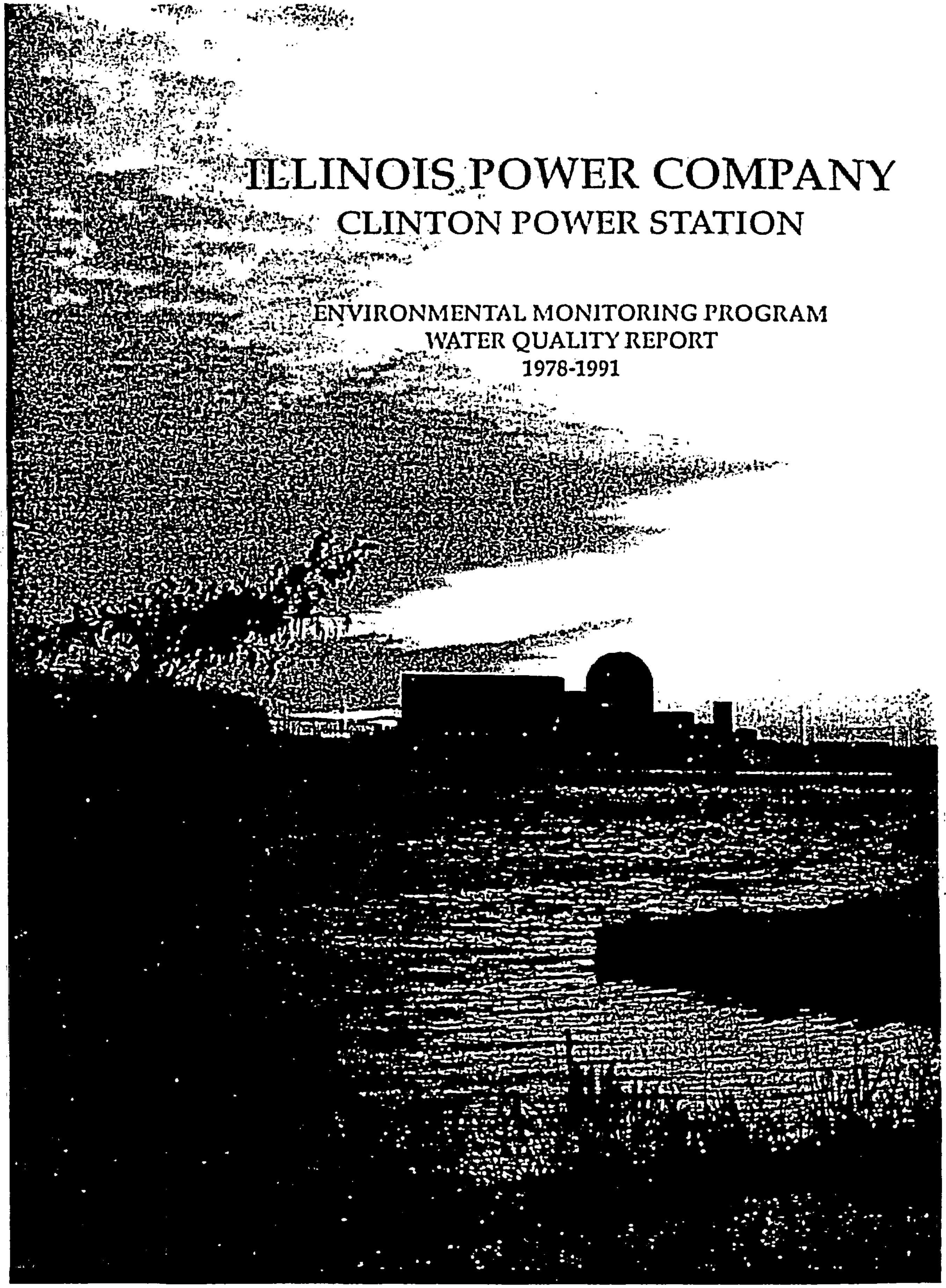
ILLINOIS POWER COMPANY
CLINTON POWER STATION

ENVIRONMENTAL MONITORING PROGRAM
WATER QUALITY REPORT
1978-1991



CLINTON POWER STATION

ENVIRONMENTAL MONITORING PROGRAM

WATER QUALITY REPORT

January 1978 through December 1991

Prepared by

Illinois Power Company

1992

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4.0 PREFACE

This report describes the results of the water quality portion of the Environmental Monitoring Program for the Clinton Power Station for data collected from 1978 through 1991.

