Cover:

Gage at Christmas Bay station (photograph by by Jeffery W. East, December 1998).

U.S. Department of the Interior
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Hydrologic, Water-Quality, and Sediment-Quality Data for the Christmas Bay System, Brazoria County, Texas, February 1999–March 2000

By Jeffery W. East

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By Jeffery W. East

Abstract

The Christmas Bay system is a group of three small secondary bays (Christmas, Bastrop, and Drum Bays) at the southwestern end of the Galveston Bay estuarine system in Brazoria County, Texas. During February 1999–March 2000, hydrologic, water-quality, and sediment-quality data were collected from each of the three bays to establish baseline conditions. Gage-height fluctuations closely matched open-water tidal fluctuations. Rainfall during February 1999–February 2000 was about 20 percent below the annual average. Specific conductance, pH, water temperature, and dissolved oxygen monitored at 30-minute intervals in Christmas Bay for 13 months showed seasonal variations typical of monitoring stations on the Texas Gulf Coast. Prevailing winds were from the southeast. Monthly water-quality sampling for 13 months showed that in each of the three bays concentrations of major ions were small, and most nutrient concentrations were at or less than minimum reporting levels; indicator bacteria counts were consistently higher in samples collected from Drum Bay. Several trace elements (sampled twice) were detected in small concentrations. The only organochlorine pesticides (sampled once) that were greater than minimum reporting levels were atrazine, deethylatrazine, metolachlor, and simazine. During February 29–March 29, 2000, three semipermeable membrane devices were deployed at the Christmas Bay monitoring station. Seven of 77 semivolatile organic compounds analyzed in the lipids from the devices were detected in minute amounts. Analyses of surficial bed sediment sampled once in each of the three bays yielded detections of a number of semivolatile organic compounds; all concentrations were less than 10 micrograms per liter and much less than the respective benchmark concentration for those compounds that have had a benchmark concentration established for the protection of aquatic life.

INTRODUCTION

The Christmas Bay system is a group of three small secondary bays at the southwestern end of the Galveston Bay estuarine system in Brazoria County, Texas. The three-bay system, which comprises Christmas, Bastrop, and Drum Bays, lies inland of Follets Island, a barrier island southwest of West Bay and San Luis Pass (fig. 1). Christmas Bay is recognized as “a near-pristine, 5,660-acre habitat” with “no known water-quality problems, nor indications of potential water-quality problems” (McFarlane, 1991, p. 1). However, McFarlane (1991, p. 1) also indicates that “the current monitoring program is inadequate” and suggests that monthly sampling to “establish baseline conditions” be undertaken. Mitchell and Windsor (1991, p. 8) state that, although Christmas Bay “remains one of the most pristine areas in the Galveston Bay system,” the area “faces some of the same potentially significant risks to its water and habitat quality that threaten the entire bay system.”

Numerous species of birds, fish, crustaceans, and mollusks inhabit the Christmas Bay system. These biota include seven endangered species of birds and an endangered species of sea turtle. Numerous flora also occur in the Christmas Bay system and include several species of seagrass that serve as prime spawning grounds for crustaceans and finfish. One seagrass habitat has decreased about 36 percent since 1956 (McFarlane, 1991, p. 2).

Previous water-resource investigations of the area have been reconnaissance in nature, including a contaminant study of benthic macroinvertebrates, finfishes,

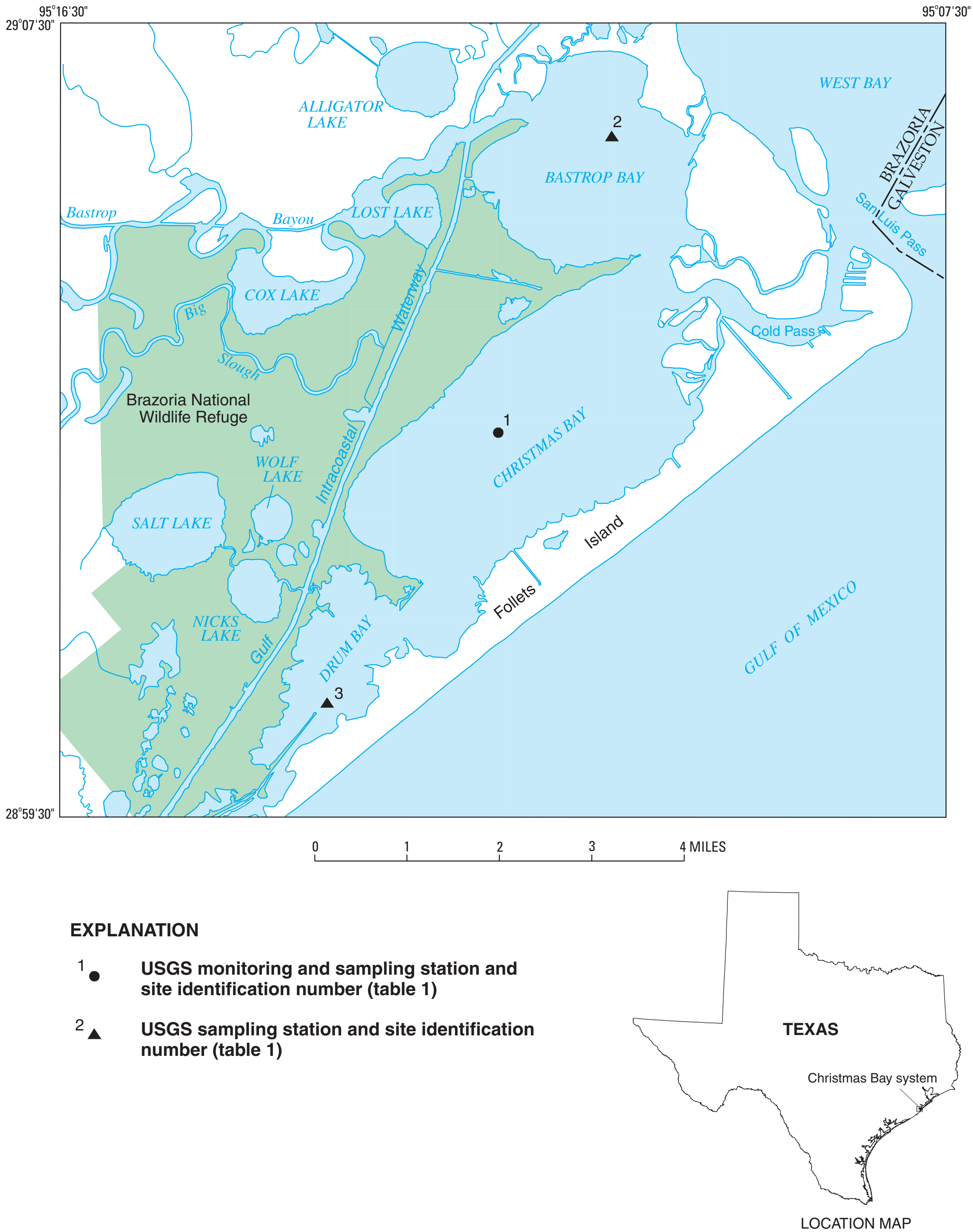

Figure 1. Christmas Bay system and locations of data-collection stations.

and sediment in Christmas Bay (Sager, 1995). The Texas Natural Resource Conservation Commission (TNRCC) collects water-quality and sediment-contaminant data from each of the bays on a quarterly basis as part of the State's water-quality monitoring program (Texas Natural Resource Conservation Commission, 1994).

During February 1999–March 2000, the U.S. Geological Survey (USGS) collected hydrologic, water-quality, and sediment-quality data in cooperation with the Houston-Galveston Area Council to establish baseline conditions in the Christmas Bay system. This data-collection effort was part of the TNRCC Clean Rivers Program.

Purpose and Scope

The purpose of this report is to document hydrologic, water-quality, and sediment-quality data collected from Christmas Bay, Bastrop Bay, and Drum Bay during February 1999–March 2000. Graphs and tables present hydrologic parameters that were monitored in Christmas Bay continuously (30-minute intervals) for 13 months. Tables list water-quality properties and constituents sampled monthly in all three bays for 1 year, trace elements sampled twice, and soluble pesticides sampled once. In addition, tables list the results of analyses for semivolatile organic compounds (SVOCs) extracted from three semipermeable membrane devices (SPMDs) deployed at the Christmas Bay monitoring station for 1 month and the results of analyses of bottom sediment in each bay sampled once.

Description of Christmas Bay System

Christmas Bay lies between Bastrop Bay and Drum Bay (fig. 1) at the southwestern end of the Galveston Bay estuarine system. Christmas Bay and Bastrop Bay exhibit similar bathymetry, with average depths of about 2.5 feet. Drum Bay is shallower, with average depths of about 1.5 feet. The three-bay system is connected to the Gulf of Mexico through Cold Pass and San Luis Pass.

The three bays are bounded on the west by the 12,200-acre Brazoria National Wildlife Refuge. Christmas Bay is included in the Christmas Bay Coastal Preserve, part of the Texas General Land Office/Texas Parks and Wildlife Department Coastal Preserves Program. The Christmas Bay Coastal Preserve is also within the jurisdiction of the Galveston Bay Estuary Program of the TNRCC.

Freshwater inflows to Christmas Bay and adjacent bays come almost exclusively from the Bastrop Bayou watershed (Texas Natural Resource Conservation Commission, 1994). The 58.7-square-mile watershed (McFarlane, 1991, p. 48) is mostly cultivated and is crisscrossed by farms and drainage canals. Agricultural runoff and septic tanks in the watershed are a "concern" regarding water quality in Christmas Bay (Mitchell and Windsor, 1991). Other activities in the watershed that could potentially affect water quality include oil and gas drilling and salt-dome injection by way of wells. The city of Danbury is wholly within the watershed, and the cities of Angleton and Lake Jackson are partially in the basin (fig. 2).

Another hydrodynamic input to the Christmas Bay system is the Gulf Intracoastal Waterway (GIWW). The GIWW makes a path through the wildlife refuge, across the southern part of the Bastrop Bayou watershed and the Christmas Bay system, from southwest to northeast (fig. 1). The dredged depth of the GIWW is maintained at 12 feet, effectively interrupting the overland flow of freshwater to the three bays. The effect of any decrease in freshwater inflow on the Christmas Bay system is unknown.

Additional development on the Christmas Bay shoreline could pose a threat to the quality of this ecosystem. The Texas Parks and Wildlife Department has undeveloped land holdings on Follets Island and the south shore of Christmas Bay (485 acres) for a future Christmas Bay State Park. The presence of about 100 cabins in the bay system potentially could affect water quality because many of the cabins do not use septic systems. Thus, some waste might discharge directly into the bay waters (McFarlane, 1991, p. 11).

Data Collection

To characterize baseline conditions in the three-bay system spatially and temporally, hydrologic parameters (gage height, rainfall[1], and wind speed and direction) were monitored in Christmas Bay continuously (30-minute intervals) during February 1999–January 2000. Water-quality properties (specific conductance, pH, temperature, and dissolved oxygen) and constituents (nutrients, major ions, phytoplankton, indicator bacteria, and suspended sediment) were sampled in all

[1] After the data-collection period, it was discovered that the Christmas Bay rain gage had not been functioning properly, thus the rainfall data were not accurate. Data from a National Weather Service rain gage at Scholes Airfield, Galveston, can be substituted.

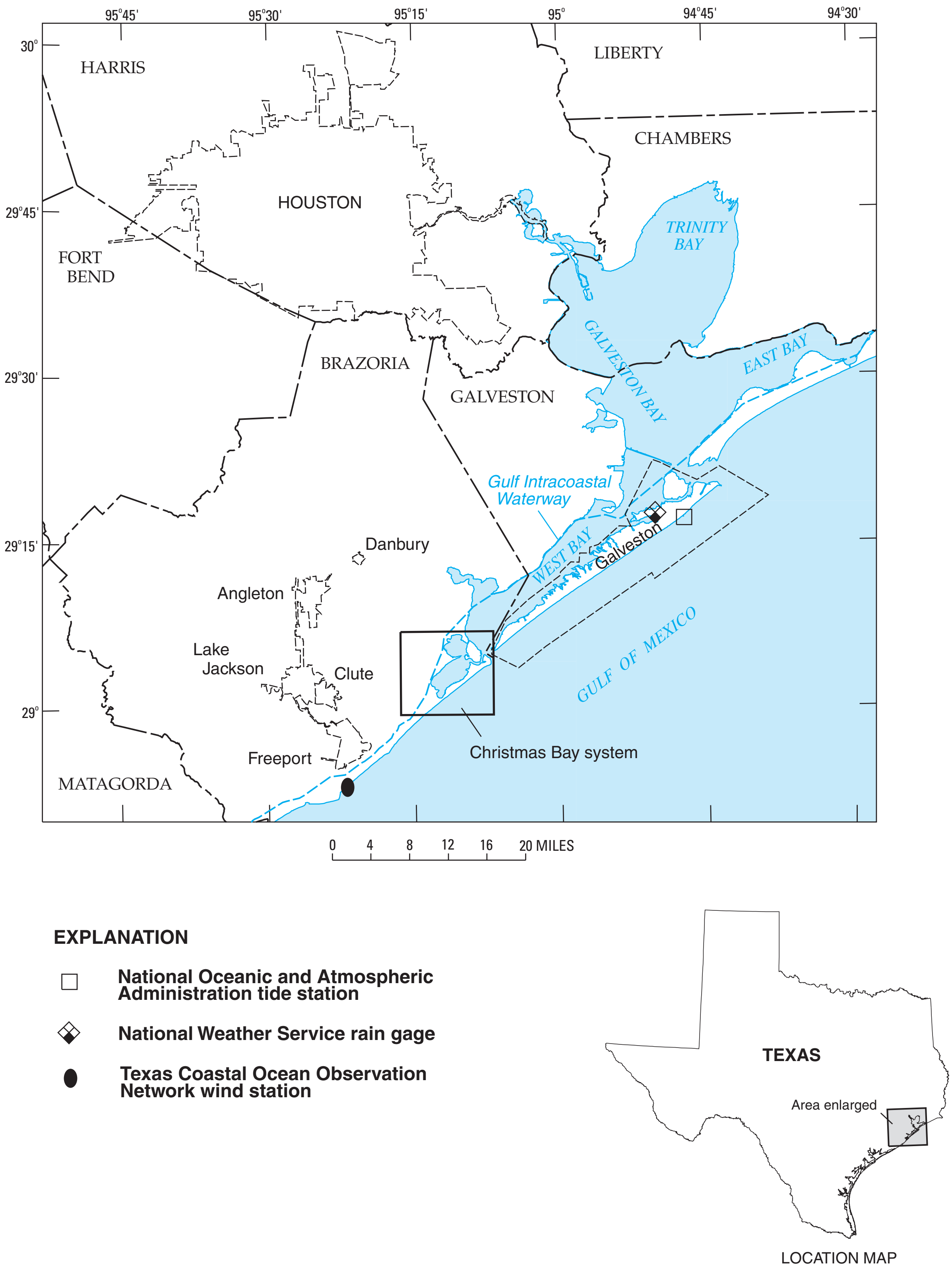

Figure 2. Locations of data-collection stations outside Christmas Bay system.

Table 1. Summary of data-collection activities in the Christmas Bay system, February 1999–March 2000

Station name	Site identification no. (fig. 1)	Location		Data-collection activity
		Latitude	Longitude	
Christmas Bay	1	29°03'08"	95°11'48"	Continuous hydrologic-parameter monitoring
				Continuous water-quality-property monitoring
				Monthly water-quality sampling
				Periodic water-quality sampling
				30-day semipermeable membrane device deployment
				One-time sediment-quality sampling
Bastrop Bay	2	29°05'56"	95°10'35"	Monthly water-quality sampling
				Periodic water-quality sampling
				One-time sediment-quality sampling
Drum Bay	3	29°00'35"	95°13'38"	Monthly water-quality sampling
				Periodic water-quality sampling
				One-time sediment-quality sampling

three bays monthly during February 1999–January 2000; trace elements were sampled twice and soluble pesticides once during the same period. SVOCs were extracted from three SPMDs deployed at the Christmas Bay monitoring station during February 29–March 29, 2000; and bottom sediment in each bay was sampled November 30, 1999, for grain size, major and trace elements, carbons, SVOCs (mostly polycyclic aromatic hydrocarbons [PAHs]), and organochlorine pesticides. Data-collection activities are summarized in table 1.

In addition to environmental samples, quality assurance (QA) samples also were collected. Depending on the constituent, QA samples consisted of equipment blanks, field blanks, laboratory blanks, split samples, replicate samples, and laboratory matrix spikes.

Acknowledgments

The author thanks Carl Masterson, Todd Running, Patrick Horton, and Karen Brettschneider of the Houston-Galveston Area Council for assistance provided throughout the period of data collection. Gary Mitchell, formerly of the Houston-Galveston Area Council, also assisted during the planning stages of data collection. Also, the author acknowledges the Texas Parks and Wildlife Department for permission to install and operate equipment in Christmas Bay.

HYDROLOGIC DATA

Because of the proximity of the Christmas Bay system to the Gulf of Mexico, as well as the relatively shallow average depths (1.5 to 2.5 feet), hydrologic conditions are factors to consider when characterizing the system. The Christmas Bay hydrologic monitoring station consisted of a gage house that contained a submersible pressure transducer to measure tidal gage height, a tipping-bucket rain gage to collect rainfall, and an ultrasonic wind anemometer to measure wind speed and direction. In addition, a multiprobe water-quality monitor was installed at the station to measure the four water-quality properties listed previously. Readings from each sensor were recorded electronically at 30-minute intervals by a data-collection platform. Every 4 hours, these data were transmitted by way of geostationary operational-environmental satellite (GOES) to the USGS National Water Information System database. The data were thus monitored on a near real-time basis.

Table 2 (at end of report) lists the daily maximum, minimum, and mean gage heights for the 13-month period. Gage height is defined as the water-surface elevation above some datum, usually sea level. The datum in this case was arbitrary because the gage was not referenced to sea level.

The gage-height data for the Christmas Bay station were aggregated by month in boxplots to show monthly range in gage height and variability of gage height (fig. 3). Similar boxplots were developed for tidal altitude data from the National Oceanic and Atmospheric Administration tide station (fig. 2) located at the Galveston Pleasure Pier on the Gulf of Mexico side of Galveston Island. The boxplots for the two stations show a close match between open-water tidal fluctuations and bay water-surface fluctuations.

Total rainfall recorded by the National Weather Service gage at Scholes Airfield, Galveston, (about 20 miles northeast of Christmas Bay) during February 1999–February 2000 (fig. 4) was 34.84 inches (National Weather Service, 2002). The average annual rainfall (1971–2000) for that gage is 44.21 inches. Because rainfall during the 13-month period was well below average (about 20 percent), it is likely that freshwater inflow to the three-bay system, from Bastrop Bayou, also was below normal. However, streamflow data for Bastrop Bayou were unavailable to verify this assumption.

Wind has a substantial effect on gage height in the Christmas Bay system. This is because the "pileup effect of wind is inversely proportional to the depth of the water" (Fisher, 1988, p. 33). Because the Christmas Bay system is relatively shallow, periods of strong wind cause substantial wave "chop" on the water surface and might lead to resuspension of bottom sediment. Wind speed and direction measured at the Christmas Bay station during the 13-month period were used to develop a wind-rose diagram (fig. 5). Wind-rose diagrams group data by wind speed and direction and summarize data for a selected time period. A second wind-rose diagram developed from data recorded by the Texas Coastal Ocean Observation Network (2001) at a station in Freeport, about 15 miles southwest of the Christmas Bay station, shows consistency with the Christmas Bay diagram. The diagrams indicate prevailing winds were from the southeast.

WATER-QUALITY DATA

Continuous Water-Quality Properties

During February 1999–January 2000, specific conductance, pH, water temperature, and dissolved oxygen were measured continuously (30-minute intervals) at the monitoring station in Christmas Bay. The depth at the monitor location was about 5 feet at mean tide. These data were monitored using a multi-probe water-quality meter that was deployed near mid-depth, about 2 feet from the bottom of the bay. Statistical summaries of the four properties are listed in table 3 (at end of report). Figure 6 shows boxplots of these data aggregated by month. Seasonal variations in these properties are typical of those observed at USGS stations on the Texas Gulf Coast. In particular, water temperature and dissolved oxygen concentration are inversely related, with periods of smallest dissolved oxygen concentrations occurring in the summer months when water temperatures are highest.

