin, including Lake Salvador. They found a high nutrient load for the lakes and discussed how the increasing development may threaten the ability of the water to process nutrients. Data collected for a proposed water quality investigation in April of 1981 found high fecal bacterial counts and low dissolved oxygen.

Garrison (1982) conducted a baseline examination of water quality, including a variety of biological, chemical, and physical parameters, from six sites in the BP. The grain-size analysis of the bed material indicated that 80-90% of the bed material was silt and clay, with little or no sand. Physical properties and inorganic chemicals varied according to site and time of year. Samples taken from Millaudon Canal had fecal coliform levels (FC) consistently higher than all other sites and the FC/FS (fecal streptococci) ratio indicated that half of these samples contained human waste. Analysis of the water for trace elements found all samples were below the EPA tolerance levels for domestic water supply except manganese (one site) and mercury (all sites). Concentrations for most pesticides were lower than detection levels except for diazinon and 2,4-D, which were found in low concentrations in the water. Pesticides were detected in the bed materials (Garrison 1982).

Water quality measurements were taken in response to two fish kills detected in park waterways (Berjarano 1982, 1985). Results from the 1982 water quality samples revealed extremely detrimental conditions for fish (e.g., high ammonia nitrogen, ammonia, ammonium, iron, CO_2, and low O_2 levels). High numbers of sewage fly pupa, a biological indicator of organic pollution, were found in the water. In addition to urban runoff, known points of entry for pollutants include the Bayou Segnette Pumping Station and multiple sewage treatment plants (including Westwego's Sewage Treatment Plant). The second fish kill was linked to low dissolved O_2 indirectly caused by Hurricane Danny. High ammonia concentrations were also found at one station during 1985, which also indicated sewage pollution.

Demcheck (1991) conducted a seven-day study of the quality of the water flowing in and out of the Barataria estuarine system in a tidal cycle. He found increased algal growth that was likely due to increased nutrients in the water from sewage. He did not find DDT or its breakdown components, which had been detected during the 1970's, but did find other organic compounds at low concentrations.

Baron and Newkirk (1992) analyzed water quality data collected by the USGS and the National Park Service (NPS) from 1981 to 1991 to examine possible trends during this period as they related to specific park concerns (such as potential saltwater intrusion, reduction in wetlands, and contamination by human waste, urban sewage, and chemicals from agriculture) and to determine if the current sampling strategy was adequate. They also summarized other studies that had occurred during that period (Demcheck 1991; Garrison 1982, 1985; Taylor et al. 1988), described the extent of analysis and discussed findings if available. In her final report, Baron (1992) recommended monitoring the effects of a number of additional environmental factors including sewage, pumps, abandoned oil and gas wells, canals and erosion on water quality. She also listed multiple avenues for future research.

A baseline inventory of water quality of JELA, which examined data from EPA databases, found 14 groups of parameters that exceeded water quality screening limits at least one time in the study area (Horizon Systems Corp. 1994). Seventeen of the 120 monitoring stations were located within the park; the rest exist within the study area. Five of the park's monitoring stations collected long-term data. The report summarized the existing water quality data from prior monitoring efforts, descriptive statistics of seasonal and annual trends, and compared this data with relevant EPA and WRD water quality screening criteria. This report described waters that were impacted by anthropogenic activities such as development, stormwater runoff from paved areas, industry, and boat traffic in the waterways.

Bi-weekly monitoring of the water quality at 11 sites in or near the BP sampled basic water quality parameters (Jean Lafitte National Historical Park and Preserve 1997). Water quality data were also collected for the Inner Millaudon Canal (in the BP; Jefferson Parish Louisiana Environmental and Development Control Department n.d.). While sampling fish populations, Seale (1999) found dissolved oxygen levels in the summer between 2.27 -2.68 mg/l, which were considered dangerous conditions for fish.

From March 1999 to May 2000, Swarzenski (2002) conducted a follow-up survey of the six water-quality survey sites Garrison sampled during 1981-1982 in the BP. Six additional sites were also sampled. Chemical levels in the bottom sediments changed between the two surveys. Levels of DDT and DDE (a degradate product of DDT) suggested that DDT concentrations were reducing in the bottom sediments. PCB levels, however, were similar or increased since the original samples. Trace element levels varied according to element and location.

In a survey of the fish and aquatic invertebrate community within the BP, Swarzenski et al. (2004) examined concentrations of selected organic compounds and heavy metal in the flesh of four fish species. Organic compounds were not detected in any of the fish samples but mercury concentrations were found in all four species with concentrations increasing with weight in the three predatory species. Mercury concentrations in larger fish could reach levels of concern for humans. Additionally, most of the fish species detected in the park were considered 'intermediate' in tolerance to poor water quality.

Water quality data for surface water in the state, including the New Orleans area, have been monitored by multiple state, federal, and local agencies. To comply with Section 303(d) of the Clean Water Act, states are required to compile a list of impaired waters every two years. The modified court ordered 1999 list contained five impaired waterbodies on or near JELA (Table 1). Additional data on water quality (including physical, biological and chemical parameters) and flow of Louisiana waterbodies are listed on the USGS website (USGS 2004). Additionally, water quality samples taken in the park over the years have been incorporated into a database managed by USGS and will be used for habitat modeling in the park.

Table 1. Waterbodies within JELA listed on the Louisiana state 1999 303(d) list, which denotes waterbodies that do not meet the standards set for their use.

Waterway	Concern	Possible Sources
Bayou Barataria	siltation, salinity, TDS, chlorides, sulfates, oil & grease, nutrients	minor industrial point sources, package plants, petroleum activities, channelization
Lake Cataouatche	nutrients, organic enrichment, low DO, pathogen indicators, oil & grease, priority organics	industrial, municipal, storm sewers, petroleum activities, spills
Lake Salvador	priority organics, nutrients, salinity/TDS/chlorides/sulfates, radiation, oil & grease, pathogen indicators, noxious aquatic plants	minor industrial point sources, petroleum activities, septic tanks, spills, contaminated sediments, recreational activities, upstream sources, channelization/dredging
Intracoastal Waterway	nutrients, oil & grease, organic enrichment/low DO, pathogen indicators, radiation, salinity/TDS/chlorides/sulfates, suspended solids, turbidity, pesticides	pastureland, petroleum activities, septic tanks, spills, upstream sources, industrial
Bayou Segnette	organic enrichment, low DO, pathogens, oil & grease, nutrients	collections system failure, other source, urban runoff, storm sewers,

Salinity

Multiple studies have noted increased salinity in surface water within the park. Kucera (1984) noted, during his fish collection trip in 1984, salinity levels for all waters were less than one ppt. Taylor (1988) and Taylor et al. (1988) found the mean salinity of the park had increased 1.2 ppt since the late 1950's and the vegetation in the western portion of the park was now dominated by *Spartina patens*, a salt tolerant species. However, they did not find the saltwater intrusion to be a serious problem as vegetation composition was changing but no significant wetland loss had occurred and the healthiest and firmest marsh occurred, in areas with the highest salinity. Taylor (1988) found that salinity in JELA varies with the seasons. Salinities were low in the winter due to high freshwater runoff and offshore winds. Levels increase in the spring due to an increase in evapotranspiration and onshore winds. Evapotranspiration remains high through the summer but offshore winds decrease causing lower salinity levels. Fall levels peak due to a return of the offshore winds while evapotranspiration remains high. Computer modeling of waterflow and salinity transport in the park found little negative effect from upland runoff but instead was sensitive to tidal effects (Taylor et al. 1987).

Garrison (unpublished, as described in Baron & Newkirk 1992) also collected salinity samples across the Barataria Basin during one day in August of 1985 to examine the influx of sea water south of the BP.

Experts: C. Swarzenski (USGS)

AIR QUALITY

Air quality data collected in the park is non-existent (D. Muth, personal communication, 17 March 2004; Jean Lafitte National Historical Park and Preserve 1997). Although no data has been collected in the park, air quality data for ambient air in the state, including the New Orleans area, have been monitored by The Louisiana Department of Environmental Quality (LDEQ), Environmental Evaluation Division, Air Analysis Section since 1994. Data on and summaries of the pollutants for these stations are listed on their website (LDEQ 2004a). LDEQ also monitors toxics in fish tissue for their fish consumption advisory program. One mercury monitoring site (#0598) is at Lake Salvador near JELA. Data and summaries of mercury levels for the state can be found on their website (LDEQ 2004b).

Volatile organic compounds (e.g., benzene, toluene, etc.) are monitored near Baton Rouge and in some northern and western cities by the state, and in Norco (west of New Orleans) by some industrial sources, but no toxics air monitoring is done in or near New Orleans (T. Maniero, personal communication, May 2004).

JELA's air quality can be assessed from National Atmospheric Deposition Program/National Trends Network (NADP/NTN) data collected at the Iberia Parish, Louisiana (#LA12/Iberia Research Station, ~200 miles west of JELA) that has been operating since 1982, and the Washington Parish, Louisiana site (#LA30/Southeast Research Station, ~65 miles north of JELA) operational since 1983. The Iberia Parish data show a decrease in wet sulfate concentration and deposition, a decrease in wet ammonium concentration and deposition, but no trend in wet nitrate concentration and deposition; whereas the Washington Parish site data shows a slight decrease in wet sulfate concentration and deposition, but no trend in wet nitrate concentration and deposition, and no trend in wet ammonium concentration and deposition (T. Maniero, personal communication, May 2004).

The nearest NADP Mercury Deposition Network (MDN) sites are at Alexandria, Louisiana (#LA23, ~155 miles northwest of JELA) operational since 2001, Chase, Louisiana (#LA10, ~170 miles northwest of JELA) operational since 1998, and the Hammond, Louisiana site (#LA28 ~45 miles north-northwest of JELA) operational since 1998. The mercury concentrations for the four Louisiana NADP MDN sites have had the highest maximum values of the 10 MDN sites in the Gulf Coast Network as illustrated in the Table 2 (T. Maniero, personal communication, May 2004).

Table 2. Comparison of mercury concentration and deposition in Louisiana verses three neighboring states in the Gulf Coast Network.

	Louisiana		Texas/Mississippi/Florida	
Sites	Alexandria, Chase, Hammond, & Lake Charles, La. Sites		Delta Elementary, Centerville, Bay Road, Alabama; Oak Grove, Mississippi; and Longview & Ft. Worth, Texas Sites	
Total Mercury Concentrations	31.9-338 ng/L	0 = 127 ng/L	29.2-49.0 ng/L	0 = 38 ng/L
Mercury Deposition	2075-2244 ng/m^2	0 = 2175 ng/m^2	1145-1749 ng/m^2	0 = 1438 ng/m^2

The nearest Clean Air Status and Trends Network (CASTNet) sites to JELA are the Sumatra, Florida site (#SUM156, ~350 miles east of JELA), the Coffeeville, Mississippi site (#CVL151, ~280 miles north-northwest of JELA) operational since 1988, and the Caddo Valley, Arkansas site (#CAD150, ~325 miles northwest of JELA). The nearest Interagency Monitoring of Protected Visual Environments (IMPROVE) sites to JELA are the Sikes, Louisiana site (#SIKE, ~195 miles northwest of JELA), the Breton National Wildlife Refuge (NWR), Louisiana site (#BRET, ~60 miles east of JELA), and the Sipsey Wilderness Area, Alabama site (#SIPS, ~ 385 miles northeast of JELA) operational since 1992. The Breton NWR, Louisiana site is near enough that it would likely represent acid deposition conditions in JELA; however, the other CASTNet and IMPROVE sites are probably too distant to be meaningful for assessing acid deposition or visibility (T. Maniero, personal communication, May 2004).

Experts: Manop Vanichagorn (LDEQ), Tonnie Maniero (NPS Air Quality specialist)

ECOSYSTEM STUDIES

GENERAL PARK STUDIES

Muth (1991) described the flora and fauna using transects, perpendicular to the Barataria des Familles distributary, which bisected six ecological zones. The description was accompanied by a table that listed species and the ecological zones in which they were found. Swanson (1991) described the natural history of the upland forest, swamp forest, and the swamp of the Terre Haute de Barataria. She listed the species found and how anthropogenic disturbances had affected the current plant communities.

The BP consists of six ecological zones, natural levee live oak forest, ridge and swale bottomland hardwoods, backslope transitional red maple swamp forest, baldcypress-water tupelo swamp, fresh marsh and intermediate marshes, including large expanses of floating marsh, and shrub communities, and bayous, ponds and estuarine lakes. These habitats can be grouped in more general terms into marsh and forested lands. Multiple studies have examined the vegetation, water quality, productivity, effects of saltwater intrusion, and subsistence and water level rise on these habitats.

MARSH

Day et al. (1984) discussed the role and importance of wetlands and how canals affected the wetlands in the BP. Three management options for the illegal canals and levees were presented (no action, plug outlets and manipulating water levels through pumping, and breech the levees) and recommendations for which course of action to follow were given.

Michot (1984) conducted a wildlife habitat evaluation that projected available future habitat based on past habitat trends. One of the largest changes projected was a decrease in total marsh habitat and a related increase in open water. In addition, the make up of the marsh, fresh vs. intermediate, was also changing. He found that freshwater habitat had already decreased by half since 1953 and if this trend continued almost 90% would be converted to intermediate marsh by 2035. Due to past decreases, Mottled Duck and muskrat populations have declined. Based on the predicted habitat conversions, both mink and Wood Duck also would suffer significant declines. Scrub-shrub was the only habitat expected to increase by 2035. Scrub-shrub ranked high in habitat suitability index for mink, white-tailed deer, and marsh rice rat (*Oryzomys palustris*). Both marsh habitats also ranked high for Wood Duck wintering, American alligator and muskrat (fresh marsh only) habitat. Fresh marsh provided moderate habitat for Mottled Duck brood habitat. In that same study, Michot found an increase in open water on the western portion of the park that he attributed to saltwater intrusion. This intrusion was believed to have occurred relatively recently because freshwater species were killed off but these areas had not yet recolonized with saltwater species.

A 1985 marsh management plan for the BP suggested altering the hydrology of the area through the use of weirs and plugs (Crescent Soil and Water Conservation District in Taylor 1988). It was felt that these implementations would lead to a reduction in saltwater intrusion and convert the *Sagittaria spp*. marsh to *Panicum* marsh. Taylor (1988) criticized the assumptions the plan was based upon. She found there was no documentation of whether a conversion of the plant community could occur by altering water control and whether the use of structures was effective in curbing saltwater intrusion or encroachment of scrub-shrub community. Due to small salinity increases and healthy vegetation communities found during her study, Taylor (1988) instead suggested opening access to the sediment sources from the local lakes, bayous, and canals. She noted that the implementation of plugs and weirs would exacerbate the sedimentation deficit as well as increase waterlogging. Her study also found that this sedimentation deficit was leading to the development of floating marsh in the park.

In reaction to a final decision on the location of a hurricane levee that would severely impact the BP, a Boundary Study and Environmental Assessment was conducted during 1996 to identify and evaluate the key adjacent wetlands that may be important to protect (Jean Lafitte National Historical Park and Preserve 1996). The 1996 boundary study identified three wetlands between the Harvey Canal Hurricane Protection Levee and the BP that were hydrologically linked to the park but were not currently within its boundaries. The hurricane levee was approved through the 'least' damaging route and as of 2004 was still in the building stages. There have been no studies on the effect of the levee (D. Muth, personal communication, 17 March 2004).

Hargis et al. (1999) examined the effect of the proximity of a marsh to saltwater intrusion on the soil redox, porewater salinity, and sulfides in four marshes within the BP. Detailed analysis of the monthly samples revealed that salinity increased with depth for most sites and redox was highest in early spring and lowest during late summer/early fall. Sulfide levels were directly related to salinity exposure. Vegetation varied for each marsh type, which influenced the redox and along with the amount of marsh mat movement, affected the salinity and sulfide levels. They also found that the accretion within the marshes depended more on root production and decomposition of the vegetation than mineral sediment accumulation. It was suggested that the late-summer salinity pulses were more important then the spring floods in affecting the health and composition of the marsh.

Doyle et al. (1999a) examined the floating marsh and depicted the growth and decline of scrub/shrub formation using a series of seven aerial photos (ranging from 1955 to 1990) and found that they appear to be naturally cyclical. The disturbance of the marsh mat by seismic surveys and powerline rights-of-way appear to have helped establish the wax myrtle (*Myrica cerifera*) dominated scrub-shrub community. Doyle et al. (1999b) found that the hydrology and chronic exposure to salinity significantly affected the vegetation community. They analyzed long-term data on water level, mat movement, and water salinity and found significant differences in water retention for marsh/forest basins and open canals. Muth et al. (2000) described the ecology of the floating peat marsh. He addressed such topics as the effect of marsh movement on water circulation, the effects of salt pulses on the plant community, and the link between plant and animal diversity in the marsh.

The above and below ground productivity for bulltongue arrowhead (*Sagittaria lancifolia*) was measured on multiple sites within an intermediate marsh complex in the BP (1999). Based on hydrology, four sites were included that ranged from well drained to ponded areas. They found significant differences in above ground productivity between sites in a given month and between months for a given site, although below ground productivity was more variable. However, below ground productivity was correlated with that above ground on a given site. Drained sites had more biomass than ponded sites and late season droughts appeared to stimulate below ground production for ponded sites.

Swarzenski et al. (2004) conducted a two-year study of the fauna within the waterway of the BP. Although they found the fish and aquatic invertebrate communities to be abundant and diverse, mercury levels within the larger predatory fish were elevated to the point of concern for human consumption.

FORESTED LANDS

General forest studies

White et al. (1983) conducted the first complete vegetation survey on what was about ½ of the BP. They classified the area into 4 natural habitat types: marsh, baldcypress-tupelo swamp, intermediate swamp and hardwood bottoms, and compared the plant composition of the three forest types by examining the difference in species importance values.

In his wildlife habitat assessment, Michot (1984) detected a decrease in both wooded swamp and bottomland hardwood habitats between 1956 and 1983 and predicted this trend to continue. Upland forests (spoilbanks) were not predicted to change. The habitat suitability index rated bottomland hardwood habitat high for its four associated animal species, and wooded swamp ranked high for all species except white-tailed deer. Upland forested habitat was of low to moderate quality for most species, except mink for which it was rated high quality.

Denslow and Battaglia (2002) conducted a study to examine the variation that occurs across elevation and hydrologic gradients in forest stand composition and structure. As they moved down the elevational gradient, they found forest and community structure followed that of a temporarily flooded zone through semi-permanently flooded zone with higher densities of small trees at the lower elevation. Water levels affected the community make-up along the gradient (flood tolerant vs. less tolerant), as well as the growth form (single vs. multi-stemmed) and the ability of saplings of canopy species to regenerate. They did not find that the flooding affected species richness between the two extremes although they did not have any permanently flooded sites. Community composition will likely change as flood-intolerant species fail to regenerate; change could be accelerated by timber harvesting of these species. Denslow (1999) described the change in community structure in which the water oak (*Quercus nigra*), live oak (*Q. virginiana*), sweetgum (*Liquidambar styraciflua*) and American elm (*Ulmus americana*) along the higher elevations were replaced by red maple (*Acer rubrum*) and pumpkin ash (*Fraxinus profunda*) in the lower elevations. In addition, elevation strongly affected forest structure as well as the population structures of the canopy and understory species.

