

1999 Annual Mercury Report
Mercury Contaminant Levels in Louisiana
Biota, Sediments and Surface Waters
1994-1999

Louisiana Department of Environmental Quality
Environmental Planning Division
Baton Rouge, Louisiana

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INTRODUCTION

Mercury contamination of fish is a widespread problem throughout much of the United States and other countries. Levels of mercury in fish sufficient to exceed the U.S. Food and Drug Administration (FDA) action level of 1 part per million (ppm) have been found from many water bodies, including some in Louisiana (Cormier, 1995, LDEQ, 1993; LDEQ, 1995; LDEQ, 1997). Mercury is the primary cause of fish consumption advisories in the United States, accounting for 60 percent of all water bodies with an advisory. A total of 39 states have advisories due to mercury contamination of fish, and ten states have statewide mercury advisories (U.S. EPA Website, 1999). Louisiana's first advisory due to mercury was initiated in August 1992 for a stretch of the Ouachita River from the Arkansas border to the lock and dam at Columbia. This advisory was issued by the Louisiana Department of Health and Hospitals (LDHH) and the Louisiana Department of Environmental Quality (LDEQ). As of April 2000, 16 separate advisories on 15 Louisiana water bodies have been issued as a result of mercury contamination of fish. (Table 1).

The Louisiana Departments of Health and Hospitals and Environmental Quality coordinate in the assessment of data for health risks and jointly issue advisories if warranted. The Louisiana Departments of Wildlife and Fisheries, and Agriculture and Forestry are also apprised of the situation and asked to comment. LDHH uses a limited meals approach in establishing health advisories. LDHH will consider issuing a health advisory limiting fish consumption for pregnant or breast feeding women and children less than 7 years of age for locations where the average concentration of mercury exceeds 0.5 parts per million (ppm) in fish and shellfish. At average concentrations exceeding 1.0 ppm, LDHH will recommend limited meals or no consumption for pregnant or breast feeding women and children less than 7 years of age and limited consumption for the general population. In addition, LDHH considers other types of information when making advisory decisions. These considerations include, but are not limited to, information on sensitive subpopulations and local fish consumption practices that can affect exposure, the number of samples within a species, and the size and number of fish collected. FDA uses a maximum allowable mercury level of 1.0 ppm in fish which was established to protect consumers at mercury concentrations 10 times lower than the lowest levels associated with the initial adverse effects of mercury (Foulke, 1994).

LITERATURE REVIEW

Characteristics of Mercury in the Environment

Mercury is released into the environment in either elemental or ionic form. Ionic mercury tends to be deposited in the same region as the source, while elemental mercury usually enters the global atmospheric reservoir. Once in the atmosphere it can circulate for approximately one year and travel long distances from the sources (U.S. EPA Website, 1999). While mercury is generally released in its elemental or ionic form, methylmercury is the form predominantly bioaccumulated by fish and stored in muscle tissue (Schofield, 1994). The methylation of inorganic mercury seems to be enhanced by the presence of clear, low pH water (Lange et al., 1993; Wiener et al., 1990a and 1990b). Methylation rates of mercury also tend to be higher in freshwater compared to saltwater and in low oxygen conditions compared to waters with high dissolved oxygen levels. There are numerous potential sources of mercury to Louisiana waters, including atmospheric deposition, natural geologic deposits, industrial/municipal discharges, and previously contaminated sediment (Krabbenhoft and Rickert, 1995; Gordon, LDEQ undated). Inorganic mercury in water bodies is primarily bound to the sediment, and only found at extremely low concentrations in the water column (Beckvar et al., 1994; LDEQ, unpublished data). However, presence of mercury in the sediments of a water body is not alone sufficient to produce a contamination problem in fish (LDEQ, 1995). Water conditions, as described above, must also be conducive to methylation of inorganic mercury for significant accumulations in fish to occur.

Mercury levels tend to increase at higher trophic levels through biomagnification. Small aquatic organisms pick up methylmercury and transfer it to larger organisms when they are eaten. Because methylmercury is almost completely absorbed in the digestion process, the level of methylmercury becomes magnified as progressively larger predators ingest organisms that are contaminated by mercury. When the rate of uptake exceeds the depuration rate, concentrations in fish begin to increase, potentially leading to hazardous contaminant levels for human consumption. Large predators such as adult largemouth bass and bowfin (choupique) tend to have the highest levels of mercury contamination in rivers and lakes (LDEQ, 1995). For mercury, the biomagnification rate is so extreme that despite a mean mercury concentration of 0.002 ppb for Minnesota lakes, fish concentrations often exceeded 0.45 ppm (Sorensen et al., 1990). This amounts to a bioaccumulation factor of 225,000. In summary, mercury poses a threat to humans primarily through the consumption of large predatory fish from water bodies where mercury is present and water conditions promote methylation of mercury into a form that aquatic organisms bioaccumulate.

Risks to Fish and Wildlife

Besides posing a human health risk, elevated levels of mercury in fish can also have ecologically significant effects, such as affecting reproduction (Beckvar et al., 1994; Wiener, 1995). Although fish can generally excrete inorganic mercury, methylmercury, which crosses biological barriers more easily, is not readily excreted or sequestered in a form which is less harmful to the fish (Wiener, 1995). Because of the ease with which methylmercury crosses biological barriers, embryonic fish are at a much higher risk of mortality than adults even at mercury concentrations 1% to 10% lower than concentrations associated with adult mortality in fish (Wiener, 1995).

Among terrestrial wildlife, top predators of the aquatic food chain tend to have the highest concentrations of mercury. Such species include raccoons (*Procyon lotor*), mink (*Mustela vison*), otters (*Lutra canadensis*), cougars (*Felis concolor coryi*) and fish-eating birds such as eagles (*Haliaeetus leucocephalus*), ospreys (*Pandion haliaetus*) and great blue herons (*Ardea herodias*). Mercury levels in a female Florida Panther were 130 ppm in hair and 110 ppm in the liver. The Florida panther, an endangered species, subsists on a diet of raccoons (Facemire, 1995). Effects on terrestrial wildlife are similar to those of aquatic organisms and range from adverse effects on growth and reproduction to behavioral effects to mortality. The U.S. Fish and Wildlife Service (USFWS) has found high concentrations of mercury in raccoon and great blue herons sampled in the Upper Ouachita and D'Arbonne National Wildlife Refuges (USFWS, 1994). This finding led the USFWS to issue an advisory recommending no consumption of raccoons or fish from either refuge.

Risks to Human Health

The primary route of exposure to methylmercury in Louisiana is consumption of locally caught fish. Subsistence fishermen are at a much higher risk than the general population. Methylmercury is stored in the muscle tissue of the fish rather than the fat, therefore cleaning and trimming the fish before eating does little to reduce the risk of exposure. Adverse effects on the nervous system, particularly in developing fetuses and young children among whom effects can be permanent, is of primary concern with mercury contamination. Paresthesia, which consists of numbness and tingling of lips, fingers and toes, is generally the first symptom of mercury poisoning. Continued exposure results in stumbling, slurred speech, constricted visual fields, and impaired hearing. In extreme cases tremors and jerks can occur, followed by coma and death. Table 1 is a list of all fish consumption advisories related to mercury in Louisiana.

Table 1.

Fish consumption advisories related to mercury contamination in Louisiana water bodies. As of April 2000.

Description	Suspected Cause	Advisory Type	Advisory	Area	Date Issued
Ouachita River LA/AR border to lock at Columbia	Mercury	Advisory fish consumption	Pregnant/breast-feeding women and children <7 years of age should consume no bass (all species), and limit consumption of all other species to TWO MEALS PER MONTH. Non-pregnant women, men, and children >=7 years of age should limit bass to TWO MEALS PER MONTH with no limit on other species. ¹	102 miles	07/29/92 reviewed 8/94
Henderson Lake area including Lake Bigeux	Mercury	Advisory fish consumption	Pregnant/breast-feeding women and children <7 years of age limit consumption of largemouth bass, crappie, and freshwater drum to ONE MEAL PER MONTH. No limit on other species or for the general population. ¹	37.8 square miles	03/04/96
Bayou Plaquemine Brule	Mercury	Advisory fish consumption	Pregnant/breast-feeding women and children <7 years of age consume no bowfin (choupique), and limit consumption of largemouth bass, crappie, or freshwater drum to ONE MEAL PER MONTH. Non-pregnant women, men, and children >=7 years of age should limit bowfin to TWO MEALS PER MONTH, with no limit on other species.	40 miles	10/96
Black Lake	Mercury	Advisory fish consumption	Pregnant/breast-feeding women and children <7 years of age consume no bowfin (choupique), and limit consumption of largemouth bass, white bass, or crappie to ONE MEAL PER MONTH. Non-pregnant women, men, and children >=7 years of age should limit bowfin to TWO MEALS PER MONTH, with no limit on other species.	8 square miles	10/96
Bogue Chitto River	Mercury	Advisory fish consumption	Pregnant/breast-feeding women and children <7 years of age should limit	35 miles	8/96

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			consumption of bass (all species) or bowfin (choupique) to ONE MEAL PER MONTH. There is no consumption limit on any species for non-pregnant women, men, and children ≥ 7 years of age.		
Pearl River	Mercury	Advisory fish consumption	Pregnant/breast-feeding women and children < 7 years of age should consume no bowfin (choupique), and limit consumption of bass (all species), freshwater drum or bigmouth buffalo to ONE MEAL PER MONTH. Non-pregnant women, men, and children ≥ 7 years of age should CONSUME NO BOWFIN, with no consumption limit on other species. ¹	57 miles	2/97
Bayou Liberty	Mercury	Advisory fish consumption	Pregnant/breast-feeding women and children < 7 years of age should limit consumption of largemouth bass, white/black crappie, and freshwater drum to ONE MEAL PER MONTH. ¹ This same group should limit consumption of redear sunfish to TWO MEALS PER MONTH. There is no consumption limit on any species for non-pregnant women, men, and children ≥ 7 years of age.	10 miles	2/97
Chicot Lake	Mercury	Advisory fish consumption	Pregnant/breast-feeding women and children < 7 years of age should consume no bowfin (choupique), and limit consumption of largemouth bass to ONE MEAL PER MONTH. Non-pregnant women, men, and children ≥ 7 years of age should limit consumption of bowfin to TWO MEALS PER MONTH. There is no consumption limit on other species. ¹	2.54 square miles	5/27/97
Seventh Ward Canal	Mercury	Advisory fish consumption	Pregnant/breast-feeding women and children < 7 years of age should eat no more than a total of ONE MEAL PER MONTH of these fish combined:	11.5 miles	6/25/97