This program represents a cooperative effort between the Power Production and Environmental Affairs departments of Illinois Power Company. The Central Laboratory of the Power Production Department was responsible for collections and analyses of water quality samples during the program. The Environmental Affairs Department was responsible for analysis, interpretation and presentation of data.

This report was authored and typed by Thomas V. Clevenger. Technical review was provided by Jill Witts, Thomas L. Davis and Brett J. Marshall. Computer entry of analytical data was performed by Gretchen Williamson. Thomas V. Clevenger and Jill Witts were responsible for data analyses. Charyle A. Miller assisted in preparation of the final draft.

5.0 EXECUTIVE SUMMARY

Clinton Lake was constructed in 1978 to provide cooling water the Clinton Power Station (CPS). Since then, Illinois Power Comp has monitored the water quality of Clinton Lake to satisfy vari environmental laws, licenses, and permits associated with construction and operation of CPS. Twenty-eight water qual constituents have been monitored during 1978 through 1991.

Establishment of the preoperational water quality database Clinton Lake was the primary goal for previous water quality repor The preoperational database is used as a baseline for assessments potential effects of CPS operations. The primary goal of this report to assess what effects CPS operations had on the water quality Clinton Lake. These assessments include nine years of water qual data prior to the operation of CPS (1978 through 1986) and five years data since CPS began to operate (1987 through 1991).

Clinton Lake water quality data are similar to other Illinois lak and there were no unusual patterns in the distributions of data for a of the water quality constituents. Cluster analyses of water quality da for 13 lakes in Illinois indicated that Clinton Lake was more similar ten non-cooling Illinois lakes than to the two other cooling lak (Sangchris and Coffeen lakes) used in the comparisons.

Illinois Pollution Control Board General Use water quality standar were not met for six constituents in Clinton Lake. Total phosph exceedances occurred for 73% of the epilimnion samples in Clinton L Exceedance of the total phosphorus standard in Illinois lakes is commo exceedances have been reported in 62% of the lakes and reservoirs Illinois. As with other Illinois lakes the high concentrations phosphorus in Clinton Lake are probably due to surface water runo from adjacent agricultural land.

Four water quality constituents (pH, mercury, nitrate, and fec coliforms) had exceedances during the period prior to CPS operatio Only one exceedance occurred for pH in epilimnion samples collected fro 1978 through 1988. Six nitrate samples exceeded the IPCB standar during 1978 through 1991. Mercury concentrations exceeded the standa in 25 epilimnion samples (6%) prior to 1984; the only other exceeden after 1984 occurred in a hypolimnion sample during 1989. Exceedances mercury were attributed to sampling or analytical errors. This conclusi was supported by: inconsistent results among strata and among precedir and succeeding sampling events; exceedances have occurred for only on sample collected since 1984; and results of mercury analyses of fish fles and sediments do not provide evidence that there is a problem wit mercury in Clinton Lake. Fecal coliform counts exceeded the IPC standard in 14 samples (4%) collected from 1978 through 1986. Ratios c fecal coliform to fecal streptococcus suggest fecal contamination is nc from human sources. Samples were not analyzed for fecal coliform subsequent to 1986.

Dissolved oxygen concentrations were below the IPCB standard (5 mg/l) during the preoperational and operational periods. Most Illinois lakes cannot meet the standard in bottom waters during summer. One percent of the epilimnion dissolved oxygen concentrations were less than the standard during the preoperational period and 4% were less than the standard during the operational period. The increase in dissolved oxygen noncompliances during the operational period was apparently due to increased water temperatures.

Carlson's Trophic State Index (TSI) values indicate Clinton Lake is eutrophic (highly productive). The mean TSI (65.9) for Clinton Lake is slightly greater than the mean TSI for 69 other Illinois lakes (65.2). Comparisons of TSI values for Secchi transparency, total phosphorus and chlorophyll a indicate algal production in Clinton Lake may be limited due to light attenuation from suspended inorganic materials (silt and clay). TSI values have gradually increased in Clinton Lake during 1978 through 1991.

Analysis of variance indicate significant (95% confidence) differences between preoperational and operational periods for six water quality constituents. Trend analysis for these constituents indicate two of these constituents, temperature and chloride, had increasing trends and four constituents, dissolved oxygen, nitrate, mercury, and silica had decreasing trends.

Water temperatures were significantly (95% confidence) greater during the period when CPS was operational. Temperature is the most important variable in the assessment of CPS-induced limnological changes in Clinton Lake. In general, Clinton Lake does not develop the stable, long-term thermal stratification. Distinct long-term stratification did not develop even at Site 8, the deepest site and the site where stratification was most expected. Temperatures during operational conditions indicate the greatest temperature range among sites was 10.2° C.