Yu et al. (n.d.) examined the variation in soil redox potential, O_2 and greenhouse gases in three soil types (swamp, transition, and ridge) along a hydrological gradient within coastal forest in the BP. They found much higher levels of CO_2 and CH_4 in swamp soils than the other two soil types. Due to the predicted sea level rise in the future, they also felt that the output of CH_4 in the ridge and transitional soil types could also increase greatly due to the increased inundation of water.

Bottomland hardwood

The woodlands adjacent to the Barataria des Familles were one of the southern-most examples of bottomland hardwood forests and alluvial upland in North America (Swanson 1991). Swanson (1991) further subdivided the upland forest into seven succession types, based on the predominant past landuse (e.g., recently logged, reforested sugar cane field, and reforested pecan orchard) and provided detailed descriptions of past and present plant species.

Harper (1995, 1999) conducted a study examining the invasion of Chinese tallow into a bottomland hardwood forest and found that there was no difference in the amount of treefall-gap between old-growth and second-growth forests. However, she found that palmetto trees, a native palm in the area, were more abundant in the old-growth forest. A detailed study of *Sabal minor* was conducted in the park and found that the species grew slowly and may live for hundreds of years (Ramp 1989).

Schenke (1996) studied the successional trends of soil nutrient levels of three different aged spoilbanks in bottomland hardwood forests in the BP. Schenke found that soil water content was lower in spoilbanks (disturbed) than random, non-disturbed points and that the older the spoilbank, the higher its soil water content. Additionally, lower ammonium levels were found in the higher elevation, lower soil-water disturbed sites, than in the undisturbed sites.

Wasilevich (1999, 2001) examined the effect of slight elevation change (1 m) on the seed bank formation and regeneration patterns in a bottomland hardwood forest within the BP. He found no difference in seed bank composition between the elevational extremes and found that the seed bank did not represent the present forest composition. He did find a greater seedling emergence rate at the higher elevation site and a lower survival rate for seedlings in the lower elevations. The lower elevations were subject to excessive soil moisture, saturation, and inundation. Wasilevich concluded that if sea level rise and subsidence continued, the ability of the hardwood habitat to perpetuate itself would be in question.

Pittman et al. (1999) examined the relationship between the hydraulic gradient and the growth and productivity of an old-growth bottomland hardwood forest in the BP. Water content and root density were measured in relation to soil depth. Samples were taken from three transects, each of which had a different topography; low-lying swamp, ridge, and intermediate terrain.

Whitbeck and Yao (1999) examined the variation of hydroperiod and soil water content and its effect on fine root production (at depths of 0 to 50 cm) in a bottomland hardwood forest. When soils were fairly dry during the summer month, they found greater total fine root hair in the lowest elevation, most of which occurred in the top 10 cm. At higher elevations, most of the fine root hairs were found between 10 and 50 cm. When examined throughout the year, they found more fine root hairs in the intermediate soil.

In a study of breeding bird use in fragmented forest, Yaukey (1999, n.d.) compared the forested hardwood habitat within the BP to urban woodlots and found higher mean densities of obligate forest birds in JELA. He also compared vegetation characteristics and found urban woodlots had higher densities of <2 cm dbh (diameter breast height) stems and JELA had palmetto at more sites.

MANAGEMENT ISSUES

Because of the park's proximity to New Orleans and its surrounding suburban landscape, it is subject to many environmental problems, including degraded air and water quality, disturbed lands, hydrologic disruption, exotic species, and pests. Additionally, the park's location along the coast also causes additional management issues due to subsidence and saltwater encroachment. A detailed list of management issues and concerns that face JELA and how these issues may affect the park's resources can be found in Appendix B.

EXOTIC SPECIES

A number of exotic species have been located within the BP or have been documented nearby. Invasion of these species affect native populations through competition and predation and are therefore a concern for the park. Some exotic plant species have been documented clogging the waterway, making the area difficult to traverse as well as sample for water quality and fish species. Others have invaded the bottomland hardwood forest where they compete with native species for habitat and resources. Two mammals of concern, nutria and Eurasian wild boar, have been detected within the park. The wild boar has been extirpated for about 10 years but can be found in surrounding areas and could reenter the park at anytime.

General plants

In Muth's (1991) report of the historic flora and fauna of the Barataria des Familles, he documented plant species or groups of species (e.g., crab grasses, privets) that were introduced and existed in the park. This list was not exhaustive but instead contained the species that were considered integrated into the park. Of those listed, alligatorweed (*Alternanthera philoxeroides*) and Chinese tallow exist in all six ecological zones.

The RMP 1997 listed six species of serious management concern: water hyacinth, alligatorweed, Chinese tallow, Johnsongrass (*Sorghum halapense*), common salvinia (*Salvinia minima*) and hydrilla (*Hydrilla verticillata*; Jean Lafitte National Historical Park and Preserve 1997).

Aquatic plants

Cofrancesco (1985) surveyed two exotic plant species, water hyacinth (*Eichhornia crassipes)* and alligatorweed, and insect predators in the BP. A biological control program was implemented that released two exotic, *Amynothrips andersoni* and *Agasicles hygrophila*, and two native, *Neochetina bruchi* and *Sameodes albiguttalis*, insect species into the park.

Tipping and Hulslander (2003) examined the use of a biological control agent (salvinia weevil, *Cyrtobagous salviniae*) to control common salvinia, a non-indigenous invasive species that has spread across more than 3,600 hectares of the BP. Control of these exotic aquatic plants is a priority for park management due to its negative impacts on water quality and visitor experience, as well as the increased habitat for disease vectors. Mechanical harvesters had been used in the past to control invasive aquatic species and provide passageway for boats, but costs were too high for the level of success. Herbicides were also used but have not proved to be effective in the long-term (D. Muth, personal communication, 17 March 2004; Jean Lafitte National Historical Park and Preserve 1986; Tipping & Hulslander 2003). There have also been reports of an extremely invasive species, giant salvinia (*S. molesta*), along the Texas-Louisiana border that could pose problems for the park in the future.

Terrestrial plants

Harper (1995, 1999) examined the variation in germination, seedling survival and growth rate of Chinese tallow in relation to habitat type in bottomland hardwood forests within the BP. She found that Chinese tallow populations were increasing in all habitat types and growth rates were highest in areas with more light. When examining the effect of hydrology on structure and composition of tree species within those bottomland hardwood forests, Denslow (1999) found populations of Chinese tallow were greatest in the wetter areas although seedlings were found throughout. Denslow and Battaglia (1998) described a project, which is currently underway, that predicts the risk of invasion of Chinese tallow in the different communities within the park and will examine the resulting consequences of an invasion. Multispectal digital and photographic images were taken to determine Chinese tallow distributions. Results of this study are not currently available.

Animals

Nutria was introduced to Louisiana in 1938 and were found throughout the Louisiana coastal marsh by 1945 (Bahr & Hebrard 1976). Although they likely compete with the native muskrat for resources, some of this pressure may be alleviated as the muskrat appears in higher concentrations in brackish marsh and the nutria used more freshwater sites. However, both species can have a detrimental effect on the habitat due to their burrowing and digging (Conner & Day 1987). Linscombe and Kinler (1990) described the monitoring efforts of the vegetation damage caused by nutria in the BP during 1989 and 1990. Through aerial surveys and ground truthing, they documented a dramatic increase in damage to the park's vegetation. Areas with high densities of three-cornered grass received the most damage. Exclosure experiments revealed dramatic recoveries for areas with exposed mud, but no recovery was detected in areas with standing water. Linscombe and Kinler (1994) conducted helicopter surveys of the Barataria-Terrebonne Basins to determine the extent of damage and the status of recovery. A trapping management plan is now in place for the BP to control for nutria (D. Muth, personal communication, 17 March 2004).

Muth (1991) identified a number of non-indigenous animals that inhabit or are thought to inhabit the BP. Nutria and Eurasian Starling (*Sturnus vulgaris*) were the most widespread throughout ecological zones.

ADJACENT LANDUSE IMPACTS

Due to the proximity of the BP and CBNC to a largely urban landscape, the park's natural resources have been negatively impacted by disruption of natural hydrologic flows and nutrient deposition, pollution, and the reduction in nearby wildlife habitat. These impacts have affected the quality of the habitat in the park and created a greater burden on these resources due to their declining availability in the general area.

Berjarano (1982, 1985) described two fish kills detected in nearby waterways. Results from the 1982 water quality samples indicated that the water was contaminated with high levels of pollution. In addition to urban runoff, known points of entry for pollutants include the Bayou Segnette Pumping Station and multiple sewage treatment plants (including Westwego's Sewage Treatment Plant). The second fish kill was linked to low dissolved O_2 indirectly caused by Hurricane Danny. High ammonia concentrations were also found at one station during 1985, which also indicated sewage pollution.

Taylor et al. (1988) documented an increase in the average salinity of the park. Increased salinity has been thought to be detrimental to wetlands within the park. Mendelssohn and McKee (1989) studied the response of a freshwater marsh to increased salinity and water levels and found that the effect on the marsh was dependent on multiple factors including species composition, water level, amount of time it was inundated, and how quickly the saltwater exposure happened. Taylor et al. (1988) suggested that inundations and sediment deficits, not the salinity, were the principle causes of wetland loss. They also found the rate of saltwater intrusion, which can be damaging at high rates, had been slow enough that plants and soils in the park had been able to adapt to the changes. They suggested that the best management for saltwater intrusion was management of freshwater resources and hydrology at the basin-wide level instead of through the use of weirs, locks, and plugs on local waterways that may further inhibit the flow of sediments into the wetlands.

Taylor et al. (1988) also suggested a lack of sediment accretion within the wetlands as well as the retention of standing water had been the major factors in creating floating marshes within the park. They recommended a pilot project to examine the effectiveness and feasibility of possible attempts to reverse these marshes to previous states. Taylor (1988) suggested that management of the freshwater sources would be the most feasible way to counter the sediment deficit in the park. Three possible sources were listed to increase sediments in the BP including Lake Salvador and local canals, Millaudon Canal, and the Mississippi River. The first two diversions would help offset subsidence in the park while diverting the Mississippi River would overcome the subsidence problem.

Oil development has had a great impact on the natural resources in the park through construction of wells and more importantly through the creation of canals used for transport. These canals have severely altered the hydrology of the park and surrounding areas. Taylor (1988) and Denslow and Battaglia (2002) listed canal and levee construction, the resulting disruption of freshwater and reduction in new sediment, extraction of gas, water, or other minerals, oxidation, and saltwater intrusion as reasons for subsidence of the land. There have also been efforts to close wells at the park, including the 1990 report by the Mining and Minerals Branch of the Land Resources Division, which recommended the best methods to plug and abandon 10 wells (drilled between 1954 and 1966) in the BP (Mining And Minerals Branch Land Resources Division 1990).

The 1996 boundary study highlighted the effects of adjacent landuse on the park's natural resources. Major problems included the disruption of natural hydrologic flows, increases in residential developments near park boundaries, habitat loss, and increased water pollution due to urban runoff and sewage.

Yaukey (1999, n.d.) examined the role of the park as a population source for woodland birds due to the increasing urbanization of the surrounding landscape. He found that several of the species documented within the park's boundaries had limited distributions in the largely urban habitat to the north. When comparing the park habitat with urban woodlots he documented higher mean densities of obligate forest birds in JELA.

In a survey of the herpetofauna of the BP, Anderson and Seigel (2003) also noted the pressure from human disturbance on the park's herpetofauna due to collecting, outside landuses, and feral animals and recommended a regular monitoring program to continually assess populations.

A number of studies examined the effect of water level on the forest community. Rising water levels attributed to global warming and subsidence (natural as well as that being caused by oil and gas exploration and construction of canals) are a major concern to the bottomland hardwood forests of the BP.

LAKESIDE EROSION

Unlike most of the Mississippi Delta Plain, the BP has experienced greater land loss due to erosion than subsidence (Jean Lafitte National Historical Park and Preserve 1997). In 1983, the shoreline of Lake Salvador had reached the western spoil bank of Bayou Segnette Waterway in at least one location. Michot's (1984) comparison of 1956 and 1978 maps as well as 1983 conditions led him to believe that the shoreline encroachment on the Bayou Segnette Waterway had occurred since 1978. Taylor (1988) estimated that this loss was over 100 ha since the late 1950's. She suggested the use of barriers or baffles to decrease the wave energy and establishment of appropriate vegetation along the edge of the shoreline that can withstand deep water and waves. The Natural Resources Conservation Service (NRCS; then known as the Soil Conservation Service) produced a report documenting land loss in the Lake Salvador Watershed (Soil Conservation Service et al. 1988). This report also included high quality maps addressing a variety of topics such as erosion areas, oil and gas fields and navigational channels, fragile soils, marsh types, salinity-isohaline lines, landuse, and important biological areas.

Adams et al. (1976) described the geological processes and examined marsh deterioration and land loss that occurred in the Barataria Basin. They discussed the effects of many natural and human induced changes such as dredge and fill of waterways, coastal erosion, subsidence, and salt-water intrusion on the landscape. Using a point count method on aerial photographs, USGS quadrangle sheets and USGS orthophoto quadrangle maps, they documented land loss at various sites across the basin and found that the southwest shore of Lake Salvador had a 12% land loss from 1962 to 1974, which was a higher rate then freshwater marsh elsewhere in the basin. Land loss occurred for all marsh types in all areas except the central part of the basin.

LITERATURE CITED

Adams, R. D., B. B. Barrett, J. H. Blackmon, B. W. Gane, and W. G. Mcintire. 1976. Barataria Basin: Geologic processes and framework. Center for Wetland Resources, Louisiana State University, Baton Rouge, LA. Sea Grant Publication No. LSU-T-76-008.

Anderson, N. J., and R. A. Seigel. 2003. Jean Lafitte National Historical Park and Preserve-Barataria Unit: Inventory and monitoring program for amphibians and reptiles. Southeastern Louisiana University, Hammond, LA.

Bahr, L. M., and J. J. Hebrard. 1976. Barataria Basin: Biological characterization. Louisiana State University, Baton Rouge, LA. Sea Grant Publication No. LSU-T-76-005.

Baron, J. 1992. Water resources monitoring and research recommendations for the Barataria Unit, Jean Lafitte National Historical Park. Applied Research Branch, National Park Service Water Resource Division, Fort Collins, CO.

Baron, J., and B. Newkirk. 1992. Preliminary analysis of water quality of the Barataria Unit of Jean Lafitte National Historical Park. Applied Research Branch, Water Resources Division, National Park Service, Natural Resource Ecology Laboratory, Colorado State University, Fort Collins, CO.

Berjarano, R. 1982. Bayou Segnette fish kill. Louisiana Department of Wildlife Fisheries, Baton Rouge, LA.

Berjarano, R. 1985. Tarpaper Canal, Bayou Segnette and surrounding area fish kill. Louisiana Department of Wildlife and Fisheries, Baton Rouge, LA.

Bourne, J. 2000. Louisiana's vanishing wetlands: Going, going... Science **289**:1860-1863.

Boyd, R., and S. Penland. 1992. A geomorphologic model for Mississippi Delta evolution. U.S. Geologic Survey, Denver, CO.

Bretting, P. K. 1975. A floral analysis of Chalmette National Historical Park. Tulane University, New Orleans, LA.

Cambre, C. F. 1988. Untitled: Turtle release.

Cardwell, G. T., J. R. Rollo, and R. A. Long. 1963. Basic Ground-water Data for the Mississippi River Parishes South of Baton Rouge, Louisiana. Louisiana Department of Public Works, Baton Rouge, LA.

Chabreck, R. H., T. Joanen, and A. W. Palmisano. 1968. Vegetation type map of the Louisiana coastal marshes. Map. Louisiana Wildlife and Fisheries Commission, New Orleans, LA.

Chabreck, R. H., and R. G. Linscombe. 1978. Vegetative type map of the Louisiana coastal marshes. Louisiana Department of Wildlife and Fisheries, New Orleans, LA.

Cofrancesco, A. F. 1985. Biological control of waterhyacinth and alligatorweed in Galveston District and at Jean Lafitte Park, Louisiana. 19th Annual Meeting, Aquatic Plant control Research Program, U.S. Army Corps of Engineers:103-109.

Conner, W. H., and J. W. Day. 1987. The Ecology of the Barataria Basin, Louisiana: An estuarine profile. National Wetlands Research Center, Fish & Wildlife Service, Washington, D.C.

Conner, W. H., and J. W. Day. 1988. Rising water levels in coastal Louisiana: Implications for two coastal forested wetland areas of Louisiana. Journal of Coastal Research **4**:589-596.

Day, J. W., W. H. Conner, and W. R. Slater. 1984. A study of the effects on the Barataria Units, Jean Lafitte National Historical Parks, of the illegal canals and levees of the Bayou des

Familles corp. within the park protection zone. Coastal Ecology and Fisheries Institute, Center for Wetland Resources, Louisiana State University, Baton Rouge, LA.
Demcheck, D. K. 1991. Louisiana Hydrologic Atlas Map No. 6: Water-Quality survey of the Barataria Basin, 1988. Map. U.S. Geological Survey, Baton Rouge, LA.
Denslow, J. S. 1999. Structure and composition of a bottomland hardwood forest along a changing hydrological gradient. Jean Lafitte National Historical Park and Preserve Natural Resource Research Symposium. Lafayette, LA, Jean Lafitte National Historical Park and Preserve, April 27,1999.
Denslow, J. S., and L. Battaglia. 1998. Modeling risk of Chinese tallow invasion in a heterogeneous landscape: Effects of natural and anthropogenic disturbances across a hydrologic gradient. Louisiana State University, Baton Rouge, LA.
Denslow, J. S., and L. Battaglia. 2002. Stand composition and structure across a changing hydrologic gradient: Jean Lafitte National Park, Louisiana, USA. Wetlands **22**:738-752.
Dial, D. C. 1983. Ground-water data for the Mississippi River parishes in the greater New Orleans area, Louisiana. Water Resources Basic Records Report **11**.
Dial, D. C., and D. J. Tomaszewski. 1988. Geohydrology, water quality, and effects of pumpage on the North Orleans aquifer system, northern Jefferson Parish, Louisiana. U.S. Geologic Survey, Denver, CO. Water Resources Investigations No. 88-4097.
Doyle, T. W., M. J. Fuhrmann, and L. R. Handley. 1999a. Spatial and temporal dynamics of a scrub-shrub community at Jean Lafitte National Park. Jean Lafitte National Historical Park and Preserve Natural Resource Research Symposium. Lafayette, LA, Jean Lafitte National Historical Park and Preserve, April 27,1999.
Doyle, T. W., C. M. Swarzenski, T. G. Hargis, R. Walters, G. Girod, and M. Books. 1999b. Monitoring and modeling ecological succession of woody habitat and sea-level rise. Jean Lafitte National Historical Park and Preserve Natural Resource Research Symposium. Lafayette, LA, Jean Lafitte National Historical Park and Preserve, April 27,1999.
Dunn, P. 1995. Breeding bird census in the Barataria Preserve Unit, Jean Lafitte National Historical Park and Preserve. Louisiana State University, Baton Rouge, LA.
Eddards, M. L., L. R. Kister, and G. Scarcia. 1956. Water Resources of the New Orleans Area, Louisiana. U.S. Geological Survey, Washington, D.C.
EPA. 1985. A hydrological, chemical, and biological assessment of Bayou aux Carpes, New Orleans, Louisiana. Environmental Protection Agency, Environmental Services Division, Ecological Support Branch, Athens, GA.
Eustis Engineering Company Inc. 1992. Geotechnical investigation, Lake Salvador shoreline stabilization, Jefferson Parish, Louisiana. Eustis Engineering Company, Metairie, LA.
Fruge, D. 1985. Untitled: letter containing a report on the Habitat Evaluation Procedures (HEP) analysis and vegetation study. U.S. Fish and Wildlife Service, Lafayette, LA.
Garrison, C. R. 1982. Water quality of the Barataria Unit, Jean Lafitte National Historical Park, Louisiana (April 1981- March 1982). U.S. Geological Survey, Baton Rouge, LA. Open File Report No. 82-691.
Garrison, C. R. 1985. Map of temperature, conductance, cation and salinity of the Barataria Unit, Jean Lafitte National Historical Park, August, 1985. Map. (unpublished).
Gorin, S. 1989. Identifying selected waterways in the Barataria Unit Jean Lafitte National Historical Park. New Orleans, LA, University of New Orleans.
Gosselink, J. G., and C. E. Sasser. 1991. An ecological overview of the Barataria-Terrebonne Estuary: Processes, scales, and management principles. Barataria Terrebonne National

Estuary Program, Thibodaux, LA. Scientific-Technical Committee Data Inventory Workshop Proceedings, BTNEP Publication No. 5.