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Description	Suspected Cause	Advisory Type	Advisory	Area	Date Issued
			bowfin (choupique), white crappie (sac-a-lait), flathead catfish and freshwater drum. ¹ There is no consumption limit on other species of fish. ¹ There is no consumption limit on any species for non-pregnant women, men, and children ≥ 7 years of age. ¹		
Lake Vernon	Mercury	Advisory fish consumption	Pregnant/breast-feeding women and children < 7 years of age should eat no more than a total of ONE MEAL PER MONTH of the following fish, combined: largemouth bass, flathead catfish, redear and bluegill sunfish (bream). There is no consumption limit on other species of fish. There is no consumption limit on any species for non-pregnant women, men, and children ≥ 7 years of age. ¹	4,224 acres	8/5/97
Gulf of Mexico off Louisiana Coast	Mercury	Advisory fish consumption	For king mackerel 39 inches or less in total length: Pregnant/breast-feeding women and children < 7 years of age should eat no more than ONE MEAL PER MONTH. ¹ Non-pregnant women, men, and children ≥ 7 years of age should limit consumption to TWO MEALS PER MONTH. For king mackerel greater than 39 inches in total length: No consumption for all individuals. There is no consumption limit on other species of fish. ¹	Not determined	9/4/97

Bayou des Cannes	Mercury	Advisory fish consumption	Pregnant/breast-feeding women and children < 7 years of age should eat no more than ONE MEAL PER MONTH of the following fish, combined: bowfin (choupique), black crappie or freshwater drum (gaspergou). There	54 miles	10/9/97
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Description	Suspected Cause	Advisory Type	Advisory	Area	Date Issued
			is no consumption limit on other species of fish. There is no consumption limit on any species for non-pregnant women, men, and children ≥ 7 years of age. ¹		
Louisiana waters of Toledo Bend north of Pine Island (across from Circle Drive)	Mercury	Advisory fish consumption	Pregnant/breast-feeding women, women planning to be pregnant, and children < 7 years of age should eat no more than ONE MEAL PER MONTH of the following fish, combined: bowfin (choupique), white crappie (sac-a-lait) or largemouth bass. There is no consumption limit on other species of fish. There is no consumption limit on any species for non-pregnant women, women not planning to become pregnant, men, and children ≥ 7 years of age. ¹	Not determined	11/17/97
Louisiana waters of Toledo Bend within the Bayou San Patricio Arm	Mercury	Advisory fish consumption	Pregnant/breast-feeding women, women planning to be pregnant, and children < 7 years of age should consume no bowfin (choupique) and should eat no more than ONE MEAL PER MONTH of the following fish, combined: crappie or largemouth bass. There is no consumption limit on other species of fish. Non-pregnant women, women not planning to become pregnant, men, and children ≥ 7 years of age should limit consumption of bowfin (choupique) to no more than TWO MEALS PER MONTH. There is no consumption limit on other species of fish. ¹	Not determined	11/17/97
Blind River	Mercury	Advisory fish consumption	Pregnant/breast-feeding women, women planning to be pregnant, and children < 7 years of age should limit their consumption of bowfin (choupique) to ONE MEAL PER MONTH. There is no consumption limit on other species of fish. There is no consumption limit on any	25 miles	04/27/98

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Description	Suspected Cause	Advisory Type	Advisory	Area	Date Issued
			species of fish for non-pregnant women, women not breast-feeding or planning to become pregnant, men, and children >=7 years of age.		
Bayou Bartholomew	Mercury	Advisory fish consumption	Pregnant/breast-feeding women, women planning to be pregnant, and children < 7 years of age should limit their consumption of all fish species to ONE MEAL PER MONTH. There is no consumption limit on any species of fish for non-pregnant women, women not breast-feeding or planning to become pregnant, men, and children >=7 years of age.	69 miles	01/21/99
<p>1. One meal is considered to be one half pound of fish Henderson Lake advisory includes Henderson Lake, Lake Bigeux, and all waters within the area bounded on the north by the St. Landry-St. Martin Parish Line, on the east by the West Atchafalaya River levee (Hwy. 3177), on the south by Hwy. 3177 and on the west by the West Atchafalaya Basin levee.</p>					

Sources of Mercury in Louisiana

The most common point sources of mercury are chlor-alkali plants, hazardous waste incinerators, municipal waste incinerators, chemical manufacturing plants, and coal-fired utilities. Due to public interest, a summary of mercury emissions and surface water discharges are included in this report. Mercury is discharged either directly into the surface water or into the air. Mercury in the atmosphere is deposited into surface water primarily by wet deposition. Atmospheric residence time for gaseous emissions of mercury is estimated at one year, increasing the likelihood of transport to other regions. (Schroeder, 1998). Because of the nature of atmospheric mercury, the concentrations of mercury in Louisiana surface waters can not be directly traced to air emissions from the facilities located within Louisiana. Twenty-three facilities are currently included in LDEQ's Toxic Emission Data Inventory (TEDI). Five facilities in Louisiana currently report surface water discharges to the Toxic Release Inventory (TRI). The TRI facilities all discharge to the Mississippi River with the exception of PPG Industries which discharges to the Calcasieu River.

Table 2.
Mercury and mercury compounds discharged directly to Louisiana surface water, as reported to Toxic Release Inventory (TRI). Sum of release estimates reported in pounds per year

Facility Name	Annual Mercury Releases in pounds											Total
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	
Borden Chemicals & Plastics Operating L.P.	1	9	9	12	11	14	18	17	18	17	17	143
Chalmette Refining L.L.C.	0	0	0	0	0	0	0	0	0	0	0	0

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Dow Chemical Co., Louisiana Division	0	0	0	0	0	0	0	0	0	0	0	0
Pioneer Chlor-Alkali Co. Inc.	250	18	27	17	17	18	0	0	20	23	26	416
PPG Inds. Inc.	12	15	0	12	11	24	10	5	4	22	0	115
Total	263	42	36	41	39	56	28	22	42	62	43	674

Table 3.

Mercury air emissions in Louisiana, as reported to Toxic Emission Data Inventory (TEDI). Sum of release estimates reported in pounds per year.

Facility Name	Parish	Annual Mercury Emissions in pounds								
		1991	1992	1993	1994	1995	1996	1997	1998	
Boise Cascade-Oakdale Plywood	Allen	0	0	0	0	0	0	0	0	910
Rubicon, Inc.	Ascension	15	13	13	13	14	25	23	30	
Boise Cascade – Southern Ops	Beauregard	0	4	3	61	56	55	48	111	
Westvaco	Beauregard	0	0	2	2	2	2	2	1	
Condea Vista-Chemical Complex	Calcasieu	0	0	0	0	0	0	20	0	
PPG Industries, Inc.	Calcasieu	1210	1208	1238	1282	1287	1281	1228	1220	
International Paper-Mansfield	DeSoto	0	75	66	67	218	260	240	240	
Georgia Pacific Corporation	E. Baton Rouge	0	83	81	143	73	69	73	70	
Rollins Environ. Services, Inc	E. Baton Rouge	1	2	2	9	9				
Safety-Kleen (Formerly Rollins Environ. Services)	E. Baton Rouge							0	0	
Novartis Crop Protection Inc.	Iberville	0	0	0	0	0	0	0	3	
Dow U.S.A., Plaquemine Site	Iberville	44	127	0	588	227	16	0	0	
Stone Container Corporation	Jackson	0	49	49	48	48	12	18	18	
La-Pacific Corp., Urania Complex	LaSalle	2	2	2	2	2	0	0	0	
Sunland Fabricators/Walker	Livingston	0	0	0	0	0	0	0	67	
International Paper	Morehouse	0	83	66	66	99	92	91	87	
Willamette Ind., Inc. Red River	Natchitoches	0	0	21	20	15	15	16	16	
Riverwood International Plnt31	Ouachita	0	53	54	56	16	14	14	14	
International Paper-Pineville	Rapides	0	45	46	47	2	95	60	57	
Union Carbide	St. Charles	1	0	0	0	3	3	4	3	
Marine Shale Processors. Inc.	St. Mary	30	25	22	0	0	0	0	0	
Gaylord Container Corporation	Washington	0	91	80	87	83	85	90	89	
Crown Paper Company (Formerly James River Corp.)	West Feliciana					29	0	20	20	
James River Corp.	W Feliciana	0	14	27	27					

LDEQ'S MERCURY MONITORING PROGRAM

Past Data Assessment

Since at least 1986, LDEQ has conducted analysis to detect mercury contamination of fish from several water bodies throughout the state (Cormier, 1995; LDEQ, 1993; LDEQ, 1995; LDEQ, 1997; LDEQ, unpublished data). Mercury levels in edible portions of some species exceeding 0.5 were found in several areas. In January and July 1990 largemouth bass samples from the Tangipahoa River had mercury levels of 1.02 and 0.67 ppm, respectively (LDEQ, unpublished data). An Amite River largemouth bass sample collected in September 1990 was found to have 0.94 ppm mercury in edible tissue (LDEQ, unpublished data). Two of three largemouth bass samples from the Bogue Chitto River collected in July 1990 exceeded 0.5 ppm mercury (0.78 and 1.18 ppm) (LDEQ, unpublished data). In contrast, fish collected by LDEQ from the Mississippi River since 1990 did not have elevated mercury levels (Henrich et al., 1995).

