HYDROLOGIC, WATER-QUALITY, AND METEOROLOGIC DATA FROM SELECTED SITES IN THE UPPER CATAWBA RIVER BASIN, NORTH CAROLINA, JANUARY 1993 THROUGH MARCH 1994

By M. L. Jaynes

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ABSTRACT

Hydrologic, water-quality, and meteorologic data were collected from January 1993 through March 1994 as part of a water-quality investigation of the Upper Catawba River Basin, North Carolina. Specific objectives of the investigation were to characterize the water quality of Rhodhiss Lake, Lake Hickory, and three tributary streams, and to calibrate hydrodynamic water-quality models for the two reservoirs.

Sampling locations included 11 sites in Rhodhiss Lake, 14 sites in Lake Hickory, and 3 tributary sites. Tributary sites were located at Lower Creek upstream from Rhodhiss Lake and at Upper Little River and Middle Little River upstream from Lake Hickory. During 21 sampling visits, specific conductance, pH, water temperature, dissolved-oxygen concentration, and water transparency were measured at all sampling locations. Water samples were collected for analysis of biochemical oxygen demand, fecal coliform bacteria, hardness, alkalinity, total and volatile suspended solids, suspended sediment, nutrients, total organic carbon, chlorophyll, iron, calcium, and magnesium from three sites in each reservoir and from the three tributary sites. Chemical and particle-size analyses of bottom material from Rhodhiss Lake and Lake Hickory were performed once during the study. At selected locations, automated instruments recorded water level, streamflow, water temperature, solar radiation, and air temperature at 15-minute intervals throughout the study.

Hydrologic data presented in the report include monthly water-level statistics and daily mean values of discharge. Diagrams, tables, and statistical summaries of water-quality data are provided. Meteorologic data in the report include monthly precipitation, and daily mean values of solar radiation and air temperature.

INTRODUCTION

The Upper Catawba River Basin extends from the lower Blue Ridge Mountains into the Piedmont Physiographic Province of North Carolina (fig. 1). Four mainstem reservoirs are located within about a 100-mile segment of the Catawba River as it flows through McDowell County and continues eastward through Burke, Caldwell, Catawba, and Alexander Counties. Moving downstream, these reservoirs are Lake James, Rhodhiss Lake, Lake Hickory, and Lookout Shoals Lake. These reservoirs were impounded between 1915 and 1928 to supply hydroelectric power for a growing textile industry. Today, besides power generation, reservoir uses include drinking and industrial water supply, waste assimilation, recreation, and habitat for fish and wildlife.

More than three decades ago, the North Carolina Department of Water Resources (1961) noted the importance of these mainstem reservoirs to the character and economic prosperity of the region. Although a ready and ample supply of water historically has aided industrial development and municipal growth in the region, pollution from municipal and industrial point sources has degraded the water quality of several streams in the Upper Catawba River Basin (North Carolina Department of Water Resources, 1961).

Waters of the Upper Catawba River Basin remain in high demand, and the ability to meet that demand depends, in part, on maintaining good water quality. Government regulation and advances in wastewater-treatment technology have helped improve water-quality conditions over time; however, point-source discharges are still a significant source of pollution in the basin today (North Carolina Department of Environment, Health, and Natural Resources, 1994). Furthermore, recent investigations indicate that nonpoint pollution from agricultural, silvicultural, and urban sources also adversely affects water quality in the basin (North Carolina Department of Environment, Health, and Natural Resources, 1994).

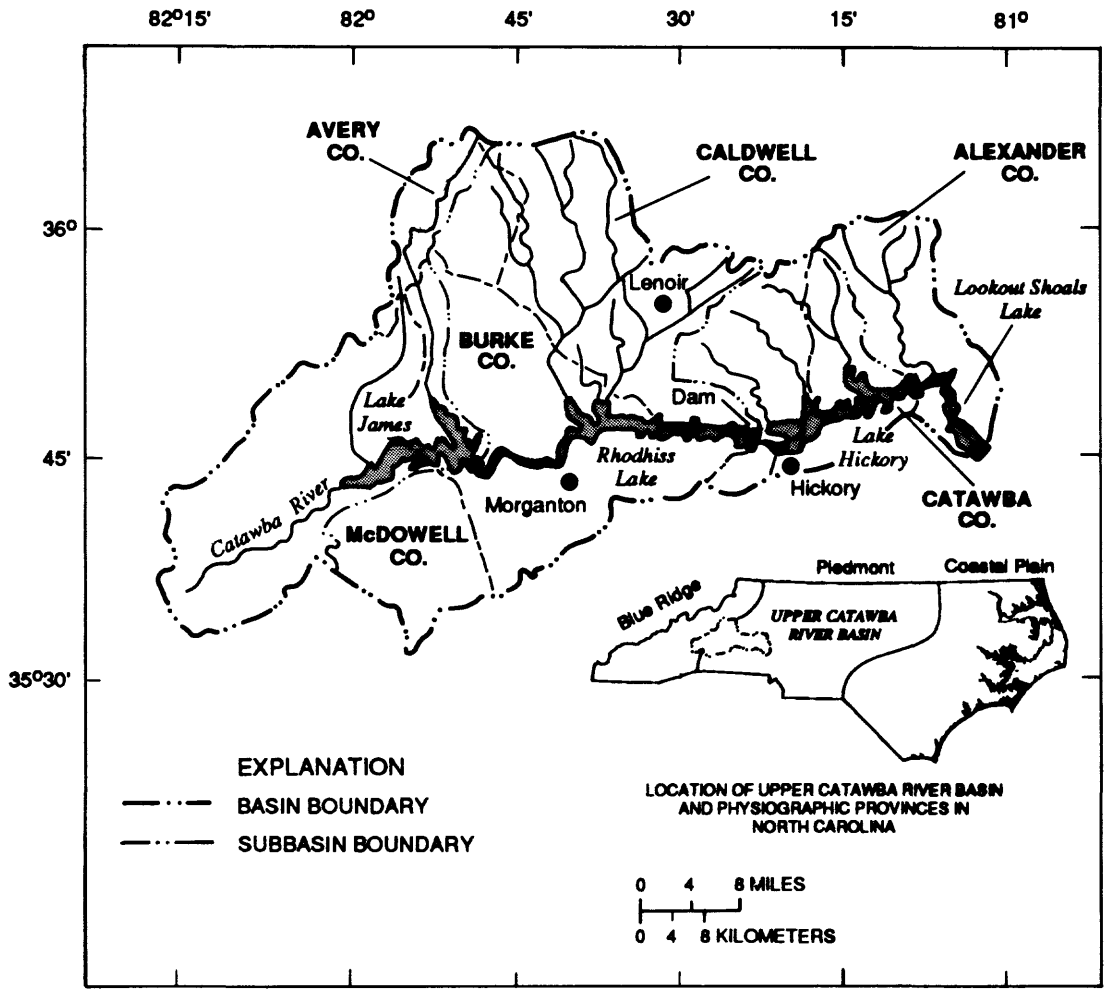


Figure 1. The Upper Catawba River Basin.

Despite the importance of water resources in the Upper Catawba River Basin, little is known about hydraulic circulation and constituent transport and transformation processes in the reservoirs. This information is needed to more effectively manage the reservoirs and to predict water-quality responses to future changes in nutrient loading or hydrologic regime. Such changes are likely to occur in the Upper Catawba River Basin as a result of new watershed-protection regulations, proposed wastewater-treatment plant expansions, and a new basin-wide approach used by State regulators to permit point-source discharges. Loadings of nonpoint-source pollutants could increase with development along reservoir shorelines and elsewhere in the watershed, or could decrease as a result of the adoption of forestry best-management practices (BMP's), the implementation of a statewide sedimentation control program, and the availability of cost share funding for installing agricultural BMP's.

During 1993-94, the U.S. Geological Survey (USGS), in cooperation with the Western Piedmont Council of Governments, conducted an investigation to

1. Characterize hydrologic and water-quality conditions in Rhodhiss Lake and one of its tributaries, and in Lake Hickory and two of its tributaries; and
2. Develop the capability of simulating circulation patterns and water-quality conditions in Rhodhiss Lake and Lake Hickory by the application of a computer model.

The study included monitoring water levels, streamflow, water quality, and selected meteorologic factors at strategic locations, analyzing data to characterize conditions during a 15-month period, and modeling circulation and water-quality processes in the two reservoirs.

Purpose and Scope

This report presents hydrologic, water-quality, and meteorologic data collected by the USGS from January 1993 through March 1994 during an investigation of water quality in Rhodhiss Lake, Lake Hickory, and three tributaries. Descriptions of the study sites and data-collection procedures are provided, followed by diagrams, tables, and statistical summaries of the data.

Hydrologic data include measurements of water level at reservoir headwater sites, and water-level and streamflow at a tributary to Rhodhiss Lake (Lower Creek) and two tributaries to Lake Hickory (Upper Little River and Middle Little River). Physical water-quality characteristics, including temperature, dissolved-oxygen concentration, specific conductance, pH, and water transparency, were measured in the field at 11 sites in Rhodhiss Lake and at 14 sites in Lake Hickory. Temperature, dissolved-oxygen concentration, specific conductance, and pH were measured in the field at the three tributary sites. Water samples were collected from three sites in each reservoir and were analyzed for biochemical oxygen demand, fecal coliform bacteria, hardness, alkalinity, total and volatile suspended solids, nutrients, total organic carbon, chlorophyll, iron, calcium, and magnesium. Water samples collected from the three tributary sites were analyzed for biochemical oxygen demand, fecal coliform bacteria, hardness, alkalinity, total and volatile suspended solids, suspended sediment, nutrients, total organic carbon, iron, calcium, and magnesium. Solar radiation and air temperature were measured at Oxford Dam on Lake Hickory. Records of precipitation at Rhodhiss Dam and Oxford Dam were provided by Duke Power Company.

Duke Power Company also measured water levels in the forebay of each reservoir and outflows from Rhodhiss and Oxford Dams. These data will be used to model hydrodynamic processes in the reservoirs; however, they are not presented in this report.

Description of Study Area

The Upper Catawba River Basin originates in the Blue Ridge physiographic province in western McDowell County and flows in an easterly direction into the Piedmont counties of Burke, Caldwell, Alexander, and Catawba. The basin has a warm, temperate climate (Lee, 1955). Mean annual precipitation is approximately 50 inches near Rhodhiss Lake and Lake Hickory, and 57 inches near Lake James (Eder and others, 1983).

Geologic formations in the basin are mostly Precambrian gneisses and schists (Lee, 1955). Steep slopes with stony soil materials, loam soils, or micaceous silty clay loams characterize higher elevations of the Upper Catawba, where predominant soil associations include Stony Rough Land, Talladega-Ramsey, and Porters-Ashe. At lower elevations, erodible red clay loams or gray sandy loams with red clay subsoils prevail, including the Hayesville-Cecil, Cecil-Lloyd, and Madison-Surry soil associations (Lee, 1955).

Low mountains, foothills, and rounded uplands characterize the topography of the Upper Catawba River Basin. Land use varies from sparsely populated, forested areas around the headwaters of Lake James, to agricultural regions, to highly-developed urban and industrial areas around the cities of Lenoir, Morganton, and Hickory (fig. 1). The basin contains numerous textile mills and furniture-manufacturing plants. In addition, the manufacture of textile machinery and dye products is important to the economy of the basin.

Rhodhiss Lake and Lake Hickory supply drinking water to several municipalities in the Upper Catawba River Basin. The two reservoirs and their tributaries also receive discharge from several domestic and industrial facilities, along with runoff from urban, agricultural, and silvicultural areas. Water-quality problems, such as algal blooms and elevated nutrient concentrations, have been observed in both reservoirs by the North Carolina Department of Environment, Health, and Natural Resources (1992 and 1994). Rhodhiss Lake and Lake Hickory have somewhat similar morphometric characteristics compared to the other two reservoirs in the Upper Catawba River Basin (table 1).

Rhodhiss Lake, located in Caldwell and Burke Counties, has been classified eutrophic by the U.S. Environmental Protection Agency (1975b) and the North Carolina Department of Environment, Health, and Natural Resources (1994). Principal municipalities in the watershed of Rhodhiss Lake include the cities of Lenoir and Morganton. The Catawba River is the dominant inflow to Rhodhiss Lake, followed by the Johns River and Lower Creek (fig. 2). Duke Power Company regulates water release at Rhodhiss Dam.

Table 1. Characteristics of four reservoirs in the Upper Catawba River Basin

[Locations of the reservoirs are shown in figure 1. Mean depth was calculated as volume divided by surface area. Source: Mr. William Foris, Duke Power Company, written commun., August 17, 1994]

Characteristic	Lake James	Rhodhiss Lake	Lake Hickory	Lookout Shoals Lake
Year of initial hydroelectric operation	1919	1925	1928	1915
Drainage area (square kilometers)	984	2,823	3,393	3,755
Surface area (square kilometers)	26.3	10.4	14.0	3.4
Mean depth (meters)	13.5	8.0	11.2	9.7
Maximum depth (meters)	36	16	26	21
Volume (10^6 cubic meters)	356	83	157	33
Volume divided by mean inflow (days)	208	21	33	7

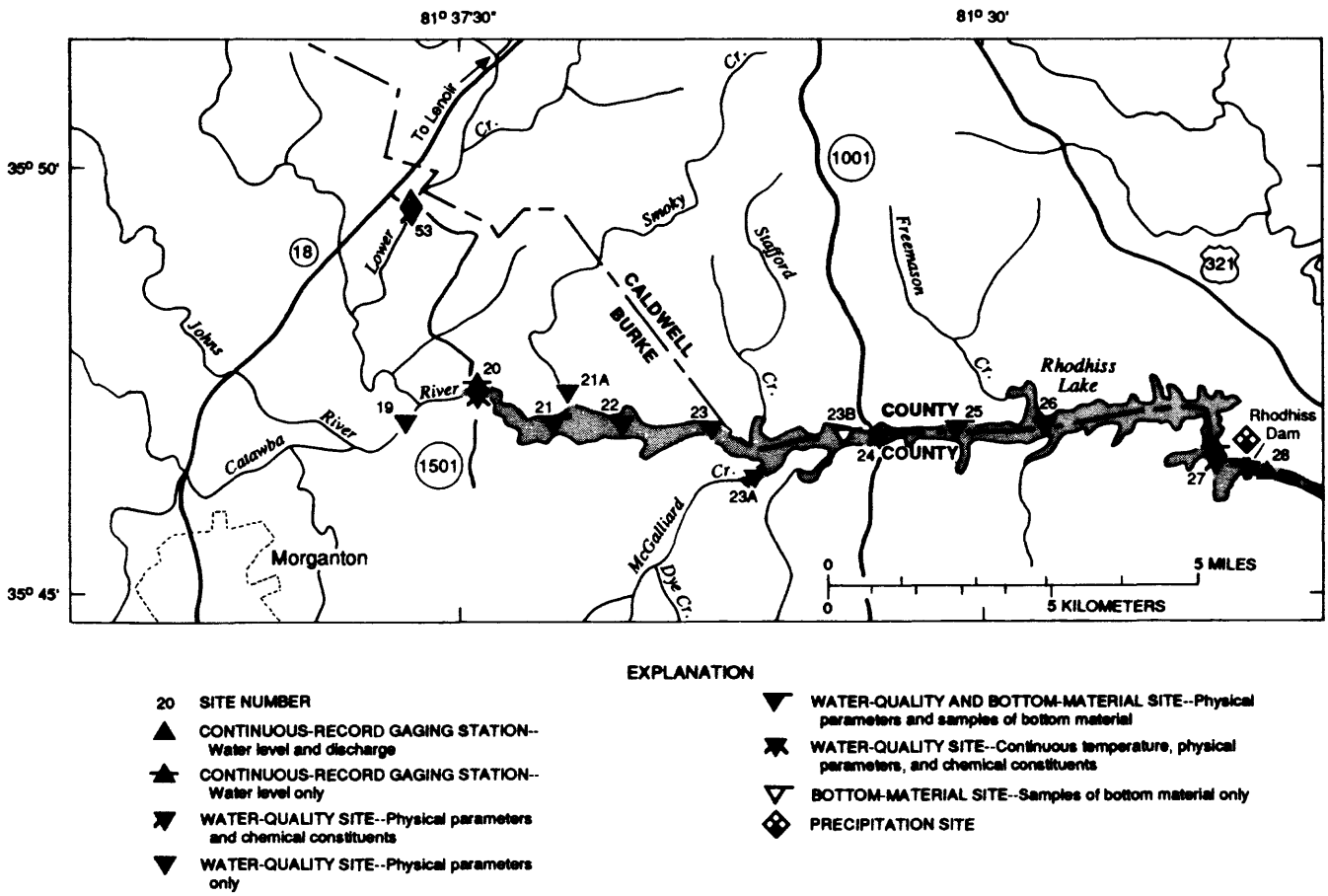
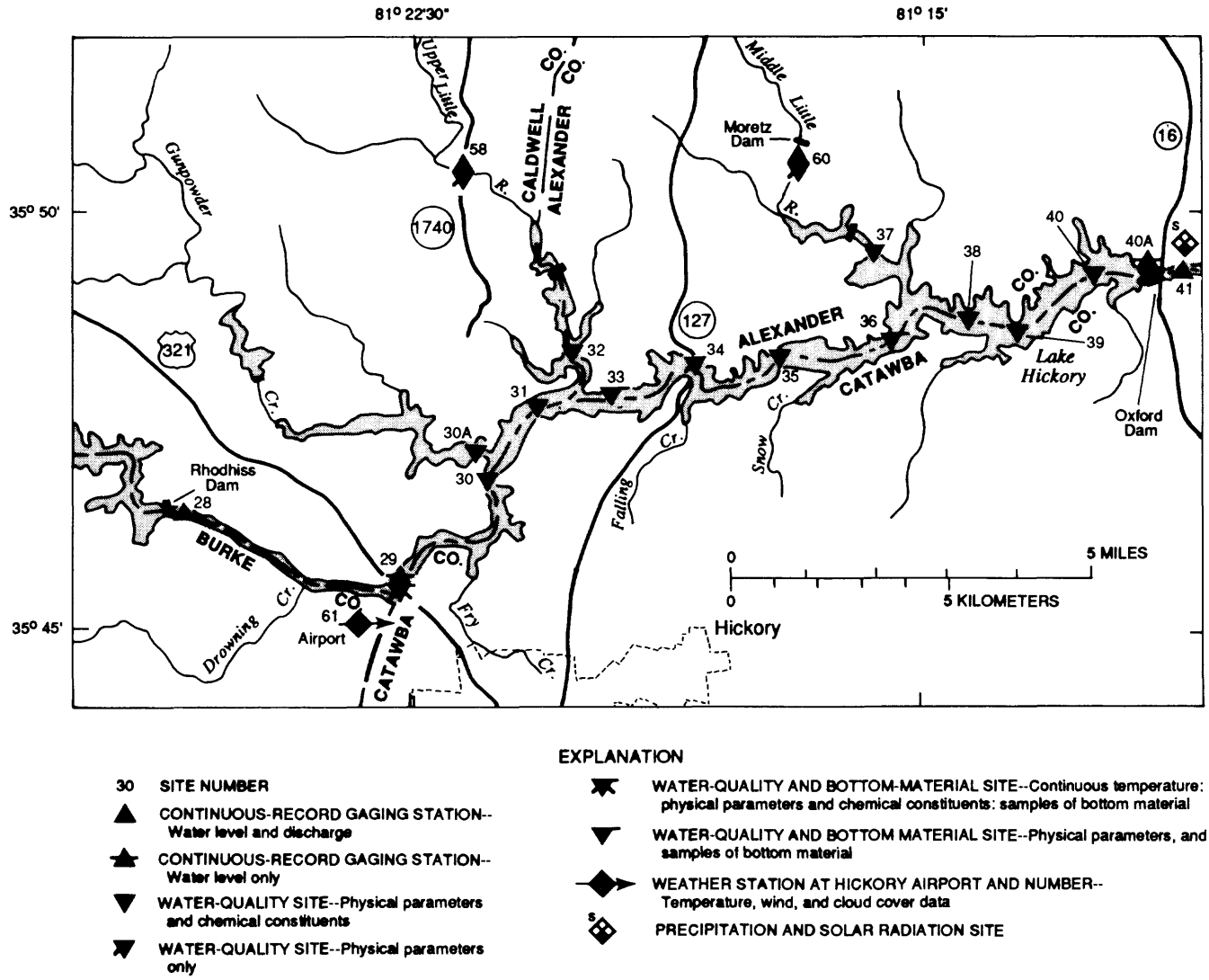


Figure 2. Data-collection sites at Rhodhiss Lake.

Lake Hickory, which adjoins Caldwell, Burke, Alexander, and Catawba Counties (fig. 3), also has been classified eutrophic (U.S. Environmental Protection Agency, 1975a; North Carolina Department of Environment, Health, and Natural Resources, 1994). The city of Hickory is the largest municipality in the Lake Hickory watershed. Major inflows include Gunpowder Creek, Upper Little River, Middle Little River, and releases from Rhodhiss Dam (fig. 3). Release of water from the reservoir through the Lake Hickory dam, also known as Oxford Dam, is regulated by Duke Power Company.



EXPLANATION

- 30 SITE NUMBER
- CONTINUOUS-RECORD GAGING STATION--Water level and discharge
- CONTINUOUS-RECORD GAGING STATION--Water level only
- WATER-QUALITY SITE--Physical parameters and chemical constituents
- WATER-QUALITY SITE--Physical parameters only
- WATER-QUALITY AND BOTTOM-MATERIAL SITE--Continuous temperature: physical parameters and chemical constituents: samples of bottom material
- WATER-QUALITY AND BOTTOM MATERIAL SITE--Physical parameters, and samples of bottom material
- WEATHER STATION AT HICKORY AIRPORT AND NUMBER--Temperature, wind, and cloud cover data
- PRECIPITATION AND SOLAR RADIATION SITE

Figure 3. Data-collection sites at Lake Hickory.

Acknowledgments

This study was conducted in cooperation with the Western Piedmont Council of Governments (WPCOG), with contributions from 30 local governments in Alexander, Burke, Caldwell, Catawba, and McDowell Counties. The Appalachian Regional Commission provided funds to the WPCOG in support of water-quality aspects of the project. The assistance throughout the investigation of Mr. R. Douglas Taylor, Mr. Michael R. Struve, and Mr. H. DeWitt Blackwell, Jr., of the WPCOG is appreciated. Mr. Jerry Twiggs, Director of Public Utilities for the City of Hickory, secured support and assistance during the investigation in a number of ways. He arranged for fecal coliform analyses by the City of Hickory Water Filtration Plant, biochemical oxygen demand analyses by the Henry Fork Wastewater Treatment Plant, and safe storage for the boat between sampling trips at a City of Hickory facility. Duke Power Company staff assisted with reconnaissance sampling and permitted a solar radiation monitor to be placed on their property. They also provided data to the USGS, including hourly reservoir levels at forebay sites, hourly dam release records, and daily totals of precipitation.

DATA-COLLECTION METHODS

Data collection began in January 1993 and ended in March 1994. Data were collected from 32 sites located at Rhodhiss Lake, Lake Hickory, and three influent streams (figs. 2 and 3; table 2). The three tributary sites included Lower Creek, a tributary to Rhodhiss Lake (fig. 2), and Upper Little River and Middle Little River, tributaries to Lake Hickory (fig. 3).

Water level was measured at one headwater site in each reservoir, and water level and streamflow were measured at the three tributary sites (figs. 2 and 3; table 2). Physical water-quality conditions were measured at 28 sites--11 in Rhodhiss Lake, 14 in Lake Hickory, and the 3 tributary sites. Water samples were collected for chemical characterization from three sites in each reservoir and from the three tributary sites. Field measurements were made and water samples were collected monthly from January through March 1993, twice monthly from April through September 1993, and monthly from October 1993 through March 1994. Once during the study, samples of bottom material were collected and composited from three sites in each reservoir. Meteorologic data were collected from three locations (figs. 2 and 3; table 2).

Measurement of Hydrologic Conditions

At the beginning of the study, continuous-record gages were established at one headwater site in each reservoir and at the three tributary sites (sites 20, 29, 53, 58, 60, figs. 2 and 3; table 2). The gages recorded water level, also referred to as stage, every 15 minutes. At the tributary sites, field personnel documented instantaneous stage and measured streamflow during each sampling trip, following procedures outlined by Buchanan and Somers (1968). Stage-discharge relations subsequently were developed for the three tributary streams, providing estimates of streamflow at 15-minute intervals.

Additional streamflow data were available from two pre-existing USGS gaging stations upstream from Rhodhiss Lake (stations 0213903612, Catawba River at Calvin; and 02140991, Johns River at Arneys Store). These data can be used to model hydrodynamic processes in the reservoirs; however, they are not presented in this report. Data from these two sites are published annually (Barker and others, 1994).

In addition to hydrologic measurements made by the USGS, Duke Power Company recorded water levels in the forebay of each reservoir (site 27, fig. 2; and site 40A, fig. 3) at hourly intervals. USGS personnel ran levels to the Rhodhiss and Hickory dams to check datums before entering water levels into the data base. Duke Power Company also provided hourly estimates of outflow from Rhodhiss and Oxford Dams based on kilowatts generated at the two power plants. During the summer of 1993, USGS personnel measured actual discharge below each dam during two different rates of power generation. Estimates derived from power-generation records were within 5 percent of discharge rates measured by USGS personnel.

Measurement of Physical Water-Quality Characteristics

Temperature, dissolved-oxygen concentration, specific conductance, and pH, were measured with a Hydrolab H20 multiparameter water-quality meter. The meter was linked to either a lap-top computer or a Hydrolab Surveyor 3 to display and log the data. At stream sites, measurements were made 0.1 meter (m) beneath the water surface at three equidistant points across a perpendicular transect of the channel. These "quarter points" were located 25, 50, and 75 percent of the distance from the left bank of the channel.

At reservoir sites, vertical profiles of temperature, dissolved-oxygen concentration, specific conductance, and pH were measured in order to characterize patterns of stratification. Readings generally were taken at 1- or 2-m vertical intervals throughout the water column at each site. To locate the thermocline to the nearest 0.5 m, measurements sometimes were made at smaller depth intervals. At reservoir sites where no water-chemistry samples were collected (table 2), profiles were measured only at midchannel. At water-chemistry sites 20, 24, 27, 29, 34, and 40A (figs. 2 and 3), measurements were made at three quarter points across a perpendicular transect of the channel. Water transparency was measured at each reservoir site using a Secchi disk.

In addition to data collected during routine sampling visits, water temperature was monitored continuously at headwater sites 20 and 29 in both reservoirs. At each of these sites, three temperature probes were installed--one near the water surface, one at the midpoint of the water column, and another near the reservoir bottom. Water temperature was measured every minute, and average values were recorded every 15 minutes at each depth.

Table 2. Description of data-collection network in the Upper Catawba River Basin

[Physical water-quality characteristics and chemical constituents are listed in text. --, data not collected; x, data collected; SR, secondary road]

Site number (figs. 2 and 3)	Site location and USGS downstream order identification number	Type of hydrologic measurement		Type of water-quality data			Type of meteorologic data
		Water level	Discharge	Physical	Chemical	Bottom material	
	Rhodhiss Lake sites						
19	Rhodhiss Lake, 0214101475	--	--	x	--	--	--
20	Rhodhiss Lake at Huffman Bridge, SR 1501, 0214126765	x	--	x	x	--	--
21	Rhodhiss Lake, 0214126800	--	--	x	--	x	--
21A	Smoky Creek at Amherst, 0214127125	--	--	x	--	--	--
22	Rhodhiss Lake, 0214127175	--	--	x	--	--	--
23	Rhodhiss Lake, 0214134900	--	--	x	--	--	--
23A	McGalliard Creek above mouth, 0214142595	--	--	x	--	--	--
23B	Rhodhiss Lake, 0214146090	--	--	--	--	x	--
24	Rhodhiss Lake at Castle Bridge, SR 1001, 0214146100	--	--	x	x	--	--
25	Rhodhiss Lake, 0214146295	--	--	x	--	x	--
26	Rhodhiss Lake, 0214147230	--	--	x	--	--	--
27	Rhodhiss Lake at Rhodhiss Dam, 0214148975	x[a]	--	x	x	--	Precipitation[a].
	Lake Hickory sites						
28	Lake Hickory below Rhodhiss Dam, 0214149005	x[a]	x[a]	--	--		--
29	Lake Hickory at U.S. 321, 0214157625	x	--	x	x	x	--
30	Lake Hickory above Gunpowder Creek, 0214179775	--	--	x	--	--	--
30A	Gunpowder Creek at SR 1751, 0214179800	--	--	x	--	--	--
31	Lake Hickory above Upper Little River, 0214179810	--	--	x	--	--	--
32	Upper Little River, 0.6 mi above mouth, 0214183410	--	--	x	--	--	--
33	Lake Hickory below Upper Little River, 0214183550	--	--	x	--	x	--
34	Lake Hickory at NC 127, 0214184000	--	--	x	x	--	--
35	Lake Hickory, 0214187210	--	--	x	--	--	--
36	Lake Hickory, 0214187285	--	--	x	--	x	--
37	Lake Hickory, Middle Little River arm below SR 1137, 0214192595	--	--	x	--	--	--
38	Lake Hickory, 0214193528	--	--	x	--	--	--
39	Lake Hickory, 0214193585	--	--	x	--	--	--
40	Lake Hickory, 0214193597	--	--	x	--	--	--
40A	Lake Hickory above Oxford Dam, 0214196095	x[a]	--	x	x	--	Solar radiation, air temperature, precipitation[a].
41	Catawba River below Oxford Dam, 0214196105	x[a]	x[a]	--	--	--	--
	Tributary sites						
53	Lower Creek near Morganton at SR 1501, 02141245	x	x	x	x	--	--
58	Upper Little River at SR 1740 at Petra Mills, 0214183365	x	x	x	x	--	--
60	Middle Little River at Moretz Dam near Bethlehem, 0214192500	x	x	x	x	--	--
	Additional meteorologic site						
61	Hickory FAA Airport, 354426081233201	--	--	--	--	--	Precipitation, air temperature, wind speed and direction, cloud cover.

[a] Measured by Duke Power Company. Water level and discharge data are not presented in this report.

Collection of Water-Chemistry Samples

Chemical constituents were sampled from the three tributary sites and from three sites in each reservoir (table 2). Tributary samples from Lower Creek, Upper Little River, and Middle Little River (sites 53, 58, and 60, respectively; figs 2 and 3) were analyzed for suspended sediment, total and volatile suspended solids, total organic carbon (TOC), fecal coliform bacteria, nutrients (total ammonia plus organic nitrogen, dissolved ammonia-nitrogen, dissolved nitrite plus nitrate-nitrogen, total phosphorus, and dissolved orthophosphorus), biochemical oxygen demand (BOD), hardness, alkalinity, iron, calcium, and magnesium. The six reservoir sites were chosen to represent headwater, midsection, and forebay areas of Rhodhiss Lake and Lake Hickory (figs. 2 and 3). Water samples from the reservoirs were analyzed for total and volatile suspended solids, TOC, fecal coliform bacteria, nutrients, BOD, hardness, alkalinity, chlorophyll, iron, calcium, and magnesium.

Sample-collection methods varied depending on the type of site and the constituents being sampled. At tributary sites 53, 58, and 60, composite samples were collected for most constituents. To obtain a composite, water was collected from several points across the stream using a depth-integrating sampler (Edwards and Glysson, 1988). A model DH-48 sampler (or DH-76 TM if the stream was not wadable) was used to collect composite samples for determination of suspended sediment. A DH-81 (or DH-76 TM if stage was elevated) was used to collect composite samples for BOD, hardness, alkalinity, total and volatile suspended solids, nutrients, total iron, dissolved calcium, and dissolved magnesium. Grab samples for fecal coliform bacteria and TOC were collected at midchannel by hand-dipping or by using a weighted bottle holder because contact with compositing equipment could have contaminated these samples.

At each reservoir water-chemistry site (sites 20, 24, 27, 29, 34, and 40A; figs. 2 and 3), water was collected from three depths in order to characterize water-quality conditions near the surface (0.5 m below surface), near the bottom (1.0 m above bottom), and at the thermocline. Water from the three layers was collected at quarter points across a perpendicular transect of the channel using an Alpha-type water sampler, also known as a horizontal Van Dorn sampler. Quarter-point samples from the same water layers then were composited. If no thermocline was apparent at the time of sampling, only surface and bottom samples were collected. These laterally integrated composite samples were analyzed for BOD, hardness, alkalinity, total and volatile suspended solids, nutrients, total iron, dissolved calcium, and dissolved magnesium.

Chlorophyll *a* and chlorophyll *b* samples also were collected at reservoir water-chemistry sites. At midchannel, the depth of the euphotic zone was estimated by doubling the Secchi disk depth. A depth-integrated composite sample of the euphotic zone was collected using a Lab-Line sampler. Samples were then filtered through a 0.45-micron (µm) glass fiber filter. Filters were sealed in vials, then vials were wrapped in aluminum foil to block light penetration and were chilled to 4 degrees Celsius (°C).

To prevent contamination, water samples for TOC and fecal coliform bacteria were not composited. At midchannel at each reservoir site, water samples for TOC analysis were collected near the surface, near the bottom, and at the thermocline using a Teflon sampler. A single water sample was collected just below the water surface at midchannel of each reservoir site and was examined for fecal coliform bacteria. All water samples examined for fecal coliform bacteria were collected directly into a sterile bottle by hand dipping or by using a weighted bottle holder.

At both tributary and reservoir sites, standard USGS procedures were followed to meet sample-handling requirements and holding times. Water samples for dissolved constituents were filtered through a 0.45 µm membrane filter. Water samples for nutrients were preserved with mercuric chloride and chilled to 4 °C. Water samples for iron, calcium, and magnesium were acidified with nitric acid immediately after collection. BOD and fecal coliform water samples were chilled to 4 °C.

Collection of Bottom-Material Samples

Bottom material, or sediment, was collected from the reservoirs once during the study to determine particle-size distribution and concentrations of nutrients, trace metals, organochlorine pesticides, and semivolatile organic compounds. On July 14, 1993, sediment was collected and composited from sites 21, 23B, and 25 in Rhodhiss Lake (fig. 2). Sediment was collected and composited from sites 29, 33, and 36 in Lake Hickory (fig. 3) on July 13, 1993. Sediment samples were collected and composited for different analyses, using the following procedures.

Samples for nutrient and trace metal determinations were collected using a BMH-60 TM sampler. Bottom material from each reservoir site was passed through a polyethylene sieve to remove particles larger than 2 millimeters (mm) in diameter.

Sieved sediment from the three sites was stirred together in a plastic container to achieve a uniform mix. A sample of the composited material was placed into a glass jar, which then was sealed and chilled to 4 °C.

Samples analyzed for particle-size distribution, organochlorine pesticides, and semivolatile organic compounds were collected with a stainless steel Ponar dredge. Bottom material from each reservoir site was passed through a stainless steel sieve to remove particles larger than 2 mm in diameter. Sieved sediment from the three sites was stirred together in a stainless-steel pan to achieve a homogeneous mix. Samples of the composited material were placed into three glass jars, which then were sealed and chilled to 4 °C. Prior to sampling, two of the jars were ashed in a muffle furnace to remove all organic matter. Samples for the analysis of organochlorine pesticides and semivolatile organic compounds were placed into these organically clean jars. Sediment from the third jar was used for particle-size analysis.

Laboratory Analysis of Water-Chemistry and Bottom-Material Samples

Water samples were analyzed for alkalinity, nutrients, TOC, chlorophyll, and metals at the USGS National Water-Quality Laboratory in Denver, Colorado. Alkalinity was determined by electrometric titration with hydrochloric acid (Fishman, 1993). Nitrogen and phosphorus fractions were analyzed by automated colorimetric procedures. Low-level analyses were performed, resulting in laboratory reporting levels of 0.002 milligram per liter (mg/L) for dissolved ammonia-nitrogen, 0.005 mg/L for dissolved nitrite plus nitrate-nitrogen, and 0.001 mg/L for total phosphorus and dissolved orthophosphorus (Fishman, 1993). Total organic plus ammonia nitrogen was reported to the nearest 0.2 mg/L (Fishman and Friedman, 1989).

TOC was determined by wet oxidation with potassium persulfate, followed by infrared spectrometry (Wershaw and others, 1987). Concentrations of chlorophyll *a* and chlorophyll *b* were separated by high-pressure liquid chromatography (HPLC) and measured fluorometrically (Britton and Greeson, 1987). Unlike standard fluorometric or spectrophotometric methods, this procedure did not require a correction for pheophytin, because the chlorophyll pigments and their degradation products were separated during the HPLC extraction (American Public Health Association and others, 1992). Dissolved calcium and magnesium and total recoverable iron were analyzed by atomic absorption spectrometry (Fishman and Friedman, 1989).

Suspended-sediment concentrations were determined in the USGS District sediment laboratory in Raleigh, North Carolina, using gravimetric procedures documented by Guy (1969). Total suspended solids and volatile suspended solids also were measured in the Raleigh laboratory, using gravimetric methods described in Fishman and Friedman (1989).

Water samples were analyzed for fecal coliform bacteria at the City of Hickory Water Filtration Plant using culture media and 0.7–µm filters supplied by the USGS. The membrane filtration technique used at this laboratory has been approved by the U.S. Environmental Protection Agency (USEPA), and follows procedures outlined in "Standard Methods for the Analysis of Water and Wastewater" (American Public Health Association and others, 1992). Samples were chilled and delivered to the Hickory Water Filtration Plant within 6 hours following collection.

Water samples were analyzed for BOD at the City of Hickory Henry Fork Wastewater Treatment Plant. Analytical procedures for the BOD measurement are outlined in "Standard Methods for the Analysis of Water and Wastewater" (American Public Health Association and others, 1992) and have been approved by the USEPA. Water samples were chilled in the field, and analysis commenced within 24 hours following collection.

Samples of bottom material were analyzed for particle-size distribution at the USGS District sediment laboratory in Raleigh, North Carolina, following sieving methods outlined by Guy (1969). All other analyses of bottom material were performed at the USGS National Water-Quality Laboratory. Total ammonia plus organic nitrogen was analyzed by a titrimetric method; other nutrients, including ammonia-nitrogen, nitrite plus nitrate-nitrogen, and total phosphorus, were determined by colorimetric methods (Fishman, 1993). Metals, including arsenic, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, selenium, and zinc, were analyzed by atomic absorption spectrometry (Fishman and Friedman, 1989). Gas chromatography with electron capture detector was used to detect organochlorine pesticides (Wershaw and others, 1987). Semivolatile organic compounds in bottom-material samples were analyzed by gas chromatography/mass spectrometry (Wershaw and others, 1987). All analytical results were reported in terms of sediment dry weight.

Acquisition of Meteorologic Data

Daily precipitation was recorded by Duke Power Company at the Rhodhiss and Oxford Dams (table 2). Duke Power Company provided these data to the USGS on a monthly basis. In June 1993, the USGS installed a silicon pyranometer and an air temperature probe at Oxford Dam. Measurements of solar radiation and air temperature were recorded every 15 minutes. Additional meteorologic data, including air temperature, dewpoint temperature, wind speed, wind direction, cloud cover, and historical precipitation records, were obtained from a Federal Aviation Administration (FAA) weather station at the Hickory Airport (site 61, fig. 3). Except for historical precipitation, data from the FAA station are not presented in this report.