Hargis, T. G., C. M. Swarzenski, R. Walters, and T. W. Doyle. 1999. Variability of soil redox and porewater sulfides along a salinity gradient in peat (flotant) marsh of JLNHPP. Jean Lafitte National Historical Park and Preserve Natural Resource Research Symposium. Lafayette, LA, Jean Lafitte National Historical Park and Preserve, April 27,1999.

Harper, M. G. 1995. A model of the invasion of Chinese tallow tree (*Sapium sebiferum* L.) Roxb.) in a bottomland-hardwood forest in Louisiana. Thesis. Tulane University, New Orleans, LA.

Harper, M. G. 1999. A model of the invasion of Chinese tallow tree (*Sapium sebiferum* L.) roxb.) into a bottomland-hardwood forest in Louisiana. Jean Lafitte National Historical Park and Preserve Natural Resource Research Symposium. Lafayette, LA, Jean Lafitte National Historical Park and Preserve, April 27,1999.

Holmes, B. 1986. Historical Resource Study: the Barataria Unit of Jean Lafitte National Historical Park. Southwest Cultural Resource Center, Santa Fe, NM.

Hood, C. S. 2004. Mammal inventory and monitoring program, Jean Lafitte National Historical Park and Preserve. Loyola University. http://www.loyno.edu/~chood/jlnpmammals.html (Accessed January 2004).

Hopkinson, C. S., and J. W. Day. 1979. Aquatic productivity and water quality at the upland-estuary interface in Barataria Basin, Louisiana. Pages 20-47 *in* R. Livingston, Editor. Ecological Processes in Coastal and Marine Systems. Plenum Press, New York, NY.

Horizon Systems Corp. 1994. Baseline water quality data inventory and analysis, Jean Lafitte National Historical Park. USDI, National Park Service, Washington, D.C.

Hulslander, B. 2001. Jean Lafitte NHPP 1996-2001 Barataria butterfly count. Jean Lafitte National Historical Park, New Orleans, LA.

Hurbert, H. E. 1923. The known spiders of the state of Louisiana. Thesis. Tulane University, New Orleans, LA.

Isenogle, J. L. 1984. Memorandum: Mid-winter eagle survey 1984. New Orleans, LA.

Jaworski, E. 1972. The blue crab fishery, Barataria estuary. Louisiana State University Center for Wetland Resources, Baton Rouge, LA. Sea Grant Publication No. LSU-SG-72-01.

Jean Lafitte National Historical Park and Preserve. 1986. Aquatic vegetation control plan Barataria Unit, Jean Lafitte National Historical Park. Jean Lafitte National Historical Park and Preserve, New Orleans, LA.

Jean Lafitte National Historical Park and Preserve. 1987. Resource management plan. Jean Lafitte National Historical Park and Preserve, New Orleans, LA.

Jean Lafitte National Historical Park and Preserve. 1989. Untitled: Chalmette forest inventory. Jean Lafitte National Historical Park and Preserve, New Orleans, LA.

Jean Lafitte National Historical Park and Preserve. 1990. Amendment to the general management plan/development concept plan, Chalmette Unit, Jean Lafitte National Historical Park and Preserve, St. Bernard Parish, Louisiana. National Park Service, Denver, CO.

Jean Lafitte National Historical Park and Preserve. 1996. Boundary study and environmental assessment: Barataria Preserve Unit, Jean Lafitte National Historical Park and Preserve. National Park Service, Denver, CO.

Jean Lafitte National Historical Park and Preserve. 1997. Jean Lafitte National Historical Park and Preserve Resource Management Plan. Jean Lafitte National Historical Park and Preserve, New Orleans, LA.

Jefferson Parish Louisiana Environmental and Development Control Department. n.d. Untitled: Water quality in Inner Millaudon Canal. Jefferson Parish Louisiana Environmental and Development Control Department

Kratter, A. W. 1994. Habitat use by fall neotropical migrant birds in eastern Louisiana. Louisiana State University, Baton Rouge, LA.

Kucera, W. 1984. Report on fish collecting trip to Jean Lafitte National Park (JLNP) September 10-14, 1984. U.S. Fish and Wildlife Service, Lafayette, LA.

Linscombe, R. G., and N. Kinler. 1990. A report on nutria management. The Louisiana Department of Wildlife and Fisheries, New Iberia, LA.

Linscombe, R. G., and N. Kinler. 1994. A survey of vegetative damage caused by nutria herbivory in the Barataria-Terrebonne Basins. Barataria-Terrebonne National Estuary Program

Linscombe, R. G., N. Kinler, D. John, and J. Farrar. 1989. A Report submitted to Jean Lafitte National Historical Park under Cooperative Agreement No CA 702970002. Louisiana Department of Wildlife and Fisheries, New Iberia, LA.

LDEQ. 2004a. Air Monitoring Operations. Louisiana Department of Environmental Quality. http://www.deq.state.la.us/evaluation/airmon/airmon.htm (Accessed 7 April).

LDEQ. 2004b. Mercury. Louisiana Department of Environmental Quality. http://www.deq.state.la.us/surveillance/mercury/index.htm (Accessed 7 July).

Louisiana Department of Wildlife & Fisheries. 2004. Louisiana Amphibian Monitoring Program. LA Department of Wildlife & Fisheries (Accessed April 2004).

Matthews, D. 1983. Soil survey of Jefferson Parish, Louisiana. USDA Soil Conservation Service, Washington, D.C.

Mendelssohn, I. A., and K. L. McKee. 1989. Response of a freshwater marsh plant community to increased salinity and increased water level. Aquatic Botany **34**:301-316.

Michot, T. C. 1984. A marsh vegetation study of Jean Lafitte National Historical Park, Division of Ecological Services. U.S. Fish and Wildlife Service, Lafayette, LA.

Michot, T. C., and T. W. Doyle. 1999. Composition and change in marsh vegetation from transects at Jean Lafitte National and Historical Park and Preserve, Barataria Unit, in 1983 and 1993. Jean Lafitte National Historical Park and Preserve Natural Resource Research Symposium. Lafayette, LA, Jean Lafitte National Historical Park and Preserve, April 27,1999.

Mining And Minerals Branch Land Resources Division. 1990. Oil and gas well plug and abandonment report for Jean Lafitte National Historic Park and Preserve. National Park Service

Muth, D. 1991. Historic flora and fauna of the old Barataria-des Familles Distributary. Pages 23-32 *in* B. Swanson, Editor. Terre Haute de Barataria; an historic upland on an old river distributary overtaken by forest in the Barataria Unit of the Jean Lafitte National Historical Park and Preserve. Jefferson Parish Historical Commission, New Orleans, LA.

Muth, D., C. M. Swarzenski, T. W. Doyle, and T. Hargis. 2000. Ecology of floating peat marshes of Jean Lafitte National and Historical Parks and Preserve in Coastal Louisiana. SWS Wetlands Conference. Quebec, Canada.

National Audubon Society. 2004. Christmas Bird Count, historical results. National Audubon Society. http://www.audubon.org/bird/cbc/hr/index.html (Accessed March 2004).

Nyman, J. A., and S. Bordelon. 2003. Quantifying deer population and develop a hunting management plan for the Barataria Preserve; final report (draft). Louisiana State University, Baton Rouge, LA.

O'Neil, T. 1949. The muskrat in the Louisiana coastal marshes. Louisiana Department of Fish and Wildlife, New Orleans, LA.

Penland, S., and K. E. Ramsey. 1990. Relative sea-level rise in Louisiana and the Gulf of Mexico: 1908-1988. Journal of Coastal Research **6**:323-343.

Pittman, R. S., J. Whitbeck, and L. J. Steinberg. 1999. Hydraulic gradient and its relationship to root density in a bottomland hardwood swamp. Jean Lafitte National Historical Park and Preserve Natural Resource Research Symposium. Lafayette, LA, Jean Lafitte National Historical Park and Preserve, April 27,1999.

Ramp, P. F. 1989. Natural history of *Sabal minor*: Demography, population genetics and reproductive ecology. Dissertation. Tulane University, New Orleans, LA.

Rollo, J. R. 1966. Groundwater resources of the Greater New Orleans area, Louisiana. Louisiana Department of Conservation, Baton Rouge, LA. Water Resources Bulletin No. 9.

Rossman, D. A., and J. W. Demastes. 1989. Final Report to the National Park Service: Inventory of the amphibians, reptiles, and mammals of the Jean Lafitte National Historical Park. Louisiana State University, Baton Rouge, LA.

Saso-Ostendorf, J. L. 1993. Synergism of side-looking airborne radar and landsat thematic mapper for wetland habitat discrimination in Jean Lafitte National Historical Park, Louisiana. University of Southern Mississippi, Hattiesburg, MS.

Schenke, G. 1996. Successional study of soil water and nutrient availability in a bottomland hardwood forest. Tulane University, New Orleans, LA. Looks like it was a journal article but found no records for it in Web of Science or WorldCat

Schultz, D. 2003. Untitled: Progress report on fish surveys conducted on Jean Lafitte National Historical Park and Preserve. Nicholls State University, Thibodaux, LA.

Seale, M. E. 1999. Fish survey of Jean Lafitte NHPP. Environmental Studies Project

Smalley, A. E. 1982. Final report faunistic inventory of the core area Jean Lafitte National Historical Park. Tulane University, New Orleans, LA.

Soil Conservation Service, Crescent Soil and Water Conservation District, and Plaquemines Soil and Water Conservation District. 1988. East Central Barataria Basin Cooperative River Basin Study Report. Soil Conservation Service, Fort Worth, TX.

Swanson, B. 1991. Terre Haute de Barataria; an historic upland on an old river distributary overtaken by forest in the Barataria Unit of the Jean Lafitte National Historical Park and Preserve. Jefferson Parish Historical Commission, New Orleans, LA.

Swarzenski, C. M. 2002. Resurvey of quality of surface water and bottom sediment of the Barataria Preserve of Jean Lafitte National Historical Park and Preserve, Louisiana 1999-2000. U.S. Geological Survey, Baton Rouge, LA.

Swarzenski, C. M., S. Mize, B. A. Thompson, and G. W. Peterson. 2004. Fish and aquatic invertebrate communities in waterways, and selected contaminant concentrations in fish, at the Barataria Preserve, Jean Lafitte National Historical Park and Preserve, Louisiana, 1999-2000. U.S. Geological Survey, Baton Rouge, LA.

Taylor, N. C. 1988. Ecological characterization of Jean Lafitte National Historical Park, Louisiana: basis for a management plan. Louisiana State University, Baton Rouge, LA.

Taylor, N. C., J. W. Day, and G. E. Neusaenger. 1988. Ecological characterization of Jean Lafitte National Historical Park, Louisiana: Basis for a management plan.
Taylor, N. C., S. K. Yan, R. M. Boumans, and F. C. Wang. 1987. Spatial and temporal variations of water and salinity patterns in Jean Lafitte National Historical Park, LA. Louisiana State University, Baton Rouge, LA.
Tipping, P., and B. Hulslander. 2003. Establish a biological control program of exotic *Salvinia* at the Barataria Preserve. New Orleans, LA.
U.S. Army Corps of Engineers. 1975. Inventory of basic environmental data, New Orleans-Baton Rouge Metropolitan Area. U.S. Army Topographic Laboratories, Washington, D.C.
U.S. Department of Agriculture. 1971. Parish general soil maps: Louisiana. Soil Conservation Service, Alexandria, LA.
U.S. Department of Agriculture, and Louisiana Agricultural Experimental Station. 1978. Soil Survey of West Bank of Jefferson Parish, Louisiana. U.S. Department of Agriculture; Louisiana Agricultural Experimental Station, Washington, D.C.
USGS. 2004. Water Resources of Louisiana. USGS. http://la.water.usgs.gov/ (Accessed 7 April).
USGS Patuxent Wildlife Research Center. 2004. North American Breeding Bird Survey. http://www.pwrc.usgs.gov/bbs/ (Accessed March 2004).
Valderrama-Ardila, C. H. 2004. Effect of bottomland hardwood forest fragmentation on spider communities in southeastern Louisiana. Dissertation. Tulane University, New Orleans, LA.
Walters, R. J., T. W. Doyle, T. Hargis, and C. M. Swarzenski. 1999. Interannual variation in *Sagittaria lancifolia* productivity in a peat marsh of Jean Lafitte National Park, Louisiana. Jean Lafitte National Historical Park and Preserve Natural Resource Research Symposium. Lafayette, LA, Jean Lafitte National Historical Park and Preserve, April 27,1999.
Wasilevich, M. 1996. Effect of elevation upon successional trends in Jean-Lafitte National Park, Louisiana. Tulane University, New Orleans, LA.
Wasilevich, M. 1999. Effect of hydroperiod on seed banks, seedlings demographics, and successional dynamics within a coastal plain forested wetland. Jean Lafitte National Historical Park and Preserve Natural Resource Research Symposium. Lafayette, LA, Jean Lafitte National Historical Park and Preserve, April 27,1999.
Wasilevich, M. J. 2001. Effects of hydroperiod on seed and seedling banks in a bottomland hardwood forest of southeastern Louisiana. Dissertation. Tulane University, New Orleans, LA.
Weldon, A. 2000. Untitled: List of fungi from Jean Lafitte National Historical Park and Preserve. Jean Lafitte National Historical Park and Preserve, New Orleans, LA.
Whitbeck, J., and X. Yao. 1999. Influence of topography and soil water content on fine root distribution in bottomland hardwood forest. Jean Lafitte National Historical Park and Preserve Natural Resource Research Symposium. Lafayette, LA, Jean Lafitte National Historical Park and Preserve, April 27,1999.
White, D. A. 1988. Fall, 1988 marsh vegetation study of Jean Lafitte National Historical Park. Loyola University, New Orleans, LA.
White, D. A., S. P. Darwin, and L. B. Thien. 1983. Plants and plant communities of Jean Lafitte National Historical Park, Louisiana. Tulane Studies in Zoology and Botany **24**:100-129.

White, D. A., and L. B. Thien. n.d. Plant communities of Jean Lafitte National Historical Park. New Orleans, LA.

Wicker, K. M., J. B. Johnston, and M. W. Young. 1980. The Mississippi Deltaic Plain Region habitat mapping study. U.S. Fish and Wildlife Service, Office of Biological Services, Washington, D.C.

Williams, L. R. 1999. Growth of the sedge, *Carex lupulina*, in Jean Lafitte National Historical Park and Preserve. Jean Lafitte National Historical Park and Preserve Natural Resource Research Symposium. Lafayette, LA, Jean Lafitte National Historical Park and Preserve, April 27,1999.

Woodrey, M. S., and F. R. Moore. 1990. Trans-gulf migration: fall 1990. University of Southern Mississippi, Hattiesburg, MS.

Yaukey, P. 1999. Comparison of breeding bird use of forested lands in the Barataria Unit with nearby urban forest fragments. Jean Lafitte National Historical Park and Preserve Natural Resource Research Symposium. Lafayette, LA, Jean Lafitte National Historical Park and Preserve, April 27,1999.

Yaukey, P. H. n.d. Final Report: Breeding bird distribution in contiguous forest and forest patches in the vicinity of an urban/park interface. University of New Orleans, New Orleans, LA.

Yu, K., S. P. Faulkner, and W. H. Patrick. n.d. Redox potential characterization and greenhouse gas production across a hydrological gradient in a Gulf coast forest. Louisiana State University, Baton Rouge, LA.

Zilkoski, D. B., and S. M. Reese. 1986. Subsidence in the vicinity of New Orleans as indicated by analysis of geodetic leveling data. U.S. Department of Commerce, Rockville, MD.

Appendix A. Federal and State Listed Species that have been documented in or are possible inhabitants of JELA (* indicates possible inhabitants based on range). List of species was adapted from the JELA Resource Management Plan 1997 and current park research.

Species[1]	**Scientific name**	**Status**[2]
Plants		
Swamp Milkweed*	*Asclepias incarnata*	State Imperiled
Floating Antler-fern	*Ceratopteris pteridoides*	State Imperiled
Creeping Spike-rush*	*Eleocharis fallax*	(Possibly) State Critically Imperiled
Orchid	*Calopogon sp.*	Three species of this genus are Critically Imperiled in Louisiana
Mammals		
Big Brown Bat*	*Epecticus fuscus*	State Imperiled/Critically Imperiled
Long-tailed Weasel*	*Mustela frenata*	State Imperiled
Reptiles		
American Alligator	*Alligator mississippiensis*	Federally Threatened by Similarity of Appearance
Amphibians		
No documented or suspected species		
Birds		
Brown Pelican (V)	*Pelicanus occidentalis*	Federally and State Endangered
(Interior) Least Tern (M?)	*Sterna antillarum athaloassos*	Federally and State Endangered
Bald Eagle	*Haliaeetus leucocephalus*	Federally Threatened, State Endangered
Peregrine Falcon (M)	*Falco peregrinus*	State Threatened/Endangered
Cooper's Hawk	*Accipiter cooperia*	State Imperiled
Glossy Ibis	*Plegadis falcinellus*	State Imperiled
Reddish Egret (V)	*Egretta rufescens*	State Imperiled
Osprey	*Pandion haliaetus*	State Imperiled (B) or Rare (N)
American Swallow-tailed Kite (M)	*Elanus leucurus*	State Imperiled or Critically Imperiled (B)
American Woodcock (W)	*Scolopax minor*	State Critically Imperiled (B)
Caspian Tern (V)	*Sterna caspia*	State Imperiled or Critically Imperiled (B)
Gull-billed Tern (V)	*Sterna nilotica*	State Imperiled (B)
Warbling Vireo (M)	*Vireo gilvus*	State Critically Imperiled (B)
Cerulean Warbler (M)	*Dendroica cerulea*	State Critically Imperiled (B)
Lark Sparrow (M)	*Chondestes grammacus*	State Imperiled or Rare (B)
Fish		
No documented or suspected species.		
Invertebrates		
No documented or suspected species.		

[1] M, Migrant only, non-breeding; V, Visitor to park, non-breeding; W, Winter only, non-breeding.
[2] B, Status refers to breeding populations only within state; N, Status of non-breeding populations within state.