Dissolved oxygen concentrations were significantly (95% confidence) lower during the period when CPS was operational. The solubility of oxygen is inversely related to temperature. Periods of depleted oxygen occurred prior to the operation of CPS. However, the operation of CPS appeared to extend the area and duration of depleted oxygen conditions. The extent of oxygen-depleted water in Clinton Lake is within conditions considered normal for non-cooling reservoirs. It is not uncommon for reservoirs to have as much as 50% of their total volume that are not capable of supporting aerobic aquatic communities. Analyses demonstrated that at least 51% of Clinton Lake's waters maintained dissolved oxygen concentrations greater than 5 mg/l during operational years.

Decreased nitrate concentrations during the operational period were, in part, attributed to greater concentrations of phytoplankton which depleted nitrate supplies, and to reduced runoff due to low precipitation in 1988.

Decreased silica concentrations were attributed to an artifact changes in sample collection schedules between periods, and concomi shifts in diatom population densities. Usage of silica by diato greatly modify flux rates of silica in lakes.

Chloride concentrations were significantly greater during the pe when CPS was operational. Sodium hypochlorite is used to treat condenser cooling water system of CPS. However, the cumulative dos used in these treatments could account for only 1% of the increase chloride concentrations in Clinton Lake during the period when CPS operational. The significant increase in chloride concentrations was n likely due to low water levels during the initial years of CPS operatio

Influences of CPS operations are mostly associated with increa water temperatures and concomitant decreased dissolved oxy concentrations. These effects are mostly restricted to the area near CPS discharge. Data collected in 1988 were influenced by inordinately hot and dry meteorological conditions (second lowest rain on record in 110 years). Thus, the limnological changes in Clinton L due to CPS operations are probably overstated for years with more no meteorological conditions.

6.0 INTRODUCTION

Illinois Power Company (IPC) initiated an Environmental Monitoring Program (EMP) for the Clinton Site to satisfy the requirements of various environmentally related permits, approvals, and licenses required from federal and state agencies. The scope of this report is limited to the water quality monitoring portion of the Clinton Lake EMP.

Water quality conditions of Clinton Lake before the Clinton Power Station became operational were characterized in previous reports (Illinois Power Company 1986 and 1989). To characterize preoperational water quality conditions, monitoring data were organized to:

1. Establish preoperational baseline water quality;

2. Determine the inter- and intra-site variability of data; and

3. Identify temporal trends.

Water quality data utilized to characterize the preoperational database for Clinton Lake are defined as data collected from the time Clinton Lake reached pool level (1978) until the Clinton Power Station began power generation (February, 1987).

The primary goal of this report is to assess changes in the water quality of Clinton Lake since Clinton Power Station began operation. Operational data were compared to preoperational data to determine if there were significant changes in:

1. Inter- or intra-site distributions of data; and

2. Long-term trends.

6.1 Description of Clinton Lake

Clinton Lake was built to provide cooling water for the Clinton Power Station (CPS). It is located in DeWitt County approximately 9.6 km east of Clinton, Illinois. Clinton Lake was formed by the construction of an earthen dam across Salt Creek 366 m downstream from its confluence with the North Fork. Dam construction was completed on October 12, 1977 and the lake reached normal pool elevation (210 m) on May 17, 1978. Clinton Lake is a 1,981 ha, V-shaped impoundment with an average depth of 4.75 m and a maximum depth of 13.7 m near the dam. There are approximately 209 km of shoreline. The North Fork arm of the lake extends about 12.8 km from the dam; the Salt Creek arm extends about 25.6 km from the dam. The average width of the lake is 600.5 m at normal pool. Inflows to the lake occur as a direct response to precipitation on its drainage area and through groundwater flow. This and other pertinent data are summarized in Table 1.

Table 1. Selected hydrological features of Clinton Lake, near Clinton, Illinois.

PARAMETER	METRIC	ENGLISH
Surface Area	1981 ha	4,895 a
Average Depth	4.75 m	15.6 ft
Maximum Depth	13.7 m	45 ft
Shoreline Length	209 km	130 mi
Storage Capacity	9.15 million cu m	74,000 acre ft
Watershed	766.6 sq km	296 sq mi
Shoreline Development	13.2	13.2
Normal Pool Elevation	210 m	690 ft
Length of North Fork Arm	12.8 km	8 mi
Length of Salt Creek Arm	25.6 km	16 mi

Clinton Lake and approximately 5,000 acres of the surrounding land are leased to the Illinois Department of Conservation (IDOC). The IDOC has opened the area to the public for recreational activities such as fishing, boating, swimming, and camping. Most of the remaining acreage within the watershed is used for agricultural purposes (approximately 180,000 acres).

