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LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

Prepared in cooperation with the Louisiana Department of Transportation and Development

Water Resources of Iberia Parish, Louisiana

Introduction

Information concerning the availability, use, and quality of water in Iberia Parish, Louisiana (fig. 1), is critical for proper water-resource management. This fact sheet summarizes the availability, past and current use, use trends, and water quality from groundwater and surface-water sources in the parish for water managers, parish residents, and others to assist in stewardship of this vital resource. Previously published reports (see References Cited section) and data stored in the U.S. Geological Survey's National Water Information System (U.S. Geological Survey, 2016) are the primary sources of the information presented here.

In 2010, about 31.24 million gallons per day (Mgal/d) of water were withdrawn in Iberia Parish, Louisiana, including about 23.13 Mgal/d from groundwater sources and 8.11 Mgal/d from surface-water sources[1] (table 1). Withdrawals for public supply and industrial use each accounted for about 32 percent of the total water withdrawn (table 2). Other water-use categories included rural domestic, livestock, rice irrigation, general irrigation, and aquaculture. Water-use data collected at 5-year intervals from 1960 to 2010 indicated that water withdrawals in Iberia Parish peaked at about 58.57 Mgal/d in 1975 (fig. 2; Sargent, 2011; B.P. Sargent, U.S. Geological Survey, written commun., 2015).

[1]Water-withdrawal data are based on estimated or reported site-specific data and aggregated data, which are distributed to sources. For a full description of water-use estimate methodology, see "Data Collection" in Sargent (2011). Tabulation of numbers in text and tables may result in different totals because of rounding; nonrounded numbers are used for calculation of totals.