Monthly Water-Quality Properties and Constituents

Selected water-quality properties and constituents were determined during monthly visits to each of the three bays (table 4, at end of report). Specific conductance, pH, water temperature, and dissolved oxygen were measured in the field. Water-quality constituents that were determined by laboratory analysis include

1. Major ions (calcium, magnesium, potassium, sodium, chloride, fluoride, silica, sulfate) and trace elements (iron, manganese, mercury)
2. Nutrients (ammonia nitrogen, ammonia plus organic nitrogen, nitrite plus nitrate nitrogen, nitrite nitrogen, phosphorus, orthophosphorus)
3. Phytoplankton (biomass, chlorophyll-*a*, chlorophyll-*b*)
4. Indicator bacteria (fecal coliform, fecal streptococcus)
5. Suspended sediment

Each month, physical landmarks and a portable global positioning system (GPS) unit were used to ensure that samples were collected at the same location in each of the three bays. Water depths at the three sites were relatively shallow (about 2 feet in Drum Bay, 2.5 feet in Bastrop Bay, and 5 feet in Christmas Bay);

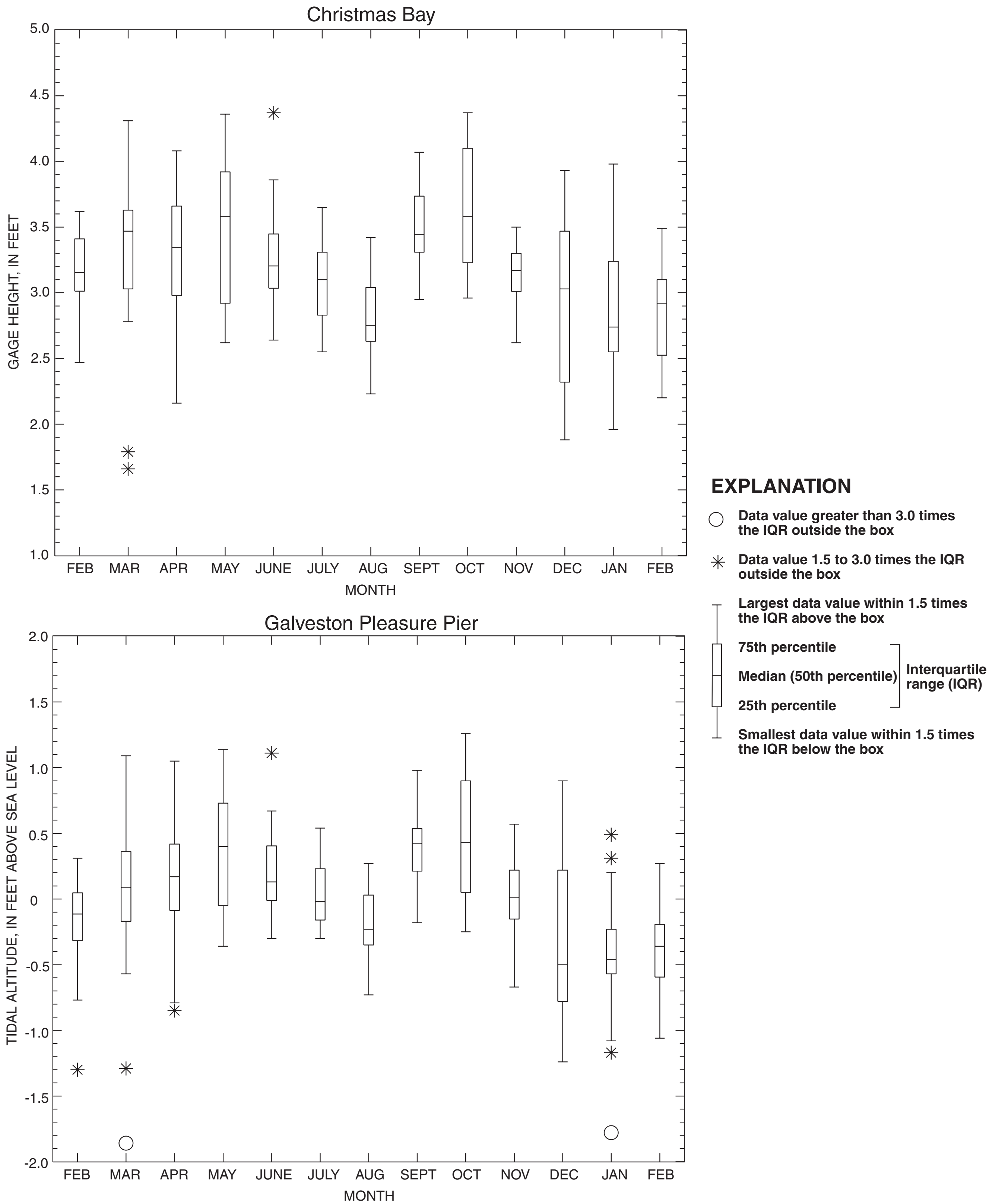

Figure 3. Distribution of gage height at Christmas Bay and tidal altitude at the Galveston Pleasure Pier, February 1999–February 2000.

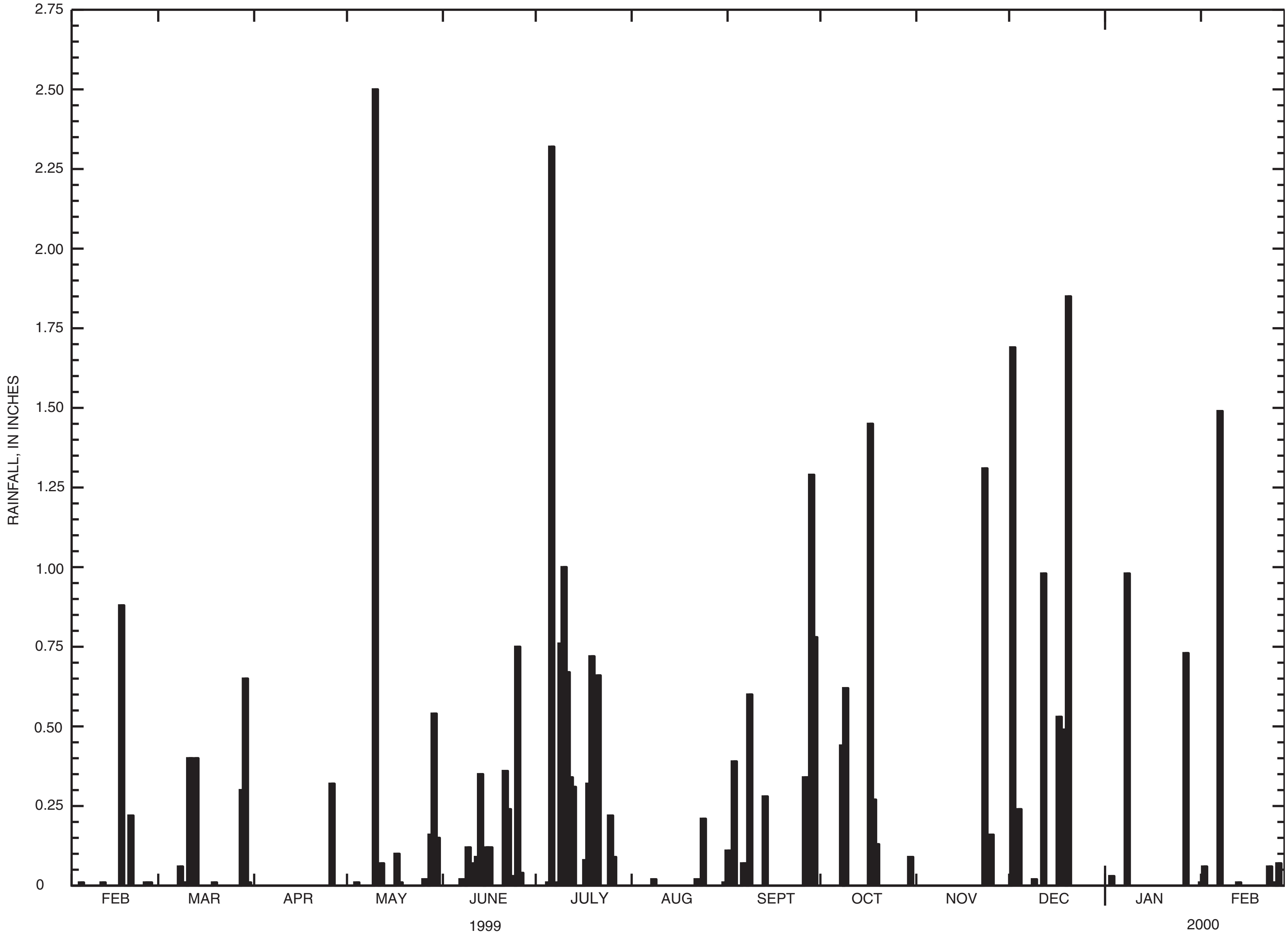

Figure 4. Rainfall at National Weather Service gage, Scholes Airfield, Galveston, February 1999–February 2000.

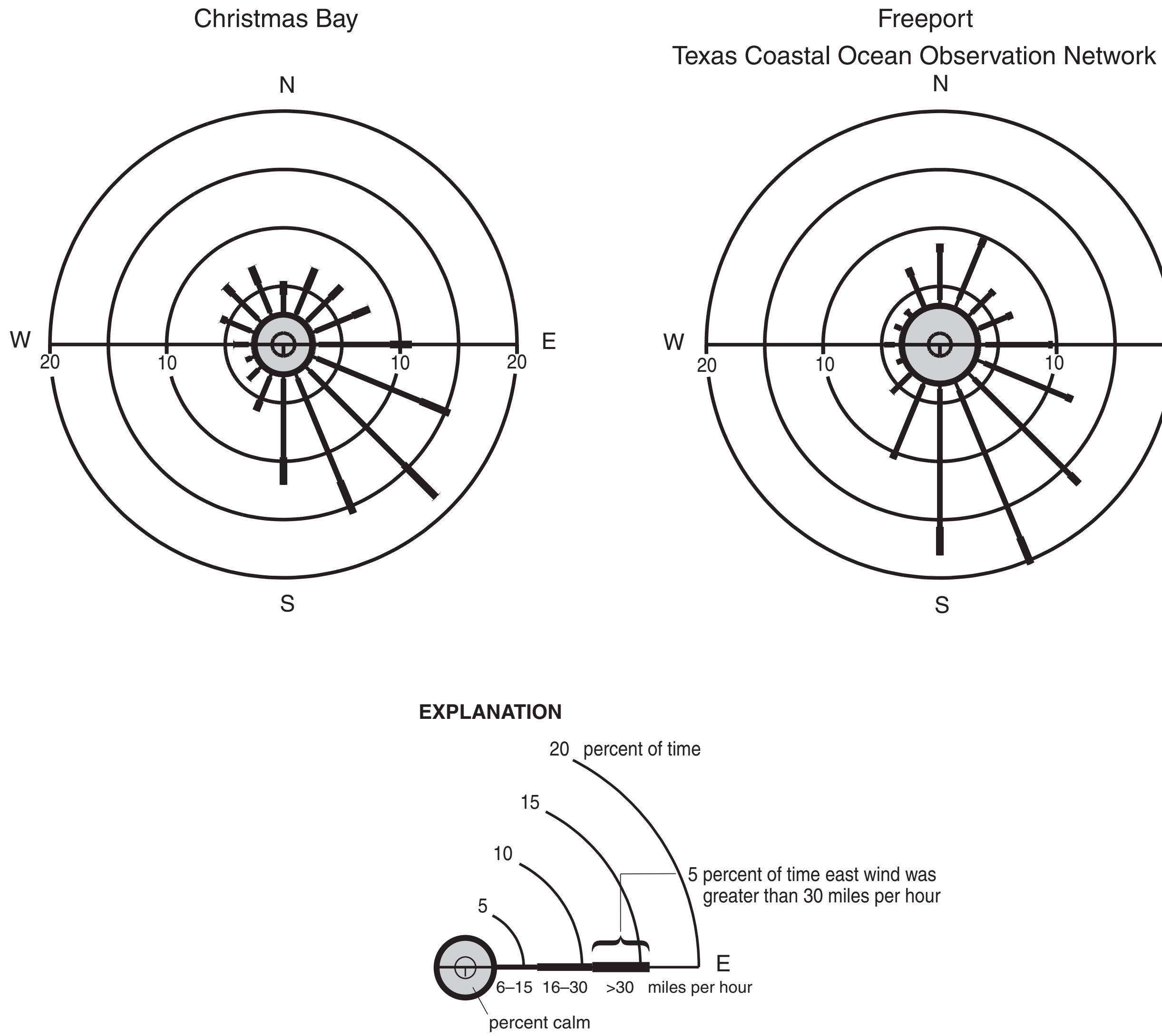

Figure 5. Wind speed and direction at Christmas Bay and Freeport, February 1999–February 2000.

therefore, water samples were collected about 1 foot below the water surface at each site. Because the samples were collected near the surface and the continuous water-quality monitor in Christmas Bay was about 5 feet below the surface, values of specific conductance, pH, water temperature, and dissolved oxygen using the two modes of measurement during site visits might not be comparable.

Standard USGS procedures for sample compositing, filtering, and preservation (Ward and Harr, 1990) were followed. Laboratory analyses for major ions, nutrients, and phytoplankton were done by the USGS National Water Quality Laboratory (NWQL) in Denver, Colo. Analyses for indicator bacteria were done in the USGS Houston Subdistrict laboratory, and analyses for suspended sediment concentration were done by the USGS Louisiana District sediment laboratory in Baton Rouge, La.

Laboratory analyses for selected constituents, such as iron and manganese, were done using several methods. As a result, the minimum reporting levels varied, as reflected by different “less than” (<) values in table 4.

Results of laboratory analysis show that concentrations of major ions were small in each of the three bays. Most nutrient concentrations were at or less than minimum reporting levels in each of the three bays throughout the data-collection period. Indicator bacteria

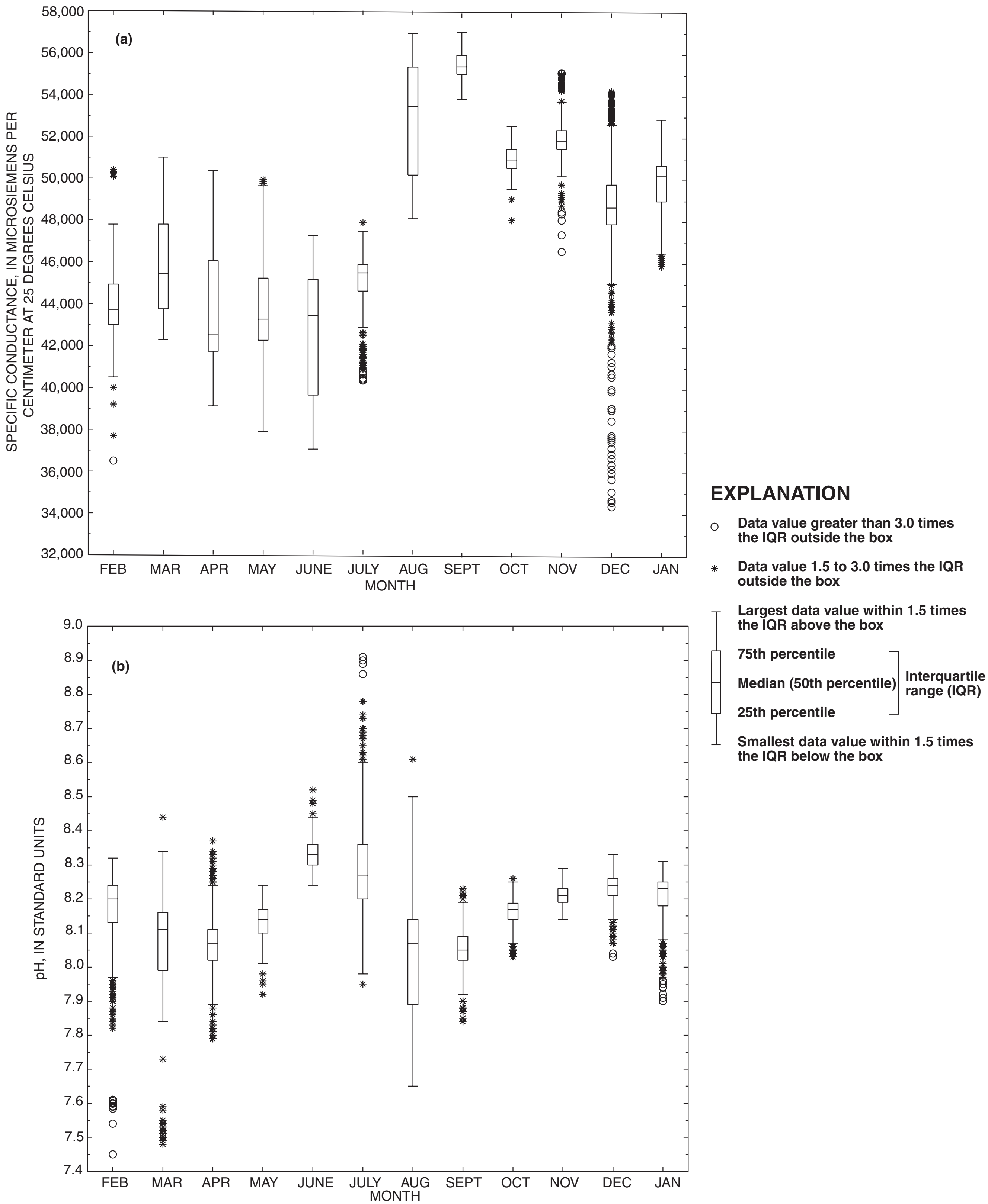

Figure 6. Distribution of (a) specific conductance, (b) pH, (c) water temperature, and (d) dissolved oxygen in Christmas Bay, February 1999–January 2000.

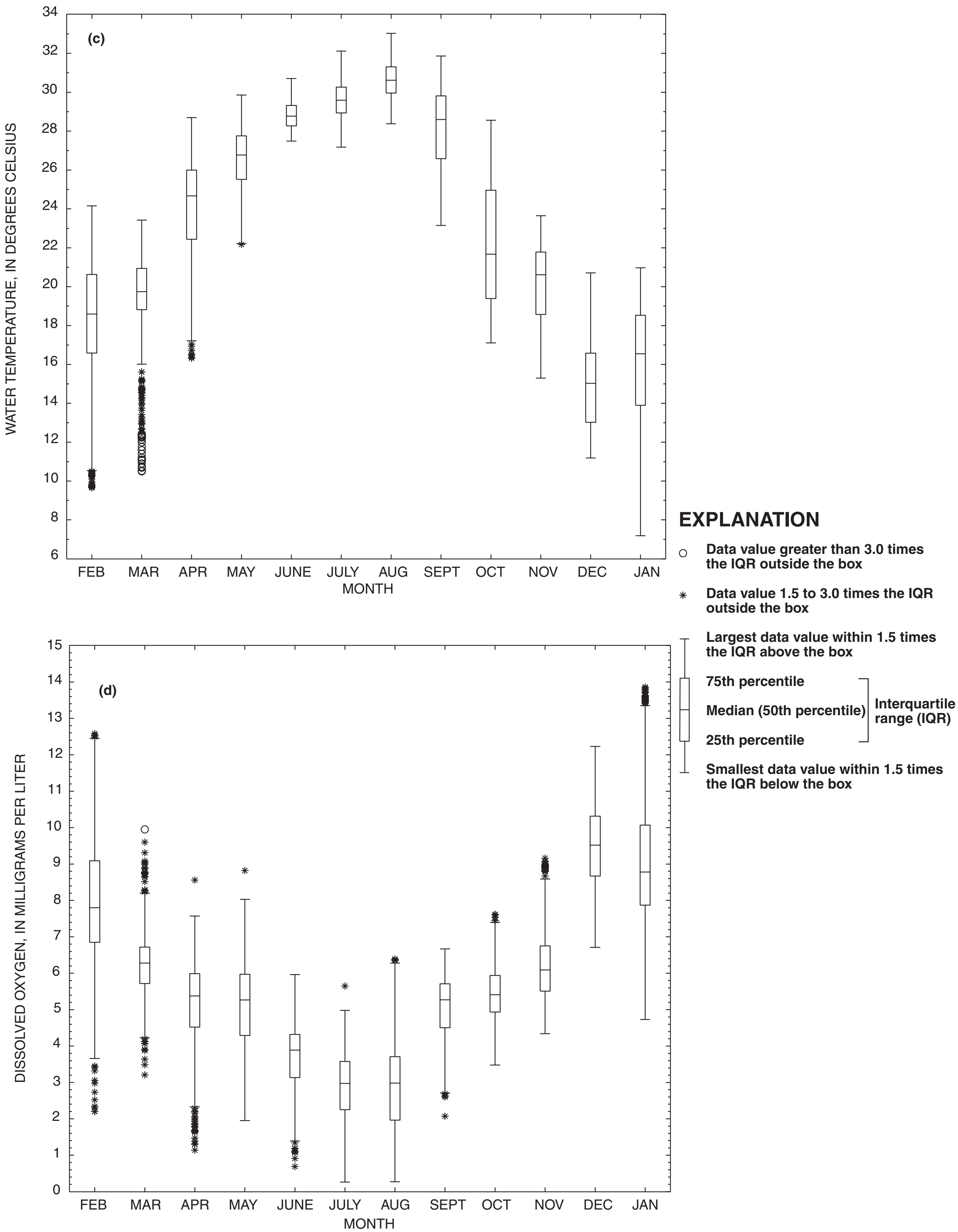

Figure 6. Continued.

counts were consistently higher in samples collected from Drum Bay.

To ensure the quality of these data, various QA samples were collected along with environmental samples. Equipment blanks and field blanks were used to verify the adequacy of cleaning procedures. Split samples were used to determine the analytical precision (reproducibility) for various constituents. Concurrent samples were used to provide a measure of sampling precision (reproducibility) and to indicate spatial or temporal inhomogeneities in the system being sampled. Results of concurrent samples also can reflect differences in sampling, processing, and laboratory analysis. In the Quality Assurance Project Plan, the stated QA objective for sampling and analytical precision was a relative percent difference (RPD) of less than 20. The RPD of all split and concurrent samples were within the 20-percent objective. If equipment blanks or field blanks were greater than QA limits (two times the minimum reporting level or 10 percent of the environmental value), a remark code of "V" (indicating contamination) precedes the value in table 4.

Periodic Water-Quality Properties and Constituents

During the May and December monthly site visits, water samples were collected from each bay and submitted to the NWQL for analysis of the following trace elements: aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, molybdenum, nickel, selenium, silver, zinc, and uranium. Results of these analyses are listed in table 4. Arsenic, barium, chromium, iron, manganese, nickel, and selenium were detected in small concentrations in all three bays; aluminum and zinc also were detected in small concentrations in Christmas and Drum Bays.

During the April monthly site visits, water samples were collected from each bay and submitted to the NWQL for analysis of selected organochlorine pesticides. Results of these analyses are listed in table 4. The only pesticides that were greater than minimum reporting levels were atrazine and its breakdown product deethylatrazine, metolachlor, and simazine. Concentrations of these four pesticides were tens to hundreds of times less than benchmark concentrations in water established for the protection of aquatic life. Atrazine, metolachlor, and simazine are commonly used herbicides and were three of the four most frequently detected herbicides in the Trinity River Basin during the 1992–95 USGS National Water-Quality Assessment (Land and others, 1998, p. 9).