HYDROLOGIC CONDITIONS

Hydrologic data collected by the USGS during this study included measurements of water level at two reservoir headwater sites and measurements of streamflow at three tributary sites (table 2). Continuous water-level recorders were installed at reservoir headwater sites 20 and 29 (figs. 2 and 3, respectively) in February 1993. Monthly water-level statistics for these two sites are presented in tables 3 and 4. From February 1993 through March 1994, water level at site 20 in Rhodhiss Lake ranged 7.9 feet (ft) and averaged 992.55 ft above sea level (table 3). At site 29 in Lake Hickory, water level ranged 3.8 ft and averaged 932.48 ft above sea level during the same period (table 4).

Table 3. Monthly water-level statistics at Rhodhiss Lake site 20, February 1993 through March 1994

[Site descriptions are listed in table 2. Site 20 is at latitude 35°47'15", longitude 81°37'30", Burke County. Water level, in feet above sea level]

Period	Mean	Maximum	Minimum
	1993		
February	992.93	993.51	992.31
March	994.34	998.71	990.81
April	993.55	995.00	991.71
May	992.90	995.34	991.72
June	992.21	993.20	991.08
July	992.19	992.85	991.21
August	992.01	992.60	991.06
September	991.95	992.47	991.01
October	992.04	992.95	991.43
November	992.06	993.64	991.19
December	992.09	993.22	991.33
	1994		
January	992.53	994.02	991.72
February	992.61	995.04	991.32
March	992.62	996.35	991.59
Total	992.55	998.71	990.81

Table 4. Monthly water-level statistics at Lake Hickory site 29, February 1993 through March 1994

[Site descriptions are listed in table 2. Site 29 is at latitude 35°45'30", longitude 81°22'40", Burke County. Water level, in feet above sea level]

Period	Mean	Maximum	Minimum
	1993		
February	933.24	934.05	932.45
March	934.11	934.96	931.65
April	933.90	934.92	931.64
May	932.83	934.89	931.52
June	932.18	932.96	931.47
July	932.08	932.89	931.34
August	931.84	932.37	931.15
September	931.77	932.33	931.22
October	931.84	932.40	931.36
November	931.99	933.05	931.51
December	931.93	932.41	931.42
	1994		
January	932.31	934.42	931.44
February	933.92	934.83	931.98
March	932.38	934.75	931.27
Total	932.48	934.96	931.15

Streamflow data indicated that Lower Creek (site 53, fig. 2) had the highest average discharge of the three gaged tributaries (table 5). The highest and lowest instantaneous discharges were recorded at site 58 at the Upper Little River (fig. 3; table 5). Records of streamflow for site 53 at Lower Creek began in January 1993. However, records for site 58 at Upper Little River began in March 1993, and records for site 60 at Middle Little River began in April 1993, because difficulties were encountered when establishing these two gaging stations. Records for all three tributary sites continued through March 1994, the end of the study period. Daily mean values of discharge for the three tributary sites are listed in tables 6 through 8.

Table 5. Mean, maximum, and minimum discharge at tributary sites during the study period

Site number (figs. 2 and 3)	Site location	Discharge, in cubic feet per second		
		Mean	Maximum	Minimum
53	Lower Creek near Morganton, SR 1501	134	1,440	43
58	Upper Little River at SR 1740 at Petra Mills	50.9	5,730	17
60	Middle Little River at Moretz Dam near Bethlehem	64.5	1,430	26

Table 6. Daily mean values of discharge at Rhodhiss Lake tributary site 53, January 1993 through March 1994

LOWER CREEK NEAR MORGANTON AT SR 1501

[Site 53 is at latitude 35°49'31", longitude 81°38'10", Caldwell County; U.S. Geological Survey downstream order number 02141245; ---, missing data or no day in month; MEAN, monthly mean; MAX, highest instantaneous value recorded during month; MIN, lowest instantaneous value recorded during month; CFSM, cubic feet per second per square mile]

DAILY MEAN VALUES OF DISCHARGE (in cubic feet per second)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1	140[e]	120	126	213	128	99	77	61	58	50	59	60	78	133	146
2	130[e]	114	122	185	125	94	76	63	56	51	55	57	76	118	636
3	110[e]	112	124	171	125	93	81	66	57	49	55	56	94	108	464
4	120[e]	110	769	163	233	91	73	66	121	48	54	95	237	104	243
5	450[e]	106	328	247	219	91	73	80	86	47	96	437	153	109	186
6	213	105	208	403	150	87	72	77	64	46	70	131	115	100	157
7	166	102	172	242	134	86	70	82	60	48	58	94	109	93	141
8	299	100	157	202	230	86	68	70	68	48	55	80	234	90	133
9	344	96	145	218	143	84	76	67	124	46	55	73	135	89	127
10	221	94	138	401	129	83	85	65	65	46	55	94	108	125	146
11	251	95	132	231	122	99	72	64	58	46	53	84	98	358	121
12	288	382	127	198	118	85	70	65	56	52	54	71	467	322	110
13	205	210	175	180	117	97	159	75	54	50	53	68	225	234	106
14	167	156	177	169	135	97	84	74	54	49	53	70	127	190	104
15	149	136	158	164	117	91	77	65	55	48	56	94	95	158	99
16	156	185	167	241	110	88	78	61	55	49	54	75	74	137	96
17	137	155	318	179	108	87	79	59	65	52	57	68	120	123	94
18	128	137	397	164	110	87	80	58	66	51	61	68	155	113	93
19	121	127	296	156	114	121	80	58	55	50	54	66	90	105	92
20	117	122	236	151	112	87	82	60	55	50	53	66	82	100	91
21	321	127	224	149	106	83	68	75	60	52	50	89	68	96	90
22	255	191	218	144	105	86	65	57	55	57	50	81	64	93	92
23	177	138	515	140	102	82	64	56	53	52	51	77	62	580	89
24	356	126	1,040	138	101	79	82	56	53	52	51	75	63	530	88
25	274	121	545	136	102	79	231	61	52	53	50	71	65	250	98
26	189	152	291	210	106	78	87	125	57	53	49	69	92	185	89
27	161	145	797	150	100	79	112	111	74	52	292	69	240	151	397
28	145	133	479	138	97	76	77	69	59	52	138	74	628	135	883
29	135	---	300	135	97	92	69	63	52	52	78	116	311	---	710
30	126	---	241	132	98	86	65	60	50	107	66	98	195	---	302
31	123	---	212	---	98	---	63	59	---	77	---	83	155	---	216
MEAN	199	139	301	192	126	88.4	83.7	68.6	63.2	52.7	67.8	90.6	155	176	208
MAX	---	644	1,440	654	510	202	668	414	306	171	567	819	954	1,050	1,030
MIN	---	93	118	128	95	75	60	54	49	43	48	54	59	86	88
CFSM	2.23	1.56	3.36	2.14	1.40	.99	.94	.77	.71	.59	.76	1.01	1.74	1.97	2.32

[e] Estimated value.

Table 7. Daily mean values of discharge at Lake Hickory tributary site 58, March 1993 through March 1994

UPPER LITTLE RIVER AT SR 1740 AT PETRA MILLS

[Site 58 is at latitude 35°50'31", longitude 81°21'43", Caldwell County; U.S. Geological Survey downstream order number 0214183365; ---, missing data or no day in month; MEAN, monthly mean; MAX, highest instantaneous value recorded during month; MIN, lowest instantaneous value recorded during month; CFSM, cubic feet per second per square mile]

DAILY MEAN VALUES OF DISCHARGE (in cubic feet per second)

Day	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1	---	131	68	53	37	26	21	18	24	25	32	41	45
2	---	101	65	50	39	26	27	19	22	24	29	37	323
3	---	90	63	49	45	27	31	19	22	23	32	33	230
4	---	85	122	48	35	27	71	18	21	28	71	31	115
5	---	115	122	47	33	27	43	18	29	199	57	32	85
6	---	251	87	45	34	29	30	18	25	62	44	30	71
7	---	127	78	45	31	31	27	18	23	43	41	28	64
8	---	105	73	44	29	30	27	18	22	36	85	27	60
9	---	114	71	43	32	27	29	18	22	32	58	26	57
10	69	185	68	42	34	26	25	17	22	36	46	32	76
11	66	120	65	42	30	28	23	18	21	35	39	100	62
12	65	105	65	41	29	29	23	19	21	31	206	102	60
13	85	98	66	47	69	29	22	19	21	29	96	79	56
14	74	94	68	44	37	31	22	19	21	28	60	65	55
15	68	98	62	44	33	28	23	19	21	30	47	51	53
16	69	136	60	41	33	26	23	19	21	29	49	43	52
17	162	109	59	39	32	26	26	21	22	27	59	38	49
18	199	101	60	40	33	40	33	21	23	27	102	35	49
19	149	98	62	40	30	50	24	20	21	27	103	33	47
20	118	96	60	37	31	54	23	19	21	28	102	31	46
21	117	98	57	36	27	56	24	20	21	35	102	30	46
22	118	92	56	38	26	50	22	23	21	32	102	29	47
23	---	88	55	34	29	46	21	21	20	30	74	241	45
24	911	84	54	34	69	26	20	20	20	29	31	214	44
25	249	81	55	34	45	25	20	21	20	29	32	88	47
26	135	97	56	32	35	29	22	21	20	29	37	61	43
27	437	81	52	32	48	35	22	21	130	28	66	48	203
28	186	76	51	31	33	26	21	21	62	30	321	43	929
29	134	74	55	66	29	25	19	21	34	38	115	---	378
30	110	71	56	47	27	23	19	34	28	36	65	---	133
31	109	---	54	---	26	22	---	28	---	33	49	---	92
MEAN	---	107	66.0	42.2	35.5	31.6	26.1	20.2	27.4	37.0	75.9	58.9	118
MAX	---	450	330	210	207	74	171	50	264	396	829	757	2,600
MIN	---	70	49	29	24	17	18	17	20	23	17	26	40
CFSM	---	3.15	1.95	1.24	1.05	.93	.77	.60	.81	1.09	2.24	1.74	3.48

Table 8. Daily mean values of discharge at Lake Hickory tributary site 60, April 1993 through March 1994

MIDDLE LITTLE RIVER AT MORETZ DAM NEAR BETHLEHEM

[Site 60 is at latitude 35°51'50", longitude 81°12'39", Alexander County; U.S. Geological Survey downstream order number 0214192500; ---, missing data or no day in month; MEAN, monthly mean; MAX, highest instantaneous value recorded during month; MIN, lowest instantaneous value recorded during month; CFSM, cubic feet per second per square mile]

DAILY MEAN VALUES OF DISCHARGE (in cubic feet per second)

Day	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1	---	110	84	53	46	31	30	36	42	44	79	80
2	---	106	80	54	46	43	31	33	40	43	72	308
3	---	104	79	56	47	53	30	31	38	45	68	278
4	---	148	77	54	47	104	29	31	45	79	65	150
5	---	183	76	53	47	69	28	42	238	74	66	113
6	---	130	74	54	49	45	28	40	91	61	63	95
7	---	118	74	54	50	41	29	33	63	58	60	86
8	---	113	73	53	48	40	30	32	53	114	59	82
9	149	113	72	52	45	43	29	32	48	80	59	79
10	239	158	71	51	43	38	28	31	51	63	64	98
11	182	116	70	52	44	36	27	31	49	57	116	82
12	166	108	74	51	47	35	29	31	43	240	145	76
13	156	107	98	57	46	35	29	31	42	141	121	74
14	152	123	76	51	47	35	28	31	41	88	107	73
15	152	107	73	51	43	35	28	32	44	69	93	70
16	209	101	71	51	40	37	28	32	42	50	82	67
17	169	99	66	51	38	44	30	34	39	69	75	65
18	156	99	66	50	38	44	29	34	40	85	71	65
19	150	100	80	47	37	36	28	34	40	50	67	63
20	146	99	64	47	37	36	27	31	41	59	65	61
21	146	94	63	47	38	38	29	30	53	56	63	62
22	139	92	63	45	35	35	32	30	49	51	62	63
23	134	90	60	46	36	33	29	30	45	50	214	59
24	131	89	59	76	34	33	29	30	43	49	293	59
25	128	89	58	70	34	33	29	29	42	50	143	64
26	145	91	55	86	38	36	29	29	40	55	104	60
27	127	86	56	81	44	35	30	192	40	76	87	223
28	120	84	55	59	36	35	30	109	42	271	80	862
29	117	86	65	52	34	31	29	55	51	185	---	510
30	113	89	64	49	32	30	50	46	49	112	---	199
31	---	84	---	47	32	---	46	---	43	90	---	135
MEAN	---	107	69.9	54.8	41.2	40.6	30.2	41.4	52.5	84.3	94.4	141
MAX	---	295	152	125	56	235	64	402	397	440	470	1,430
MIN	---	82	53	43	31	29	26	29	28	27	57	58
CFSM	---	2.32	1.52	1.19	.89	.88	.66	.90	1.14	1.83	2.05	3.05

WATER-QUALITY CHARACTERISTICS

In this report, water-quality data for Rhodhiss Lake, Lake Hickory, and the three tributaries are summarized in tables and diagrams. Water-quality data consist of continuous records of water temperature at selected sites, and physical and chemical data obtained during monthly or semimonthly sampling visits.

Water temperature was monitored continuously at headwater sites 20 and 29 (figs. 2 and 3, respectively) in both reservoirs beginning in March 1993. At each of these shallow-water sites, thermistors measured temperature near the water surface, near the reservoir bottom, and at the midpoint of the water column. Water temperature was recorded every 15 minutes at each depth, and daily mean values were calculated. Daily mean values of near-surface water temperature for sites 20 and 29 are presented in tables 9 and 10.

Daily mean values of water temperature for middle and bottom depths are not presented in this report, because water temperatures at these depths were very similar to surface values. At site 20 (fig. 2), water temperatures at the three depths never varied by more than 2 °C. Likewise, surface and middepth water temperatures never differed by more than 2 °C at site 29 (fig. 3). Differences between surface and bottom water temperatures at site 29 exceeded 2 °C on four dates (table 10).

Vertical profiles of water temperature, dissolved-oxygen concentration, specific conductance, and pH were measured at 11 sites in Rhodhiss Lake and 14 sites in Lake Hickory (figs. 2 and 3; table 2). Listing these data in tables would be cumbersome and difficult to view; therefore, data for selected sites and dates are displayed in depth-distance diagrams. The diagrams were produced using data collected from sites along the mainstem of each reservoir. The spatial distribution of data-collection points used to produce a typical depth-distance diagram for each reservoir is shown in figure 4 on page 20.

A regularly spaced grid was created from the data by the minimum curvature method of interpolation. Contours were then generated with ARC/INFO Software Sub-system GRID (Environmental Systems Research Institute, Inc., 1992).

In the diagrams presented in this report, the contour lines represent isopleths, which are lines of constant value which show the occurrence of a variable as a function of two other variables (in this case, water depth and distance from the dam). Because the process of interpolation and contouring can produce visual artifacts, each diagram was checked and corrected when necessary, to assure agreement with the original water-quality data.

Depth-distance diagrams of water temperature, dissolved-oxygen concentration, specific conductance, and pH are shown for Rhodhiss Lake (figs. 5-8) and Lake Hickory (figs. 9-12) beginning on page 21. Results are provided for six sampling dates, which illustrate seasonal differences in physical water-quality conditions. Each diagram depicts a longitudinal section of a reservoir on one sampling date. The top line of each plot represents the surface of the water, and depth below the surface is shown on the ordinate (y-axis). The abscissa (x-axis) shows the distance from the dam along the main channel of the reservoir.

Physical properties were measured and water was collected for chemical analysis at sites 20, 24, 27, 29, 34, 40A, 53, 58, and 60 (table 2). These data were collected monthly from January through March 1993, and October 1993 through March 1994, and twice monthly from April through September 1993, for a total of 21 visits. For each site, the number of samples collected or measurements made, the properties and constituents measured, and statistical summaries of the results are presented (tables 11-19 at the back of this report). Maxima, minima, and arithmetic means are listed, along with the 5th, 25th, 50th, 75th, and 95th percentiles, for each variable. Percentiles were not calculated if sample sizes were small or if a large proportion of the data was censored (less than the laboratory reporting level). As noted previously, water samples were collected from multiple depths at reservoir sites 20, 24, 27, 29, 34, and 40A (figs. 2 and 3), and results for each depth are indicated in the summary tables.

Water-chemistry data from sites 20, 24, 27, 29, 34, 40A, 53, 58, and 60 (figs. 2 and 3; table 2) are listed in entirety in tables 20 through 28 (at the back of this report). Data reported for each site include BOD, fecal coliform bacteria, total hardness, dissolved calcium, dissolved magnesium, alkalinity, total suspended solids, volatile suspended solids, dissolved nitrite plus nitrate-nitrogen, dissolved ammonia-nitrogen, total ammonia plus organic nitrogen, total phosphorus, dissolved orthophosphorus, total iron, and TOC. Also listed for each site are specific conductance, pH, water temperature, dissolved-oxygen concentration, and dissolved-oxygen percent saturation associated with each set of chemical samples. Water transparency and concentrations of chlorophyll *a* and chlorophyll *b* are reported for reservoir sites 20, 24, 27, 29, 34, and 40A (tables 20-25). Suspended-sediment concentrations are reported for tributary sites 53, 58, and 60 (tables 26-28).

Table 9. Daily mean values of water temperature at Rhodhiss Lake site 20, near surface, March 1993 through March 1994

RHODHISS LAKE AT HUFFMAN BRIDGE AT SR 1501

[Site 20 is at latitude 35°47'15", longitude 81°37'30", Burke County; U.S. Geological Survey downstream order number 0214126765; ---, missing data or no day in month; MEAN, monthly mean; MAX, highest instantaneous value recorded during month; MIN, lowest instantaneous value recorded during month]

DAILY MEAN VALUES OF WATER TEMPERATURE, NEAR SURFACE (in degrees Celsius)

Day	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1	---	10.2	14.5	17.1	22.9	23.7	22.5	16.1	10.8	8.0	3.3	4.6	5.9
2	---	10.0	14.4	16.8	23.2	23.6	23.6	15.7	9.6	7.2	3.3	3.9	5.4
3	---	9.3	14.1	17.5	24.3	23.7	23.5	15.9	9.4	8.0	4.4	3.7	6.0
4	---	9.3	13.9	18.7	25.1	22.5	23.3	16.5	9.8	9.3	4.8	4.1	6.8
5	---	9.2	14.8	19.5	25.1	22.1	21.3	16.7	10.9	10.1	5.0	4.9	8.6
6	---	8.5	15.8	19.6	25.4	22.1	21.4	16.7	12.8	9.4	5.1	5.5	8.8
7	---	10.3	16.3	19.9	25.3	21.1	22.0	16.7	12.0	8.5	6.5	5.4	8.4
8	---	11.3	16.4	20.9	25.5	22.1	22.2	16.9	10.2	9.2	6.8	6.1	8.7
9	---	10.9	16.7	22.1	25.8	22.5	22.5	17.2	8.9	8.9	4.8	6.9	9.7
10	---	10.7	16.9	21.1	25.9	22.6	22.2	17.4	9.1	8.4	3.5	7.7	8.4
11	---	11.4	17.1	20.7	25.3	21.9	22.0	16.3	9.3	9.1	3.8	4.8	7.9
12	8.7	12.2	17.3	22.0	25.4	20.6	21.5	15.5	9.3	7.1	5.0	4.4	7.4
13	4.4	12.7	17.2	20.4	23.8	19.1	20.8	15.1	10.4	5.1	5.8	5.3	7.3
14	2.0	12.8	16.2	17.9	24.3	19.4	20.9	14.7	11.8	5.2	6.1	5.4	7.9
15	3.9	13.1	16.2	19.2	23.1	21.6	21.3	15.0	13.6	6.9	3.7	5.2	8.3
16	4.8	13.7	16.5	20.3	22.6	23.5	21.8	14.9	15.2	7.4	1.7	5.5	8.7
17	6.0	13.0	16.8	19.6	23.5	24.2	22.8	16.1	15.9	7.1	1.7	5.8	8.4
18	6.3	12.2	16.9	20.3	24.8	22.8	23.1	17.1	15.2	6.8	2.5	6.2	8.6
19	6.4	12.4	16.6	20.3	24.8	22.9	22.3	17.9	14.0	6.9	2.1	6.8	9.4
20	6.6	13.1	15.4	20.2	25.2	23.9	20.4	18.9	13.0	5.9	2.1	7.7	10.5
21	8.0	13.6	14.2	20.0	25.6	24.8	20.2	18.6	11.1	4.5	2.6	7.9	10.6
22	9.4	12.0	13.7	19.5	25.0	24.2	20.3	17.4	9.5	4.1	3.3	6.8	10.3
23	9.2	11.6	14.5	21.1	25.4	24.0	20.0	16.4	9.0	5.5	3.4	7.4	10.6
24	9.8	12.0	15.5	21.2	24.7	24.0	20.9	14.7	9.6	4.6	4.1	8.5	11.8
25	9.6	12.5	15.7	20.9	24.3	22.6	20.5	13.6	9.1	3.7	4.4	8.0	11.7
26	9.3	14.0	15.8	21.3	24.1	21.0	20.4	13.4	8.8	3.4	4.7	7.4	11.2
27	9.1	13.6	16.2	21.9	23.1	21.7	20.4	14.1	9.1	3.2	5.1	6.7	10.7
28	9.2	13.0	16.9	22.8	22.4	21.5	19.6	14.6	9.7	3.5	4.5	5.8	11.4
29	9.7	13.3	17.4	22.4	23.6	20.5	18.7	13.3	9.4	4.6	6.1	---	11.4
30	10.2	13.8	17.1	22.6	22.8	20.4	17.1	12.7	9.2	4.3	6.6	---	10.4
31	10.3	---	16.8	---	22.8	20.7	---	12.4	---	4.4	5.7	---	10.4
MEAN	---	11.9	15.9	20.3	24.4	22.3	21.3	15.8	10.9	6.5	4.3	6.0	9.1
MAX	---	15.1	18.4	24.4	29.3	27.9	26.1	20.4	16.4	10.6	7.6	8.8	12.6
MIN	---	8.0	12.8	16.1	21.4	18.1	16.4	11.4	8.0	2.2	0.8	3.1	5.2

Table 10. Daily mean values of water temperature at Lake Hickory site 29, near surface, March 1993 through March 1994

LAKE HICKORY AT U.S. 321

[Site 29 is at latitude 35°45'30", longitude 81°22'40", Burke County; U.S. Geological Survey downstream order number 0214157625; ---, missing data or no day in month; MEAN, monthly mean; MAX, highest instantaneous value recorded during month; MIN, lowest instantaneous value recorded during month]

DAILY MEAN VALUES OF WATER TEMPERATURE, NEAR SURFACE (in degrees Celsius)

Day	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1	---	10.6	15.0	19.4	25.6	28.4	27.7	20.8	14.3	10.1	4.7	---	7.4
2	---	10.8	15.1	19.6	26.9	27.4	26.9	21.0	14.2	9.7	4.9	---	7.1
3	---	10.8	14.9	19.1	27.2	27.3	26.3	21.0	14.1	9.6	5.1	---	7.5
4	---	10.7	14.8	19.2	26.2	26.7	25.9	20.6	13.9	10.0	4.7	---	7.6
5	---	10.5	15.3	20.4	27.8	26.7	25.7	20.9	14.1	9.9	4.3	---	7.9
6	---	10.0	16.0	20.6	27.9	26.1	26.2	21.3	14.3	9.6	4.4	---	7.6
7	---	10.4	16.2	21.5	29.0	26.4	26.8	20.8	13.2	9.3	4.6	---	7.6
8	---	10.5	16.4	21.9	29.8[a]	26.6	25.7	20.8	12.6	9.2	4.6	---	8.4
9	---	10.1	16.6	21.7	29.8	26.3	24.8	21.4	11.9	8.9	4.1	---	8.8
10	---	10.6	17.6	22.0	29.2	26.4	25.5	21.3	12.6	8.8	4.0	---	8.6
11	---	11.8	17.8	25.0	29.1	26.6	25.3	19.2	12.2	8.5	4.0	---	8.8
12	8.5	11.7	18.3	25.9	28.8	26.0	25.3	18.3	12.0	7.7	4.3	---	8.9
13	7.2	12.4	18.2	23.3	27.8	25.4	24.4	18.6	12.0	7.3	4.5	---	8.6
14	6.9	12.3	17.9	24.0	26.5	26.0	24.7	18.7	12.3	7.5	4.8	---	9.1
15	6.9	12.6	18.1	23.0	26.3	26.3	25.0	18.8	13.0	7.7	4.2	---	9.6
16	6.9	13.0	18.5	22.2	27.1	27.2	25.0	18.7	13.9	7.7	3.7	---	9.4
17	7.1	13.5	19.0	22.8	28.3	26.5	25.7	18.9	14.8	7.7	3.5	---	9.0
18	7.3	14.3	18.9	25.7[a]	28.5	26.6	26.0	19.2	13.8	7.7	3.5	---	9.2
19	6.4	14.1	18.7	23.7	28.2	28.1	25.4	19.3	12.9	7.5	3.1	---	9.3
20	6.1	14.0	18.6	23.6	27.8	28.1	25.1	19.5	12.6	7.2	2.8	---	9.9
21	6.5	14.1	18.3	23.0	29.2	27.9	23.7	19.1	11.7	6.9	3.1	---	10.0
22	7.0	14.5	18.5	23.3	29.4	28.2	23.8	19.0	11.2	6.6	3.2	---	10.1
23	7.2	14.6	18.5	24.9	30.0	27.3	24.6	18.1	11.5	6.4	3.4	6.8	11.0
24	8.2	14.7	18.2	25.5	29.1	26.7	24.7	17.4	11.2	6.3	3.5	7.0	11.2
25	10.0	14.5	17.3	26.0[a]	28.4	26.0	24.6	17.6	11.4	6.0	---	7.5	11.3
26	9.9	14.7	17.3	25.8	27.6	26.1	23.9	17.5	11.2	5.5	---	7.6	11.0
27	9.7	15.1	18.9	25.5	27.4	26.9	23.0	17.2	10.9	5.6	---	7.3	11.1
28	9.5	14.6	18.8	25.3	28.1	26.6	22.0	17.0	11.0	5.8	---	7.5	11.3
29	9.4	14.5	18.6	25.2	27.9	26.7	22.3	16.4	10.7	5.5	---	---	11.5
30	9.7	14.7	19.3	25.6	28.3	25.9	21.2	16.0	10.4	5.1	---	---	11.7
31	10.0	---	18.9	---	28.2	28.1[a]	---	15.4	---	4.9	---	---	11.6
MEAN	---	12.7	17.6	23.2	28.1	26.8	24.9	19.0	12.5	7.6	---	---	9.4
MAX	---	16.3	21.9	28.0	31.6	30.5	29.0	22.6	17.7	10.3	---	---	10.5
MIN	---	9.7	14.2	17.7	24.1	24.9	20.8	14.9	10.1	4.7	---	---	6.9

[a] Daily mean value near surface exceeds value near bottom by more than 2 degrees Celsius.

One composite sample of bottom material from each reservoir was analyzed for nutrients, trace metals, particle-size distribution, organochlorine pesticides, and semivolatile organic compounds (tables 29-31 at the back of this report). Results from this one-time sampling should be interpreted with caution because these data are limited. In both reservoirs, fine-grained silts and clays (material smaller than 0.062 mm in diameter) constituted a large proportion of the bottom material (table 29). Analytical scans for 33 organochlorine pesticides detected three compounds in Rhodhiss Lake and three compounds in Lake Hickory (table 30).

Analysis of 66 semivolatile organic compounds in bottom material identified 19 compounds in Rhodhiss Lake and 14 compounds in Lake Hickory (table 31). The laboratory reporting level for these compounds generally was 50 micrograms per kilogram (µg/kg). At times, in the absence of interferences, analysts qualitatively identified a compound and provided a concentration below the normal reporting level (indicated with an asterisk (*) in table 31). In contrast, when recovery was low, analysts used a higher reporting level. For example, 2,6-dinitrotoluene was reported at less than 500 µg/kg (table 31).

METEOROLOGIC CONDITIONS

Records of daily precipitation at Rhodhiss and Oxford Dams (fig. 3; table 2) were used to calculate total precipitation during each month of the study. Monthly accumulations of precipitation were calculated as the average of values recorded at Rhodhiss and Oxford Dams. Long-term average precipitation was based on records collected at the Hickory FAA airport (site 61, fig. 3) from 1951 through 1990. Compared to historical precipitation, monthly precipitation during the study tended to be above average during winter months and below average during summer months (fig. 13). Cumulative precipitation was higher than average from January through June 1993, and lower than average from August 1993 through the end of the study in March 1994.

Solar radiation and air temperature were measured continuously at Oxford Dam (fig. 3; table 2) from June 1993 through March 1994. Daily mean values of solar radiation and air temperature are listed in tables 32 and 33, respectively, at the back of this report.

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FIGURES 4-13

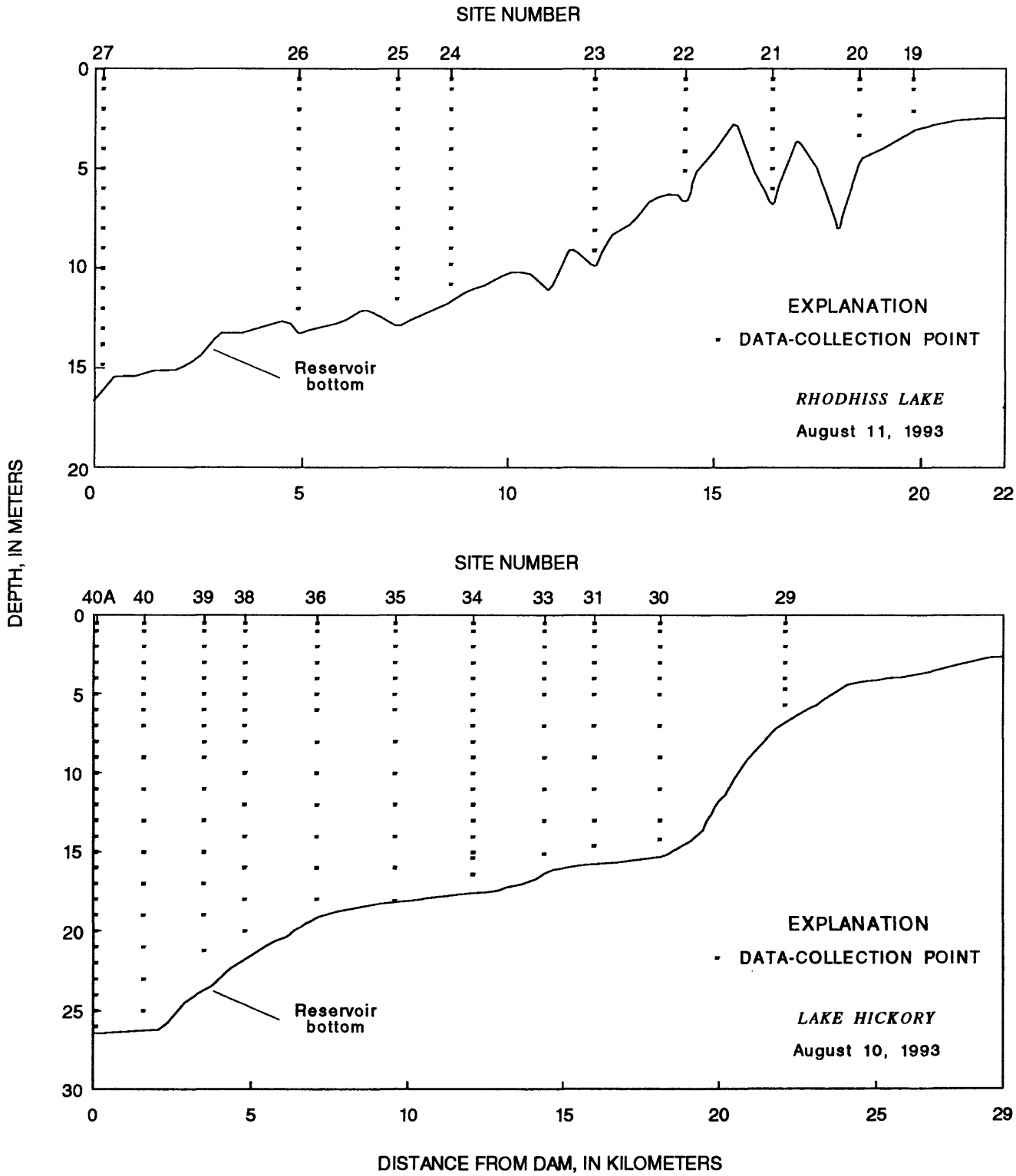

Figure 4. Data-collection points in Rhodhiss Lake and Lake Hickory from which isopleth diagrams were constructed. (Points represent midchannel profiles where water temperature, dissolved-oxygen concentration, specific conductance, and pH were measured during a typical sampling visit.)

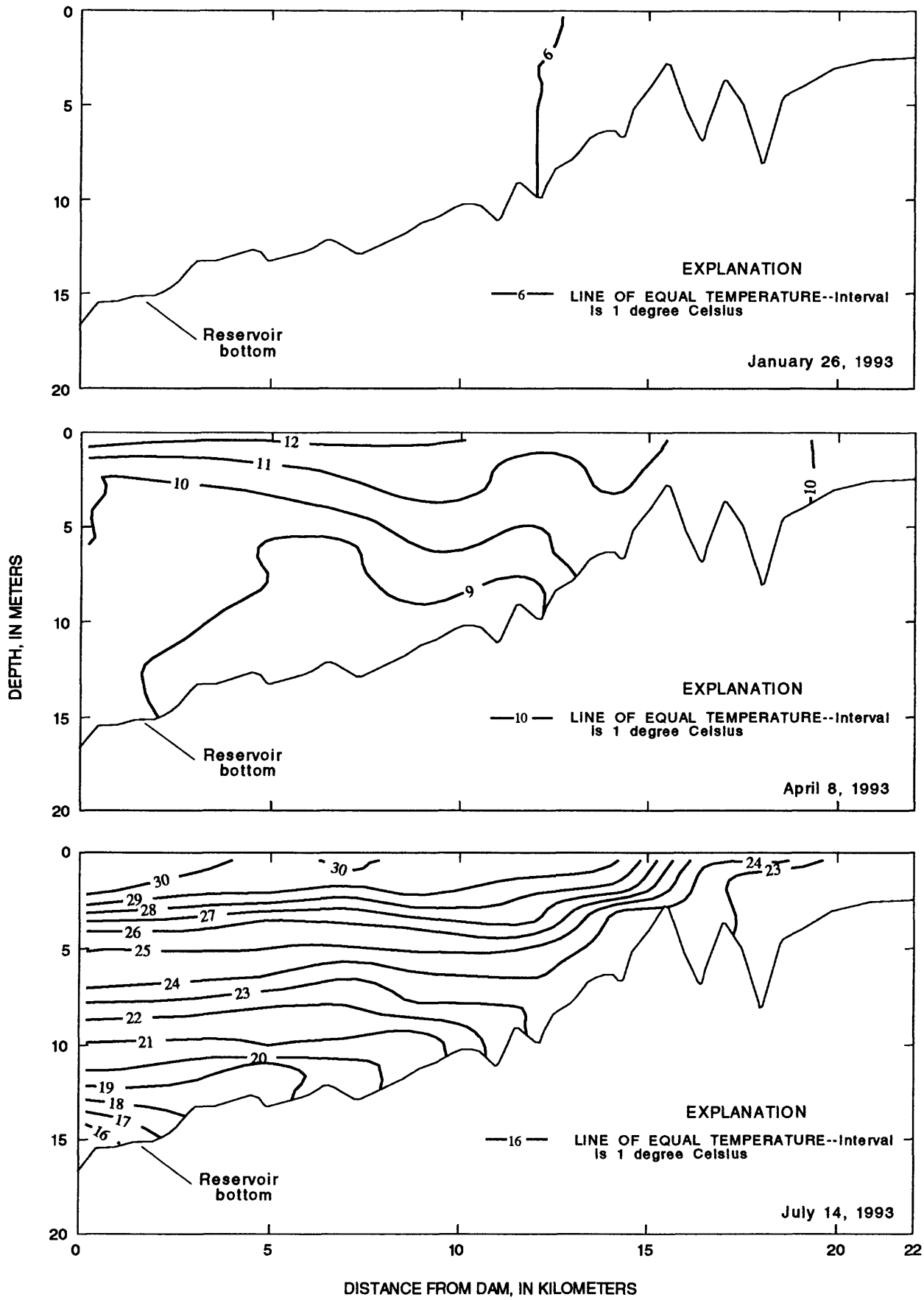

Figure 5. Depth-distance isopleths of water temperature (in degrees Celsius), Rhodhiss Lake, for selected dates during the study period.

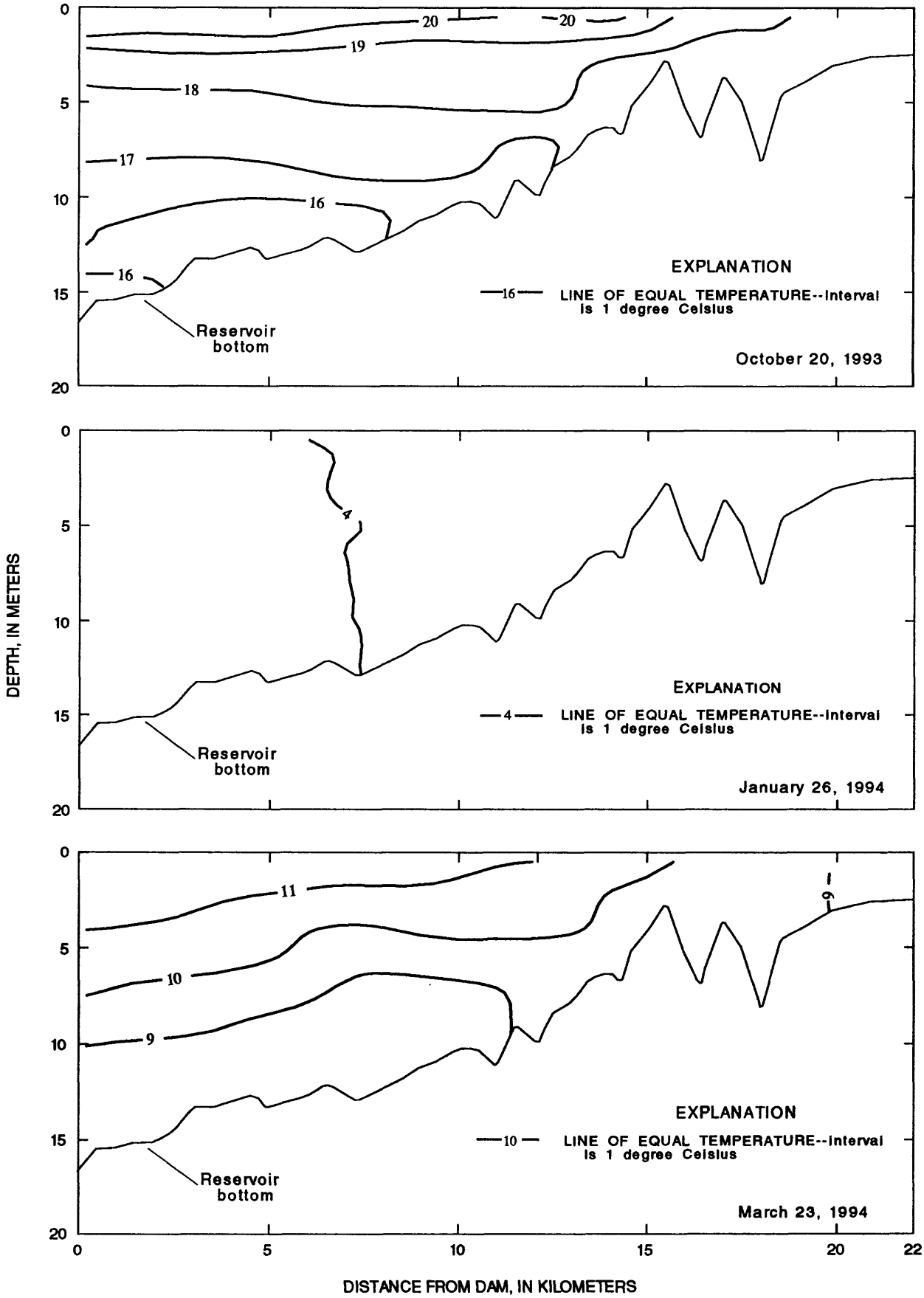

Figure 5. Depth-distance of isopleths of water temperature (in degrees Celsius), Rhodhiss Lake, for selected dates during the study period--Continued.