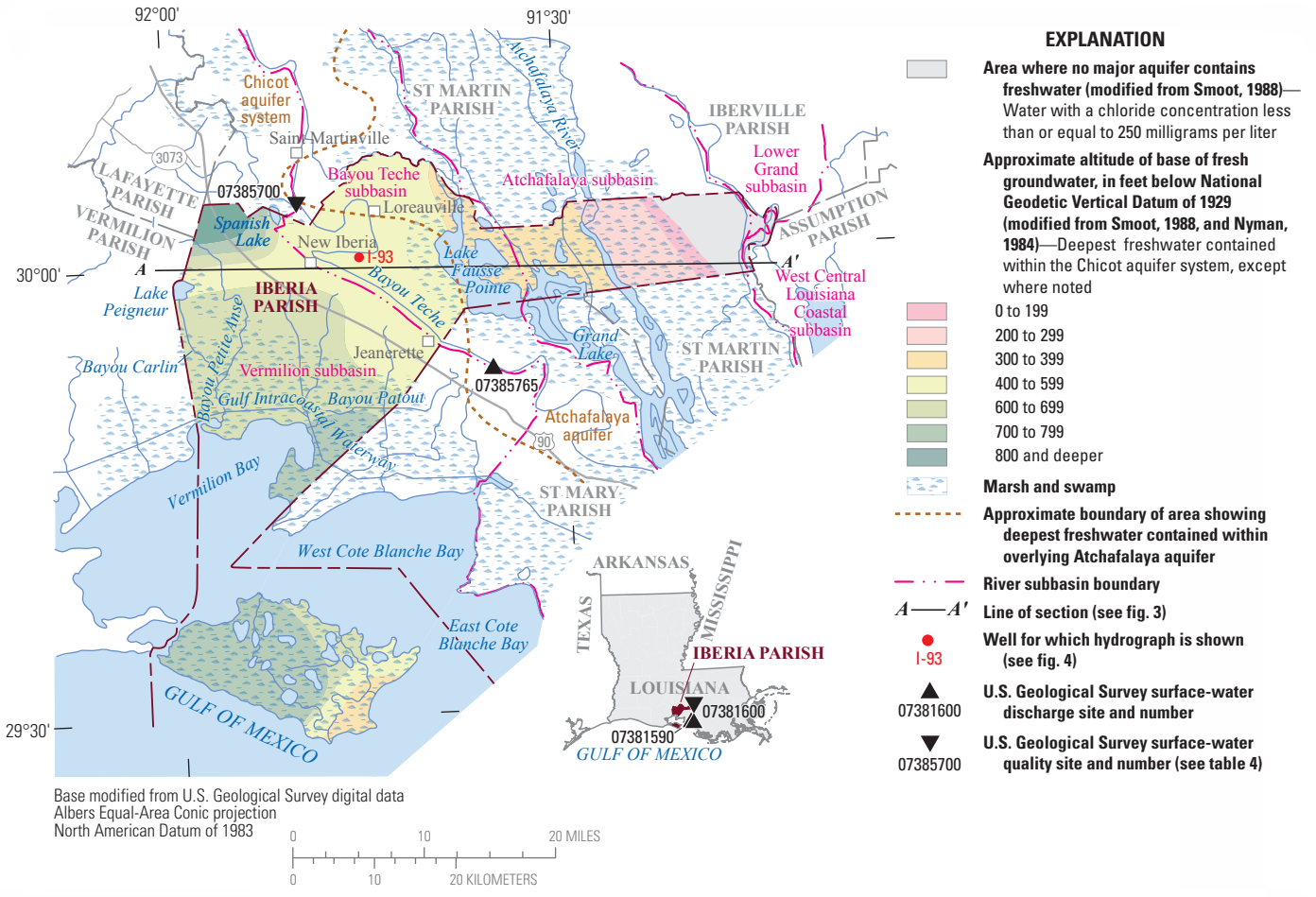

Figure 1. Location of study area, Iberia Parish, Louisiana.

Table 1. Water withdrawals, in million gallons per day, by source in Iberia Parish, Louisiana, 2010 (Sargent, 2011; B.P. Sargent, U.S. Geological Survey, written commun., 2015).

Aquifer, aquifer system, or surface-water body	Groundwater	Surface water
Atchafalaya aquifer	3.51	
Chicot aquifer system	19.63	
Bayou Teche		0.87
Gulf Intracoastal Waterway		5.03
Bayou Patout		0.38
Miscellaneous streams and ponds		1.83
Total	**23.13**	**8.11**

Table 2. Water withdrawals, in million gallons per day, by use category in Iberia Parish, Louisiana, 2010 (Sargent, 2011; B.P. Sargent, U.S. Geological Survey, written commun., 2015).

Use category	Groundwater	Surface water	Total
Public supply	10.07	0.00	10.07
Industrial	4.40	5.45	9.85
Rural domestic	1.19	0.00	1.19
Livestock	0.06	0.01	0.07
Rice irrigation	0.13	0.98	1.12
General irrigation	0.61	0.00	0.61
Aquaculture	6.66	1.67	8.33
Total	**23.13**	**8.11**	**31.24**