During February 29–March 29, 2000, three SPMDs were deployed at the Christmas Bay monitoring station (fig. 1). SPMDs are lipid-filled membranes that simulate bioaccumulation occurring in living organisms, such as in the gills of fish. By deploying SPMDs for an extended duration, very small concentrations of constituents in the water can accumulate to a level that can be detected through laboratory analysis. Samples extracted from the SPMDs in Christmas Bay were composited and analyzed for 77 SVOCs. Results from these analyses, along with QA data (field blank, laboratory blank, and laboratory matrix spike), are listed in table 5 (at end of report). The SVOCs detected in uncontaminated samples in concentrations greater than minimum reporting levels were *p*-cresol, 4-chloro-3-methylphenol, 2,6-dimethylnaphthalene, 1,6-dimethylnaphthalene, 2,2-biquinoline, Di-*n*-octylphthalate, benzo[*b*]fluoranthene, and benzo[*k*]fluoranthene. Each of these constituent concentrations was estimated by lab technicians because they were present in such minute amounts. Benchmark concentrations of these seven SVOCs in tissue have not been established for the protection of aquatic life.

The concentrations of phenol and *bis*(2-ethylhexyl)phthalate were greater in field blanks than in environmental samples. Because the concentrations in the field blanks and environmental samples were of the same order of magnitude, it is impossible to determine whether the source of the SVOCs is the water or the atmosphere. Also, phthalates can be present in the SPMD material (S.L. Marr, U.S. Geological Survey, written commun., 2001). Therefore, whether phenol or *bis*(2-ethylhexyl)phthalate was present in the water is unknown. Benchmark concentrations of these two SVOCs in tissue have not been established for the protection of aquatic life.

SEDIMENT-QUALITY DATA

Sediment quality is an integral aspect of water quality because of the transport and fate of chemical constituents associated with sediment; for example, hydrophobic contaminants can be highly bioavailable. To identify the presence of various constituents in bottom sediment, surficial bed-sediment samples were collected from each of the three bays on November 30, 1999, and submitted for laboratory analysis. Samples were analyzed for grain size by the USGS Iowa District sediment laboratory and for major and trace elements, carbons, SVOCs (mostly PAHs), and organochlorine pesticides by the NWQL.

Surficial sediment samples were collected using a 15- by 15- by 20-centimeter Wildco box corer (Van Metre and Callender, 1997). The sampler was gently lowered to the bay bottom using a rope and allowed to penetrate the lacustrine sediment. The sampler then was raised abruptly, which actuates jaws in the sampler to close around the sediment, and brought to the surface. The top 3 centimeters of the sample were extruded by sliding the plexiglass liner down onto a piston, which pushes the sample up into an empty liner. The sample then was sliced horizontally and the top 3 centimeters placed into a baked glass jar. Multiple samples were collected and composited in the glass jar before subsampling.

Subsamples for grain-size analysis were taken directly from the glass jar, placed in plastic containers, and submitted to the laboratory. Grain-size data for all three bays, including QA data (split sample), are listed in table 6 (at end of report). Quantitative data are available only for silt and clay. However, it was observed during collection of the samples that the remaining fraction of grain-size materials was composed primarily of sand and shell fragments.

Subsamples for analysis of carbon and major and trace elements were taken from the glass jar and wet-sieved through a 0.062-millimeter mesh using native water. The subsamples were collected in 125-milliliter acid-washed Nalgene jars and submitted to the laboratory for analysis. Laboratory results for these constituents are listed in table 7 (at end of report).

Subsamples for SVOC and organochlorine pesticide analysis were taken from the glass jar and wet-sieved through a 2-millimeter screen using native water. The subsamples were collected in baked glass jars and submitted to the laboratory for analysis. Laboratory results for 64 SVOCs, including QA samples (split sample, laboratory blank, and laboratory matrix spike), are listed in table 8 (at end of report). Results for 17 organochlorine pesticides, including QA samples (split sample) are listed in table 9 (at end of report).

Those SVOCs (mostly PAHs) detected in sediment samples generally were at minute concentrations, less than 10 micrograms per kilogram. Concentrations of the SVOCs detected, for which benchmark concentrations in sediment have been established for the protection of aquatic life, were tens or hundreds of times less than the respective benchmark concentrations. All pesticides analyzed in bay sediment were less than minimum reporting levels.

SUMMARY

The Christmas Bay system is a group of three small secondary bays at the southwestern end of the Galveston Bay estuarine system in Brazoria County. Numerous species of birds, fish, crustaceans, and mollusks inhabit the three-bay system. These biota include seven endangered species of birds and an endangered species of sea turtle. Numerous flora also occur in the Christmas Bay system and include several species of seagrass that serve as prime spawning grounds for crustaceans and finfish. During February 1999–March 2000, the USGS collected hydrologic, water-quality, and sediment-quality data to establish baseline conditions in the Christmas Bay system.

Tidal gage height, wind speed, and wind direction were measured at one station in Christmas Bay. Gage-height fluctuations closely matched open-water tidal fluctuations. Total rainfall during February 1999–February 2000 at a National Weather Service gage 20 miles northeast of Christmas Bay was about 20 percent below the annual average; thus, freshwater inflow to the three-bay system, from Bastrop Bayou, probably was below normal during the data-collection period. Wind-speed and wind-direction data collected at the Christmas Bay station indicate prevailing winds were from the southeast.

Specific conductance, pH, water temperature, and dissolved oxygen were recorded at 30-minute intervals in Christmas Bay during February 1999–January 2000. These data showed seasonal variations that are typical of stations on the Texas Gulf Coast. In particular, water temperature and dissolved oxygen concentration are inversely related, with periods of smallest dissolved oxygen concentrations occurring in the summer months when water temperatures are highest.

Water samples were collected monthly from each of the three bays. Results of laboratory analysis show that concentrations of major ions were small in each of the three bays, and most nutrient concentrations were at or less than minimum reporting levels. Indicator bacteria counts were consistently higher in samples collected from Drum Bay. Water samples collected during the May and December site visits to each bay were analyzed for trace elements; nine trace elements were detected in small concentrations in Christmas and Drum Bays and seven in Bastrop Bay.

During the April monthly site visits, water samples were collected from each bay and submitted for analysis of selected organochlorine pesticides. The only pesticides greater than minimum reporting levels were atrazine and its breakdown product deethylatrazine, metolachlor, and simazine. Concentrations of these pesticides were much less than the respective benchmark concentrations in water established for the protection of aquatic life.

During February 29–March 29, 2000, three SPMDs were deployed at the Christmas Bay monitoring station. Seven of 77 SVOCs analyzed in the lipids from the SPMDs were detected in minute amounts.

Surficial bed-sediment samples collected from each of the three bays on November 30, 1999, were analyzed for major and trace elements, carbon, 64 SVOCs (mostly PAHs), and 17 organochlorine pesticides. Concentrations of SVOCs detected were less than 10 micrograms per liter. Concentrations of those SVOCs for which a benchmark concentration in sediment has been established for the protection of aquatic life were much less than the respective benchmark.

REFERENCES CITED

Fisher, J.C., 1988, Hydrologic data for the Salt Bayou estuary near Sabine Pass, Texas, October 1984 to March 1986, U.S. Geological Survey Open-File Report 88–499, 128 p.

Land, L.F., Moring, J.B., Van Metre, P.C., Reutter, D.C., Mahler, B.J., Shipp, A.A., and Ulery, R.L., 1998, Water quality in the Trinity River Basin, Texas, 1992–95: U.S. Geological Survey Circular 1171, 39 p.

McFarlane, R.W., 1991, An environmental inventory of the Christmas Bay Coastal Preserve: Webster, Tex., Galveston Bay National Estuary Program, GBNEP–7, 95 p.

Mitchell, Gary, and Windsor, Duane, 1991, Regulatory effectiveness study for the Christmas Bay Coastal Preserve: Webster, Tex., Galveston Bay National Estuary Program, GBNEP–14, 188 p.

National Weather Service, 2002, Local monthly climate sites data, Scholes Airfield, Galveston: Accessed February 19, 2002, at URL http://www.srh.noaa.gov/HGX/index3/climate3.htm

Sager, David, 1995, An assessment of contaminant concentrations in estuarine resources of selected reference bays of coastal Texas: Texas Parks and Wildlife Department, EQTS–1995–003.

Texas Coastal Ocean Observation Network, 2001, Conrad Blucher Institute, Division of Nearshore Research, data query: Accessed March 12, 2001, at URL http://dco.cbi.tamucc.edu/pquery/056

Texas Natural Resource Conservation Commission, 1994, The State of Texas water-quality inventory—Volume 2 (12th ed.): State/Federal Report 11.

Van Metre, P.C., and Callender, Edward, 1997, Water-quality trends in White Rock Creek Basin from 1912–1994 identified using sediment cores from White Rock Lake reservoir, Dallas, Texas: Journal of Paleolimnology, v. 17, p. 239–249.

Ward, J.R., and Harr, C.A., 1990, Methods for collection and processing of surface-water and bed-material samples for physical and chemical analysis: U.S. Geological Survey Open-File Report 90–140, 71 p.

Table 2. Maximum, minimum, and mean gage heights in Christmas Bay, February 1999–February 2000

GAGE HEIGHT, IN FEET

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY 1999			MARCH 1999			APRIL 1999			MAY 1999		
1	3.43	2.52	3.01	3.27	2.33	2.80	3.75	3.23	3.56	4.85	3.82	4.36
2	3.58	2.78	3.25	3.53	2.77	3.19	3.93	3.35	3.71	4.45	3.57	4.07
3	3.63	3.12	3.42	3.33	2.65	2.92	4.39	3.59	4.07	3.96	3.30	3.67
4	3.76	3.19	3.42	4.05	2.75	3.41	4.37	3.57	4.08	4.40	3.27	3.92
5	3.83	3.42	3.62	4.13	3.36	3.80	4.32	3.54	3.96	4.39	3.42	3.98
6	3.55	3.10	3.31	3.36	2.88	3.17	4.13	3.17	3.69	4.14	3.52	3.89
7	3.48	3.06	3.17	4.49	2.80	3.81	3.70	2.96	3.39	4.12	3.34	3.77
8	3.23	2.56	2.91	4.52	4.08	4.31	3.40	2.79	3.16	4.05	3.20	3.69
9	3.28	2.62	3.02	4.08	3.36	3.63	3.36	2.50	3.00	4.33	3.57	3.99
10	3.56	2.54	3.03	3.97	2.96	3.53	3.57	2.60	3.13	4.64	3.87	4.23
11	3.87	2.92	3.38	4.13	3.39	3.79	3.61	2.93	3.31	4.54	4.18	4.35
12	3.59	2.64	2.94	4.44	3.43	3.96	3.71	2.97	3.37	4.42	3.53	4.12
13	2.87	2.00	2.47	4.39	2.63	3.61	3.91	3.30	3.65	3.94	2.87	3.58
14	3.53	2.26	2.81	2.63	1.19	1.66	4.32	3.35	3.87	3.64	2.87	3.36
15	3.56	2.56	3.13	2.74	1.26	1.79	3.58	2.22	2.92	3.88	2.86	3.51
16	3.63	2.85	3.30	3.32	2.49	2.92	3.19	2.15	2.81	4.19	3.03	3.79
17	3.69	2.80	3.25	3.55	3.05	3.34	3.19	2.16	2.78	4.31	3.19	3.83
18	3.59	2.78	3.24	3.85	3.32	3.55	2.89	1.94	2.51	4.33	3.28	3.82
19	3.26	2.70	3.03	3.93	3.06	3.53	2.52	1.82	2.16	3.98	2.95	3.54
20	4.28	2.92	3.61	3.56	2.59	3.15	2.55	1.60	2.16	3.71	2.78	3.33
21	4.24	3.21	3.51	3.01	2.36	2.78	3.21	1.86	2.62	3.60	2.81	3.26
22	3.99	2.99	3.59	3.24	2.34	2.92	3.95	2.71	3.36	3.34	2.78	3.07
23	3.82	3.15	3.43	3.51	2.55	3.11	3.71	2.96	3.39	3.07	2.64	2.84
24	3.41	2.37	2.92	3.43	2.49	3.03	3.53	2.92	3.26	2.80	2.43	2.66
25	3.42	2.62	3.12	3.57	2.55	3.08	3.40	2.83	3.18	2.84	2.24	2.62
26	3.56	2.54	3.12	3.91	2.90	3.47	3.64	3.30	3.48	3.00	2.25	2.69
27	3.55	2.72	3.14	4.40	3.44	3.92	3.78	2.97	3.44	3.02	2.33	2.73
28	3.24	2.38	2.84	4.57	3.77	4.15	3.44	2.93	3.26	3.08	2.32	2.76
29	---	---	---	3.88	3.14	3.53	3.57	2.90	3.33	3.15	2.30	2.84
30	---	---	---	3.83	3.40	3.61	4.40	2.88	3.94	3.34	2.38	2.93
31	---	---	---	3.82	3.23	3.53	---	---	---	3.32	2.33	2.92
MONTH	4.28	2.00	3.18	4.57	1.19	3.32	4.40	1.60	3.29	4.85	2.24	3.49

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE 1999			JULY 1999			AUGUST 1999			SEPTEMBER 1999		
1	3.35	2.38	2.97	3.23	2.28	2.85	2.85	2.22	2.63	3.66	3.06	3.43
2	3.69	2.62	3.24	3.64	2.46	3.17	2.93	2.40	2.72	3.84	3.14	3.59
3	3.58	2.68	3.20	4.01	3.16	3.65	2.93	2.47	2.70	3.81	2.86	3.45
4	3.45	2.60	3.09	3.74	3.16	3.44	2.90	2.38	2.70	3.82	2.64	3.36
5	3.58	2.68	3.17	3.37	2.83	3.11	3.16	2.61	2.91	3.48	2.41	3.07
6	3.48	2.82	3.16	3.22	2.74	2.94	3.39	2.49	3.07	3.39	2.47	3.05
7	3.42	2.71	3.10	3.33	2.82	3.08	3.40	2.45	3.04	3.33	2.38	2.95
8	3.61	3.06	3.33	3.54	3.00	3.31	3.48	2.24	3.02	3.27	2.38	2.97
9	3.77	3.26	3.53	3.58	2.60	3.24	3.08	1.89	2.61	3.31	2.56	3.01
10	3.74	2.86	3.42	3.67	2.69	3.33	2.77	1.84	2.37	3.82	2.72	3.38
11	3.57	2.56	3.21	3.66	2.49	3.24	2.82	1.78	2.47	3.43	3.08	3.28
12	3.54	2.58	3.21	3.54	2.47	3.08	2.81	2.07	2.50	3.46	3.08	3.28
13	3.55	2.52	3.10	3.48	2.49	3.10	2.54	1.96	2.29	3.80	3.26	3.44
14	3.48	2.44	3.02	3.31	2.38	2.97	2.43	1.88	2.23	3.99	3.42	3.73
15	3.46	2.28	3.02	3.34	2.35	2.97	3.23	2.16	2.75	4.10	3.46	3.82
16	3.62	2.54	3.20	3.49	2.71	3.19	3.36	3.01	3.17	4.06	3.29	3.73
17	3.76	2.65	3.32	3.44	2.77	3.17	3.22	2.55	2.93	3.70	2.96	3.42
18	4.18	3.18	3.75	3.55	3.01	3.31	3.05	2.45	2.78	3.61	2.89	3.32
19	4.15	3.51	3.86	3.76	3.24	3.54	2.99	2.21	2.68	3.80	3.00	3.46
20	4.12	3.54	3.84	3.76	3.13	3.55	3.05	2.25	2.71	3.74	3.16	3.49
21	4.73	3.85	4.37	3.53	2.94	3.31	3.16	2.44	2.91	4.00	3.38	3.75
22	3.85	3.10	3.58	3.42	2.54	3.12	3.84	2.69	3.42	4.39	3.42	4.06
23	3.63	2.98	3.39	3.17	2.29	2.83	3.82	2.71	3.41	4.18	3.34	3.92
24	3.90	2.99	3.59	3.08	2.26	2.75	3.44	2.65	3.17	3.79	2.83	3.42
25	3.55	2.62	3.28	3.24	2.26	2.85	3.39	2.41	3.06	3.83	2.78	3.37
26	3.41	2.43	3.04	3.10	2.18	2.72	2.94	2.17	2.66	4.01	3.45	3.71
27	3.38	2.38	2.97	3.08	2.14	2.66	2.73	2.06	2.52	4.07	3.33	3.72
28	3.13	2.22	2.76	2.97	2.08	2.61	3.05	2.22	2.72	4.36	3.73	4.07
29	3.03	2.09	2.64	2.90	2.07	2.59	3.08	2.53	2.85	4.40	3.45	3.95
30	3.10	2.04	2.71	2.78	2.09	2.55	3.26	2.61	2.91	4.17	3.52	3.89
31	---	---	---	2.88	2.15	2.62	3.47	2.74	3.08	---	---	---
MONTH	4.73	2.04	3.27	4.01	2.07	3.06	3.84	1.78	2.81	4.40	2.38	3.50

Table 2. Maximum, minimum, and mean gage heights in Christmas Bay, February 1999–February 2000—Continued

GAGE HEIGHT, IN FEET

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER 1999			NOVEMBER 1999			DECEMBER 1999			JANUARY 2000		
1	4.44	3.52	4.06	3.15	2.40	2.79	3.68	3.29	3.47	2.91	1.91	2.38
2	4.49	3.71	4.15	2.88	2.26	2.62	4.05	3.42	3.72	3.17	2.27	2.73
3	4.50	3.63	4.14	3.25	2.40	2.97	4.14	3.54	3.93	3.23	2.43	2.93
4	4.45	3.64	4.17	3.38	3.03	3.17	4.14	3.45	3.82	2.98	1.50	1.97
5	4.66	3.77	4.31	3.31	2.79	3.05	3.93	2.55	3.05	2.86	1.53	1.96
6	4.57	3.81	4.32	3.55	2.98	3.26	3.04	1.97	2.43	3.88	2.71	3.12
7	4.51	3.95	4.28	3.34	2.74	3.12	3.81	2.62	3.14	3.96	3.12	3.57
8	4.67	4.04	4.37	3.43	2.72	3.13	4.06	3.09	3.61	3.90	2.77	3.35
9	4.25	3.91	4.10	3.68	2.73	3.21	4.04	2.84	3.43	3.42	2.32	2.86
10	3.96	3.44	3.76	3.79	2.96	3.43	3.27	2.07	2.62	3.10	2.04	2.60
11	3.94	3.36	3.66	3.82	3.03	3.50	4.12	2.98	3.38	2.79	2.15	2.51
12	4.20	3.48	3.84	3.73	2.81	3.27	4.24	3.17	3.65	2.82	2.21	2.55
13	4.21	3.44	3.88	---	---	---	3.17	1.63	2.23	2.97	2.45	2.73
14	3.99	3.02	3.55	---	---	---	2.85	2.08	2.32	3.89	2.85	3.48
15	3.96	3.17	3.64	---	---	---	2.91	1.94	2.32	3.89	3.41	3.57
16	4.07	3.22	3.70	---	---	---	3.23	2.21	2.57	3.43	2.66	2.98
17	4.05	2.97	3.58	---	---	---	3.69	2.91	3.23	3.07	2.28	2.74
18	3.65	3.06	3.40	---	---	---	3.77	2.91	3.28	2.97	2.07	2.58
19	3.72	2.95	3.38	---	---	---	3.46	2.47	2.98	2.92	1.81	2.45
20	3.50	3.01	3.30	---	---	---	4.62	3.25	3.84	3.27	2.19	2.74
21	3.60	2.82	3.29	---	---	---	4.56	3.39	3.83	3.69	2.76	3.24
22	3.21	2.72	3.04	---	---	---	3.47	2.44	3.05	3.75	2.80	3.38
23	3.30	2.72	2.96	---	---	---	3.41	2.50	3.03	3.50	2.21	2.83
24	3.64	2.93	3.23	---	---	---	3.22	1.86	2.48	3.09	2.10	2.58
25	3.39	2.71	3.15	---	---	---	3.01	2.22	2.62	2.90	2.35	2.58
26	3.33	2.48	2.99	---	---	---	3.01	1.88	2.42	3.67	2.68	3.06
27	3.41	2.42	2.97	---	---	---	2.46	1.55	1.98	4.43	3.67	3.98
28	3.62	2.58	3.12	---	---	---	2.22	1.62	1.88	4.06	2.43	3.09
29	3.88	2.99	3.53	---	---	---	2.38	1.78	1.99	2.65	1.86	2.27
30	3.96	2.92	3.55	3.62	2.85	3.33	2.54	2.11	2.31	3.03	2.11	2.50
31	3.67	2.37	3.02	---	---	---	2.54	1.99	2.32	3.76	2.80	3.25
MONTH	4.67	2.37	3.63	---	---	---	4.62	1.55	2.93	4.43	1.50	2.86

DAY	MAX	MIN	MEAN
	FEBRUARY 2000		
1	3.88	3.00	3.49
2	3.79	2.94	3.33
3	3.22	2.20	2.65
4	2.60	1.95	2.30
5	2.66	2.01	2.34
6	2.77	2.08	2.50
7	2.85	2.08	2.53
8	2.47	1.93	2.26
9	2.36	1.96	2.20
10	2.82	2.20	2.49
11	2.71	2.36	2.52
12	2.90	2.26	2.61
13	3.19	2.33	2.82
14	3.25	2.50	2.92
15	3.34	2.16	2.75
16	3.38	2.43	3.00
17	3.52	2.49	3.09
18	3.51	2.53	3.10
19	3.42	2.56	3.03
20	3.30	2.69	3.05
21	3.16	2.59	2.95
22	3.29	2.83	3.10
23	3.59	2.86	3.18
24	3.29	2.61	2.90
25	3.76	3.06	3.45
26	3.66	3.09	3.40
27	3.09	2.51	2.82
28	3.60	2.40	2.99
29	3.53	2.77	3.24
30	---	---	---
31	---	---	---
MONTH	3.88	1.93	2.86

Table 3. Maximum, minimum, and mean specific conductance, pH, water temperature, and dissolved oxygen in Christmas Bay, February 1999–February 2000