Ouachita River fish have been sampled on numerous occasions, with high levels of mercury often observed in the composite samples. Three largemouth bass samples collected in September 1990 south of the Arkansas line had mercury levels of 0.96-1.29 ppm. A blue catfish (*Ictalurus furcatus*) sample and a flathead catfish (*Pylodictis olivaris*) sample from the same area also had high levels of mercury (0.62 and 0.93 ppm, respectively). One of three carp (*Cyprinus carpio*) samples in this effort had elevated levels of mercury (0.65 ppm) (LDEQ, unpublished data). In October 1990 three largemouth bass samples collected near Monroe had mercury levels ranging from 0.80-1.01 ppm. Three channel catfish (*I. punctatus*) samples taken from the same area had 0.52-0.66 ppm of mercury. From November 1991 to February 1992 five Ouachita River stations from the Arkansas state line to Columbia Lock and Dam were sampled for largemouth bass or spotted bass (*M. punctulatus*) and largemouth buffalo (*Ictiobus cyprinellus*) or smallmouth buffalo (*I. bubalus*). Composites of each genus were used for analysis. Mercury levels in bass ranged from 0.52-4.04 ppm. Buffalo had elevated levels of mercury at two stations (0.52 ppm and 0.74 ppm) (LDEQ, unpublished data). From 1992-1993 a more formal study of fish from the Ouachita River was undertaken by LDEQ (LDEQ, 1993). A total of 83 samples from nine sites were collected from the Arkansas state line to north of Jonesville. Twelve of 29 bass (both largemouth and striped) had mercury concentrations greater than or equal to 1.0 ppm, while 8 samples ranged from 0.5-0.9 ppm. Only one of 15 crappie (*Pomoxis sp.*) samples exceeded 1.0 ppm mercury; however, six crappie samples had mercury concentrations greater than 0.5 ppm but less than 1.0 ppm. Bluegill (*Lepomis macrochirus*), buffalo and catfish from this study were generally found to be below 1.0 ppm (LDEQ, 1993).

During the fall of 1993, fish from twelve North Louisiana lakes were sampled (Cormier, 1995). Fifteen largemouth bass were collected from each lake except upper Toledo Bend where one of the 15 fish was a spotted bass. All fish were analyzed individually. Results varied greatly, with four of the lakes having no fish with mercury levels exceeding 0.5 ppm mercury in fillets. These included Lakes Providence, Claiborne, Bruin and Caney. At Lake Bartholomew only one individual had mercury levels above 0.5 ppm and at Caddo Lake two fish exceeded that level of contamination. Cross Lake had a greater mercury contamination problem with 12 largemouth bass at or near the 0.5 ppm level. Lakes Bistineau, D'Arbonne, Wallace and Cheniere all had at least one fish exceeding 1.0 ppm mercury. The highest single fish concentration in that study came from Cheniere Lake. It had a mercury concentration of 1.532 ppm.

Objectives

The primary objective of this project is to determine statewide mercury contamination levels of fish commonly eaten in Louisiana, as well as mercury concentrations in sediments, water, and epiphytic plant material collected at the same locations. Fish tissue information will provide input for analyses of

risks to human health due to consumption of mercury contaminated fish. This will allow LDHH and LDEQ to address concerns of the public regarding the safety of fish consumption from many water bodies. Epiphytic plant material will be used to help assess the significance of atmospheric sources of mercury. Results of the epiphytic plant material analyses, together with the fish tissue, water and sediment concentration information, may help address questions regarding sources of mercury by combining data generated by this and previous projects with the knowledge of LDEQ field personnel regarding potential sources of mercury in areas around the state. Additionally, it will provide baseline data that can be used for trend analysis to determine whether the contamination problem is improving, getting worse, or remaining stable.

Fish, Water, Sediment and Plant Sampling

Recreationally-fished water bodies throughout Louisiana, especially those with water chemistry characteristics promoting methylation of mercury were targeted for sampling. Initially, a prioritized list of recommended sampling locations was compiled by personnel in the Acadiana, Bayou Lafourche, Capitol, Kisatchie Central, Southwest, and Southeast Regions. Priorities were based on public use and potential for mercury contamination. In order to narrow the prioritization further, average and median values for pH were calculated using ambient water quality data where available. A pH value of ≤ 6.93 was used as a cutoff for water bodies where methylation of mercury may be favored. This value of 6.93 was determined based upon an assessment of available water quality and fish tissue data using regression analysis (SAS, 1990; Sokal and Rohlf, 1981). Since the initial water body selection in 1994, emphasis has been placed on recreationally fished waters, without regard to ambient water body pH.

Current site selection is based on three sampling needs. New sites are sampled in order to expand the extent of water bodies tested. Water bodies currently under an advisory for mercury are resampled annually. Finally, some water bodies are resampled if LDHH determines additional samples are needed to make a decision regarding the need for advisories. Guided by these needs, LDEQ is endeavoring to sample a total of 100 sites per year.

As of November, 1999 318 sites on 182 water bodies have been tested as part of the statewide mercury project. All data presented in this report was collected prior to that date. Some sites have been retested one or more times to confirm the presence of high concentrations of mercury in fish tissue. All sampling locations were described by latitude and longitude, and site location information and identification numbers were entered into the LDEQ sites (STS) data file. A Trimble Pathfinder was used in the field to determine coordinates for the sampling locations by sampling continuously for three minutes. Data was post-processed with data collected by the Trimble 4000 community base station located at LDEQ's main office in Baton Rouge.

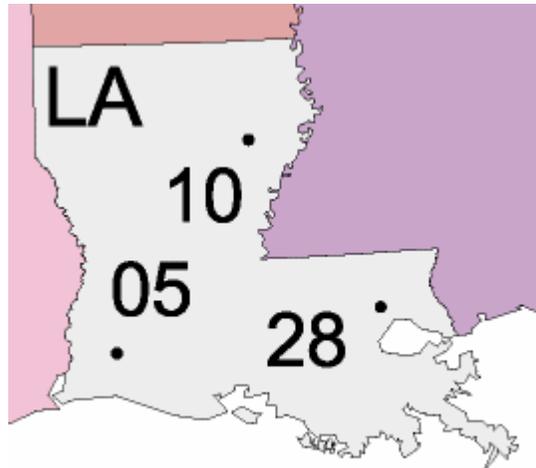
A complete listing of sample sites, along with summary information, as of November 2000 can be found in Table 4.

Air Monitoring

Beginning in October 1998, LDEQ implemented an air monitoring program designed to assess the geographical extent and quantity of mercury deposition from the atmosphere. Air monitors were set up at the Southeastern University Campus in Hammond, Louisiana, McNeese State University in Lake Charles, Louisiana, and at the Louisiana State University sweet potato farm in Chase, Louisiana. Figure 1 shows the location of all air monitoring sites for the mercury program. Samples are tested for wet deposition of elemental and methylated mercury during rainfall events. If possible, samples are collected on a weekly basis. LDEQ's air monitoring sites are part of the National Atmospheric Deposition Program and the Mercury Deposition Network. Results are not yet available for the air monitoring program, but will be reported in future updates.

Figure 1.

Location of Louisiana Department of Environmental Quality air deposition monitoring sites for elemental and methylated mercury.



SAMPLING PROCEDURES

Fish Tissue Sampling Procedures

For the first three years, fish were collected by the LDEQ Water Quality Management Division (WQMD) Surveillance field staff and the U.S. Geological Survey (USGS) using an electroshocking rig, nets, hook and line, or traps as described in LDEQ's *Quality Control Manual For Biosurveys and Fish Community Assessments* (LDEQ, 1991a). Following completion of USGS's contract with LDEQ, sample collection was continued by Surveillance Division's (SD's) field staff. Composite samples of at least three fish species were collected from the chosen water bodies. Target species included largemouth bass, channel catfish, blue catfish, crappie (*Pomoxis annularis* and *P. nigromaculatus*), and bowfin (*Amia calva*). Other appropriate species were substituted for the targeted species if those were not found; appropriate substitutes included freshwater drum (*Aplodinotus grunniens*), garfish (*Lepisosteus sp.*), striped bass (*Morone saxatilis*), white bass (*M. chrysops*) and buffalo. Fish of the same species and the same age/weight ($\pm 15\%$) class were composited for a sample. A Hydrolab Scout II, or equivalent water quality meter, was used to measure pH, dissolved oxygen, temperature and conductivity at a depth of one meter at each station. Field data, including lengths and weights of fish, were recorded at the time of sample

collection using field forms. Fish collected from nets, hook and line, and traps were immediately placed on ice in a plastic tray inside an ice chest. Fish collected by electroshocking were retained in a live well until sampling was completed and were placed on ice after selection. Only live or freshly dead fish (red gills) were retained.

Fish sample preparation was done in the field. All equipment used to prepare the samples was first cleaned with soap and water, then rinsed with 10% nitric acid, and finally rinsed with type 1 deionized water. Equipment was cleaned between each composite prepared. Composite fish samples consisted of skinless fillets from three to ten individuals of the same species and size class. Fish were filleted with a ceramic or stainless steel blade knife. All fillets making up a composite were divided into equal portions. The total weight of the sample was at least 250 grams. If an exceptionally large fish of one species was collected, it was analyzed individually.

Each composite was placed in a new, clear, colorless plastic Ziploc bag. The outside of the bag was labeled with a unique sample number, the date, and name of water body. Fish composite samples were placed on ice immediately after compositing and kept on ice or frozen until delivery to the laboratory.

Water and Sediment Sampling Procedures

At each fish sampling site one water and one sediment sample were also collected. Water and sediment samples were collected using the new protocol documented in the USGS, Office of Water Quality Technical Memo 94.05, as modified below (Horowitz et al., 1994). Sediment samples were collected with a Teflon coated Petite Ponar dredge. Sediment samples were placed in clean pint-sized, plastic, wide-mouth jars and placed on ice immediately after collection for transport to the laboratory. The sediment sampler was cleaned with soap and water and rinsed with type 1 deionized water. Water samples were placed in clean 6 oz. glass bottles which had been rinsed with 5% HCl. Samples were then kept at ambient temperature until being filtered through a 0.45 micron, 142-mm diameter filter. After filtration, water samples were preserved with nitric acid to a pH <2 and put on ice. Following completion of the USGS contract with LDEQ, SD personnel continued sediment sampling using the same protocols.

Plant Material Sampling Procedures

Epiphytic plant material, either Spanish moss (*Tilandsia usneoides*) or lichens, from above the high water line were also sampled from some stations. Plant material was placed in labeled clear plastic bags and put on ice or frozen until delivery to the laboratory.