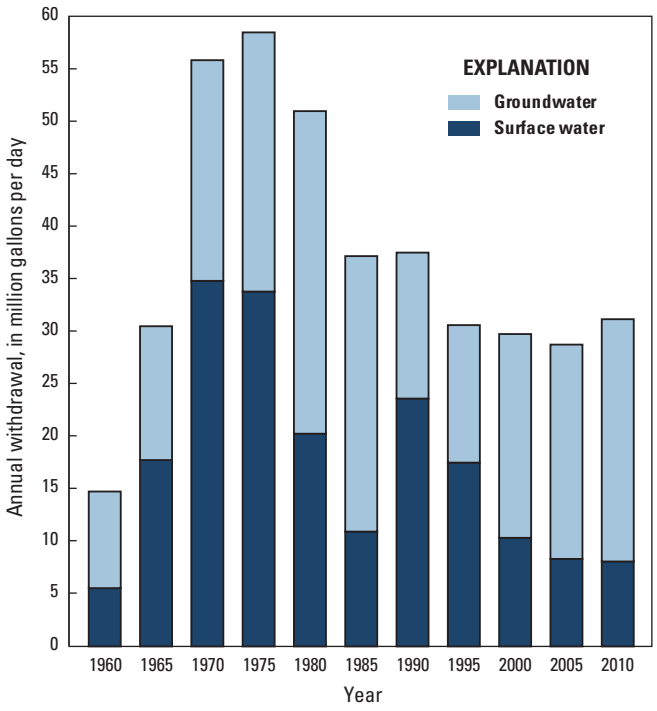

Figure 2. Water withdrawals in Iberia Parish, Louisiana, 1960–2010 (Sargent, 2011; B.P. Sargent, U.S. Geological Survey, written commun., 2015).

Groundwater Resources

The primary sources of fresh groundwater (water with a chloride concentration of 250 milligrams per liter [mg/L] or less) in Iberia Parish are the Atchafalaya aquifer and Chicot aquifer system (fig. 3). The base of fresh groundwater generally ranges from shallower than 200 feet (ft) below the National Geodetic Vertical Datum of 1929 (NGVD 29) in the eastern part of the parish to deeper than 800 ft below NGVD 29 in the northwestern part of the parish (fig. 1). Little or no fresh groundwater is available at the eastern end of the parish.

Recharge to aquifers in Iberia Parish is from precipitation, lateral movement from other aquifers, and seasonal recharge from rivers. The principal source of recharge to the Atchafalaya aquifer is the Atchafalaya River (Jones and others, 1956). Much of the recharge to the Chicot aquifer system in the parish is from vertical leakage through surficial clays, particularly in coastal wetlands (Nyman, 1984). Discharge from the Atchafalaya aquifer is by well withdrawals, discharge into the Atchafalaya River during low river stage, and lateral flow into the Chicot aquifer system induced by withdrawals from the Chicot aquifer system (Jones and others, 1956). Discharge from the Chicot aquifer system in the parish is by well withdrawals and lateral flow to the west and north induced by large groundwater withdrawals in southwestern Louisiana (Lovelace and others, 2004). North of Iberia Parish, the Chicot aquifer system and Atchafalaya aquifer are strongly interconnected; however, the aquifer and aquifer system are generally poorly connected south of St. Martinville (Nyman, 1984).

The Atchafalaya Aquifer

In Iberia Parish, freshwater in the Atchafalaya aquifer extends eastward from near Bayou Teche to a northwest-southeast trending line located about 8 miles (mi) west of the Iberia-Assumption Parish line, beyond which the aquifer contains only saltwater (Smoot, 1986, 1988; figs. 1 and 3). The aquifer consists of the sand and gravel component of Atchafalaya River and Mississippi River alluvial deposits. Depth of the base of the alluvial deposits ranges from shallower than 100 ft below NGVD 29 near Bayou Teche to about 375 ft below NGVD 29 under Lake Fausse Pointe. Depths of about 225 to about 275 ft below NGVD 29 are found in the northern part of the parish and from about 250 to 275 ft below NGVD 29 at the eastern end of the parish (Saucier, 1994). Overlying the aquifer is a thick deposit of clay (Jones and others, 1956).

State well-registration records listed 275 active water wells screened in the Atchafalaya aquifer in Iberia Parish in 2015, including 244 domestic, 19 irrigation, and 12 public supply. Depths of these wells ranged from about 70 to 262 ft below land surface, and reported yields ranged from 5 to 500 gallons per minute (Louisiana Department of Natural Resources, written commun., 2015). In 2010, about 3.51 Mgal/d of water were withdrawn from the Atchafalaya aquifer in Iberia Parish, including 3.33 Mgal/d for aquaculture, 0.15 Mgal/d for rural-domestic use, 0.01 Mgal/d for rice irrigation, and 0.01 Mgal/d for livestock (B.P. Sargent, U.S. Geological Survey, written commun., 2015).