Appendix B. Management issues and concerns that face JELA and how these issues may affect the park's resources

Management Issues	Priority	Significant Natural Resources Impacted	Monitoring Questions
Adjacent Landuse	HIGH	All encompassing	How are landuses affecting Park resources? Water quality impacts? Exotic species introductions? What species are most at risk due to habitat fragmentation?
Air Quality (Compliance with Clean Air Act)	HIGH	All encompassing	Are ozone or other air toxins affecting native plants, cultural landscapes, native wildlife or water chemistry? Identify common pollutants and levels released from nearby refineries.
Climate Change	HIGH	All encompassing	What are the impacts of sea level rise on park resources (plant communities, water temperature, etc.)
Erosion	HIGH	Soils, wetlands, shorelines, plant communities, hydrology, water quality, cultural landscapes, archeological sites, wildlife	What are the rates of shoreline erosion and shoreline accretion? What are the effects of the new sediment from the Davis Pond Diversion?
Exotics (Animals)	HIGH	Native plant community composition, wetlands, native furbearer populations	What is the status and distribution of exotic animals? Are new exotics invading? What are the impacts on native species? What are the best control procedures? To what extent is nutria impacting wetland vegetation?
Exotics (Plants)	HIGH	Native plant community composition, cultural landscapes, water quality, all aquatic ecosystem components, fish, wildlife	What are the status, distribution and rate of spread of exotic plants? Are new exotics invading? What are the impacts on native species and water quality? Are certain plant communities at greater risk? What are the best control methods?
Fishing (Rec & Comm)	HIGH	Finfish, crustaceans, non-target species	What is the status of the fisheries resource in the Park? Any T&E species? How will the Davis Pond Diversion impact the resource?
Floodplain protection	HIGH	Water quality, quantity, hydrology, all aquatic ecosystem components, wildlife, fisheries	What impacts will the Davis Pond Diversion have on wetland plant communities, below ground biomass, water levels, etc.?
Forest pests/Diseases	HIGH	Native plant community composition, wildlife, cultural landscapes	What pests-diseases are present and what are their impacts? Should we monitor for specifics?
Hunting & Trapping	HIGH	Vertebrates (deer, squirrel, nutria, rabbit, muskrat, mink, otter, raccoon) vegetation, non-target species	What are current populations and trends of game species? What plant and animal species or ecosystem processes are most at risk from deer over grazing? Should current hunting & trapping areas be expanded or decreased? How many individuals of each species can be harvested each year?
Migratory Birds	HIGH	native plant community composition, wildlife, wetlands	What are the foraging strategies, vegetation utilization patterns, effects of fragmentation, predation, prey selection, and temporal requirements of neotropical migrants? What are the estimates of breeding success?
Native Pests	HIGH	Native plant community composition, wildlife, wetlands	What is the extent of infestation? What threshold should trigger mgt. action?

Appendix B. Continued.

Management Issues	Priority	Significant Natural Resources Impacted	Monitoring Questions
Native Species Overpopulation	HIGH	Native plant community composition, wildlife, wetlands	Is deer grazing altering native plant regeneration?
Native Vegetation Restoration	HIGH	Air quality, native plant community composition, wildlife, cultural landscapes, wetlands, hydrology, floodplains	What effects do disturbed lands have on hydrology, wildlife and native plant species?
Non-NPS/ Inholding Issues	HIGH	water quality, landscapes, wetlands	How does wastewater from fishing camps affect water quality? Are inholdings a source for exotics?
Oil/Gas	HIGH	All encompassing	What are the impacts associated with repeated geophysical explorations?
Outside Development	HIGH	All encompassing	How is this development affecting Park resources? Water quality impacts? Exotic species introductions? Species home ranges?
Right-of-ways/Easements	HIGH	Native plant community composition, wetlands, wildlife, exotic plants, landscapes, hydrology	What are the impacts of ROW maintenance? Do right-of-ways provide a conduit for the spread of exotic species or modify hydrology?
Subsidence	HIGH	Wetlands, shorelines, plant communities, hydrology, water quality, wildlife	What is the rate of subsidence and how does it affect flooding frequency and plant communities? What are the effects of the new sediment from the Davis Pond Diversion?
T&E Species	HIGH	Wildlife, native plant community composition	What is the status of current T&E species in the Park? Are new T&E species entering?
Water Quality (Surface) (Compliance with Clean Water Act)	HIGH	All encompassing	To what degree is water quality being affected by atmospheric deposition, herbicide use, exotic aquatic plants, urban runoff or outside/adjacent development? What contaminants does the Park receive from adjacent lands and pumping stations and what are their impacts? What are the normal patterns or trends? Impacts from salt water intrusion and the Davis Pond Diversion? Presence of toxins?
Wetlands	HIGH	No information	What impacts will the Davis Pond Diversion have on wetland plant communities, below ground biomass, water levels, etc.?
Native Wildlife Reintroductions	MED	Wildlife	Could Park habitats sustain introduced populations of wild turkey, bobcat or other lost species?
Visitor Overuse	MED	soils, erosion, water quality, noise, native plant community composition, wildlife	What are the impacts of concentrated bank-side fishing?
Water Quantity (Surface Water)	MED	Hydrology, wetlands, wildlife, all aquatic ecosystem components	What are the long-term ecological effects of the Davis Pond Diversion? What are the effects of seasonal drought on forest regeneration and wildlife distribution? What will the habitat response be to changing water levels?
With/In Park Development	MED	All encompassing	What are the impacts of roads/trail maintenance activities?

Appendix B. Continued.

Management Issues	**Priority**	**Significant Natural Resources Impacted**	**Monitoring Questions**
Water Quality (Ground)	NA	NA	NA
Data Gaps	LOW	NA	NA
Fire Management	LOW	All encompassing	Is fire a natural ecosystem component? Would fire be an effective management tool? Could fire be used to control exotic plant and/or animal species?
Genetic Contamination	LOW	NA	NA
Mining	LOW	NA	NA
Night Sky	LOW	NA	NA
Poaching	LOW	NA	NA
Slope Failure	LOW	NA	NA
Soundscape	LOW	NA	NA
Viewscape	LOW	NA	NA
Water Quantity (Groundwater)	LOW	NA	NA

GIS DATA, DATA SETS

A list of available spatial and non-spatial data is provided for the park. Data have been organized into the following groups: GIS data, non-GIS digital maps, hardcopy maps, digital databases, digital publications, NatureBib maps, and abbreviations. GIS data have been further separated into three categories: park specific or local, statewide, and nationwide. A unique identifier has been given to each line of data as follows: "X_#", where "X" is a letter describing the data type (L=local GIS, S=Statewide GIS, N=Nationwide GIS, M=digital map, SD= state non-spatial data, and D=database) and "#" is a unique number. Basic information is provided to allow quick review of the publicly available data, including the title of the data and the organization from which the data are available. To view more extensive details about the data, an EXCEL workbook has been provided. The EXCEL workbook includes several datasheets for each of the aforementioned data categories. Among some of the additional details provided in the EXCEL workbook are partial metadata, web addresses, and descriptions of the data. Blank fields within the EXCEL workbook represent information that were not readily available, but can be gathered at a later date with a more in depth search of the available metadata.

General Park Information

Spatial Extent	
Lat	**Long**
30.5	-92.42
29.73	-89.89

Barataria Preserve

1:24,000 Quadrangles	1:100,000	1:250,000	Counties	Watersheds:		HUC
Lake Cataouatche East	New Orleans	New Orleans	Jefferson	Barataria	East Central Louisiana Coastal	8090301
Barataria						
Bertrandville						

Chalmette Battlefield

1:24,000 Quadrangles	1:100,000	1:250,000	Counties	Watersheds:		HUC
Little Woods	Gulfport	Mobile	Orleans	Pontchartrain	Eastern Louisiana Coastal	8090203

French Quarter Visitor Center

1:24,000 Quadrangles	1:100,000	1:250,000	Counties	Watersheds:		HUC
Chalmette	Black Bay	Breton Sound	St. Bernard	Pontchartrain	Eastern Louisiana Coastal	8090203

Acadian Cultural Center

1:24,000 Quadrangles	1:100,000	1:250,000	Counties	Watersheds:		HUC
Broussard	Baton Rouge	Baton Rouge	Lafayette	Vermilion-Teche	Vermilion	8080103

Prairie Acadian Cultural Center

1:24,000 Quadrangles	1:100,000	1:250,000	Counties	Watersheds:		HUC
Eunice South	Crowley	Lake Charles	St. Landry	Mermentau	Mermentau Headwaters	8080201

Wetlands Acadian Cultural Center

1:24,000 Quadrangles	1:100,000	1:250,000	Counties	Watersheds:		HUC
Thibodaux	New Orleans	New Orleans	Lafourche	Barataria	East Central Louisiana Coastal	8090301
				Terrebonne	West Central Louisiana Coastal	8090302

Local: by Quarter-Quad, Quad, County or Watershed

ID	Available From	Originator/ Publisher	Location	Data	Scale	Structure	Resolution
Parts							
L_1	USGS		30.5N 29.62S 92.5W 89.88E	NED	1:24,000	raster	30 m
L_2	USGS		30.5N 29.62S 92.5W 89.88E	NED		raster	10 m
L_3	USGS		30.5N 29.62S 92.5W 89.88E	NLCD		raster	30 m
L_4	USGS		30.5N 29.62S 92.5W 89.88E	BTS Roads		vector	
L_5	USGS		30.5N 29.62S 92.5W 89.88E	SRTM		raster	30 m
L_6	USGS		30.5N 29.62S 92.5W 89.88E	SRTM		raster	90 m
L_7	USGS		30.5N 29.62S 92.5W 89.88E	MODIS NDVI (current)		raster	1 km
L_8	USGS		30.5N 29.62S 92.5W 89.88E	MODIS NDVI (2nd Day)		raster	1 km
L_9	USGS		30.5N 29.62S 92.5W 89.88E	MODIS NDVI (3rd Day)		raster	1 km
L_10	USGS		30.5N 29.62S 92.5W 89.88E	MODIS NDVI (4th Day)		raster	1 km
L_11	USGS		30.5N 29.62S 92.5W 89.88E	MODIS NDVI (5th Day)		raster	1 km
L_12	USGS		30.5N 29.62S 92.5W 89.88E	MODIS NDVI (6th Day)		raster	1 km
L_13	USGS		30.5N 29.62S 92.5W 89.88E	MODIS NDVI (7th Day)		raster	1 km
Barataria Preserve							
L_14	USGS		East Central Louisiana Coastal Watershed	NHD	1:100,000		
L_15	USGS		New Orleans 1:250,000 Quad	Land Use/Land Cover	1:250,000	raster	
L_16	USGS		New Orleans_E 1:250,000 Quad	DEM	1:250,000	raster	
L_17	USGS		New Orleans_W 1:250,000 Quad	DEM	1:250,000	raster	
L_18	USGS/ATLAS		Barataria	DEM	1:24,000	raster	30 m
L_19	USGS/ATLAS		Bertrandville	DEM	1:24,000	raster	30 m
L_20	USGS/ATLAS		Lake Cataouatche East	DEM	1:24,000	raster	30 m
L_21	USGS	USGS	Barataria	DRG	1:24,000	img	
L_22	USGS	USGS	Bertrandville	DRG	1:24,000	img	
L_23	USGS	USGS	Lake Cataouatche East	DRG	1:24,000	img	
L_24	ATLAS	USGS	Barataria	DRG	1:24,000	img	
L_25	ATLAS	USGS	Bertrandville	DRG	1:24,000	img	
L_26	ATLAS	USGS	Lake Cataouatche East	DRG	1:24,000	img	
L_27	USGS		New Orleans 1:100,000 Quad	DRG	1:100,000		
L_28	USGS		New Orleans 1:250,000 Quad	DRG	1:250,000		
L_29	ATLAS	USGS	New Orleans 1:100,000 Quad	DRG	1:100,000		

Local: by Quarter-Quad, Quad, County or Watershed

ID	Available From	Originator/ Publisher	Location	Data	Scale	Structure	Resolution
L_30	ATLAS	USGS	New Orleans 1:250,000 Quad	DRG	1:250,000		
L_31	USGS		New Orleans_E	DLG	1:100,000		
L_32	USGS		New Orleans_W	DLG	1:100,000		
L_33	USGS		Barataria	DLG_Boundaries	1:24,000		
L_34	USGS		Barataria	DLG_Hydrography	1:24,000		
L_35	USGS		Barataria	DLG_Hypsography	1:24,000		
L_36	USGS		Barataria	DLG_Public Lands	1:24,000		
L_37	USGS		Barataria	DLG_Transportation	1:24,000		
L_38	USGS		Bertrandville	DLG_Boundaries	1:24,000		
L_39	USGS		Bertrandville	DLG_Hydrography	1:24,000		
L_40	USGS		Bertrandville	DLG_Hypsography	1:24,000		
L_41	USGS		Bertrandville	DLG_Public Lands	1:24,000		
L_42	USGS		Bertrandville	DLG_Transportation	1:24,000		
L_43	USGS		Lake Cataouatche East	DLG_Boundaries	1:24,000		
L_44	USGS		Lake Cataouatche East	DLG_Hydrography	1:24,000		
L_45	USGS		Lake Cataouatche East	DLG_Hypsography	1:24,000		
L_46	USGS		Lake Cataouatche East	DLG_Public Lands	1:24,000		
L_47	USGS		Lake Cataouatche East	DLG_Transportation	1:24,000		
L_48	USGS		Barataria_NE	DOQQ		raster	1 m
L_49	USGS		Barataria_NW	DOQQ		raster	1 m
L_50	USGS		Barataria_SE	DOQQ		raster	1 m
L_51	USGS		Barataria_SW	DOQQ		raster	1 m
L_52	USGS		Bertrandville_NE	DOQQ		raster	1 m
L_53	USGS		Bertrandville_NW	DOQQ		raster	1 m
L_54	USGS		Bertrandville_SE	DOQQ		raster	1 m
L_55	USGS		Bertrandville_SW	DOQQ		raster	1 m
L_56	USGS		Lake Cataouatche East_NE	DOQQ		raster	1 m
L_57	USGS		Lake Cataouatche East_NW	DOQQ		raster	1 m
L_58	USGS		Lake Cataouatche East_SE	DOQQ		raster	1 m
L_59	USGS		Lake Cataouatche East_SW	DOQQ		raster	1 m
L_60	ATLAS	USGS	Barataria_NE	DOQQ		raster	1 m
L_61	ATLAS	USGS	Barataria_NW	DOQQ		raster	1 m
L_62	ATLAS	USGS	Barataria_SE	DOQQ		raster	1 m

Local: by Quarter-Quad, Quad, County or Watershed

ID	Available From	Originator/ Publisher	Location	Data	Scale	Structure	Resolution
L_63	ATLAS	USGS	Barataria_SW	DOQQ		raster	1 m
L_64	ATLAS	USGS	Bertrandville_NE	DOQQ		raster	1 m
L_65	ATLAS	USGS	Bertrandville_NW	DOQQ		raster	1 m
L_66	ATLAS	USGS	Bertrandville_SE	DOQQ		raster	1 m
L_67	ATLAS	USGS	Bertrandville_SW	DOQQ		raster	1 m
L_68	ATLAS	USGS	Lake Cataouatche East_NE	DOQQ		raster	1 m
L_69	ATLAS	USGS	Lake Cataouatche East_NW	DOQQ		raster	1 m
L_70	ATLAS	USGS	Lake Cataouatche East_SE	DOQQ		raster	1 m
L_71	ATLAS	USGS	Lake Cataouatche East_SW	DOQQ		raster	1 m
L_72	USGS	FEMA	Jefferson County	Q3 Flood Data			
L_73	USGS		New Orleans 1:250,000 Quad	Composite Them Grid Format		raster	200 m
L_74	USGS		New Orleans 1:250,000 Quad	Censu County Subdivision			
L_75	USGS		New Orleans 1:250,000 Quad	Federal Land			
L_76	USGS		New Orleans 1:250,000 Quad	Hydrologic Units			
L_77	USGS		New Orleans 1:250,000 Quad	Land Use/Land Cover			
L_78	USGS		New Orleans 1:250,000 Quad	Political Units			
L_79	USGS		New Orleans 1:250,000 Quad	State Land			
L_80	USGS	USFWS	Bertrandville	NWI Wetlands	1:24,000		
L_81	USGS		New Orleans_NE 1:100,000 Quad	TM-Spot Composite Imagery	1:100,000	raster	
L_82	USGS		New Orleans_NW 1:100,000 Quad	TM-Spot Composite Imagery	1:100,000	raster	
L_83	USGS		New Orleans_SE 1:100,000 Quad	TM-Spot Composite Imagery	1:100,000	raster	
L_84	USGS		New Orleans_SW 1:100,000 Quad	TM-Spot Composite Imagery	1:100,000	raster	
L_85	USGS		New Orleans 1:100,000 Quad	TM-Spot Composite Imagery	1:100,000	raster	
L_86	USGS		Jefferson County	Tiger/Line 2000		vector	
L_87	USGS		Jefferson County	Tiger/Line 2002		vector	
L_88	ATLAS	USGS	New Orleans 1:100,000 Quad	GAP		raster	
L_89	ATLAS		Barataria_NE	LIDAR		raster/vector	
L_90	ATLAS		Barataria_NW	LIDAR		raster/vector	
L_91	ATLAS		Barataria_SE	LIDAR		raster/vector	
L_92	ATLAS		Barataria_SW	LIDAR		raster/vector	
L_93	ATLAS		Bertrandville_NE	LIDAR		raster/vector	
L_94	ATLAS		Bertrandville_NW	LIDAR		raster/vector	
L_95	ATLAS		Bertrandville_SE	LIDAR		raster/vector	

Local: by Quarter-Quad, Quad, County or Watershed

ID	Available From	Originator/ Publisher	Location	Data	Scale	Structure	Resolution
L_96	ATLAS		Bertrandville_SW	LIDAR		raster/vector	
L_97	ATLAS		Lake Cataouatche East_NE	LIDAR		raster/vector	
L_98	ATLAS		Lake Cataouatche East_NW	LIDAR		raster/vector	
L_99	ATLAS		Lake Cataouatche East_SE	LIDAR		raster/vector	
L_100	ATLAS		Lake Cataouatche East_SW	LIDAR		raster/vector	
L_101	ATLAS	NWRC	Barataria	NWI		vector	
L_102	ATLAS	NWRC	Bertrandville	NWI		vector	
L_103	ATLAS	NWRC	Lake Cataouatche East	NWI		vector	
Chalmette Battlefield							
L_104	USGS		Eastern Louisiana Coastal Watershed	NHD	1:100,000		
L_105	USGS		Mobile 1:250,000 Quad	Land Use/Land Cover	1:250,000	raster	
L_106	USGS		Mobile_E 1:250,000 Quad	DEM	1:250,000	raster	
L_107	USGS		Mobile_W 1:250,000 Quad	DEM	1:250,000	raster	
L_108	USGS/ATLAS		Little Woods	DEM	1:24,000	raster	30 m
L_109	USGS	USGS	Little Woods	DRG	1:24,000	img	
L_110	USGS	USGS	Gulfport 1:100,000 Quad	DRG	1:100,000		
L_111	USGS	USGS	Mobile 1:250,000 Quad	DRG	1:250,000		
L_112	ATLAS	USGS	Little Woods	DRG	1:24,000		
L_113	ATLAS	USGS	Gulfport 1:100,000 Quad	DRG	1:100,000		
L_114	ATLAS	USGS	Mobile 1:250,000 Quad	DRG	1:250,000		
L_115	USGS		Gulfport_E 1:100,000 Quad	DLG	1:100,000		
L_116	USGS		Gulfport_W 1:100,000 Quad	DLG	1:100,000		
L_117	USGS		Little Woods	DLG_Boundaries	1:24,000	vector	
L_118	USGS		Little Woods	DLG_Hydrography	1:24,000	vector	
L_119	USGS		Little Woods	DLG_Hypsography	1:24,000	vector	
L_120	USGS		Little Woods	DLG_Public Lands	1:24,000	vector	
L_121	USGS		Little Woods	DLG_Transportation	1:24,000	vector	
L_122	USGS		Little Woods_NE	DOQQ		raster	1 m
L_123	USGS		Little Woods_NW	DOQQ		raster	1 m
L_124	USGS		Little Woods_SE	DOQQ		raster	1 m
L_125	USGS		Little Woods_SW	DOQQ		raster	1 m