SPECIFIC CONDUCTANCE, IN MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY 1999			MARCH 1999			APRIL 1999			MAY 1999		
1	42500	41600	42100	43600	43100	43400	44300	43500	44000	49900	48600	49300
2	42100	41800	42000	43700	42900	43300	44600	43500	44200	49100	47000	48000
3	42800	42100	42400	43700	43300	43500	44300	43700	44000	48100	46000	47300
4	43200	42700	43000	43800	43200	43500	44000	41200	42500	47400	43800	46200
5	43400	43200	43300	45900	43300	44000	43400	41900	42900	47000	44700	46100
6	43500	42800	43100	45500	43900	44700	43300	40800	41800	46900	43100	45500
7	43900	42800	43400	45900	43900	44800	43100	42100	42700	47100	44600	45700
8	44500	43900	44200	45900	45200	45600	43100	42100	42400	47400	45100	46000
9	44900	44200	44600	45700	44600	45000	42500	41800	42200	46000	40600	44200
10	44900	44100	44600	45200	44800	45000	42300	41400	41800	44800	38400	42000
11	45000	43700	44300	45000	43500	44200	41900	40600	41200	44300	39900	42700
12	45600	44800	45200	43800	43300	43500	41400	40600	41000	44400	40200	42800
13	46300	43700	44700	43900	42300	42900	41100	40200	40700	44000	40900	42300
14	46300	45100	45600	45900	43100	45000	41700	40500	40900	43100	39600	41900
15	46700	46000	46300	45900	44700	45500	42300	39600	41500	43700	40700	42300
16	46700	46100	46500	47400	44500	45800	42300	40400	41800	43000	39500	41600
17	46600	45400	45700	48500	47000	47900	42100	40600	41600	43100	40000	41700
18	45600	44700	45300	49600	48400	49100	42100	40100	41800	42700	37900	40400
19	44700	42300	43200	49100	48500	48900	42200	41700	42000	44100	38900	42000
20	42800	41200	42300	48900	48000	48600	42400	39100	41800	44700	41400	44000
21	44400	42000	43400	48500	48000	48100	45800	42200	43500	44300	41400	43300
22	45500	44000	44900	48300	47900	48100	50400	44300	47500	44200	42300	43600
23	45900	44600	45400	48500	48200	48300	47500	45800	46400	43400	38900	42400
24	45800	42700	44700	48300	47300	47800	46800	44300	45400	43500	39400	42800
25	44400	40000	43200	47700	46400	47000	49400	45500	47100	43200	40400	42000
26	42800	42100	42500	47600	46300	46900	47600	45900	46800	43500	38500	42200
27	43000	42400	42700	47600	46700	47400	48700	46100	47700	43500	41800	42900
28	43500	43000	43200	47300	45000	46000	47500	46200	47200	44400	41300	43200
29	---	---	---	46900	43500	44800	47200	45800	46900	44400	40500	43200
30	---	---	---	43800	43500	43700	49900	46100	48400	45900	42000	43500
31	---	---	---	44400	43400	43900	---	---	---	46000	41000	43700
MONTH	46700	40000	44000	49600	42300	45700	50400	39100	43700	49900	37900	43700

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE 1999			JULY 1999			AUGUST 1999			SEPTEMBER 1999		
1	45900	41300	43500	42100	40300	41300	49300	47900	48500	55500	54300	55200
2	47100	41900	44100	44100	40400	42500	49400	48000	48700	55700	54100	55300
3	46600	42600	44200	46700	41500	44400	49900	48600	49400	55500	54500	55100
4	46900	42900	44500	45800	43900	44700	50000	48600	49600	55800	54000	55000
5	45600	42800	44200	45200	44100	44700	50000	49200	49700	55900	54000	55100
6	46700	42100	44600	45500	44200	44800	50000	49400	49800	55800	54200	55000
7	46900	42900	45600	46100	44700	45400	50100	49700	49900	56000	54500	55000
8	47000	43600	45400	46700	45500	46200	50500	49800	50100	56000	54500	55000
9	47200	42800	45700	45800	45300	45500	51000	50000	50800	55400	53900	55000
10	47200	41700	46000	45400	44400	45000	51000	50000	50700	55700	54200	54900
11	47300	39500	45900	44800	44100	44400	52200	50700	51400	55400	54900	55100
12	47000	41800	45800	44600	44200	44300	52400	51300	51800	55700	55100	55400
13	46900	41900	45000	44700	44300	44600	53600	51800	52800	55600	55100	55400
14	45900	39300	43000	44800	44200	44600	53800	51400	53400	55900	54800	55400
15	44800	42500	43600	44800	43700	44200	53800	53300	53500	55900	55300	55600
16	45200	40700	43500	44800	44000	44500	53400	52700	53300	56500	55300	55800
17	46800	42000	45300	45800	44600	44900	53500	52600	53300	56300	55500	55900
18	46900	42800	44600	45900	45100	45600	53800	53100	53500	56400	55600	56000
19	46600	40800	44000	46200	45700	45900	54300	53200	53900	56500	55100	56100
20	42200	38500	40600	46900	45600	46500	54400	53100	54300	56700	55700	56200
21	40400	38200	39400	46800	45400	46000	55300	53900	54800	56400	54700	56000
22	40200	37000	39100	46500	45400	45800	56400	54800	55900	56800	55500	56200
23	40000	37800	39300	45900	45400	45700	56500	55200	55900	56600	55100	56300
24	40000	37800	38900	45900	45400	45700	56000	55400	55700	56900	55800	56300
25	40200	38800	39500	46100	44700	45700	56400	54300	55500	57100	53700	56200
26	39800	38900	39400	45800	44700	45600	56700	55200	55800	56100	55000	55600
27	39900	38100	38900	46200	45400	45700	57000	55500	56000	---	---	---
28	39600	38300	39100	45900	45300	45500	56600	54700	55700	---	---	---
29	40200	39000	39500	46200	45400	45800	55900	54700	55500	---	---	---
30	41800	39600	40800	46900	45700	46200	55700	54400	55200	---	---	---
31	---	---	---	47900	46600	46900	55700	53200	55300	---	---	---
MONTH	47300	37000	42800	47900	40300	45100	57000	47900	52900	---	---	---

Table 3. Maximum, minimum, and mean specific conductance, pH, water temperature, and dissolved oxygen in Christmas Bay, February 1999–February 2000—Continued

SPECIFIC CONDUCTANCE, IN MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER 1999			NOVEMBER 1999			DECEMBER 1999			JANUARY 2000		
1	---	---	---	53000	51000	51900	54300	45600	53300	48900	47800	48600
2	---	---	---	53800	52000	52600	54200	50500	53300	49000	43600	48600
3	---	---	---	53400	51800	52400	53000	48200	52100	49600	47200	48700
4	---	---	---	52300	51600	52000	52200	49200	51700	49400	46700	48800
5	---	---	---	52600	50900	52000	50600	50000	50300	49900	48700	49200
6	---	---	---	52200	50000	51600	50900	40700	50300	52700	49100	49900
7	---	---	---	53100	47000	50600	50600	48500	49900	52900	52000	52500
8	---	---	---	52700	50200	51700	50000	46500	49400	52400	50800	51600
9	---	---	---	52300	50900	51600	50300	49100	49900	51600	49900	51100
10	---	---	---	52100	50200	51400	49800	46100	48700	50900	49700	50300
11	---	---	---	52000	46600	51100	50200	48700	49800	51200	49900	50500
12	---	---	---	52300	49300	51400	50200	48000	49500	51300	49900	50500
13	---	---	---	---	---	---	49400	47200	49000	51600	49800	50700
14	50900	50300	50500	---	---	---	49500	36700	47000	50900	50400	50600
15	50900	50200	50500	---	---	---	49500	38400	47000	51100	50600	50900
16	51200	50500	50800	---	---	---	49800	37200	46900	50900	50100	50600
17	51000	50400	50700	---	---	---	50100	31300	45400	51000	49500	50400
18	51300	50400	50800	---	---	---	49300	41100	47700	51100	49900	50600
19	51300	50300	50700	---	---	---	49200	36400	45700	51000	50100	50600
20	51600	50800	51300	---	---	---	49200	47600	48400	50900	50300	50600
21	51900	50600	51300	---	---	---	47900	45100	47600	51000	49100	50500
22	52100	50300	51600	---	---	---	48400	47500	47900	50900	49700	50400
23	52100	51100	51700	---	---	---	48600	47500	48200	50800	47500	50100
24	51800	50300	51300	---	---	---	48400	44300	47700	50400	50000	50200
25	52200	51100	51600	---	---	---	48100	44000	47700	50400	48100	50000
26	52300	50700	51500	---	---	---	48200	39500	45800	50400	49700	50000
27	52300	49800	51300	---	---	---	48600	42700	47500	50400	47400	49500
28	51900	49900	51100	---	---	---	48800	34400	45700	48000	47100	47700
29	51200	50200	50500	---	---	---	48700	44000	47500	47500	45800	46400
30	51600	47800	50300	54900	52400	54500	49100	42000	48200	47300	46200	46600
31	52700	48100	51100	---	---	---	49000	47100	48600	47500	46900	47100
MONTH	---	---	---	---	---	---	54300	31300	48600	52900	43600	49800

DAY	MAX	MIN	MEAN
	FEBRUARY 2000		
1	47800	45800	47000
2	46900	45500	46300
3	46700	45500	45900
4	45800	45100	45400
5	45200	44300	44700
6	45600	44800	45200
7	45700	42900	44800
8	44400	40700	43700
9	44300	42600	43700
10	44100	42600	43800
11	43900	43200	43600
12	43600	39000	43200
13	43400	40400	43100
14	43200	39900	42400
15	43400	37500	42800
16	43200	36500	42500
17	43400	36500	42700
18	43800	39500	42700
19	43200	42000	42800
20	43600	40900	43100
21	43700	37700	43200
22	43700	37100	43000
23	44000	36500	43200
24	43800	43000	43500
25	44500	43200	43800
26	44300	43500	43900
27	44400	43800	44100
28	44500	41800	44000
29	50400	43600	47500
30	---	---	---
31	---	---	---
MONTH	50400	36500	44000

Table 3. Maximum, minimum, and mean specific conductance, pH, water temperature, and dissolved oxygen in Christmas Bay, February 1999–February 2000—Continued

PH, IN STANDARD UNITS

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY 1999			MARCH 1999			APRIL 1999			MAY 1999		
1	8.3	8.2	8.2	8.3	8.1	8.2	8.2	8.0	8.1	8.2	8.1	8.2
2	8.3	8.2	8.2	8.2	8.1	8.2	8.1	8.0	8.0	8.2	8.1	8.2
3	8.3	8.2	8.2	8.2	8.1	8.2	8.1	8.0	8.0	8.2	8.1	8.1
4	8.2	8.2	8.2	8.2	8.1	8.2	8.1	8.0	8.0	8.2	8.1	8.1
5	8.2	8.2	8.2	8.3	8.1	8.1	8.1	7.9	8.0	8.1	7.9	8.1
6	8.2	8.1	8.2	8.3	8.1	8.2	8.2	8.0	8.1	8.2	7.9	8.1
7	8.3	8.1	8.2	8.2	8.1	8.2	8.0	7.9	8.0	8.2	8.1	8.1
8	8.3	8.1	8.3	8.2	8.1	8.1	8.0	7.9	8.0	8.1	8.0	8.1
9	8.3	8.2	8.2	8.3	8.1	8.2	8.1	7.9	8.0	8.2	8.0	8.1
10	8.2	8.2	8.2	8.2	8.1	8.1	8.1	8.0	8.1	8.2	8.0	8.2
11	8.3	8.2	8.2	---	---	---	8.3	8.1	8.2	8.2	8.1	8.1
12	8.3	8.2	8.2	---	---	---	8.2	8.1	8.1	---	---	---
13	8.3	8.2	8.3	---	---	---	8.1	8.1	8.1	---	---	---
14	8.3	8.3	8.3	---	---	---	8.1	8.0	8.1	---	---	---
15	8.3	8.2	8.3	---	---	---	8.1	8.0	8.1	---	---	---
16	8.3	8.2	8.2	---	---	---	8.3	8.0	8.1	---	---	---
17	8.2	8.2	8.2	---	---	---	8.4	8.2	8.3	---	---	---
18	8.3	8.2	8.2	8.2	8.1	8.1	8.3	8.2	8.2	---	---	---
19	8.3	8.2	8.2	8.4	8.0	8.1	8.2	8.1	8.1	---	---	---
20	8.3	8.2	8.2	8.2	8.0	8.1	8.1	8.1	8.1	---	---	---
21	8.3	8.2	8.3	8.1	8.0	8.0	8.1	8.0	8.1	---	---	---
22	8.3	8.2	8.3	8.1	7.9	8.0	8.1	8.0	8.0	---	---	---
23	8.3	8.1	8.2	8.1	7.9	7.9	8.1	7.9	8.0	---	---	---
24	8.3	8.2	8.2	8.1	7.9	8.0	8.1	8.0	8.1	---	---	---
25	8.3	8.1	8.1	8.0	7.9	8.0	8.2	8.0	8.1	---	---	---
26	8.3	8.1	8.2	8.0	7.9	7.9	8.1	7.8	8.0	---	---	---
27	8.2	8.1	8.1	8.0	7.9	8.0	8.1	7.8	7.9	---	---	---
28	8.2	8.1	8.1	8.1	7.9	8.0	8.1	7.9	8.0	---	---	---
29	---	---	---	8.2	7.9	8.1	8.1	7.9	8.1	---	---	---
30	---	---	---	8.2	8.0	8.1	8.2	8.1	8.1	---	---	---
31	---	---	---	8.2	8.0	8.1	---	---	---	---	---	---
MONTH	8.3	8.1	8.2	---	---	---	8.4	7.8	8.1	---	---	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE 1999			JULY 1999			AUGUST 1999			SEPTEMBER 1999		
1	---	---	---	8.4	8.3	8.3	8.3	8.1	8.2	8.0	7.8	7.9
2	---	---	---	8.4	8.3	8.4	8.4	8.0	8.1	8.0	7.9	8.0
3	---	---	---	8.6	8.3	8.4	8.5	8.0	8.2	8.1	8.0	8.0
4	---	---	---	8.5	8.2	8.4	8.6	8.0	8.2	8.1	8.0	8.0
5	---	---	---	8.7	8.1	8.4	8.3	8.0	8.1	8.1	8.0	8.0
6	---	---	---	8.9	8.2	8.5	8.4	7.9	8.1	8.1	8.0	8.0
7	---	---	---	8.8	8.1	8.3	8.4	8.0	8.1	8.1	8.0	8.0
8	---	---	---	8.6	8.1	8.3	8.3	8.0	8.2	8.1	8.0	8.0
9	---	---	---	8.4	8.1	8.2	8.2	8.0	8.1	8.1	8.0	8.0
10	---	---	---	8.4	8.1	8.3	8.2	8.1	8.1	8.1	8.0	8.0
11	---	---	---	8.5	8.2	8.3	8.2	8.1	8.1	8.1	8.0	8.0
12	---	---	---	8.4	8.1	8.3	8.3	8.1	8.1	8.1	8.0	8.0
13	---	---	---	8.4	8.1	8.2	8.2	8.1	8.1	8.1	8.0	8.0
14	---	---	---	8.6	8.2	8.4	8.2	7.9	8.1	8.1	8.0	8.0
15	---	---	---	8.5	8.1	8.3	8.1	7.9	8.1	8.1	8.0	8.1
16	---	---	---	8.4	8.1	8.3	8.2	7.9	8.1	8.1	8.0	8.1
17	---	---	---	8.5	8.2	8.4	8.3	7.8	8.0	8.1	8.0	8.1
18	---	---	---	8.5	8.2	8.3	8.2	7.8	8.0	8.1	8.0	8.1
19	---	---	---	8.4	8.1	8.3	8.2	7.8	8.0	8.1	8.0	8.1
20	---	---	---	8.3	8.1	8.2	8.2	7.9	8.0	8.1	8.1	8.1
21	---	---	---	8.4	8.1	8.2	8.2	7.8	8.0	8.1	8.1	8.1
22	---	---	---	8.5	8.1	8.3	8.1	8.0	8.1	8.1	8.1	8.1
23	---	---	---	8.5	8.1	8.2	8.2	7.9	8.1	8.2	8.1	8.2
24	---	---	---	8.3	8.1	8.2	8.1	7.8	7.9	8.2	8.2	8.2
25	---	---	---	8.4	8.1	8.2	7.8	7.8	7.8	8.2	8.1	8.2
26	8.4	8.3	8.3	8.3	8.2	8.2	7.9	7.7	7.8	8.2	8.1	8.2
27	8.4	8.3	8.3	8.3	8.0	8.2	7.9	7.8	7.8	---	---	---
28	8.4	8.3	8.3	8.3	8.1	8.2	7.9	7.7	7.8	---	---	---
29	8.5	8.3	8.4	8.4	7.9	8.2	7.9	7.7	7.8	---	---	---
30	8.4	8.3	8.4	8.4	8.1	8.2	7.9	7.8	7.8	---	---	---
31	---	---	---	8.3	8.1	8.2	7.9	7.8	7.9	---	---	---
MONTH	---	---	---	8.9	7.9	8.3	8.6	7.7	8.0	---	---	---

Table 3. Maximum, minimum, and mean specific conductance, pH, water temperature, and dissolved oxygen in Christmas Bay, February 1999–February 2000—Continued

PH, IN STANDARD UNITS

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER 1999			NOVEMBER 1999			DECEMBER 1999			JANUARY 2000		
1	---	---	---	8.2	8.2	8.2	8.3	8.2	8.3	8.3	8.1	8.2
2	---	---	---	8.2	8.2	8.2	8.3	8.2	8.2	8.3	8.2	8.2
3	---	---	---	8.3	8.2	8.2	8.2	8.2	8.2	8.3	8.1	8.2
4	---	---	---	8.2	8.2	8.2	8.2	8.1	8.2	8.3	8.2	8.3
5	---	---	---	8.2	8.2	8.2	8.2	8.2	8.2	8.3	8.2	8.2
6	---	---	---	8.2	8.1	8.2	8.3	8.2	8.2	8.3	8.2	8.2
7	---	---	---	8.2	8.1	8.2	8.3	8.2	8.2	8.2	8.2	8.2
8	---	---	---	8.3	8.1	8.2	8.3	8.2	8.2	8.2	7.9	8.2
9	---	---	---	8.2	8.1	8.2	8.3	8.2	8.2	8.2	7.9	8.1
10	---	---	---	8.2	8.1	8.2	8.3	8.2	8.3	8.2	7.9	8.2
11	---	---	---	8.2	8.1	8.2	8.3	8.3	8.3	8.2	8.0	8.1
12	---	---	---	8.3	8.2	8.2	8.3	8.3	8.3	8.2	8.1	8.2
13	---	---	---	---	---	---	8.3	8.2	8.2	8.3	8.0	8.1
14	8.2	8.2	8.2	---	---	---	8.2	8.1	8.2	8.3	8.2	8.3
15	8.2	8.2	8.2	---	---	---	8.2	8.2	8.2	8.3	8.2	8.2
16	8.2	8.2	8.2	---	---	---	8.3	8.1	8.2	8.3	8.1	8.2
17	8.2	8.1	8.2	---	---	---	8.3	8.1	8.2	8.2	8.1	8.2
18	8.2	8.2	8.2	---	---	---	8.3	8.2	8.3	8.3	8.1	8.2
19	8.2	8.2	8.2	---	---	---	8.3	8.2	8.2	8.2	8.2	8.2
20	8.2	8.1	8.2	---	---	---	8.3	8.2	8.3	8.2	8.1	8.2
21	8.2	8.2	8.2	---	---	---	8.2	8.2	8.2	8.3	8.2	8.2
22	8.2	8.1	8.2	---	---	---	8.3	8.2	8.2	8.2	8.0	8.1
23	8.2	8.1	8.1	---	---	---	8.2	8.0	8.2	8.2	7.9	8.1
24	8.2	8.1	8.1	---	---	---	8.3	8.1	8.2	8.2	8.0	8.2
25	8.1	8.1	8.1	---	---	---	8.3	8.1	8.2	8.3	8.0	8.1
26	8.2	8.0	8.1	---	---	---	8.3	8.1	8.2	8.3	8.2	8.3
27	8.1	8.1	8.1	---	---	---	8.3	8.1	8.2	8.3	8.2	8.2
28	8.2	8.0	8.1	---	---	---	8.3	8.2	8.3	8.2	8.2	8.2
29	8.3	8.2	8.2	---	---	---	8.3	8.2	8.2	8.3	8.2	8.2
30	8.2	8.1	8.2	8.3	8.2	8.3	8.3	8.1	8.2	8.3	8.1	8.2
31	8.2	8.2	8.2	---	---	---	8.3	8.1	8.2	8.3	8.2	8.3
MONTH	---	---	---	---	---	---	8.3	8.0	8.2	8.3	7.9	8.2

DAY	MAX	MIN	MEAN
	FEBRUARY 2000		
1	8.3	8.2	8.2
2	8.3	7.8	8.2
3	8.3	7.9	8.1
4	8.3	8.0	8.2
5	8.3	8.2	8.3
6	8.3	8.1	8.2
7	8.3	7.9	8.2
8	8.2	8.0	8.1
9	8.2	7.8	8.1
10	8.2	8.1	8.2
11	8.2	7.9	8.1
12	8.2	7.8	8.0
13	8.2	8.0	8.1
14	8.2	8.0	8.1
15	8.2	8.1	8.1
16	8.2	8.1	8.2
17	8.2	8.1	8.2
18	8.2	8.1	8.1
19	8.2	8.1	8.2
20	8.2	8.2	8.2
21	8.2	8.0	8.1
22	8.2	8.0	8.1
23	8.2	7.9	8.1
24	8.1	7.9	8.1
25	8.1	7.9	8.1
26	8.2	7.9	8.1
27	8.2	7.9	8.1
28	8.2	7.9	8.1
29	8.1	7.4	7.8
30	---	---	---
31	---	---	---
MONTH	8.3	7.4	8.1

Table 3. Maximum, minimum, and mean specific conductance, pH, water temperature, and dissolved oxygen in Christmas Bay, February 1999–February 2000—Continued