Laboratory Procedures

Mercury analysis was performed on tissue samples using atomic absorption spectrometry in the form of a Perkin Elmer Flow Injection Mercury System (FIMS). Sediment and water sample analysis was performed on a LDC 3200 Mercury Analysis System. Water analysis was done according to EPA Method 245.1, modified in regard to reagents and digestion containers in order for the method to work with the LDC Mercury 3200 Analyzer. Sediment analysis was done according to EPA Method 245.5, modified for compatibility with the 3200 Analyzer.

Quality Assurance/Quality Control Procedures

Procedures for quality assurance/quality control and sample chain of custody as outlined in the *Quality Assurance Project Plan Surface Water Monitoring and Analysis* were followed during this project (LDEQ, 1991b). Samples with chain-of-custody forms were delivered to the laboratories with proper log-

in procedures. Field and/or equipment blanks were analyzed, as were standard reference material samples. Replicate samples of water, bottom material, and tissue were also submitted to the laboratory for analysis. Subsamples of up to 10% of all samples were delivered to a second laboratory for analysis.

Calibrations were done according to LDEQ's *Quality Assurance Project Plan Surface Water Monitoring and Analysis* (LDEQ, 1991b). Mercury analyzers were calibrated daily for each group of samples. A series of three standards plus a reagent blank, in the expected concentration range were used. Baseline drift was checked with a reagent blank after every tenth sample or more often if needed.

SAMPLING RESULTS

Fish Tissue Analysis Results

In order to facilitate quick release of this report, data is being presented in summary tables only. Complete analytical results for all fish tissue samples are provided in Appendix A.

Mean and maximum fish tissue concentrations for all species combined, listed by site, are provided in Table 4. Species mean and maximums are found in Table 5. Mean concentrations by species for those water bodies under an advisory are provided in Table 6.

Table 4.

Sample sites and summary statistics for study on mercury contaminant levels in Louisiana fishes, all species combined. Louisiana Department of Environmental Quality, Environmental Planning Division. 1994-November 1999.

Site Description	Site Number	N	Mean	Maximum	Standard Deviation
Amite River southeast of Port Vincent, Louisiana	0435	11	0.129	0.284	0.074
Anacoco Lake west of Leesville, Louisiana	0501	8	0.398	0.789	0.173
Atchafalaya Basin near Crewboat Chute, Louisiana	0698	4	0.015	0.023	0.006
Barataria Bay North of Grand Isle, Louisiana	0635	5	0.143	0.224	0.075
Bay Antoine South of Houma, Louisiana	0718	2	0.048	0.052	0.006
Bay Gardene (Bayou Lost) East of Pointe a la Hache, Louisiana	0006	1	0.120	0.120	.
Bay Wallace south of Gibson, Louisiana	0502	10	0.104	0.293	0.130
Bayou Bartholomew at Hwy. 425	0911	17	1.076	3.904	0.760
Bayou Bartholomew northeast of Bastrop, Louisiana	0458	12	0.881	1.317	0.211
Bayou Benoit east of Loreauville, Louisiana	0483	25	0.292	0.676	0.134
Bayou Bonfouca	0397	11	0.491	0.674	0.170
Bayou Bonfouca at Slidell, Louisiana	0301	7	0.206	0.269	0.037
Bayou Boue East of Pointe a la Hache	0745	2	0.099	0.110	0.016
Bayou Choctaw near I-10 East of Gross Tete, Louisiana	0609	8	0.230	0.339	0.085
Bayou Choctaw near Indian Village, Louisiana	0610	8	0.167	0.393	0.136
Bayou Choupique at Carlyss, Louisiana	0849	14	0.259	0.619	0.173
Bayou Cocodrie North of Washington, Louisiana	0625	14	0.214	0.639	0.181
Bayou Courtableau east of Port Barre, Louisiana	0388	26	0.273	0.728	0.184
Bayou Cowan	0912	14	0.411	0.877	0.192
Bayou De Saird Southeast of Sterlington, Louisiana	0626	17	0.532	1.058	0.334
Bayou des Cannes	0913	13	0.499	1.136	0.293
Bayou Des Cannes northeast of Jennings, Louisiana	0308	47	0.432	1.176	0.329
Bayou Desiard north of Monroe, Louisiana	0353	8	0.205	0.505	0.210
Bayou D'Inde near Lake Charles, Louisiana	0094	2	0.669	0.797	0.182
Bayou D'Inde SW of Westlake, Louisiana	0168	6	0.249	0.512	0.193
Bayou D'Inde WSW of Lake Charles, Louisiana	0170	4	0.118	0.185	0.073

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Site Description	Site Number	N	Mean	Maximum	Standard Deviation
Bayou Gravenberg	0611	7	0.189	0.548	0.174
Bayou Lacassine near Hayes, Louisiana	0706	15	0.449	1.441	0.357
Bayou Lacassine near Lake Arthur, Louisiana	0098	14	0.507	1.047	0.322
Bayou Lacombe north of Lacombe, Louisiana	0419	16	0.461	1.354	0.436
Bayou Lacombe south of Lacombe, Louisiana	0421	13	0.234	0.521	0.137
Bayou Lafourche at Lockport, Louisiana	0294	15	0.125	0.461	0.131
Bayou Liberty near Slidell, Louisiana	0503	29	0.582	1.528	0.405
Bayou Long near Stephenville, Louisiana	0726	14	0.202	0.633	0.142
Bayou Nezpique northeast of Jennings, Louisiana	0438	26	0.366	1.033	0.195
Bayou Petite Anse east of Delcambre, Louisiana	0578	27	0.265	0.678	0.160
Bayou Plaquemine Brule near Mermentau, Louisiana	0504	50	0.549	1.883	0.437
Bayou Pointe Aux Chiens, East of Montegut, Louisiana	0873	1	0.201	0.201	.
Bayou Queue de Tortue near confluence with Mermentau River	0874	13	0.691	1.670	0.620
Bayou Queue de Tortue west of Kaplan, Louisiana	0580	7	0.194	0.321	0.116
Bayou Rambio	0867	2	0.129	0.199	0.100
Bayou Saint John at New Orleans, Louisiana	0305	7	0.072	0.174	0.062
Bayou Sale south of Franklin, Louisiana	0442	27	0.153	0.615	0.157
Bayou Segnette South of Westwego, Louisiana	0853	7	0.148	0.270	0.083
Bayou Teche at New Iberia, Louisiana	0505	20	0.252	0.542	0.135
Bayou Teche at Patterson, Louisiana	0508	27	0.192	0.492	0.127
Bayou Teche near Franklin, Louisiana	0870	14	0.116	0.275	0.076
Beau Bayou east of St. Martinville, Louisiana	0469	6	0.081	0.182	0.059
Beckwith Creek Southeast of DeQuincy, Louisiana	0699	11	0.433	0.735	0.228
Big Alabama southeast of Krotz Springs, Louisiana	0506	24	0.526	1.544	0.348
Big Bayou Pigeon southwest of Pigeon, Louisiana	0470	9	0.063	0.097	0.024
Big Saline Bayou East of Deville, Louisiana	0700	14	0.418	1.096	0.288
Bird Island Bayou at Marsh Island	0579	12	0.010	0.051	0.015
Black Bayou Lake north of Natchitoches, Louisiana	0366	32	0.637	2.278	0.492
Black Bayou Reservoir near Benton, Louisiana	0612	7	0.349	0.991	0.296
Black Bayou Lake at Hosston	0581	11	0.339	1.124	0.299
Black River at Jonesville, Louisiana	0090	9	0.310	0.625	0.216
Blind River near Gramercy, Louisiana	0538	44	0.456	1.692	0.332
Blue Hammock Bayou	0866	5	0.102	0.137	0.028
Boeuf River West of Alto, Louisiana	0735	15	0.062	0.234	0.066
Bogue Chitto near Clifton, Louisiana	0507	28	0.693	1.676	0.481
Bogue Chitto River near Bush, Louisiana	0064	50	0.575	1.341	0.403
Bogue Chitto River southeast of Sun, Louisiana	0582	14	0.564	0.865	0.206
Bogue Falaya at Covington, Louisiana	0411	20	0.412	1.152	0.309
Breton Sound at Pelican Point	0731	4	0.168	0.277	0.096
Breton Sound near block 25	0546	1	0.776	0.776	.
Breton Sound near Shell Beach, Louisiana	0509	9	0.432	0.689	0.137
Buffalo Cove	0613	3	0.105	0.116	0.010
Bunchs Cutoff (Rock Pile)	0746	11	0.422	0.766	0.131
Bundick Lake southeast of DeRidder, Louisiana	0380	24	0.243	0.954	0.189
Caddo Lake (James Bayou) northwest of Oil City, Louisiana	0481	3	0.489	0.556	0.061
Caddo Lake (James Bayou) west of Oil City, Louisiana	0474	4	0.167	0.264	0.065
Caddo Lake at Mooringsport, Louisiana	0476	2	0.162	0.320	0.223
Caddo Lake at Mooringsport, Louisiana	0560	24	0.180	0.620	0.187
Caddo Lake northeast of Mooringsport, Louisiana	0475	1	0.136	0.136	.