Chicot Aquifer System

The Chicot aquifer system is a regional aquifer underlying southwestern Louisiana. In Iberia Parish, the aquifer system is composed of a surficial confining unit, shallow sands, and the upper and lower sands. The surficial confining unit is a layer of clay, which is present at land surface and ranges in thickness

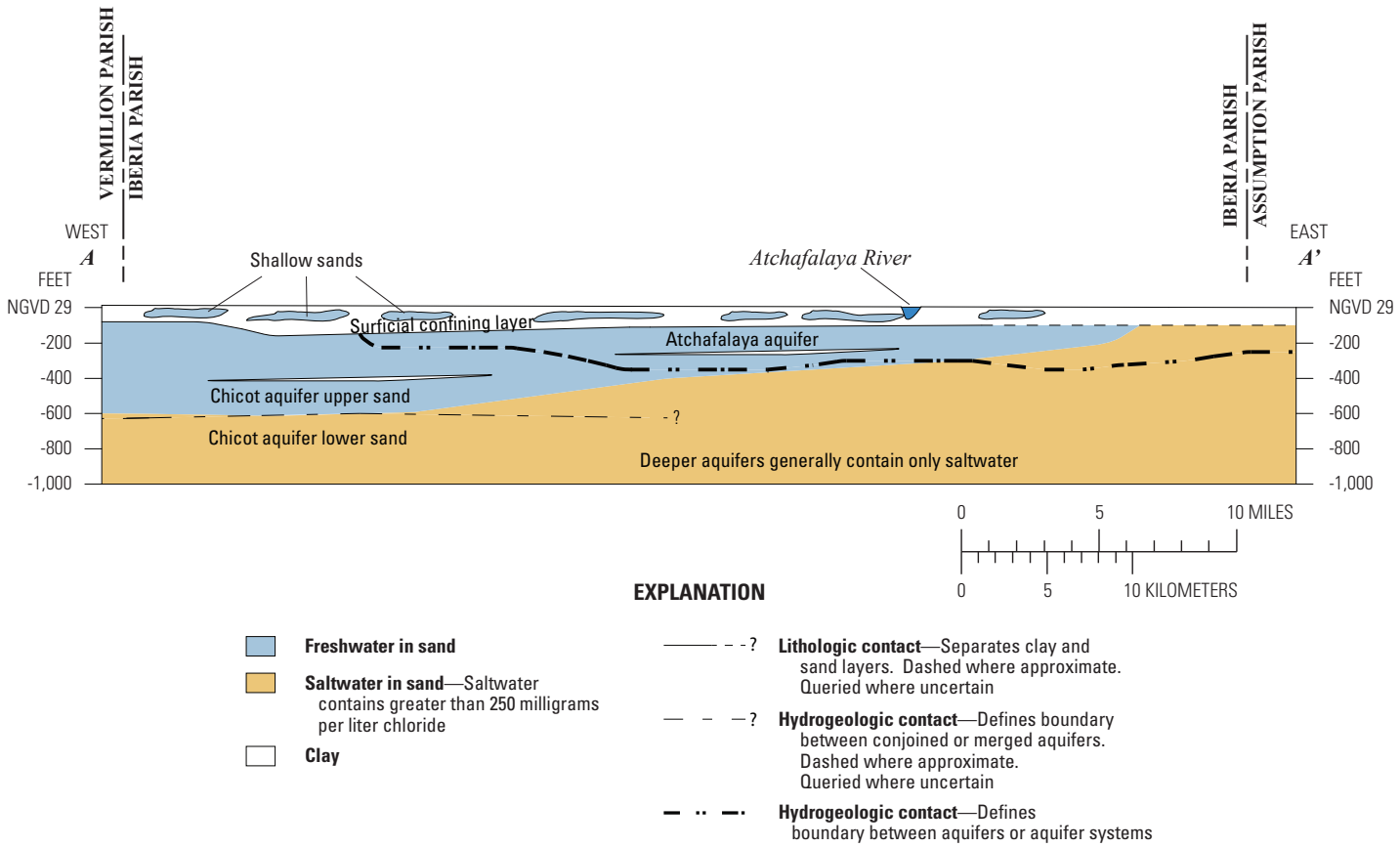

Figure 3. Idealized west-to-east hydrogeologic section through Iberia Parish, Louisiana (modified from Smoot, 1988; Nyman, 1989; Saucier, 1994; and Sargent, 2004). Trace of section shown on figure 1.