6.2 Description of Clinton Power Station

The CPS is a nuclear generating facility consisting of one 933 MW steam turbine generator powered by a General Electric boiling water reactor. Construction of the CPS was completed in 1986 and low power testing and commercial operations commenced in 1987. At full load, the once-through cooling system dissipates 6.713 billion Btu/hr. The multi-pressure condenser used at CPS is served by three 189,567 gpm pumps and at 100 percent load is designed for a cooling water temperature rise of 12.6 degrees Celcius. A total cooling water flow of 1387.5 cfs is taken from and returned to Clinton Lake via the once-through system under three-pump operation. Circulating water is withdrawn from the North Fork arm of Clinton Lake, passes through the condenser, flows through a 5 km discharge flume and is discharged to the Salt Creek arm of the lake. The intake is designed to withdraw water from a depth of 2.1 to 6.1 m below the normal pool elevation of 210.3 m at msl. Two drop structures are placed in the discharge flume to dissipate hydraulic energy. The discharge flume is trapezoidal in cross-section and has a surface area of 31.5 ha. Total residence time of the cooling water at full flow is 4.5 hours, of which 4.4 hours is in the discharge flume.

Power generation at the station first began in 1987. Initial criticality of the reactor occurred in February, 1987. A full power operating license was granted by the U. S. Nuclear Regulatory Commission (NRC) and initial synchronization of the generator with the transmission system occurred in April, 1987. The 100 percent reactor power level was first reached on September 15, 1987. The 100-hour reactor warranty run began on October 5 and was concluded on October 9, 1987. Operation was intermittent until August, 1987. Percent operation since August, 1987 is presented in Figures 1 and 2.

All discharges from the CPS are regulated by the National Pollutant Discharge Elimination System (NPDES) by the Illinois Environmental Protection Agency (IEPA). Illinois Power has an NPDES permit for nine discharges from the CPS. Authorized discharges include those for the sewage treatment plant, radwaste system, transformer area and diesel generator oil-water separators, potable water treatment wastes, screen house intake water backwash, safe shutdown system, area runoff collection basin and the cooling water discharge to Clinton Lake. Permit conditions require IPC to limit pollutant concentrations in each discharge. Water quality for each discharge is monitored and Discharge Monitoring Reports are submitted monthly to the IEPA.