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Site Description	Site Number	N	Mean	Maximum	Standard Deviation
Caddo Lake south of Oil City, Louisiana	0479	14	0.123	0.484	0.164
Caddo Lake west-southwest of Oil City, Louisiana	0480	31	0.276	0.711	0.184
Caillou Bay near Raccoon Point (Isles Dernieres)	0732	1	0.063	0.063	.
Caillou Lake south of Houma, Louisiana	0351	6	0.013	0.076	0.031
Calcasieu Lake at Nine Mile Cut	0876	3	0.174	0.244	0.072
Calcasieu Lake West Pass near Grand Lake, Louisiana	0190	4	0.109	0.191	0.067
Calcasieu River at mile 27.61, near Lake Charles, Louisiana.	0187	4	0.112	0.281	0.119
Calcasieu River at Moss Bluff, Louisiana	0093	26	0.350	0.995	0.268
Calcasieu River Clooney Island Loop near Westlake, Louisiana	0628	2	0.055	0.102	0.067
Calcasieu River Clooney Island Loop, near Lake Charles, Louisiana	0184	1	0.043	0.043	.
Calcasieu River Clooney Island Loop, west of Lake Charles, Louisiana	0183	3	0.168	0.231	0.106
Calcasieu River Coastal Waters Southeast of Cameron Jetties	0852	6	0.101	0.140	0.026
Calcasieu River Coon Island Loop, near Westlake, Louisiana	0182	2	0.832	0.884	0.074
Calcasieu River Coon Island Loop, west of Lake Charles, Louisiana	0181	4	0.066	0.170	0.082
Calcasieu River near Kinder pumping station	0875	13	0.567	1.068	0.322
Calcasieu River North of Lake Charles, Louisiana	0627	2	0.163	0.169	0.008
Caminada Bay North of Cheniere Caminada	0727	1	1.243	1.243	.
Cane River at Natchitoches, Louisiana	0333	23	0.077	0.241	0.058
Caney Lake North of Minden, Louisiana	0855	17	0.420	1.305	0.350
Capitol Lake at Baton Rouge, Louisiana	0583	5	0.172	0.192	0.022
Catahoula Lake at Catahoula, Louisiana	0629	20	0.169	0.373	0.089
Catfish Lake West of Golden Meadow, Louisiana	0566	10	0.059	0.146	0.056
Chatham Lake near Chatham, Louisiana	0736	7	0.228	0.459	0.156
Cheneire Brake west of Monroe, Louisiana	0473	11	0.136	0.436	0.185
Cheniere Brake Lake south of West Monroe, Louisiana	0788	10	0.665	2.149	0.602
City Park Lake at Baton Rouge, Louisiana	0630	7	0.074	0.107	0.032
City Park Lake at Children's Rodeo at New Orleans, Louisiana	0533	8	0.161	0.316	0.095
City Park Lake at Disposal Area at New Orleans, Louisiana	0528	7	0.199	0.408	0.127
City Park Lake at New Orleans, Louisiana	0511	30	0.355	1.257	0.290
Clear Lake east of Campti, Louisiana	0614	6	0.368	0.667	0.166
Clear Lake north of Mansfield, Louisiana	0281	11	0.082	0.311	0.090
Clear Lake southeast of Bossier City, Louisiana	0584	8	0.174	0.523	0.160
Cocodrie Lake east of Glenmora, Louisiana	0378	10	0.292	0.538	0.146
Cocodrie Lake Southwest of Vidalia, Louisiana	0701	18	0.114	0.284	0.076
Contraband Bayou at Lake Charles, Louisiana	0631	3	0.033	0.066	0.032
Corney Lake at Spillway	0783	10	0.416	0.801	0.213
Cote Blanche Bay near Lake Point (Marsh Island)	0733	2	0.049	0.093	0.063
Cotile Lake southwest of Boyce, Louisiana	0510	10	0.259	0.565	0.123
Cow Island Lake east of Butte La Rose, Louisiana.	0482	17	0.150	0.402	0.093
Crew Boat Chute Northeast of Grand Lake	0747	14	0.165	0.315	0.079
Crooked Creek Reservoir southwest of Turkey Creek, Louisiana	0585	29	0.537	1.109	0.218
Cross Lake near Shreveport, Louisiana	0432	18	0.255	0.780	0.208
Cypress Bayou Reservoir, east of Benton, Louisiana	0586	8	0.151	0.264	0.087

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Site Description	Site Number	N	Mean	Maximum	Standard Deviation
Devil's Bay	0728	3	0.040	0.048	0.008
English Bayou near Lake Charles, Louisiana	0131	14	0.272	0.571	0.167
False River	0536	18	0.248	0.380	0.086
Flat Lake north of Morgan City, Louisiana	0440	24	0.183	0.380	0.109
Fohs Canal southwest of Dulac, Louisiana	0444	9	0.072	0.128	0.036
Franklin Canal Southeast of Franklin, Louisiana	0632	14	0.111	0.284	0.074
Garden City Oilfield Canals South of Franklin, Louisiana	0633	17	0.192	1.066	0.257
Grand Bayou Reservoir near Coushatta, Louisiana	0587	29	0.424	1.411	0.378
Grand Isle Beach at Gulf of Mexico	0702	1	0.491	0.491	.
Grand Lake near Hackberry Point, Louisiana	0737	10	0.186	0.600	0.162
Grand Lake northeast of Franklin, Louisiana	0441	9	0.114	0.210	0.071
Grassy Lake southwest of Napoleonville, Louisiana	0588	23	0.348	0.738	0.211
Gulf of Mexico at Grand Isle Beach	0860	1	0.438	0.438	.
Gulf of Mexico south of Grand Isle, Louisiana	0569	1	0.713	0.713	.
Gulf of Mexico south-southeast of Grand Isle, Louisiana	0568	6	0.984	2.202	0.769
Gulf of Mexico south-southwest of Grand Isle, Louisiana	0567	1	0.519	0.519	.
Gulf of Mexico, Diamond Reef	0748	3	0.226	0.456	0.200
Gulf of Mexico, South Marsh Island Block 6	0749	7	0.652	0.953	0.164
Gulf of Mexico, South of Southwest Pass	0914	6	1.362	2.328	0.658
Gulf of Mexico, Southwest Pass	0634	1	1.386	1.386	.
Gulf of Mexico, SS-45 near Isles Dernieres, Louisiana	0721	2	0.043	0.052	0.013
Gulf of Mexico, ST-128	0643	2	0.633	0.826	0.274
Gulf of Mexico, Sulphur Mine	0644	5	0.159	0.214	0.082
Gulf of Mexico, Tete-Butte Reef	0703	8	0.104	0.244	0.070
Gulf of Mexico, WD-40	0719	4	0.119	0.305	0.125
Gulf of Mexico, WD-41	0646	1	0.020	0.020	.
Gulf of Mexico, West Cameron Block 110	0750	1	0.322	0.322	.
Gulf of Mexico, West Cameron Block 140	0877	5	0.224	0.810	0.331
Gulf of Mexico, West Cameron Block 171	0751	9	0.589	1.183	0.351
Gulf of Mexico, West Delta Block 21	0878	3	0.178	0.289	0.099
Gulf of Mexico, West Delta Block 93E	0752	1	0.078	0.078	.
Harvey Canal Southwest of Belle Chasse, Louisiana	0856	9	0.117	0.189	0.043
Hickory Creek Southeast of DeQuincy, Louisiana	0704	11	0.410	0.741	0.195
Horseshoe Lake near Lamkin, Louisiana	0879	12	0.997	1.887	0.481
Houston River Northwest of Sulphur, Louisiana	0705	13	0.589	2.015	0.539
Iatt Lake northeast of Colfax, Louisiana	0375	13	0.516	1.260	0.296
Indian Creek Reservoir west of Lecompte, Louisiana	0589	11	0.425	0.698	0.126
Intracoastal Waterway at Forked Island, Louisiana	0857	6	0.137	0.199	0.040
Intracoastal Waterway at Warren Canal	0880	7	0.223	0.368	0.103
Intracoastal Waterway near Belle Chasse, Louisiana	0861	11	0.105	0.428	0.111
Intracoastal Waterway near Bourg, Louisiana	0615	33	0.132	0.248	0.057
Intracoastal Waterway South of Avery Island, Louisiana	0694	12	0.168	0.346	0.074
Intracoastal Waterway, West of Vermilion Lock	0753	6	0.175	0.269	0.065
Kepler Lake north of Castor, Louisiana	0590	9	0.261	0.799	0.263
Kincaid Lake west of Alexandria, Louisiana	0512	10	0.181	0.556	0.199
Lac des Allemands	0541	25	0.216	0.596	0.169
Lacassine Pools southwest of Lake Arthur, Louisiana	0591	11	0.158	0.410	0.112
Lake Arthur	0617	30	0.321	0.761	0.195
Lake Barre	0564	4	0.235	0.679	0.303
Lake Bartholomew East of Sterlington	0754	9	0.209	0.321	0.098
Lake Bistineau west of Ringgold, Louisiana	0592	11	0.140	0.632	0.186

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Site Description	Site Number	N	Mean	Maximum	Standard Deviation
Lake Boeuf north of Raceland, Louisiana	0439	26	0.083	0.537	0.126
Lake Bruin at Lake Bruin State Park, near St. Joseph, Louisiana	0141	9	0.076	0.203	0.053
Lake Buhlow at Pineville, Louisiana	0593	18	0.320	0.722	0.237
Lake Cataouatche South of Avondale, Louisiana	0636	10	0.184	0.283	0.059
Lake Charles at Lake Charles, Louisiana	0175	21	0.167	0.521	0.136
Lake Chicot south of St. Landry, Louisiana	0379	60	0.543	1.419	0.318
Lake Claiborne southwest of Lisbon, Louisiana	0882	5	0.331	0.498	0.140
Lake Concordia near Ferriday, Louisiana	0707	11	0.050	0.305	0.089
Lake Cuatro Caballo (4 Horse Lake)	0725	6	0.086	0.133	0.032
Lake D'Arbonne at Farmerville, Louisiana	0326	21	0.213	1.522	0.323
Lake Dauterive northeast of Loreauville, Louisiana	0594	49	0.386	0.990	0.215
Lake de Cade west of Dulac, Louisiana	0513	10	0.392	0.838	0.224
Lake Dubuisson	0618	20	0.282	0.663	0.157
Lake Fausse Pointe east of New Iberia, Louisiana	0313	55	0.314	0.891	0.234
Lake Fields near Lockport, Louisiana	0730	15	0.087	0.238	0.066
Lake Hatch southwest of Crozier, Louisiana	0869	12	0.066	0.165	0.042
Lake Henderson east of Henderson, Louisiana	0436	140	0.450	1.243	0.254
Lake Lafourche North of Rayville, Louisiana	0738	13	0.121	0.349	0.088
Lake Louis West of Sicily Island, Louisiana	0774	11	0.298	0.749	0.175
Lake Martin near Parks, Louisiana	0514	9	0.109	0.265	0.087
Lake Michael, Marsh Island	0708	2	0.069	0.097	0.040
Lake Misere near Bayou Misere	0739	12	0.429	1.330	0.375
Lake Palourde near Morgan City, Louisiana	0338	37	0.354	0.936	0.250
Lake Peigneur at Jefferson Island, Louisiana	0595	10	0.116	0.353	0.138
Lake Pelto	0561	8	0.056	0.142	0.062
Lake Pelto near Isles Dernieres, Louisiana	0722	3	0.051	0.090	0.033
Lake Pelto/Lost Lake	0562	3	0.081	0.122	0.070
Lake Penchant Southwest of Houma, Louisiana	0896	13	0.109	0.268	0.072
Lake Pontchartrain -07 near New Orleans, Louisiana	0206	4	0.225	0.436	0.155
Lake Pontchartrain at Bonne Carre Spillway	0709	19	0.102	0.280	0.070
Lake Pontchartrain at South Causeway	0710	15	0.046	0.312	0.079
Lake Pontchartrain near Mandeville, Louisiana	0637	9	0.161	0.275	0.074
Lake Pontchartrain near Railroad Bridge	0868	3	0.225	0.280	0.069
Lake Pontchartrain south of Bayou Lacombe	0596	12	0.461	1.113	0.424
Lake Pontchartrain South of Madisonville, Louisiana	0638	14	0.319	1.271	0.317
Lake Providence at mid lake near Lake Providence, Louisiana	0134	8	0.369	1.077	0.300
Lake Rodemacher west of Boyce, Louisiana	0597	7	0.368	0.531	0.084
Lake Saint John northeast of Ferriday, Louisiana	0367	9	0.058	0.196	0.063
Lake Saint Joseph southeast of Newellton, Louisiana	0361	11	0.127	0.243	0.083
Lake Salvador	0558	11	0.192	0.686	0.199
Lake Salvador South of Avondale, Louisiana	0639	15	0.108	0.306	0.102
Lake Salvador south of Westwego, Louisiana	0598	24	0.492	1.098	0.342
Lake Tambour Southeast of Chauvin, Louisiana	0720	2	0.056	0.062	0.008
Lake Theriot southwest of Crozier, Louisiana	0871	18	0.090	0.191	0.051
Lake Verret at Attakapas Landing near Georgia, Louisiana	0144	35	0.272	1.310	0.282
Larto Lake Northeast of Marksville, Louisiana	0711	14	0.272	0.641	0.195
Little Atchafalaya River near Cow Island	0743	4	0.266	0.356	0.071
Little Bayou Pigeon	0915	11	0.447	0.606	0.134
Little Lake	0565	6	0.082	0.146	0.065
Little Lake at Fisherman's Point, Louisiana	0729	2	0.011	0.018	0.011