from less than 40 ft in the northwestern corner of the parish to more than 320 ft near the coast along the border with Vermilion Parish (Sargent, 2004). Within the surficial confining unit are scattered sand streaks, lenses, and layers known as the shallow sand of the Chicot aquifer system, which can provide water for domestic use (Prakken, 2003). Underlying the surficial confining unit are the Chicot aquifer upper and lower sands. The upper sand is the primary aquifer and generally contains freshwater west of the Atchafalaya River; however, most of this freshwater is underlain with saltwater except for a small area in the northwestern corner of the parish (Nyman, 1984). The upper sand consists mostly of coarse sand grading to gravel near the base of individual beds (Nyman and others, 1990). The top of the upper sand ranges from less than 200 ft to more than 400 ft below NGVD 29, and the base ranges from less than 600 ft in the northern part of the parish to greater than 800 ft below NGVD 29 in the southern part of the parish (Nyman, 1984, 1989). The lower sand underlies the upper sand and generally contains only saltwater (water with chloride concentrations greater than 250 mg/L) within the parish (Nyman, 1989).

Water levels in wells screened in the Chicot aquifer system in Iberia Parish vary temporally and spatially. Yearly well levels in the Chicot aquifer upper sand generally fluctuate in response to seasonal water demands, as indicated by the water level in well I-93 (site number 300035091443301), located east of New Iberia (figs. 1 and 4). At a multiyear timescale, water levels in well I-93 declined about 2 ft from 1990 to 2015. In 2003, well levels ranged from greater than the NGVD 29 east of well I-93 to 0–20 ft below NGVD 29 along the border with Vermilion Parish. The lower water levels in wells along the western border of the parish are primarily caused by withdrawals from the aquifer in parishes to the west and north of Iberia Parish.

State well-registration records indicate that in 2015 there were 1,862 active wells screened in the Chicot aquifer system in Iberia Parish, including 1,553 domestic, 162 public supply, 72 industrial, and 75 irrigation. Depths of these wells ranged from about 60 to 856 ft below land surface, and reported yields ranged from 3 to 3,800 gallons per minute (Louisiana Department of Natural Resources, written commun., 2015). In 2010, about 19.6 Mgal/d of water were withdrawn from the Chicot aquifer system in the parish, with use categories including about 10.07 Mgal/d for public supply, 4.40 Mgal/d for industry, 3.33 Mgal/d for aquaculture, 1.04 Mgal/d for rural-domestic use, 0.61 Mgal/d for general irrigation, 0.12 Mgal/d for rice irrigation, and 0.05 Mgal/d for livestock (B.P. Sargent, U.S. Geological Survey, written commun., 2015).

Groundwater Quality

Groundwater in each of the primary aquifers underlying Iberia Parish is of similar quality. Freshwater samples taken from the Chicot aquifer upper sand during 1940–2009 were very hard.[2] Iron and manganese concentrations generally exceeded the U.S. Environmental Protection Agency's

[2]Hardness ranges, expressed as milligrams per liter of calcium carbonate, are as follows: 0–60, soft; 61–120, moderately hard; 121–180, hard; greater than 180, very hard (Hem, 1985).