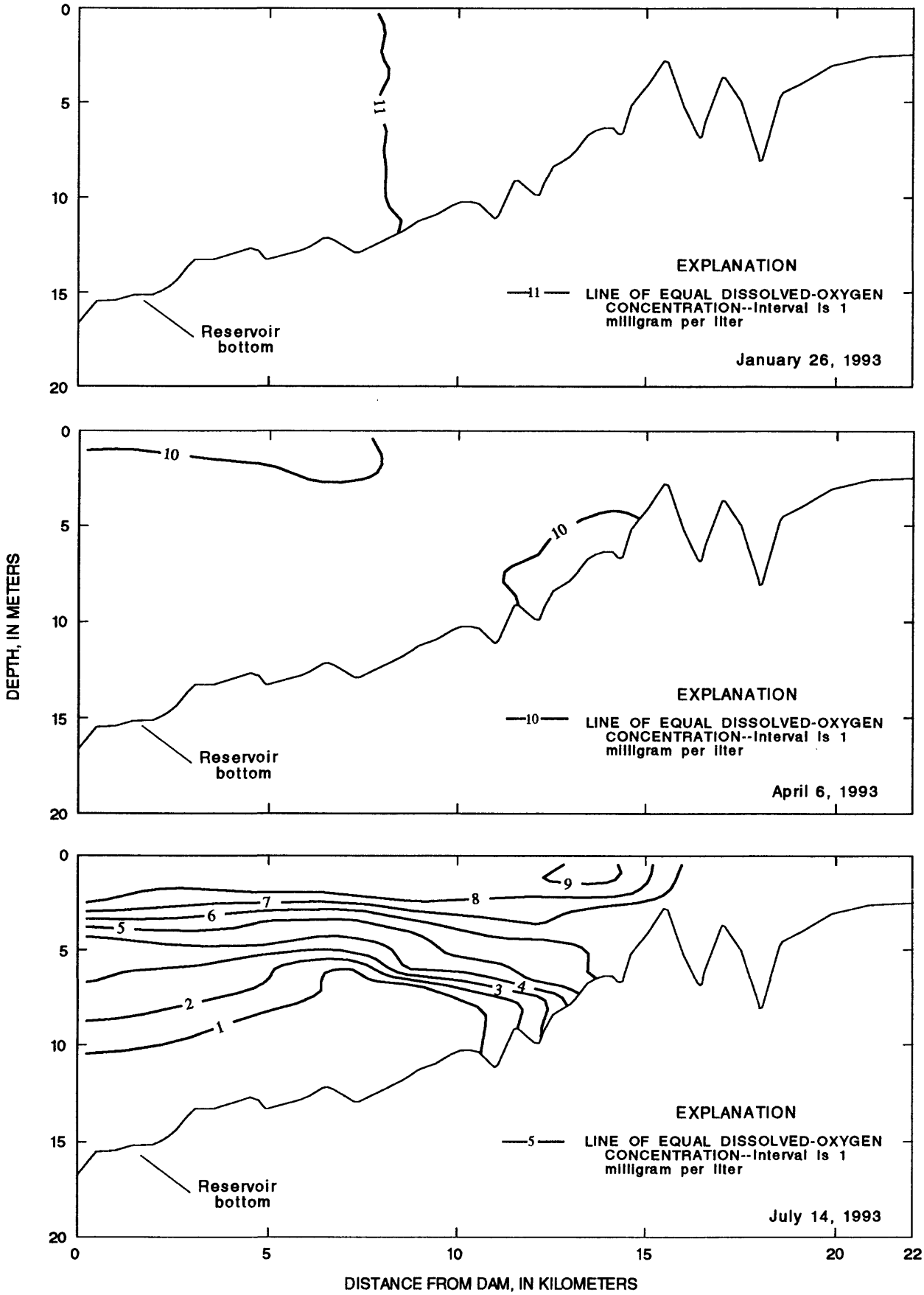

Figure 6. Depth-distance isopleths of dissolved-oxygen concentrations (in milligrams per liter), Rhodhiss Lake, for selected dates during the study period.

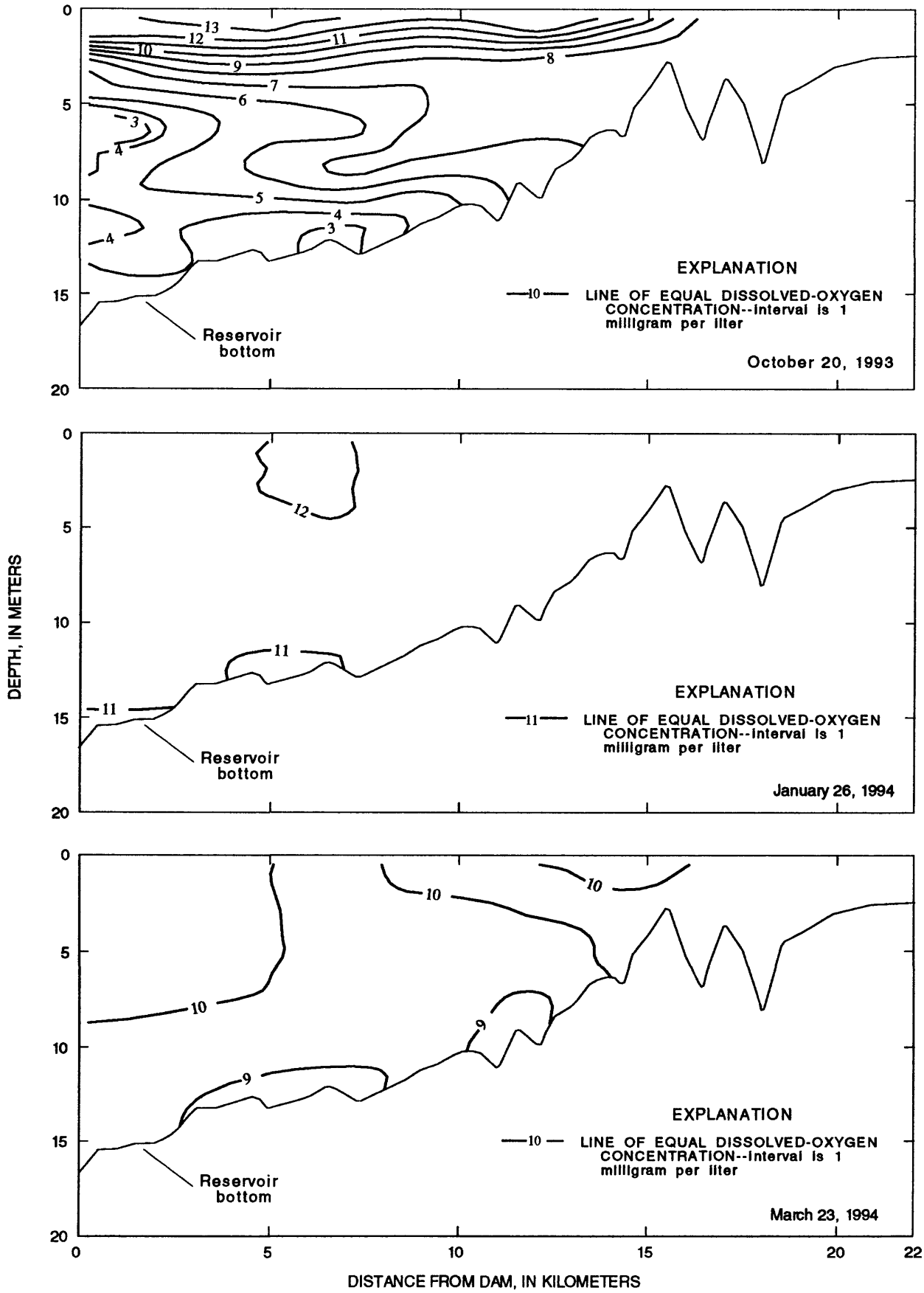

Figure 6. Depth-distance isopleths of dissolved-oxygen concentrations (in milligrams per liter), Rhodhiss Lake, for selected dates during the study period--Continued.

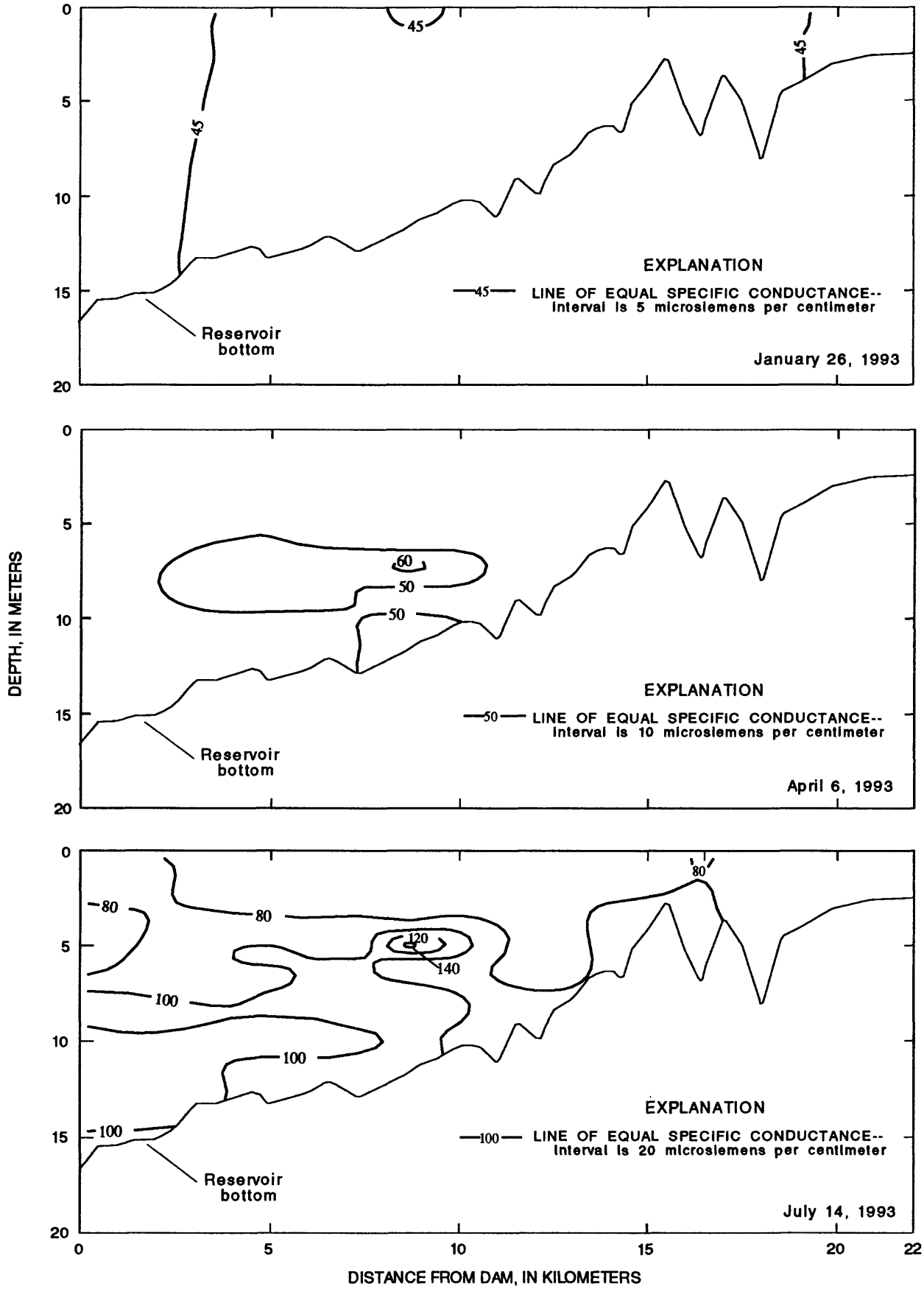

Figure 7. Depth-distance isopleths of specific conductance (in microsiemens per centimeter at 25 degrees Celsius), Rhodhiss Lake, for selected dates during the study period.

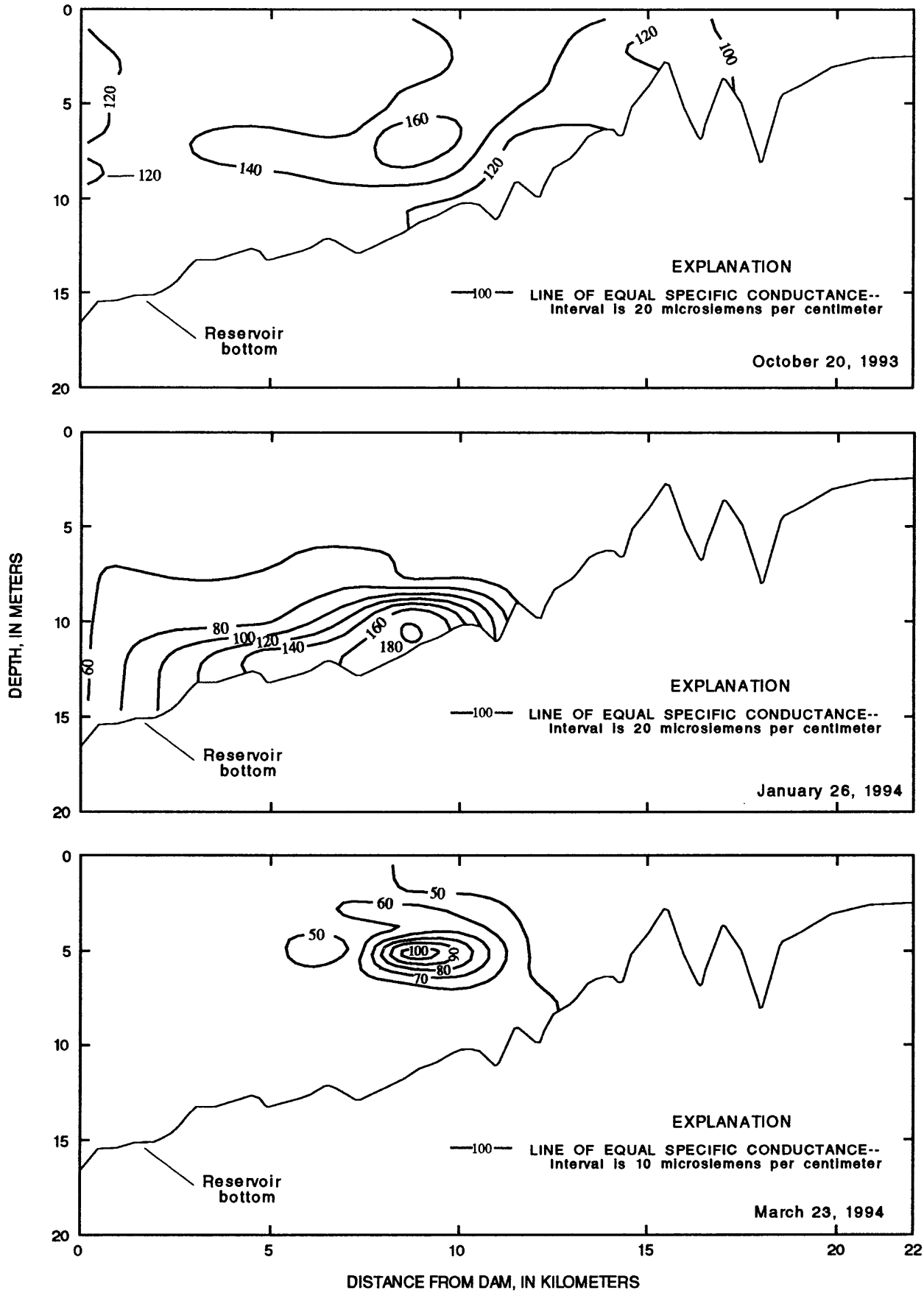

Figure 7. Depth-distance isopleths of specific conductance (in microsiemens per centimeter at 25 degrees Celsius), Rhodhiss Lake, for selected dates during the study period--Continued.

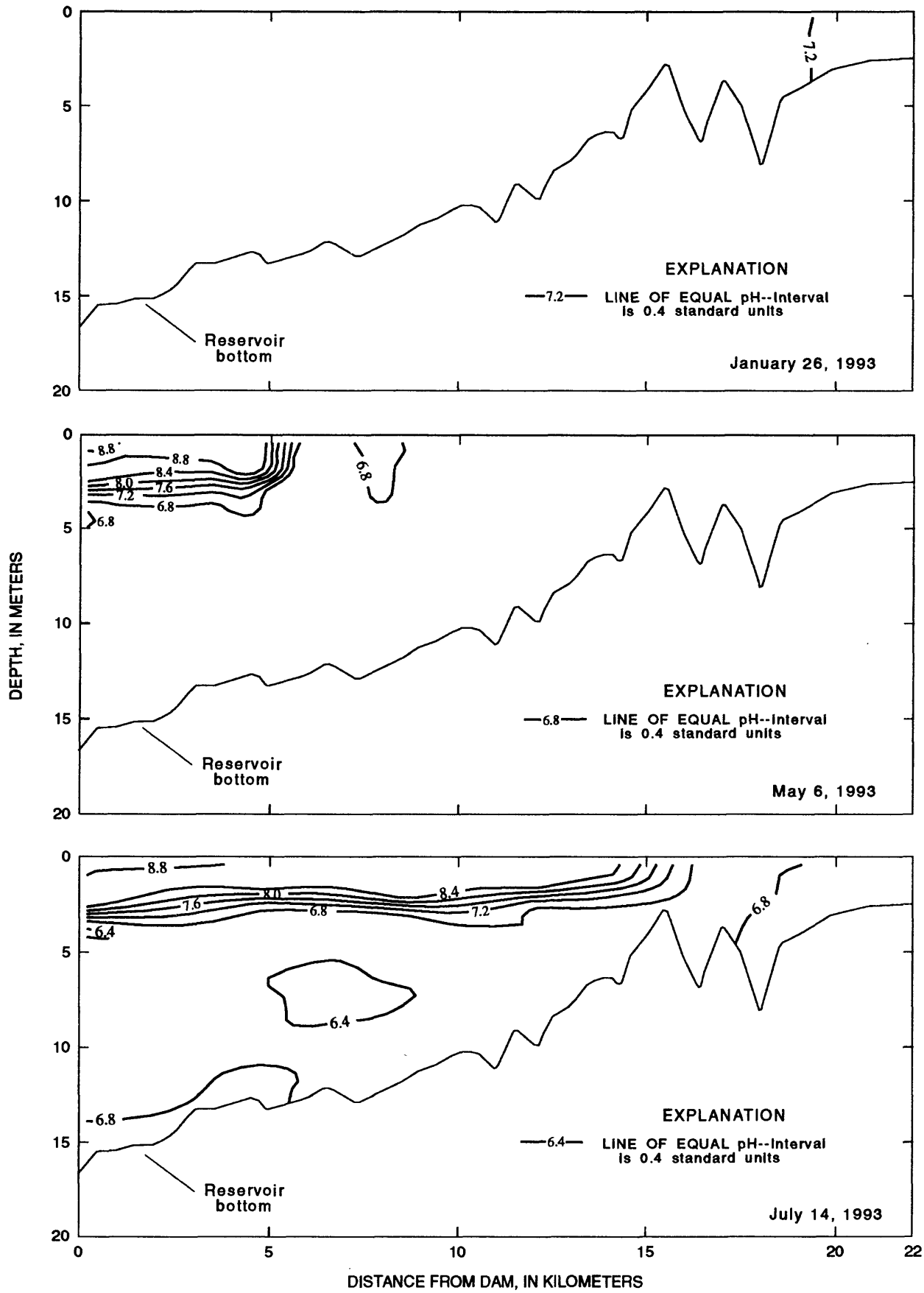

Figure 8. Depth-distance isopleths of pH (in standard units), Rhodhiss Lake, for selected dates during the study period.

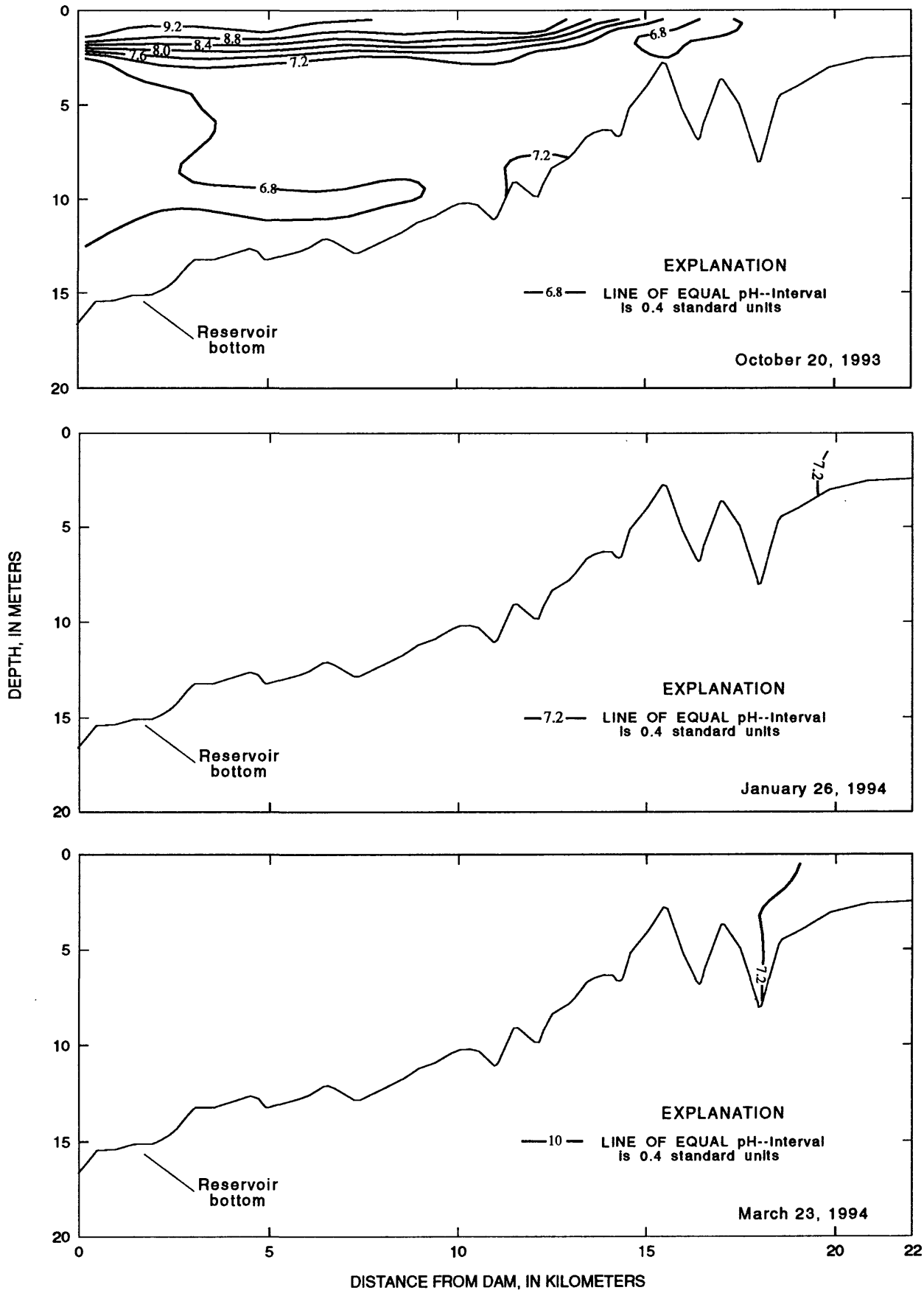

Figure 8. Depth-distance isopleths of pH (in standard units), Rhodhiss Lake, for selected dates during the study period--Continued.

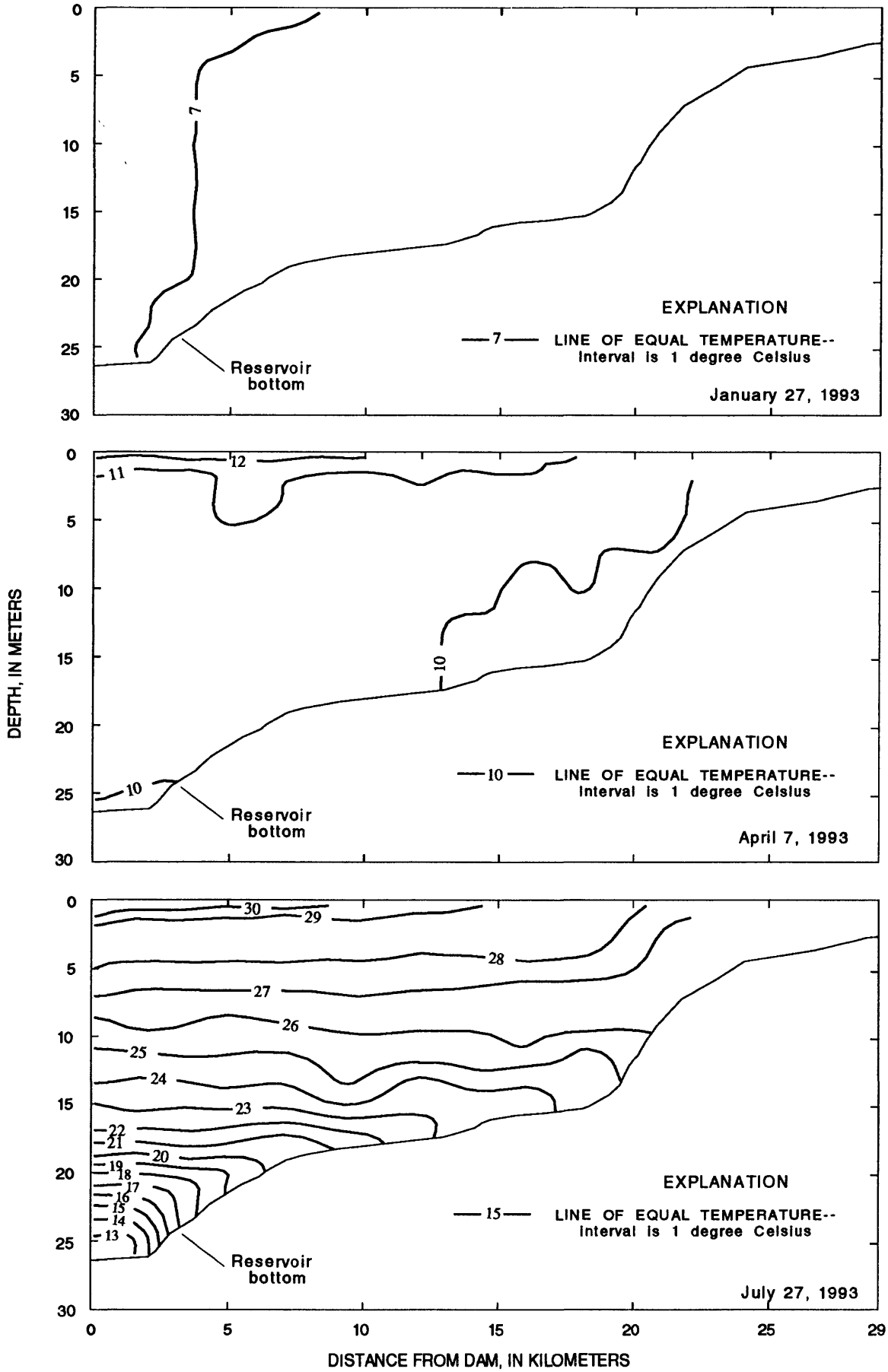

Figure 9. Depth-distance isopleths of water temperature (in degrees Celsius), Lake Hickory, for selected dates during the study period.

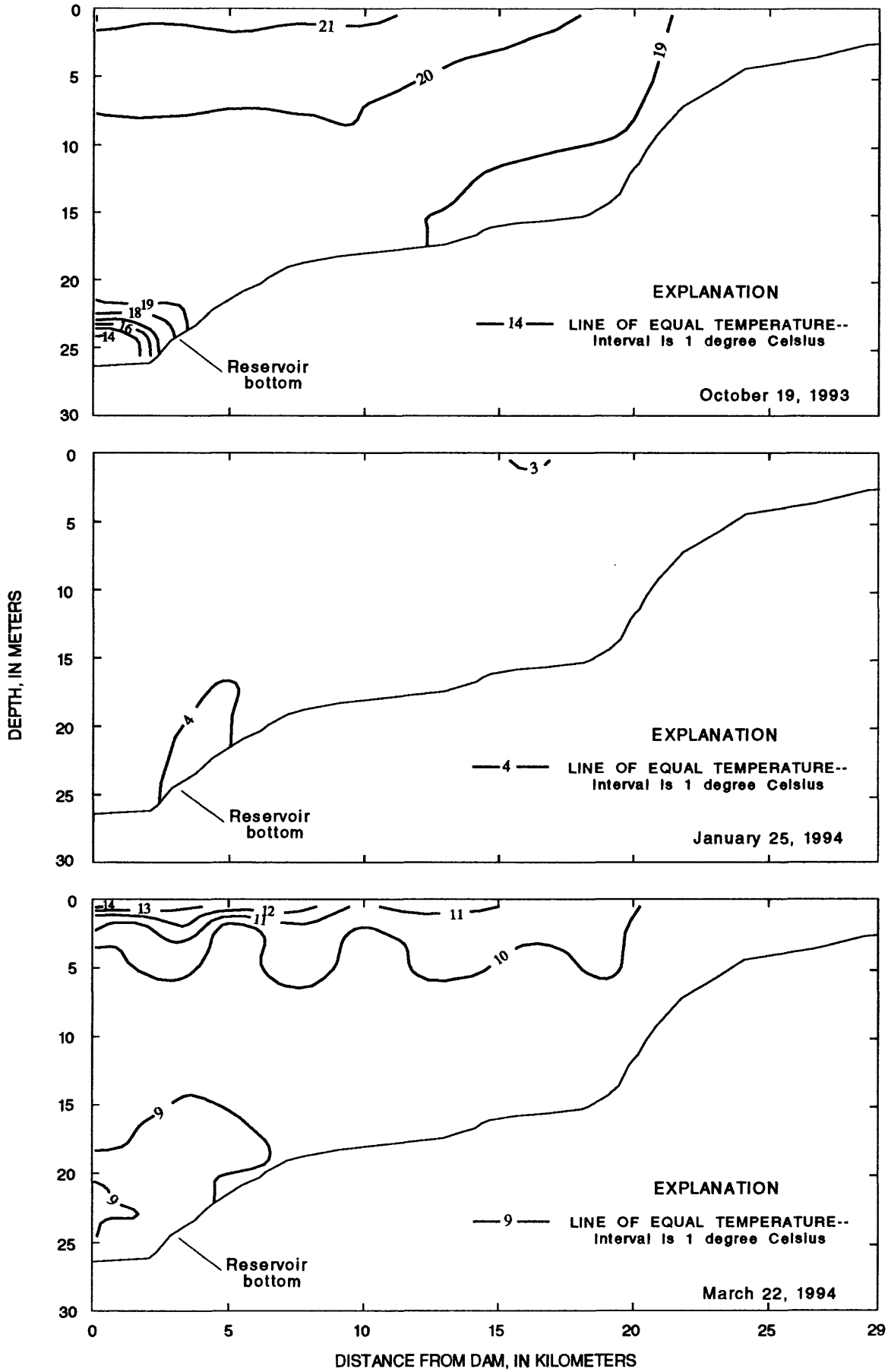

Figure 9. Depth-distance isopleths of water temperature (in degrees Celsius), Lake Hickory, for selected dates during the study period--Continued.

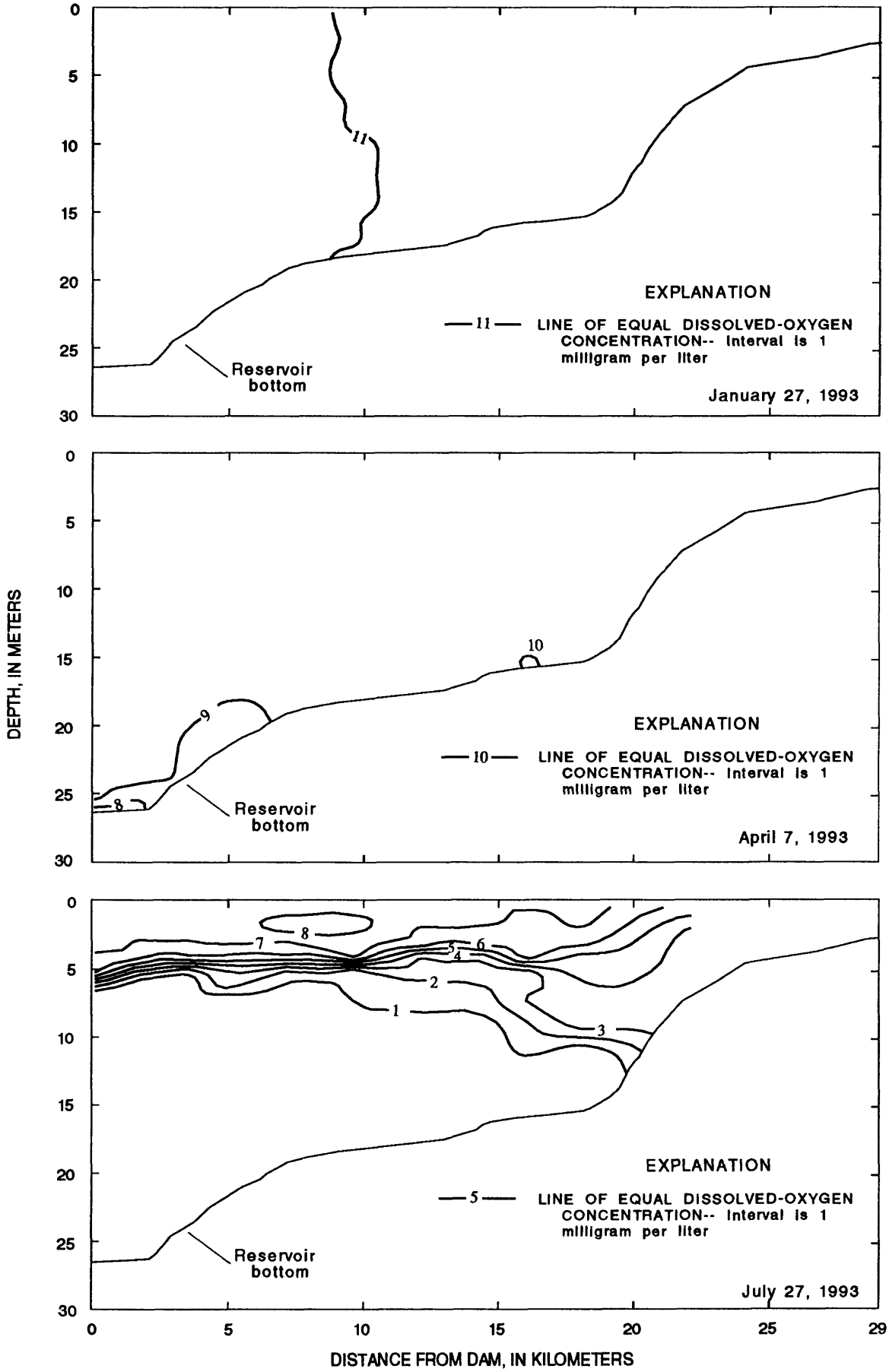

Figure 10. Depth-distance isopleths of dissolved-oxygen concentrations (in milligrams per liter), Lake Hickory, for selected dates during the study period.

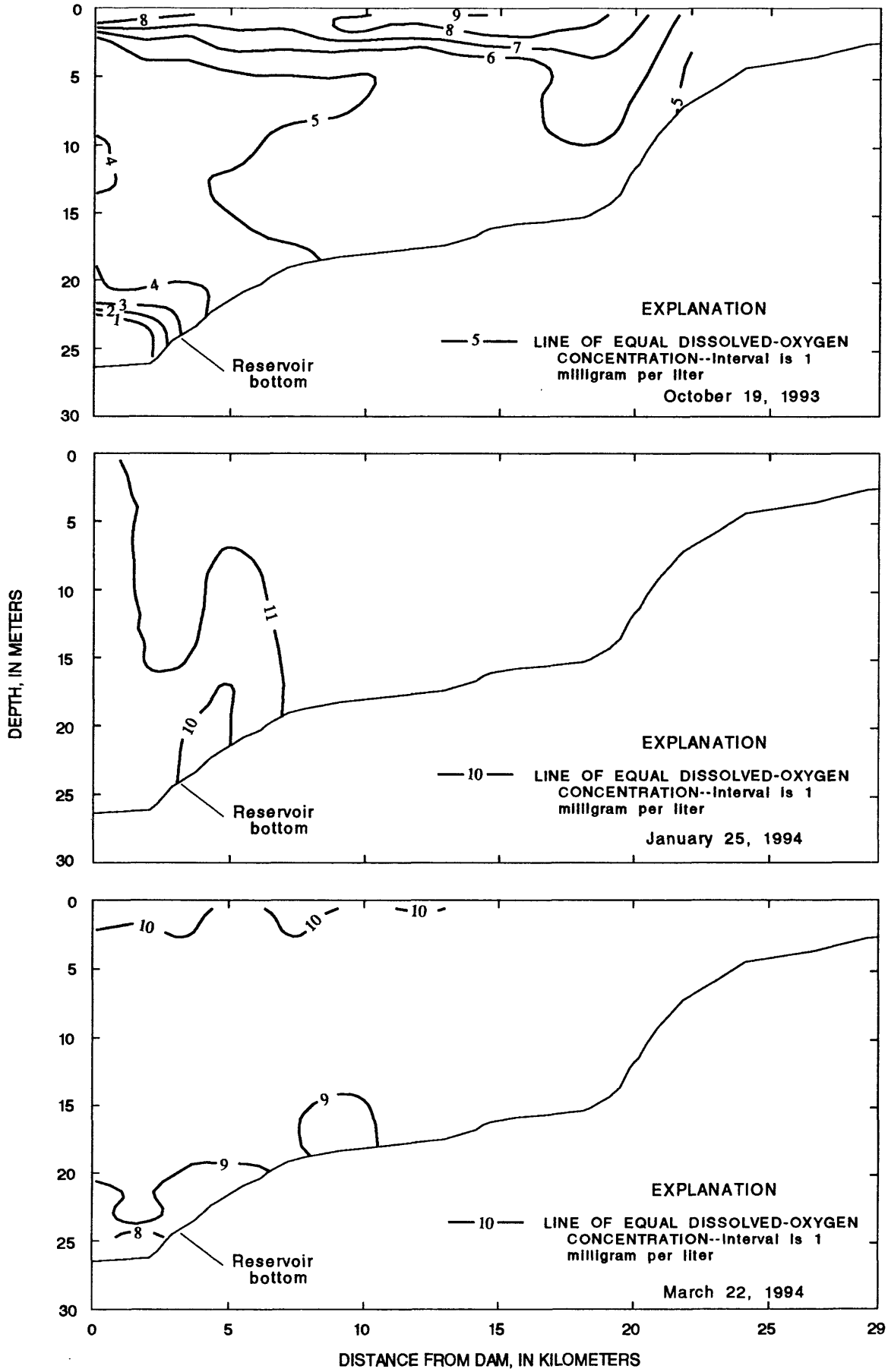

Figure 10. Depth-distance isopleths of dissolved-oxygen concentrations (in milligrams per liter), Lake Hickory, for selected dates during the study period--Continued.