Local: by Quarter-Quad, Quad, County or Watershed

ID	Available From	Originator/ Publisher	Location	Data	Scale	Structure	Resolution
L_126	ATLAS	USGS	Little Woods_NE	DOQQ		raster	1 m
L_127	ATLAS	USGS	Little Woods_NW	DOQQ		raster	1 m
L_128	ATLAS	USGS	Little Woods_SE	DOQQ		raster	1 m
L_129	ATLAS	USGS	Little Woods_SW	DOQQ		raster	1 m
L_130	USGS	FEMA	Orleans County	Q3 Flood Data			
L_131	USGS		Mobile 1:250,000 Quad	Composite Them Grid Format		raster	200 m
L_132	USGS		Mobile 1:250,000 Quad	Census County Subdivision			
L_133	USGS		Mobile 1:250,000 Quad	Federal Land			
L_134	USGS		Mobile 1:250,000 Quad	Hydrologic Units			
L_135	USGS		Mobile 1:250,000 Quad	Land Use/Land Cover			
L_136	USGS		Mobile 1:250,000 Quad	Political Units			
L_137	USGS		Mobile 1:250,000 Quad	State Land			
L_138	USGS	USFWS	Little Woods	NWI Wetlands	1:24,000	vector	
L_139	USGS		Gulfport_NW 1:100,000 Quad	TM-Spot Composite Imagery	1:100,000	raster	
L_140	USGS		Gulfport_SE 1:100,000 Quad	TM-Spot Composite Imagery	1:100,000	raster	
L_141	USGS		Gulfport_SW 1:100,000 Quad	TM-Spot Composite Imagery	1:100,000	raster	
L_142	USGS		Gulfport 1:100,000 Quad	TM-Spot Composite Imagery	1:100,000	raster	
L_143	USGS		Orleans County	Tiger/Line 2000		vector	
L_144	USGS		Orleans County	Tiger/Line 2002		vector	
L_145	ATLAS		Gulfport 1:100,000 Quad	GAP		raster	
L_146	ATLAS		Little Woods_NE	LIDAR		raster/vector	
L_147	ATLAS		Little Woods_NW	LIDAR		raster/vector	
L_148	ATLAS		Little Woods_SE	LIDAR		raster/vector	
L_149	ATLAS		Little Woods_SW	LIDAR		raster/vector	
L_150	ATLAS	NWRC	Little Woods	NWI		vector	
French Quarter Visitor Center							
L_151	USGS		Eastern Louisiana Coastal Watershed	NHD	1:100,000		
L_152	USGS		Breton Sound 1:250,000 Quad	Land Use/Land Cover	1:250,000	raster	
L_153	USGS		Breton Sound_E 1:250,000 Quad	DEM	1:250,000	raster	
L_154	USGS		Breton Sound_W 1:250,000 Quad	DEM	1:250,000	raster	
L_155	USGS/ATLAS		Chalmette	DEM	1:24,000	raster	30 m
L_156	USGS		Chalmette	DRG	1:24,000	img	

Local: by Quarter-Quad, Quad, County or Watershed

ID	Available From	Originator/ Publisher	Location	Data	Scale	Structure	Resolution
L_157	USGS		Black Bay 1:100,000 Quad	DRG	1:100,000		
L_158	USGS		Breton Sound 1:250,000 Quad	DRG	1:250,000		
L_159	ATLAS	USGS	Chalmette	DRG	1:24,000		
L_160	ATLAS	USGS	Black Bay 1:100,000 Quad	DRG	1:100,000		
L_161	ATLAS	USGS	Breton Sound 1:250,000 Quad	DRG	1:250,000		
L_162	USGS		Black Bay_E 1:100,000 Quad	DLG	1:100,000	vector	
L_163	USGS		Black Bay_W 1:100,000 Quad	DLG	1:100,000	vector	
L_164	USGS		Chalmette	DLG_Boundaries	1:24,000	vector	
L_165	USGS		Chalmette	DLG_Hydrography	1:24,000	vector	
L_166	USGS		Chalmette	DLG_Hypsography	1:24,000	vector	
L_167	USGS		Chalmette	DLG_Public Lands	1:24,000	vector	
L_168	USGS		Chalmette	DLG_Transportation	1:24,000	vector	
L_169	USGS		Chalmette_NE	DOQQ		raster	1 m
L_170	USGS		Chalmette_NW	DOQQ		raster	1 m
L_171	USGS		Chalmette_SE	DOQQ		raster	1 m
L_172	USGS		Chalmette_SW	DOQQ		raster	1 m
L_173	ATLAS	USGS	Chalmette_NE	DOQQ		raster	1 m
L_174	ATLAS	USGS	Chalmette_NW	DOQQ		raster	1 m
L_175	ATLAS	USGS	Chalmette_SE	DOQQ		raster	1 m
L_176	ATLAS	USGS	Chalmette_SW	DOQQ		raster	1 m
L_177	USGS	FEMA	St. Bernard County	Q3 Flood Data			
L_178	USGS		Breton Sound 1:250,000 Quad	Composite Them Grid Format		raster	200 m
L_179	USGS		Breton Sound 1:250,000 Quad	Census County Subdivision			
L_180	USGS		Breton Sound 1:250,000 Quad	Federal Land			
L_181	USGS		Breton Sound 1:250,000 Quad	Hydrologic Units			
L_182	USGS		Breton Sound 1:250,000 Quad	Land Use/Land Cover			
L_183	USGS		Breton Sound 1:250,000 Quad	Political Units			
L_184	USGS		Breton Sound 1:250,000 Quad	State Land			
L_185	USGS	USFWS	Chalmette	NWI Wetlands	1:24,000	vector	
L_186	USGS		Black Bay_NE 1:100,000 Quad	TM-Spot Composite Imagery		raster	
L_187	USGS		Black Bay_NW 1:100,000 Quad	TM-Spot Composite Imagery		raster	
L_188	USGS		Black Bay_SE 1:100,000 Quad	TM-Spot Composite Imagery		raster	
L_189	USGS		Black Bay_SW 1:100,000 Quad	TM-Spot Composite Imagery		raster	

ID	Available From	Originator/ Publisher	Location	Data	Scale	Structure	Resolution
Local: by Quarter-Quad, Quad, County or Watershed							
L_190	USGS		Black Bay 1:100,000 Quad	TM-Spot Composite Imagery		raster	
L_191	USGS		St. Bernard County	Tiger/Line 2000		vector	
L_192	USGS		St. Bernard County	Tiger/Line 2002		vector	
L_193	ATLAS		Black Bay 1:100,000 Quad	GAP		raster	
L_194	ATLAS		Chalmette_NE	LIDAR		raster/vector	
L_195	ATLAS		Chalmette_NW	LIDAR		raster/vector	
L_196	ATLAS		Chalmette_SE	LIDAR		raster/vector	
L_197	ATLAS		Chalmette_SW	LIDAR		raster/vector	
L_198	ATLAS	NWRC	Chalmette	NWI		vector	
Acadian Cultural Center							
L_199	USGS		Vermilion Watershed	NHD	1:100,000		
L_200	USGS		Baton Rouge 1:250,000 Quad	Land Use/Land Cover	1:250,000	raster	
L_201	USGS		Baton Rouge_E 1:250,000 Quad	DEM	1:250,000	raster	
L_202	USGS		Baton Rouge_W 1:250,000 Quad	DEM	1:250,000	raster	
L_203	USGS/ATLAS		Broussard	DEM	1:24,000	raster	30 m
L_204	USGS		Broussard	DRG	1:24,000	img	
L_205	USGS		Baton Rouge 1:100,000 Quad	DRG	1:100,000		
L_206	USGS		Baton Rouge 1:250,000 Quad	DRG	1:250,000		
L_207	ATLAS	USGS	Broussard	DRG	1:24,000		
L_208	ATLAS	USGS	Baton Rouge 1:100,000 Quad	DRG	1:100,000		
L_209	ATLAS	USGS	Baton Rouge 1:250,000 Quad	DRG	1:250,000		
L_210	USGS		Baton Rouge_E 1:100,000 Quad	DLG	1:100,000		
L_211	USGS		Baton Rouge_W 1:100,000 Quad	DLG	1:100,000		
L_212	USGS		Broussard	DLG_Boundaries	1:24,000	vector	
L_213	USGS		Broussard	DLG_Hydrography	1:24,000	vector	
L_214	USGS		Broussard	DLG_Hypsography	1:24,000	vector	
L_215	USGS		Broussard	DLG_Transportation	1:24,000	vector	
L_216	USGS		Broussard_NE	DOQQ		raster	1 m
L_217	USGS		Broussard_NW	DOQQ		raster	1 m
L_218	USGS		Broussard_SE	DOQQ		raster	1 m
L_219	USGS		Broussard_SW	DOQQ		raster	1 m

Local: by Quarter-Quad, Quad, County or Watershed

ID	Available From	Originator/ Publisher	Location	Data	Scale	Structure	Resolution
L_220	ATLAS	USGS	Broussard_NE	DOQQ		raster	1 m
L_221	ATLAS	USGS	Broussard_NW	DOQQ		raster	1 m
L_222	ATLAS	USGS	Broussard_SE	DOQQ		raster	1 m
L_223	ATLAS	USGS	Broussard_SW	DOQQ		raster	1 m
L_224	USGS	FEMA	Lafayette County	Q3 Flood Data			
L_225	USGS		Baton Rouge 1:250,000 Quad	Composite Them Grid Format		raster	
L_226	USGS		Baton Rouge 1:250,000 Quad	Census County Subdivision			
L_227	USGS		Baton Rouge 1:250,000 Quad	Federal Land			
L_228	USGS		Baton Rouge 1:250,000 Quad	Hydrologic Units			
L_229	USGS		Baton Rouge 1:250,000 Quad	Land Use/Land Cover			
L_230	USGS		Baton Rouge 1:250,000 Quad	Political Units			
L_231	USGS		Baton Rouge 1:250,000 Quad	State Land			
L_232	USGS		Baton Rouge_NE 1:100,000 Quad	TM-Spot Composite Imagery			
L_233	USGS		Baton Rouge_NW 1:100,000 Quad	TM-Spot Composite Imagery			
L_234	USGS		Baton Rouge_SE 1:100,000 Quad	TM-Spot Composite Imagery			
L_235	USGS		Baton Rouge_SW 1:100,000 Quad	TM-Spot Composite Imagery			
L_236	USGS		Baton Rouge 1:100,000 Quad	TM-Spot Composite Imagery			
L_237	USGS		Lafayette County	Tiger/Line 2000		vector	
L_238	USGS		Lafayette County	Tiger/Line 2002		vector	
L_239	ATLAS		Baton Rouge 1:100,000 Quad	GAP		raster	
L_240	ATLAS	NWRC	Broussard	NWI		vector	
Prairie Acadian Cultural Center							
L_241	USGS		Mermentau Headwaters Watershed		1:100,000		
L_242	USGS		Lake Charles 1:250,000 Quad	Land Use/Land Cover	1:250,000	raster	
L_243	USGS		Lake Charles_E 1:250,000 Quad	DEM	1:250,000	raster	
L_244	USGS		Lake Charles_W 1:250,000 Quad	DEM	1:250,000	raster	
L_245	USGS/ATLAS		Eunice South	DEM	1:24,0000	raster	30 m
L_246	USGS		Eunice South	DRG	1:240,000	img	
L_247	USGS		Crowley 1:100,000 Quad	DRG	1:100,000		
L_248	USGS		Lake Charles 1:250,000 Quad	DRG	1:250,000		
L_249	ATLAS	USGS	Eunice South	DRG	1:240,000		

ID	Available From	Originator/ Publisher	Location	Data	Scale	Structure	Resolution
Local: by Quarter-Quad, Quad, County or Watershed							
L_250	ATLAS	USGS	Crowley 1:100,000 Quad	DRG	1:100,000		
L_251	ATLAS	USGS	Lake Charles 1:250,000 Quad	DRG	1:250,000		
L_252	USGS		Crowley_E 1:100,000 Quad	DLG	1:100,000		
L_253	USGS		Crowley_W 1:100,000 Quad	DLG	1:100,000		
L_254	USGS		Eunice South	DLG_Boundaries	1:24,000		
L_255	USGS		Eunice South	DLG_Hydrography	1:24,000		
L_256	USGS		Eunice South	DLG_Hypsography	1:24,000		
L_257	USGS		Eunice South	DLG_Transportation	1:24,000		
L_258	USGS		Eunice South_NE	DOQQ		raster	1 m
L_259	USGS		Eunice South_NW	DOQQ		raster	1 m
L_260	USGS		Eunice South_SE	DOQQ		raster	1 m
L_261	USGS		Eunice South_SW	DOQQ		raster	1 m
L_262	ATLAS	USGS	Eunice South_NE	DOQQ		raster	1 m
L_263	ATLAS	USGS	Eunice South_NW	DOQQ		raster	1 m
L_264	ATLAS	USGS	Eunice South_SE	DOQQ		raster	1 m
L_265	ATLAS	USGS	Eunice South_SW	DOQQ		raster	1 m
L_266	USGS	FEMA	St. Landry County	Q3 Flood Data			
L_267	USGS		Crowley_NE 1:100,000 Quad	TM-Spot Composite Imagery			
L_268	USGS		Crowley_NW 1:100,000 Quad	TM-Spot Composite Imagery			
L_269	USGS		Crowley_SE 1:100,000 Quad	TM-Spot Composite Imagery			
L_270	USGS		Crowley_SW 1:100,000 Quad	TM-Spot Composite Imagery			
L_271	USGS		Crowley 1:100,000 Quad	TM-Spot Composite Imagery			
L_272	USGS	USCB	St. Landry County	Tiger/Line 2000			
L_273	USGS	USCB	St. Landry County	Tiger/Line 2002			
L_274	ATLAS		Crowley 1:100,000 Quad	GAP		raster	
L_275	ATLAS	NWRC	Eunice South	NWI		vector	
Wetlands Acadian Cultural Center							
L_276	USGS		East Central Louisiana Coastal Watershed	NHD	1:100,000		
L_277	USGS		West Central Louisiana Coastal Watershed	NHD	1:100,000		
L_278	USGS		New Orleans 1:250,000 Quad	Land Use/Land Cover	1:250,000	raster	
L_279	USGS		New Orleans_E 1:250,000 Quad	DEM	1:250,000	raster	

Local: by Quarter-Quad, Quad, County or Watershed

ID	Available From	Originator/ Publisher	Location	Data	Scale	Structure	Resolution
L_280	USGS		New Orleans_W 1:250,000 Quad	DEM	1:250,000	raster	
L_281	USGS/ATLAS		Thibodaux	DEM	1:24,000	raster	30 m
L_282	USGS	USGS	Thibodaux	DRG	1:24,000		
L_283	USGS	USGS	New Orleans 1:100,000 Quad	DRG	1:100,000		
L_284	USGS	USGS	New Orleans 1:250,000 Quad	DRG	1:250,000		
L_285	ATLAS	USGS	Thibodaux	DRG	1:24,000		
L_286	ATLAS	USGS	New Orleans 1:100,000 Quad	DRG	1:100,000		
L_287	ATLAS	USGS	New Orleans 1:250,000 Quad	DRG	1:250,000		
L_288	USGS		New Orleans_E 1:100,000 Quad	DLG	1:100,000		
L_289	USGS		New Orleans_W 1:100,000 Quad	DLG	1:100,000		
L_290	USGS		Thibodaux	DLG_Boundaries	1:24,000		
L_291	USGS		Thibodaux	DLG_Hydrography	1:24,000		
L_292	USGS		Thibodaux	DLG_Hypsography	1:24,000		
L_293	USGS		Thibodaux	DLG_Public Lands	1:24,000		
L_294	USGS		Thibodaux	DLG_Transportation	1:24,000		
L_295	USGS		Thibodaux_NE	DOQQ	1:24,000	raster	1 m
L_296	USGS		Thibodaux_NW	DOQQ	1:24,000	raster	1 m
L_297	USGS		Thibodaux_SE	DOQQ	1:24,000	raster	1 m
L_298	USGS		Thibodaux_SW	DOQQ	1:24,000	raster	1 m
L_299	ATLAS	USGS	Thibodaux_NE	DOQQ	1:24,000	raster	1 m
L_300	ATLAS	USGS	Thibodaux_NW	DOQQ	1:24,000	raster	1 m
L_301	ATLAS	USGS	Thibodaux_SE	DOQQ	1:24,000	raster	1 m
L_302	ATLAS	USGS	Thibodaux_SW	DOQQ	1:24,000	raster	1 m
L_303	USGS	FEMA	Lafourche County	Q3 Flood Data			
L_304	USGS		New Orleans 1:250,000 Quad	Composite Them Grid Format		raster	200 m
L_305	USGS		New Orleans 1:250,000 Quad	Censu County Subdivision			
L_306	USGS		New Orleans 1:250,000 Quad	Federal Land			
L_307	USGS		New Orleans 1:250,000 Quad	Hydrologic Units			
L_308	USGS		New Orleans 1:250,000 Quad	Land Use/Land Cover			
L_309	USGS		New Orleans 1:250,000 Quad	Political Units			
L_310	USGS		New Orleans 1:250,000 Quad	State Land			
L_311	USGS		New Orleans_NE 1:100,000 Quad	TM-Spot Composite Imagery	1:100,000	raster	
L_312	USGS		New Orleans_NW 1:100,000 Quad	TM-Spot Composite Imagery	1:100,000	raster	

Local: by Quarter-Quad, Quad, County or Watershed

ID	Available From	Originator/ Publisher	Location	Data	Scale	Structure	Resolution
L_313	USGS		New Orleans_SE 1:100,000 Quad	TM-Spot Composite Imagery	1:100,000	raster	
L_314	USGS		New Orleans_SW 1:100,000 Quad	TM-Spot Composite Imagery	1:100,000	raster	
L_315	USGS		New Orleans 1:100,000 Quad	TM-Spot Composite Imagery	1:100,000	raster	
L_316	USGS	USCB	Lafourche County	Tiger/Line 2000		vector	
L_317	USGS	USCB	Lafourche County	Tiger/Line 2002		vector	
L_318	ATLAS		New Orleans 1:100,000 Quad	GAP		raster	
L_319	ATLAS		Thibodaux_NE	LIDAR		raster/vector	
L_320	ATLAS		Thibodaux_NW	LIDAR		raster/vector	
L_321	ATLAS		Thibodaux_SE	LIDAR		raster/vector	
L_322	ATLAS		Thibodaux_SW	LIDAR		raster/vector	
L_323	ATLAS	NWRC	Thibodaux	NWI		vector	

NOTE: free downloads from the USGS can also be ordered on CD for a nominal write fee (i.e., usually considerably <$1.00)

NOTE: ATLAS has free downloads of:

DRGs (1:24,000, 1:100,000, 1:250,000)	all available
DOQQs	all available
GAP 1992, by 1:100,000 quad	all available
LIDAR by quarter-quads	not available for: Eunice South nor Broussard 1:24,000 quads
NWI 1988 by 1:24,000 quad	all available
Coastwide 2001 image by frame, roll, flight	all available
DEM (1:24,000)	all available

Statewide

ID	Available From	Originator/ Publisher	Location	Data	Scale	Structure	Resolution
S_1	ATLAS		statewide	Abandoned Barges		vector	
S_2	ATLAS		statewide	Abandoned Non-Hazardous Waste Pits		vector	
S_3	ATLAS		statewide	Alligator Habitats		vector	
S_4	ATLAS		statewide	Atlas Indices		vector	
S_5	ATLAS		statewide	Atlas Indices		vector	
S_6	ATLAS		statewide	Aquifers		vector	
S_7	ATLAS		statewide	Attributes for ESI Geospatial Data		none	
S_8	ATLAS		statewide	Baseline Sampling and Analysis Monitor Point Locations, 1996-1997 Sampling Year		vector	
S_9	ATLAS		statewide	Baseline Sampling and Analysis Monitor Point Locations, 1997-1998 Sampling Year		vector	
S_10	ATLAS		statewide	Baseline Sampling and Analysis Monitor Point Locations, 1998-1999 Sampling Year		vector	
S_11	ATLAS		statewide	Basin-Subsegments		vector	
S_12	ATLAS		statewide	Bathymetry		vector	
S_13	ATLAS		statewide	Bear Habitat		vector	
S_14	ATLAS		statewide	Benchmarks		vector	
S_15	ATLAS		statewide	Brackish Marsh Habitat		vector	
S_16	ATLAS		statewide	Census 2000 Block Groups		vector	
S_17	ATLAS		statewide	Census 2000 Blocks		vector	
S_18	ATLAS		statewide	Census 2000 Counties		vector	
S_19	ATLAS		statewide	Census 2000 Tracts		vector	
S_20	ATLAS		statewide	Cities for ESI		vector	
S_21	ATLAS		statewide	Coast Guard Marine Safety Office (MSO) Zones		vector	
S_22	ATLAS		statewide	Coastal Louisiana Habitat Data		raster	
S_23	ATLAS		statewide	Coastal Marsh Vegetative Type		vector	
S_24	ATLAS		statewide	Coastal Zone Boundary		vector	
S_25	ATLAS		statewide	Congressional Districts for 103rd Congress		vector	
S_26	ATLAS		statewide	Congressional Districts for 104th Congress		vector	
S_27	ATLAS		statewide	Congressional Districts for 105th Congress		vector	
S_28	ATLAS		statewide	Congressional Districts for 106th Congress		vector	
S_29	ATLAS		statewide	Congressional Districts for 107th Congress		vector	
S_30	ATLAS		statewide	Congressional Districts for 108th Congress		vector	
S_31	ATLAS		statewide	Conservation Plan Boundary		vector	

Statewide

ID	Available From	Originator/ Publisher	Location	Data	Scale	Structure	Resolution
S_32	ATLAS		statewide	Crawfish Habitat		vector	
S_33	ATLAS		statewide	DEQ Compound Detection Points		vector	
S_34	ATLAS		statewide	Dispersant Preapproval Areas		vector	
S_35	ATLAS		statewide	EPA Eco Areas		vector	
S_36	ATLAS		statewide	Federal-State Boundary		vector	
S_37	ATLAS		statewide	Flood Zones Collection		vector	
S_38	ATLAS		statewide	Fresh Water Habitat		vector	
S_39	ATLAS		statewide	Fresh Water Fish Habitat		vector	
S_40	ATLAS		statewide	Generalized Soils		vector	
S_41	ATLAS		statewide	Geographic Names		vector	
S_42	ATLAS		statewide	Geologic Map		vector	
S_43	ATLAS		statewide	GNIS Place Names		vector	
S_44	ATLAS		statewide	High Tide Line		vector	
S_45	ATLAS		statewide	Hydrography		vector	
S_46	ATLAS		statewide	Inshore Lease Blocks		vector	
S_47	ATLAS		statewide	In-situ Burn Preapproval and Exclusion Areas		vector	
S_48	ATLAS		statewide	Intermediate Marsh Habitat		vector	
S_49	ATLAS		statewide	Land/water Interface		vector	
S_50	ATLAS		statewide	LOSCO 1:100,000 Scale Index Map		vector	
S_51	ATLAS		statewide	LOSCO 24K Scale Index Map		vector	
S_52	ATLAS		statewide	LOSCO Monitoring Points		vector	
S_53	ATLAS		statewide	Louisiana and Surrounding Urban Areas (2000)		vector	
S_54	ATLAS		statewide	Major Water Bodies		vector	
S_55	ATLAS		statewide	Managed Lands		vector	
S_56	ATLAS		statewide	Marina Images		raster	
S_57	ATLAS		statewide	Marina Locations		vector	
S_58	ATLAS		statewide	National Wildlife Refuges		vector	
S_59	ATLAS		statewide	Natural Heritage Program (NHP) Data		vector	
S_60	ATLAS		statewide	Navigated Waterways		vector	
S_61	ATLAS		North Louisiana	Oil and Gas Wells		vector	
S_62	ATLAS		South Louisiana	Oil and Gas Wells		vector	
S_63	ATLAS		statewide	Outer Coast Environmental Sensitivity Index		vector	
S_64	ATLAS		statewide	Oyster Lease Areas		vector	

Statewide

ID	Available From	Originator/ Publisher	Location	Data	Scale	Structure	Resolution
S_65	ATLAS		statewide	Parish Map		vector	
S_66	ATLAS		statewide	Pipeline Company Tables		vector	
S_67	ATLAS		statewide	Pipeline Crossing Point Map		vector	
S_68	ATLAS		statewide	Place Names		vector	
S_69	ATLAS		statewide	Powerlines		vector	
S_70	ATLAS		statewide	Precinct Map		vector	
S_71	ATLAS		statewide	Primary Roads		vector	
S_72	ATLAS		statewide	Public Land Survey		vector	
S_73	ATLAS		statewide	Public Land Survey		vector	
S_74	ATLAS		statewide	Quarter 24K Scale Index Map		vector	
S_75	ATLAS		statewide	Railroads		vector	
S_76	ATLAS		statewide	Rivers and Streams		vector	
S_77	ATLAS		statewide	Salinity Habitat		vector	
S_78	ATLAS		statewide	Salt marsh Habitat		vector	
S_79	ATLAS		statewide	Scurb Shrub & Wetland Habitat		vector	
S_80	ATLAS		statewide	Seabird and Wading Bird Nesting Colonies		vector	
S_81	ATLAS		statewide	Seabird Locations		vector	
S_82	ATLAS		statewide	Seagrass Habitat		vector	
S_83	ATLAS		statewide	Shorebird Habitat		vector	
S_84	ATLAS		statewide	Small Mammals Habitat		vector	
S_85	ATLAS		statewide	Socio-economic Features for ESI		vector	
S_86	ATLAS		statewide	State Boundary		vector	
S_87	ATLAS		statewide	Survey Boundaries for ESI		vector	
S_88	ATLAS		statewide	Swamp Habitat		vector	
S_89	ATLAS		statewide	Threatened and Endangered Species Tables		vector	
S_90	ATLAS		statewide	TM 2002 Fusion Index Map		vector	
S_91	ATLAS		statewide	TM 2002 Panchromatic Index Map		vector	
S_92	ATLAS		statewide	TM 2002 RGB 7,5,3 Index Map		vector	
S_93	ATLAS		statewide	TM Image		raster	
S_94	ATLAS		statewide	TM Image		raster	
S_95	ATLAS		statewide	Urban Areas (2000)		vector	
S_96	ATLAS		statewide	USGS 24K Scale Index Map		vector	
S_97	ATLAS		statewide	USGS Parish Map		vector	

Statewide

ID	Available From	Originator/ Publisher	Location	Data	Scale	Structure	Resolution
S_98	ATLAS		statewide	Waterfowl Habitat		vector	
S_99	ATLAS		statewide	Wildlife Management Areas		vector	
S_100	ATLAS		statewide	Zip code Tabulation Areas for 2000 Census (3 digit)		vector	
S_101	ATLAS		statewide	Zip code Tabulation Areas for 2000 Census (5 digit)		vector	
S_102	LOSCO		statewide	Wildlife Management Areas			
S_103	LOSCO		statewide	Waterway Network			
S_104	LOSCO		statewide	Watershed Basin-Subsegments		vector	
S_105	LOSCO		statewide	24K USGS Paper Quadrangle Map/DRG		vector	
S_106	LOSCO		statewide	Boundaries of RCRA Hazardous Waste Treatment, Disposal and Storage Facilities			
S_107	LOSCO		statewide	Point Locations of RCRA Hazardous Waste Treatment, Disposal and Storage Facilities			
S_108	LOSCO		statewide	Threatened and Endangered Species			
S_109	LOSCO		statewide	Louisiana Rivers and Streams			
S_110	LOSCO		statewide	State Boundary			
S_111	LOSCO		LA Coast	Seabird Colonies in LA Coastal Region			
S_112	LOSCO		statewide	Schools			
S_113	LOSCO		statewide	Public Use Airport Runways			
S_114	LOSCO		statewide	US Navigated Waterway Mile Marker Locations			
S_115	LOSCO		statewide	Petroleum Refineries			
S_116	LOSCO		statewide	Railroads			
S_117	LOSCO		statewide	Railroads	1:100,000		
S_118	LOSCO		statewide	Highways			
S_119	LOSCO		statewide	Powerlines			
S_120	LOSCO		statewide	Populated Places			
S_121	LOSCO		LA Coast	Oil and Gas Platform Structures in the Gulf of Mexico			
S_122	LOSCO		statewide	Abandoned Non-Hazardous Waste Pit and Facility Study, Phases 1-7			
S_123	LOSCO		statewide	Pipeline Crossing Points at Roads, Rivers, and Bayous			
S_124	LOSCO		statewide	Pipeline Company Tables			
S_125	LOSCO		statewide	Parish Boundaries			
S_126	LOSCO		statewide	Parish Boundaries			
S_127	LOSCO		statewide	Oyster Lease Areas			
S_128	LOSCO		statewide	Petroleum Product Storage Stations and Terminals			

Statewide

ID	Available From	Originator/ Publisher	Location	Data	Scale	Structure	Resolution
S_129	LOSCO		statewide	Oil and Gas Well Locations			
S_130	LOSCO		statewide	Crude Petroleum and Natural Gas Production and Extraction Operations			
S_131	LOSCO		LA Coast	Western Gulf of Mexico Ocean Currents, Monthly and Annual Averages			
S_132	LOSCO		LA Coast	Eastern Gulf of Mexico Ocean Currents, Monthly and Annually			
S_133	LOSCO		LA Coast	Gulf of Mexico Coastal LA Habitat	1:24,000	raster	
S_134	LOSCO		statewide	Navigated Waterways			
S_135	LOSCO		statewide	National Wildlife Refuges			
S_136	LOSCO		statewide	US Coast Guard Marine Safety Office (MSO) Zones			
S_137	LOSCO		LA Coast	Coastal Marsh Vegetative Type			
S_138	LOSCO		statewide	Major Waters			
S_139	LOSCO		statewide	Thematic Mapper Image 80:1		raster	30 m
S_140	LOSCO		statewide	Thematic Mapper Image 20:1		raster	30 m
S_141	LOSCO		statewide	Thematic Mapper Image Resampled		raster	120 m
S_142	LOSCO		LA Coast	Land and Water Interface		vector	
S_143	LOSCO		statewide	North Atlantic Hurricane Tracks			
S_144	LOSCO		statewide	North Atlantic Hurricane Center Points			
S_145	LOSCO		Lake Verret and Terrebonne Bay	Gulf-wide Information System			
S_146	LOSCO		statewide	Water Feature Extract of GNIS Points			
S_147	LOSCO		statewide	Physical Landscape Feature Extract of GNIS Points			
S_148	LOSCO		statewide	Infrastructure Feature Extract of GNIS Points			
S_149	LOSCO		statewide	Park and Forest Feature Extract of GNIS Points			
S_150	LOSCO		statewide	Culture Feature Extract of GNIS Points			
S_151	LOSCO		statewide	GNIS Points			
S_152	LOSCO		statewide	Airport Feature Extract of GNIS Points			
S_153	LOSCO		statewide	Drinking Water Sources with Surface Intakes			
S_154	LOSCO		LA Offshore	Oil Dispersant Preapproval Area			
S_155	LOSCO		statewide	Complaints and Spills Data Table			
S_156	LOSCO		LA Coast	Coastal Boundary Zone			
S_157	LOSCO		LA Coast	Conservation Plan Boundary			
S_158	LOSCO		LA Coast	Coastal Use Permits			
S_159	LOSCO		LA Offshore	In-situ Burn Preapproval Area			

Statewide

ID	Available From	Originator/ Publisher	Location	Data	Scale	Structure	Resolution
S_160	LOSCO		LA Offshore	In-situ Preapproval Exclusion Areas			
S_161	LOSCO		LA Coast	Astronomical High Tide			
S_162	LOSCO		statewide	Aquifer Systems and Recharge Potential			
S_163	LOSCO		statewide	Public Use Airports			
S_164	LOSCO		statewide	24K USGS Paper Quadrangle Map/DRG Boundaries			
S_165	LOSCO		statewide	12K Grid/Orthophoto Index			
S_166	LOSCO		statewide	Color Infrared Orthophotography		raster	
S_167	LOSCO		LA Offshore	Bathymetry			
S_168	LOSCO		statewide	Basin-Subsegments		vector	
S_169	LOSCO		statewide	State Boundary		vector	
S_170	LOSCO		statewide	Baseline Sampling and Analysis Monitor Point Locations		vector	
S_171	LOSCO		LA Coast	Marinas and Boat Launches		vector	
S_172	LOSCO		statewide	Landsat Thematic Mapper Satellite Image: 2002 RGB753-Pan Merge		raster	
S_173	LOSCO		statewide	Generalized Soils		vector	
S_174	LOSCO		LA Coast/Offshore	G-WIS Environmental Sensitivity Index datasets		vector	
S_175	LOSCO		statewide	Abandoned Barge and Vessel Inventory		vector	
S_176	LOSCO		statewide	100K USGS Paper Quadrangle Map/DRG Boundaries		vector	
S_177	LOSCO		statewide	Baseline Sampling and Analysis Monitor Point Locations		vector	
S_178	LOSCO		statewide	Baseline Sampling and Analysis Monitor Point Locations		vector	
S_179	LOSCO		statewide	Local Roads		vector	
S_180	LOSCO		statewide	Digital Overlay of the Geologic Map		vector	
S_181	LOSCO		statewide	Q3 Flood Data for Parishes			
S_182	LOSCO		statewide	Early Warning Organic Compound Detection System (EWOCDS)			
S_183	USFWS		statewide	Partners for Wildlife Boundary	1:24,000	vector	
S_184	USFWS		statewide	Partners for Wildlife Boundary	1:24,000	vector	
S_185	USFWS		statewide	Partners for Wildlife Boundary	1:24,000	vector	
S_186	USFWS		statewide	Partners for Wildlife Boundary	1:24,000	vector	
S_187	USFWS		statewide	Partners for Wildlife Boundary	1:24,000	vector	
S_188	USFWS		statewide	Partners for Wildlife Boundary	1:24,000	vector	
S_189	USFWS		statewide	Partners for Wildlife Boundary	1:24,000	vector	
S_190	USFWS		statewide	Wetland Reserve Program Boundary	1:24,000	vector	
S_191	USFWS		statewide	Wetland Mitigation Banks Boundary	1:24,000	vector	

Statewide

ID	Available From	Originator/ Publisher	Location	Data	Scale	Structure	Resolution
S_192	USFWS		statewide	Farmer's Home Administrative Properties Boundary	1:24,000	vector	
S_193	USFWS	USFWS	statewide	Wildlife Refuges		vector	
S_194	USGS		statewide	Cultural Landmarks-Lines		vector	
S_195	USGS		statewide	Cultural Landmarks-Points		vector	
S_196	USGS		statewide	Political/Ocean-Network		vector	
S_197	USGS		statewide	Political/Ocean-Points		vector	
S_198	USGS		statewide	Populated Places-Points		vector	
S_199	USGS		statewide	Populated Places-Polygons		vector	
S_200	USGS		statewide	State Soil Geographic (STATSGO)		vector	
S_201	USGS		statewide	Physiography-Line		vector	
S_202	USGS		statewide	Drainage-network		vector	
S_203	USGS		statewide	Drainage-Points		vector	
S_204	USGS		statewide	Drainage Supplemental-Points		vector	
S_205	USGS		statewide	Ocean Features-Lines		vector	
S_206	USGS		statewide	Hypsography-network		vector	
S_207	USGS		statewide	Hypsography-points		vector	
S_208	USGS		statewide	Hypsography supplemental-lines		vector	
S_209	USGS		statewide	Hypsography supplemental-points		vector	
S_210	USGS		statewide	Land Cover-points		vector	
S_211	USGS		statewide	Land Cover-polygons		vector	
S_212	USGS		statewide	Aeronautical-points		vector	
S_213	USGS		statewide	Railroads-lines		vector	
S_214	USGS		statewide	Roads-lines		vector	
S_215	USGS		statewide	Transportation structure-lines		vector	
S_216	USGS		statewide	Utilities-lines		vector	
S_217	USGS		statewide	Vegetation-polygons		vector	
S_218	USGS	USGS	statewide	Land Use/Land Cover		raster	30 m
S_219	USGS	USGS	statewide	MRLC Land Cover - Louisiana		Raster	30 m
S_220	USGS	USGS	statewide	GAP Analysis Project			
S_221	NOAA	C-CAP	LA Coast	Coastal Change Analysis Program		Raster	30 m
S_222	NOAA	C-CAP	LA Coast	Coastal Change Analysis Program		Raster	30 m
S_223	NOAA	C-CAP	LA Coast	Coastal Change Analysis Program		Raster	30 m
S_224	USFS	USFS	statewide	LAA - Forest Area Density		Raster	30 m