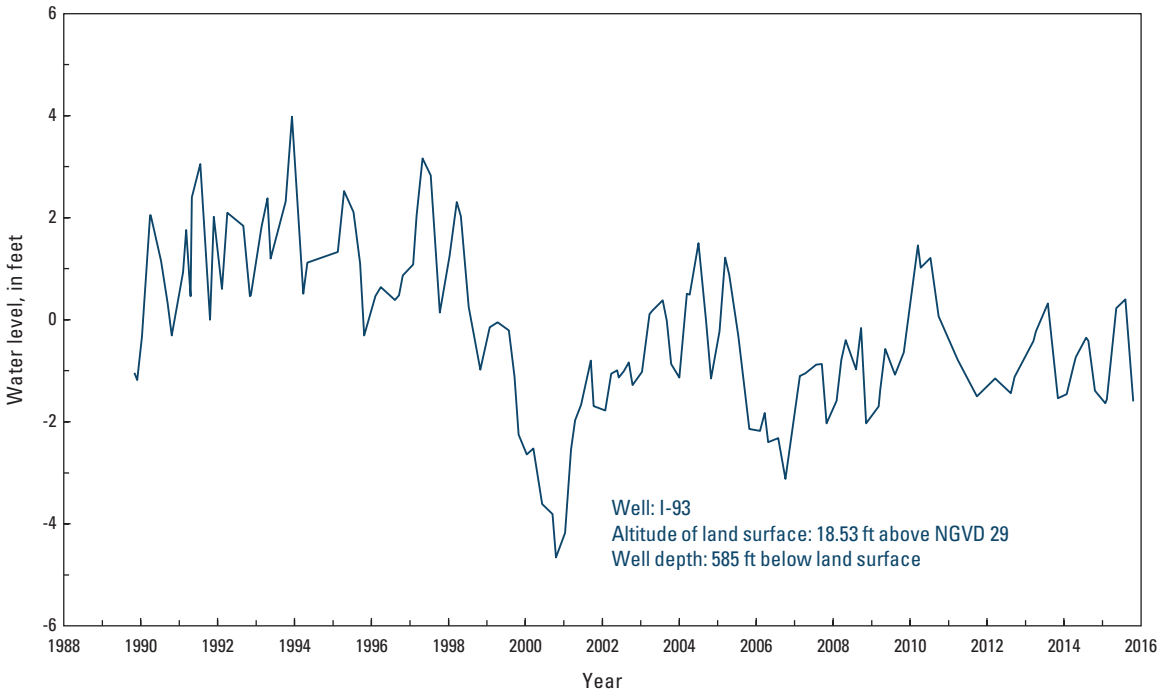

Figure 4. Water levels in well I-93 screened in the Chicot aquifer upper sand in Iberia Parish, Louisiana (see fig. 1 for well location; U.S. Geological Survey, 2016). Land surface and water levels are in feet (ft) relative to the National Geodetic Vertical Datum of 1929 (NGVD 29).

Secondary Maximum Contaminant Levels[3] (SMCLs) (table 3). The median value for pH was within the SMCLs, and dissolved-solids concentrations were generally within the SMCL. Water samples from wells screened in the Atchafalaya aquifer in Iberia Parish west of the Atchafalaya River were found to have iron concentrations that ranged from 1,000 to greater than 5,000 micrograms per liter (µg/L), hardness concentrations that generally exceeded 500 mg/L as calcium carbonate, pH generally in the range of 6.5–7.5 standard units, and specific conductance that ranged from 500 to 1,000 microsiemens per centimeter at 25 degrees Celsius (Nyman, 1989).

Surface-Water Resources

Surface-water resources in Iberia Parish are present primarily in the regional Atchafalaya-Vermilion drainage basin (Hydrologic Unit Code [HUC] 080801), with minor resources at the eastern end of the parish in the West Central Louisiana Coastal (HUC 08090302) and Lower Grand (HUC 08070300) subbasins. The Atchafalaya-Vermilion Basin in Iberia Parish is subdivided into the Vermilion (HUC 08080103), Bayou Teche (HUC 08080102), and Atchafalaya subbasins (HUC 08080101) (fig. 1; U.S. Geological Survey, 2016). In 2010, about 8.11 Mgal/d of surface water were withdrawn in Iberia Parish, including 5.45 Mgal/d for industrial use, 0.01 Mgal/d for livestock, 0.98 Mgal/d for rice irrigation, and 1.67 Mgal/d for aquaculture (table 2).