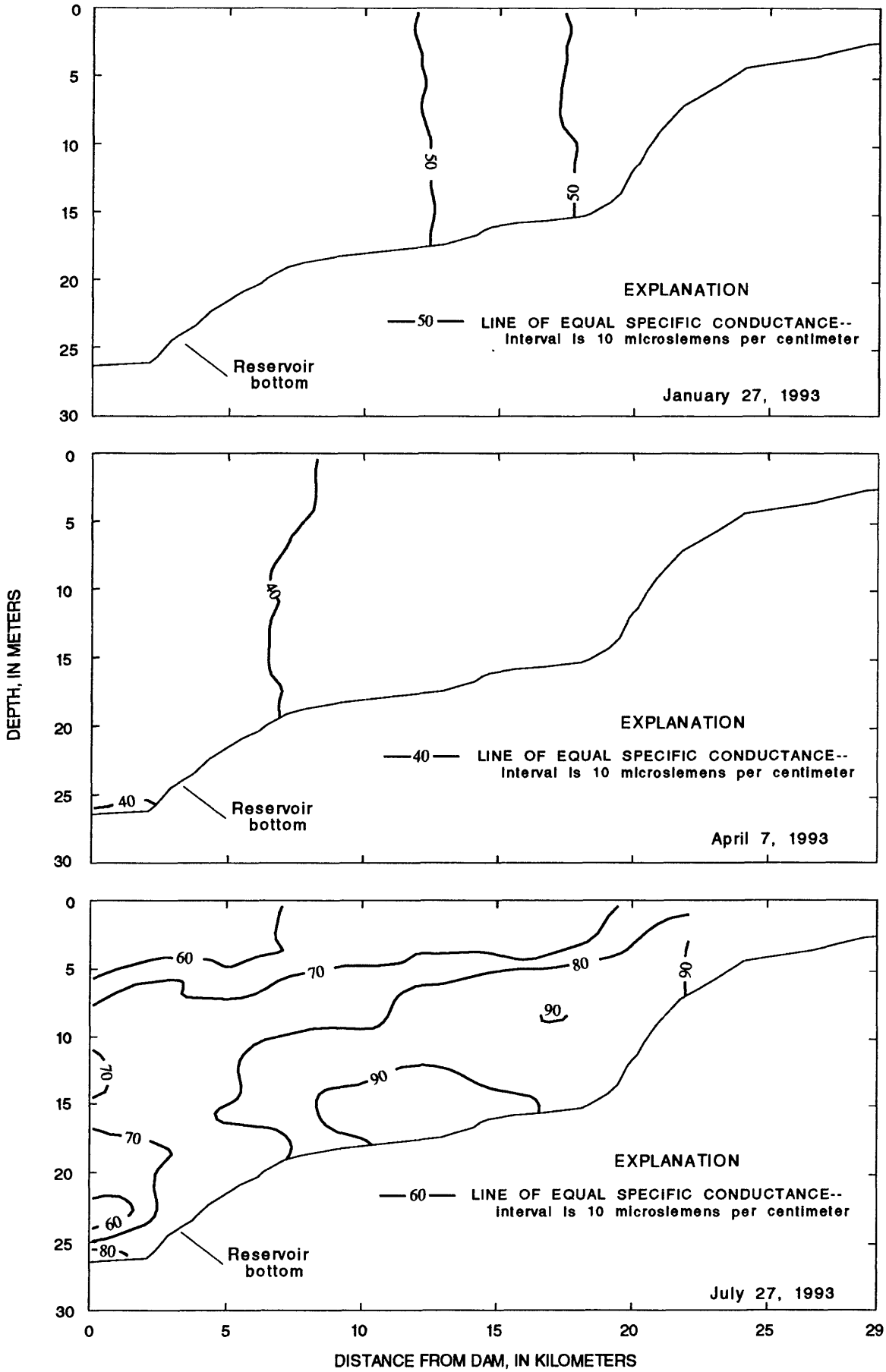

Figure 11. Depth-distance isopleths of specific conductance (in microsiemens per centimeter at 25 degrees Celsius), Lake Hickory, for selected dates during the study period.

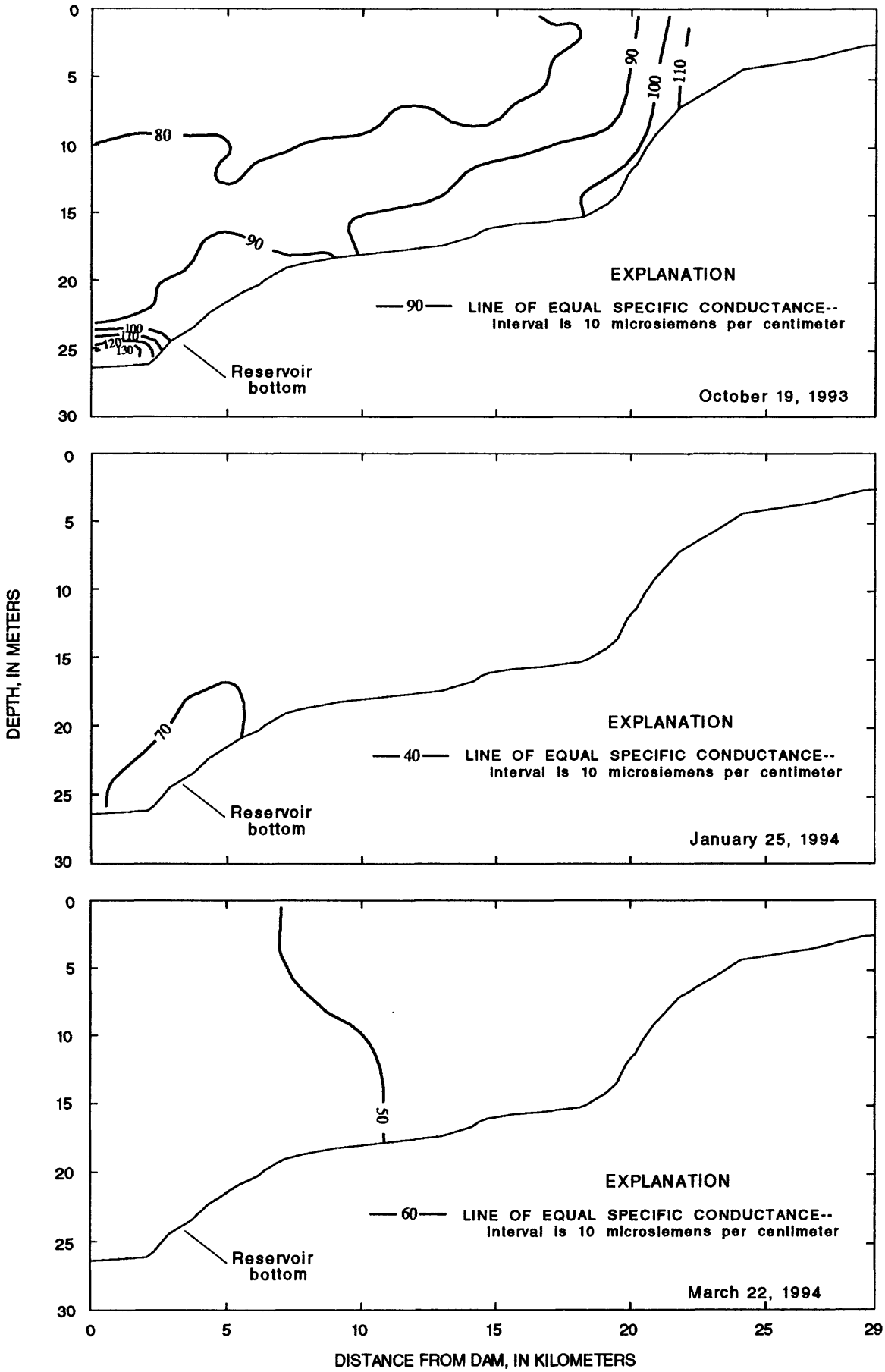

Figure 11. Depth-distance isopleths of specific conductance (in microsiemens per centimeter at 25 degrees Celsius), Lake Hickory, for selected dates during the study period--Continued.

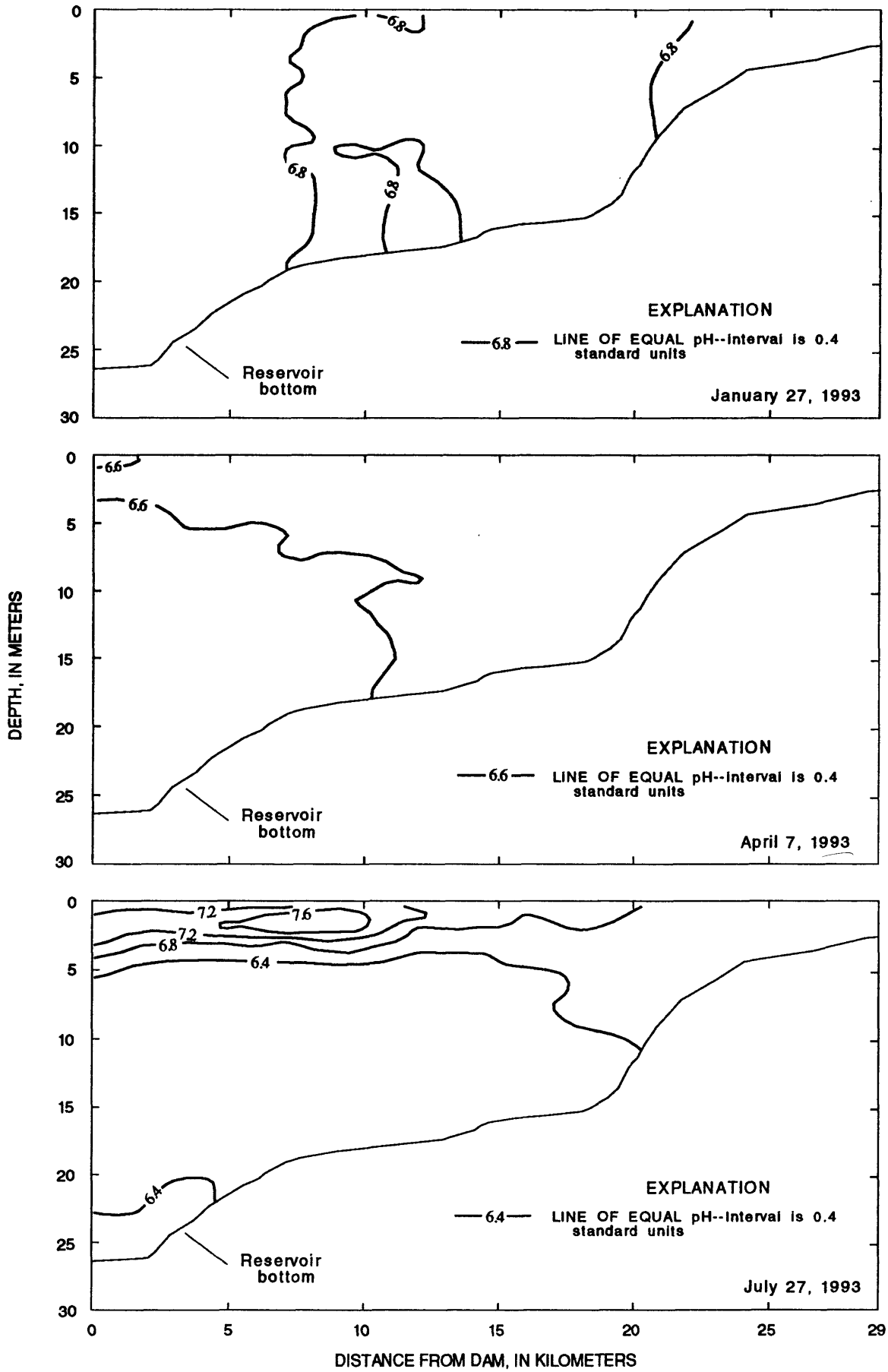

Figure 12. Depth-distance isopleths of pH (in standard units), Lake Hickory, for selected dates during the study period.

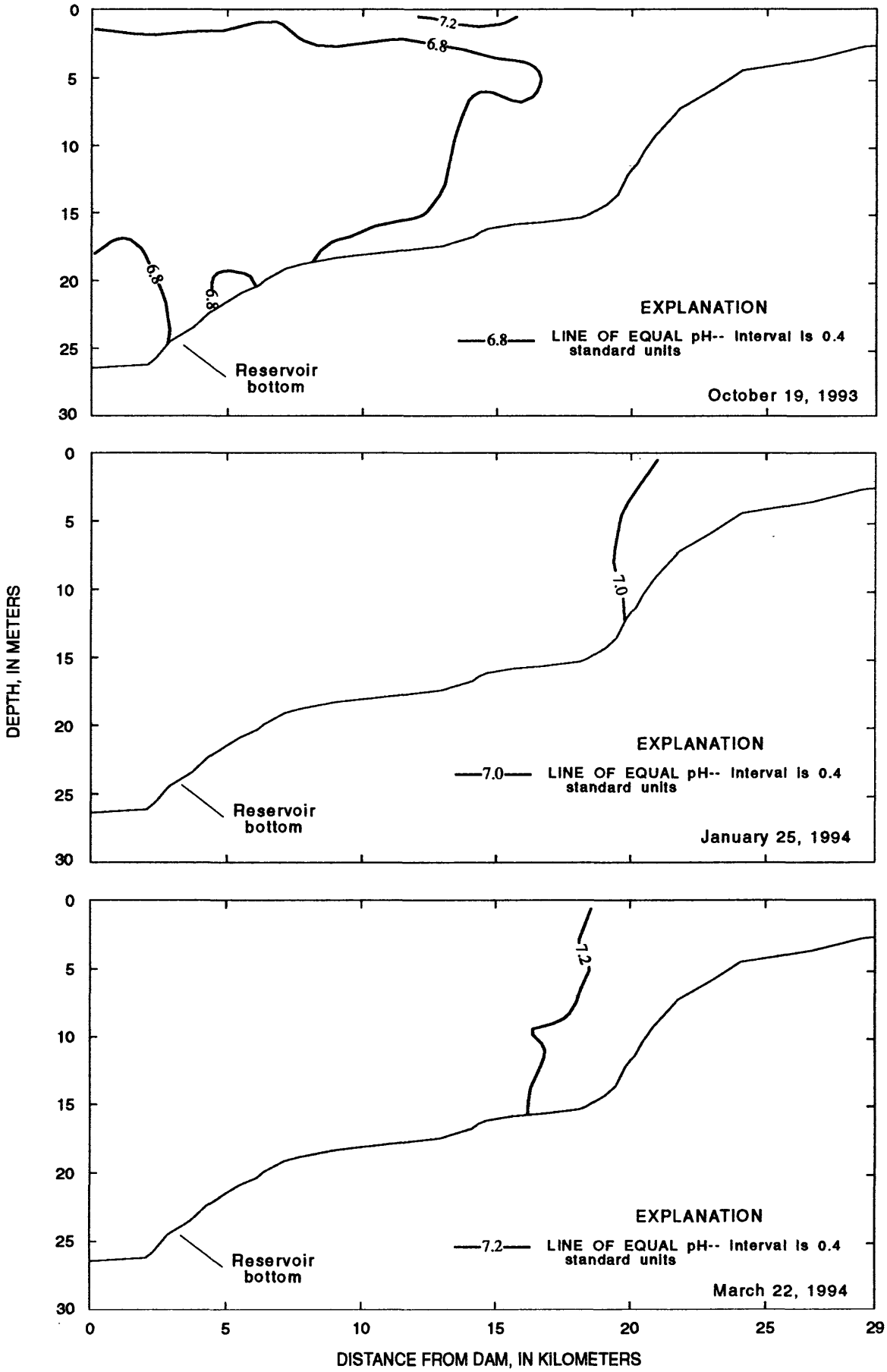

Figure 12. Depth-distance isopleths of pH (in standard units), Lake Hickory, for selected dates during the study period--Continued.

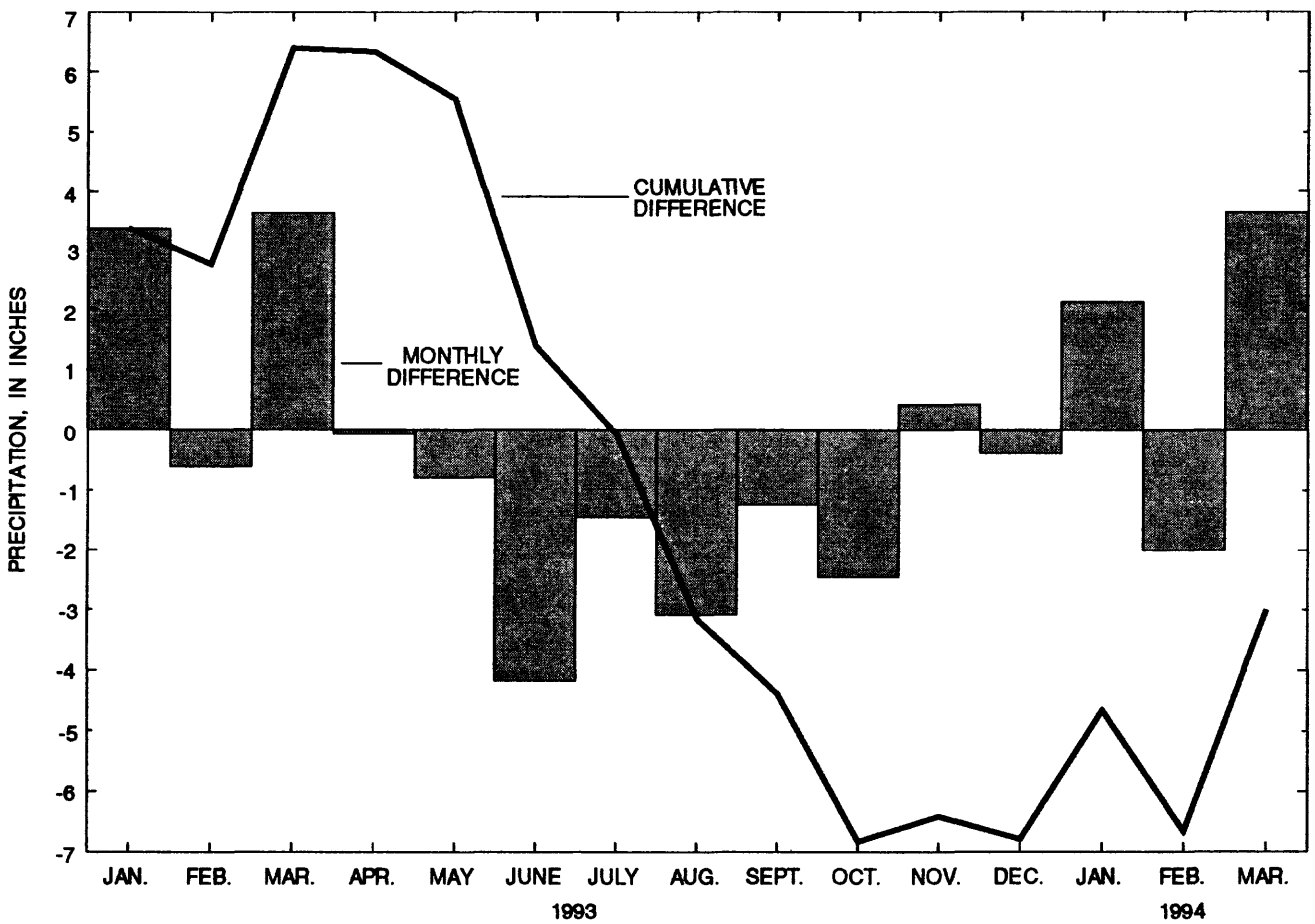

Figure 13. Relation of monthly and cumulative precipitation to long-term average precipitation near Hickory, North Carolina, during the study period.

DATA TABLES

Abbreviations, in addition to those listed inside the back cover of this report, that are used in tables 6-33.

>	greater than
<	less than
---	missing data or no day in month
*	value is estimated by using a log-probability regression to predict the values of data below the detection limit
CFSM	cubic feet per second per square mile
cols/100 mL	colonies per 100 milliliters
e or E	estimated value
K	results based on colony count outside the acceptable range
mg/kg	milligram per kilogram
NO_2+NO_3	nitrite plus nitrate nitrogen
µg/g	microgram per gram
µg/L	microgram per liter
µS/cm	microsiemens per centimeter at 25 degrees Celsius
°C	degrees Celsius

Table 11. Statistical summary of water-quality data at Rhodhiss Lake site 20, January 1993 through March 1994

RHODHISS LAKE AT HUFFMAN BRIDGE, SR 1501

[Site 20 is at latitude 35°47'15", longitude 81°37'30", Burke County, U.S. Geological Survey downstream order number 0214126765; --, data insufficient to calculate statistic; *, value is estimated by using a log-probability regression to predict the values of data below the detection limit. Multiple detection limits during the period of record may result in different values flagged with a "<"]

PARAMETER CODE	PROPERTY OR CONSTITUENT	DESCRIPTIVE STATISTICS				PERCENT OF SAMPLES IN WHICH VALUES WERE LESS THAN OR EQUAL TO THOSE SHOWN				
		SAMPLE SIZE	MAXIMUM	MINIMUM	MEAN	95%	75%	50%	25%	5%
	NEAR SURFACE									
00098	Sampling depth (meters)	21	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500
00095	Specific conductance (µS/cm at 25 °C)	21	116.000	33.000	64.524	115.800	72.000	61.000	45.000	33.400
00400	pH, field (standard pH units)	21	7.200	6.600	6.857	7.180	6.950	6.800	6.800	6.610
00010	Water temperature (°C)	21	24.000	4.500	14.310	23.750	20.500	15.500	8.000	4.600
00098	Transparency, Secchi disk (meters)	21	1.550	0.150	0.564	1.495	0.650	0.550	0.400	0.155
00300	Oxygen, dissolved (mg/L)	21	11.700	6.700	8.814	11.670	10.300	8.200	7.250	6.730
00301	Oxygen, dissolved (percent of saturation)	21	94.000	77.000	86.905	93.900	91.000	88.000	83.000	77.400
00310	Biochemical oxygen demand, 5-day (mg/L)	19	3.100	<2.000	--	3.100	<2.000	<2.000	<2.000	<2.000
31625	Fecal coliform bacteria (cols/100 mL)	19	1,300.000	20.000	261.053	1,300.000	290.000	120.000	58.000	20.000
00900	Hardness, total (mg/L as $CaCO_3$)	21	18.000	9.000	12.476	17.800	13.500	12.000	11.000	9.000
00915	Calcium, dissolved (mg/L as Ca)	21	4.100	2.100	3.062	4.090	3.450	3.000	2.700	2.110
00925	Magnesium, dissolved (mg/L as Mg)	21	1.800	0.800	1.157	1.760	1.200	1.200	1.000	0.800
90410	Alkalinity, lab (mg/L as $CaCO_3$)	21	21.000	12.000	16.238	21.000	18.500	16.000	14.000	12.100
00530	Solids, total suspended (mg/L)	21	71.000	6.000	17.524	66.600	19.500	15.000	10.500	6.200
00535	Solids, volatile suspended (mg/L)	21	24.000	1.000	6.381	22.700	8.000	6.000	3.500	1.100
00631	Nitrogen, NO_2 + NO_3 dissolved (mg/L as N)	21	0.306	0.118	0.227	0.305	0.263	0.237	0.191	0.118
00608	Nitrogen, ammonia dissolved (mg/L as N)	21	0.248	0.011	0.100	0.244	0.122	0.089	0.065	0.015
00625	Nitrogen, ammonia + organic total (mg/L as N)	21	0.800	<0.200	0.301*	0.700	0.400	0.300	<0.200	<0.200
00665	Phosphorus, total (mg/L as P)	21	0.154	0.026	0.057	0.150	0.070	0.053	0.028	0.026
00671	Phosphorus, orthophosphate dissolved (mg/L as P)	21	0.052	0.003	0.019	0.052	0.024	0.014	0.009	0.003
01045	Iron, total (µg/L as Fe)	21	2,500.000	310.000	684.762	2,370.002	690.000	560.000	460.000	315.000
00680	Carbon, organic total (mg/L as C)	21	5.900	1.700	2.581	5.800	2.600	2.300	2.050	1.700
70953	Chlorophyll-a (µg/L)	21	3.800	0.200	0.986	3.630	1.350	0.800	0.450	0.210
70954	Chlorophyll-b (µg/L)	21	0.200	<0.100	--	0.100	<0.100	<0.100	<0.100	<0.100
	NEAR BOTTOM									
00098	Sampling depth (meters)	21	3.400	1.600	2.024	3.310	2.250	1.900	1.700	1.600
00095	Specific conductance (µS/cm at 25 °C)	21	116.000	33.000	64.143	115.800	71.500	61.000	44.500	33.300
00400	pH, field (standard pH units)	21	7.200	6.600	6.876	7.190	7.000	6.900	6.800	6.610
00010	Water temperature (°C)	21	22.500	4.500	14.095	22.350	20.250	15.000	8.000	4.600
00300	Oxygen, dissolved (mg/L)	21	11.700	6.800	8.833	11.660	10.400	8.200	7.300	6.820
00301	Oxygen, dissolved (percent of saturation)	21	95.000	77.000	86.905	94.700	91.500	88.000	83.000	77.300
00310	Biochemical oxygen demand, 5-day (mg/L)	19	3.200	<2.000	--	3.200	<2.000	<2.000	<2.000	<2.000
00900	Hardness, total (mg/L as $CaCO_3$)	21	16.000	9.000	12.238	15.900	13.500	12.000	11.000	9.000
00915	Calcium, dissolved (mg/L as Ca)	21	4.000	2.200	3.062	3.980	3.400	3.000	2.750	2.200
00925	Magnesium, dissolved (mg/L as Mg)	21	1.400	0.800	1.114	1.400	1.200	1.100	1.000	0.800
90410	Alkalinity, lab (mg/L as $CaCO_3$)	21	20.000	11.000	16.000	20.000	18.000	16.000	14.000	11.200
00530	Solids, total suspended (mg/L)	21	86.000	10.000	30.714	84.200	38.000	26.000	19.000	10.100
00535	Solids, volatile suspended (mg/L)	21	57.000	2.000	12.143	54.000	15.000	8.000	5.000	2.200
00631	Nitrogen, NO_2 + NO_3 dissolved (mg/L as N)	21	0.315	0.006	0.218	0.313	0.262	0.238	0.184	0.018
00608	Nitrogen, ammonia dissolved (mg/L as N)	21	0.259	0.019	0.101	0.255	0.130	0.085	0.063	0.021
00625	Nitrogen, ammonia + organic total (mg/L as N)	21	0.600	<0.200	0.276*	0.500	0.400	0.200	0.200	<0.200
00665	Phosphorus, total (mg/L as P)	21	0.129	0.023	0.065	0.128	0.088	0.062	0.033	0.023
00671	Phosphorus, orthophosphate dissolved (mg/L as P)	21	0.052	0.001	0.017	0.051	0.020	0.015	0.008	0.001
01045	Iron, total (µg/L as Fe)	21	2,800.000	340.000	1,286.667	2,750.001	1,650.000	1,100.000	835.000	359.000
00680	Carbon, organic total (mg/L as C)	20	4.700	1.700	2.640	4.695	2.800	2.450	2.050	1.710

Table 12. Statistical summary of water-quality data at Rhodhiss Lake site 24, January 1993 through March 1994

RHODHISS LAKE AT CASTLE BRIDGE, SR 1001

[Site 24 is at latitude 35°44'48", longitude 81°31'27", Burke County, U.S. Geological Survey downstream order number 0214146100; --, data insufficient to calculate statistic; *, value is estimated by using a log-probability regression to predict the values of data below the detection limit. Multiple detection limits during the period of record may result in different values flagged with a "<"]

PARAM-ETER CODE	PROPERTY OR CONSTITUENT	DESCRIPTIVE STATISTICS				PERCENT OF SAMPLES IN WHICH VALUES WERE LESS THAN OR EQUAL TO THOSE SHOWN				
		SAMPLE SIZE	MAXIMUM	MINIMUM	MEAN	95%	75%	50%	25%	5%
	NEAR SURFACE									
00098	Sampling depth (meters)	21	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500
00095	Specific conductance (µS/cm at 25 °C)	21	139.000	36.000	74.952	138.900	111.000	59.000	47.000	36.300
00400	pH, field (standard pH units)	21	9.100	6.600	7.762	9.090	8.800	7.000	6.900	6.610
00010	Water temperature (°C)	21	30.000	5.000	17.548	29.950	25.500	19.500	8.750	5.150
00078	Transparency, Secchi disk (meters)	21	1.600	0.200	0.829	1.575	1.100	0.800	0.550	0.205
00300	Oxygen, dissolved (mg/L)	21	12.700	7.200	10.033	12.650	10.850	9.800	9.300	7.350
00301	Oxygen, dissolved (percent of saturation)	21	139.000	85.000	108.048	138.600	123.500	98.000	92.000	85.300
00310	Biochemical oxygen demand, 5-day (mg/L)	17	3.400	<2.000	--	3.400	<2.000	<2.000	<2.000	<2.000
31625	Fecal coliform bacteria (cols/100 mL)	19	980.000	<4.000	111.279*	980.000	110.000	40.000	8.000	4.000
00900	Hardness, total (mg/L as $CaCO_3$)	21	14.000	8.000	11.381	13.900	13.000	12.000	10.000	8.100
00915	Calcium, dissolved (mg/L as Ca)	21	3.300	2.000	2.771	3.290	3.100	2.800	2.550	2.030
00925	Magnesium, dissolved (mg/L as Mg)	21	1.300	0.800	1.081	1.300	1.200	1.100	0.950	0.810
90410	Alkalinity, lab (mg/L as $CaCO_3$)	21	49.000	11.000	18.857	46.400	22.000	17.000	14.500	11.200
00530	Solids, total suspended (mg/L)	21	44.000	1.000	7.286	41.700	6.000	4.000	3.000	1.100
00535	Solids, volatile suspended (mg/L)	21	9.000	1.000	3.286	9.000	3.500	3.000	2.000	1.000
00631	Nitrogen, NO_2 + NO_3 dissolved (mg/L as N)	21	0.285	<0.005	0.124*	0.280	0.213	0.124	<0.005	<0.005
00608	Nitrogen, ammonia dissolved (mg/L as N)	21	0.094	<0.002	0.034*	0.076	0.061	0.026	0.006	<0.002
00625	Nitrogen, ammonia + organic total (mg/L as N)	21	0.900	<0.200	0.290*	0.800	0.400	0.200	<0.200	<0.200
00665	Phosphorus, total (mg/L as P)	21	0.167	0.024	0.050	0.158	0.052	0.044	0.034	0.024
00671	Phosphorus, orthophosphate dissolved (mg/L as P)	21	0.029	<0.001	0.007*	0.017	0.010	0.004	<0.001	<0.001
01045	Iron, total (µg/L as Fe)	21	1,500.000	80.000	314.286	1,420.001	340.000	240.000	110.000	82.000
00680	Carbon, organic total (mg/L as C)	21	4.500	1.300	2.876	4.480	3.550	3.000	2.100	1.320
70953	Chlorophyll *a* (µg/L)	21	52.000	0.100	9.110	49.800	13.500	5.500	0.900	0.150
70954	Chlorophyll *b* (µg/L)	21	2.800	<0.100	0.567*	1.400	0.800	0.300	<0.100	<0.100
	THERMOCLINE									
00098	Sampling depth (meters)	8	6.500	1.700	3.363	6.500	3.875	3.100	2.500	1.700
00095	Specific conductance (µS/cm at 25 °C)	7	203.000	65.000	113.000	203.000	152.000	98.000	76.000	65.000
00400	pH, field (standard pH units)	7	8.600	6.800	7.143	8.600	7.000	6.900	6.900	6.800
00010	Water temperature (°C)	7	27.500	18.500	23.643	27.500	25.500	23.500	22.500	18.500
00300	Oxygen, dissolved (mg/L)	7	10.400	5.400	7.071	10.400	8.900	6.100	5.700	5.400
00301	Oxygen, dissolved (percent of saturation)	7	126.000	65.000	85.714	126.000	100.000	79.000	71.000	65.000
00310	Biochemical oxygen demand, 5-day (mg/L)	6	2.100	<2.000	--	2.100	2.000	<2.000	<2.000	<2.000
00900	Hardness, total (mg/L as $CaCO_3$)	8	14.000	11.000	12.250	14.000	12.750	12.000	12.000	11.000
00915	Calcium, dissolved (mg/L as Ca)	8	3.400	2.600	2.963	3.400	3.175	2.900	2.800	2.600
00925	Magnesium, dissolved (mg/L as Mg)	8	1.300	1.000	1.150	1.300	1.200	1.150	1.100	1.000
90410	Alkalinity, lab (mg/L as $CaCO_3$)	8	25.000	16.000	19.375	25.000	21.750	19.000	16.250	16.000
00530	Solids, total suspended (mg/L)	8	11.000	<1.000	4.317*	11.000	6.000	3.000	1.000	1.000
00535	Solids, volatile suspended (mg/L)	8	4.000	<1.000	2.298*	4.000	4.000	2.000	<1.000	<1.000
00631	Nitrogen, NO_2 + NO_3 dissolved (mg/L as N)	8	0.182	0.022	0.104	0.182	0.125	0.120	0.067	0.022
00608	Nitrogen, ammonia dissolved (mg/L as N)	8	0.139	<0.002	0.050*	0.139	0.066	0.023	<0.002	<0.002
00625	Nitrogen, ammonia + organic total (mg/L as N)	8	0.400	<0.200	0.317*	0.400	0.400	0.300	<0.200	<0.200
00665	Phosphorus, total (mg/L as P)	8	0.160	0.040	0.078	0.160	0.109	0.066	0.042	0.040
00671	Phosphorus, orthophosphate dissolved (mg/L as P)	8	0.108	<0.001	0.038*	0.108	0.054	0.022	<0.001	<0.001
01045	Iron, total (µg/L as Fe)	8	420.000	130.000	265.000	420.000	380.000	265.000	165.000	130.000
00680	Carbon, organic total (mg/L as C)	8	3.300	2.200	2.863	3.300	3.175	2.950	2.500	2.200
	NEAR BOTTOM									
00098	Sampling depth (meters)	21	10.600	9.200	9.757	10.600	9.950	9.700	9.400	9.210
00095	Specific conductance (µS/cm at 25 °C)	21	197.000	30.000	80.000	192.800	93.500	71.000	51.000	30.200
00400	pH, field (standard pH units)	21	7.700	6.400	6.786	7.640	6.950	6.800	6.600	6.410
00010	Water temperature (°C)	21	23.500	4.500	13.976	23.400	20.250	14.500	7.750	4.650
00300	Oxygen, dissolved (mg/L)	21	11.600	0.000	7.043	11.550	9.900	7.700	5.000	0.040
00301	Oxygen, dissolved (percent of saturation)	21	94.000	0.000	66.714	93.800	88.500	81.000	56.500	0.500
00310	Biochemical oxygen demand, 5-day (mg/L)	19	2.800	<2.000	--	2.800	<2.000	<2.000	<2.000	<2.000
00900	Hardness, total (mg/L as $CaCO_3$)	21	16.000	8.000	12.095	15.900	13.000	12.000	11.000	8.100
00915	Calcium, dissolved (mg/L as Ca)	21	3.900	2.000	3.029	3.890	3.400	3.100	2.650	2.010
00925	Magnesium, dissolved (mg/L as Mg)	21	1.400	0.800	1.119	1.390	1.200	1.200	1.000	0.800
90410	Alkalinity, lab (mg/L as $CaCO_3$)	20	25.000	11.000	17.000	24.850	19.000	18.000	14.000	11.000
00530	Solids, total suspended (mg/L)	20	68.000	5.000	24.300	67.000	37.750	18.500	12.500	5.150
00535	Solids, volatile suspended (mg/L)	20	18.000	2.000	7.350	17.750	9.750	7.000	5.000	2.050
00631	Nitrogen, NO_2 + NO_3 dissolved (mg/L as N)	21	0.285	0.118	0.202	0.285	0.228	0.206	0.173	0.119
00608	Nitrogen, ammonia dissolved (mg/L as N)	21	0.668	0.031	0.176	0.638	0.255	0.135	0.076	0.034
00625	Nitrogen, ammonia + organic total (mg/L as N)	21	0.900	<0.200	0.364*	0.600	0.500	0.300	0.200	<0.200
00665	Phosphorus, total (mg/L as P)	21	0.170	0.033	0.088	0.167	0.103	0.086	0.068	0.034
00671	Phosphorus, orthophosphate dissolved (mg/L as P)	21	0.085	0.007	0.023	0.084	0.023	0.014	0.009	0.007
01045	Iron, total (µg/L as Fe)	21	2,700.000	390.000	1,045.714	2,620.001	1,550.000	900.000	540.000	393.000
00680	Carbon, organic total (mg/L as C)	21	22.000	1.700	3.795	20.410	3.550	2.700	1.850	1.710

Table 13. Statistical summary of water-quality data at Rhodhiss Lake site 27, January 1993 through March 1994

RHODHISS LAKE AT RHODHISS DAM

[Site 27 is at latitude 35°46'27", longitude 81°26'33", Burke County, U.S. Geological Survey downstream order number 0214148975; --, data insufficient to calculate statistic; *, value is estimated by using a log-probability regression to predict the values of data below the detection limit. Multiple detection limits during the period of record may result in different values flagged with a "<"]