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Site Description	Site Number	N	Mean	Maximum	Standard Deviation
Little River southwest of Jena, Louisiana	0089	10	0.826	2.438	0.787
Little Tensas Bayou	0895	12	0.308	0.852	0.201
Lost Lake near Delacroix, Louisiana	0405	1	0.241	0.241	.
Mermentau River at Mermentau, Louisiana	0003	28	0.230	0.754	0.171
Mill Creek Reservoir near Saline, Louisiana	0599	9	0.114	0.335	0.123
Millers Chute East of Grand Lake	0755	11	0.333	0.475	0.079
Miller's Lake northwest of Ville Platte, Louisiana	0515	9	0.053	0.370	0.121
Mississippi River at Caernarvon, Louisiana	0865	1	0.165	0.165	.
Mississippi River at Marengo Bend	0863	10	0.290	0.421	0.098
Mississippi River Southwest of St. Francisville, Louisiana	0862	15	0.186	0.319	0.060
Mississippi River, 3 miles S of Grand Pass	0916	6	0.130	0.216	0.069
Mississippi River, 3 miles SE of Venice	0917	5	0.158	0.266	0.079
Mystic Crew Bayou	0542	21	0.334	0.704	0.172
Nantachie Lake Southwest of Montgomery, Louisiana	0712	13	0.048	0.257	0.084
North Pass South of Ponchatoula, Louisiana	0640	14	0.332	1.186	0.317
North Prong of Schooner Bayou	0756	4	0.222	0.360	0.116
Old River near Niblett Bluff, Louisiana	0713	13	0.450	1.033	0.256
Old River north of Morganza, Louisiana	0516	10	0.140	0.368	0.127
Orange Grove Canal west of Houma, Louisiana	0443	24	0.084	0.331	0.074
Ouachita River at Sterlington, Louisiana	0013	14	0.758	1.241	0.240
Ouachita River near Columbia, Louisiana	0543	9	0.430	1.560	0.477
Ouachita River near State Line	0544	13	0.672	1.453	0.371
Oyster Lake at Marsh Island, Louisiana	0600	12	0.014	0.038	0.013
Pass Manchac at Manchac, Louisiana	0036	14	0.179	0.486	0.139
Pass Manchac east of Manchac, Louisiana	0265	11	0.270	0.587	0.129
Pass Rigolets (The Rigolets) southeast of Slidell, Louisiana	0035	16	0.536	1.190	0.306
Pearl River (West) east of Slidell, Louisiana	0468	27	0.715	2.815	0.673
Pearl River Diversion Canal	0545	16	0.571	1.274	0.397
Pearl River near Bogalusa, Louisiana	0377	19	0.329	1.004	0.277
Pearl River near Bogalusa, Louisiana	0539	17	0.612	1.357	0.324
Phillips Lake northeast of Crossroads, Louisiana	0883	30	1.347	3.040	0.470
Ponchatoula Creek near Ponchatoula, Louisiana	0740	11	0.526	1.100	0.336
Prien Lake near Lake Charles, Louisiana	0174	10	0.114	0.449	0.137
Red River at Alexandria, Louisiana	0559	11	0.301	0.657	0.146
Red River South of Elm Grove, Louisiana	0858	15	0.164	0.568	0.121
Sabine River northeast of Orange, Texas	0091	10	0.311	0.460	0.100
Sabine River Northwest of Merryville, Louisiana	0715	16	0.266	0.461	0.104
Sabine Wildlife Refuge Canals north of Johnson Bayou, Louisiana	0601	14	0.221	0.473	0.120
Saline Bayou north of Marksville, Louisiana	0376	11	0.391	1.078	0.361
Saline Bayou west of Calvin, Louisiana	0622	19	0.543	1.318	0.313
Saline Lake Southwest of Calvin, Louisiana	0716	12	0.535	1.675	0.421
Second Bay	0864	1	0.123	0.123	.
Seventh Ward Canal South of Kaplan, Louisiana	0757	24	0.283	0.753	0.180
Seventh Ward Canal southwest of Abbeville, Louisiana	0517	38	0.524	1.588	0.387
Sibley Lake west of Natchitoches, Louisiana	0518	8	0.277	0.699	0.272
Six Mile Lake, Atchafalaya Basin	0758	14	0.117	0.283	0.056
Sixmile Creek southeast of Grant, Louisiana	0445	3	0.186	0.235	0.047
South Point, Marsh Island	0717	6	0.091	0.308	0.107
Spanish Lake near Baton Rouge, Louisiana	0741	8	0.188	0.474	0.150
Spanish Lake near New Iberia, Louisiana	0642	22	0.049	0.132	0.029

Site Description	Site Number	N	Mean	Maximum	Standard Deviation
Spanish Lake south of New Orleans, Louisiana	0404	6	0.228	0.476	0.129
Spring Bayou near Marksville, Louisiana	0519	51	0.417	1.276	0.255
Sweet Lake northeast of Cameron, Louisiana	0602	15	0.211	0.378	0.097
Tangipahoa River west of Madisonville, Louisiana	0467	11	0.258	0.517	0.123
Tangipahoa River west of Robert, Louisiana	0033	13	0.465	1.223	0.387
Taylor's Bayou near Caillou Bay	0723	5	0.082	0.115	0.045
Tchefuncte River near Covington, Louisiana	0409	21	0.357	0.972	0.296
Tensas River at Cooter Point	0540	21	0.369	0.747	0.208
Tickfaw River east of Killian, Louisiana	0427	25	0.455	1.737	0.426
Timbalier Bay	0563	3	0.267	0.428	0.142
Toledo Bend near WLF Fish Hatchery	0537	10	0.182	1.256	0.382
Toledo Bend Reservoir near Converse, Louisiana	0530	9	0.240	0.442	0.127
Toledo Bend Reservoir near Hunter, Louisiana	0529	32	0.437	1.964	0.450
Toledo Bend Reservoir near Negreet, Louisiana	0534	9	0.463	0.657	0.134
Toledo Bend Reservoir near San Patrice, Louisiana	0531	28	0.689	1.807	0.543
Toledo Bend Reservoir near Toro, Louisiana	0535	9	0.273	0.408	0.122
Toledo Bend Reservoir south of Logansport, Louisiana	0471	36	0.261	0.935	0.237
Toledo Bend Reservoir south of Zwolle, Louisiana	0374	16	0.203	0.402	0.108
Toledo Bend Reservoir southwest of Zwolle, Louisiana	0532	6	0.336	0.527	0.126
Toledo Bend southwest of Logansport, Louisiana	0603	9	0.951	1.206	0.189
Toledo Bend west of Zwolle, Louisiana	0604	8	0.848	1.017	0.170
Turkey Creek Lake south of Winnsboro, Louisiana	0372	7	0.280	0.423	0.093
Turner's Bay (Calcasieu Lake)	0744	2	0.002	0.003	0.002
Two O'Clock Bayou, West of Krotz Springs, Louisiana	0759	14	0.289	0.573	0.147
Union Oil Canal System southwest of Houma, Louisiana	0520	10	0.335	0.869	0.262
University Lake in Baton Rouge, Louisiana	0645	8	0.062	0.082	0.013
Upper Grand River near Cow Island	0734	10	0.133	0.224	0.054
Upper Grand River West of Bayou Pigeon, Louisiana	0894	11	0.227	0.710	0.189
Vermilion Bay at Blue Point	0854	1	0.079	0.079	.
Vermilion Bay at Redfish Point, Louisiana	0714	5	0.183	0.490	0.199
Vermilion River at Lafayette, Louisiana	0521	46	0.303	0.927	0.259
Vermilion River near Abbeville, Louisiana	0624	13	0.258	0.697	0.182
Vermilion River near Lafayette, Louisiana	0576	2	0.174	0.348	0.246
Vermilion River south of Abbeville, Louisiana	0605	24	0.513	1.329	0.318
Vernon Lake south of Anacoco, Louisiana	0522	33	0.533	1.150	0.282
Warren Canal near Intracoastal Waterway	0881	10	0.264	0.620	0.198
West Cote Blanche Bay, Hammock Bulkhead	0760	1	0.097	0.097	.
West Fork Calcasieu River north of Westlake, Louisiana	0437	11	0.284	0.753	0.204
West Lake Verret near Intracoastal Waterway	0859	15	0.278	0.550	0.148
West Retention Levee Borrow Pit Canal	0608	5	0.027	0.042	0.012
White Lake southwest of Abbeville, Louisiana	0310	14	0.088	0.338	0.090
Willow Lake northeast of Cameron, Louisiana	0606	16	0.070	0.215	0.077
Wonder Lake Southeast of Chauvin, Louisiana	0724	3	0.114	0.283	0.148
Woolen Lake	0742	8	0.254	0.558	0.216

Table 5.