TEMPERATURE, IN DEGREES CELSIUS

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY 1999			MARCH 1999			APRIL 1999			MAY 1999		
1	18.3	16.2	17.4	21.3	18.6	19.9	22.5	20.2	21.3	25.0	23.4	24.1
2	18.2	17.7	17.9	21.5	20.1	20.8	22.7	21.7	22.2	23.7	22.2	23.0
3	18.4	17.2	17.8	20.6	17.8	18.9	23.0	22.0	22.4	23.8	22.5	23.1
4	19.0	18.3	18.6	19.0	16.9	18.0	23.6	22.3	23.0	25.0	23.4	24.1
5	19.3	18.1	18.7	19.6	18.4	19.1	24.4	23.1	23.5	27.0	24.6	25.6
6	20.9	19.1	19.9	21.9	19.5	20.5	24.4	22.9	23.9	26.7	24.7	25.7
7	21.9	20.4	21.1	21.4	18.5	19.5	25.9	23.6	24.5	25.7	23.7	24.7
8	23.2	21.4	22.3	20.1	18.4	19.2	26.5	24.5	25.4	26.6	24.0	25.2
9	23.7	21.9	22.8	21.5	19.9	20.6	26.5	24.8	25.6	27.7	25.6	26.5
10	24.2	22.5	23.3	21.6	20.6	21.1	26.6	24.6	25.6	26.9	25.4	26.3
11	23.6	20.5	22.8	21.4	20.9	21.1	28.2	26.1	27.0	26.8	24.7	25.8
12	20.5	15.3	17.0	22.8	21.0	21.8	27.8	26.1	26.9	26.5	25.4	25.9
13	15.6	13.0	14.4	22.4	16.0	19.7	26.8	25.3	26.0	27.3	24.8	25.9
14	16.0	13.7	14.9	16.0	11.8	13.2	26.2	25.0	25.6	28.5	26.1	27.1
15	17.2	14.7	15.9	14.8	10.5	12.7	25.6	20.8	23.0	28.6	26.6	27.5
16	18.7	16.6	17.5	18.0	14.0	16.2	20.8	18.0	18.9	28.8	26.7	27.6
17	19.0	17.9	18.5	19.8	17.5	18.6	19.4	16.3	17.7	28.8	27.0	27.8
18	19.7	17.8	18.7	21.0	19.3	20.1	20.7	17.5	19.0	28.1	26.0	26.7
19	19.0	17.4	18.3	21.1	20.2	20.7	22.5	18.9	20.6	27.9	23.5	26.7
20	18.6	17.5	18.0	20.8	19.2	20.2	24.0	20.7	22.3	28.7	26.4	27.5
21	18.0	15.8	16.7	20.1	17.8	19.0	24.0	21.2	22.7	29.0	26.6	27.8
22	15.8	14.3	15.0	20.9	18.4	19.6	25.6	22.8	23.9	29.6	26.8	28.1
23	16.7	14.8	15.7	21.3	19.5	20.4	27.0	24.5	25.6	29.4	27.0	28.2
24	17.9	15.6	16.8	23.4	20.6	21.9	26.7	25.5	26.1	29.5	27.4	28.3
25	19.3	17.3	18.3	23.4	22.0	22.7	26.8	25.4	26.0	29.7	27.5	28.5
26	20.8	19.0	19.9	22.0	20.1	21.0	26.3	24.8	25.7	29.7	27.1	28.3
27	21.9	20.2	21.0	20.1	18.9	19.5	26.6	24.3	25.2	29.9	27.6	28.7
28	21.2	19.3	20.3	19.6	18.8	19.2	28.5	25.5	26.7	29.0	27.0	27.8
29	---	---	---	19.6	19.1	19.4	28.7	26.4	27.4	27.4	26.0	26.7
30	---	---	---	19.1	18.8	18.9	27.5	25.0	26.0	27.8	25.6	26.5
31	---	---	---	20.9	18.7	19.6	---	---	---	29.3	26.7	27.8
MONTH	24.2	13.0	18.6	23.4	10.5	19.5	28.7	16.3	24.0	29.9	22.2	26.6

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE 1999			JULY 1999			AUGUST 1999			SEPTEMBER 1999		
1	30.0	27.8	28.8	30.0	27.6	28.8	31.9	29.2	30.5	30.6	29.0	29.7
2	29.6	27.9	28.6	30.1	28.0	29.1	32.2	29.8	31.0	30.7	28.8	29.6
3	29.6	28.0	28.8	30.5	28.3	29.3	32.6	30.3	31.4	29.8	28.6	29.2
4	30.6	28.3	29.3	30.6	28.5	29.4	32.3	30.1	31.2	30.4	28.0	29.0
5	30.4	28.2	29.3	30.4	28.9	29.6	32.4	30.2	31.3	31.1	28.9	29.9
6	30.6	28.4	29.3	30.4	28.9	29.4	33.0	30.5	31.6	31.6	29.5	30.4
7	30.7	28.8	29.6	30.4	28.3	29.2	33.0	30.8	31.8	31.9	29.7	30.7
8	29.9	29.0	29.4	31.3	28.9	30.0	31.7	30.3	30.9	31.7	29.6	30.6
9	29.5	28.1	28.8	30.4	28.0	29.0	31.5	29.5	30.4	31.6	29.7	30.6
10	30.4	27.9	28.9	29.6	27.2	28.3	31.1	28.9	30.0	31.0	29.4	30.2
11	30.0	28.4	29.2	30.3	28.4	29.1	31.5	28.9	30.2	30.9	29.0	29.9
12	29.5	28.4	29.0	31.3	28.9	30.0	31.5	29.2	30.4	30.6	28.6	29.5
13	29.2	27.9	28.5	30.2	28.8	29.5	31.3	29.1	30.2	30.0	28.5	29.3
14	29.5	27.7	28.6	30.2	27.8	29.0	31.8	28.8	30.3	29.7	28.0	28.8
15	28.8	27.8	28.3	30.6	28.0	29.2	31.3	29.8	30.5	28.9	27.4	28.2
16	29.1	27.5	28.2	31.1	28.8	29.9	31.2	29.1	30.1	28.4	26.8	27.6
17	30.0	25.9	28.9	31.1	29.0	30.0	32.1	29.7	30.8	28.2	26.5	27.3
18	29.3	27.6	28.5	31.3	29.3	30.2	32.6	30.0	31.2	28.0	26.2	27.0
19	29.5	27.5	28.5	31.3	29.3	30.3	32.5	30.2	31.2	27.8	25.8	26.7
20	29.3	27.7	28.5	30.5	29.3	29.8	32.0	29.9	30.9	27.9	25.8	26.8
21	29.0	27.9	28.5	29.3	27.6	28.1	31.5	30.0	30.7	27.5	26.1	26.9
22	29.5	27.8	28.7	30.2	27.2	28.5	30.6	29.1	29.7	26.1	24.3	24.9
23	29.5	27.8	28.7	31.5	28.6	29.8	29.8	28.4	29.0	24.6	23.1	23.9
24	---	---	---	30.4	29.3	29.8	30.8	28.7	29.6	25.5	23.3	24.2
25	---	---	---	31.1	28.9	29.7	31.7	29.4	30.3	25.4	24.0	24.7
26	29.6	27.5	28.5	31.5	28.8	30.1	32.1	29.8	30.8	26.9	24.8	25.7
27	30.5	28.1	29.2	32.0	29.2	30.5	32.2	29.7	30.9	---	---	---
28	30.5	28.4	29.4	31.9	29.6	30.6	32.0	30.2	31.1	---	---	---
29	30.4	28.3	29.3	32.1	29.6	30.9	31.8	30.0	30.8	---	---	---
30	29.8	27.8	28.8	31.8	29.4	30.6	31.7	29.5	30.6	---	---	---
31	---	---	---	31.5	28.9	30.2	31.0	29.9	30.4	---	---	---
MONTH	---	---	---	32.1	27.2	29.6	33.0	28.4	30.6	---	---	---

Table 3. Maximum, minimum, and mean specific conductance, pH, water temperature, and dissolved oxygen in Christmas Bay, February 1999–February 2000—Continued

TEMPERATURE, IN DEGREES CELSIUS

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER 1999			NOVEMBER 1999			DECEMBER 1999			JANUARY 2000		
1	---	---	---	21.1	19.8	20.5	17.7	16.3	17.0	17.8	15.6	16.7
2	---	---	---	20.0	16.7	18.6	18.5	17.5	18.0	19.3	17.5	18.4
3	---	---	---	17.1	15.3	16.2	20.0	18.5	19.2	20.3	18.9	19.5
4	---	---	---	18.7	16.3	17.5	20.7	19.8	20.2	18.9	12.6	15.1
5	---	---	---	20.8	18.5	19.6	20.3	16.1	17.9	13.0	10.7	12.0
6	---	---	---	21.7	20.0	20.8	16.1	13.8	14.9	15.0	12.6	13.5
7	---	---	---	22.0	20.2	21.1	15.8	14.0	14.9	15.8	14.9	15.3
8	---	---	---	22.0	20.3	21.1	17.1	15.6	16.3	16.8	15.4	16.0
9	---	---	---	22.4	20.7	21.5	17.7	16.6	17.2	17.1	16.5	16.7
10	---	---	---	23.3	21.6	22.4	16.6	15.0	15.9	18.0	16.2	17.1
11	---	---	---	23.6	22.2	22.9	17.6	15.8	16.6	19.1	17.0	18.0
12	---	---	---	23.0	21.9	22.4	18.5	17.2	17.9	20.0	18.5	19.2
13	---	---	---	---	---	---	17.2	14.7	15.9	21.0	19.5	20.0
14	28.6	26.9	27.7	---	---	---	16.2	13.9	15.1	19.5	15.5	16.9
15	28.3	26.8	27.5	---	---	---	15.6	12.2	13.4	16.8	15.1	15.9
16	28.2	26.5	27.2	---	---	---	12.7	11.2	12.0	18.2	16.3	17.2
17	27.5	25.5	26.9	---	---	---	14.1	12.2	13.0	19.4	17.3	18.3
18	25.5	21.7	23.3	---	---	---	15.8	14.0	14.8	20.8	18.5	19.6
19	21.7	18.4	19.9	---	---	---	15.7	14.1	15.0	21.0	19.2	20.1
20	18.8	17.1	18.1	---	---	---	15.8	14.8	15.5	20.2	17.6	19.2
21	19.6	17.4	18.5	---	---	---	14.8	12.5	13.5	17.6	16.0	16.3
22	20.3	18.1	19.2	---	---	---	12.6	11.3	12.0	17.9	15.9	16.8
23	20.3	18.6	19.5	---	---	---	12.7	11.4	12.1	19.4	17.5	18.3
24	20.0	18.4	19.2	---	---	---	13.4	11.3	12.4	18.4	15.7	16.8
25	20.3	18.3	19.3	---	---	---	13.0	11.9	12.5	16.2	14.6	15.4
26	21.1	18.8	19.8	---	---	---	13.4	11.6	12.5	15.2	12.3	13.4
27	22.4	20.1	21.1	---	---	---	14.9	12.7	13.7	13.3	12.1	12.6
28	23.5	20.5	22.4	---	---	---	14.3	12.6	13.4	12.1	9.6	10.8
29	23.7	22.4	23.0	---	---	---	14.2	11.9	13.0	9.6	8.0	8.5
30	24.6	22.6	23.4	19.3	17.0	17.8	15.6	13.4	14.5	8.0	7.2	7.7
31	22.6	21.1	21.7	---	---	---	16.6	14.9	15.8	9.7	7.8	8.7
MONTH	---	---	---	---	---	---	20.7	11.2	15.0	21.0	7.2	15.8

DAY	MAX	MIN	MEAN
	FEBRUARY 2000		
1	10.8	9.6	10.2
2	10.9	10.2	10.6
3	12.9	10.3	11.5
4	14.3	12.1	13.0
5	13.4	11.4	12.4
6	13.4	11.7	12.6
7	15.4	13.3	14.3
8	16.9	14.6	15.7
9	18.1	15.7	16.8
10	19.2	16.7	17.9
11	20.3	18.1	19.2
12	21.1	19.6	20.4
13	20.9	19.9	20.4
14	21.5	19.9	20.6
15	22.0	20.2	21.1
16	21.5	21.0	21.3
17	22.7	20.8	21.6
18	23.2	21.3	22.2
19	22.7	19.2	20.6
20	19.2	17.6	18.2
21	19.3	17.1	18.2
22	20.3	18.3	19.2
23	21.1	19.2	20.1
24	22.1	20.0	21.0
25	21.9	20.8	21.4
26	21.4	19.9	20.9
27	19.9	17.9	19.0
28	20.2	18.0	19.2
29	22.8	19.1	20.0
30	---	---	---
31	---	---	---
MONTH	23.2	9.6	17.9

Table 3. Maximum, minimum, and mean specific conductance, pH, water temperature, and dissolved oxygen in Christmas Bay, February 1999–February 2000—Continued

DISSOLVED OXYGEN, IN MILLIGRAMS PER LITER

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY 1999			MARCH 1999			APRIL 1999			MAY 1999		
1	8.4	6.8	7.6	7.4	5.0	6.3	6.5	5.3	6.0	6.2	5.2	5.9
2	8.4	6.9	7.7	7.2	5.2	6.0	6.6	5.1	5.9	6.4	5.8	6.0
3	8.4	6.8	7.7	7.3	5.8	6.5	6.5	4.6	5.8	6.1	5.1	5.8
4	8.6	6.3	7.6	7.6	6.3	7.0	6.3	4.2	5.6	7.8	4.9	6.2
5	8.1	7.2	7.7	7.4	5.4	6.1	6.2	4.0	4.8	7.8	2.7	5.3
6	7.6	5.9	6.9	---	---	---	6.3	3.5	5.3	7.3	2.2	5.3
7	7.8	5.8	6.9	---	---	---	5.6	4.2	4.9	7.6	4.3	6.1
8	7.4	6.2	6.8	---	---	---	5.7	4.4	5.0	7.0	5.3	6.4
9	7.6	5.9	6.7	---	---	---	5.8	3.6	4.9	7.9	3.9	6.1
10	7.6	6.3	6.9	---	---	---	5.5	2.0	4.2	6.7	3.5	5.9
11	8.7	6.1	7.2	---	---	---	5.0	1.6	3.7	7.8	4.8	6.3
12	9.7	7.2	8.9	6.5	4.3	5.2	5.8	3.6	4.9	8.0	3.0	6.0
13	10.6	7.3	9.4	7.4	3.2	6.3	5.8	4.2	5.1	---	---	---
14	11.1	8.8	10.3	9.1	6.6	8.0	6.3	4.9	5.7	---	---	---
15	10.7	8.4	10.0	8.3	5.1	6.7	6.8	3.4	6.0	---	---	---
16	9.4	7.5	8.8	7.2	3.5	6.0	6.9	3.3	6.1	---	---	---
17	9.5	7.4	8.5	---	---	---	7.7	3.4	5.8	---	---	---
18	9.6	7.2	8.4	---	---	---	7.6	4.8	6.5	---	---	---
19	9.5	8.0	9.0	---	---	---	7.5	5.9	6.5	---	---	---
20	10.1	8.0	9.2	---	---	---	6.3	5.7	6.0	5.6	4.3	5.1
21	10.3	8.8	9.7	---	---	---	8.6	5.5	6.2	5.6	4.4	5.2
22	10.8	10.0	10.4	---	---	---	6.3	4.5	5.5	5.3	4.3	4.8
23	10.4	8.0	9.3	---	---	---	6.6	2.7	4.8	5.6	3.8	4.6
24	10.2	8.6	9.4	6.3	5.2	5.8	5.9	2.6	4.9	5.4	2.3	3.7
25	8.9	6.3	7.6	6.6	5.1	5.8	5.6	1.1	3.9	5.5	2.2	4.4
26	7.1	5.7	6.5	6.6	6.0	6.4	6.1	1.3	4.0	5.4	2.1	4.2
27	7.6	5.2	6.5	6.9	6.1	6.6	4.9	1.2	2.6	4.7	2.0	3.8
28	7.4	5.7	6.5	7.0	4.8	6.0	5.4	1.9	3.5	5.2	2.0	3.5
29	---	---	---	7.0	3.9	5.8	5.9	2.4	4.3	5.4	2.6	3.9
30	---	---	---	6.6	5.2	5.8	6.0	3.0	5.6	5.5	3.3	4.3
31	---	---	---	6.8	5.0	5.8	---	---	---	4.4	2.0	3.6
MONTH	11.1	5.2	8.1	---	---	---	8.6	1.1	5.1	---	---	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE 1999			JULY 1999			AUGUST 1999			SEPTEMBER 1999		
1	4.4	3.0	3.8	4.6	2.9	4.0	4.0	1.6	2.9	5.9	2.4	4.2
2	4.2	2.4	3.3	4.3	2.4	3.5	3.4	.4	1.9	6.1	3.1	5.1
3	4.6	1.9	3.3	4.1	.4	2.9	3.9	.3	2.0	5.7	2.7	4.4
4	4.6	3.0	4.0	3.9	.3	2.2	3.4	.3	2.1	6.4	4.0	5.3
5	4.7	3.0	4.1	2.5	.2	1.0	3.3	1.1	2.2	6.3	3.7	4.8
6	4.5	2.2	3.4	3.3	.2	1.7	2.7	.3	1.3	5.3	2.5	4.0
7	4.1	.7	2.7	3.0	.8	2.1	3.4	.8	2.0	5.7	2.8	4.5
8	4.3	2.1	3.2	3.6	1.5	2.8	3.6	1.1	2.4	6.0	2.7	4.6
9	4.3	1.9	3.5	3.7	2.4	3.2	4.7	2.8	3.6	5.8	2.7	4.3
10	4.4	2.8	3.8	4.6	1.5	2.9	4.9	2.9	3.8	5.1	3.4	4.6
11	4.1	2.7	3.6	3.5	.4	2.2	4.8	2.7	3.7	5.8	3.6	4.9
12	4.0	2.2	3.3	4.0	.2	2.4	4.4	2.7	3.6	5.8	4.5	5.2
13	4.3	.9	2.8	4.8	2.0	2.9	4.5	2.4	3.7	6.2	3.4	5.2
14	4.7	.9	2.5	4.1	1.4	3.2	4.4	.5	2.6	6.1	4.6	5.5
15	4.7	1.1	2.7	4.3	2.0	3.4	4.1	.4	2.7	6.1	4.2	5.3
16	3.9	1.5	2.8	4.7	1.1	3.0	3.8	1.1	2.3	6.3	3.1	5.5
17	7.1	2.1	4.2	4.5	.3	2.3	2.9	.3	1.5	6.1	3.1	5.0
18	5.3	4.5	4.8	4.1	1.9	2.9	3.6	.4	1.9	6.1	2.1	5.0
19	5.0	3.9	4.4	5.3	2.2	3.5	3.1	.3	1.8	6.0	3.0	4.6
20	4.8	3.5	4.1	5.7	1.2	3.2	3.5	.4	2.2	6.1	3.5	4.8
21	4.5	1.8	3.4	5.3	2.7	3.6	3.7	.3	1.8	6.7	4.5	5.8
22	4.7	1.7	3.5	4.2	1.4	2.2	3.6	2.0	3.1	6.6	5.5	6.2
23	5.0	3.6	4.2	3.5	.9	2.3	4.1	1.5	3.2	6.3	4.9	5.7
24	---	---	---	3.5	1.7	2.6	6.6	1.5	4.2	6.3	3.8	5.4
25	---	---	---	3.9	1.5	2.5	6.4	3.5	5.1	6.5	4.6	5.7
26	5.1	3.5	4.5	4.0	.3	2.7	6.4	1.7	4.5	6.1	3.8	5.3
27	4.8	4.1	4.4	4.2	1.0	2.7	6.2	3.2	4.6	---	---	---
28	4.7	3.7	4.2	4.6	1.3	3.1	5.0	2.2	3.9	---	---	---
29	4.3	2.6	3.5	4.2	1.9	3.2	5.8	1.6	3.2	---	---	---
30	4.8	2.7	4.1	4.3	2.6	3.6	5.5	1.3	3.5	---	---	---
31	---	---	---	4.7	2.7	3.8	5.6	2.4	4.1	---	---	---
MONTH	---	---	---	5.7	.2	2.8	6.6	.3	2.9	---	---	---

Table 3. Maximum, minimum, and mean specific conductance, pH, water temperature, and dissolved oxygen in Christmas Bay, February 1999–February 2000—Continued

DISSOLVED OXYGEN, IN MILLIGRAMS PER LITER

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER 1999			NOVEMBER 1999			DECEMBER 1999			JANUARY 2000		
1	---	---	---	6.6	4.4	5.7	9.3	8.4	8.8	9.7	8.0	9.0
2	---	---	---	6.8	5.2	6.2	8.9	8.4	8.6	9.1	7.9	8.7
3	---	---	---	7.2	6.1	6.7	8.5	8.0	8.2	8.7	6.9	7.9
4	---	---	---	7.0	6.6	6.8	8.2	6.6	7.6	10.3	7.5	9.5
5	---	---	---	6.7	6.0	6.3	8.7	6.7	8.1	11.2	9.9	10.7
6	---	---	---	6.5	5.1	6.0	9.7	7.6	8.9	10.9	9.6	10.4
7	---	---	---	6.3	4.6	5.5	10.3	6.7	9.0	10.4	9.1	9.7
8	---	---	---	6.2	4.4	5.5	10.0	7.4	8.9	9.9	6.2	8.4
9	---	---	---	6.5	4.7	5.7	9.0	7.8	8.3	8.8	5.0	7.3
10	---	---	---	6.2	4.3	5.5	9.8	7.5	8.8	9.5	4.9	8.2
11	---	---	---	6.2	5.1	5.6	9.5	8.1	8.8	9.1	5.1	7.6
12	---	---	---	6.0	4.9	5.5	9.2	7.7	8.4	8.4	6.9	7.8
13	---	---	---	---	---	---	9.7	8.2	8.8	8.8	4.8	6.9
14	6.2	4.8	5.5	---	---	---	9.8	8.3	9.0	9.7	8.5	9.3
15	6.1	4.7	5.5	---	---	---	10.7	9.2	10.1	9.5	7.7	8.9
16	6.0	5.1	5.5	---	---	---	11.0	9.4	10.1	9.1	6.5	8.3
17	5.7	4.4	5.1	---	---	---	11.1	9.2	10.3	9.0	6.9	8.1
18	5.6	5.0	5.3	---	---	---	10.6	7.8	9.7	9.0	6.6	7.8
19	6.3	5.5	6.0	---	---	---	10.2	8.8	9.7	8.6	7.3	7.9
20	6.6	5.0	5.9	---	---	---	10.1	9.4	9.7	8.6	6.1	8.1
21	6.8	4.9	5.7	---	---	---	10.6	9.0	10.0	9.3	7.8	8.8
22	6.6	4.6	5.6	---	---	---	11.6	10.4	11.2	9.0	5.3	7.7
23	5.9	4.3	5.1	---	---	---	11.8	8.2	11.0	9.2	4.5	7.4
24	5.6	4.1	5.1	---	---	---	11.9	8.4	10.8	9.1	6.2	8.0
25	5.1	4.0	4.7	---	---	---	12.2	9.8	11.3	9.5	5.8	7.8
26	4.9	3.5	4.3	---	---	---	11.5	9.3	10.6	10.7	8.3	10.1
27	4.8	3.4	4.2	---	---	---	11.9	8.9	10.3	10.9	9.9	10.6
28	8.0	3.7	6.0	---	---	---	11.2	9.9	10.6	11.9	10.6	11.2
29	6.9	4.9	6.2	---	---	---	11.1	9.6	10.4	13.2	11.7	12.7
30	6.9	5.4	6.1	9.2	8.6	8.9	10.4	8.4	9.6	13.9	11.8	13.4
31	6.7	4.8	5.5	---	---	---	10.3	8.4	9.4	13.7	12.3	13.3
MONTH	---	---	---	---	---	---	12.2	6.6	9.5	13.9	4.5	9.1