PARAMETER CODE	PROPERTY OR CONSTITUENT	DESCRIPTIVE STATISTICS				PERCENT OF SAMPLES IN WHICH VALUES WERE LESS THAN OR EQUAL TO THOSE SHOWN				
		SAMPLE SIZE	MAXIMUM	MINIMUM	MEAN	95%	75%	50%	25%	5%
	NEAR SURFACE									
00098	Sampling depth (meters)	21	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500
00095	Specific conductance (µS/cm at 25 °C)	21	131.000	31.000	74.238	129.900	107.500	65.000	48.500	32.200
00400	pH, field (standard pH units)	21	9.100	6.400	7.848	9.100	8.850	7.600	6.950	6.430
00010	Water temperature (°C)	21	31.500	3.000	18.214	31.450	27.750	20.000	9.000	3.350
00078	Transparency, Secchi disk (meters)	21	1.700	0.100	0.940	1.670	1.150	1.000	0.700	0.125
00300	Oxygen, dissolved (mg/L)	21	12.300	7.300	9.805	12.240	10.650	9.900	8.900	7.390
00301	Oxygen, dissolved (percent of saturation)	21	140.000	71.000	107.048	139.100	123.000	103.000	90.000	71.500
00310	Biochemical oxygen demand, 5-day (mg/L)	19	3.000	<2.000	--	3.000	<2.000	<2.000	<2.000	<2.000
31625	Fecal coliform bacteria (cols/100 mL)	19	2,400.000	<1.000	199.394*	2,400.000	150.000	40.000	1.000	<2.000
00900	Hardness, total (mg/L as $CaCO_3$)	21	16.000	7.000	11.190	15.700	12.000	11.000	10.000	7.200
00915	Calcium, dissolved (mg/L as Ca)	21	3.900	1.700	2.738	3.850	3.000	2.600	2.500	1.750
00925	Magnesium, dissolved (mg/L as Mg)	21	1.600	0.700	1.076	1.570	1.200	1.100	1.000	0.710
90410	Alkalinity, lab (mg/L as $CaCO_3$)	21	23.000	9.700	16.748	23.000	20.000	16.000	14.000	10.030
00530	Solids, total suspended (mg/L)	21	114.000	<1.000	9.824*	17.000	6.000	4.000	2.000	<1.000
00535	Solids, volatile suspended (mg/L)	20	9.000	<1.000	3.450*	9.000	4.000	2.000	<1.000	<1.000
00631	Nitrogen, NO_2 + NO_3 dissolved (mg/L as N)	21	0.316	<0.005	0.119*	0.278	0.236	0.065	<0.005	<0.005
00608	Nitrogen, ammonia dissolved (mg/L as N)	21	0.152	<0.002	0.035*	0.109	0.059	0.016	0.003	<0.002
00625	Nitrogen, ammonia + organic total (mg/L as N)	21	0.800	<0.200	0.311*	0.600	0.400	0.300	<0.200	<0.200
00665	Phosphorus, total (mg/L as P)	21	0.113	0.020	0.038	0.108	0.037	0.034	0.028	0.021
00671	Phosphorus, orthophosphate dissolved (mg/L as P)	21	0.022	<0.001	0.005*	0.015	0.008	0.002	<0.001	<0.001
01045	Iron, total (µg/L as Fe)	21	3,000.000	70.000	342.857	2,771.003	270.000	130.000	100.000	71.000
00680	Carbon, organic total (mg/L as C)	21	6.300	1.600	2.890	6.030	3.300	2.700	2.450	1.610
70953	Chlorophyll a (µg/L)	21	21.000	0.100	5.876	20.800	9.050	3.100	1.250	0.110
70954	Chlorophyll *b* (µg/L)	21	4.800	<0.100	0.577*	1.500	0.700	<0.100	<0.100	<0.100
	THERMOCLINE									
00098	Sampling depth (meters)	7	4.000	1.600	2.886	4.000	3.500	3.000	2.500	1.600
00095	Specific conductance (µS/cm at 25 °C)	6	124.000	48.000	75.000	124.000	97.000	68.500	51.750	48.000
00400	pH, field (standard pH units)	6	8.800	6.500	7.700	8.800	8.650	7.750	6.725	6.500
00010	Water temperature (°C)	6	27.500	19.000	23.583	27.500	26.000	24.000	20.875	19.000
00300	Oxygen, dissolved (mg/L)	6	10.900	2.600	7.733	10.900	10.825	8.200	4.925	2.600
00301	Oxygen, dissolved (percent of saturation)	6	128.000	33.000	92.833	128.000	123.500	99.500	64.500	33.000
00310	Biochemical oxygen demand, 5-day (mg/L)	6	<2.000	<2.000	--	<2.000	<2.000	<2.000	<2.000	<2.000
00900	Hardness, total (mg/L as $CaCO_3$)	7	12.000	10.000	11.286	12.000	12.000	12.000	10.000	10.000
00915	Calcium, dissolved (mg/L as Ca)	7	3.000	2.400	2.729	3.000	2.900	2.800	2.500	2.400
00925	Magnesium, dissolved (mg/L as Mg)	7	1.100	1.000	1.071	1.100	1.100	1.100	1.000	1.000
90410	Alkalinity, lab (mg/L as $CaCO_3$)	7	21.000	15.000	17.000	21.000	19.000	17.000	15.000	15.000
00530	Solids, total suspended (mg/L)	7	6.000	<1.000	2.703*	6.000	4.000	2.000	2.000	2.000
00535	Solids, volatile suspended (mg/L)	7	6.000	<1.000	2.228*	6.000	2.000	2.000	1.000	1.000
00631	Nitrogen, NO_2 + NO_3 dissolved (mg/L as N)	7	0.109	0.010	0.058	0.109	0.088	0.069	0.022	0.010
00608	Nitrogen, ammonia dissolved (mg/L as N)	7	0.044	<0.002	0.015*	0.044	0.028	0.008	<0.002	<0.002
00625	Nitrogen, ammonia + organic total (mg/L as N)	7	0.500	<0.200	--	0.500	0.400	<0.200	<0.200	<0.200
00665	Phosphorus, total (mg/L as P)	7	0.037	0.026	0.032	0.037	0.034	0.034	0.026	0.026
00671	Phosphorus, orthophosphate dissolved (mg/L as P)	7	0.008	<0.001	--	0.008	0.005	<0.001	<0.001	<0.001
01045	Iron, total (µg/L as Fe)	7	190.000	100.000	130.000	190.000	160.000	120.000	100.000	100.000
00680	Carbon, organic total (mg/L as C)	7	3.300	2.400	2.714	3.300	3.000	2.600	2.500	2.400
	NEAR BOTTOM									
00098	Sampling depth (meters)	21	14.900	13.400	13.971	14.870	14.150	14.000	13.650	13.410
00095	Specific conductance (µS/cm at 25 °C)	21	130.000	34.000	73.619	129.100	101.000	59.000	49.500	35.100
00400	pH, field (standard pH units)	21	7.600	6.500	6.867	7.550	7.000	6.900	6.700	6.510
00010	Water temperature (°C)	21	19.500	3.000	12.500	19.500	16.750	13.000	8.000	3.250
00300	Oxygen, dissolved (mg/L)	21	11.500	0.000	5.900	11.420	9.500	7.400	0.550	0.000
00301	Oxygen, dissolved (percent of saturation)	21	96.000	0.000	53.810	95.400	86.000	69.000	6.000	0.000
00310	Biochemical oxygen demand, 5-day (mg/L)	19	2.500	<2.000	--	2.500	<2.000	<2.000	<2.000	<2.000
00900	Hardness, total (mg/L as $CaCO_3$)	21	18.000	7.000	13.048	17.900	15.000	13.000	11.500	7.300
00915	Calcium, dissolved (mg/L as Ca)	21	4.700	1.800	3.267	4.670	3.800	3.100	2.800	1.880
00925	Magnesium, dissolved (mg/L as Mg)	21	1.500	0.700	1.157	1.490	1.300	1.200	1.000	0.720
90410	Alkalinity, lab (mg/L as $CaCO_3$)	21	24.000	9.900	16.948	23.900	19.500	17.000	14.000	10.210
00530	Solids, total suspended (mg/L)	21	124.000	4.000	19.571	115.300	22.000	10.000	8.000	4.000
00535	Solids, volatile suspended (mg/L)	21	32.000	1.000	8.333	31.600	12.500	5.000	3.000	1.100
00631	Nitrogen, NO_2 + NO_3 dissolved (mg/L as N)	21	0.330	0.005	0.169	0.324	0.249	0.193	0.090	0.006
00608	Nitrogen, ammonia dissolved (mg/L as N)	21	1.100	0.002	0.343	1.090	0.592	0.147	0.071	0.006
00625	Nitrogen, ammonia + organic total (mg/L as N)	21	1.600	<0.200	0.544*	1.100	0.700	0.400	0.200	<0.200
00665	Phosphorus, total (mg/L as P)	21	0.288	0.034	0.080	0.277	0.116	0.052	0.039	0.034
00671	Phosphorus, orthophosphate dissolved (mg/L as P)	21	0.130	0.001	0.025	0.129	0.021	0.014	0.008	0.001
01045	Iron, total (µg/L as Fe)	21	8,100.000	260.000	1,906.667	7,830.004	3,250.000	1,100.000	495.000	264.000
00680	Carbon, organic total (mg/L as C)	21	26.000	1.600	4.133	24.070	3.500	2.700	2.200	1.610

Table 14. Statistical summary of water-quality data at Lake Hickory site 29, January 1993 through March 1994

LAKE HICKORY AT U.S. 321

[Site 29 is at latitude 35°45'30", longitude 81°22'40", Burke County, U.S. Geological Survey downstream order number 0214157625; --, data insufficient to calculate statistic; *, value is estimated by using a log-probability regression to predict the values of data below the detection limit. Multiple detection limits during the period of record may result in different values flagged with a "<"]

PARAMETER CODE	PROPERTY OR CONSTITUENT	DESCRIPTIVE STATISTICS				PERCENT OF SAMPLES IN WHICH VALUES WERE LESS THAN OR EQUAL TO THOSE SHOWN				
		SAMPLE SIZE	MAXIMUM	MINIMUM	MEAN	95%	75%	50%	25%	5%
	NEAR SURFACE									
00098	Sampling depth (meters)	21	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500
00095	Specific conductance (µS/cm at 25 °C)	21	125.000	45.000	69.190	123.300	80.500	61.000	49.000	45.000
00400	pH, field (standard pH units)	21	7.300	6.500	6.805	7.280	6.900	6.800	6.650	6.510
00010	Water temperature (°C)	21	28.000	3.000	15.833	27.950	23.750	15.000	7.250	3.300
00098	Transparency, Secchi disk (meters)	22	1.100	0.150	0.709	1.070	0.800	0.750	0.638	0.188
00300	Oxygen, dissolved (mg/L)	21	11.700	4.800	8.143	11.650	10.400	7.500	6.150	4.870
00301	Oxygen, dissolved (percent of saturation)	21	95.000	57.000	82.048	94.900	90.500	87.000	71.500	57.500
00310	Biochemical oxygen demand, 5-day (mg/L)	19	2.600	<2.000	--	2.600	<2.000	<2.000	<2.000	<2.000
31625	Fecal coliform bacteria (cols/100 mL)	20	200.000	4.000	58.700	199.000	113.000	23.000	8.000	4.050
00900	Hardness, total (mg/L as $CaCO_3$)	21	14.000	7.000	11.238	14.000	12.000	11.000	10.000	7.300
00915	Calcium, dissolved (mg/L as Ca)	21	3.500	1.400	2.681	3.490	3.000	2.700	2.450	1.470
00925	Magnesium, dissolved (mg/L as Mg)	21	1.300	0.800	1.100	1.300	1.200	1.100	1.000	0.820
90410	Alkalinity, lab (mg/L as $CaCO_3$)	21	27.000	12.000	16.810	26.900	18.500	14.000	14.000	12.100
00530	Solids, total suspended (mg/L)	21	50.000	1.000	8.286	46.700	8.000	6.000	3.500	1.100
00535	Solids, volatile suspended (mg/L)	21	11.000	1.000	4.000	10.700	5.500	3.000	2.000	1.000
00631	Nitrogen, NO_2 + NO_3 dissolved (mg/L as N)	21	0.315	0.058	0.195	0.313	0.265	0.192	0.132	0.058
00608	Nitrogen, ammonia dissolved (mg/L as N)	21	0.142	0.008	0.074	0.142	0.088	0.074	0.045	0.009
00625	Nitrogen, ammonia + organic total (mg/L as N)	21	0.900	<0.200	0.328*	0.700	0.400	0.300	<0.200	<0.200
00665	Phosphorus, total (mg/L as P)	21	0.126	0.020	0.052	0.123	0.057	0.047	0.036	0.021
00671	Phosphorus, orthophosphate dissolved (mg/L as P)	21	0.020	<0.001	0.010*	0.020	0.017	0.010	0.003	<0.001
01045	Iron, total (µg/L as Fe)	21	1,600.000	160.000	441.429	1,570.000	400.000	320.000	260.000	161.000
00680	Carbon, organic total (mg/L as C)	21	6.100	1.600	2.671	5.950	2.950	2.600	1.950	1.610
70953	Chlorophyll a (µg/L)	21	110.000	0.300	13.014	103.200	16.500	1.600	0.500	0.300
70954	Chlorophyll *b* (µg/L)	21	4.800	<0.100	0.457*	1.000	0.400	<0.100	<0.100	<0.100
	NEAR BOTTOM									
00098	Sampling depth (meters)	21	5.500	4.300	4.852	5.490	5.200	4.700	4.600	4.310
00095	Specific conductance (µS/cm at 25 °C)	21	125.000	45.000	73.095	123.900	95.000	63.000	49.000	45.100
00400	pH, field (standard pH units)	21	7.300	6.400	6.748	7.290	6.900	6.700	6.500	6.410
00010	Water temperature (°C)	21	26.500	3.000	15.429	26.450	22.750	15.000	7.250	3.300
00300	Oxygen, dissolved (mg/L)	21	11.700	2.600	7.286	11.660	10.300	7.200	3.900	2.660
00301	Oxygen, dissolved (percent of saturation)	21	96.000	33.000	70.619	95.800	89.500	75.000	48.000	33.700
00310	Biochemical oxygen demand, 5-day (mg/L)	19	<2.000	<2.000	--	<2.000	<2.000	<2.000	<2.000	<2.000
00900	Hardness, total (mg/L as $CaCO_3$)	21	15.000	10.000	12.095	15.000	13.000	12.000	11.000	10.100
00915	Calcium, dissolved (mg/L as Ca)	21	3.900	2.400	2.986	3.890	3.150	2.900	2.700	2.420
00925	Magnesium, dissolved (mg/L as Mg)	21	1.300	1.000	1.110	1.300	1.200	1.100	1.000	1.000
90410	Alkalinity, lab (mg/L as $CaCO_3$)	21	26.000	11.000	16.381	25.900	18.500	15.000	13.500	11.200
00530	Solids, total suspended (mg/L)	21	51.000	1.000	13.857	50.800	14.000	10.000	8.000	1.300
00535	Solids, volatile suspended (mg/L)	21	23.000	1.000	7.000	22.400	9.000	5.000	3.000	1.100
00631	Nitrogen, NO_2 + NO_3 dissolved (mg/L as N)	21	0.317	0.134	0.217	0.315	0.270	0.202	0.175	0.136
00608	Nitrogen, ammonia dissolved (mg/L as N)	21	0.193	0.054	0.111	0.192	0.146	0.095	0.074	0.055
00625	Nitrogen, ammonia + organic total (mg/L as N)	21	1.300	<0.200	0.335*	0.800	0.400	0.300	0.200	<0.200
00665	Phosphorus, total (mg/L as P)	21	0.127	0.032	0.059	0.126	0.068	0.050	0.045	0.032
00671	Phosphorus, orthophosphate dissolved (mg/L as P)	21	0.020	0.001	0.012	0.020	0.017	0.012	0.008	0.001
01045	Iron, total (µg/L as Fe)	21	2,600.000	320.000	782.857	2,480.002	915.000	620.000	460.000	323.000
00680	Carbon, organic total (mg/L as C)	21	4.500	1.700	2.314	4.340	2.500	2.200	1.950	1.710

Table 15. Statistical summary of water-quality data at Lake Hickory site 34, January 1993 through March 1994

LAKE HICKORY AT NC 127

[Site 34 is at latitude 35°48'10", longitude 81°18'17", Catawba County, U.S. Geological Survey downstream order number 0214184000; –, data insufficient to calculate statistic; *, value is estimated by using a log-probability regression to predict the values of data below the detection limit. Multiple detection limits during the period of record may result in different values flagged with a "<"]

PARAMETER CODE	PROPERTY OR CONSTITUENT	DESCRIPTIVE STATISTICS				PERCENT OF SAMPLES IN WHICH VALUES WERE LESS THAN OR EQUAL TO THOSE SHOWN				
		SAMPLE SIZE	MAXIMUM	MINIMUM	MEAN	95%	75%	50%	25%	5%
	NEAR SURFACE									
00098	Sampling depth (meters)	21	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500
00095	Specific conductance (µS/cm at 25 °C)	21	98.000	41.000	60.762	97.000	74.000	57.000	47.000	41.100
00400	pH, field (standard pH units)	21	8.600	6.400	7.162	8.580	7.200	6.900	6.850	6.420
00010	Water temperature (°C)	21	30.500	3.500	18.024	30.450	26.000	19.500	9.250	3.850
00078	Transparency, Secchi disk (meters)	21	1.600	0.600	1.117	1.600	1.325	1.100	0.900	0.605
00300	Oxygen, dissolved (mg/L)	21	11.200	4.800	9.086	11.200	10.400	9.400	7.800	4.880
00301	Oxygen, dissolved (percent of saturation)	21	132.000	59.000	97.476	131.100	103.000	96.000	92.500	60.100
00310	Biochemical oxygen demand, 5-day (mg/L)	19	2.000	<2.000	--	2.000	<2.000	<2.000	<2.000	<2.000
31625	Fecal coliform bacteria (cols/100 mL)	20	800.000	<1.000	59.908*	120.000	18.000	9.000	2.000	<1.000
00900	Hardness, total (mg/L as $CaCO_3$)	21	14.000	7.000	9.905	13.900	11.500	10.000	8.000	7.000
00915	Calcium, dissolved (mg/L as Ca)	21	3.200	1.100	2.167	3.180	2.700	2.100	1.600	1.110
00925	Magnesium, dissolved (mg/L as Mg)	21	1.800	1.000	1.100	1.740	1.100	1.100	1.000	1.000
90410	Alkalinity, lab (mg/L as $CaCO_3$)	21	23.000	12.000	15.333	22.800	17.500	14.000	13.000	12.000
00530	Solids, total suspended (mg/L)	20	9.000	<1.000	3.825*	8.000	5.000	4.000	1.000	<1.000
00535	Solids, volatile suspended (mg/L)	20	8.000	<1.000	2.582*	5.000	4.000	2.000	1.000	<1.000
00631	Nitrogen, NO_2 + NO_3 dissolved (mg/L as N)	21	0.367	0.006	0.166	0.362	0.285	0.166	0.050	0.007
00608	Nitrogen, ammonia dissolved (mg/L as N)	21	0.757	0.004	0.089	0.697	0.090	0.053	0.014	0.004
00625	Nitrogen, ammonia + organic total (mg/L as N)	21	1.000	<0.200	0.238*	0.500	0.300	0.200	<0.200	<0.200
00665	Phosphorus, total (mg/L as P)	21	0.073	0.019	0.033	0.071	0.037	0.031	0.025	0.019
00671	Phosphorus, orthophosphate dissolved (mg/L as P)	21	0.038	<0.001	0.009*	0.023	0.017	0.002	<0.001	<0.001
01045	Iron, total (µg/L as Fe)	21	870.000	40.000	208.095	817.001	290.000	200.000	70.000	41.000
00680	Carbon, organic total (mg/L as C)	21	3.100	1.600	2.390	3.100	2.800	2.400	2.050	1.610
70953	Chlorophyll *a* (µg/L)	21	26.000	0.400	7.438	25.200	11.000	5.000	1.350	0.460
70954	Chlorophyll *b* (µg/L)	21	1.500	<0.100	0.421*	1.100	0.500	0.300	<0.100	<0.100
	THERMOCLINE									
00098	Sampling depth (meters)	5	4.600	2.900	--	--	--	--	--	--
00095	Specific conductance (µS/cm at 25 °C)	5	61.000	45.000	--	--	--	--	--	--
00400	pH, field (standard pH units)	5	7.400	6.400	--	--	--	--	--	--
00010	Water temperature (°C)	5	28.500	17.000	--	--	--	--	--	--
00300	Oxygen, dissolved (mg/L)	5	8.500	5.300	--	--	--	--	--	--
00301	Oxygen, dissolved (percent of saturation)	5	102.000	66.000	--	--	--	--	--	--
00310	Biochemical oxygen demand, 5-day (mg/L)	4	<2.000	<2.000	--	--	--	--	--	--
00900	Hardness, total (mg/L as $CaCO_3$)	4	10.000	8.000	--	--	--	--	--	--
00915	Calcium, dissolved (mg/L as Ca)	4	2.400	1.400	--	--	--	--	--	--
00925	Magnesium, dissolved (mg/L as Mg)	4	1.100	1.000	--	--	--	--	--	--
90410	Alkalinity, lab (mg/L as $CaCO_3$)	5	15.000	11.000	--	--	--	--	--	--
00530	Solids, total suspended (mg/L)	5	6.000	3.000	--	--	--	--	--	--
00535	Solids, volatile suspended (mg/L)	5	4.000	<1.000	--	--	--	--	--	--
00631	Nitrogen, NO_2 + NO_3 dissolved (mg/L as N)	5	0.192	0.046	--	--	--	--	--	--
00608	Nitrogen, ammonia dissolved (mg/L as N)	5	0.088	<0.002	--	--	--	--	--	--
00625	Nitrogen, ammonia + organic total (mg/L as N)	5	0.500	<0.200	--	--	--	--	--	--
00665	Phosphorus, total (mg/L as P)	5	0.039	0.017	--	--	--	--	--	--
00671	Phosphorus, orthophosphate dissolved (mg/L as P)	5	0.003	<0.001	--	--	--	--	--	--
01045	Iron, total (µg/L as Fe)	5	180.000	70.000	--	--	--	--	--	--
00680	Carbon, organic total (mg/L as C)	5	3.000	1.800	--	--	--	--	--	--
	NEAR BOTTOM									
00098	Sampling depth (meters)	21	16.200	13.500	15.500	16.200	16.100	15.400	15.450	13.620
00095	Specific conductance (µS/cm at 25 °C)	21	109.000	45.000	71.381	107.900	92.500	66.000	53.000	45.000
00400	pH, field (standard pH units)	21	7.100	6.300	6.619	7.090	6.900	6.600	6.400	6.300
00010	Water temperature (°C)	21	25.000	3.500	14.857	25.000	22.250	15.000	7.500	3.750
00300	Oxygen, dissolved (mg/L)	21	11.200	0.000	6.295	11.190	9.800	7.300	2.900	0.000
00301	Oxygen, dissolved (percent of saturation)	21	95.000	0.000	58.571	94.900	85.000	70.000	34.000	0.000
00310	Biochemical oxygen demand, 5-day (mg/L)	19	<2.000	<2.000	--	<2.000	<2.000	<2.000	<2.000	<2.000
00900	Hardness, total (mg/L as $CaCO_3$)	21	13.000	9.000	11.190	12.900	12.000	11.000	10.500	9.100
00915	Calcium, dissolved (mg/L as Ca)	21	3.300	1.900	2.657	3.270	2.900	2.700	2.400	1.920
00925	Magnesium, dissolved (mg/L as Mg)	21	1.200	1.000	1.119	1.200	1.200	1.100	1.050	1.000
90410	Alkalinity, lab (mg/L as $CaCO_3$)	21	22.000	13.000	15.714	21.700	18.000	15.000	14.000	13.000
00530	Solids, total suspended (mg/L)	21	42.000	3.000	11.905	39.800	14.500	11.000	6.500	3.200
00535	Solids, volatile suspended (mg/L)	21	38.000	1.000	6.857	35.900	7.000	4.000	3.500	1.100
00631	Nitrogen, NO_2 + NO_3 dissolved (mg/L as N)	21	0.425	0.085	0.235	0.419	0.315	0.228	0.165	0.085
00608	Nitrogen, ammonia dissolved (mg/L as N)	21	0.632	0.015	0.164	0.609	0.215	0.109	0.068	0.018
00625	Nitrogen, ammonia + organic total (mg/L as N)	21	0.700	<0.200	0.332*	0.700	0.400	0.300	<0.200	<0.200
00665	Phosphorus, total (mg/L as P)	21	0.071	0.023	0.048	0.071	0.063	0.046	0.036	0.024
00671	Phosphorus, orthophosphate dissolved (mg/L as P)	21	0.040	0.001	0.014	0.040	0.019	0.014	0.003	0.001
01045	Iron, total (µg/L as Fe)	21	2,000.000	220.000	638.095	1,930.001	840.000	510.000	335.000	223.000
00680	Carbon, organic total (mg/L as C)	21	4.100	1.700	2.252	3.970	2.500	2.100	1.950	1.710

Table 16. Statistical summary of water-quality data at Lake Hickory site 40A, January 1993 through March 1994

LAKE HICKORY ABOVE OXFORD DAM

[Site 40A is at latitude 35°49'17", longitude 81°11'38", Catawba County, U.S. Geological Survey downstream order number 0214196095; --, data insufficient to calculate statistic; *, value is estimated by using a log-probability regression to predict the values of data below the detection limit. Multiple detection limits during the period of record may result in different values flagged with a "<"]

PARAMETER CODE	PROPERTY OR CONSTITUENT	DESCRIPTIVE STATISTICS				PERCENT OF SAMPLES IN WHICH VALUES WERE LESS THAN OR EQUAL TO THOSE SHOWN				
		SAMPLE SIZE	MAXIMUM	MINIMUM	MEAN	95%	75%	50%	25%	5%
	NEAR SURFACE									
00098	Sampling depth (meters)	21	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500
00095	Specific conductance (µS/cm at 25 °C)	21	100.000	37.000	57.667	98.800	71.000	50.000	42.500	37.300
00400	pH, field (standard pH units)	21	8.700	6.500	7.205	8.680	7.400	7.000	6.700	6.510
00010	Water temperature (°C)	21	31.000	4.000	19.024	30.950	28.000	21.500	9.750	4.300
00078	Transparency, Secchi disk (meters)	21	2.300	0.350	1.269	2.260	1.625	1.300	0.750	0.380
00300	Oxygen, dissolved (mg/L)	21	11.300	5.000	8.857	11.270	10.500	9.100	7.650	5.100
00301	Oxygen, dissolved (percent of saturation)	21	123.000	62.000	96.714	122.700	109.500	99.000	87.000	62.900
00310	Biochemical oxygen demand, 5-day (mg/L)	19	<2.000	<2.000	--	<2.000	<2.000	<2.000	<2.000	<2.000
31625	Fecal coliform bacteria (cols/100 mL)	20	98.000	<1.000	18.944*	50.000	25.000	10.000	3.000	<1.000
00900	Hardness, total (mg/L as $CaCO_3$)	21	12.000	7.000	9.571	12.000	11.000	9.000	8.000	7.100
00915	Calcium, dissolved (mg/L as Ca)	21	3.000	1.400	2.086	2.980	2.500	2.000	1.600	1.410
00925	Magnesium, dissolved (mg/L as Mg)	21	1.200	0.800	1.043	1.200	1.100	1.000	1.000	0.810
90410	Alkalinity, lab (mg/L as $CaCO_3$)	21	23.000	11.000	14.619	22.700	16.000	14.000	12.500	11.100
00530	Solids, total suspended (mg/L)	21	9.000	<1.000	3.327*	9.000	4.000	2.000	1.000	<1.000
00535	Solids, volatile suspended (mg/L)	21	8.000	<1.000	2.336*	6.000	4.000	1.000	1.000	<1.000
00631	Nitrogen, NO_2 + NO_3 dissolved (mg/L as N)	21	0.351	<0.005	0.183*	0.343	0.280	0.227	0.049	<0.005
00608	Nitrogen, ammonia dissolved (mg/L as N)	21	0.149	0.002	0.052	0.149	0.071	0.050	0.011	0.002
00625	Nitrogen, ammonia + organic total (mg/L as N)	21	0.600	<0.200	0.259*	0.300	0.300	0.300	0.200	<0.200
00665	Phosphorus, total (mg/L as P)	21	0.050	0.012	0.025	0.050	0.035	0.019	0.014	0.012
00671	Phosphorus, orthophosphate dissolved (mg/L as P)	21	0.025	<0.001	0.006*	0.017	0.013	0.001	<0.001	<0.001
01045	Iron, total (µg/L as Fe)	21	500.000	10.000	158.571	486.000	235.000	100.000	60.000	13.000
00680	Carbon, organic total (mg/L as C)	21	3.100	1.800	2.424	3.090	2.600	2.500	2.100	1.810
70953	Chlorophyll *a* (µg/L)	21	12.000	0.400	4.652	11.700	7.000	5.400	0.950	0.400
70954	Chlorophyll *b* (µg/L)	21	0.700	<0.100	0.308*	0.700	0.500	<0.100	<0.100	<0.100
	THERMOCLINE									
00098	Sampling depth (meters)	6	4.000	1.700	3.017	4.000	3.775	3.200	2.150	1.700
00095	Specific conductance (µS/cm at 25 °C)	5	51.000	40.000	--	--	--	--	--	--
00400	pH, field (standard pH units)	5	7.800	6.600	--	--	--	--	--	--
00010	Water temperature (°C)	5	28.500	18.500	--	--	--	--	--	--
00300	Oxygen, dissolved (mg/L)	5	9.600	6.100	--	--	--	--	--	--
00301	Oxygen, dissolved (percent of saturation)	5	114.000	82.000	--	--	--	--	--	--
00310	Biochemical oxygen demand, 5-day (mg/L)	5	<2.000	<2.000	--	--	--	--	--	--
00900	Hardness, total (mg/L as $CaCO_3$)	6	11.000	8.000	9.000	11.000	9.500	9.000	8.000	8.000
00915	Calcium, dissolved (mg/L as Ca)	6	2.700	1.600	1.983	2.700	2.250	1.900	1.675	1.600
00925	Magnesium, dissolved (mg/L as Mg)	6	1.000	0.900	0.983	1.000	1.000	1.000	0.975	0.900
90410	Alkalinity, lab (mg/L as $CaCO_3$)	6	15.000	11.000	13.167	15.000	14.250	13.500	11.750	11.000
00530	Solids, total suspended (mg/L)	6	5.000	2.000	3.000	5.000	3.500	3.000	2.000	2.000
00535	Solids, volatile suspended (mg/L)	6	5.000	2.000	2.833	5.000	3.500	2.500	2.000	2.000
00631	Nitrogen, NO_2 + NO_3 dissolved (mg/L as N)	6	0.331	0.029	0.130	0.331	0.229	0.092	0.040	0.029
00608	Nitrogen, ammonia dissolved (mg/L as N)	6	0.084	0.003	0.042	0.084	0.077	0.038	0.009	0.003
00625	Nitrogen, ammonia + organic total (mg/L as N)	6	0.500	<0.200	--	0.500	0.400	0.200	<0.200	<0.200
00665	Phosphorus, total (mg/L as P)	6	0.042	0.014	0.022	0.042	0.027	0.020	0.017	0.014
00671	Phosphorus, orthophosphate dissolved (mg/L as P)	6	0.015	<0.001	--	0.015	0.001	<0.001	<0.001	<0.001
01045	Iron, total (µg/L as Fe)	6	240.000	70.000	103.333	240.000	135.000	70.000	70.000	70.000
00680	Carbon, organic total (mg/L as C)	6	3.000	1.900	2.433	3.000	2.775	2.500	1.975	1.900
	NEAR BOTTOM									
00098	Sampling depth (meters)	21	25.700	20.500	24.814	25.690	25.200	24.900	24.800	20.920
00095	Specific conductance (µS/cm at 25 °C)	21	118.000	38.000	67.524	117.000	96.000	56.000	46.000	38.300
00400	pH, field (standard pH units)	21	7.100	6.200	6.695	7.090	6.900	6.700	6.450	6.210
00010	Water temperature (°C)	21	14.500	4.000	10.524	14.450	13.250	11.000	8.000	4.100
00300	Oxygen, dissolved (mg/L)	21	12.200	0.000	4.905	12.050	9.550	5.800	0.000	0.000
00301	Oxygen, dissolved (percent of saturation)	21	104.000	0.000	42.952	102.500	81.000	54.000	0.000	0.000
00310	Biochemical oxygen demand, 5-day (mg/L)	19	2.900	<2.000	--	2.900	<2.000	<2.000	<2.000	<2.000
00900	Hardness, total (mg/L as $CaCO_3$)	21	15.000	10.000	11.714	14.900	12.500	12.000	11.000	10.000
00915	Calcium, dissolved (mg/L as Ca)	21	3.500	2.300	2.800	3.480	3.000	2.800	2.500	2.310
00925	Magnesium, dissolved (mg/L as Mg)	21	1.400	0.900	1.133	1.390	1.250	1.100	1.000	0.910
90410	Alkalinity, lab (mg/L as $CaCO_3$)	21	56.000	11.000	17.667	52.800	18.000	15.000	13.500	11.100
00530	Solids, total suspended (mg/L)	21	84.000	4.000	16.952	81.400	16.000	11.000	5.000	4.000
00535	Solids, volatile suspended (mg/L)	21	75.000	1.000	9.143	69.300	10.000	5.000	2.000	1.000
00631	Nitrogen, NO_2 + NO_3 dissolved (mg/L as N)	21	0.360	0.005	0.229	0.358	0.322	0.256	0.158	0.008
00608	Nitrogen, ammonia dissolved (mg/L as N)	21	0.828	0.066	0.216	0.803	0.239	0.135	0.095	0.067
00625	Nitrogen, ammonia + organic total (mg/L as N)	21	1.400	<0.200	0.421*	0.800	0.500	0.300	0.300	<0.200
00665	Phosphorus, total (mg/L as P)	21	0.217	0.015	0.071	0.211	0.109	0.054	0.031	0.016
00671	Phosphorus, orthophosphate dissolved (mg/L as P)	21	0.065	0.001	0.016	0.063	0.020	0.010	0.006	0.001
01045	Iron, total (µg/L as Fe)	21	5,900.000	130.000	1,665.238	5,780.002	2,700.000	760.000	405.000	143.000
00680	Carbon, organic total (mg/L as C)	21	7.100	1.600	2.843	6.820	3.400	2.300	2.100	1.620

Table 17. Statistical summary of water-quality data at Rhodhiss Lake tributary site 53, January 1993 through March 1994

LOWER CREEK NEAR MORGANTON, SR 1501

[Site 53 is at latitude 35°49'31", longitude 81°38'10", Burke County, U.S. Geological Survey downstream order number 02141245; --, data insufficient to calculate statistic; *, value is estimated by using a log-probability regression to predict the values of data below the detection limit. Multiple detection limits during the period of record may result in different values flagged with a "<"]

PARAM-ETER CODE	PROPERTY OR CONSTITUENT	DESCRIPTIVE STATISTICS				PERCENT OF SAMPLES IN WHICH VALUES WERE LESS THAN OR EQUAL TO THOSE SHOWN				
		SAMPLE SIZE	MAXIMUM	MINIMUM	MEAN	95%	75%	50%	25%	5%
00095	Specific conductance (µS/cm at 25 °C)	21	86.000	38.000	70.095	85.900	79.000	73.000	65.500	38.800
00400	pH, field (standard pH units)	21	7.600	6.200	6.924	7.550	7.100	7.000	6.800	6.220
00010	Water temperature (°C)	21	25.500	5.000	14.905	25.300	21.750	14.500	8.250	5.100
00300	Oxygen, dissolved (mg/L)	21	12.100	7.100	9.167	12.040	10.550	9.000	7.900	7.100
00301	Oxygen, dissolved (percent of saturation)	21	111.000	85.000	92.238	109.800	94.000	92.000	89.000	85.100
00310	Biochemical oxygen demand, 5-day (mg/L)	19	2.800	<2.000	--	2.800	<2.000	<2.000	<2.000	<2.000
31625	Fecal coliform bacteria (cols/100 mL)	21	5,000.000	10.000	837.667	4,900.002	875.000	320.000	180.000	12.900
00900	Hardness, total (mg/L as $CaCO_3$)	21	22.000	9.000	19.048	22.000	22.000	21.000	18.500	9.200
00915	Calcium, dissolved (mg/L as Ca)	21	5.800	2.000	4.824	5.800	5.600	5.300	4.700	2.060
00925	Magnesium, dissolved (mg/L as Mg)	21	2.000	0.900	1.686	2.000	1.900	1.800	1.600	0.910
90410	Alkalinity, lab (mg/L as $CaCO_3$)	21	30.000	10.000	22.810	29.900	27.500	25.000	19.000	10.200
00530	Solids, total suspended (mg/L)	21	497.000	3.000	74.095	477.700	48.000	29.000	18.500	3.300
00535	Solids, volatile suspended (mg/L)	21	164.000	1.000	23.429	158.800	12.500	8.000	5.500	1.200
00631	Nitrogen, NO_2 + NO_3 dissolved (mg/L as N)	21	0.802	<0.005	0.522*	0.798	0.639	0.533	0.403	0.036
00608	Nitrogen, ammonia dissolved (mg/L as N)	21	0.316	0.008	0.099	0.311	0.132	0.088	0.033	0.010
00625	Nitrogen, ammonia + organic total (mg/L as N)	21	2.800	0.200	0.543	2.630	0.500	0.400	0.300	0.200
00665	Phosphorus, total (mg/L as P)	21	0.561	0.028	0.117	0.533	0.123	0.086	0.047	0.029
00671	Phosphorus, orthophosphate dissolved (mg/L as P)	21	0.045	0.004	0.022	0.044	0.035	0.021	0.008	0.004
01045	Iron, total (µg/L as Fe)	21	2,000.000	760.000	2,408.571	11,690.004	2,000.000	1,300.000	955.000	764.000
00680	Carbon, organic total (mg/L as C)	21	14.000	1.600	3.943	13.800	3.250	2.700	2.200	1.620
80154	Sediment, suspended (mg/L)	21	558.000	11.000	87.857	542.700	59.000	31.000	21.500	11.200

Table 18. Statistical summary of water-quality data at Lake Hickory tributary site 58, January 1993 through March 1994

UPPER LITTLE RIVER AT SR 1740 AT PETRA MILLS

[Site 58 is at latitude 35°50'31", longitude 81°21'43", Caldwell County, U.S. Geological Survey downstream order number 0214183365; --, data insufficient to calculate statistic; *, value is estimated by using a log-probability regression to predict the values of data below the detection limit. Multiple detection limits during the period of record may result in different values flagged with a "<"]