Vermilion Subbasin

The Vermilion subbasin is located west of Bayou Teche and drains in a general southerly direction towards Vermilion Bay and West Cote Blanche Bay (fig. 1). The Vermilion subbasin contains the Gulf Intracoastal Waterway, which traverses Iberia Parish both inland of and along the shore of Vermilion Bay. In addition, other water bodies include Lake Peigneur on the border with Vermilion Parish, Spanish Lake on the border with St. Martin Parish, Bayou Petite Anse, Bayou Carlin, Bayou Patout, and many other streams and canals. In 2010, 5.03 Mgal/d were withdrawn from the Gulf Intracoastal Waterway for industrial use, 0.38 Mgal/d from Bayou Patout for industrial use, and 1.81 Mgal/d from miscellaneous water bodies for aquaculture (1.12 Mgal/d), industrial use (0.02 Mgal/d), livestock (0.01 Mgal/d), and rice irrigation (0.66 Mgal/d) (B.P. Sargent, U.S. Geological Survey, written commun., 2015).

Bayou Teche Subbasin

The Bayou Teche subbasin is present in the central part of the parish and extends from near the western bank of Bayou Teche eastward to include Lake Fausse Pointe. Lake Fausse Pointe, located in Iberia and St. Mary Parishes (fig. 1), is a large, shallow lake that is separated from the Atchafalaya River floodway by a levee. At an average estimated water-surface elevation of about 2 ft above NGVD 29, the lake has a surface area of about 24 square miles and an average depth of about 3 ft (Shampine, 1971). The average daily mean discharge for Bayou Teche at Adeline Bridge near Jeanerette (site number 07385765; fig. 1) was 416 cubic feet per second (ft^3/s) for the period 1996–2015. Flow at this site is affected by tides at all stages, and reverse (upstream) flow and no flow conditions occur at times during the year (U.S. Geological Survey, 2016). In 2010, 0.87 Mgal/d of water were withdrawn from Bayou Teche for aquaculture (0.55 Mgal/d) and rice irrigation (0.32 Mgal/d), and 0.02 Mgal/d of water were withdrawn from miscellaneous streams for industrial use (0.01 Mgal/d) and livestock (0.01 Mgal/d) (B.P. Sargent, U.S. Geological Survey, written commun., 2015).

Atchafalaya Subbasin

The Atchafalaya subbasin (fig. 1) is located between two north-south trending flood protection levees that are located just east of Lake Fausse Pointe and near the eastern end of Iberia

[3]The SMCLs are nonenforceable Federal guidelines regarding cosmetic effects (such as tooth or skin discoloration), aesthetic effects (such as taste, odor, or color), or technical effects (such as damage to water equipment or reduced effectiveness of treatment for other contaminants) of drinking water. SMCLs were established as guidelines by the U.S. Environmental Protection Agency (2016).

Table 3. Summary of selected water-quality characteristics for freshwater in the Chicot aquifer system upper sand in Iberia Parish, Louisiana, 1940–2009 (U.S. Geological Survey, 2016).

[Values are in milligrams per liter, except as noted. °C, degree Celsius; PCU, platinum cobalt unit; µS/cm, microsiemen per centimeter; SU, standard unit; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; SMCL, Secondary Maximum Contaminant Level established by the U.S. Environmental Protection Agency (2016); NA, not applicable]

	Temperature (°C)	Color, (PCU)	Specific conductance, field (µS/cm at 25 °C)	pH, field (SU)	Hardness (as $CaCO_3$)	Chloride, filtered (as Cl)	Iron, filtered (µg/L as Fe)	Manganese, filtered (µg/L as Mn)	Dissolved solids, filtered
Chicot aquifer system upper sand (57 wells)									
Median	21.9	10	628	7.2	200	20	1,100	240	350
10th percentile	21.0	3	448	6.8	140	8.3	140	100	200
90th percentile	23.0	28	935	7.5	420	150	2,900	410	502
Number of samples	31	16	42	37	44	57	20	14	26
Percentage of samples that do not exceed SMCLs	NA	62	NA	95	NA	100	15	7	88
SMCLs									
	NA	15	NA	6.5–8.5	NA	250	300	50	500