DAY	MAX	MIN	MEAN
	FEBRUARY 2000		
1	12.6	11.9	12.3
2	12.2	5.6	10.9
3	11.7	4.5	8.6
4	11.6	5.9	10.0
5	11.5	10.1	10.9
6	11.1	9.0	10.4
7	10.2	5.9	9.1
8	9.8	5.1	8.3
9	9.4	4.3	7.4
10	9.1	7.3	8.2
11	8.2	4.4	6.8
12	8.1	3.8	6.5
13	8.1	5.4	6.8
14	8.0	3.6	6.0
15	7.7	5.0	6.7
16	7.9	4.8	6.7
17	8.0	5.8	7.3
18	7.8	4.3	6.6
19	8.5	4.3	7.9
20	9.2	8.2	8.7
21	8.8	6.1	7.9
22	8.7	6.0	7.9
23	8.3	4.1	6.7
24	7.7	2.3	6.3
25	7.7	4.0	6.5
26	7.6	2.2	5.6
27	8.3	3.4	6.4
28	8.4	2.2	6.7
29	10.2	5.1	7.0
30	---	---	---
31	---	---	---
MONTH	12.6	2.2	7.8

Table 4. Monthly and periodic water-quality data in Christmas, Bastrop, and Drum Bays, February 1999–January 2000

[MG/L, milligrams per liter; US/CM, microsiemens per centimeter at 25 degrees Celsius; DEG C, degrees Celsius; <, less than; V, contamination; E, estimated; COLS./100 ML, colonies per 100 milliliters; UG/L, micrograms per liter; >, greater than]

CHRISTMAS BAY

DATE	TIME	OXYGEN, DIS- SOLVED (MG/L)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	SODIUM, DIS- SOLVED (MG/L AS NA)	ALKA- LINITY WAT DIS TOT IT FIELD (MG/L AS CACO3)	BICAR- BONATE WATER DIS IT FIELD (MG/L AS HCO3)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)
FEB 1999													
25...	0951	7.0	8.0	43100	17.6	373	1180	306	9550	--	--	15700	.6
MAR													
17...	0845	7.1	7.6	47100	17.6	399	1250	334	10300	102	120	17100	.6
APR													
21...	1012	6.4	8.1	42000	21.7	872	1140	304	9450	112	139	14700	1.1
MAY													
19...	1110	6.0	8.3	42800	26.0	357	1100	278	9260	104	127	14800	.6
JUN													
17...	1030	4.5	7.9	46800	28.1	382	1220	374	9640	122	140	17200	.9
JUL													
16...	0934	4.2	8.5	44000	28.8	382	1180	315	9320	116	142	15600	.6
AUG													
24...	1202	4.7	8.1	57800	29.8	405	1290	438	10600	132	161	20500	.7
SEP													
27...	0954	4.4	8.1	56400	26.0	423	1380	434	11000	150	183	20400	.6
OCT													
28...	0954	5.8	8.2	50400	21.6	367	1140	339	9160	98	128	17500	.6
NOV													
17...	0928	6.5	8.1	51900	20.0	381	1180	378	9600	108	138	18100	.7
DEC													
16...	0923	7.0	7.9	50700	11.3	371	1150	406	9630	101	123	17400	.5
JAN 2000													
21...	0918	7.7	7.7	52700	15.8	368	1150	358	9520	120	147	18100	.6

DATE	SILICA, DIS- SOLVED (MG/L AS SIO2)	SULFATE DIS- SOLVED (MG/L AS SO4)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHORUS TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	PLANK- TON BIOMASS ASH WT (MG/L)	PLANK- TON BIOMASS DRY WT (MG/L)
FEB 1999													
25...	<5.0	2050	<.020	.22	.26	<.050	.019	.021	.015	.024	2.8	123	126
MAR													
17...	<5.0	2250	.021	.16	.36	<.050	<.010	.017	.016	.038	V2.8	283	291
APR													
21...	5.4	1940	.024	.23	--	.074	<.010	.017	.023	.173	5.6	444	466
MAY													
19...	3.0	2180	.026	.26	.37	<.050	<.010	.018	.019	.039	4.2	594	612
JUN													
17...	3.2	2250	.071	E.07	.41	<.050	<.010	.021	.025	.056	4.3	229	238
JUL													
16...	E3.8	2120	<.020	.13	.13	<.050	<.010	.022	.022	.041	3.0	231	237
AUG													
24...	E3.8	2780	.053	.21	.26	<.050	<.010	.043	.034	.056	4.2	242	247
SEP													
27...	3.0	2890	<.020	.45	.24	<.050	<.010	.030	.022	.055	3.2	165	171
OCT													
28...	1.6	2270	<.020	.27	.43	<.050	<.010	.023	.014	.040	--	251	259
NOV													
17...	<1.0	2580	<.020	.20	.32	<.050	<.010	.020	.016	.042	2.2	280	290
DEC													
16...	.6	2390	.033	.17	.18	<.050	<.010	.016	.019	.030	1.6	--	--
JAN 2000													
21...	1.1	2240	.029	.24	.49	<.050	<.010	.015	.013	.079	3.1	--	--

Table 4. Monthly and periodic water-quality data in Christmas, Bastrop, and Drum Bays, February 1999–January 2000—Continued

CHRISTMAS BAY—CONTINUED

DATE	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML)	FECAL STREP, KF STRP MF, WATER (COL/100 ML)	CHLOR-A PHYTO-PLANK-TON CHROMO FLUOROM (UG/L)	CHLOR-B PHYTO-PLANK-TON CHROMO FLUOROM (UG/L)	ALUM-INUM, DIS-SOLVED (UG/L AS AL)	ANTI-MONY, DIS-SOLVED (UG/L AS SB)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)
FEB 1999													
25...	1	8	E.9	<.1	--	--	--	--	--	--	--	--	--
MAR													
17...	2	2	3.3	<.1	--	--	--	--	--	--	--	--	--
APR													
21...	1	66	1.2	<.1	--	--	--	--	--	--	--	--	--
MAY													
19...	1	54	1.6	<.1	26	<20.0	4.1	37.2	<20.0	<20.0	<1.0	<20.0	<20.0
JUN													
17...	1	30	4.1	<.1	--	--	--	--	--	--	--	--	--
JUL													
16...	1	1	1.0	<.1	--	--	--	--	--	--	--	--	--
AUG													
24...	2	4	4.8	.4	--	--	--	--	--	--	--	--	--
SEP													
27...	1	1	2.5	<.1	--	--	--	--	--	--	--	--	--
OCT													
28...	1	4	1.6	<.1	--	--	--	--	--	--	--	--	--
NOV													
17...	1	42	1.4	<.1	--	--	--	--	--	--	--	--	--
DEC													
16...	6	6	2.0	<.1	<20	<20.0	<4.0	37.9	<20.0	<20.0	2.8	<20.0	<20.0
JAN 2000													
21...	2	2	2.0	<.1	--	--	--	--	--	--	--	--	--

DATE	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, DIS-SOLVED (UG/L AS ZN)	2,6-DI-ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L)	ACETO-CHLOR, WATER FLTRD REC (UG/L)	ALA-CHLOR, WATER, DISS, REC, (UG/L)	ALPHA BHC DIS-SOLVED (UG/L)
FEB 1999													
25...	<500	--	<200	--	--	--	--	--	--	--	--	--	--
MAR													
17...	<500	--	<200	<.10	--	--	--	--	--	--	--	--	--
APR													
21...	<500	--	<150	<.10	--	--	--	--	--	<.003	<.002	<.002	<.002
MAY													
19...	<500	<20.0	<20.0	<.10	<20.0	<20.0	4.7	<20.0	<20	--	--	--	--
JUN													
17...	<250	--	<75.0	<.10	--	--	--	--	--	--	--	--	--
JUL													
16...	<500	--	<200	<.10	--	--	--	--	--	--	--	--	--
AUG													
24...	<500	--	<200	<.10	--	--	--	--	--	--	--	--	--
SEP													
27...	<10	--	42.3	<.10	--	--	--	--	--	--	--	--	--
OCT													
28...	<300	--	<90.0	<.23	--	--	--	--	--	--	--	--	--
NOV													
17...	<200	--	<60.0	<.23	--	--	--	--	--	--	--	--	--
DEC													
16...	<10	<20.0	<20.0	<.23	<20.0	35.6	<4.0	<20.0	33	--	--	--	--
JAN 2000													
21...	20	--	<2.2	<.23	--	--	--	--	--	--	--	--	--

Table 4. Monthly and periodic water-quality data in Christmas, Bastrop, and Drum Bays, February 1999–January 2000—Continued

CHRISTMAS BAY—CONTINUED

DATE	ATRAZINE, WATER, DISS, REC (UG/L)	BENFLURALIN WAT FLD 0.7 U GF, REC (UG/L)	BUTYLATE, WATER, DISS, REC (UG/L)	CARBARYL WATER FLTRD 0.7 U GF, REC (UG/L)	CARBOFURAN WATER FLTRD 0.7 U GF, REC (UG/L)	CHLORPYRIFOS DISSOLVED (UG/L)	CYANAZINE, WATER, DISS, REC (UG/L)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L)	DEETHYL ATRAZINE, WATER, DISS, REC (UG/L)	DIAZINON D10 SRG WAT FLT 0.7 U GF, REC PERCENT	DIAZINON, DISSOLVED (UG/L)	DIELDRIN DISSOLVED (UG/L)	DISULFOTON WATER FLTRD 0.7 U GF, REC (UG/L)
FEB 1999													
25...	--	--	--	--	--	--	--	--	--	--	--	--	--
MAR													
17...	--	--	--	--	--	--	--	--	--	--	--	--	--
APR													
21...	.052	<.002	<.002	<.003	<.003	<.004	<.010	<.002	E.008	77	<.002	<.001	<.017
MAY													
19...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUN													
17...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUL													
16...	--	--	--	--	--	--	--	--	--	--	--	--	--
AUG													
24...	--	--	--	--	--	--	--	--	--	--	--	--	--
SEP													
27...	--	--	--	--	--	--	--	--	--	--	--	--	--
OCT													
28...	--	--	--	--	--	--	--	--	--	--	--	--	--
NOV													
17...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC													
16...	--	--	--	--	--	--	--	--	--	--	--	--	--
JAN 2000													
21...	--	--	--	--	--	--	--	--	--	--	--	--	--

DATE	EPTC WATER FLTRD 0.7 U GF, REC (UG/L)	ETHALFLURALIN WAT FLT 0.7 U GF, REC (UG/L)	ETHOPROP WATER FLTRD 0.7 U GF, REC (UG/L)	FONOFOS WATER DISS REC (UG/L)	HCH ALPHA D6 SRG WAT FLT 0.7 U GF, REC PERCENT	LINDANE DISSOLVED (UG/L)	LINURON WATER FLTRD 0.7 U GF, REC (UG/L)	MALATHION, DISSOLVED (UG/L)	METHYL AZINPHOS WAT FLT 0.7 U GF, REC (UG/L)	METHYL PARATHION WAT FLT 0.7 U GF, REC (UG/L)	METOLACHLOR WATER DISSOLV (UG/L)	METRIBUZIN SENCOR WATER DISSOLV (UG/L)	MOLINATE WATER FLTRD 0.7 U GF, REC (UG/L)
FEB 1999													
25...	--	--	--	--	--	--	--	--	--	--	--	--	--
MAR													
17...	--	--	--	--	--	--	--	--	--	--	--	--	--
APR													
21...	<.002	<.004	<.003	<.003	87	<.004	<.002	<.005	<.001	<.006	.006	<.004	<.004
MAY													
19...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUN													
17...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUL													
16...	--	--	--	--	--	--	--	--	--	--	--	--	--
AUG													
24...	--	--	--	--	--	--	--	--	--	--	--	--	--
SEP													
27...	--	--	--	--	--	--	--	--	--	--	--	--	--
OCT													
28...	--	--	--	--	--	--	--	--	--	--	--	--	--
NOV													
17...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC													
16...	--	--	--	--	--	--	--	--	--	--	--	--	--
JAN 2000													
21...	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 4. Monthly and periodic water-quality data in Christmas, Bastrop, and Drum Bays, February 1999–January 2000—Continued

CHRISTMAS BAY—CONTINUED

DATE	NAPROP-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L)	P,P' DDE DISSOLV (UG/L)	PARA-THION, DIS-SOLVED (UG/L)	PEB-ULATE WATER FILTRD 0.7 U GF, REC (UG/L)	PENDI-METH-ALIN WAT FLT 0.7 U GF, REC (UG/L)	PER-METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L)	PRO-METON, WATER, DISS, REC (UG/L)	PRON-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L)	PROPA-CHLOR, WATER, DISS, REC (UG/L)	PRO-PANIL WATER FLTRD 0.7 U GF, REC (UG/L)	PRO-PARGITE WATER FLTRD 0.7 U GF, REC (UG/L)	SI-MAZINE, WATER, DISS, REC (UG/L)
FEB 1999													
25...	--	--	--	--	--	--	--	--	--	--	--	--	--
MAR													
17...	--	--	--	--	--	--	--	--	--	--	--	--	--
APR													
21...	<.003	<.006	<.004	<.004	<.004	<.005	<.002	<.018	<.003	<.007	<.004	<.013	.008
MAY													
19...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUN													
17...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUL													
16...	--	--	--	--	--	--	--	--	--	--	--	--	--
AUG													
24...	--	--	--	--	--	--	--	--	--	--	--	--	--
SEP													
27...	--	--	--	--	--	--	--	--	--	--	--	--	--
OCT													
28...	--	--	--	--	--	--	--	--	--	--	--	--	--
NOV													
17...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC													
16...	--	--	--	--	--	--	--	--	--	--	--	--	--
JAN 2000													
21...	--	--	--	--	--	--	--	--	--	--	--	--	--

DATE	TEBU-THIURON WATER FLTRD 0.7 U GF, REC (UG/L)	TER-BACIL WATER FLTRD 0.7 U GF, REC (UG/L)	TER-BUFOS WATER FLTRD 0.7 U GF, REC (UG/L)	TERBUTH YLAZINE SURROGT WAT FLT 0.7 U GF, REC PERCENT	THIO-BENCARB WATER FLTRD 0.7 U GF, REC (UG/L)	TRIAL-LATE WATER FLTRD 0.7 U GF, REC (UG/L)	TRI-FLUR-ALIN WAT FLT 0.7 U GF, REC (UG/L)	URANIUM NATURAL DIS-SOLVED (UG/L AS U)	SEDI-MENT, SUS-PENDED (MG/L)
FEB 1999									
25...	--	--	--	--	--	--	--	--	18
MAR									
17...	--	--	--	--	--	--	--	--	39
APR									
21...	<.010	<.007	<.013	112	<.002	<.001	<.002	--	319
MAY									
19...	--	--	--	--	--	--	--	<20.0	27
JUN									
17...	--	--	--	--	--	--	--	--	38
JUL									
16...	--	--	--	--	--	--	--	--	16
AUG									
24...	--	--	--	--	--	--	--	--	14
SEP									
27...	--	--	--	--	--	--	--	--	19
OCT									
28...	--	--	--	--	--	--	--	--	19
NOV									
17...	--	--	--	--	--	--	--	--	24
DEC									
16...	--	--	--	--	--	--	--	<20.0	15
JAN 2000									
21...	--	--	--	--	--	--	--	--	169

Table 4. Monthly and periodic water-quality data in Christmas, Bastrop, and Drum Bays, February 1999–January 2000—Continued

BASTROP BAY

DATE	TIME	OXYGEN, DIS- SOLVED (MG/L)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	SODIUM, DIS- SOLVED (MG/L AS NA)	ALKA- LINITY WAT DIS TOT IT FIELD (MG/L AS CACO3)	BICAR- BONATE WATER DIS IT FIELD (MG/L AS HCO3)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)
MAR 1999													
17...	1020	7.7	7.9	48800	18.4	426	1330	358	10900	108	138	17300	.6
APR													
21...	1140	7.0	7.9	48400	22.9	460	1440	368	12000	113	128	18000	1.3
MAY													
19...	1310	6.9	8.2	39600	27.5	343	1040	269	8370	110	134	13800	.6
JUN													
17...	1148	7.5	8.3	37100	29.1	314	959	264	7580	112	128	13500	.8
JUL													
16...	1048	5.8	8.3	45800	29.8	401	1240	328	9800	116	142	16300	.6
AUG													
24...	1331	4.8	8.0	57800	31.1	647	2000	446	16500	108	132	21000	.7
OCT													
28...	1117	6.6	8.0	51200	21.8	363	1050	371	8410	91	108	17400	.6
NOV													
17...	1143	7.1	8.1	49400	20.7	359	1100	292	9080	110	133	15400	.7
DEC													
16...	1130	7.1	8.0	50200	11.4	354	1100	380	9200	115	140	17100	.5
JAN 2000													
21...	1104	7.2	7.6	52200	13.1	367	1150	346	9500	108	132	17800	.6

DATE	SILICA, DIS- SOLVED (MG/L AS SIO2)	SULFATE DIS- SOLVED (MG/L AS SO4)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHORUS TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	PLANK- TON BIOMASS ASH WT (MG/L)	PLANK- TON BIOMASS DRY WT (MG/L)
MAR 1999													
17...	<5.0	2420	.042	.16	.35	<.050	<.010	.011	.012	.055	4.2	278	287
APR													
21...	2.3	2380	.055	.17	--	.097	<.010	.012	.022	.119	V3.3	610	645
MAY													
19...	<2.5	2030	.022	.28	.35	<.050	<.010	.009	.016	.029	3.0	277	284
JUN													
17...	.6	1770	.034	E.10	.47	<.050	<.010	.011	.019	.047	5.6	233	240
JUL													
16...	E2.7	1890	<.020	.17	.15	<.050	<.010	<.004	.020	.047	3.5	256	267
AUG													
24...	E1.7	2850	.049	.15	.22	<.050	<.010	.016	.015	.040	3.3	76.8	78.8
OCT													
28...	E1.2	2380	--	--	--	--	--	--	--	--	--	290	304
NOV													
17...	1.2	2390	<.020	.16	.28	<.050	<.010	.019	<.010	.036	2.1	259	270
DEC													
16...	<.1	2390	.043	E.07	.15	<.050	<.010	.018	.013	.029	1.3	--	--
JAN 2000													
21...	2.5	2230	<.020	.21	.36	<.050	<.010	.016	.018	.046	2.6	562	578

Table 4. Monthly and periodic water-quality data in Christmas, Bastrop, and Drum Bays, February 1999–January 2000—Continued

BASTROP BAY—CONTINUED

DATE	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	FECAL STREP, KF STRP MF, WATER (COL/ 100 ML)	CHLOR-A PHYTO-PLANK-TON CHROMO FLUOROM (UG/L)	CHLOR-B PHYTO-PLANK-TON CHROMO FLUOROM (UG/L)	ALUM-INUM, DIS-SOLVED (UG/L AS AL)	ANTI-MONY, DIS-SOLVED (UG/L AS SB)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)
MAR 1999													
17...	1	150	4.0	<.1	--	--	--	--	--	--	--	--	--
APR													
21...	1	120	5.0	<.1	--	--	--	--	--	--	--	--	--
MAY													
19...	4	64	1.9	<.1	<15	<15.0	5.0	32.3	<15.0	<15.0	<1.0	<15.0	<15.0
JUN													
17...	4	170	4.4	<.1	--	--	--	--	--	--	--	--	--
JUL													
16...	2	2	4.8	.2	--	--	--	--	--	--	--	--	--
AUG													
24...	1	110	8.3	.3	--	--	--	--	--	--	--	--	--
OCT													
28...	18	32	2.6	<.1	--	--	--	--	--	--	--	--	--
NOV													
17...	1	20	1.8	<.1	--	--	--	--	--	--	--	--	--
DEC													
16...	1	2	1.4	<.1	<20	<20.0	<4.0	38.0	<20.0	<20.0	6.0	<20.0	<20.0
JAN 2000													
21...	4	30	2.9	<.1	--	--	--	--	--	--	--	--	--

DATE	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, DIS-SOLVED (UG/L AS ZN)	2,6-DI-ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L)	ACETO-CHLOR, WATER FLTRD REC (UG/L)	ALA-CHLOR, WATER, DISS, REC, (UG/L)	ALPHA BHC DIS-SOLVED (UG/L)
MAR 1999													
17...	E420	--	<200	.12	--	--	--	--	--	--	--	--	--
APR													
21...	<500	--	<150	1.06	--	--	--	--	--	<.003	<.002	<.002	<.002
MAY													
19...	<500	<15.0	15.4	.13	<15.0	<15.0	5.3	<15.0	<15	--	--	--	--
JUN													
17...	<10	--	<3.0	<.10	--	--	--	--	--	--	--	--	--
JUL													
16...	<500	--	<200	<.10	--	--	--	--	--	--	--	--	--
AUG													
24...	<500	--	<200	<.10	--	--	--	--	--	--	--	--	--
OCT													
28...	30	--	18.4	<.23	--	--	--	--	--	--	--	--	--
NOV													
17...	<200	--	<60.0	<.23	--	--	--	--	--	--	--	--	--
DEC													
16...	<10	<20.0	<20.0	<.23	<20.0	39.0	<4.0	<20.0	<20	--	--	--	--
JAN 2000													
21...	160	--	<2.2	<.23	--	--	--	--	--	--	--	--	--