PARAM-ETER CODE	PROPERTY OR CONSTITUENT	DESCRIPTIVE STATISTICS				PERCENT OF SAMPLES IN WHICH VALUES WERE LESS THAN OR EQUAL TO THOSE SHOWN				
		SAMPLE SIZE	MAXIMUM	MINIMUM	MEAN	95%	75%	50%	25%	5%
00095	Specific conductance (µS/cm at 25 °C)	21	31.000	23.000	27.667	31.000	30.000	28.000	26.000	23.100
00400	pH, field (standard pH units)	21	7.600	6.400	7.024	7.580	7.300	7.100	6.800	6.410
00010	Water temperature (°C)	21	24.500	4.500	14.833	24.450	21.250	15.000	9.250	4.600
00300	Oxygen, dissolved (mg/L)	21	13.400	8.200	9.952	13.280	11.150	9.600	8.650	8.210
00301	Oxygen, dissolved (percent of saturation)	21	121.000	94.000	100.048	119.400	101.000	99.000	97.000	94.200
00310	Biochemical oxygen demand, 5-day (mg/L)	19	2.000	<2.000	--	2.000	<2.000	<2.000	<2.000	<2.000
31625	Fecal coliform bacteria (cols/100 mL)	20	800.000	27.000	216.950	785.000	325.000	185.000	67.250	27.000
00900	Hardness, total (mg/L as $CaCO_3$)	21	24.000	6.000	8.810	22.500	9.000	8.000	8.000	6.100
00915	Calcium, dissolved (mg/L as Ca)	21	6.200	1.300	2.019	5.790	2.000	1.800	1.750	1.320
00925	Magnesium, dissolved (mg/L as Mg)	21	2.000	0.700	0.886	1.890	0.900	0.800	0.800	0.710
90410	Alkalinity, lab (mg/L as $CaCO_3$)	21	86.000	38.000	70.095	85.900	79.000	73.000	65.500	38.800
00530	Solids, total suspended (mg/L)	21	142.000	2.000	20.524	134.600	22.500	8.000	5.000	2.100
00535	Solids, volatile suspended (mg/L)	20	60.000	<1.000	8.368*	25.000	5.000	3.000	2.000	<1.000
00631	Nitrogen, NO_2 + NO_3 dissolved (mg/L as N)	21	0.341	0.053	0.248	0.339	0.293	0.254	0.233	0.060
00608	Nitrogen, ammonia dissolved (mg/L as N)	21	0.057	<0.002	0.018*	0.048	0.028	0.013	0.006	<0.002
00625	Nitrogen, ammonia + organic total (mg/L as N)	21	0.300	<0.200	0.176*	0.300	0.200	<0.200	<0.200	<0.200
00665	Phosphorus, total (mg/L as P)	21	0.107	0.006	0.028	0.104	0.046	0.016	0.009	0.006
00671	Phosphorus, orthophosphate dissolved (mg/L as P)	21	0.007	<0.001	0.002*	0.006	0.002	0.001	<0.001	<0.001
01045	Iron, total (µg/L as Fe)	21	4,800.000	180.000	854.286	4,510.005	925.000	480.000	320.000	186.000
00680	Carbon, organic total (mg/L as C)	21	6.600	0.900	2.329	6.430	2.850	1.800	1.600	0.930
80154	Sediment, suspended (mg/L)	21	194.000	3.000	26.000	182.000	22.500	10.000	6.000	3.100

Table 19. Statistical summary of water-quality data at Lake Hickory tributary site 60, January 1993 through March 1994

MIDDLE LITTLE RIVER AT MORETZ DAM NEAR BETHLEHEM

[Site 60 is at latitude 35°51'50", longitude 81°12'39", Alexander County, U.S. Geological Survey downstream order number 0214192500; --, data insufficient to calculate statistic; *, value is estimated by using a log-probability regression to predict the values of data below the detection limit. Multiple detection limits during the period of record may result in different values flagged with a "<"]

PARAM-ETER CODE	PROPERTY OR CONSTITUENT	DESCRIPTIVE STATISTICS				PERCENT OF SAMPLES IN WHICH VALUES WERE LESS THAN OR EQUAL TO THOSE SHOWN				
		SAMPLE SIZE	MAXIMUM	MINIMUM	MEAN	95%	75%	50%	25%	5%
00095	Specific conductance (µS/cm at 25 °C)	21	33.000	22.000	28.238	32.800	30.000	29.000	26.500	22.200
00400	pH, field (standard pH units)	21	7.500	6.700	6.990	7.490	7.100	6.900	6.800	6.700
00010	Water temperature (°C)	21	24.500	3.500	14.643	24.400	21.000	15.500	8.250	3.700
00300	Oxygen, dissolved (mg/L)	21	13.500	7.800	9.829	13.390	11.250	9.500	8.400	7.820
00301	Oxygen, dissolved (percent of saturation)	21	120.000	92.000	98.238	118.000	100.000	99.000	95.000	92.000
00310	Biochemical oxygen demand, 5-day (mg/L)	19	2.000	<2.000	--	2.000	<2.000	<2.000	<2.000	<2.000
31625	Fecal coliform bacteria (cols/100 mL)	20	980.000	20.000	319.650	980.000	385.000	240.000	103.500	23.200
00900	Hardness, total (mg/L as $CaCO_3$)	21	20.000	5.000	8.667	19.000	9.000	8.000	8.000	5.200
00915	Calcium, dissolved (mg/L as Ca)	21	5.100	1.200	2.043	4.820	2.050	1.900	1.800	1.230
00925	Magnesium, dissolved (mg/L as Mg)	21	1.800	0.600	0.867	1.720	0.900	0.800	0.800	0.610
90410	Alkalinity, lab (mg/L as $CaCO_3$)	21	69.000	5.300	13.976	63.800	13.000	11.000	10.000	5.460
00530	Solids, total suspended (mg/L)	20	143.000	3.000	25.950	140.100	24.000	14.500	8.250	3.150
00535	Solids, volatile suspended (mg/L)	19	75.000	<1.000	10.192*	75.000	10.000	5.000	3.000	1.000
00631	Nitrogen, NO_2 + NO_3 dissolved (mg/L as N)	21	0.549	0.084	0.264	0.532	0.309	0.254	0.221	0.088
00608	Nitrogen, ammonia dissolved (mg/L as N)	21	0.069	0.005	0.037	0.068	0.048	0.036	0.025	0.006
00625	Nitrogen, ammonia + organic total (mg/L as N)	21	1.000	<0.200	0.219*	0.800	0.300	<0.200	<0.200	<0.200
00665	Phosphorus, total (mg/L as P)	21	0.139	0.009	0.038	0.135	0.043	0.027	0.014	0.009
00671	Phosphorus, orthophosphate dissolved (mg/L as P)	21	0.014	<0.001	0.002*	0.010	0.002	<0.001	<0.001	<0.001
01045	Iron, total (µg/L as Fe)	21	4,200.000	280.000	1,091.905	4,020.003	1,350.000	840.000	490.000	289.000
00680	Carbon, organic total (mg/L as C)	21	7.300	1.000	2.538	7.180	2.550	2.000	1.600	1.020
80154	Sediment, suspended (mg/L)	21	162.000	5.000	28.143	153.600	28.000	15.000	10.500	5.100

Table 20. Water-quality field measurements and sample analyses at Rhodhiss Lake site 20, January 1993 through March 1994

RHODHISS LAKE AT HUFFMAN BRIDGE, SR 1501

[Site 20 is at latitude 35°47'15", longitude 81°37'30", Burke County, U.S. Geological Survey downstream order number 0214126765; <, less than; --, missing data; K, results based on colony count outside the acceptable range; >, greater than]

Date	Sampling depth (m)	Specific conductance (µS/cm)	pH (standard units)	Temperature of water (°C)	Secchi disk transparency (m)	Dissolved oxygen (mg/L)	Dissolved oxygen (percent saturation)	Biochemical oxygen demand, 5-day (mg/L)	Fecal coliform bacteria (colonies/100 mL)
				1993					
Jan. 26	0.5	43	7.0	5.5	0.60	11.4	93	<2.0	50
26	1.7	43	7.1	5.5	--	11.3	92	<2.0	--
Feb. 17	.5	45	7.0	6.0	.40	10.9	90	<2.0	160
17	2.0	44	7.0	6.0	--	10.9	90	<2.0	--
Mar. 25	.5	33	6.8	9.0	.15	10.0	90	<2.0	1,300K
25	3.4	33	6.9	9.0	--	10.0	90	<2.0	--
Apr. 08	.5	45	6.8	10.0	.65	9.8	90	<2.0	58
08	2.5	45	6.8	10.0	--	9.8	90	<2.0	--
22	.5	45	6.8	11.0	1.00	9.4	88	<2.0	53
22	1.7	44	6.9	11.0	--	9.3	88	<2.0	--
May 06	.5	37	6.6	15.0	.20	8.2	84	<2.0	60K
06	2.5	36	6.6	15.0	--	8.2	84	<2.0	--
19	.5	47	6.8	16.0	.70	8.6	92	<2.0	290K
19	1.9	47	6.8	16.0	--	8.6	92	<2.0	--
June 09	0.5	69	6.7	21.0	.75	7.7	89	<2.0	--
09	1.8	71	6.7	20.5	--	7.8	90	<2.0	--
23	.5	69	6.8	20.0	.60	7.2	81	<2.0	59
23	2.4	69	6.8	19.5	--	7.2	81	<2.0	--
July 14	.5	71	6.8	24.0	.30	6.7	82	--	>120
14	1.9	67	6.8	22.5	--	6.8	80	--	--
28	.5	68	6.8	21.5	.40	7.0	81	<2.0	28K
28	1.7	68	6.8	21.0	--	7.0	81	<2.0	--
Aug. 11	.5	72	6.8	21.0	.35	7.3	84	<2.0	220K
11	2.3	72	6.8	21.0	--	7.3	84	<2.0	--
25	.5	72	6.8	21.5	.50	7.2	84	<2.0	1,200K
25	2.2	70	6.8	21.0	--	7.3	84	<2.0	--
Sept. 15	.5	112	6.7	20.0	.50	7.6	86	--	92
15	1.6	112	6.7	20.0	--	7.6	86	--	--
29	.5	116	6.9	17.5	.45	7.2	77	<2.0	100
29	2.1	116	6.9	17.5	--	7.2	77	<2.0	--
Oct. 20	.5	83	6.9	18.0	.55	7.6	83	<2.0	140
20	2.2	82	7.0	18.0	--	7.6	83	<2.0	--
Nov. 17	.5	114	6.9	15.5	.65	8.1	83	<2.0	270
17	1.8	114	6.9	15.0	--	8.1	83	<2.0	--
Dec. 16	.5	61	7.0	7.0	.60	10.5	91	3.1	--
16	1.7	61	7.0	7.0	--	10.5	91	3.2	--
				1994					
Jan. 26	.5	48	7.0	4.5	.55	11.7	92	<2.0	300K
26	1.8	48	7.0	4.5	--	11.7	92	<2.0	--
Feb. 23	.5	59	6.9	7.0	.40	10.9	94	<2.0	440K
23	1.7	58	6.9	7.0	--	11.0	95	2.0	--
Mar. 23	.5	46	7.2	9.5	1.55	10.1	91	<2.0	20
23	1.6	47	7.2	9.0	--	10.3	92	<2.0	--

Table 20. Water-quality field measurements and sample analyses at Rhodhiss Lake site 20, January 1993 through March 1994--Continued

RHODHISS LAKE AT HUFFMAN BRIDGE, SR 1501

[Site 20 is at latitude 35°47'15", longitude 81°37'30", Burke County, U.S. Geological Survey downstream order number 0214126765]

Date	Sampling depth (m)	Total hardness (mg/L as $CaCO_3$)	Dissolved calcium (mg/L as Ca)	Dissolved magnesium (mg/L as Mg)	Alkalinity (mg/L as $CaCO_3$)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Dissolved nitrogen, NO_2+NO_3 (mg/L as N)	Dissolved nitrogen, ammonia (mg/L as N)
				1993					
Jan. 26	0.5	12	2.8	1.1	14	15	9	0.280	0.072
26	1.7	11	2.7	1.0	14	19	11	.279	.065
Feb. 17	.5	11	2.7	1.0	14	16	1	.306	.062
17	2.0	11	2.8	1.0	13	38	4	.315	.064
Mar. 25	.5	9	2.1	.80	12	71	8	.225	.075
25	3.4	9	2.2	.80	11	86	12	.006	.019
Apr. 08	.5	11	2.7	1.0	13	12	3	.265	.048
08	2.5	11	2.7	1.0	13	20	5	.263	.044
22	.5	10	2.5	.90	14	6	5	.225	.067
22	1.7	10	2.6	.90	14	11	8	.222	.067
May 06	.5	9	2.2	.80	13	22	2	.185	.011
06	2.5	9	2.2	.80	13	48	6	.212	.035
19	.5	11	2.7	1.0	14	11	2	.242	.057
19	1.9	11	2.8	1.0	14	28	5	.242	.062
June 09	.5	12	3.0	1.2	17	11	5	.237	.105
09	1.8	12	3.1	1.1	17	26	7	.238	.117
23	.5	13	3.4	1.2	16	10	2	.284	.089
23	2.4	13	3.2	1.1	16	19	4	.275	.088
July 14	.5	12	2.9	1.1	15	19	7	.291	.119
14	1.9	12	3.0	1.1	20	38	9	.297	.114
28	.5	12	2.9	1.2	17	25	7	.252	.076
28	1.7	12	2.9	1.1	17	28	9	.253	.081
Aug. 11	.5	12	3.0	1.2	18	20	4	.253	.108
11	2.3	13	3.2	1.3	18	56	6	.259	.148
25	.5	14	3.5	1.2	18	17	8	.262	.095
25	2.2	14	3.6	1.2	19	11	8	.261	.093
Sept. 15	.5	15	3.8	1.4	21	18	4	.223	.163
15	1.6	15	3.8	1.4	20	14	2	.225	.153
29	.5	18	4.1	1.8	21	14	4	.177	.205
29	2.1	14	3.5	1.2	18	19	5	.176	.215
Oct. 20	.5	16	4.0	1.4	20	9	8	.122	.147
20	2.2	16	4.0	1.4	20	23	18	.123	.132
Nov. 17	.5	15	3.7	1.3	21	11	7	.118	.248
17	1.8	14	3.6	1.3	18	33	27	.123	.259
Dec. 16	.5	13	3.4	1.2	19	8	7	.196	.084
16	1.7	13	3.3	1.2	18	10	7	.193	.085
				1994					
Jan. 26	.5	12	3.0	1.2	16	16	11	.174	.057
26	1.8	12	2.9	1.2	15	26	24	.171	.059
Feb. 23	.5	12	2.8	1.1	14	27	24	.250	.125
23	1.7	12	3.0	1.1	14	68	57	.242	.127
Mar. 23	.5	13	3.1	1.2	14	10	6	.206	.089
23	1.6	13	3.2	1.2	14	24	21	.204	.085

Table 20. Water-quality field measurements and sample analyses at Rhodhiss Lake site 20, January 1993 through March 1994--Continued

RHODHISS LAKE AT HUFFMAN BRIDGE, SR 1501

[Site 20 is at latitude 35°47'15", longitude 81°37'30", Burke County, U.S. Geological Survey downstream order number 0214126765; <, less than; --, missing data]

Date	Sampling depth (m)	Total ammonia + organic nitrogen (mg/L as N)	Total phosphorus (mg/L as P)	Dissolved ortho-phosphorus (mg/L as P)	Total recoverable iron (ug/L as Fe)	Total organic carbon (mg/L as C)	Chlorophyll *a* (µg/L)	Chlorophyll *b* (µg/L)
				1993				
Jan. 26	0.5	0.20	0.027	0.028	460	2.4	0.6	< 0.1
26	1.7	.20	.026	.009	610	--	--	--
Feb. 17	.5	< .20	.029	.009	520	2.2	1.0	< .1
17	2.0	.30	.044	.010	2,100	3.1	--	--
Mar. 25	.5	.40	.154	.012	2,500	4.9	.7	< .1
25	3.4	.40	.096	< .001	2,800	4.7	--	--
Apr. 08	.5	< .20	.028	.009	420	1.8	.3	< .1
08	2.5	< .20	.031	.009	530	1.9	--	--
22	.5	< .20	.026	.008	310	2.3	.4	< .1
22	1.7	< .20	.027	.008	340	2.0	--	--
May 06	.5	< .20	.054	.004	1,200	5.9	1.1	< .1
06	2.5	< .20	.073	.007	1,500	4.6	--	--
19	.5	< .20	.034	.011	540	2.0	.5	< .1
19	1.9	< .20	.062	.012	1,500	2.4	--	--
June 09	.5	.20	.052	.017	580	1.8	.9	< .1
09	1.8	.20	.069	.019	1,200	2.5	--	--
23	.5	.30	.052	.026	520	2.2	.8	< .1
23	2.4	.30	.062	.020	860	2.5	--	--
July 14	.5	.20	.070	.017	590	2.4	3.8	< .1
14	1.9	.30	.080	.019	1,800	2.4	--	--
28	.5	.70	.056	.017	690	2.6	.8	< .1
28	1.7	.20	.065	.018	1400	2.4	--	--
Aug. 11	.5	.80	.070	.023	830	2.6	1.4	.1
11	2.3	.50	.115	.024	2,300	2.8	--	--
25	.5	.30	.053	.014	630	2.2	2.1	< .1
25	2.2	.20	.060	.016	820	2.3	--	--
Sept. 15	.5	.40	.092	.038	660	2.6	1.4	< .1
15	1.6	.40	.099	.041	850	2.7	--	--
29	.5	.40	.110	.052	690	3.2	1.5	< .1
29	2.1	.40	.116	.052	910	3.3	--	--
Oct. 20	.5	.30	.053	.019	560	2.3	.3	< .1
20	2.2	.40	.074	.019	1,100	2.8	--	--
Nov. 17	.5	.70	.096	.047	530	2.5	1.	< .1
17	1.8	.60	.129	.046	1,400	2.7	--	--
Dec. 16	.5	.30	.033	.013	460	2.1	.5	< .1
16	1.7	.30	.035	.009	600	2.2	--	--
				1994				
Jan. 26	.5	< .20	.028	.009	420	1.7	.2	< .1
26	1.8	.20	.051	.008	1,100	1.9	--	--
Feb. 23	.5	.30	.056	.013	910	2.8	.8	.1
23	1.7	.20	.028	.015	2,200	1.7	--	--
Mar. 23	.5	< .20	.028	.003	360	1.7	.3	.2
23	1.6	.20	.023	.004	1,100	1.9	--	--

Table 21. Water-quality field measurements and sample analyses at Rhodhiss Lake site 24, January 1993 through March 1994

RHODHISS LAKE AT CASTLE BRIDGE, SR 1001

[Site 24 is at latitude 35°44'48", longitude 81°31'27", Burke County, U.S. Geological Survey downstream order number 0214146100; <, less than; --, missing data]

Date	Sampling depth (m)	Specific conductance (µS/cm)	pH (standard units)	Temperature of water (°C)	Secchi disk trans-parency (m)	Dissolved oxygen (mg/L)	Dissolved oxygen (percent saturation)	Biochemical oxygen demand, 5-day (mg/L)	Fecal coliform bacteria (colonies/ 100 mL)
				1993					
Jan. 26	0.5	45	6.9	6.5	0.30	11.1	92	<2.0	240
26	10.5	42	6.9	6.0	--	11.1	92	<2.0	--
Feb. 17	.5	49	7.0	7.0	.60	10.4	89	<2.0	40K
17	9.9	63	7.0	6.5	--	10.5	89	<2.0	--
Mar. 25	.5	36	6.6	10.0	.20	9.7	89	<2.0	980
25	10.6	30	6.6	9.5	--	9.7	88	<2.0	--
Apr. 08	.5	45	6.8	12.5	.35	9.5	92	<2.0	210
08	10.1	53	6.8	9.0	--	9.7	86	<2.0	--
22	.5	47	6.8	13.5	.70	9.3	93	--	62
22	9.7	49	6.8	13.0	--	9.1	90	<2.0	--
May 06	.5	39	6.7	19.5	.25	8.7	98	<2.0	39
06	10.6	32	6.5	14.5	--	8.0	81	<2.0	--
19	.5	54	8.1	21.0	.80	10.0	118	<2.0	20
19	2.5	76	7.0	18.5	--	8.9	100	2.1	--
19	9.3	47	6.7	16.5	--	7.7	83	<2.0	--
June 09	.5	63	8.8	25.5	1.25	10.6	135	<2.0	--
09	1.7	65	8.6	23.0	--	10.4	126	<2.0	--
09	10.0	57	6.6	16.5	--	4.8	51	<2.0	--
23	.5	86	8.8	25.5	.90	9.7	124	<2.0	4K
23	2.7	98	6.9	23.5	--	5.4	65	<2.0	--
23	9.4	67	6.6	19.5	--	5.6	63	<2.0	--
July 14	.5	69	8.7	30.0	1.15	8.8	120	--	140
14	3.5	--	--	--	--	--	--	--	--
14	9.8	101	6.6	20.5	--	.0	0	--	--
28	.5	85	9.0	29.5	1.10	9.4	128	<2.0	60
28	2.5	85	6.9	27.5	--	6.0	79	<2.0	--
28	9.7	89	6.5	23.5	--	.5	6	<2.0	--
Aug. 11	.5	104	8.6	27.0	1.00	9.1	117	<2.0	6K
11	4.0	152	6.9	25.0	--	6.1	76	2.0	--
11	9.8	71	6.5	22.5	--	5.2	62	<2.0	--
25	.5	118	8.8	27.5	1.35	9.3	121	<2.0	8K
25	3.5	203	6.8	25.5	--	5.7	71	<2.0	--
25	9.5	90	6.4	21.5	--	.4	5	<2.0	--
Sept. 15	.5	124	8.6	25.0	1.00	9.8	123	--	<4
15	6.5	112	6.9	22.5	--	7.0	83	--	--
15	9.7	85	6.6	21.0	--	5.6	65	--	--
29	.5	131	7.0	22.0	.75	7.2	85	<2.0	7K
29	9.9	92	6.8	20.0	--	5.5	62	<2.0	--
Oct. 20	.5	139	9.1	20.0	.50	12.2	139	<2.0	74
20	9.6	133	6.8	16.5	--	4.8	51	<2.0	--
Nov. 17	.5	138	9.0	15.5	.75	12.7	131	3.4	22K
17	9.3	95	7.7	10.5	--	7.6	71	<2.0	--
Dec. 16	.5	59	6.9	7.0	.80	10.3	88	2.6	--
16	9.6	197	7.0	6.5	--	10.1	86	2.8	--
				1994					
Jan. 26	.5	48	7.0	5.0	1.60	11.7	94	<2.0	37
26	9.3	155	7.1	4.5	--	11.6	92	<2.0	--
Feb. 23	.5	47	6.9	7.5	1.10	11.1	97	<2.0	54
23	9.2	74	6.9	7.0	--	11.0	94	<2.0	--
Mar. 23	.5	48	6.9	11.5	.95	10.1	96	<2.0	110
23	9.4	58	7.1	8.5	--	9.4	84	<2.0	--

Table 21. Water-quality field measurements and sample analyses at Rhodhiss Lake site 24, January 1993 through March 1994--Continued

RHODHISS LAKE AT CASTLE BRIDGE, SR 1001

[Site 24 is at latitude 35°44'48", longitude 81°31'27", Burke County, U.S. Geological Survey downstream order number 0214146100; <, less than; --, missing data]

Date	Sampling depth (m)	Total hardness (mg/L as $CaCO_3$)	Dissolved calcium (mg/L as Ca)	Dissolved magnesium (mg/L as Mg)	Alkalinity (mg/L as $CaCO_3$)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Dissolved nitrogen, NO_2+NO_3 (mg/L as N)	Dissolved nitrogen, ammonia (mg/L as N)
				1993					
Jan. 26	0.5	11	2.6	1.0	13	21	9	0.268	0.061
26	10.5	11	2.6	1.0	13	42	13	.272	.059
Feb. 17	.5	10	2.5	.90	14	5	3	.280	.054
17	9.9	10	2.5	1.0	15	14	6	.284	.056
Mar. 25	.5	8	2.0	.80	11	44	9	.249	.034
25	10.6	9	2.1	.80	11	48	7	.218	.074
Apr. 08	.5	11	2.8	1.0	13	10	3	.285	.057
08	10.1	11	2.8	1.0	14	22	4	.285	.083
22	.5	10	2.6	.90	15	6	3	.225	.060
22	9.7	10	2.6	.90	15	21	5	.221	.068
May 06	.5	9	2.3	.90	14	15	2	.128	<.002
06	10.6	8	2.0	.80	11	68	10	.186	.031
19	.5	10	2.5	1.0	15	3	1	.124	.007
19	2.5	11	2.6	1.0	16	3	<1	.182	.009
19	9.3	12	2.8	1.1	14	14	2	.226	.114
June 09	.5	12	2.8	1.1	16	2	2	.037	<.002
09	1.7	12	2.8	1.1	17	<1	<1	.065	<.002
09	10.0	12	3.1	1.1	--	5	5	.198	.179
23	.5	12	2.9	1.1	19	3	3	<.005	.003
23	2.7	12	2.9	1.2	16	2	2	.124	.053
23	9.4	12	3.1	1.1	18	38	7	.229	.135
July 14	.5	12	2.9	1.1	17	6	4	.005	.012
14	3.5	12	3.1	1.1	18	6	4	.072	.023
14	9.8	15	3.8	1.3	19	43	10	.127	.668
28	.5	11	2.7	1.1	19	5	5	<.005	<.002
28	2.5	12	2.8	1.1	20	6	4	.022	<.002
28	9.7	12	3.1	1.1	18	19	6	.206	.335
Aug. 11	.5	12	2.7	1.2	21	1	<1	<.005	.007
11	4.0	12	2.9	1.2	22	11	4	.121	.066
11	9.8	12	3.0	1.2	18	37	7	.231	.148
25	.5	9	2.3	.90	22	2	2	<.005	.006
25	3.5	13	3.2	1.2	25	5	2	.120	.104
25	9.5	13	3.4	1.2	19	14	3	.172	.366
Sept. 15	.5	13	3.1	1.3	22	2	1	<.005	<.002
15	6.5	14	3.4	1.3	21	1	1	.126	.139
15	9.7	14	3.6	1.3	19	15	3	.191	.275
29	.5	13	3.1	1.2	22	6	2	.075	.066
29	9.9	13	3.4	1.2	18	30	9	.165	.236
Oct. 20	.5	14	3.3	1.3	23	3	2	<.005	.026
20	9.6	16	3.9	1.4	21	18	18	.118	.283
Nov. 17	.5	13	3.2	1.3	22	6	6	.054	.009
17	9.3	14	3.6	1.2	22	12	10	.128	.188
Dec. 16	.5	12	3.0	1.1	17	3	2	.155	.094
16	9.6	13	3.3	1.2	25	8	5	.173	.135
				1994					
Jan. 26	.5	13	3.1	1.2	17	3	3	.213	.066
26	9.3	12	3.0	1.2	20	8	8	.225	.079
Feb. 23	.5	11	2.7	1.1	15	3	3	.191	.063
23	9.2	12	2.7	1.2	16	10	9	.176	.078
Mar. 23	.5	13	3.1	1.2	49	4	3	.209	.076
23	9.4	13	3.2	1.2	14	--	--	.211	.109

Table 21. Water-quality field measurements and sample analyses at Rhodhiss Lake site 24, January 1993 through March 1994--Continued

RHODHISS LAKE AT CASTLE BRIDGE, SR 1001

[Site 24 is at latitude 35°44'48", longitude 81°31'27", Burke County, U.S. Geological Survey downstream order number 0214146100; <, less than; --, missing data]

Date	Sampling depth (m)	Total ammonia + organic nitrogen (mg/L as N)	Total phosphorus (mg/L as P)	Dissolved ortho-phosphorus (mg/L as P)	Total recoverable iron (µg/L as Fe)	Total organic carbon (mg/L as C)	Chlorophyll *a* (µg/L)	Chlorophyll *b* (µg/L)
				1993				
Jan. 26	0.5	0.20	0.054	0.017	700	2.8	0.8	< 0.1
26	10.5	.30	.081	.015	1,500	4.3	--	--
Feb. 17	.5	< .20	.048	.029	340	1.9	1.0	< .1
17	9.9	.20	.090	.070	570	1.8	--	--
Mar. 25	.5	.40	.167	.010	1,500	3.4	.9	< .1
25	10.6	.60	.170	.007	1,800	6.1	--	--
Apr. 08	.5	.20	.044	.010	490	2.5	.6	< .1
08	10.1	.30	.086	.026	800	3.0	--	--
22	.5	< .20	.042	.017	290	2.3	1.0	< .1
22	9.7	< .20	.066	.019	900	3.2	--	--
May 06	.5	< .20	.050	< .001	490	3.5	4.3	.3
06	10.6	< .20	.105	.007	1,900	4.9	--	--
19	.5	< .20	.045	.006	230	2.3	9.2	.5
19	2.5	< .20	.096	.054	290	2.2	--	--
19	9.3	< .20	.042	.007	670	2.2	--	--
June 09	.5	< .20	.032	< .001	190	2.5	8.4	.8
09	1.7	< .20	.043	< .001	180	2.8	--	--
09	10.0	.20	.033	.009	420	1.8	--	--
23	.5	.40	.048	.002	210	3.3	16	2.8
23	2.7	.30	.061	.026	250	2.4	--	--
23	9.4	.30	.101	.010	1,600	2.2	--	--
July 14	.5	.20	.030	< .001	100	3.0	5.6	.6
14	3.5	.30	.040	< .001	130	3.0	--	--
14	9.8	.90	.140	.017	2,700	2.7	--	--
28	.5	.90	.034	< .001	110	3.2	12	.7
28	2.5	< .20	.041	< .001	160	3.3	--	--
28	9.7	.50	.062	.007	940	2.5	--	--
Aug. 11	.5	.30	.034	< .001	100	3.3	13	1.1
11	4.0	.40	.114	.073	420	3.1	--	--
11	9.8	.40	.095	.015	1,800	3.3	--	--
25	.5	.20	.039	< .001	110	3.7	14	.8
25	3.5	.40	.160	.108	280	3.2	--	--
25	9.5	.60	.070	.009	890	22	--	--
Sept. 15	.5	.40	.044	.001	80	3.8	5.5	.3
15	6.5	.40	.072	.022	410	2.9	--	--
15	9.7	.50	.076	.010	940	2.8	--	--
29	.5	.30	.073	.016	240	3.6	14	.9
29	9.9	.40	.090	.014	1,100	3.8	--	--
Oct. 20	.5	.50	.060	.003	100	4.3	30	1.0
20	9.6	.60	.088	.019	910	3.3	--	--
Nov. 17	.5	.80	.074	.002	160	4.5	52	1.4
17	9.3	.50	.059	.009	510	2.6	--	--
Dec. 16	.5	.20	.039	.015	340	1.9	1.3	< .1
16	9.6	.30	.119	.085	390	1.7	--	--
				1994				
Jan. 26	.5	< .20	.034	.007	240	1.3	< .1	< .1
26	9.3	.30	.126	.071	480	1.8	--	--
Feb. 23	.5	< .20	.024	.008	260	1.5	.9	.1
23	9.2	< .20	.077	.044	460	1.8	--	--
Mar. 23	.5	.40	.026	.004	320	1.8	.7	.1
23	9.4	.20	.078	.013	680	1.9	--	--

Table 22. Water-quality field measurements and sample analyses at Rhodhiss Lake site 27, January 1993 through March 1994

RHODHISS LAKE AT RHODHISS DAM

[Site 27 is at latitude 35°46'27", longitude 81°26'33", Burke County, U.S. Geological Survey downstream order number 0214148975; <, less than; K, results based on colony count outside the acceptable range; --, missing data]

Date	Sampling depth (m)	Specific conductance (µS/cm)	pH (standard units)	Temperature of water (°C)	Secchi disk transparency (m)	Dissolved oxygen (mg/L)	Dissolved oxygen (percent saturation)	Biochemical oxygen demand, 5-day (mg/L)	Fecal coliform bacteria (colonies/100 mL)
				1993					
Jan. 26	0.5	48	6.9	6.5	0.35	10.8	90	<2.0	290K
26	14.1	47	6.9	6.5	--	10.7	90	<2.0	--
Feb. 17	.5	46	7.0	8.0	.80	10.1	88	<2.0	200
17	14.5	51	7.0	7.5	--	10.1	87	<2.0	--
Mar. 25	.5	31	6.4	10.0	.10	9.3	85	<2.0	2,400[e]
25	14.9	34	6.6	9.5	--	9.2	83	<2.0	--
Apr. 08	.5	44	7.0	12.5	.65	10.1	98	<2.0	8K
08	14.1	48	6.9	9.0	--	9.4	85	<2.0	--
22	.5	43	7.3	15.0	.90	9.9	102	<2.0	48
22	14.0	45	6.7	12.5	--	8.4	82	<2.0	--
May 06	.5	53	8.7	21.5	1.40	10.5	122	<2.0	51
06	1.6	53	8.8	19.0	--	10.8	120	<2.0	--
06	14.6	53	6.7	13.0	--	7.0	69	<2.0	--
19	.5	49	9.1	23.5	1.10	10.4	128	<2.0	400K
19	3.0	48	8.5	21.5	--	10.9	128	<2.0	--
19	14.0	46	6.5	14.5	--	4.2	43	<2.0	--
June 09	.5	65	8.7	28.0	1.70	9.2	122	<2.0	--
09	2.6	64	8.6	23.5	--	10	122	<2.0	--
09	14.0	59	6.6	14.5	--	3.6	37	<2.0	--
23	.5	76	9.0	28.5	1.30	9.3	124	<2.0	<1
23	2.5	73	6.8	24.5	--	6.4	79	<2.0	--
23	13.7	67	6.6	15.5	--	1.0	11	<2.0	--
July 14	.5	82	8.8	31.0	1.20	8.2	113	--	100
14	3.0	--	--	--	--	--	--	--	--
14	14.2	90	6.9	16.0	--	0	0	--	--
28	.5	84	8.9	31.5	1.05	8.6	121	<2.0	<2
28	3.5	88	7.0	27.5	--	5.7	75	<2.0	--
28	13.6	105	7.0	17.5	--	0	0	<2.0	--
Aug. 11	.5	102	8.8	27.5	1.00	10.0	131	2.9	1K
11	13.8	121	7.0	17.5	--	0	0	2.5	--
25	.5	113	8.9	28.5	1.25	9.6	128	<2.0	4K
25	4.0	124	6.5	25.5	--	2.6	33	<2.0	--
25	13.4	81	6.9	19.5	--	.1	1	<2.0	--
Sept. 15	.5	119	8.0	25.0	.90	9.1	113	--	<4
15	13.5	97	6.7	19.5	--	0	0	--	--
29	.5	118	7.6	23.0	.75	8.5	103	<2.0	16K
29	14.2	118	7.6	19.5	--	8.5	96	<2.0	--
Oct. 20	.5	120	9.1	20.0	.65	12.3	140	2.0	<2
20	13.7	130	6.8	16.0	--	3.9	41	<2.0	--
Nov. 17	.5	131	6.9	12.5	1.05	7.3	71	<2.0	40
17	13.6	113	7.0	10.0	--	7.4	68	<2.0	--
Dec. 16	.5	70	6.7	8.0	.45	8.7	76	3.0	--
16	14.1	70	6.8	7.5	--	8.6	75	2.3	--
				1994					
Jan. 26	.5	59	7.0	3.0	1.00	11.7	90	<2.0	150
26	13.7	59	7.0	3.0	--	11.5	88	<2.0	--
Feb. 23	.5	52	6.9	7.5	1.10	11.5	100	<2.0	54
23	14.1	58	6.9	5.5	--	10.7	89	<2.0	--
Mar. 23	.5	54	7.1	11.5	1.05	10.8	103	<2.0	23
23	13.6	54	7.1	8.5	--	9.6	85	<2.0	--

[e] Estimated value.