Mean concentrations of mercury in fish (ppm) for all sites combined, by species. Louisiana Department of Environmental Quality, Environmental Planning Division. 1994-November 1999.

Species	N	Mean	Maximum	Standard Deviation
alligator gar	4	0.231	0.665	0.294

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Species	N	Mean	Maximum	Standard Deviation
bigmouth buffalo	93	0.307	1.123	0.282
black buffalo	1	0.116	0.116	.
black bullhead	2	0.037	0.055	0.025
black crappie	340	0.285	1.160	0.247
black drum	18	0.150	0.490	0.158
blacktail redhorse	3	0.160	0.198	0.033
blue catfish	312	0.175	1.588	0.188
blue crab	46	0.156	0.884	0.217
blue sucker	2	0.527	0.664	0.194
bluegill sunfish	99	0.159	0.780	0.164
bowfin	286	0.594	3.904	0.523
bowfin eggs	1	0.064	0.064	.
brown bullhead	2	0.117	0.178	0.086
bullhead catfish	2	0.109	0.217	0.153
carp	33	0.124	0.460	0.114
chain pickerel	5	0.389	0.556	0.113
channel catfish	210	0.144	0.865	0.155
channel catfish	1	0.368	0.368	.
cobia	4	0.289	0.776	0.335
croaker	2	0.055	0.067	0.017
flathead catfish	122	0.344	1.585	0.329
Florida pompano	1	0.151	0.151	.
freshwater drum	325	0.395	1.897	0.335
gafftopsail catfish	2	0.373	0.521	0.210
grass carp	1	0.008	0.008	.
green sunfish	1	0.167	0.167	.
jack crevalle	4	0.593	1.243	0.451
king mackerel	29	0.917	2.328	0.537
lane snapper	1	0.049	0.049	.
largemouth bass	1236	0.430	2.438	0.334
longear sunfish	4	0.157	0.274	0.085
red drum	87	0.163	1.113	0.210
red snapper	2	0.049	0.078	0.041
red swamp crawfish	8	0.023	0.042	0.011
redeer sunfish	130	0.184	0.950	0.190
rock bass	3	0.578	0.747	0.192
sheepshead	27	0.232	0.946	0.274
smallmouth buffalo	62	0.178	0.835	0.173
southern flounder	15	0.120	0.688	0.199
spotted seatrout	1	0.201	0.201	.
Spanish mackerel	8	0.258	0.466	0.127
spotted bass	72	0.568	1.676	0.352
spotted gar	1	0.402	0.402	.
spotted seatrout	111	0.130	0.635	0.129
spotted sucker	1	0.186	0.186	.
striped bass	16	0.214	1.256	0.302

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Species	N	Mean	Maximum	Standard Deviation
striped mullet	1	0.000	0.000	.
tripletail	3	0.052	0.070	0.016
warmouth	35	0.244	0.747	0.172
white bass	27	0.244	1.120	0.201
white crappie	299	0.299	1.964	0.257
white shrimp	5	0.035	0.093	0.034
yellow bass	5	0.389	0.540	0.112
yellow bullhead	6	0.170	0.315	0.111

Table 6.

Summary of mercury concentration, by species, for Louisiana sites with current consumption advisories due to mercury. Louisiana Department of Environmental Quality, Environmental Planning Division. 1994-November 1999.

Site Number	Site Description	Species	N	Mean	Maximum	Standard Deviation
0013	Ouachita River at Sterlington, LA	bigmouth	1	0.477	0.477	.
		buffalo				
		black crappie	2	0.725	0.923	0.281
		freshwater drum	3	0.706	0.821	0.104
		largemouth bass	4	0.979	1.241	0.241
		smallmouth	1	0.436	0.436	.
		buffalo				
0064	Bogue Chitto River near Bush, LA	spotted bass	1	0.947	0.947	.
		white crappie	2	0.633	0.734	0.143
		redeer sunfish	4	0.142	0.214	0.051
		spotted bass	5	0.480	0.607	0.124
		striped bass	1	0.123	0.123	.
0308	Bayou Des Cannes northeast of Jennings, LA	warmouth	1	0.488	0.488	.
		black crappie	4	0.494	0.865	0.291
		bowfin	7	0.695	1.176	0.383
		channel catfish	3	0.394	0.611	0.342
		freshwater drum	11	0.599	1.059	0.293
		largemouth bass	12	0.325	1.129	0.287
		smallmouth	2	0.143	0.148	0.008
		buffalo				
		warmouth	1	0	0	.
		white crappie	7	0.217	0.485	0.192

0366	Black Lake north of Natchitoches	black crappie	3	0.25	0.337	0.078
		bluegill sunfish	2	0.361	0.502	0.199
		bowfin	3	1.396	2.278	1.019
		channel catfish	1	0.143	0.143	.
		freshwater drum	4	0.437	0.596	0.195
		largemouth bass	14	0.713	1.568	0.384

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Site Number	Site Description	Species	N	Mean	Maximum	Standard Deviation
0377	Pearl River near Bogalusa, LA	redeer sunfish	1	0.182	0.182	.
		white bass	1	1.12	1.12	.
		white crappie	3	0.514	0.615	0.13
		black crappie	1	0.229	0.229	.
		channel catfish	3	0.076	0.101	0.026
		flathead catfish	2	0.356	0.506	0.213
		freshwater drum	4	0.385	0.733	0.304
		largemouth bass	7	0.468	1.004	0.323
		smallmouth	1	0.178	0.178	.
		buffalo				
0379	Chicot Lake south of St. Landry, LA	white crappie	1	0.096	0.096	.
		black crappie	18	0.33	0.646	0.171
		bluegill sunfish	1	0.3	0.3	.
		bowfin	7	1.118	1.419	0.198
		largemouth bass	27	0.623	1.105	0.21
		redeer sunfish	6	0.25	0.421	0.143
0436	Henderson Lake east of Henderson, LA	yellow bullhead	1	0.227	0.227	.
		bigmouth	4	0.352	0.553	0.161
		buffalo				
		black crappie	16	0.396	0.989	0.249
		bluegill sunfish	2	0.209	0.418	0.296
		bowfin	12	0.377	0.824	0.186
		channel catfish	2	0.158	0.263	0.148
		freshwater drum	13	0.42	0.844	0.196
		largemouth bass	73	0.529	1.243	0.266
		redeer sunfish	2	0.252	0.273	0.03
0468	Pearl River (West) east of Slidell, LA	smallmouth	2	0.124	0.247	0.175
		buffalo				
		spotted bass	1	0.151	0.151	.
		warmouth	3	0.207	0.29	0.072
		white crappie	10	0.44	0.769	0.21
		bigmouth	1	0.569	0.569	.
		buffalo				
		black buffalo	1	0.116	0.116	.
		black crappie	1	0.737	0.737	.
		blue catfish	2	0.435	0.492	0.081
0471	Toledo Bend Reservoir south of Logansport, LA	bluegill sunfish	1	0.278	0.278	.
		bowfin	3	1.552	2.815	1.16
		channel catfish	1	0.039	0.039	.
		flathead catfish	4	0.299	0.437	0.135
		largemouth bass	7	1.153	1.985	0.642
		redeer sunfish	3	0.274	0.682	0.354
		spotted bass	2	0.897	0.938	0.058
		white crappie	1	0.157	0.157	.
		black crappie	2	0.216	0.255	0.055
		blue catfish	8	0.141	0.411	0.136
		channel catfish	1	0.212	0.212	.
		largemouth bass	11	0.428	0.935	0.217
		smallmouth	2	0.03	0.059	0.042
		buffalo				

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Site Number	Site Description	Species	N	Mean	Maximum	Standard Deviation
0503	Bayou Liberty near Slidell, LA	spotted bass	2	0.703	0.875	0.243
		white crappie	10	0.146	0.492	0.164
		black crappie	1	1.018	1.018	.
		blue catfish	1	0.064	0.064	.
		bluegill sunfish	3	0.302	0.78	0.414
		channel catfish	3	0.092	0.251	0.139
		freshwater drum	2	0.665	0.928	0.372
		largemouth bass	13	0.791	1.528	0.344
		reardear sunfish	4	0.447	0.926	0.322
		white crappie	2	0.607	0.97	0.513
0504	Bayou Plaquemine Brule near Mermentau, LA	black crappie	5	0.561	0.844	0.19
		blue catfish	7	0.217	0.367	0.068
		bowfin	4	0.902	1.573	0.457
		channel catfish	6	0.178	0.732	0.278
		freshwater drum	4	0.86	1.264	0.289
		largemouth bass	9	0.995	1.883	0.558
		smallmouth	3	0.281	0.38	0.092
		buffalo				
		white crappie	12	0.434	0.914	0.26
		blue sucker	2	0.527	0.664	0.194
0507	Bogue Chitto near Clifton, LA	bluegill sunfish	1	0.054	0.054	.
		channel catfish	4	0.261	0.745	0.325
		flathead catfish	1	0.359	0.359	.
		largemouth bass	5	0.908	1.612	0.507
		rock bass	2	0.494	0.617	0.175
		spotted bass	12	0.925	1.676	0.463
		white crappie	1	0.254	0.254	.
		bluegill sunfish	1	0.608	0.608	.
0522	Vernon Lake south of Anacoco, LA	channel catfish	9	0.308	0.547	0.103
		flathead catfish	1	0.513	0.513	.
		largemouth bass	16	0.622	1.15	0.317
		reardear sunfish	6	0.626	0.95	0.252
		black crappie	2	0.08	0.16	0.113
0529	Toledo Bend Reservoir near Hunter, LA	blue catfish	2	0.128	0.164	0.051
		channel catfish	3	0.049	0.146	0.084
		freshwater drum	1	0	0	.
		largemouth bass	16	0.511	1.074	0.304
		white crappie	8	0.657	1.964	0.687
0531	Toledo Bend Reservoir near San Patrice, LA	black crappie	4	0.294	0.755	0.341
		bowfin	2	1.77	1.807	0.053
		flathead catfish	1	0	0	.
		freshwater drum	1	0	0	.
		largemouth bass	20	0.729	1.804	0.439
0538	Blind River near Gramercy, LA	black crappie	3	0.193	0.366	0.184
		blue catfish	9	0.274	0.559	0.195
		bluegill sunfish	1	0	0	.
		bowfin	10	0.81	1.692	0.407