Table 4. Monthly and periodic water-quality data in Christmas, Bastrop, and Drum Bays, February 1999–January 2000—Continued

BASTROP BAY—CONTINUED

DATE	ATRAZINE, WATER, DISS, REC (UG/L)	BENFLURALIN WAT FLD 0.7 U GF, REC (UG/L)	BUTYLATE, WATER, DISS, REC (UG/L)	CARBARYL WATER FLTRD 0.7 U GF, REC (UG/L)	CARBOFURAN WATER FLTRD 0.7 U GF, REC (UG/L)	CHLORPYRIFOS DISSOLVED (UG/L)	CYANAZINE, WATER, DISS, REC (UG/L)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L)	DEETHYL ATRAZINE, WATER, DISS, REC (UG/L)	DIAZINON D10 SRG WAT FLT 0.7 U GF, REC PERCENT	DIAZINON, DISSOLVED (UG/L)	DIELDRIN DISSOLVED (UG/L)	DISULFOTON WATER FLTRD 0.7 U GF, REC (UG/L)
MAR 1999 17...	--	--	--	--	--	--	--	--	--	--	--	--	--
APR 21...	.029	<.002	<.002	<.003	<.003	<.004	<.004	<.002	E.005	77	<.002	<.001	<.017
MAY 19...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUN 17...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUL 16...	--	--	--	--	--	--	--	--	--	--	--	--	--
AUG 24...	--	--	--	--	--	--	--	--	--	--	--	--	--
OCT 28...	--	--	--	--	--	--	--	--	--	--	--	--	--
NOV 17...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC 16...	--	--	--	--	--	--	--	--	--	--	--	--	--
JAN 2000 21...	--	--	--	--	--	--	--	--	--	--	--	--	--

DATE	EPTC WATER FLTRD 0.7 U GF, REC (UG/L)	ETHALFLURALIN WAT FLT 0.7 U GF, REC (UG/L)	ETHOPROP WATER FLTRD 0.7 U GF, REC (UG/L)	FONOFOS WATER DISS REC (UG/L)	HCH ALPHA D6 SRG WAT FLT 0.7 U GF, REC PERCENT	LINDANE DISSOLVED (UG/L)	LINURON WATER FLTRD 0.7 U GF, REC (UG/L)	MALATHION, DISSOLVED (UG/L)	METHYL AZINPHOS WAT FLT 0.7 U GF, REC (UG/L)	METHYL PARATHION WAT FLT 0.7 U GF, REC (UG/L)	METOLACHLOR WATER DISSOLV (UG/L)	METRIBUZIN SENCOR WATER DISSOLV (UG/L)	MOLINATE WATER FLTRD 0.7 U GF, REC (UG/L)
MAR 1999 17...	--	--	--	--	--	--	--	--	--	--	--	--	--
APR 21...	<.002	<.004	<.003	<.003	84	<.004	<.002	<.005	<.001	<.006	.006	<.004	<.004
MAY 19...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUN 17...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUL 16...	--	--	--	--	--	--	--	--	--	--	--	--	--
AUG 24...	--	--	--	--	--	--	--	--	--	--	--	--	--
OCT 28...	--	--	--	--	--	--	--	--	--	--	--	--	--
NOV 17...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC 16...	--	--	--	--	--	--	--	--	--	--	--	--	--
JAN 2000 21...	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 4. Monthly and periodic water-quality data in Christmas, Bastrop, and Drum Bays, February 1999–January 2000—Continued

BASTROP BAY—CONTINUED

DATE	NAPROP-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L)	P,P' DDE DISSOLV (UG/L)	PARA-THION, DIS-SOLVED (UG/L)	PEB-ULATE WATER FILTRD 0.7 U GF, REC (UG/L)	PENDI-METH-ALIN WAT FLT 0.7 U GF, REC (UG/L)	PER-METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L)	PRO-METON, WATER, DISS, REC (UG/L)	PRON-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L)	PROPA-CHLOR, WATER, DISS, REC (UG/L)	PRO-PANIL WATER FLTRD 0.7 U GF, REC (UG/L)	PRO-PARGITE WATER FLTRD 0.7 U GF, REC (UG/L)	SI-MAZINE, WATER, DISS, REC (UG/L)
MAR 1999													
17...	--	--	--	--	--	--	--	--	--	--	--	--	--
APR													
21...	<.003	<.006	<.004	<.004	<.004	<.005	<.002	<.018	<.003	<.007	<.004	<.013	<.005
MAY													
19...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUN													
17...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUL													
16...	--	--	--	--	--	--	--	--	--	--	--	--	--
AUG													
24...	--	--	--	--	--	--	--	--	--	--	--	--	--
OCT													
28...	--	--	--	--	--	--	--	--	--	--	--	--	--
NOV													
17...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC													
16...	--	--	--	--	--	--	--	--	--	--	--	--	--
JAN 2000													
21...	--	--	--	--	--	--	--	--	--	--	--	--	--

DATE	TEBU-THIURON WATER FLTRD 0.7 U GF, REC (UG/L)	TER-BACIL WATER FLTRD 0.7 U GF, REC (UG/L)	TER-BUFOS WATER FLTRD 0.7 U GF, REC (UG/L)	TERBUTH YLAZINE SURROGT WAT FLT 0.7 U GF, REC PERCENT	THIO-BENCARB WATER FLTRD 0.7 U GF, REC (UG/L)	TRIAL-LATE WATER FLTRD 0.7 U GF, REC (UG/L)	TRI-FLUR-ALIN WAT FLT 0.7 U GF, REC (UG/L)	URANIUM NATURAL DIS-SOLVED (UG/L AS U)	SEDI-MENT, SUS-PENDED (MG/L)
MAR 1999									
17...	--	--	--	--	--	--	--	--	41
APR									
21...	<.010	<.007	<.013	105	<.002	<.001	<.002	--	128
MAY									
19...	--	--	--	--	--	--	--	<15.0	27
JUN									
17...	--	--	--	--	--	--	--	--	43
JUL									
16...	--	--	--	--	--	--	--	--	38
AUG									
24...	--	--	--	--	--	--	--	--	28
OCT									
28...	--	--	--	--	--	--	--	--	24
NOV									
17...	--	--	--	--	--	--	--	--	24
DEC									
16...	--	--	--	--	--	--	--	<20.0	21
JAN 2000									
21...	--	--	--	--	--	--	--	--	62

Table 4. Monthly and periodic water-quality data in Christmas, Bastrop, and Drum Bays, February 1999–January 2000—Continued

DRUM BAY

DATE	TIME	OXYGEN, DIS-SOLVED (MG/L)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	SODIUM, DIS-SOLVED (MG/L AS NA)	ALKA-LINITY WAT DIS TOT IT FIELD (MG/L AS CACO3)	BICAR-BONATE WATER DIS IT FIELD (MG/L AS HCO3)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)
FEB 1999 25...	1121	7.8	8.0	42400	19.1	359	1130	298	9220	--	--	15500	.6
MAR 17...	0926	7.0	7.7	47500	18.3	414	1300	174	10600	111	142	18200	.6
APR 21...	1102	6.6	7.7	44300	22.7	394	1200	296	10200	109	133	15800	1.0
MAY 19...	1205	6.4	8.1	43000	26.5	377	1150	256	9230	113	138	15000	.7
JUN 17...	1108	6.2	7.9	39700	28.2	330	1020	281	8090	93	102	14500	.8
JUL 16...	1008	5.0	8.2	43900	29.7	375	1160	317	9190	106	129	15300	.6
AUG 24...	1248	4.5	7.9	57400	30.4	401	1270	424	10500	110	134	20500	.7
SEP 27...	1042	5.2	8.0	60300	26.1	468	1300	472	12000	166	203	23000	.6
OCT 28...	1034	6.5	8.0	52100	21.6	365	1090	342	8760	111	142	17800	.6
NOV 17...	1059	5.6	8.0	51700	20.1	374	1150	336	9360	122	141	16500	.7
DEC 16...	1045	8.4	7.9	50800	10.2	364	1130	382	9460	118	144	17500	.5
JAN 2000 21...	0959	6.4	7.7	52900	15.0	362	1140	356	9380	117	143	18100	.6

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC DIS. (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	PHOS-PHORUS DIS-SOLVED (MG/L AS P)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P)	PHOS-PHORUS TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	PLANK-TON BIOMASS ASH WT (MG/L)	PLANK-TON BIOMASS DRY WT (MG/L)
FEB 1999 25...	<5.0	2020	.037	.22	.34	<.050	.023	.027	.016	.053	3.1	233	239
MAR 17...	<5.0	2340	.065	.21	.42	.055	<.010	.030	.027	.069	V2.5	670	692
APR 21...	3.3	2180	.060	.26	.38	.087	<.010	.024	.029	<.050	7.4	896	966
MAY 19...	3.3	2110	.028	.29	.42	<.050	<.010	.033	.018	.055	3.9	386	402
JUN 17...	3.5	1910	.067	E.07	.43	.053	.010	.013	.016	.053	4.6	221	228
JUL 16...	E3.5	1830	<.020	.20	.20	<.050	.015	.020	.025	.057	3.1	236	244
AUG 24...	E2.8	2810	.034	.23	.25	<.050	<.010	.037	.033	.071	4.1	258	264
SEP 27...	5.5	3180	.042	.35	.49	<.050	<.010	.018	.011	.070	6.1	433	467
OCT 28...	1.6	2320	.053	.30	.45	<.050	<.010	.035	.024	.054	3.8	287	299
NOV 17...	1.3	2560	--	--	--	--	--	--	--	--	--	284	295
DEC 16...	.4	2380	.048	.15	.19	<.050	<.010	.021	.019	.035	1.4	--	--
JAN 2000 21...	1.6	2260	<.020	.26	.45	<.050	<.010	.012	.013	.088	3.4	1020	1050

Table 4. Monthly and periodic water-quality data in Christmas, Bastrop, and Drum Bays, February 1999–January 2000—Continued

DRUM BAY—CONTINUED

DATE	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	FECAL STREP, KF STRP MF, WATER (COL/ 100 ML)	CHLOR-A PHYTO-PLANK-TON CHROMO FLUOROM (UG/L)	CHLOR-B PHYTO-PLANK-TON CHROMO FLUOROM (UG/L)	ALUM-INUM, DIS-SOLVED (UG/L AS AL)	ANTI-MONY, DIS-SOLVED (UG/L AS SB)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)
FEB 1999													
25...	24	88	E1.2	<.1	--	--	--	--	--	--	--	--	--
MAR													
17...	16	520	1.9	<.1	--	--	--	--	--	--	--	--	--
APR													
21...	2	>200	6.8	<.1	--	--	--	--	--	--	--	--	--
MAY													
19...	1	180	3.3	<.1	31	<20.0	3.6	37.9	<20.0	<20.0	<1.0	<20.0	<20.0
JUN													
17...	54	120	5.1	<.1	--	--	--	--	--	--	--	--	--
JUL													
16...	1	2	4.8	.3	--	--	--	--	--	--	--	--	--
AUG													
24...	1	92	6.3	.9	--	--	--	--	--	--	--	--	--
SEP													
27...	2	8	14.1	1.6	--	--	--	--	--	--	--	--	--
OCT													
28...	1	88	1.1	<.1	--	--	--	--	--	--	--	--	--
NOV													
17...	12	46	1.2	<.1	--	--	--	--	--	--	--	--	--
DEC													
16...	1	2	.3	<.1	<20	<20.0	<4.0	44.6	<20.0	<20.0	7.3	<20.0	<20.0
JAN 2000													
21...	4	28	2.5	<.1	--	--	--	--	--	--	--	--	--

DATE	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, DIS-SOLVED (UG/L AS ZN)	2,6-DI-ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L)	ACETO-CHLOR, WATER FLTRD REC (UG/L)	ALA-CHLOR, WATER, DISS, REC, (UG/L)	ALPHA BHC DIS-SOLVED (UG/L)
FEB 1999													
25...	<500	--	<200	--	--	--	--	--	--	--	--	--	--
MAR													
17...	<500	--	<200	1.52	--	--	--	--	--	--	--	--	--
APR													
21...	<500	--	<150	<.10	--	--	--	--	--	<.003	<.002	<.002	<.002
MAY													
19...	<500	<20.0	<20.0	<.10	<20.0	<20.0	3.4	<20.0	28	--	--	--	--
JUN													
17...	<250	--	4.0	<.10	--	--	--	--	--	--	--	--	--
JUL													
16...	<500	--	<200	<.10	--	--	--	--	--	--	--	--	--
AUG													
24...	<500	--	<200	<.10	--	--	--	--	--	--	--	--	--
SEP													
27...	<10	--	141	<.10	--	--	--	--	--	--	--	--	--
OCT													
28...	10	--	<2.2	<.23	--	--	--	--	--	--	--	--	--
NOV													
17...	<200	--	E38.3	<.23	--	--	--	--	--	--	--	--	--
DEC													
16...	<10	<20.0	<20.0	<.23	<20.0	32.4	<4.0	<20.0	21	--	--	--	--
JAN 2000													
21...	<10	--	<2.2	<.23	--	--	--	--	--	--	--	--	--

Table 4. Monthly and periodic water-quality data in Christmas, Bastrop, and Drum Bays, February 1999–January 2000—Continued

DRUM BAY—CONTINUED

DATE	ATRA- ZINE, WATER, DISS, REC (UG/L)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L)	BUTYL- ATE, WATER, DISS, REC (UG/L)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L)	CHLOR- PYRIFOS DIS- SOLVED (UG/L)	CYANA- ZINE, WATER, DISS, REC (UG/L)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L)	DIAZ- INON D10 SRG WAT FLT 0.7 U GF, REC PERCENT	DI- AZINON, DIS- SOLVED (UG/L)	DI- ELDRIN DIS- SOLVED (UG/L)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L)
FEB 1999													
25...	--	--	--	--	--	--	--	--	--	--	--	--	--
MAR													
17...	--	--	--	--	--	--	--	--	--	--	--	--	--
APR													
21...	.100	<.002	<.002	<.003	<.003	<.004	<.010	<.002	E.012	75	<.002	<.001	<.017
MAY													
19...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUN													
17...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUL													
16...	--	--	--	--	--	--	--	--	--	--	--	--	--
AUG													
24...	--	--	--	--	--	--	--	--	--	--	--	--	--
SEP													
27...	--	--	--	--	--	--	--	--	--	--	--	--	--
OCT													
28...	--	--	--	--	--	--	--	--	--	--	--	--	--
NOV													
17...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC													
16...	--	--	--	--	--	--	--	--	--	--	--	--	--
JAN 2000													
21...	--	--	--	--	--	--	--	--	--	--	--	--	--

DATE	EPTC WATER FLTRD 0.7 U GF, REC (UG/L)	ETHAL- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L)	FONOFOS WATER DISS REC (UG/L)	HCH ALPHA D6 SRG WAT FLT 0.7 U GF, REC PERCENT	LINDANE DIS- SOLVED (UG/L)	LIN- URON WATER FLTRD 0.7 U GF, REC (UG/L)	MALA- THION, DIS- SOLVED (UG/L)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L)	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L)	METO- LACHLOR WATER DISSOLV (UG/L)	METRI- BUZIN SENCOR WATER DISSOLV (UG/L)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L)
FEB 1999													
25...	--	--	--	--	--	--	--	--	--	--	--	--	--
MAR													
17...	--	--	--	--	--	--	--	--	--	--	--	--	--
APR													
21...	<.002	<.004	<.003	<.003	89	<.004	<.002	<.005	<.001	<.006	.016	<.004	<.004
MAY													
19...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUN													
17...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUL													
16...	--	--	--	--	--	--	--	--	--	--	--	--	--
AUG													
24...	--	--	--	--	--	--	--	--	--	--	--	--	--
SEP													
27...	--	--	--	--	--	--	--	--	--	--	--	--	--
OCT													
28...	--	--	--	--	--	--	--	--	--	--	--	--	--
NOV													
17...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC													
16...	--	--	--	--	--	--	--	--	--	--	--	--	--
JAN 2000													
21...	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 4. Monthly and periodic water-quality data in Christmas, Bastrop, and Drum Bays, February 1999–January 2000—Continued

DRUM BAY—CONTINUED

DATE	NAPROP-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L)	P,P' DDE DISSOLV (UG/L)	PARA-THION, DIS-SOLVED (UG/L)	PEB-ULATE WATER FILTRD 0.7 U GF, REC (UG/L)	PENDI-METH-ALIN WAT FLT 0.7 U GF, REC (UG/L)	PER-METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L)	PRO-METON, WATER, DISS, REC (UG/L)	PRON-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L)	PROPA-CHLOR, WATER, DISS, REC (UG/L)	PRO-PANIL WATER FLTRD 0.7 U GF, REC (UG/L)	PRO-PARGITE WATER FLTRD 0.7 U GF, REC (UG/L)	SI-MAZINE, WATER, DISS, REC (UG/L)
FEB 1999													
25...	--	--	--	--	--	--	--	--	--	--	--	--	--
MAR													
17...	--	--	--	--	--	--	--	--	--	--	--	--	--
APR													
21...	<.003	<.006	<.004	<.004	<.004	<.005	<.002	<.018	<.003	<.007	<.004	<.013	.007
MAY													
19...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUN													
17...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUL													
16...	--	--	--	--	--	--	--	--	--	--	--	--	--
AUG													
24...	--	--	--	--	--	--	--	--	--	--	--	--	--
SEP													
27...	--	--	--	--	--	--	--	--	--	--	--	--	--
OCT													
28...	--	--	--	--	--	--	--	--	--	--	--	--	--
NOV													
17...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC													
16...	--	--	--	--	--	--	--	--	--	--	--	--	--
JAN 2000													
21...	--	--	--	--	--	--	--	--	--	--	--	--	--

DATE	TEBU-THIURON WATER FLTRD 0.7 U GF, REC (UG/L)	TER-BACIL WATER FLTRD 0.7 U GF, REC (UG/L)	TER-BUFOS WATER FLTRD 0.7 U GF, REC (UG/L)	TERBUTH YLAZINE SURROGT WAT FLT 0.7 U GF, REC PERCENT	THIO-BENCARB WATER FLTRD 0.7 U GF, REC (UG/L)	TRIAL-LATE WATER FLTRD 0.7 U GF, REC (UG/L)	TRI-FLUR-ALIN WAT FLT 0.7 U GF, REC (UG/L)	URANIUM NATURAL DIS-SOLVED (UG/L AS U)	SEDI-MENT, SUS-PENDED (MG/L)
FEB 1999									
25...	--	--	--	--	--	--	--	--	47
MAR									
17...	--	--	--	--	--	--	--	--	106
APR									
21...	<.010	<.007	<.013	112	<.002	<.001	<.002	--	478
MAY									
19...	--	--	--	--	--	--	--	<20.0	27
JUN									
17...	--	--	--	--	--	--	--	--	49
JUL									
16...	--	--	--	--	--	--	--	--	37
AUG									
24...	--	--	--	--	--	--	--	--	36
SEP									
27...	--	--	--	--	--	--	--	--	18
OCT									
28...	--	--	--	--	--	--	--	--	34
NOV									
17...	--	--	--	--	--	--	--	--	69
DEC									
16...	--	--	--	--	--	--	--	<20.0	9
JAN 2000									
21...	--	--	--	--	--	--	--	--	165

Table 5. Semivolatile organic compounds in samples collected using a semipermeable membrane device deployed in Christmas Bay, February 29–March 29, 2000

[µg/kg, micrograms per kilogram; <, less than]

Compound	Concentration (µg/kg)			Recovery (percent)
	Environmental sample	Field blank	Laboratory blank	Laboratory matrix spike
Phenol	[1,2]28.0	[1]39.1	<50	78.56
bis(2-Chloroethyl)ether	<100	<100	<50	77.99
2-Chlorophenol	<100	<100	<50	80.65
1,3-Dichlorobenzene	<100	<100	<50	71.48
1,4-Dichlorobenzene	<100	<100	<50	77.35
1,2-Dichlorobenzene	<100	<100	<50	76.43
bis(2-Chloroisopropyl)ether	<100	<100	<50	80.50
Hexachloroethane	<100	<100	<50	76.32
N-Nitrosodi-*n*-propylamine	<100	<100	<50	75.96
p-Cresol	[1]3.9	<100	<50	77.84
Nitrobenzene	<100	<100	<50	75.50
Isophorone	<100	<100	<50	77.49
2-Nitrophenol	<100	<100	<50	82.39
C8-Alkylphenol	<100	<100	<50	69.67
bis(2-Chloroethoxy)methane	<100	<100	<50	77.48
2,4-Dichlorophenol	<100	<100	<50	77.96
3,5-Dimethylphenol	<100	<100	<50	69.97
1,2,4-Trichlorobenzene	<100	<100	<50	80.33
Naphthalene	<100	<100	<50	85.01
2,4,6-Trimethylphenol	<100	<100	<50	[1]18.89
Hexachlorobutadiene	<100	<100	<50	79.86
Quinoline	<100	<100	<50	83.57
Isoquinoline	<100	<100	<50	72.28
4-Chloro-3-methylphenol	[1]5.1	<100	<50	79.70
Hexachlorocyclopentadiene	<100	<100	<50	[1]39.47
2,4,6-Trichlorophenol	<100	<100	<50	74.56
2-Chloronaphthalene	<100	<100	<50	79.23
2-Ethylnaphthalene	<100	<100	<50	72.79
2,6-Dimethylnaphthalene	[1]3.1	<100	<50	84.32
1,6-Dimethylnaphthalene	[1]1.0	<100	<50	80.83
Acenaphthylene	<100	<100	<50	78.86
1,2-Dimethylnaphthalene	<100	<100	<50	77.50
Dimethylphthalate	<100	<100	<50	81.50
2,6-Dinitrotoluene	<100	<100	<50	81.50
Acenaphthene	<100	<100	<50	83.89
4-Nitrophenol	<100	<100	<50	0
2,4-Dinitrotoluene	<100	<100	<50	88.87
2,4-Dinitrophenol	<100	<100	<50	90.54
2,3,6-Trimethylnaphthalene	<100	<100	<50	81.99
9*H*-Fluorene	<100	<100	<50	86.90
4-Chlorophenyl-phenylether	<100	<100	<50	83.54
Diethylphthalate	<100	[1]17.6	<50	92.45
N-Nitrosodiphenylamine	<100	<100	<50	92.31
Azobenzene	<100	<100	<50	81.33

Footnotes at end of table.