Table 22. Water-quality field measurements and sample analyses at Rhodhiss Lake site 27, January 1993 through March 1994--Continued

RHODHISS LAKE AT RHODHISS DAM

[Site 27 is at latitude 35°46'27", longitude 81°26'33", Burke County, U.S. Geological Survey downstream order number 0214148975; <, less than; --, missing data]

Date	Sampling depth (m)	Total hardness (mg/L as $CaCO_3$)	Dissolved calcium (mg/L as Ca)	Dissolved magnesium (mg/L as Mg)	Alkalinity (mg/L as $CaCO_3$)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Dissolved nitrogen, NO_2+NO_3 (mg/L as N)	Dissolved nitrogen, ammonia (mg/L as N)
				1993					
Jan. 26	0.5	13	3.4	1.1	14	17	9	0.316	0.096
26	14.1	12	3.0	1.0	14	29	13	.330	.094
Feb. 17	.5	10	2.4	.90	13	13	8	.278	.061
17	14.5	11	2.6	1.0	14	19	6	.274	.065
Mar. 25	.5	7	1.7	.70	9.7	114	9	.258	.032
25	14.9	7	1.8	.70	9.9	124	16	.249	.045
Apr. 08	.5	11	2.7	1.0	13	10	8	.273	.026
08	14.1	11	2.7	1.0	14	8	3	.274	.051
22	.5	10	2.5	.90	14	6	3	.124	.021
22	14.0	10	2.6	.90	15	4	2	.212	.085
May 06	.5	10	2.5	1.0	16	<1	<1	.065	<.002
06	1.6	10	2.5	1.0	17	2	2	.069	<.002
06	14.6	12	2.8	1.1	16	5	2	.193	.071
19	.5	10	2.4	1.0	15	<1	<1	<.005	.010
19	3.0	10	2.4	1.0	15	2	2	.025	.008
19	14.0	12	3.0	1.0	13	10	3	.182	.272
June 09	.5	11	2.5	1.1	16	3	--	<.005	<.002
09	2.6	11	2.6	1.1	15	<1	<1	.010	.003
09	14.0	13	3.2	1.2	19	10	3	.202	.209
23	.5	12	2.9	1.1	17	1	0	<.005	.003
23	2.5	12	2.8	1.1	15	2	2	.109	.044
23	13.7	15	3.6	1.4	16	5	4	.144	<.002
July 14	.5	11	2.6	1.0	16	4	2	<.005	.009
14	3.0	12	2.9	1.1	17	4	1	.088	.028
14	14.2	15	4.0	1.3	19	20	5	.069	.680
28	.5	11	2.5	1.1	19	5	<1	.007	.003
28	3.5	12	3.0	1.1	19	6	6	.022	<.002
28	13.6	18	4.7	1.4	23	9	1	<.005	.995
Aug. 11	.5	11	2.6	1.2	20	<1	<1	<.005	<.002
11	13.8	17	4.4	1.5	24	24	6	.018	1.10
25	.5	9	2.2	.80	20	2	1	<.005	.004
25	4.0	12	2.9	1.1	21	2	2	.081	.021
25	13.4	14	3.6	1.2	19	8	2	.112	.503
Sept. 15	.5	16	3.9	1.6	23	2	2	<.005	<.002
15	13.5	16	3.9	1.4	18	11	4	.035	.976
29	.5	12	3.0	1.2	20	2	2	.019	.016
29	14.2	15	3.9	1.3	20	4	3	.039	1.00
Oct. 20	.5	12	3.0	1.2	23	2	2	.023	.010
20	13.7	15	3.7	1.3	20	20	17	.114	.345
Nov. 17	.5	13	3.2	1.3	22	2	1	.135	.109
17	13.6	13	3.1	1.2	20	34	28	.131	.303
Dec. 16	.5	11	2.9	1.0	17	9	8	.222	.152
16	14.1	11	2.9	1.0	17	12	12	.226	.147
				1994					
Jan. 26	.5	12	3.0	1.1	15	4	4	.236	.068
26	13.7	12	3.1	1.1	17	8	5	.249	.071
Feb. 23	.5	11	2.6	1.1	14	4	3	.246	.059
23	14.1	12	2.8	1.1	14	37	32	.264	.089
Mar. 23	.5	12	3.0	1.2	15	5	4	.222	.058
23	13.6	13	3.2	1.2	14	10	8	.223	.094

Table 22. Water-quality field measurements and sample analyses at Rhodhiss Lake site 27, January 1993 through March 1994--Continued

RHODHISS LAKE AT RHODHISS DAM

[Site 27 is at latitude 35°46'27", longitude 81°26'33", Burke County, U.S. Geological Survey downstream order number 0214148975; <, less than; --, missing data]

Date	Sampling depth (m)	Total ammonia + organic nitrogen (mg/L as N)	Total phosphorus (mg/L as P)	Dissolved ortho-phosphorus (mg/L as P)	Total recoverable iron (µg/L as Fe)	Total organic carbon (mg/L as C)	Chlorophyll *a* (µg/L)	Chlorophyll *b* (µg/L)
				1993				
Jan. 26	0.5	0.30	0.058	0.015	710	2.6	0.8	<0.1
26	14.1	.30	.052	.013	1,100	2.6	--	--
Feb. 17	.5	.30	.049	.015	520	2.4	1.6	<.1
17	14.5	.20	.052	.016	810	2.4	--	--
Mar. 25	.5	.60	.113	.005	3,000	6.3	1.6	.1
25	14.9	.40	.109	.009	3,100	6.7	--	--
Apr. 08	.5	<.20	.036	.009	240	1.9	2.3	<.1
08	14.1	<.20	.037	.019	300	1.6	--	--
22	.5	.80	.036	.002	180	2.6	9.8	4.8
22	14.0	<.20	.036	.015	260	2.2	--	--
May 06	.5	<.20	.027	.002	90	3.2	8.3	.9
06	1.6	<.20	.026	.003	100	2.4	--	--
06	14.6	.20	.040	.012	340	5.9	--	--
19	.5	<.20	.026	<.001	100	2.7	6.9	<.1
19	3.0	<.20	.034	<.001	120	2.7	--	--
19	14.0	.40	.052	.009	650	2.7	--	--
June 09	.5	<.20	.020	<.001	130	2.6	2.0	.3
09	2.6	<.20	.026	<.001	140	2.5	--	--
09	14.0	.40	.040	.008	570	1.8	--	--
23	.5	.30	.025	<.001	120	2.6	<.1	<.1
23	2.5	.30	.037	.008	190	2.5	--	--
23	13.7	.50	.034	.005	520	1.9	--	--
July 14	.5	.20	.030	<.001	100	3.3	4.1	<.1
14	3.0	<.20	.030	<.001	100	3.0	--	--
14	14.2	.90	.130	.049	3,800	2.2	--	--
28	.5	<.20	.026	<.001	70	3.1	6.4	.5
28	3.5	.50	.034	<.001	100	3.3	--	--
28	13.6	1.1	.174	.115	5,400	3.3	--	--
Aug. 11	.5	.40	.034	<.001	80	3.0	12.0	1.5
11	13.8	1.6	.288	.130	8,100	5.2	--	--
25	.5	.20	.029	<.001	100	3.3	12.0	.7
25	4.0	.40	.034	.005	160	2.6	--	--
25	13.4	.70	.045	.001	1,600	2.3	--	--
Sept. 15	.5	.40	.035	.001	90	3.6	8.3	.3
15	13.5	1.1	.054	.008	3,400	3.2	--	--
29	.5	.30	.039	<.001	100	3.5	19.0	1.4
29	14.2	1.1	.056	.019	4,100	26	--	--
Oct. 20	.5	.50	.033	.001	100	3.5	21.0	1.1
20	13.7	.70	.093	.010	1,200	2.7	--	--
Nov. 17	.5	.40	.031	.003	210	2.5	2.1	<.1
17	13.6	.60	.136	.022	1,800	2.7	--	--
Dec. 16	.5	.40	.055	.022	480	3.0	.9	<.1
16	14.1	.40	.061	.022	590	3.0	--	--
				1994				
Jan. 26	.5	<.20	.035	.013	280	1.7	.2	<.1
26	13.7	<.20	.035	.014	330	1.7	--	--
Feb. 23	.5	<.20	.033	.008	240	1.7	.9	<.1
23	14.1	.30	.124	.018	1,600	3.0	--	--
Mar. 23	.5	.40	.035	.006	260	1.6	3.1	<.1
23	13.6	<.20	.039	.008	470	3.7	--	--

Table 23. Water-quality field measurements and sample analyses at Lake Hickory site 29, January 1993 through March 1994

LAKE HICKORY AT U.S. 321

[Site 29 is at latitude 35°45'30", longitude 81°22'40", Burke County, U.S. Geological Survey downstream order number 0214157625; <, less than; --, missing data; K, results based on colony count outside the acceptable range]

Date	Sampling depth (m)	Specific conductance (µS/cm)	pH (standard units)	Temperature of water (°C)	Secchi disk trans-parency (m)	Dissolved oxygen (mg/L)	Dissolved oxygen (percent saturation)	Biochemical oxygen demand, 5-day (mg/L)	Fecal coliform bacteria (colonies/ 100 mL)
				1993					
Jan. 27	0.5	48	6.8	6.0	0.40	11.2	94	<2.0	92
27	5.5	48	6.8	6.0	--	11.2	94	<2.0	--
Feb. 18	.5	52	6.9	7.0	.60	10.8	93	<2.0	130
18	5.4	53	6.9	7.0	--	10.8	93	<2.0	--
Mar. 23	.5	49	7.1	7.0	.60	11.2	95	<2.0	120
23	5.2	49	7.1	7.0	--	11.3	96	<2.0	--
Apr. 07	.5	45	6.7	10.0	.70	9.8	90	<2.0	28K
07	5.3	46	6.8	10.0	--	9.8	89	<2.0	--
20	.5	45	6.7	13.0	.80	8.9	88	<2.0	8K
20	5.2	45	6.7	13.0	--	8.9	87	<2.0	--
May 05	.5	48	6.5	15.0	.15	8.4	86	<2.0	200K
05	5.3	48	6.5	15.0	--	8.5	86	<2.0	--
18	.5	49	6.6	18.0	.80	7.2	79	<2.0	47
18	4.6	49	6.6	18.0	--	7.2	78	<2.0	--
June 08	.5	61	6.7	21.0	.90	7.5	87	<2.0	--
08	4.8	63	6.6	20.0	--	6.6	75	<2.0	--
22	.5	68	6.7	23.5	.75	7.1	87	2.6	4K
22	4.9	75	6.5	22.0	--	5.3	62	<2.0	--
July 13	.5	74	6.9	28.0	.70	7.1	94	--	73
13	5.1	89	6.5	26.0	--	3.7	48	--	--
27	.5	79	6.6	27.5	.80	5.5	73	<2.0	5K
27	4.7	90	6.5	26.5	--	3.7	48	<2.0	--
Aug. 10	.5	82	6.6	26.0	.75	5.5	69	2.3	5K
10	4.7	88	6.4	25.5	--	3.2	40	<2.0	--
24	.5	79	6.8	27.0	.90	6.7	87	<2.0	8K
24	4.8	100	6.5	25.5	--	2.6	33	<2.0	--
Sept. 14	.5	99	6.7	24.0	.75	5.6	68	--	13K
14	4.7	107	6.6	23.5	--	4.0	48	--	--
28	.5	99	6.6	21.5	.75	4.8	57	<2.0	13K
28	4.6	104	6.6	21.5	--	3.8	44	<2.0	--
Oct. 19	.5	108	6.9	18.5	.75	5.6	62	<2.0	5K
19	4.6	114	6.8	18.5	--	4.7	52	<2.0	--
Nov. 16	.5	125	6.9	13.0	.75	7.2	70	<2.0	12K
16	4.3	125	6.8	13.0	--	7.0	68	<2.0	--
Dec. 15	.5	75	6.8	7.5	.45	8.3	73	<2.0	53
15	4.4	75	6.9	7.5	--	8.3	73	<2.0	--
				1994					
Jan. 25	.5	60	7.0	3.0	.65	11.7	90	<2.0	160
25	4.7	60	7.1	3.0	--	11.7	90	<2.0	--
Feb. 22	.5	53	7.1	6.5	.65	10.9	91	<2.0	180
22	4.5	53	7.2	6.0	--	10.9	90	<2.0	--
Mar. 22	.5	55	7.3	9.5	.90	10	90	<2.0	18K
22	4.6	54	7.3	9.5	--	9.8	89	<2.0	--

Table 23. Water-quality field measurements and sample analyses at Lake Hickory site 29, January 1993 through March 1994--Continued

LAKE HICKORY AT U.S. 321

[Site 29 is at latitude 35°45'30", longitude 81°22'40", Burke County, U.S. Geological Survey downstream order number 0214157625; <, less than; --, missing data]

Date	Sampling depth (m)	Total hardness (mg/L as $CaCO_3$)	Dissolved calcium (mg/L as Ca)	Dissolved magnesium (mg/L as Mg)	Alkalinity (mg/L as $CaCO_3$)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Dissolved nitrogen, NO_2+NO_3 (mg/L as N)	Dissolved nitrogen, ammonia (mg/L as N)
				1993					
Jan. 27	0.5	12	2.8	1.1	14	11	8	0.315	0.082
27	5.5	12	2.8	1.1	14	15	9	.298	.063
Feb. 18	.5	11	2.8	1.0	14	7	2	.286	.066
18	5.4	11	2.6	1.0	14	10	2	.286	.062
Mar. 23	.5	11	2.6	1.0	14	6	2	.299	.060
23	5.2	11	2.7	1.0	15	4	4	.317	.082
Apr. 07	.5	11	2.6	1.0	13	--	--	.285	.052
07	5.3	11	2.7	1.0	13	10	3	.285	.054
20	.5	11	2.6	1.0	14	8	3	.181	.084
20	5.2	11	2.6	1.0	14	10	3	.188	.079
May 05	.5	10	2.5	1.0	14	50	6	.234	.077
05	5.3	11	2.9	1.0	13	51	9	.227	.072
18	.5	10	2.4	1.0	13	7	5	.192	.093
18	4.6	10	2.4	1.0	13	11	5	.194	.095
June 08	.5	10	2.5	1.0	14	2	2	.140	.039
08	4.8	11	2.7	1.0	15	4	3	.174	.087
22	.5	12	2.7	1.2	12	3	2	.124	.019
22	4.9	13	3.0	1.3	14	9	5	.177	.119
July 13	.5	10	2.1	1.1	18	7	4	.058	.008
13	5.1	12	2.9	1.1	16	11	5	.159	.179
27	.5	10	2.2	1.2	14	17	4	.114	.082
27	4.7	12	2.7	1.2	16	49	9	.165	.168
Aug. 10	.5	10	2.2	1.1	26	2	2	.107	.033
10	4.7	11	2.7	1.1	11	9	9	.156	.144
24	.5	7	1.4	.80	19	1	< 1	.058	.039
24	4.8	12	3.1	1.1	21	< 1	< 1	.134	.147
Sept. 14	.5	12	3.0	1.2	25	5	3	.151	.072
14	4.7	14	3.5	1.2	25	7	2	.182	.120
28	.5	13	3.3	1.2	27	5	1	.186	.136
28	4.6	15	3.9	1.2	26	9	2	.206	.193
Oct. 19	.5	14	3.4	1.3	18	5	5	.174	.115
19	4.6	15	3.8	1.3	20	13	12	.202	.127
Nov. 16	.5	14	3.5	1.3	22	6	6	.199	.141
16	4.3	13	3.2	1.2	23	17	17	.202	.162
Dec. 15	.5	12	3.0	1.1	17	12	11	.234	.142
15	4.4	12	3.1	1.0	17	13	11	.233	.144
				1994					
Jan. 25	.5	12	2.8	1.2	17	5	5	.254	.078
25	4.7	12	3.0	1.2	17	4	4	.254	.081
Feb. 22	.5	11	2.7	1.1	13	8	7	.275	.074
22	4.5	12	3.0	1.1	13	24	23	.285	.075
Mar. 22	.5	13	3.2	1.2	15	4	2	.236	.069
22	4.6	13	3.4	1.2	14	10	8	.234	.068

Table 23. Water-quality field measurements and sample analyses at Lake Hickory site 29, January 1993 through March 1994--Continued

LAKE HICKORY AT U.S. 321

[Site 29 is at latitude 35°45'30", longitude 81°22'40", Burke County, U.S. Geological Survey downstream order number 0214157625; <, less than; --, missing data]

Date	Sampling depth (m)	Total ammonia + organic nitrogen (mg/L as N)	Total phosphorus (mg/L as P)	Dissolved ortho-phosphorus (mg/L as P)	Total recoverable iron (µg/L as Fe)	Total organic carbon (mg/L as C)	Chlorophyll *a* (µg/L)	Chlorophyll *b* (µg/L)
				1993				
Jan. 27	0.5	0.20	0.055	0.020	1,600	2.6	0.7	< 0.1
27	5.5	.20	.061	.019	500	2.4	--	--
Feb. 18	.5	< .20	.040	.020	360	2.3	.9	< .1
18	5.4	< .20	.048	.019	1,300	2.2	--	--
Mar. 23	.5	< .20	.044	.018	330	1.9	.8	< .1
23	5.2	< .20	.045	.019	350	1.9	--	--
Apr. 07	.5	< .20	.033	.014	290	1.7	.4	< .1
07	5.3	< .20	.032	.014	420	1.8	--	--
20	.5	< .20	.035	.018	330	1.7	.3	< .1
20	5.2	.20	.045	.019	820	2.0	--	--
May 05	.5	< .20	.082	.014	1,300	6.1	1.6	< .1
05	5.3	.20	.077	.010	1,400	4.5	--	--
18	.5	.20	.030	.011	320	2.0	0.5	< .1
18	4.6	.20	.048	.012	830	2.1	--	--
June 08	.5	.50	.057	.004	270	2.9	18	.3
08	4.8	.30	.049	.015	320	1.8	--	--
22	.5	.40	.096	.003	160	3.0	42	.4
22	4.9	.30	.064	.014	480	2.4	--	--
July 13	.5	.90	.020	< .001	170	4.6	110	4.8
13	5.1	.50	.050	.009	470	2.2	--	--
27	.5	.60	.043	.002	230	2.6	15	.8
27	4.7	.80	.117	.009	2,600	2.1	--	--
Aug. 10	.5	.30	.048	.001	300	2.7	14	< .1
10	4.7	.30	.053	.003	760	2.5	--	--
24	.5	.40	.047	< .001	180	3.3	9.3	.5
24	4.8	1.3	.046	< .001	480	2.5	--	--
Sept. 14	.5	.50	.062	< .001	250	3.0	20	1.0
14	4.7	.30	.062	.003	620	2.9	--	--
28	.5	.40	.053	.003	290	2.5	21	.6
28	4.6	.40	.127	.007	690	2.2	--	--
Oct. 19	.5	.70	.126	.003	270	2.7	13	.4
19	4.6	.40	.045	.003	1,000	2.0	--	--
Nov. 16	.5	.30	.052	.009	980	2.4	3.6	< .1
16	4.3	.40	.073	.012	540	2.8	--	--
Dec. 15	.5	.40	.056	.020	490	2.6	.4	< .1
15	4.4	.40	.053	.020	630	2.7	--	--
				1994				
Jan. 25	.5	< .20	.035	.017	350	2.0	.3	< .1
25	4.7	< .20	.033	.014	380	2.0	--	--
Feb. 22	.5	.20	.038	.015	410	1.9	.5	< .1
22	4.5	.30	.076	.014	1,400	1.9	--	--
Mar. 22	.5	< .20	.045	.010	390	1.6	1.0	< .1
22	4.6	< .20	.038	.009	450	1.7	--	--

Table 24. Water-quality field measurements and sample analyses at Lake Hickory site 34, January 1993 through March 1994

LAKE HICKORY AT NC 127

[Site 34 is at latitude 35°48'10", longitude 81°18'17", Catawba County, U.S. Geological Survey downstream order number 0214184000; <, less than; --, missing data; K, results based on colony count outside the acceptable range]

Date	Sampling depth (m)	Specific conductance (uS/cm)	pH (standard units)	Temperature of water (°C)	Secchi disk trans-parency (m)	Dissolved oxygen (mg/L)	Dissolved oxygen (percent saturation)	Biochemical oxygen demand, 5-day (mg/L)	Fecal coliform bacteria (colonies/ 100 mL)
				1993					
Jan. 27	0.5	53	6.9	7.0	0.90	11.2	96	<2.0	18
27	16.1	53	6.9	7.0	--	11.1	94	<2.0	--
Feb. 18	.5	53	6.9	7.0	1.10	11.2	96	<2.0	13
18	16.1	53	6.9	7.0	--	11.1	95	<2.0	--
Mar. 23	.5	47	7.0	10.5	.60	10.4	96	<2.0	10K
23	16.2	46	7.0	6.5	--	10.9	91	<2.0	--
Apr. 07	.5	42	6.7	11.5	.65	9.7	92	<2.0	11K
07	16.2	45	6.6	10.0	--	9.4	86	<2.0	--
20	.5	41	6.8	15.0	.90	9.4	96	<2.0	4K
20	16.2	45	6.5	11.5	--	8.2	78	<2.0	--
May 05	.5	42	6.9	19.5	1.50	9.1	102	<2.0	9K
05	4.6	49	6.7	17.0	--	8.3	89	<2.0	--
05	16.1	56	6.6	15.0	--	8.3	84	<2.0	--
18	.5	42	8.1	23.0	.95	10.0	121	2.0	7K
18	3.5	45	6.5	20.0	--	7.0	80	<2.0	--
18	15.6	48	6.3	16.0	--	5.4	57	<2.0	--
June 08	.5	47	8.6	25.5	1.10	10.4	132	<2.0	--
08	2.9	46	7.4	23.0	--	8.5	102	<2.0	--
08	15.4	61	6.5	18.0	--	5.3	58	<2.0	--
22	.5	48	8.2	26.0	1.25	9.2	119	<2.0	1K
22	3.3	50	6.5	24.5	--	5.3	66	<2.0	--
22	15.4	73	6.3	19.0	--	2.3	25	<2.0	--
July 13	.5	57	8.4	30.5	1.25	8.9	123	--	56
13	3.0	61	6.4	28.5	--	5.5	74	--	--
13	15.8	83	6.3	21.5	--	0	1	--	--
27	.5	63	7.1	30.0	1.25	7.3	100	<2.0	<1
27	15.4	98	6.3	23.0	--	0	0	<2.0	--
Aug. 10	.5	66	6.9	27.5	1.40	7.3	94	<2.0	1K
10	15.4	92	6.4	25.0	--	.5	6	<2.0	--
24	.5	69	7.2	28.0	1.60	7.7	102	<2.0	9K
24	15.4	96	6.4	24.5	--	0	0	<2.0	--
Sept. 14	.5	82	6.6	26.0	1.60	5.6	71	--	18K
14	15.3	90	6.4	25.0	--	3.5	43	--	--
28	.5	85	6.4	24.0	1.00	4.8	59	<2.0	2K
28	15.4	83	6.4	24.0	--	4.7	57	<2.0	--
Oct. 19	.5	79	7.2	20.5	1.25	8.7	100	<2.0	5K
19	15.1	93	6.8	19.0	--	5.6	62	<2.0	--
Nov. 16	.5	88	7.0	16.5	1.15	9.9	104	<2.0	120
16	13.5	109	6.8	13.0	--	7.3	70	<2.0	--
Dec. 15	.5	98	6.7	8.0	1.50	7.9	70	<2.0	2K
15	15.5	98	6.6	8.0	--	7.9	70	<2.0	--
				1994					
Jan. 25	.5	65	6.9	3.5	.65	11.2	88	<2.0	800K
25	15.3	66	6.9	3.5	--	11.2	86	<2.0	--
Feb. 22	.5	57	6.9	7.5	.85	10.8	93	<2.0	110
22	14.7	58	7.0	6.0	--	10.2	84	<2.0	--
Mar. 22	.5	52	7.0	11.5	1.00	10.1	95	<2.0	2K
22	15.4	53	7.1	9.5	--	9.3	83	<2.0	--

Table 24. Water-quality field measurements and sample analyses at Lake Hickory site 34, January 1993 through March 1994--Continued

LAKE HICKORY AT NC 127

[Site 34 is at latitude 35°48'10", longitude 81°18'17", Catawba County, U.S. Geological Survey downstream order number 0214184000; <, less than; --, missing data]

Date	Sampling depth (m)	Total hardness (mg/L as $CaCO_3$)	Dissolved calcium (mg/L as Ca)	Dissolved magnesium (mg/L as Mg)	Alkalinity (mg/L as $CaCO_3$)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Dissolved nitrogen, NO_2+NO_3 (mg/L as N)	Dissolved nitrogen, ammonia (mg/L as N)
				1993					
Jan. 27	0.5	11	2.7	1.1	14	8	8	0.321	0.117
27	16.1	11	2.7	1.1	14	9	9	.312	.066
Feb. 18	.5	11	2.7	1.1	15	1	< 1	.319	.042
18	16.1	11	2.7	1.1	15	6	4	.320	.046
Mar. 23	.5	11	2.7	1.0	15	5	2	.367	.070
23	16.2	11	2.6	1.0	15	17	3	.318	.070
Apr. 07	.5	10	2.5	1.0	12	5	2	.285	.059
07	16.2	11	2.7	1.0	13	9	3	.292	.063
20	.5	10	2.3	1.0	13	5	1	.180	.032
20	16.2	10	2.4	1.0	13	16	4	.220	.113
May 05	.5	9	2.1	1.0	14	4	3	.166	.019
05	4.6	10	2.4	1.0	15	6	4	.192	.029
05	16.1	11	2.6	1.0	15	12	4	.197	.065
18	.5	9	1.9	1.0	13	7	3	.102	.007
18	3.5	9	2.1	1.0	13	4	2	.173	.027
18	15.6	10	2.4	1.0	13	12	7	.218	.109
June 08	.5	8	1.7	1.0	13	3	3	.035	.004
08	2.9	9	1.8	1.0	12	3	3	.061	< .002
08	15.4	11	2.7	1.1	15	12	4	.213	.205
22	.5	8	1.5	1.0	15	4	4	.014	.004
22	3.3	--	--	--	11	4	< 1	.094	.088
22	15.4	12	3.0	1.1	14	7	4	.425	.285
July 13	.5	7	1.1	1.0	12	--	--	.006	.014
13	3.0	8	1.4	1.1	12	5	3	.046	.032
13	15.8	12	2.8	1.2	15	17	5	.362	.225
27	.5	8	1.3	1.1	13	6	5	.047	.014
27	15.4	12	2.9	1.2	17	11	5	.133	.397
Aug. 10	.5	8	1.5	1.1	20	< 1	1	.054	.029
10	15.4	12	2.7	1.2	19	13	8	.086	.287
24	.5	7	1.2	1.0	13	< 1	< 1	.032	.010
24	15.4	12	2.8	1.2	19	3	3	.085	.632
Sept. 14	.5	9	1.7	1.1	23	3	1	.076	.086
14	15.3	11	2.4	1.1	22	5	1	.110	.171
28	.5	14	2.6	1.8	21	< 1	< 1	.114	.153
28	15.4	9	1.9	1.1	14	9	2	.119	.142
Oct. 19	.5	9	1.8	1.1	14	1	1	.064	.757
19	15.1	10	2.1	1.2	15	42	38	.204	.015
Nov. 16	.5	10	2.0	1.1	18	3	3	.228	.071
16	13.5	10	2.2	1.2	18	9	7	.230	.097
Dec. 15	.5	13	3.2	1.2	20	4	4	.229	.152
15	15.5	13	3.3	1.2	19	5	4	.228	.154
				1994					
Jan. 25	.5	12	3.0	1.2	17	1	1	.267	.095
25	15.3	12	2.9	1.2	18	5	5	.267	.097
Feb. 22	.5	12	3.0	1.1	14	9	4	.284	.071
22	14.7	12	3.0	1.2	14	11	7	.278	.100
Mar. 22	.5	12	3.0	1.1	13	5	4	.299	.053
22	15.4	12	3.0	1.1	13	20	17	.320	.106

Table 24. Water-quality field measurements and sample analyses at Lake Hickory site 34, January 1993 through March 1994--Continued

LAKE HICKORY AT NC 127

[Site 34 is at latitude 35°48'10", longitude 81°18'17", Catawba County, U.S. Geological Survey downstream order number 0214184000; <, less than; --, missing data]

Date	Sampling depth (m)	Total ammonia + organic nitrogen (mg/L as N)	Total phosphorus (mg/L as P)	Dissolved ortho-phosphorus (mg/L as P)	Total recoverable iron (µg/L as Fe)	Total organic carbon (mg/L as C)	Chlorophyll *a* (µg/L)	Chlorophyll *b* (µg/L)
				1993				
Jan. 27	0.5	< 0.20	0.043	0.023	310	2.1	1.2	< 0.1
27	16.1	.20	.046	.024	290	1.9	--	--
Feb. 18	.5	< .20	.031	.018	230	1.6	1.0	< .1
18	16.1	< .20	.035	.017	330	1.8	--	--
Mar. 23	.5	.20	.048	.018	320	2.1	2.5	< .1
23	16.2	< .20	.066	.019	820	2.1	--	--
Apr. 07	.5	< .20	.035	.011	300	2.0	1.4	< .1
07	16.2	< .20	.045	.014	460	2.0	--	--
20	.5	< .20	.029	.008	240	2.1	2.4	< .1
20	16.2	.30	.059	.019	680	2.3	--	--
May 05	.5	< .20	.021	< .001	80	1.7	3.7	.3
05	4.6	< .20	.021	.003	140	1.8	--	--
05	16.1	< .20	.050	.014	510	1.7	--	--
18	.5	< .20	.029	.001	130	2.8	11	< .1
18	3.5	< .20	.024	.001	180	2.2	--	--
18	15.6	.30	.032	.012	510	2.1	--	--
June 08	.5	.20	.025	< .001	70	2.6	9.6	.5
08	2.9	.20	.039	< .001	90	3.0	--	--
08	15.4	.40	.056	.040	520	1.8	--	--
22	.5	< .20	.030	.002	60	3.1	9.6	1.0
22	3.3	.20	.017	.002	70	2.3	--	--
22	15.4	.40	.066	.040	250	2.2	--	--
July 13	.5	.50	.020	< .001	50	3.1	18	1.5
13	3.0	.50	.030	< .001	70	2.8	--	--
13	15.8	.50	.070	.015	820	2.1	--	--
27	.5	.40	.019	< .001	70	2.7	26	1.1
27	15.4	.70	.046	.004	860	2.0	--	--
Aug. 10	.5	.30	.029	< .001	90	2.4	11	.9
10	15.4	.70	.067	.001	1,300	2.8	--	--
24	.5	< .20	.022	< .001	70	2.6	12	.5
24	15.4	.70	.060	.008	900	2.5	--	--
Sept. 14	.5	.30	.025	< .001	80	2.8	14	.6
14	15.3	.40	.031	< .001	320	2.8	--	--
28	.5	.30	.032	.001	200	2.6	9.4	.3
28	15.4	.30	.036	.001	440	2.1	--	--
Oct. 19	.5	1.0	.073	.038	40	2.8	11	.5
19	15.1	.30	.023	.001	2,000	4.1	--	--
Nov. 16	.5	.20	.034	.001	270	3.1	5.0	.3
16	13.5	.30	.041	.002	500	2.5	--	--
Dec. 15	.5	.40	.034	.017	870	2.1	1.0	< .1
15	15.5	.40	.038	.014	220	2.1	--	--
				1994				
Jan. 25	.5	.20	.039	.020	340	2.1	.4	< .1
25	15.3	< .20	.037	.018	340	2.1	--	--
Feb. 22	.5	.20	.039	.017	280	1.9	1.3	< .1
22	14.7	.20	.043	.021	400	1.8	--	--
Mar. 22	.5	< .20	.035	.004	270	1.9	4.7	< .1
22	15.4	< .20	.071	.008	930	2.5	--	--

Table 25. Water-quality field measurements and sample analyses at Lake Hickory site 40A, January 1993 through March 1994

LAKE HICKORY ABOVE OXFORD DAM

[Site 40A is at latitude 35°49'17", longitude 81°11'38", Catawba County, U.S. Geological Survey downstream order number 0214196095; <, less than; --, missing data; K, results based on colony count outside the acceptable range]

Date	Sampling depth (m)	Specific conductance (µS/cm)	pH (standard units)	Temperature of water (°C)	Secchi disk transparency (m)	Dissolved oxygen (mg/L)	Dissolved oxygen (percent saturation)	Biochemical oxygen demand, 5-day (mg/L)	Fecal coliform bacteria (colonies/ 100 mL)
				1993					
Jan. 27	0.5	47	6.7	7.5	0.70	10.5	90	< 2.0	98
27	24.8	47	6.7	7.0	--	10.4	89	< 2.0	--
Feb. 18	.5	47	6.7	7.0	1.60	10.9	93	< 2.0	50
18	25.0	47	6.7	6.5	--	12.2	104	< 2.0	--
Mar. 23	.5	43	7.2	9.5	.80	11.3	102	< 2.0	10K
23	1.7	--	--	--	--	--	--	< 2.0	--
23	25.6	42	7.0	6.5	--	10.1	85	< 2.0	--
Apr. 07	.5	37	6.6	12.0	.35	9.4	90	< 2.0	25K
07	25.6	38	6.4	10.0	--	8.9	81	< 2.0	--
20	.5	40	7.2	16.0	.70	9.8	102	< 2.0	11K
20	25.5	41	6.4	10.5	--	8.1	75	< 2.0	--
May 05	.5	40	7.1	21.5	1.90	9.4	110	< 2.0	3K
05	2.3	40	7.3	18.5	--	9.6	106	< 2.0	--
05	25.7	44	6.3	11.0	--	5.8	54	< 2.0	--
18	.5	41	8.2	25.5	1.35	9.1	116	< 2.0	8K
18	2.9	41	6.7	22.5	--	8.2	99	< 2.0	--
18	24.9	45	6.4	11.0	--	3.7	35	< 2.0	--
June 08	.5	42	8.4	28.0	1.70	9.0	120	< 2.0	--
08	3.7	42	7.8	24.0	--	9.3	114	< 2.0	--
08	24.7	49	6.2	11.5	--	.4	4	< 2.0	--
22	.5	45	8.7	28.0	1.25	9.2	123	< 2.0	< 1
22	4.0	43	7.0	26.5	--	7.3	94	< 2.0	--
22	25.4	54	6.6	12.0	--	0	0	< 2.0	--
July 13	.5	50	8.5	31.0	1.05	8.3	115	--	17K
13	3.5	51	6.6	28.5	--	6.1	82	--	--
13	25.0	59	6.5	12.5	--	0	0	--	--
27	.5	57	7.1	30.5	1.65	7.2	99	<2.0	< 1
27	25.0	71	6.6	13.0	--	0	0	< 2.0	--
Aug. 10	.5	64	6.7	28.5	1.60	6.0	79	< 2.0	1K
10	25.0	84	6.7	13.5	--	0	0	< 2.0	--
24	.5	67	7.6	29.5	1.30	7.7	104	< 2.0	5K
24	24.7	92	6.9	13.0	--	0	0	< 2.0	--
Sept. 14	.5	75	6.7	26.5	1.60	6.2	80	--	27
14	24.8	108	6.9	13.5	--	0	0	--	--
28	.5	83	6.5	24.5	1.25	5.0	62	< 2.0	3K
28	24.8	102	6.9	14.5	--	0	0	< 2.0	--
Oct. 19	.5	80	7.0	22.0	1.10	8.4	99	< 2.0	< 1
19	24.7	118	7.0	14.0	--	.1	1	2.3	--
Nov. 16	.5	88	6.8	17.0	1.35	8.7	93	< 2.0	19K
16	24.9	104	6.8	13.5	--	5.9	58	2.9	--
Dec. 15	.5	100	6.7	10.0	1.75	7.6	71	< 2.0	30K
15	24.8	100	6.7	9.5	--	7.6	70	< 2.0	--
				1994					
Jan. 25	.5	66	6.9	4.0	2.30	11.0	85	< 2.0	37
25	24.9	69	6.9	4.0	--	10.7	84	< 2.0	--
Feb. 22	.5	51	6.9	7.0	.70	10.5	89	< 2.0	24
22	24.8	56	6.9	5.0	--	10.1	81	< 2.0	--
Mar. 22	.5	48	7.1	14.0	.65	10.8	109	< 2.0	8K
22	20.5	48	7.1	9.0	--	9.0	81	< 2.0	--

Table 25. Water-quality field measurements and sample analyses at Lake Hickory site 40A, January 1993 through March 1994--Continued

LAKE HICKORY ABOVE OXFORD DAM

[Site 40A is at latitude 35°49'17", longitude 81°11'38", Catawba County, U.S. Geological Survey downstream order number 0214196095; <, less than]

Date	Sampling depth (m)	Total hardness (mg/L as $CaCO_3$)	Dissolved calcium (mg/L as Ca)	Dissolved magnesium (mg/L as Mg)	Alkalinity (mg/L as $CaCO_3$)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Dissolved nitrogen, NO_2+NO_3 (mg/L as N)	Dissolved nitrogen, ammonia (mg/L as N)
				1993					
Jan. 27	0.5	11	2.7	1.1	15	8	6	0.337	0.149
27	24.8	11	2.7	1.0	15	37	14	.340	.135
Feb. 18	.5	11	2.6	1.0	13	4	1	.343	.066
18	25.0	11	2.7	1.0	14	10	3	.339	.066
Mar. 23	.5	8	2.0	.80	15	7	5	.331	.053
23	1.7	11	2.7	1.0	15	2	2	.331	.075
23	25.6	11	2.6	1.0	15	11	6	.336	.105
Apr. 07	.5	11	2.3	.90	11	<1	<1	.280	.075
07	25.6	10	2.4	1.0	12	13	1	.278	.090
20	.5	10	2.2	1.0	13	2	2	.167	.014
20	25.5	10	2.4	.90	12	58	9	.237	.096
May 05	.5	9	2.1	1.0	13	1	1	.193	.007
05	2.3	9	2.1	1.0	14	3	3	.195	.011
05	25.7	10	2.5	1.0	14	8	3	.256	.092
18	.5	9	1.8	1.0	12	1	1	.098	.015
18	2.9	9	2.0	1.0	13	2	2	.121	.050
18	24.9	10	2.5	1.0	13	5	2	.260	.119
June 08	.5	8	1.7	.90	12	3	0	.058	<.002
08	3.7	8	1.7	.90	12	3	2	.063	.003
08	24.7	12	2.8	1.1	14	4	3	.303	.095
22	.5	8	1.6	1.0	14	2	2	<.005	.008
22	4.0	9	1.8	1.0	11	3	3	.044	.026
22	25.4	13	3.0	1.3	14	4	<1	.330	.080
July 13	.5	8	1.5	1.0	12	6	4	.012	.021
13	3.5	8	1.6	1.0	14	5	5	.029	.084
13	25.0	12	3.0	1.2	15	15	5	.124	.278
27	.5	8	1.4	1.1	13	4	4	.049	.014
27	25.0	12	3.0	1.2	56	5	5	.185	.200
Aug. 10	.5	9	1.6	1.1	16	3	1	.032	.062
10	25.0	12	2.9	1.2	21	11	2	.038	.310
24	.5	7	1.5	.90	17	3	2	<.005	.008
24	24.7	13	3.1	1.3	20	4	2	.035	.578
Sept. 14	.5	9	1.6	1.1	14	1	1	.016	.057
14	24.8	14	3.3	1.3	18	5	2	<.005	.828
28	.5	11	2.3	1.2	23	2	1	.237	.008
28	24.8	13	2.9	1.3	17	14	3	.131	.545
Oct. 19	.5	10	2.0	1.1	15	1	1	.227	.023
19	24.7	15	3.5	1.4	24	12	11	.217	.184
Nov. 16	.5	10	2.0	1.2	16	2	1	.236	.050
16	24.9	11	2.3	1.2	17	84	75	.218	.170
Dec. 15	.5	11	2.4	1.2	20	<1	<1	.244	.147
15	24.8	11	2.5	1.1	18	7	6	.244	.166
				1994					
Jan. 25	.5	12	3.0	1.2	18	1	1	.262	.139
25	24.9	12	2.9	1.2	18	10	7	.258	.137
Feb. 22	.5	12	2.8	1.1	13	9	6	.331	.100
22	24.8	12	3.0	1.1	13	17	14	.313	.122
Mar. 22	.5	11	2.7	1.0	12	9	8	.351	.066
22	20.5	11	2.8	1.0	11	22	18	.360	.135

Table 25. Water-quality field measurements and sample analyses at Lake Hickory site 40A, January 1993 through March 1994--Continued

LAKE HICKORY ABOVE OXFORD DAM

[Site 40A is at latitude 35°49'17", longitude 81°11'38", Catawba County, U.S. Geological Survey downstream order number 0214196095; <, less than; --, missing data]

Date	Sampling depth (m)	Total ammonia + organic nitrogen (mg/L as N)	Total phosphorus (mg/L as P)	Dissolved ortho-phosphorus (mg/L as P)	Total recoverable iron (µg/L as Fe)	Total organic carbon (mg/L as C)	Chlorophyll *a* (µg/L)	Chlorophyll *b* (µg/L)
				1993				
Jan. 27	0.5	0.20	0.049	0.025	360	1.8	0.4	<0.1
27	24.8	.30	.108	.025	730	2.2	--	--
Feb. 18	.5	<.20	.032	.017	240	2.2	1.0	<.1
18	25.0	<.20	.049	.018	610	2.3	--	--
Mar. 23	.5	.30	.042	.013	230	2.4	5.4	.2
23	1.7	.20	.042	.015	240	1.9	--	--
23	25.6	.20	.054	.020	550	2.1	--	--
Apr. 07	.5	.20	.050	.015	500	2.7	.9	<.1
07	25.6	.30	.062	.014	760	2.9	--	--
20	.5	.30	.030	.002	190	2.6	6.6	.3
20	25.5	.50	.158	.010	2,700	7.1	--	--
May 05	.5	<.20	.014	<.001	60	2.0	2.8	<.1
05	2.3	<.20	.014	<.001	70	2.0	--	--
05	25.7	.20	.040	.010	460	2.2	--	--
18	.5	.30	.019	<.001	80	2.6	2.3	<.1
18	2.9	.40	.018	.001	100	2.4	--	--
18	24.9	.20	.024	.010	290	1.8	--	--
June 08	.5	.30	.012	<.001	60	2.6	4.4	.4
08	3.7	.20	.022	<.001	70	2.7	--	--
08	24.7	.30	.022	.005	260	1.6	--	--
22	.5	.20	.014	.001	10	3.0	4.6	<.1
22	4.0	<.20	.019	.001	70	2.6	--	--
22	25.4	<.20	.021	.007	380	2.1	--	--
July 13	.5	.60	.019	<.001	60	3.1	5.5	.5
13	3.5	.50	.020	<.001	70	3.0	--	--
13	25.0	.60	.030	<.001	1,300	2.8	--	--
27	.5	.30	.014	<.001	60	2.3	9.0	.6
27	25.0	.40	.015	.003	1,300	2.1	--	--
Aug. 10	.5	.20	.014	<.001	70	1.9	7.6	.7
10	25.0	.50	.052	.020	2,500	4.2	--	--
24	.5	.20	.015	<.001	40	2.5	8.4	.6
24	24.7	.60	.054	.021	2,700	3.4	--	--
Sept. 14	.5	.30	.015	.001	50	2.6	7.4	.5
14	24.8	.80	.111	.065	4,700	3.9	--	--
28	.5	<.20	.020	<.001	100	2.6	12	.7
28	24.8	.60	.128	.045	3,700	4.3	--	--
Oct. 19	.5	.30	.018	.004	50	2.4	6.4	.3
19	24.7	1.4	.129	.009	5,900	3.4	--	--
Nov. 16	.5	.20	.020	<.001	170	2.6	5.8	<.1
16	24.9	.40	.217	.005	3,600	2.6	--	--
Dec. 15	.5	.30	.018	.006	170	1.9	.4	<.1
15	24.8	.40	.031	.004	370	2.1	--	--
				1994				
Jan. 25	.5	.30	.030	.013	180	2.0	.8	<.1
25	24.9	.30	.043	.013	430	2.0	--	--
Feb. 22	.5	.20	.038	.014	350	2.3	.4	<.1
22	24.8	.30	.062	.017	130	2.1	--	--
Mar. 22	.5	.30	.049	.003	300	2.8	5.6	<.1
22	20.5	.30	.073	.010	1,600	2.5	--	--