Statewide

ID	Available From	Originator/ Publisher	Location	Data	Scale	Structure	Resolution
S_225	USFS	USFS	statewide	LAA - Forest Area Connectivity		Raster	30 m
S_226	USFS	USFS	statewide	LAA - Forest Fragmentation Index		Raster	30 m
S_227	USFS	USFS	statewide	LAA - Human Use Index		Raster	30 m
S_228	USFS	USFS	statewide	LAA - Land Cover Diversity		Raster	30 m
S_229	USFS	USFS	statewide	LAA - Land Cover Contagion		Raster	30 m
S_230	USFS	USFS	statewide	LAA - Landscape Pattern Type Index A		Raster	30 m
S_231	USFS	USFS	13 state region (including LA)	LAA - Assessment Projects by watershed		Vector	
S_232	USFS	USFS	13 state region (including LA)	LAA - Assessment Projects by county		Vector	
S_233	USFS	USFS	13 state region (including LA)	LAA - Assessment Projects by ecoregion		Vector	
S_234	USGS	USGS	Brown Marsh_LA Coast	Rectified Aerial Photography		raster	
S_235	USGS	USGS	LA Coast	DOQQs		raster	
S_236	USGS	USGS	LA Coast	Geomorphic classification of coastal land loss between 1932 and 1990 in the Mississippi River Delta Plain, Southeastern Louisiana		vector	
S_237	USGS	USGS	LA Coast	Process classification of coastal land loss between 1932 and 1990 in the Mississippi River Delta Plain, Southeastern Louisiana		vector	
S_238	USGS	USGS	LA Coast_Plaqemines Island	Shoreline for Plaquemines Island, 1884		vector	
S_239	USGS	USGS	LA Coast_Plaqemines Island	Plaquemines Island, Gulf Side Transects		vector	
S_240	USGS	USGS	LA Coast_Plaqemines Island	Shoreline for Plaquemines Island, 1996		vector	
S_241	USGS	USGS	LA Coast_Caminada-Moreau Headland	Shoreline for Caminada-Moreau Headland, 1887		vector	
S_242	USGS	USGS	LA Coast_Caminada-Moreau Headland	Caminada-Moreau Headland, Gulf Side Transects		vector	
S_243	USGS	USGS	LA Coast_Caminada-Moreau Headland	Shoreline for Caminada-Moreau Headland, 1996		vector	
S_244	USGS	USGS	LA Coast_Isles Dernieres	Shoreline for the Isles Dernieres, 1887		vector	
S_245	USGS	USGS	LA Coast_Isles Dernieres	Isles Dernieres, Gulf Side Transects		vector	
S_246	USGS	USGS	LA Coast_Isles Dernieres	Shoreline for Isles Dernieres Barrier Island Arc, 1996		vector	
S_247	USGS	USGS	LA Coast_Timbalier Barrier Island	Shoreline for Timbalier Barrier Island Arc, 1887		vector	
S_248	USGS	USGS	LA Coast_Timbalier Barrier Island	Transect Measurements of Shoreline Change, Timbalier Barrier Island Arc		vector	
S_249	USGS	USGS	LA Coast_Timbalier Barrier Island	Shoreline for Timbalier Barrier Island Arc, 1996		vector	
S_250	USGS	USGS	LA Coast_North Chandeleur Barrier Island Arc	Shoreline for North Chandeleur Barrier Island Arc, 1855		vector	

Statewide

ID	Available From	Originator/ Publisher	Location	Data	Scale	Structure	Resolution
S_251	USGS	USGS	LA Coast_North Chandeleur Barrier Island Arc	Transect Measurements of Shoreline Change, North Chandeleur Barrier Island Arc		vector	
S_252	USGS	USGS	LA Coast_North Chandeleur Barrier Island Arc	Shoreline for North Chandeleur Barrier Island Arc, 1999		vector	
S_253	USGS	USGS	LA Coast_South Chandeleur Barrier Island Arc	Shoreline for South Chandeleur Barrier Island Arc, 1855		vector	
S_254	USGS	USGS	LA Coast_South Chandeleur Barrier Island Arc	Transect Measurements of Shoreline Change, South Chandeleur Barrier Island Arc		vector	
S_255	USGS	USGS	LA Coast_South Chandeleur Barrier Island Arc	Shoreline for South Chandeleur Barrier Island Arc, 1999		vector	
S_256	USGS	LOSCO	LA Coast	Offshore Bathymetry for Louisiana, 2 meters		vector	
S_257	USGS	USGS	LA Coast	Coastal Relief Model Bathymetry image for the Gulf of Mexico area		raster	
S_258	USGS	USGS	Lake Maurepas	Contoured Bathymetry for Lake Maurepas		vector	
S_259	USGS	USGS	Lake Pontchartrain	Contoured Bathymetry for Lake Pontchartrain		vector	
S_260	USGS	NOAA	Gulf Coast	Medium Resolution Digital Vector U.S. Shoreline for the Gulf of Mexico area	1:80,000	vector	
S_261	USGS	NOAA	Lake Maurepas and Pontchartrain	Shoreline for Lakes Maurepas and Pontchartrain		vector	
S_262	USGS	USCB	statewide	Counties		vector	
S_263	USGS	FEMA	statewide	Louisiana Flood Zones	1:24,000	vector	
S_264	USGS	USGS	statewide	Louisiana Geology	1:500,000	vector	

Nationwide

ID	Available From	Originator/ Publisher	Location	Data	Scale	Structure	Resolution
N_1	TNRIS		Nationwide	USA Boundary			
N_2	TGLO	NPS, WRD	Nationwide	National Parks	1:24,000	Vector	
N_3	USGS	USGS	Nationwide	Geology of the US			
Data below found at: http://mrdata.usgs.gov/sddpftp.html							
N_4	USGS	USGS	Nationwide	Igneous rocks PLUTO		Vector	
N_5	USGS	USGS	Nationwide	NURE Sediment Chemistry		Raster	
N_6	USGS	USGS	Nationwide	Soil Chemistry		Vector	
N_7	USGS	USGS	Nationwide	Soils PLUTO		Vector	
N_8	USGS	USGS	Nationwide	Soils RASS		Vector	
N_9	USGS	USGS	Nationwide	Unconsolidated Sediments PLUTO		Vector	
N_10	USGS	USGS	Nationwide	Unconsolidated Sediments RASS		Vector	
N_11	USGS	USGS	Nationwide	US Geology	1:2,500,000	Raster	1000 m
N_12	USGS	USGS	Nationwide	US Geology [Geologic Faults]	1:2,500,000	Raster	1000 m
N_13	USGS	USGS	Nationwide	US Aeromagnetics		Raster	1000 m
N_14	USGS	USGS	Nationwide	US Bouguer Gravity Field		Raster	4 km
N_15	USGS	USGS	Nationwide	US Isostatic Gravity Field		Raster	4 km
N_16	USGS	USGS	Nationwide	US Magnetics NW Illumination		Raster	2 km
N_17	USGS	USGS	Nationwide	Active Mines and Mineral Plants		Vector	
N_18	USGS	USGS	Nationwide	Mineral Availability System		Vector	
N_19	USGS	USGS	Nationwide	Mineral Resource Data		Vector	
N_20	USGS	USGS	Nationwide	Cities	1:2,000,000	Vector	
N_21	USGS	USGS	Nationwide	Counties		Vector	
N_22	USGS	USGS	Nationwide	Elevated Shaded Relief		Raster	2km
N_23	USGS	USGS	Nationwide	Federal Lands	1:2,000,000	Vector	
N_24	USGS	USGS	Nationwide	Hydrologic Units	1:250,000 and 1:100,000	Vector	
N_25	USGS	USGS	Nationwide	Hydrology	1:2,000,000	Vector	
N_26	USGS	USGS	Nationwide	Land Cover		Raster	1000 m
N_27	USGS	USGS	Nationwide	Railroads	1:100,000	Vector	
N_28	USGS	USGS	Nationwide	Roads	1:3,000,000	Vector	
N_29	USGS	USGS	Nationwide	Urban Areas		Vector	
N_30	USGS	USGS	Nationwide	USA	1:25,000,000	Vector	
N_31	USGS	USGS	Nationwide	24000 Quadrangle Boundaries		Vector	

Nationwide

ID	Available From	Originator/ Publisher	Location	Data	Scale	Structure	Resolution
N_32	USGS	USGS	Nationwide	250000 Quadrangle LU/LC	1:250,000	Vector	
Data below found at: www.epa.gov/mrlc/data.html (a site with helpful links to spatial and non-spatial data, nationwide)							
N_33	NRCS/USDA	NRCS/USDA	Nationwide	Tiger 2002 Road			
N_34	NRCS/USDA	NRCS/USDA	Nationwide	Tiger 2002 Railroad			
N_35	NRCS/USDA	NRCS/USDA	Nationwide	Tiger 2002 hydrography			
N_36	NRCS/USDA	NRCS/USDA	Nationwide	Tiger 2000 water			
N_37	NRCS/USDA	NRCS/USDA	Nationwide	FEMAQ3 Flood Data	1:24,000		
N_38	NRCS/USDA	NRCS/USDA	Nationwide	8-digit hydrologic units	1:250,000		
N_39	NRCS/USDA	NRCS/USDA	Nationwide	DRG County Mosaic by NRCS			
N_40	NRCS/USDA	NRCS/USDA	Nationwide	DRG	1:24,000		
N_41	NRCS/USDA	NRCS/USDA	Nationwide	DRG	1:100,000		
N_42	NRCS/USDA	NRCS/USDA	Nationwide	DRG	1:250,000		
N_43	NRCS/USDA	NRCS/USDA	Nationwide	Quad 1:24,000 map index			
N_44	NRCS/USDA	NRCS/USDA	Nationwide	Quad 1:100,000 map index			
N_45	NRCS/USDA	NRCS/USDA	Nationwide	Quad 1:250,000 map index			
N_46	NRCS/USDA	NRCS/USDA	Nationwide	Quad 1 degree by state map index			
N_47	NRCS/USDA	NRCS/USDA	Nationwide	National Elevation Dataset			
N_48	NRCS/USDA	NRCS/USDA	Nationwide	DEM			
N_49	NRCS/USDA	NRCS/USDA	Nationwide	DOQ County Mosaic by APFO			
N_50	NRCS/USDA	NRCS/USDA	Nationwide	ErMapper Ortho Mosaic by NRCS			
N_51	NRCS/USDA	NRCS/USDA	Nationwide	National Land Cover Dataset by State			
N_52	NRCS/USDA	NRCS/USDA	Nationwide	Soil Survey Geographic (SSURGO) data base			
N_53	NRCS/USDA	NRCS/USDA	Nationwide	Annual Average Precipitation by state			
N_54	NRCS/USDA	NRCS/USDA	Nationwide	Monthly Average Precipitation by state			
N_55	USGS	ESRI	Nationwide	United States			
http://nationalatlas.gov/atlasftp.html							
N_56	NationalAtlas	USDA/NRCS	Nationwide	Average Annual Precipitation	1:2,000,000	vector	
N_57	NationalAtlas	USGS	Nationwide	Breeding Bird Survey Routes	1:2,000,000	vector	
N_58	NationalAtlas	USGS	Nationwide	County Boundaries	1:2,000,000	vector	
N_59	NationalAtlas	USACE	Nationwide	Dams	1:2,000,000	vector	
N_60	NationalAtlas	USFS	Nationwide	Ecoregions	1:2,000,000	vector	

Nationwide

ID	Available From	Originator/ Publisher	Location	Data	Scale	Structure	Resolution
N_61	NationalAtlas	USFS/USGS	Nationwide	Forest Cover Types	1:2,000,000	raster	
N_62	NationalAtlas	USGS	Nationwide	Forest Fragmentation Classification	1:2,000,000	raster	
N_63	NationalAtlas	USEPA/USGS	Nationwide	Forest Fragmentation Causes	1:2,000,000	raster	1 km
N_64	NationalAtlas	USEPA	Nationwide	Forest Fragmentation Causes	1:2,000,000	raster	540 m
N_65	NationalAtlas	USEPA	Nationwide	Forest Fragmentation Causes	1:2,000,000	raster	270 m
N_66	NationalAtlas	USGS	Nationwide	Generalized Geologic Map	1:2,000,000	vector	
N_67	NationalAtlas	USGS	Nationwide	Hydrologic Unit Boundaries	1:2,000,000	vector	
N_68	NationalAtlas	USGS	Nationwide	Invasive Species_Zebra Mussels	1:2,000,000	vector	
N_69	NationalAtlas	USGS	Nationwide	Land Cover Characteristics	1:2,000,000	raster	
N_70	NationalAtlas	USGS	Nationwide	Land Cover Diversity	1:2,000,000	raster	
N_71	NationalAtlas	USGS	Nationwide	Mineral Operations_Agriculture	1:2,000,000	vector	
N_72	NationalAtlas	USGS	Nationwide	Mineral Operations_Construction	1:2,000,000	vector	
N_73	NationalAtlas	USGS	Nationwide	Mineral Operations_Ferrous Metal Mines	1:2,000,000	vector	
N_74	NationalAtlas	USGS	Nationwide	Mineral Operations_Ferrous Metals Processing Plants	1:2,000,000	vector	
N_75	NationalAtlas	USGS	Nationwide	Mineral Operations_Miscellaneous Industrial	1:2,000,000	vector	
N_76	NationalAtlas	USGS	Nationwide	Mineral Operations_Nonferrous Metal Mines	1:2,000,000	vector	
N_77	NationalAtlas	USGS	Nationwide	Mineral Operations_Nonferrous Metal Processing Plants	1:2,000,000	vector	
N_78	NationalAtlas	USGS	Nationwide	Mineral Operations_Refractory, Abrasive, and other Industrial	1:2,000,000	vector	
N_79	NationalAtlas	USGS	Nationwide	Mineral Operations_Sand and Gravel	1:2,000,000	vector	
N_80	NationalAtlas	USGS	Nationwide	Mineral Operations_Stone, Crushed	1:2,000,000	vector	
N_81	NationalAtlas	USGS	Nationwide	NAWQA Surface-Water Sampling Sites	1:2,000,000	vector	
N_82	NationalAtlas	USGS	Nationwide	North American Bat Ranges	1:2,000,000	vector	
N_83	NationalAtlas	USGS	Nationwide	Parkways and Scenic Rivers	1:2,000,000	vector	
N_84	NationalAtlas	USGS	Nationwide	Principal Aquifers	1:2,000,000	vector	
N_85	NationalAtlas	USGS	Nationwide	Public Land Survey	1:2,000,000	vector	
N_86	NationalAtlas	USGS	Nationwide	Railroads	1:2,000,000	vector	
N_87	NationalAtlas	USGS	Nationwide	Realtime Streamflow Stations	1:2,000,000	vector	
N_88	NationalAtlas	USGS	Nationwide	Roads	1:2,000,000	vector	
N_89	NationalAtlas	USGS	Nationwide	Shaded Relief of North America	1:2,000,000	raster	
N_90	NationalAtlas	USGS	Nationwide	States	1:2,000,000	vector	
N_91	NationalAtlas	USGS	Nationwide	Streams and Waterbodies	1:2,000,000	vector	
N_92	NationalAtlas	USGS	Nationwide	Wilderness Areas	1:2,000,000	vector	

Nationwide

ID	Available From	Originator/ Publisher	Location	Data	Scale	Structure	Resolution
N_93	NationalAtlas	USGS	Nationwide	Amphibian Distributions			
N_94	NationalAtlas	USGS	Nationwide	Butterflies			
N_95	NationalAtlas	USDA/NRCS	Nationwide	Invasive Species_Chinese Privet			
N_96	NationalAtlas	USDA/NRCS	Nationwide	Invasive Species_Tallowtree			
N_97	NationalAtlas	USDA/NRCS	Nationwide	Invasive Species_Common Gorse			
N_98	NationalAtlas	USDA/NRCS	Nationwide	Invasive Species_Leafy Spurge			
N_99	NationalAtlas	USDA/NRCS	Nationwide	Invasive Species_Purple Loosestrife			
N_100	NationalAtlas	USGS	Nationwide	Moths			
N_101	NationalAtlas	CDC	Nationwide	West Niles Virus_Human Cases			
N_102	NationalAtlas	CDC	Nationwide	West Niles Virus_Mosquito Surveillance			
N_103	NationalAtlas	CDC	Nationwide	West Niles Virus_Sentinel Flock Surveillance			
N_104	NationalAtlas	CDC	Nationwide	West Niles Virus_Veterinary Cases			
N_105	NationalAtlas	CDC	Nationwide	West Niles Virus_Wild Bird Cases			
N_106	NationalAtlas	CDC	Nationwide	West Niles Virus_Human Cases			
N_107	NationalAtlas	CDC	Nationwide	West Niles Virus_Mosquito Surveillance			
N_108	NationalAtlas	CDC	Nationwide	West Niles Virus_Sentinel Flock Surveillance			
N_109	NationalAtlas	CDC	Nationwide	West Niles Virus_Veterinary Cases			
N_110	NationalAtlas	CDC	Nationwide	West Niles Virus_Wild Bird Cases			
N_111	NationalAtlas	USGS NWHC	Nationwide	Wildlife Mortality_Frequency Data			
N_112	NationalAtlas	USGS NWHC	Nationwide	Wildlife Mortality_Botulism			
N_113	NationalAtlas	USGS NWHC	Nationwide	Wildlife Mortality_Cholera			
N_114	NationalAtlas	USGS NWHC	Nationwide	Wildlife Mortality_Lead Poisoning			
N_115	NationalAtlas	USGS NWHC	Nationwide	Wildlife Mortality_OP/CARB Poisoning			

NonGIS Maps

ID	Available From	Originator/ Publisher	Location	Data	Format	File Format
Local (Park Specific)						
Barataria Preserve						
M_1	ATLAS	NWRC	154; 5573; 1002	Coastwide Images	CIR image	.jpg
M_2	ATLAS	NWRC	152; 5573; 1002	Coastwide Images	CIR image	.jpg
M_3	ATLAS	NWRC	201; 5573; 1002	Coastwide Images	CIR image	.jpg
M_4	ATLAS	NWRC	203; 5573; 1002	Coastwide Images	CIR image	.jpg
M_5	ATLAS	NWRC	266; 5573; 1002	Coastwide Images	CIR image	.jpg
M_6	ATLAS	NWRC	264; 5573; 1002	Coastwide Images	CIR image	.jpg
M_7	ATLAS	NWRC	313; 5573; 1002	Coastwide Images	CIR image	.jpg
M_8	ATLAS	NWRC	315; 5573; 1002	Coastwide Images	CIR image	.jpg
Chalmette Battlefield						
M_9	ATLAS	NWRC	1371; 5576; 1002	Coastwide Images	CIR image	.jpg
M_10	ATLAS	NWRC	1373; 5576; 1002	Coastwide Images	CIR image	.jpg
French Quarter Visitor Center						
M_11	ATLAS	NWRC	87; 5573; 1002	Coastwide Images	CIR image	.jpg
M_12	ATLAS	NWRC	31; 5573; 1002	Coastwide Images	CIR image	.jpg
Acadian Cultural Center						
M_13	ATLAS	NWRC	1643; 5589; 1052	Coastwide Images	CIR image	.jpg
M_14	ATLAS	NWRC	1641; 5589; 1052	Coastwide Images	CIR image	.jpg
Prairie Acadian Cultural Center						
M_15	ATLAS	NWRC	1830; 5589; 1052	Coastwide Images	CIR image	.jpg
M_16	ATLAS	NWRC	1832; 5589; 1052	Coastwide Images	CIR image	.jpg
Wetlands Acadian Cultural Center						
M_17	ATLAS	NWRC	2202; 5592; 1053	Coastwide Images	CIR image	.jpg
M_18	ATLAS	NWRC	3294; 5597; 1056	Coastwide Images	CIR image	.jpg
State Coast: www.lacoast.gov/maps/index.htm						
M_19	USGS	USGS	LA Coast	100+ Years of Land Change		.pdf
M_20	USGS	USGS	Southeast LA Coast	100+ Years of Land Change		.pdf
M_21	USGS	USGS	LA Coast	CWPPRA PPL 1-12 Projects		.pdf
M_22	USGS	USGS	LA Coast	Aerial Photography		.jpg
M_23	USGS	USGS	Brown Marsh_LA Coast	Reflight Infrared Photography	CIR	.jpg

NonGIS Maps

ID	Available From	Originator/ Publisher	Location	Data	Format	File Format
M_24	USGS	USGS	Brown Marsh_LA Coast	Marsh Dieback Syndrom (MaDS) Signature Key	power point presentation	.ppt
M_25	USGS	USGS	Brown Marsh_LA Coast	Aerial Photography		.jpg or .tiff
M_26	USGS	USGS	LA Coast	Land Loss 1994		.htm
M_27	USGS	USGS	LA Coast	Land Loss Animation		.htm