Table 5. Semivolatile organic compounds in samples collected using a semipermeable membrane device deployed in Christmas Bay, February 29–March 29, 2000—Continued

Compound	Concentration (μg/kg)			Recovery (percent)
	Environmental sample	Field blank	Laboratory blank	Laboratory matrix spike
4-Bromophenyl-phenylether	<100	<100	<50	86.04
1-Methyl-9*H*-fluorene	<100	<100	<50	92.05
Hexachlorobenzene	<100	<100	<50	86.67
Pentachloroanisole	<100	<100	<50	87.97
Dibenzothiophene	<100	<100	<50	87.00
Pentachlorophenol	<100	<100	<50	94.82
Pentachloronitrobenzene	<100	<100	<50	86.40
Phenanthrene	<100	<100	<50	87.27
Anthracene	<100	<100	<50	85.13
Acridine	<100	<100	<50	91.48
Phenanthridine	<100	<100	<50	92.91
9*H*-Carbazol	<100	<100	<50	90.58
2-Methylanthracene	<100	<100	<50	86.96
Benzo[*c*]cinnoline	<100	<100	<50	90.14
4,5-Methylenephenanthrene	<100	<100	<50	86.17
1-Methylphenanthrene	<100	<100	<50	88.46
Di-*n*-butylphthalate	<100	[1]12.8	<50	93.63
Anthraquinone	<100	<100	<50	82.35
Fluoranthene	<100	<100	<50	93.35
Pyrene	<100	<100	<50	84.84
1-Methylpyrene	<100	<100	<50	80.34
Butylbenzylphthalate	<100	<100	<50	87.67
Benz[*a*]anthracene	<100	<100	<50	89.98
Chrysene	<100	<100	<50	92.17
bis(2-Ethylhexyl)phthalate	[2]105	198	<50	93.16
2,2-Biquinoline	[1]3.5	<100	<50	93.09
Di-*n*-octylphthalate	[1]5.4	<100	<50	93.97
Benzo[*b*]fluoranthene	[1]3.0	<100	<50	93.01
Benzo[*k*]fluoranthene	[1].73	<100	<50	85.42
Benzo[*a*]pyrene	<100	<100	<50	90.99
Indeno[1,2,3-*cd*]pyrene	<100	<100	<50	97.83
Dibenz[*a,h*]anthracene	<100	<100	<50	89.93
Benzo[*ghi*]perylene	<100	<100	<50	92.37

[1] Estimated.

[2] Contaminated.

Table 6. Grain size in bed-sediment samples collected in Christmas, Bastrop, and Drum Bays, November 30, 1999

[Size of sieve was 0.062 millimeter; size of pipet was 0.004 millimeter. QA, quality assurance]

Station name	Sieve analysis (percent silt and clay)	Pipet analysis (percent clay)
Christmas Bay	32.5	21.2
Bastrop Bay	57.4	26.9
Drum Bay	72.5	44.7
Drum Bay split (QA)	72.1	45.9

Table 7. Carbon and major and trace elements in bed-sediment samples collected in Christmas, Bastrop, and Drum Bays, November 30, 1999

[UG/G, micrograms per gram; <, less than]

CHRISTMAS BAY

DATE	STATION NUMBER	DATE	TIME	CALCIUM BOT MAT FIELD PERCENT	MAGNESIUM BOT MAT FIELD PERCENT	POTASSIUM BOT MAT FIELD PERCENT	SODIUM BOT MAT FIELD PERCENT	SULFUR BOT MAT FIELD PERCENT	PHOSPHORUS BOT MAT FIELD PERCENT	CARBON, INORG, SED, BM WS,<63U (PERCENT)	CARBON, ORG + INORG, SED, BM DW, REC PERCENT	CARBON, ORGANIC SED, BM WS,<63U (PERCENT)
NOV 30...	08078800	19991130	1149	1.1	1.7	2.3	2.5	.29	.059	.28	1.2	.91

DATE	ALUMINUM BOT MAT FIELD PERCENT	ANTIMONY BOT MAT FIELD (UG/G)	ARSENIC BOT MAT FIELD (UG/G)	BARIUM BOT MAT FIELD (UG/G)	BERYLLIUM BOT MAT FIELD (UG/G)	BISMUTH BOT MAT FIELD (UG/G)	CADMIUM BOT MAT FIELD (UG/G)	CERIUM BOT MAT FIELD (UG/G)	CHROMIUM BOT MAT FIELD (UG/G)	COBALT BOT MAT FIELD (UG/G)	COPPER BOT MAT FIELD (UG/G)	EUROPIUM BOT MAT FIELD (UG/G)	GALLIUM BOT MAT FIELD (UG/G)
NOV 30...	7.6	.7	7.3	430	2.0	<1	<.1	74	76	12	22	1	17

DATE	GOLD BOT MAT FIELD (UG/G)	HOLMIUM BOT MAT FIELD (UG/G)	IRON BOT MAT FIELD PERCENT	LANTHANUM BOT MAT FIELD (UG/G)	LEAD BOT MAT FIELD (UG/G)	LITHIUM BOT MAT FIELD (UG/G)	MANGANESE BOT MAT FIELD (UG/G)	MERCURY BOT MAT FIELD (UG/G)	MOLYBDENUM BOT MAT FIELD (UG/G)	NEODYMIUM BOT MAT FIELD (UG/G)	NICKEL BOT MAT FIELD (UG/G)	NIOBIUM BOT MAT FIELD (UG/G)	SCANDIUM BOT MAT FIELD (UG/G)
NOV 30...	<1	1	3.6	44	24	53	540	.03	.6	34	28	14	13

DATE	SELENIUM BOT MAT FIELD (UG/G)	SILVER BOT MAT FIELD (UG/G)	STRONTIUM BOT MAT FIELD (UG/G)	TANTALUM BOT MAT FIELD (UG/G)	THALLIUM BED MAT D SIEVE TOTAL (UG/G)	TIN BOT MAT FIELD (UG/G)	TITANIUM, SED, BM WS,<63U REC PERCENT	VANADIUM BOT MAT FIELD (UG/G)	YTTERBIUM BOT MAT FIELD (UG/G)	YTTRIUM BOT MAT FIELD (UG/G)	ZINC BOT MAT FIELD (UG/G)	THORIUM BOT MAT FIELD (UG/G)	URANIUM BOT MAT FIELD (UG/G)
NOV 30...	.3	.5	120	1	<1	3	.390	110	2	24	100	13	3.1

BASTROP BAY

DATE	STATION NUMBER	DATE	TIME	CALCIUM BOT MAT FIELD PERCENT	MAGNESIUM BOT MAT FIELD PERCENT	POTASSIUM BOT MAT FIELD PERCENT	SODIUM BOT MAT FIELD PERCENT	SULFUR BOT MAT FIELD PERCENT	PHOSPHORUS BOT MAT FIELD PERCENT	CARBON, INORG, SED, BM WS,<63U (PERCENT)	CARBON, ORG + INORG, SED, BM DW, REC PERCENT	CARBON, ORGANIC SED, BM WS,<63U (PERCENT)
NOV 30...	290556095103501	19991130	1055	1.2	1.4	2.0	2.7	.44	.055	.28	1.2	.89

DATE	ALUMINUM BOT MAT FIELD PERCENT	ANTIMONY BOT MAT FIELD (UG/G)	ARSENIC BOT MAT FIELD (UG/G)	BARIUM BOT MAT FIELD (UG/G)	BERYLLIUM BOT MAT FIELD (UG/G)	BISMUTH BOT MAT FIELD (UG/G)	CADMIUM BOT MAT FIELD (UG/G)	CERIUM BOT MAT FIELD (UG/G)	CHROMIUM BOT MAT FIELD (UG/G)	COBALT BOT MAT FIELD (UG/G)	COPPER BOT MAT FIELD (UG/G)	EUROPIUM BOT MAT FIELD (UG/G)	GALLIUM BOT MAT FIELD (UG/G)
NOV 30...	6.8	.5	8.6	450	1.8	<1	<.1	65	67	10	20	1	15

Table 7. Carbon and major and trace elements in bed-sediment samples collected in Christmas, Bastrop, and Drum Bays, November 30, 1999—Continued

BASTROP BAY—CONTINUED

DATE	GOLD BOT MAT FIELD (UG/G)	HOLMIUM BOT MAT FIELD (UG/G)	IRON BOT MAT FIELD PERCENT	LANTHA-NUM BOT MAT FIELD (UG/G)	LEAD BOT MAT FIELD (UG/G)	LITHIUM BOT MAT FIELD (UG/G)	MANGA-NESE BOT MAT FIELD (UG/G)	MERCURY BOT MAT FIELD (UG/G)	MOLYB-DENUM BOT MAT FIELD (UG/G)	NEODYM-IUM BOT MAT FIELD (UG/G)	NICKEL BOT MAT FIELD (UG/G)	NIOBIUM BOT MAT FIELD (UG/G)	SCAN-DIUM BOT MAT FIELD (UG/G)
NOV													
30...	<1	<1	3.0	38	21	44	590	.03	.5	29	23	12	11

DATE	SELE-NIUM BOT MAT FIELD (UG/G)	SILVER BOT MAT FIELD (UG/G)	STRON-TIUM BOT MAT FIELD (UG/G)	TANTA-LUM BOT MAT FIELD (UG/G)	THAL-LIUM BED MAT D SIEVE TOTAL (UG/G)	TIN BOT MAT FIELD (UG/G)	TITA-NIUM, SED, BM WS,<63U REC PERCENT	VANA-DIUM BOT MAT FIELD (UG/G)	YTTER-BIUM BOT MAT FIELD (UG/G)	YTTRIUM BOT MAT FIELD (UG/G)	ZINC BOT MAT FIELD (UG/G)	THORIUM BOT MAT FIELD (UG/G)	URANIUM BOT MAT FIELD (UG/G)
NOV													
30...	.2	.4	120	1	<1	3	.340	93	2	22	86	11	2.4

DRUM BAY

DATE	STATION NUMBER	DATE	TIME	CALCIUM BOT MAT FIELD PERCENT	MAGNE-SIUM BOT MAT FIELD PERCENT	POTAS-SIUM BOT MAT FIELD PERCENT	SODIUM BOT MAT FIELD PERCENT	SULFUR BOT MAT FIELD PERCENT	PHOS-PHORUS BOT MAT FIELD PERCENT	CARBON, INORG, SED, BM WS,<63U (PER-CENT)	CARBON, ORG + INORG, SED, BM DW, REC PERCENT	CARBON, ORGANIC SED, BM WS,<63U (PER-CENT)
NOV												
30...	290035095133801	19991130	0921	1.8	1.7	2.2	2.8	.36	.058	.46	1.3	.82
30...	290035095133801	19991130	0945	1.8	1.6	2.2	2.7	.32	.057	.47	1.3	.83

DATE	ALUM-INUM BOT MAT FIELD PERCENT	ANTI-MONY BOT MAT FIELD (UG/G)	ARSENIC BOT MAT FIELD (UG/G)	BARIUM BOT MAT FIELD (UG/G)	BERYL-LIUM BOT MAT FIELD (UG/G)	BISMUTH BOT MAT FIELD (UG/G)	CADMIUM BOT MAT FIELD (UG/G)	CERIUM BOT MAT FIELD (UG/G)	CHRO-MIUM BOT MAT FIELD (UG/G)	COBALT BOT MAT FIELD (UG/G)	COPPER BOT MAT FIELD (UG/G)	EURO-PIUM BOT MAT FIELD (UG/G)	GALLIUM BOT MAT FIELD (UG/G)
NOV													
30...	7.2	.6	9.8	400	2.0	<1	<.1	68	71	11	23	1	16
30...	7.1	.6	9.3	390	2.0	<1	<.1	64	69	11	22	1	16

DATE	GOLD BOT MAT FIELD (UG/G)	HOLMIUM BOT MAT FIELD (UG/G)	IRON BOT MAT FIELD PERCENT	LANTHA-NUM BOT MAT FIELD (UG/G)	LEAD BOT MAT FIELD (UG/G)	LITHIUM BOT MAT FIELD (UG/G)	MANGA-NESE BOT MAT FIELD (UG/G)	MERCURY BOT MAT FIELD (UG/G)	MOLYB-DENUM BOT MAT FIELD (UG/G)	NEODYM-IUM BOT MAT FIELD (UG/G)	NICKEL BOT MAT FIELD (UG/G)	NIOBIUM BOT MAT FIELD (UG/G)	SCAN-DIUM BOT MAT FIELD (UG/G)
NOV													
30...	<1	1	3.3	40	22	49	750	.03	.5	30	26	12	12
30...	<1	<1	3.3	38	21	48	740	.03	.5	29	25	12	12

DATE	SELE-NIUM BOT MAT FIELD (UG/G)	SILVER BOT MAT FIELD (UG/G)	STRON-TIUM BOT MAT FIELD (UG/G)	TANTA-LUM BOT MAT FIELD (UG/G)	THAL-LIUM BED MAT D SIEVE TOTAL (UG/G)	TIN BOT MAT FIELD (UG/G)	TITA-NIUM, SED, BM WS,<63U REC PERCENT	VANA-DIUM BOT MAT FIELD (UG/G)	YTTER-BIUM BOT MAT FIELD (UG/G)	YTTRIUM BOT MAT FIELD (UG/G)	ZINC BOT MAT FIELD (UG/G)	THORIUM BOT MAT FIELD (UG/G)	URANIUM BOT MAT FIELD (UG/G)
NOV													
30...	.2	.4	130	1	<1	3	.360	98	2	24	91	12	2.5
30...	.2	.4	120	1	<1	3	.330	96	2	24	89	11	2.3

Table 8. Semivolatile organic compounds (mostly polycyclic aromatic hydrocarbons) in bed-sediment samples collected in Christmas, Bastrop, and Drum Bays, November 30, 1999

[µg/kg, micrograms per kilogram; <, less than; NA, not analyzed]

Compound	Concentration (µg/kg)					Recovery (percent)
	Christmas Bay sample	Bastrop Bay sample	Drum Bay sample	Drum Bay split sample	Laboratory blank	Laboratory matrix spike
Phenol	[1]17	[1]14.3	[1]14.9	[1]11.3	9.9	65.92
p-Cresol	[2]4.8	[2]3.7	[2]5.3	[2]4.9	<5	[2]14.52
C8-Alkylphenol	NA	NA	NA	NA	NA	NA
Naphthalene	<10	<10	[2]1.1	[2]1.2	<5	71.74
C1-128 isomers	<10	[2]2.6	[2]3.7	[2]4.2	<5	NA
2-Ethylnaphthalene	[2]1.6	[2]1.9	[2]2.4	[2]2.4	<5	70.08
2,6-Dimethylnaphthalene	[2]2.6	[2]5.0	[2]6.2	5.5	<5	66.89
1,6-Dimethylnaphthalene	[2]1.6	[2]2.5	[2]3.4	[2]3.1	<5	67.12
C2-128 isomers	[2]5.4	11.5	11.7	13.1	<5	NA
Acenaphthylene	[2]1.1	[2]2.0	[2]2.4	[2]3.2	<5	67.75
1,2-Dimethylnaphthalene	[2]1.9	[2]1.6	[2]2.4	[2]2.0	<5	69.50
Acenaphthene	<10	<10	<10	<10	<5	70.05
C3-128 isomers	[2]3.9	[2]8.1	10.2	11.1	<5	NA
2,3,6-Trimethylnaphthalene	[2]1.4	<10	[2]2.9	<10	<5	77.37
9*H*-Fluorene	<10	[2]1.4	[2]1.9	[2]1.9	<5	71.03
C4-128 isomers	<10	<10	<10	<10	<5	NA
1-Methyl-9*H*-fluorene	<10	[2]1.4	[2]1.7	<10	<5	74.15
C1-166 isomers	NA	NA	NA	NA	NA	NA
Dibenzothiophene	NA	NA	NA	NA	NA	NA
Phenanthrene	[2]2.1	[2]3.2	[2]5.9	[2]4.6	<5	75.14
Anthracene	[2]1.7	[2]3.0	[2]3.6	[2]3.9	<5	74.11
Acridine	NA	NA	NA	NA	NA	NA
Phenanthridine	NA	NA	NA	NA	NA	NA
9*H*-Carbazol	NA	NA	NA	NA	NA	NA
C5-128 isomers	<10	<10	<10	<10	<5	NA
C2-166 isomers	NA	NA	NA	NA	NA	NA
2-Methylanthracene	[2]1.1	[2]1.6	[2]2.2	[2]2.2	<5	70.43
4,5-Methylenephenanthrene	<10	[2]1.5	[2]2.0	[2]2.1	<5	77.94
C1-178 isomers	[2]3.2	[2]4.8	[2]6.6	[2]7.1	<5	NA
1-Methylphenanthrene	<10	[2]1.1	[2]1.4	[2]1.5	<5	75.48
C3-166 isomers	NA	NA	NA	NA	NA	NA
C2-178 isomers	<10	[2]5.2	[2]4.4	[2]6.6	<5	NA

Footnotes at end of table.

Table 8. Semivolatile organic compounds (mostly polycyclic aromatic hydrocarbons) in bed-sediment samples collected in Christmas, Bastrop, and Drum Bays, November 30, 1999—Continued

Compound	Concentration (μg/kg)					Recovery (percent)
	Christmas Bay sample	Bastrop Bay sample	Drum Bay sample	Drum Bay split sample	Laboratory blank	Laboratory matrix spike
Fluoranthene	[2]4.0	[2]7.6	[2]9.4	10.3	<5	89.25
Pyrene	[2]4.3	[2]7.2	10.9	11.7	<5	90.64
C3-178 isomers	<10	<10	[2]4.1	[2]5.1	<5	NA
C4-178 isomers	<10	<10	<10	<10	<5	NA
1-Methylpyrene	<10	[2]1.6	[2]2.3	[2]2.2	<5	91.65
C1-202 isomers	[2]3.6	[2]7.1	[2]8.3	[2]2.4	<5	NA
C2-202 isomers	[2]4.1	[2]7.5	[2]7.2	[2]1.7	<5	NA
C5-178 isomers	<10	<10	<10	<10	<5	NA
Benz(*a*)anthracene	[2]2.4	[2]4.6	[2]5.7	[2]6.1	<5	93.72
Chrysene	[2]1.3	[2]3.3	[2]3.2	[2]3.9	<5	80.95
C3-202 isomers	<10	<10	<10	[2]1.7	<5	NA
C1-228 isomers	[2]2.0	[2]4.9	[2]3.4	[2]4.5	<5	NA
C4-202 isomers	<10	<10	<10	[2]7.5	<5	NA
C5-202 isomers	<10	<10	<10	[2]2.0	<5	NA
C2-228 isomers	<10	<10	<10	<10	<5	NA
Benzo(*b*)fluoranthene	[2]4.8	10.3	10.6	12.3	<5	93.51
Benzo(*k*)fluoranthene	[2]1.7	[2]3.8	[2]5.8	[2]5.1	<5	76.43
Benzo(*e*)pyrene	[2]2.7	[2]5.8	[2]6.5	[2]7.0	<5	78.21
Benzo(*a*)pyrene	[2]2.8	[2]6.3	[2]6.7	[2]7.3	<5	81.69
Perylene	[2]9.3	14.2	13.8	14.8	<5	67.31
C1-252 isomers	[2]4.2	10.7	[2]9.6	10.6	<5	NA
C3-228 isomers	<10	<10	<10	<10	<5	NA
C2-252 isomers	<10	<10	[2]5.2	<10	<5	NA
C4-228 isomers	<10	<10	<10	<10	<5	NA
Indeno(1,2,3-*cd*)pyrene	[2]3.3	[2]5.6	[2]7.9	[2]8.0	<5	85.64
Dibenz(*a,h*)anthracene	[2]1.4	[2]2.4	[2]3.1	[2]2.7	<5	76.55
Benzo(*ghi*)perylene	[2]2.8	[2]4.5	[2]5.8	[2]6.2	<5	65.67
C3-252 isomers	<10	<10	<10	<10	<5	NA
C4-252 isomers	<10	<10	<10	<10	<5	NA
C5-228 isomers	<10	<10	[2]1.7	<10	<5	NA
C5-252 isomers	<10	<10	<5	<10	<5	NA
Coronene	[2]1.1	[2]1.6	[2]2.6	[2]2.4	<5	[2]29.32

[1] Contaminated.
[2] Estimated.

Table 9. Organochlorine pesticides in bed-sediment samples collected in Christmas, Bastrop, and Drum Bays, November 30, 1999

[Samples collected from top 3 centimeters of bottom sediments. All samples based on dry weight; units are micrograms per kilogram; <, less than]

Station name	Gamma-HCH (lindane)	Heptachlor	Aldrin	Heptachlor epoxide	Chlordane	Endosulfan I	Dieldrin	*p,p'*-DDE	Endrin
Christmas Bay	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bastrop Bay	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
Drum Bay	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Drum Bay split	<1.25	<1.25	<1.25	<1.25	<1.25	<1.25	<1.25	<1.25	<1.25

Station name	*p,p'*-DDD	*p,p'*-DDT	*p,p'*-Methoxychlor	Mirex	Toxaphene	PCB Aroclor 1242	PCB Aroclor 1254	PCB Aroclor 1260
Christmas Bay	<0.5	<0.5	<0.5	<0.5	<50	<5.0	<5.0	<5.0
Bastrop Bay	<.5	<.5	<.5	<.5	<50	<5.0	<5.0	<5.0
Drum Bay	<1.0	<1.0	<4.0	<1.0	<50	<5.0	<5.0	<5.0
Drum Bay split	<1.25	<1.25	<5.0	<1.25	<125	<5.0	<5.0	<5.0

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