Table 26. Water-quality field measurements and sample analyses at Rhodhiss Lake tributary site 53, January 1993 through March 1994

LOWER CREEK NEAR MORGANTON, SR 1501

[Site 53 is at latitude 35°49'31", longitude 81°38'10", Burke County, U.S. Geological Survey downstream order number 02141245; <, less than; K, results based on colony count outside the acceptable range; --, missing data; >, greater than]

Date	Discharge, instantaneous (ft^3/s)	Specific conductance (µS/cm)	pH (standard units)	Temperature of water (°C)	Dissolved oxygen (mg/L)	Dissolved oxygen (percent saturation)	Biochemical oxygen demand, 5-day (mg/L)	Fecal coliform bacteria (colonies/ 100 mL)
				1993				
Jan. 28	140	68	6.6	7.0	11.5	97	< 2.0	280K
Feb. 16	149	61	6.8	6.0	10.8	90	< 2.0	800
Mar. 24	990	38	6.4	10.5	9.4	87	2.2	4,000
Apr. 06	487	46	6.7	7.0	10.3	88	2.3	5,000
Apr. 21	154	65	7.0	14.5	9.0	92	< 2.0	230
May 04	124	66	7.0	15.5	9.0	93	< 2.0	300K
May 20	108	68	6.9	16.5	8.8	94	< 2.0	130
June 10	82	73	6.9	22.5	7.7	92	< 2.0	10K
June 24	80	73	7.1	21.5	7.9	92	< 2.0	320K
July 15	76	79	7.1	22.5	7.1	85	--	> 240
July 29	71	78	7.0	25.5	7.1	90	< 2.0	670K
Aug. 12	64	79	7.1	20.0	7.9	90	< 2.0	1,400K
Aug. 26	61	76	7.0	23.5	8.2	99	< 2.0	860K
Sept. 16	56	82	7.1	22.0	8.0	94	--	600K
Sept. 30	50	85	7.1	14.5	9.6	97	< 2.0	92
Oct. 21	54	86	7.1	18.0	7.9	86	< 2.0	950K
Nov. 18	58	81	6.8	13.0	9.2	90	< 2.0	890
Dec. 14	70	74	7.1	6.0	11.0	93	< 2.0	100
				1994				
Jan. 27	207	69	6.8	5.0	11.1	90	2.8	> 240
Feb. 24	390	51	6.2	9.5	12.1	111	< 2.0	440K
Mar. 24	86	74	7.6	12.5	8.9	87	< 2.0	39

Table 26. Water-quality field measurements and sample analyses at Rhodhiss Lake tributary site 53, January 1993 through March 1994--Continued

LOWER CREEK NEAR MORGANTON, SR 1501

[Site 53 is at latitude 35°49'31", longitude 81°38'10", Burke County, U.S. Geological Survey downstream order number 02141245; <, less than]

Date	Total hardness (mg/L as $CaCO_3$)	Dissolved calcium (mg/L as Ca)	Dissolved magnesium (mg/L as Mg)	Alkalinity (mg/L as $CaCO_3$)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Dissolved nitrogen, NO_2+NO_3 (mg/L as N)	Dissolved nitrogen, ammonia (mg/L as N)
				1993				
Jan. 28	20	4.8	1.9	22	26	12	0.758	0.137
Feb. 16	19	4.7	1.7	22	49	7	.505	.123
Mar. 24	11	2.6	1.0	12	497	55	.385	.066
Apr. 06	14	3.5	1.3	16	304	41	.311	.137
Apr. 21	18	4.7	1.6	24	22	5	.422	.112
May 04	21	5.5	1.7	25	23	6	.474	.085
May 20	19	4.8	1.8	24	21	6	.533	.128
June 10	19	4.8	1.7	25	38	12	.616	.100
June 24	21	5.3	1.9	26	27	6	< .005	.027
July 15	21	5.3	1.9	25	47	9	.620	.033
July 29	22	5.5	1.9	27	29	3	.537	.033
Aug. 12	22	5.6	2.0	28	30	9	.802	.008
Aug. 26	21	5.6	1.8	28	47	8	.647	.024
Sept. 16	22	5.5	2.0	29	35	6	.471	.035
Sept. 30	22	5.6	1.9	30	11	3	.501	.100
Oct. 21	9	2.0	.90	13	6	4	.375	.040
Nov. 18	22	5.8	1.8	28	13	10	.323	.032
Dec. 14	22	5.8	1.9	25	3	1	.742	.088
				1994				
Jan. 27	19	4.8	1.6	16	130	112	.708	.264
Feb. 24	14	3.4	1.3	10	182	164	.631	.184
Mar. 24	22	5.7	1.8	24	16	13	.594	.316

Table 26. Water-quality field measurements and sample analyses at Rhodhiss Lake tributary site 53, January 1993 through March 1994--Continued

LOWER CREEK NEAR MORGANTON, SR 1501

[Site 53 is at latitude 35°49'31", longitude 81°38'10", Burke County, U.S. Geological Survey downstream order number 02141245; <, less than]

Date	Total ammonia + organic nitrogen (mg/L as N)	Total phosphorus (mg/L as P)	Dissolved ortho-phosphorus (mg/L as P)	Total recoverable iron (µg/L as Fe)	Total organic carbon (mg/L as C)	Suspended sediment (mg/L)
			1993			
Jan. 28	0.30	0.028	0.010	1,100	2.4	31
Feb. 16	.40	.062	.008	2,100	3.5	71
Mar. 24	.60	.561	.013	12,000	14	558
Apr. 06	1.1	.281	.020	8,900	12	405
Apr. 21	.30	.036	.005	1,000	2.4	41
May 04	.30	.038	.004	910	2.3	26
May 20	.30	.047	.009	1,100	2.2	28
June 10	.50	.092	.035	1,300	2.7	31
June 24	.20	.066	.027	1,300	2.1	30
July 15	.40	.110	.037	1,500	3.0	47
July 29	.30	.074	.021	1,400	2.9	32
Aug. 12	.40	.103	.045	1,400	2.2	30
Aug. 26	.30	.132	.034	1,900	3.0	46
Sept. 16	.50	.115	.030	1,700	2.8	36
Sept. 30	.30	.085	.039	800	1.8	15
Oct. 21	.40	.088	.038	900	2.7	11
Nov. 18	.30	.086	.026	1,100	2.6	17
Dec. 14	.20	.048	.014	760	1.6	13
			1994			
Jan. 27	1.0	.196	.029	3,400	7.2	128
Feb. 24	2.8	.169	.008	5,200	7.4	232
Mar. 24	.50	.044	.007	810	2.0	17

Table 27. Water-quality field measurements and sample analyses at Lake Hickory tributary site 58, January 1993 through March 1994

UPPER LITTLE RIVER AT SR 1740 AT PETRA MILLS

[Site 58 is at latitude 35°50'31", longitude 81°21'43", Caldwell County, U.S. Geological Survey downstream order number 0214183365; <, less than; K, results based on colony count outside the acceptable range; --, missing data; >, greater than]

Date	Discharge, instantaneous (ft^3/s)	Specific conductance (µS/cm)	pH (standard units)	Temperature of water (°C)	Dissolved oxygen (mg/L)	Dissolved oxygen (percent saturation)	Biochemical oxygen demand, 5-day (mg/L)	Fecal coliform bacteria (colonies/ 100 mL)
				1993				
Jan. 28	82	25	6.8	5.5	12.1	99	< 2.0	37K
Feb. 16	127	26	6.8	6.5	11.4	96	< 2.0	800K
Mar. 24	322	23	6.6	10.5	10.8	100	< 2.0	500
Apr. 06	193	24	6.5	9.5	10.9	99	< 2.0	370
Apr. 21	102	26	7.3	15.5	9.2	96	< 2.0	27K
May 04	66	27	6.9	15.0	9.6	99	< 2.0	220
May 20	63	27	7.0	15.5	9.6	101	< 2.0	120
June 10	43	28	7.3	22.0	8.3	98	< 2.0	90
June 24	30	28	7.2	20.5	8.8	100	< 2.0	180
July 15	33	31	7.0	24.0	8.3	102	--	> 240
July 29	29	31	7.1	24.5	8.2	102	< 2.0	89K
Aug. 12	29	28	7.4	22.5	8.8	105	2.0	250K
Aug. 26	24	29	7.2	22.5	8.5	101	< 2.0	190
Sept. 16	22	30	7.1	20.0	8.5	97	--	190K
Sept. 30	19	29	7.4	13.5	10.2	101	< 2.0	--
Oct. 21	19	30	7.1	18.0	8.9	97	< 2.0	60
Nov. 18	22	30	6.5	13.5	9.5	94	< 2.0	150
Dec. 14	28	27	7.3	4.5	12.2	98	< 2.0	39
				1994				
Jan. 27	67	31	7.0	6.0	11.8	97	< 2.0	410K
Feb. 24	178	26	6.4	9.0	13.4	121	< 2.0	350K
Mar. 24	44	25	7.6	13.0	10	98	< 2.0	27

Table 27. Water-quality field measurements and sample analyses at Lake Hickory tributary site 58, January 1993 through March 1994--Continued

UPPER LITTLE RIVER AT SR 1740 AT PETRA MILLS

[Site 58 is at latitude 35°50'31", longitude 81°21'43", Caldwell County, U.S. Geological Survey downstream order number 0214183365; <, less than; --, missing data]

Date	Total hardness (mg/L as $CaCO_3$)	Dissolved calcium (mg/L as Ca)	Dissolved magnesium (mg/L as Mg)	Alkalinity (mg/L as $CaCO_3$)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Dissolved nitrogen, NO_2+NO_3 (mg/L as N)	Dissolved nitrogen, ammonia (mg/L as N)
				1993				
Jan. 28	8	1.6	0.90	8.8	5	--	0.310	0.023
Feb. 16	8	1.7	.80	9.4	30	8	.341	.057
Mar. 24	6	1.3	.70	7.5	142	22	.229	.035
Apr. 06	8	1.8	.80	8.2	51	11	.236	.035
Apr. 21	7	1.6	.80	9.6	6	5	.237	.008
May 04	8	1.8	.80	11	5	4	.252	.003
May 20	8	1.8	.80	11	4	4	.245	.013
June 10	8	1.8	.80	11	8	4	.313	.012
June 24	8	1.9	.90	10	8	2	.254	.006
July 15	9	2.0	.90	11	15	3	.256	.022
July 29	9	2.1	.90	11	11	3	.267	.014
Aug. 12	8	1.8	.80	13	9	2	.256	.032
Aug. 26	8	1.8	.80	13	9	3	.259	.002
Sept. 16	9	2.0	.90	14	8	< 1	.226	< .002
Sept. 30	8	1.9	.80	14	7	3	.218	.013
Oct. 21	24	6.2	2.0	32	3	1	.053	.028
Nov. 18	8	1.9	.80	13	4	3	.121	< .002
Dec. 14	9	2.1	.90	11	2	1	.275	.005
				1994				
Jan. 27	9	2.0	.90	11	31	25	.313	.017
Feb. 24	7	1.5	.80	5.9	68	60	.320	.048
Mar. 24	8	1.8	.80	9.4	5	3	.237	.008

Table 27. Water-quality field measurements and sample analyses at Lake Hickory tributary site 58, January 1993 through March 1994--Continued

UPPER LITTLE RIVER AT SR 1740 AT PETRA MILLS

[Site 58 is at latitude 35°50'31", longitude 81°21'43", Caldwell County, U.S. Geological Survey downstream order number 0214183365; <, less than]

Date	Total ammonia + organic nitrogen (mg/L as N)	Total phosphorus (mg/L as P)	Dissolved ortho-phosphorus (mg/L as P)	Total recoverable iron (µg/L as Fe)	Total organic carbon (mg/L as C)	Suspended sediment (mg/L)
			1993			
Jan. 28	< 0.20	0.007	0.002	180	1.3	8
Feb. 16	.20	.047	.005	1,300	2.9	49
Mar. 24	.30	.107	.006	4,800	6.6	194
Apr. 06	.20	.059	.007	1,800	3.8	65
Apr. 21	< .20	.006	.001	240	1.8	8
May 04	.30	.009	< .001	240	1.7	11
May 20	< .20	.010	.001	320	1.6	10
June 10	< .20	.017	.001	450	1.7	11
June 24	< .20	.012	< .001	310	1.6	5
July 15	< .20	.030	< .001	470	1.7	17
July 29	< .20	.024	.001	480	2.3	14
Aug. 12	.30	.045	< .001	650	1.7	11
Aug. 26	< .20	.021	< .001	620	2.0	9
Sept. 16	< .20	.016	.001	660	1.8	9
Sept. 30	< .20	.013	< .001	520	1.5	7
Oct. 21	< .20	.015	< .001	750	2.8	5
Nov. 18	< .20	.009	0.001	480	1.9	4
Dec. 14	< .20	.007	< .001	350	.9	3
			1994			
Jan. 27	.20	.048	.002	1,100	3.2	28
Feb. 24	.30	.075	.002	1,900	4.9	74
Mar. 24	<.20	.008	< .001	320	1.2	4

Table 28. Water-quality field measurements and sample analyses at Lake Hickory tributary site 60, January 1993 through March 1994

MIDDLE LITTLE RIVER AT MORETZ DAM NEAR BETHLEHEM

[Site 60 is at latitude 35°51'50", longitude 81°12'39", Alexander County, U.S. Geological Survey downstream order number 0214192500; <, less than; K, results based on colony count outside the acceptable range; --, missing data; >, greater than]

Date	Discharge, instantaneous (ft^3/s)	Specific conductance (µS/cm)	pH (standard units)	Temperature of water (°C)	Dissolved oxygen (mg/L)	Dissolved oxygen (percent saturation)	Biochemical oxygen demand, 5-day (mg/L)	Fecal coliform bacteria (colonies/ 100 mL)
				1993				
Jan. 28	115	26	6.8	6.0	11.9	99	< 2.0	20
Feb. 16	140	26	6.8	6.0	11.2	94	< 2.0	98
Mar. 24	605	22	6.7	11.0	10.7	100	< 2.0	740
Apr. 06	275	26	6.7	8.0	11.3	99	< 2.0	980
Apr. 21	145	27	7.0	15.5	9.3	97	< 2.0	84
May 04	104	27	6.9	15.5	9.6	100	< 2.0	180K
May 20	99	27	6.8	15.5	9.5	100	< 2.0	240
June 10	70	29	6.9	21.5	8.6	100	< 2.0	220
June 24	63	29	6.9	20.0	8.1	92	< 2.0	340K
July 15	53	31	6.9	24.5	8.0	100	--	> 240
July 29	52	33	6.9	23.5	7.8	96	< 2.0	460
Aug. 12	46	29	6.9	23.0	8.3	99	2.0	980K
Aug. 26	36	29	6.9	22.0	8.5	100	< 2.0	310
Sept. 16	35	30	6.8	20.5	8.2	93	--	400K
Sept. 30	30	30	7.4	13.5	10.0	99	< 2.0	--
Oct. 21	28	30	7.0	17.5	8.7	94	< 2.0	120
Nov. 18	36	31	7.0	14.0	9.1	92	< 2.0	260
Dec. 14	40	28	7.4	3.5	12.4	97	< 2.0	93
				1994				
Jan. 27	81	31	7.2	5.5	11.9	96	< 2.0	200K
Feb. 24	303	24	7.4	8.5	13.5	120	< 2.0	340K
Mar. 24	58	28	7.5	12.5	9.8	96	< 2.0	88

Table 28. Water-quality field measurements and sample analyses at Lake Hickory tributary site 60, January 1993 through March 1994--Continued

MIDDLE LITTLE RIVER AT MORETZ DAM NEAR BETHLEHEM

[Site 60 is at latitude 35°51'50", longitude 81°12'39", Alexander County, U.S. Geological Survey downstream order number 0214192500; <, less than; --, missing data]

Date	Total hardness (mg/L as $CaCO_3$)	Dissolved calcium (mg/L as Ca)	Dissolved magnesium (mg/L as Mg)	Alkalinity (mg/L as $CaCO_3$)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Dissolved nitrogen, NO_2+NO_3 (mg/L as N)	Dissolved nitrogen, ammonia (mg/L as N)
				1993				
Jan. 28	8	1.8	0.90	9.3	6	--	0.377	0.069
Feb. 16	8	1.7	.80	11	6	5	.334	.034
Mar. 24	5	1.2	.60	6.9	143	23	.265	.034
Apr. 06	8	1.9	.80	9.0	57	14	.253	.038
Apr. 21	7	1.7	.70	10	15	5	.239	.025
May 04	8	1.8	.80	12	9	5	.228	.005
May 20	20	5.1	1.8	11	10	5	.255	.033
June 10	8	1.9	.80	11	12	3	.276	.044
June 24	9	2.0	.90	17	18	5	.549	.041
July 15	8	2.0	.80	11	25	< 1	.215	.049
July 29	9	2.0	.90	11	31	10	.238	.049
Aug. 12	8	1.9	.80	13	19	3	.254	.047
Aug. 26	8	1.9	.80	13	21	4	.233	.042
Sept. 16	9	2.1	.90	69	14	3	.204	.024
Sept. 30	9	2.1	.90	14	--	--	.188	.059
Oct. 21	10	2.3	1.0	15	13	8	.084	.026
Nov. 18	8	1.9	.80	12	7	3	.126	.013
Dec. 14	9	2.1	.90	11	3	1	.271	.017
				1994				
Jan. 27	8	2.0	.80	12	17	14	.339	.035
Feb. 24	7	1.5	.70	5.3	85	75	.308	.052
Mar. 24	8	2.0	.80	10	8	7	.309	.036

Table 28. Water-quality field measurements and sample analyses at Lake Hickory tributary site 60, January 1993 through March 1994--Continued

MIDDLE LITTLE RIVER AT MORETZ DAM NEAR BETHLEHEM

[Site 60 is at latitude 35°51'50", longitude 81°12'39", Alexander County, U.S. Geological Survey downstream order number 0214192500; <, less than]

Date	Total ammonia + organic nitrogen (mg/L as N)	Total phosphorus (mg/L as P)	Dissolved ortho-phosphorus (mg/L as P)	Total recoverable iron (µg/L as Fe)	Total organic carbon (mg/L as C)	Suspended sediment (mg/L)
			1993			
Jan. 28	< 0.20	0.009	0.002	280	1.2	6
Feb. 16	< .20	.013	.002	370	1.6	10
Mar. 24	.30	.139	.004	4,200	7.3	162
Apr. 06	.30	.093	.010	2,000	4.5	62
Apr. 21	< .20	.011	.004	400	1.6	13
May 04	< .20	.015	< .001	370	1.5	11
May 20	1.0	.018	.002	600	1.9	15
June 10	.20	.029	< .001	840	1.9	15
June 24	< .20	.027	< .001	770	1.8	23
July 15	.30	.040	< .001	950	2.6	26
July 29	.30	.050	.001	1,400	3.1	33
Aug. 12	.80	.045	< .001	1,500	2.4	30
Aug. 26	< .20	.040	.001	1,300	2.5	23
Sept. 16	< .20	.039	< .001	1,100	2.1	19
Sept. 30	< .20	.023	< .001	1,100	2.2	15
Oct. 21	< .20	.037	< .001	400	2.5	14
Nov. 18	< .20	.018	< .001	930	2.0	9
Dec. 14	< .20	.009	< .001	580	1.0	5
			1994			
Jan. 27	< .20	.023	.002	730	2.0	12
Feb. 24	.40	.098	.014	2,400	6.1	78
Mar. 24	< .20	.014	< .001	710	1.5	10

Table 29. Nutrients, trace metals, and particle sizes in bottom material, Rhodhiss Lake and Lake Hickory, July 1993

[Results for Rhodhiss Lake represent a composite of bottom material collected from sites 21, 23B, and 25 (fig. 2) on July 14, 1993. Results for Lake Hickory represent a composite of bottom material collected from sites 29, 33, and 36 (fig. 3) July 13, 1993. Concentrations of all chemical constituents are expressed in terms of sediment dry weight. <, less than]

Property or constituent	Concentration in bottom material	
	Rhodhiss Lake	Lake Hickory
Nitrogen, nitrite plus nitrate (mg/kg as N)	19	19
Nitrogen, ammonia total (mg/kg as N)	62	21
Nitrogen, ammonia plus organic total (mg/kg as N)	2,900	2,700
Phosphorus, total (mg/kg as P)	2,200	2,500
Arsenic, total (µg/g as As)	5	9
Cadmium, total (µg/g as Cd)	1	1
Chromium, total (µg/g as Cr)	30	40
Cobalt, total (µg/g as Co)	30	30
Copper, total (µg/g as Cu)	52	37
Iron, total (µg/g as Fe)	32,000	39,000
Lead, total (µg/g as Pb)	40	90
Manganese, total (µg/g as Mn)	620	760
Mercury, recoverable (µg/g as Hg)	.05	.05
Selenium, total(µg/g as Se)	<1	<1
Zinc, total (µg/g as Zn)	120	130
Sediment, bed material, sieve diameter, 0.062 mm (percent)	59	85
Sediment, bed material, sieve diameter, 0.125 mm (percent)	66	90
Sediment, bed material, sieve diameter, 0.250 mm (percent)	89	95
Sediment, bed material, sieve diameter, 0.500 mm (percent)	96	97
Sediment, bed material, sieve diameter, 1.000 mm (percent)	98	99

Table 30. Organochlorine pesticides in bottom material, Rhodhiss Lake and Lake Hickory, July 1993

[Results for Rhodhiss Lake represent a composite of bottom material collected from sites 21, 23B, and 25 (fig. 2) on July 14, 1993. Results for Lake Hickory represent a composite of bottom material collected from sites 29, 33, and 36 (fig. 3) July 13, 1993. Concentrations of all chemical constituents are expressed as micrograms per kilogram (µg/kg) sediment dry weight. <, less than]

Constituent	Concentration in bottom material	
	Rhodhiss Lake	Lake Hickory
Chlorneb (µg/kg)	<5.0	<5.0
alpha-HCH (µg/kg)	<1.0	<1.0
Hexachlorobenzene (HCB) (µg/kg)	<1.0	<1.0
Pentachloroanisole (PCA) (µg/kg)	<1.0	<1.0
beta-HCH (µg/kg)	<1.0	<1.0
gamma-HCH (Lindane) (µg/kg)	<1.0	<1.0
delta-HCH (µg/kg)	<1.0	<1.0
Heptachlor (µg/kg)	<1.0	<1.0
Aldrin (µg/kg)	<1.0	<1.0
DCPA (Dacthal) (µg/kg)	<5.0	<5.0
Isodrin (µg/kg)	<1.0	<1.0
Heptachlor epoxide (µg/kg)	<1.0	<1.0
Oxychlordane (µg/kg)	<1.0	<1.0
trans-Chlordane (µg/kg)	1.0	1.2
Endosulfan I (µg/kg)	<1.0	<1.0
o, p'-DDE (µg/kg)	<1.0	<1.0
cis-Chlordane (µg/kg)	<1.0	<1.0
trans-Nonachlor (µg/kg)	1.4	<1.0
Dieldrin (µg/kg)	<1.0	<1.0
p, p'-DDE (µg/kg)	1.1	1.4
o, p'-DDD (µg/kg)	<1.0	<1.0
Endrin (µg/kg)	<2.0	<2.0
cis-Nonachlor (µg/kg)	<1.0	<1.0
p, p'-DDD (µg/kg)	<1.0	1.3
o, p'-DDT (µg/kg)	<2.0	<2.0
p, p'-DDT (µg/kg)	<2.0	<2.0
o, p'-Methoxychlor (µg/kg)	<5.0	<5.0
p, p'-Methoxychlor (µg/kg)	<5.0	<5.0
Mirex (µg/kg)	<1.0	<1.0
cis-Permethrin (µg/kg)	<5.0	<5.0
trans-Permethrin (µg/kg)	<5.0	<5.0
PCBs - Total (µg/kg)	<50	<50
Toxaphene (µg/kg)	<200	<200

Table 31. Semivolatile organic compounds in bottom material, Rhodhiss Lake and Lake Hickory, July 1993

[Results for Rhodhiss Lake represent a composite of bottom material collected from sites 21, 23B, and 25 (fig. 2) on July 14, 1993. Results for Lake Hickory represent a composite of bottom material collected from sites 29, 33, and 36 (fig. 3) on July 13, 1993. Concentrations of all chemical constituents are expressed in micrograms per kilogram (µg/kg) sediment dry weight. <, less than; *, estimated concentration below the laboratory reporting level of 50.0 µg/kg]

Constituent	Concentration in bottom material	
	Rhodhiss Lake	Lake Hickory
1,2,4-Trichlorobenzene (µg/kg)	< 50.0	< 50.0
2,4-Dinitrotoluene (µg/kg)	< 50.0	< 50.0
2,6-Dinitrotoluene (µg/kg)	< 500	< 500
2-Chloronaphthalene (µg/kg)	< 50.0	< 50.0
4-Bromophenyl-phenylether (µg/kg)	< 50.0	< 50.0
4-Chlorophenyl-phenylether (µg/kg)	< 50.0	< 50.0
9H-Fluorene (µg/kg)	< 50.0	< 50.0
Acenaphthene (µg/kg)	< 50.0	< 50.0
Acenaphthalene (µg/kg)	< 50.0	< 50.0
Anthracene (µg/kg)	61.0	< 50.0
bis (-2-Chloroethoxy) methane (µg/kg)	< 50.0	< 50.0
bis (-2-Chloroethyl) ether (µg/kg)	< 50.0	< 50.0
Benz (a) anthracene (µg/kg)	273	40.9*
Benzo (b) fluoranthene (µg/kg)	242	57.8
Benzo (g, h, i) perylene (µg/kg)	92.2	45.2*
Benzo (k) fluoranthene (µg/kg)	142	56.9
Benzo (a) pyrene (µg/kg)	148	40.2*
1,3-Dichlorobenzene (µg/kg)	< 50.0	< 50.0
bis (2-ethylhexyl) phthalate (µg/kg)	1,160	1,690
Butylbenzylphthalate (µg/kg)	< 50.0	<50.0
Chrysene (µg/kg)	778	85.6
Pentachloronitrobenzene (µg/kg)	< 50.0	< 50.0
Hexachlorobenzene (µg/kg)	< 50.0	< 50.0
Dibenzo (a, h) anthracene (µg/kg)	35.8*	< 50.0
1,4-Dichlorobenzene (µg/kg)	< 50.0	< 50.0
1,2-Dichlorobenzene (µg/kg)	< 50.0	< 50.0
Diethylphthalate (µg/kg)	< 50.0	< 50.0
Dimethyl phthalate (µg/kg)	< 50.0	< 50.0
Di-n-octyl phthalate (µg/kg)	70.0	< 50.0
Fluoroanthene (µg/kg)	269	98.2
Indeno (1, 2, 3-c, d) pyrene (µg/kg)	95.1	45.4*
Isophorone (µg/kg)	< 50.0	< 50.0
N-Nitrosodiphenylamine (µg/kg)	< 50.0	< 50.0
N-Nitroso-di-n-propylamine (µg/kg)	< 50.0	< 50.0
Naphthalene (µg/kg)	25.0*	< 50.0
Nitrobenzene (µg/kg)	< 50.0	< 50.0
Phenanthrene (µg/kg)	114	28.2*
Phenol (µg/kg)	< 50.0	< 50.0
Pyrene (µg/kg)	258	110
p-Cresol (µg/kg)	< 50.0	< 50.0
c8-Alkyl-phenol (µg/kg)	< 50.0	< 50.0
3,5-Dimethylphenol (µg/kg)	< 50.0	< 50.0
Quinoline (µg/kg)	< 50.0	< 50.0
Isoquinoline (µg/kg)	< 50.0	< 50.0
4-Chloro-3-methylphenol (µg/kg)	< 50.0	< 50.0
2-Ethylnaphthalene (µg/kg)	< 50.0	< 50.0
2,6-Dimethylnaphthalene (µg/kg)	22.9*	< 50.0
1,6-Dimethylnaphthalene (µg/kg)	< 50.0	< 50.0
1,2-Dimethylnaphthalene (µg/kg)	< 50.0	< 50.0
2,3,6-Trimethylnaphthalene (µg/kg)	< 50.0	< 50.0
Azo-benzene (µg/kg)	< 50.0	< 50.0
1-Methyl-9H-fluorene (µg/kg)	< 50.0	< 50.0
Pentachloroanisol (µg/kg)	< 50.0	< 50.0
Dibenzothiphene (µg/kg)	< 50.0	< 50.0
Acridine (µg/kg)	< 50.0	< 50.0
Phenanthridine (µg/kg)	< 50.0	< 50.0
9H-Carbazol (µg/kg)	< 50.0	< 50.0
2-Methylanthracene (µg/kg)	< 50.0	< 50.0
Benzo-C-quinoline (µg/kg)	< 50.0	< 50.0
4,5-Methylenephenanthrene (µg/kg)	31.4*	15.9*
1-Methylphenanthrene (µg/kg)	< 50.0	< 50.0
Anthraquinone (µg/kg)	< 50.0	< 50.0
1-Methylpyrene (µg/kg)	33.8*	< 50.0
2,2' -Biquinoline (µg/kg)	< 50.0	< 50.0
2-Chlorophenol (µg/kg)	< 50.0	< 50.0

Table 32. Daily mean values of solar radiation at Lake Hickory site 40A, June 1993 through March 1994

LAKE HICKORY AT SITE 40A

[Site 40A is at latitude 35°49'17", longitude 81°11'38", Catawba County; U.S. Geological Survey downstream order number 0214196095;---, missing data or no day in month; MEAN, monthly mean; MAX, highest instantaneous value recorded during month; MIN, lowest instantaneous value recorded during month]

DAILY MEAN VALUES, INTENSITY OF INCIDENT SOLAR RADIATION, (in calories/square centimeter/day)

Day	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1	---	0.25	0.28	0.22	0.22	0.16	0.13	0.042	0.15	0.012
2	---	.21	.19	.18	.21	.14	.088	.10	.15	.031
3	---	.29	.17	.22	.22	.075	.11	.023	.16	.13
4	---	.31	.15	.050	.21	.11	.004	.11	.13	.21
5	---	.22	.22	.19	.21	.022	.13	.13	.043	.21
6	---	.29	.11	.22	.13	.092	.12	.11	.080	.21
7	---	.31	.23	.13	.13	.16	.12	.016	.16	.17
8	---	.28	.21	.21	.16	.13	.12	.13	.047	.17
9	---	.26	.24	.23	.19	.080	.11	.13	.037	.017
10	---	.24	.28	.22	.13	.14	.016	.10	.017	.19
11	---	.21	.18	.26	.036	.14	.12	.032	.021	.23
12	---	.29	.23	.23	.19	.10	.12	.069	.040	.22
13	---	.25	.064	.21	.19	.096	.095	.028	.073	.15
14	---	.27	.20	.15	.15	.078	.043	.10	.18	.23
15	---	.20	.26	.17	.16	.097	.028	.14	.12	.17
16	0.31	.20	.21	.15	.059	.11	.12	.11	.19	.24
17	.26	.23	.21	.14	.12	.058	.032	.005	.16	.23
18	.25	.25	.23	.23	.16	.091	.015	.14	.18	.17
19	.32	.20	.22	.18	.15	.033	.11	.14	.17	.23
20	.29	.30	.21	.033	.13	.14	.016	.082	.11	.21
21	.12	.31	.22	.19	.10	.14	.12	.14	.052	.047
22	.29	.28	.19	.23	.061	.13	.039	.14	.097	.25
23	.30	.20	.19	.16	.18	.13	.080	.12	.018	.23
24	.19	.12	.23	.20	.18	.13	.057	.10	.19	.10
25	.29	.21	.18	.033	.15	.12	.086	.061	.20	.070
26	.20	.16	.13	.19	.078	.019	.12	.084	.20	.17
27	.34	.30	.25	.10	.14	.014	.11	.012	.21	.042
28	.26	.30	.24	.23	.17	.13	.023	.084	.18	.045
29	.21	.29	.24	.23	.085	.13	.019	.081	---	.24
30	.27	.29	.23	.22	.022	.13	.12	.022	---	.25
31	---	.30	.23	---	.048	---	.12	.042	---	.17
MEAN	---	.25	.21	.18	.14	.10	.082	.085	.12	.16
MAX	---	1.0	1.0	.91	.82	.72	.60	.58	.73	.90
MIN	---	.000	.000	.000	.000	.000	.000	.000	.000	.000

Table 33. Daily mean values of air temperature at Lake Hickory site 40A, June 1993 through March 1994

LAKE HICKORY AT SITE 40A

[Site 40A is at latitude 35°49'17", longitude 81°11'38", Catawba County; U.S. Geological Survey downstream order number 0214196095; ---, missing data or no day in month; MEAN, monthly mean; MAX, highest instantaneous value recorded during month; MIN, lowest instantaneous value recorded during month]

DAILY MEAN VALUES OF AIR TEMPERATURE (in degrees Celsius)

Day	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1	---	26.8	24.2	27.0	10.8	5.3	3.0	-0.3	-0.4	2.9
2	---	25.6	---	23.9	15.0	4.4	3.4	4.7	-1.5	2.5
3	---	26.5	24.2	25.5	16.9	6.5	8.3	4.4	1.5	5.5
4	---	27.8	24.4	22.8	15.1	10.2	10.5	2.5	3.4	10.2
5	---	27.1	24.3	23.6	18.7	14.7	11.6	1.6	6.8	10.9
6	---	27.3	23.3	23.8	17.1	11.2	7.1	4.2	4.3	9.0
7	---	28.3	23.1	22.8	15.3	3.7	4.7	9.0	5.7	12.5
8	---	28.9	23.0	23.8	18.4	4.1	6.4	3.2	10.0	14.4
9	---	27.5	22.9	24.5	19.8	5.6	5.1	-2.0	14.7	5.3
10	---	27.3	23.0	23.2	17.6	8.7	6.8	-2.6	1.2	6.2
11	---	26.3	22.4	18.6	8.6	6.9	3.6	1.0	.0	3.7
12	---	26.7	24.2	18.3	11.3	8.5	1.3	6.1	1.4	3.5
13	---	26.7	22.9	21.2	11.9	11.8	2.8	5.9	3.8	6.8
14	---	27.4	25.2	22.8	13.5	16.1	4.6	2.5	4.0	8.9
15	---	26.1	25.4	23.5	14.5	18.5	5.7	-7.7	3.3	12.0
16	24.3	25.9	25.1	23.5	15.5	18.9	9.3	-10.1	6.2	7.8
17	24.3	26.3	25.4	23.7	18.2	17.8	4.2	-3.2	5.3	5.4
18	25.2	26.8	25.5	23.3	19.0	12.7	6.0	-4.1	7.5	11.4
19	25.3	26.4	25.6	21.0	20.0	11.3	4.7	-10.9	9.5	14.0
20	23.7	27.9	24.5	18.7	21.0	8.7	.5	-6.4	10.7	15.2
21	22.2	25.4	25.4	21.1	18.8	3.7	2.4	-3.7	9.3	---
22	23.4	26.1	24.1	20.7	13.3	5.4	.1	.3	8.5	13.0
23	23.2	26.7	24.3	20.5	9.9	7.6	1.4	2.7	6.6	13.7
24	23.9	24.8	24.8	22.9	10.3	8.8	-.4	5.5	6.4	16.0
25	24.1	24.9	25.4	18.5	12.7	10.3	.3	5.4	6.5	13.4
26	22.8	24.7	24.0	22.6	14.9	6.5	.7	7.7	5.0	8.6
27	23.1	26.3	24.7	19.5	14.8	8.9	3.3	.5	.6	13.4
28	23.1	28.6	25.4	16.3	12.0	8.8	1.7	6.1	2.3	15.6
29	23.7	29.4	26.4	14.7	8.9	3.4	-.6	6.5	---	9.2
30	25.4	24.4	26.7	13.2	10.7	2.9	-1.5	2.3	---	8.4
31	---	23.7	27.7	---	6.3	---	-1.8	.8	---	8.7
MEAN	---	26.6	---	21.5	14.5	9.1	3.7	1.0	5.1	---
MAX	---	37.8	---	34.1	29.7	25.6	17.3	16.8	19.8	---
MIN	---	15.8	---	6.8	1.3	-2.7	-7.9	-15.5	-7.3	---

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CONVERSION FACTORS, VERTICAL DATUM, TEMPERATURE, AND ABBREVIATIONS

Multiply	By	To obtain
	Length	
inch (in.)	25.4	millimeter
foot (ft)	0.3048	meter
mile (mi)	1.609	kilometer
	Flow	
cubic foot per second (ft^3/s)	0.02832	cubic meter per second
	Mass	
ounce avoirdupois (oz avdp)	28.35	gram
pound avoirdupois (lb avdp)	0.4536	kilogram

Sea level: In this report "sea level" refers to the National Geodetic Vertical Datum of 1929 (NGVD)--a geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called Sea Level Datum of 1929.

Temperature: In this report temperature is given in degrees Celsius (°C), which can be converted to degrees Fahrenheit (°F) by the following equation:

$$°F = 1.8\ °C + 32$$

Use of trade, product, or firm names in this report is for descriptive purposes only and does not imply endorsement by the U.S. Government.

ABBREVIATIONS AND ACRONYMS:

---	missing data or no day in month
BMP	best-management practice
BOD	biochemical oxygen demand
FAA	Federal Aviation Administration
HPLC	high-pressure liquid chromatography
m	meter
mg/L	milligram per liter
mm	millimeter
MAX	highest instantaneous value recorded during month
MEAN	monthly mean
MIN	lowest instantaneous value recorded during month
TOC	total organic carbon
µg/kg	microgram per kilogram
µm	micron or micrometer
USGS	U.S. Geological Survey
WPCOG	Western Piedmont Council of Governments