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Site Number	Site Description	Species	N	Mean	Maximum	Standard Deviation
0539	Pearl River near Bogalusa, LA	channel catfish	2	0.03	0.06	0.042
		freshwater drum	6	0.53	0.62	0.094
		largemouth bass	10	0.485	0.854	0.193
		reardear sunfish	1	0.134	0.134	.
		warmouth	1	0.32	0.32	.
		white crappie	1	0.366	0.366	.
		black crappie	3	0.432	0.553	0.107
		channel catfish	1	0.256	0.256	.
		flathead catfish	3	0.698	1.076	0.328
		freshwater drum	2	0.725	1.021	0.419
		largemouth bass	4	0.822	1.357	0.434
		spotted bass	1	0.842	0.842	.
		striped bass	1	0.345	0.345	.
		white crappie	2	0.417	0.579	0.229
0544	Ouachita River near State Line	bigmouth	3	0.568	0.655	0.091
		buffalo				
		black crappie	2	0.891	1.16	0.38
		blue catfish	1	0.7	0.7	.
		bluegill sunfish	1	0	0	.
		freshwater drum	1	1.453	1.453	.
		largemouth bass	1	0.654	0.654	.
		spotted bass	3	0.709	1.017	0.288
		white crappie	1	0.318	0.318	.
		king mackerel	1	0.519	0.519	.
		0567	Gulf of Mexico south-southwest of Grand Isle, LA	king mackerel	1	0.519
0568	Gulf of Mexico south-southeast of Grand Isle, LA	king mackerel	6	0.984	2.202	0.769
0569	Gulf of Mexico south of Grand Isle, LA	king mackerel	1	0.713	0.713	.
0603	Toledo Bend southwest of Logansport, LA	black crappie	1	1.048	1.048	.
		bowfin	3	1.068	1.206	0.16
		largemouth bass	4	0.829	1.117	0.201
		white crappie	1	0.992	0.992	.
0634	Gulf of Mexico, Southwest Pass	king mackerel	1	1.386	1.386	.
0643	Gulf of Mexico, ST-128	king mackerel	2	0.633	0.826	0.274
0644	Gulf of Mexico, Sulphur Mine	cobia	3	0.126	0.185	0.098
		jack crevalle	1	0.2	0.2	.
		Spanish mackerel	1	0.214	0.214	.
0646	Gulf of Mexico, WD-41	red snapper	1	0.02	0.02	.
0719	Gulf of Mexico, WD-40	lane snapper	1	0.049	0.049	.
		red drum	3	0.142	0.305	0.142
0721	Gulf of Mexico, SS-45 near Isles Dernieres, LA	spotted seatrout	2	0.043	0.052	0.013
0757	Seventh Ward Canal	black crappie	2	0.525	0.7	0.248
		blue catfish	6	0.175	0.232	0.033
		bowfin	1	0.753	0.753	.
		carp	1	0.09	0.09	.
		channel catfish	1	0.165	0.165	.
		flathead catfish	2	0.306	0.407	0.143
		freshwater drum	1	0.593	0.593	.
		largemouth bass	1	0.272	0.272	.

Site Number	Site Description	Species	N	Mean	Maximum	Standard Deviation
0911	Bayou Bartholomew	smallmouth buffalo	3	0.137	0.153	0.024
		white crappie	6	0.3	0.36	0.084
		bigmouth buffalo	2	.759	.836	.109
		black crappie	2	.907	.943	.052
		bowfin	1	3.904	3.904	.
		channel catfish	1	.608	.608	.
		flathead catfish	1	.855	.855	.
		freshwater drum	4	1.085	1.308	.167
		largemouth bass	1	.898	.898	.
		smallmouth buffalo	1	.763	.763	.
		spotted bass	2	1.105	1.385	.397
		white bass	2	.696	.845	.211
0914	Gulf of Mexico, South of Southwest Pass	king mackerel	6	1.362	2.328	0.658

Sediment, Epiphyte and Water Analysis Results

Tables 7 and 8 are summaries of sediment and epiphyte data, respectively, for those sites that are currently under advisory. There are currently no regulatory criteria for acceptable concentrations of mercury in sediments. However, guidelines are available for screening purposes only. The two most frequently used values are the effects range-low (ER-L) and effects range-median (ER-M). For mercury these are 0.15 ppm and 0.71 ppm, respectively (EPA, 1997). A second set of screening values are the apparent effects threshold-low (AET-L) and the apparent effects threshold-high (AET-H). These are 0.59 ppm and 0.71 ppm, respectively (EPA, 1997). There are no screening values or regulatory criteria for mercury in epiphytes. Epiphyte samples were collected in an effort to correlate epiphyte concentrations to water, sediment or tissue concentrations. No correlations have been observed; however, the number of epiphyte samples is very limited, thus making correlation analysis difficult.

Four-hundred and eight water samples were taken between 1994 and November 1999. Mercury was detected in fifty-three of the water samples, and rarely exceeded 0.1 ppb in concentration. The maximum water concentration was 0.14 ppb at site number 0531 (Toledo Bend near San Patrice). By comparison, the current Louisiana water quality freshwater acute criteria for mercury is 2.04 ppb, and the freshwater chronic criteria is 0.012 ppb. The drinking water supply criteria 2.0 ppb mercury. LDEQ's ambient water quality sampling program, which is separate from the mercury study described here, has noted several water bodies where metals analysis has found similar criteria exceedences. However, it is now believed that these elevated concentrations may be the result of sample and laboratory contamination, not ambient water quality problems. This metals problem is being investigated as part of the Total Maximum Daily Load efforts currently in place. Detailed results for water sampling can be found in Appendix B.

Table 7.

Summary of mercury concentrations in sediments at Louisiana sites under fish consumption advisory. Louisiana Department of Environmental Quality, Environmental Planning Division. 1994-November 1999.

Site	Site Name	N	Mean	Maximum	Standard Deviation
0013	Ouachita River near Sterlington	1	0.259	0.259	.
0064	Bogue Chitto River at Bush	2	0.024	0.045	0.030

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Site	Site Name	N	Mean	Maximum	Standard Deviation
0308	Bayou Des Cannes	4	0.066	0.202	0.095
0377	Pearl River at Bogalusa	2	0.107	0.214	0.151
0379	Lake Chicot	4	0.227	0.413	0.144
0436	Henderson Lake	13	0.090	0.216	0.067
0468	Pearl River near Slidell	2	0.077	0.153	0.108
0471	Toledo Bend (Logansport)	3	0.059	0.095	0.051
0503	Bayou Liberty	3	0.300	0.824	0.454
0504	Bayou Plaquemine Brule	4	0.140	0.374	0.165
0507	Bogue Chitto near Clifton	2	0.000	0.000	0.000
0522	Vernon Lake	3	0.080	0.194	0.101
0529	Toledo Bend (Hunter)	3	0.106	0.246	0.127
0538	Blind River	3	0.329	0.521	0.286
0539	Pearl River near Bogalusa	1	0.288	0.288	.
0544	Ouachita River near State Line	1	0.000	0.000	.

Table 8.

Summary of mercury concentrations in epiphytes at Louisiana sites under fish consumption advisory. Louisiana Department of Environmental Quality, Environmental Planning Division. 1994-November 1999.

Site	Site Name	N	Mean	Maximum	Standard Deviation
0013	Ouachita River near Sterlington	1	0.088	0.088	.
0064	Bogue Chitto River at Bush	1	0.023	0.023	.
0308	Bayou Des Cannes	4	0.061	0.176	0.083
0366	Black Lake	4	0.024	0.069	0.032
0377	Pearl River at Bogalusa	1	0.193	0.193	.
0379	Lake Chicot	5	0.080	0.235	0.100
0436	Henderson Lake	11	0.022	0.086	0.031
0468	Pearl River near Slidell	2	0.000	0.000	.
0471	Toledo Bend (Logansport)	1	0.000	0.000	.
0503	Bayou Liberty	3	0.230	0.544	0.282
0504	Bayou Plaquemine Brule	3	0.129	0.302	0.156
0507	Bogue Chitto near Clifton	1	0.000	0.000	.
0522	Vernon Lake	1	0.000	0.000	.
0538	Blind River	4	0.034	0.134	0.067
0539	Pearl River near Bogalusa	1	0.000	0.000	.

Additional Information

For additional information on mercury contamination of water bodies and fish please contact the Louisiana Department of Health and Hospitals at (504) 568-8537, or the Louisiana Department of Environmental Quality at (225) 765-0246. A hotline number has also been established to provide current mercury advisory information. That number is 1-888-293-7020. The Website for LDEQ is located at <http://www.deq.state.la.us>. Raw data for each mercury sample site is located on the Website or this data can be requested directly by calling (225) 765-0246. EPA's 1997 *Mercury Report to Congress* is available on EPA's Website. This report cites a detailed strategy for eliminating mercury use in industry. EPA also has a report entitled *Mercury Sources and Regulations, 1999 Update*. This report can be found at www.epa.gov/grtlakes/bns/mercury/stephg.html. Although the report is draft as of this writing, it contains a great deal of information on sources of mercury in the environment and current regulations to control it. You can contact the United States Environmental Protection Agency at <http://www.epa.gov>. The address for EPA Headquarters is:

Environmental Protection Agency
401 M Street, SW
Washington, DC 20460

For EPA Region 6 the phone number is (214) 665-6444, and the address is:

Environmental Protection Agency
Fountain Place 12th Floor, Suite 1200
1445 Ross Ave.
Dallas, TX 75202-2733.

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