Parish. Within the subbasin, the Atchafalaya River serves as an important shipping channel, and the flood plain not only provides a route for Mississippi River floodwaters but also supports a variety of commercial and recreational activities, as well as a habitat for a diverse array of plants and wildlife (U.S. Army Corps of Engineers, n.d.). Most of the water moving through the Atchafalaya subbasin in Iberia Parish eventually exits the basin through the Lower Atchafalaya River or the Wax Lake Outlet, both of which are located south of Iberia Parish in St. Mary Parish (fig. 1). During the period 1995–2014, the annual average discharge at the Lower Atchafalaya River at Morgan City (site number 07381600; fig. 1 index map) was 125,700 ft^3/s and at Wax Lake Outlet at Calumet (site number 07381590; fig. 1 index map) was 96,310 ft^3/s (U.S. Geological Survey, 2016).

Surface-Water Quality

Water samples collected from the Lower Atchafalaya River at Morgan City (site number 07381600; fig. 1 index map) during 2006–9 and from Bayou Teche at Keystone Lock near St. Martinville (site number 07385700) during 1965–98 were found to be generally within SMCLs for pH and concentrations of chloride and sulfate (table 4). Atchafalaya River samples were within the SMCL for iron concentration, whereas Bayou Teche samples exceeded the SMCL for iron concentration in over 20 percent of samples. Median hardness values were within the hard range in the Atchafalaya River and within the soft range in Bayou Teche. Median values for dissolved-oxygen concentrations were greater than 5 mg/L in water from both sites, which is considered the minimum value for a diverse population of fresh, warmwater biota, including sport fish (Louisiana Department of Environmental Quality, 2008).

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Table 4. Summary of selected water-quality characteristics for the Lower Atchafalaya River at Morgan City and Bayou Teche at Keystone Lock near St. Martinville, Louisiana (U.S. Geological Survey, 2016).

[Values are in milligrams per liter, except as noted. µS/cm, microsiemen per centimeter; °C, degree Celsius; SU, standard unit; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; E, estimated; <, less than; SMCL, Secondary Maximum Contaminant Level established by the U.S. Environmental Protection Agency (2016); NA, not applicable]

	Specific conductance, field (µS/cm at 25 °C)	Oxygen, dissolved	pH, field (SU)	Hardness (as $CaCO_3$)	Calcium, filtered (as Ca)	Magnesium, filtered (as Mg)	Sodium, filtered (as Na)	Chloride, filtered (as Cl)	Sulfate, filtered (as SO_4)	Iron, filtered (µg/L as Fe)
Lower Atchafalaya River at Morgan City (2006–9)[1]										
Median	356	7.7	7.8	130	34	10	18	25	35	20
10th percentile	299	5.3	7.6	100	28	7.4	13	18	28	E <6
90th percentile	470	11.2	8.1	170	43	15	30	42	54	70
Number of samples	53	52	53	53	53	53	53	53	53	53
Percentage of samples that do not exceed SMCLs	NA	NA	98	NA	NA	NA	NA	100	100	100
Bayou Teche at Keystone Lock near St. Martinville (1965–98)[2]										
Median	151	6.0	7.1	45.9	11	4.4	10.5	13	7.6	160
10th percentile	97	3.9	6.4	29	7.1	2.7	6.1	8.1	4.1	20
90th percentile	397	8.8	7.6	116.4	28.1	11	30.3	39	25.1	350
Number of samples	141	134	140	140	140	140	138	139	140	71
Percentage of samples that do not exceed SMCLs	NA	NA	88	NA	NA	NA	NA	100	100	79
SMCLs										
	NA	NA	6.5–8.5	NA	NA	NA	NA	250	250	300

[1]Site number 07381600 (see fig. 1).

[2]Site number 07385700 (see fig. 1).

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