State Coast: pubs.usgs.gov/dds/dds79/HTMLDOCS/maps.htm

ID	Available From	Originator/ Publisher	Location	Data	Format	File Format
M_28	USGS	USGS	LA Coast	Geomorphic Classification of Coastal Lands Loss between 1932 and 1990 in the Mississippi River Delta Plain		.pdf
M_29	USGS	USGS	LA Coast	Process Classification of Coastal Lands Loss between 1932 and 1990 in the Mississippi River Delta Plain		.pdf
M_30	USGS	USGS	Timbalier Barrier Island Arc	Hurricane Andrew Impact		.pdf
M_31	USGS	USGS	Isles Dernieres Barrier Island Arc	Hurricane Andrew Impact		.pdf
M_32	USGS	USGS	Timbalier Barrier Island Arc	Shoreline Changes		.pdf
M_33	USGS	USGS	Isles Dernieres Barrier Island Arc	Shoreline Changes		.pdf
M_34	USGS	USGS	North Chandeleur Islands Barrier Arc	Shoreline Changes		.pdf
M_35	USGS	USGS	South Chandeleur Islands Barrier Arc	Shoreline Changes		.pdf
M_36	USGS	USGS	Caminada-Moreau Headland and Grand Isles	Shoreline Changes		.pdf
M_37	USGS	USGS	Plaquemines Barrier Island System	Shoreline Changes		.pdf

State: www.lacoast.gov/maps/index.htm

ID	Available From	Originator/ Publisher	Location	Data	Format	File Format
M_38	USGS	USGS	Louisiana	Satellite Imagery		.jpg

Nationwide: www.lacoast.gov/maps/index.htm

ID	Available From	Originator/ Publisher	Location	Data	Format	File Format
M_39	USGS	USGS	Nationwide	AVHRR		.jpg

Statewide NonGIS Data

ID	Available From	Originator/ Publisher	Location	Data
SD_1	USEPA	EMAP	Louisianian Province	Sediment Chemistry
SD_2	USEPA	EMAP	Louisianian Province	Sediment Grain Composition
SD_3	USEPA	EMAP	Louisianian Province	Sediment Toxicity
SD_4	USEPA	EMAP	Louisianian Province	Sediment Chemistry Code
SD_5	USEPA	EMAP	Louisianian Province	Station Location
SD_6	USEPA	EMAP	Louisianian Province	Station Information
SD_7	USEPA	EMAP	Louisianian Province	Water Quality Vertical Profile Surface
SD_8	USEPA	EMAP	Louisianian Province	Water Quality Vertical Profile QA
SD_9	USEPA	EMAP	Louisianian Province	Water Quality Vertical Profile Bottom
SD_10	USEPA	EMAP	Louisianian Province	Benthic Species Abundance
SD_11	USEPA	EMAP	Louisianian Province	Benthic Community
SD_12	USEPA	EMAP	Louisianian Province	Fish/Invertebrate Species Abundance
SD_13	USEPA	EMAP	Louisianian Province	Fish/Invertebrate Tissue Chemistry
SD_14	USEPA	EMAP	Louisianian Province	Fish/Invertebrate Chemistry Code
SD_15	USEPA	EMAP	Louisianian Province	Fish/Invertebrate Community
SD_16	USEPA	EMAP	Louisianian Province	Sediment Chemistry
SD_17	USEPA	EMAP	Louisianian Province	Sediment Grain Composition
SD_18	USEPA	EMAP	Louisianian Province	Sediment Toxicity
SD_19	USEPA	EMAP	Louisianian Province	Sediment Chemistry Code
SD_20	USEPA	EMAP	Louisianian Province	Station Location
SD_21	USEPA	EMAP	Louisianian Province	Station Information
SD_22	USEPA	EMAP	Louisianian Province	Water Quality Vertical Profile Surface
SD_23	USEPA	EMAP	Louisianian Province	Water Quality Vertical Profile QA
SD_24	USEPA	EMAP	Louisianian Province	Water Quality Vertical Profile Bottom
SD_25	USEPA	EMAP	Louisianian Province	Benthic Species Abundance
SD_26	USEPA	EMAP	Louisianian Province	Benthic Community
SD_27	USEPA	EMAP	Louisianian Province	Fish/Invertebrate Species Abundance
SD_28	USEPA	EMAP	Louisianian Province	Fish/Invertebrate Tissue Chemistry
SD_29	USEPA	EMAP	Louisianian Province	Fish/Invertebrate Chemistry Code
SD_30	USEPA	EMAP	Louisianian Province	Fish/Invertebrate Community
SD_31	USEPA	EMAP	Louisianian Province	Sediment Chemistry
SD_32	USEPA	EMAP	Louisianian Province	Sediment Grain Composition
SD_33	USEPA	EMAP	Louisianian Province	Sediment Toxicity

Statewide NonGIS Data

ID	Available From	Originator/ Publisher	Location	Data
SD_34	USEPA	EMAP	Louisianian Province	Sediment Chemistry Code
SD_35	USEPA	EMAP	Louisianian Province	Station Location
SD_36	USEPA	EMAP	Louisianian Province	Station Information
SD_37	USEPA	EMAP	Louisianian Province	Water Quality Vertical Profile Surface
SD_38	USEPA	EMAP	Louisianian Province	Water Quality Vertical Profile QA
SD_39	USEPA	EMAP	Louisianian Province	Water Quality Vertical Profile Bottom
SD_40	USEPA	EMAP	Louisianian Province	Benthic Species Abundance
SD_41	USEPA	EMAP	Louisianian Province	Benthic Community
SD_42	USEPA	EMAP	Louisianian Province	Fish/Invertebrate Species Abundance
SD_43	USEPA	EMAP	Louisianian Province	Fish/Invertebrate Tissue Chemistry
SD_44	USEPA	EMAP	Louisianian Province	Fish/Invertebrate Chemistry Code
SD_45	USEPA	EMAP	Louisianian Province	Fish/Invertebrate Community
SD_46	USEPA	EMAP	Louisianian Province	Sediment Chemistry
SD_47	USEPA	EMAP	Louisianian Province	Sediment Grain Composition
SD_48	USEPA	EMAP	Louisianian Province	Sediment Toxicity
SD_49	USEPA	EMAP	Louisianian Province	Sediment Chemistry Code
SD_50	USEPA	EMAP	Louisianian Province	Station Location
SD_51	USEPA	EMAP	Louisianian Province	Station Information
SD_52	USEPA	EMAP	Louisianian Province	Water Quality Vertical Profile Surface
SD_53	USEPA	EMAP	Louisianian Province	Water Quality Vertical Profile QA
SD_54	USEPA	EMAP	Louisianian Province	Water Quality Vertical Profile Bottom
SD_55	USEPA	EMAP	Louisianian Province	Benthic Species Abundance
SD_56	USEPA	EMAP	Louisianian Province	Benthic Community
SD_57	USEPA	EMAP	Louisianian Province	Fish/Invertebrate Species Abundance
SD_58	USEPA	EMAP	Louisianian Province	Fish/Invertebrate Tissue Chemistry
SD_59	USEPA	EMAP	Louisianian Province	Fish/Invertebrate Chemistry Code
SD_60	USEPA	EMAP	Louisianian Province	Fish/Invertebrate Community
SD_61	USGS	NWRC	Louisiana Coast	Land Loss in Coastal Louisiana 1956-1990
SD_62	USGS	USGS et al	Lake Ponchartrain Basin	The Environmental Atlas
SD_63	USGS	USGS LAGS	Louisiana Barrier Island	Louisiana Barrier Island Erosion Study: Atlas of Shoreline Changes from 1853 to 1989
SD_64	USGS	USGS LAGS	Louisiana Barrier Island	Louisiana Barrier Island Erosion Study: Atlas of Sea-Floor Changes from 1878 to 1989

Databases

ID	Database	park	county	state	Query info down to… other	Who
D_1	Amphibian Counts Database	?	?	?	?	USGS
D_2	ARMI	no	no	no	no	USGS
D_3	BEST_Biological and Ecotoxicological Characteristics of Terrestrial Vertebrate Species Residing in Estuaries	no	no	no	Gulf Coast	USGS
D_4	BEST_CEE-TV	no	no	yes	HUC, City, Species	USGS
D_5	BEST_Large River Fish Health	no	no	no	station	USGS
D_6	Breeding Bird Census	?	?	?	?	USGS
D_7	Breeding Bird Survey	no	no	yes	route	USGS
D_8	Butterflies of North America	no	yes	yes		USGS
D_9	Chinese Privet	no	yes	yes		NRCS/USDA
D_10	Christmas Bird Count	?	no	yes	count	Audubon
D_11	Christmas Bird Count	no	no	no	count	USGS
D_12	eBird	no	yes	yes	any location of choice	
D_13	Envirofacts_Air Releases (AIRS/AFS)		yes	yes	EPA region	EPA
D_14	Envirofacts_Environmental Radiation Ambient Monitoring System (ERAMS)		yes	yes	EPA region	EPA
D_15	Envirofacts_Multisystem Query		yes	yes	EPA region	EPA
D_16	Envirofacts_National Contaminant Occurrence Database (NCOD)		yes	yes	EPA region	EPA
D_17	Envirofacts_Toxic Release Inventory (TRI)		yes	yes	EPA region	EPA
D_18	Envirofacts_UV index		yes	yes	EPA region	EPA
D_19	Envirofacts_Water Discharge Permits (PCS)		yes	yes	EPA region	EPA
D_20	Inventory and Monitoring on National Parks	yes				NPS
D_21	MAPS	no	no	yes	region, station	USGS
D_22	MidWinter Bald Eagle Count	no	no	yes	route	
D_23	Mid-Winter Waterfowl Survey	no	no	yes	flyway, species, year	USFWS
D_24	Migratory Bird Data Center					USFWS/USGS
D_25	NAAMP	no	no	no	route	USGS
D_26	NARCAM	no	yes	no		USGS
D_27	National Atlas of the US					
D_28	NatureServe Explorer	no	no	yes	plant/animal, status	NatureServe
D_29	NBII			yes	can specify an area of interest with lat/long coordinates	USGS
D_30	NBII Bird Conservation node					USGS
D_31	Nonindigenous Aquatic Species (NAS)	no	no	yes	hydrologic units (2 and 6)	USGS
D_32	NWIS Web Site	no	yes	yes	HUC, Sampling Site	USGS

Databases

ID	Database	park	county	state	other	Who
				Query info down to…		
D_33	NWQA Data Warehouse	no	no	no	study unit basin	USGS
D_34	PLANTS Database	no	no	yes		NRCS/USDA
D_35	Project Feeder Watch	no	no	yes		Cornell Lab of Ornithology
D_36	Water Quality	yes	no	no		NPS
D_37	Waterbird Monitoring Partnership	no	no	no	site_ID	USGS
D_38	Waterfowl Breeding Population and Habitat Survey	no	no	?	species, year, strata	USFWS

NatureBib Maps

NBIB_ID	Author	Year	Title
82143	No Author	1988	National Wetlands Inventory [DRAFT] National Wetlands Inventory
129906	No Author	n.d.	Untitled: Landsat image
130321	No Author	n.d.	Untitled: Pipelines & Oil wells in the Barataria Unit
86143	No Author	n.d.	NPS-1
130033	No Author	1992	Untitled: Map of pipelines, etc
129903	No Author	n.d.	Untitled: land zoning maps and land ownership maps
128997	No Author	n.d.	Untitled: aerial photograph
94976	No Author	n.d.	Portion of Isle Bonne Subdivision
525663	No Author	1980	Aerial gamma ray and magnetic survey, Mississippi and Florida airborne survey, Baton Rouge Quadrangle, Louisiana and Mississippi; final report
48454	No Author	1983	Flood insurance rate map / City of New Orleans and Orleans Parish, Louisiana
525661	No Author	1980	Aerial gamma ray and magnetic survey, Mississippi and Florida airborne survey, Mobile Quadrangle, Louisiana, Mississippi and Alabama; final report
525659	No Author	1980	Aerial gamma ray and magnetic survey, Alexandria Quadrangle, Louisiana and Texas; final report
525660	No Author	1980	Aerial gamma ray and magnetic survey, Mississippi and Florida airborne survey; New Orleans and Breton Sound quadrangles of Louisiana; final report
525662	No Author	1980	Aerial gamma ray and magnetic survey, Mississippi and Florida airborne survey, Lake Charles and Port Arthur quadrangles of Louisiana and Texas; final report
136710	Barnard & Thomas Engineering, Inc.,	n.d.	Westbank Hurricane Protection Levee Study
73338	Burk And Associates,	1976	Louisiana Coastal Vegetation
128992	Cartographer Unknown,	1982	Untitled: Aerial Photographs
136344	Cartographer Unknown,	n.d.	Wax Myrtle Concentrations
2647	Cartographer Unknown (Or Just Not Entered When This Record Was Created),	1987	16JE36 Site Map
133389	Chabreck, Robert H., Joanen, Ted and Palmisano, A. W.	1968	Vegetative Type Map of the Louisiana Coastal Marshes
73341	Demcheck, Dennis K.	1991	Louisiana Hydrologic Atlas Map no 6: Water-Quality Survey of the Barataria Basin
525705	Dial, D. C, and Kilburn, C.,	1980	Ground-water resources of the Gramercy area, Louisiana Water Resources Technical Report
67877	Ehret, Frank J. Jr.	n.d.	Jean Lafitte National Historical Park Physical Characteristics
525667	Hickman, R. E.,	1990	Areal variation of suspended-sediment yield within and adjacent to the coal fields of the Eastern Coal Province and the eastern region of the Interior Coal Province Hydrologic Investigations Atlas

NatureBib Maps

NBIB_ID	Author	Year	Title
525682	Hopper, Jack T. Jr,	1988	Diagenesis and porosity development of lower Tuscaloosa sandstones in Wilkinson and Amite counties, Mississippi, and St Helena Parish, Louisiana
67880	James F. Fondren And Associates,	n.d.	Jean Lafitte State Park
130819	Jean Lafitte National Historical Park And Preserve, La,	n.d.	Untitled: vegetation types
129126	Jean Lafitte National Historical Park And Preserve, La,	n.d.	Untitled: Barataria Trapping Leases
136818	National Coastal Ecosystems Team Us Fish And Wildlife Service,	1983	Wetland Changes in Lafitte National Historical Park (1956-1983)
47332	National Flood Insurance Program,	n.d.	FIRM Flood Insurance Rate Map
83269	National Oceanic And Atmospheric Administration (NOAA),	1989	Nautical Chart 11367 Intracoastal Waterway Waveland to Catahoula Bay Mississippi-Louisiana
52013	National Park Service,	1980	General ownership Patterns: Jean Lafitte National Historical Park & Preserve (Barataria Unit) Jefferson Parish, Louisiana
129246	National Park Service,	n.d.	Untitled: Boundary Maps
126193	National Park Service,	1987	Topo-Barataria Unit & Christmas Road Area
67870	National Park Service Energy, Mining & Minerals Division,	n.d.	Jean Lafitte National Historical Park and Preserve Barataria Unit Core Area Jefferson Parish, Louisiana
501046	No author,	1979	Land use and land cover, 1972-73, Mobile, Alabama; Mississippi; Louisiana Land Use and Land Cover Maps
525717	No author,	1981	Land use and land cover and associated maps for Mobile, Alabama; Mississippi, Louisiana U S Geological Survey Open file report
525715	No author,	1980	Land use and land cover and associated maps for Baton Rouge, Louisiana; Mississippi (United States Geological Survey 1978) Open file report
525716	No author,	1980	Land use and land cover and associated maps for Breton Sound, Louisiana U S Geological Survey Open file report
501045	No author,	1977	Land use and land cover and associated maps for Mobile, Alabama U S Geological Survey Open file report
525718	No author,	1980	Land use and land cover associated maps for New Orleans, Louisiana U S Geological Survey Open file report
525751	Pope, D. E, , Gilliland, W. A., , Wermund, E. G., , Richmond, G. M., , Weide, D. L., and Moore, D. W.,	1990	Quaternary geologic map of the White Lake 4 degrees X 6 degrees Quadrangle, United States Miscellaneous Investigations Series US Geological Survey
73340	Smoot, Charles W.	1988	Louisiana Hydrologic Atlas Map No 3: Altitude of the Base of Freshwater in Louisiana
52058	Soil Conservation Service,	1971	General Soil Map Jefferson Parish, Louisiana 4-R-17344-A

NatureBib Maps

NBIB_ID	Author	Year	Title
129127	Tobin Surveys Inc.,	1964	Untitled: Barataria Unit land ownership map Map No F-8979
525764	Trahan, Larry J, , Bradley, Jeanette J., , Morris, Lyfon, , McDaniel, Donald R., and Nolde, Richard,	1989	Soil survey of St Bernard Parish, Louisiana
525723	Trippet, A. R.,	n.d.	Maps showing geology of East and West Flower Garden Banks, Northwest Gulf of Mexico Miscellaneous Field Studies Map
136792	U.S. Army Engineer District, New Orleans,	1991	Westwego to Harvey Canal, LA Westbank Hurricane Protection Levee Louisiana Highway 45 Levee Jefferson Parish, Louisiana
136819	U.S. Fish And Wildlife Service,	1983	Wetland changes in Lafitte National Historical Park (1956-83)
84088	U.S. Fish And Wildlife Service,	n.d.	New Orleans Louisiana 1:250 000-scale map of Gulf Coast Ecological Inventory 29090-A1-EI-250
130164	Various Cartographers,	n.d.	Untitled: Oak Island Maps

Abbreviations	Definition	website
ATLAS		http://atlas.lsu.edu/
AVHRR	Advanced Very High Resolution Radiometer	
BTS	Bureau of Transportation Statistics	
C-CAP	Coastal Change Analysis Program	
CIR	Color Infra-Red	
CTG	Composite Them Grid	
DEM	Digital Elevation Model	
DLG	Digital Line Graph	
DOQQ	Digital Ortho Quarter Quadrangle	
DRG	Digital Raster Graphics	
EMAP	Environmental Monitoring and Assessment Program	
FEMA	Federal Emergency Management Agency	
GIRAS	Geographic Information Retrieval and Analysis System	
GNIS	Geographic Names Information System	
LAA	Landscape Analysis and Assessment	
LAA	Landscape Analysis and Assessment	
LAGS	Louisiana Geological Survey	
LIDAR	Light Detection And Ranging Data	
LOSCO	Louisiana Oil Spill Coordinator's Office	http://www.doa.state.la.us/lgisc/
LULC	Land Use/Land Cover	
MODIS NDVI	Moderate Resolution Imaging Spectroradiometer Normalized Difference Vegetation Index	
NED	National Elevation Dataset	
NED	National Elevation Dataset	
NHD	National Hydrography Data	
NHD	National Hydrography Dataset	
NLCD	National Landcover Data	
NOAA	National Oceanic and Atmospheric Administration	
NOAA	National Oceanic and Atmospheric Administration	
NWI	National Wetlands Inventory	
NWRC	National Wetlands Research Center	
SDTS	Spatial Data Transfer Standard	
SRTM	Shuttle Radar Topography Mission	
USCB	US Census Bureau	
USEPA	US Environmental Protection Agency	http://www.epa.gov/mrlc/data.html
USFS	United States Forest Service	http://www.srs.fs.usda.gov/4803/landscapes/index.html

Abbreviations	Definition	website
USFWS	United States Fish and Wildlife Service	
USGS	United States Geologic Survey	http://mapping.usgs.gov/products.html#digital_data