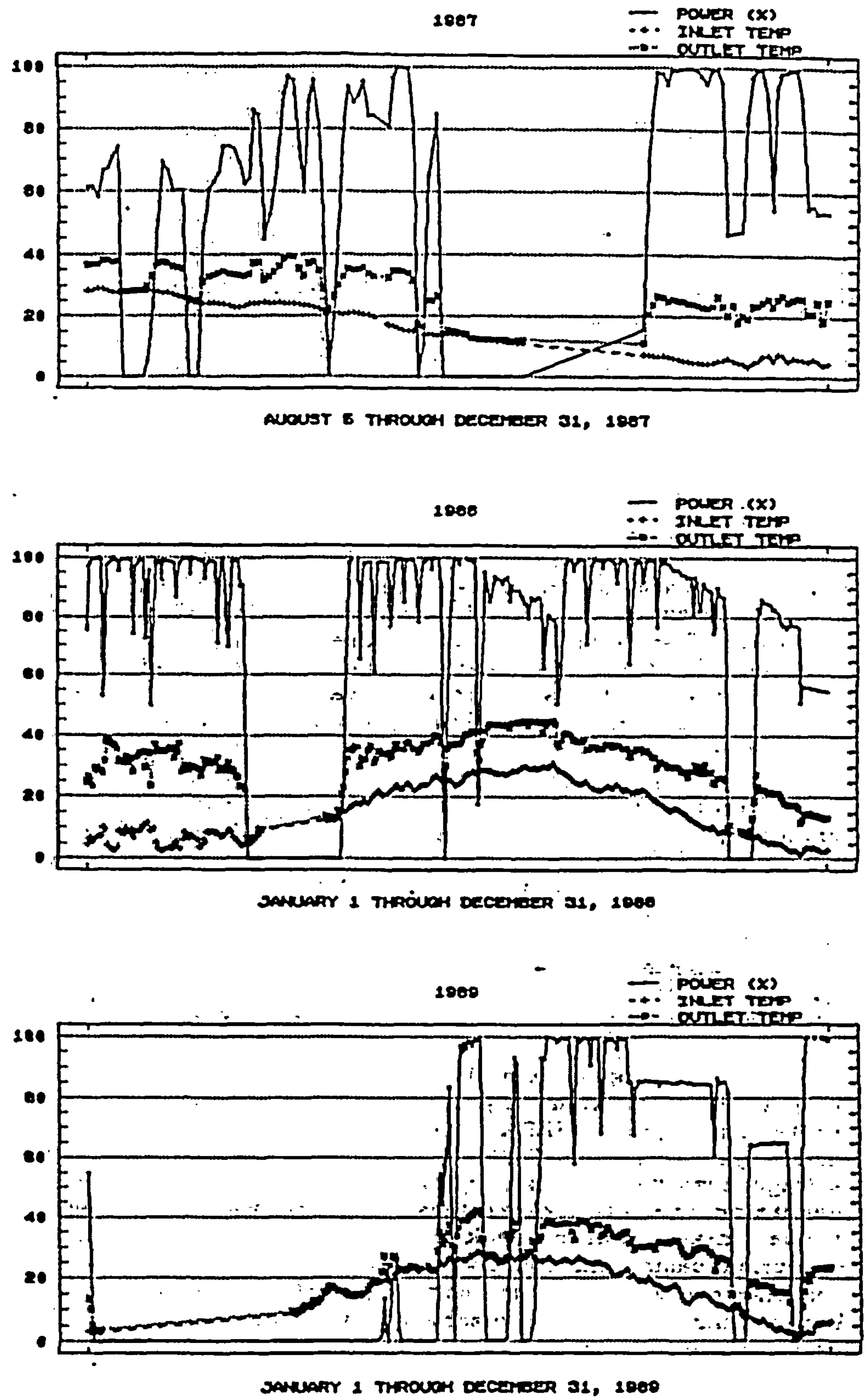
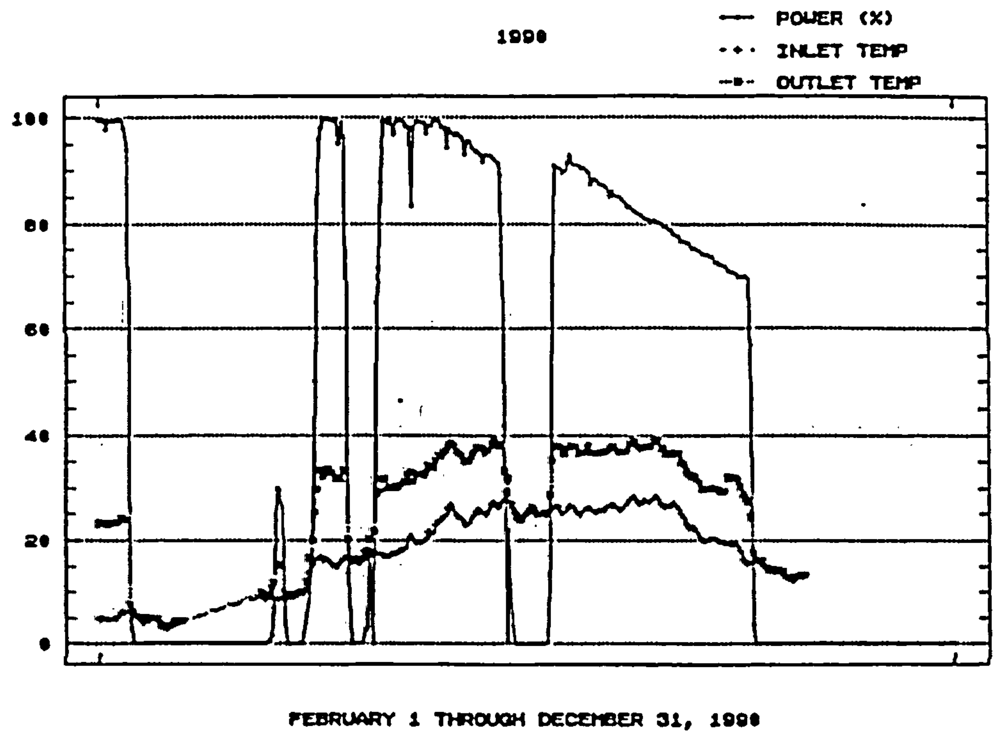


Figure 1. Percent operation of Clinton Power Station and wa temperatures (C) at the inlet and outlet water bo: during August, 1987 through December, 1989.



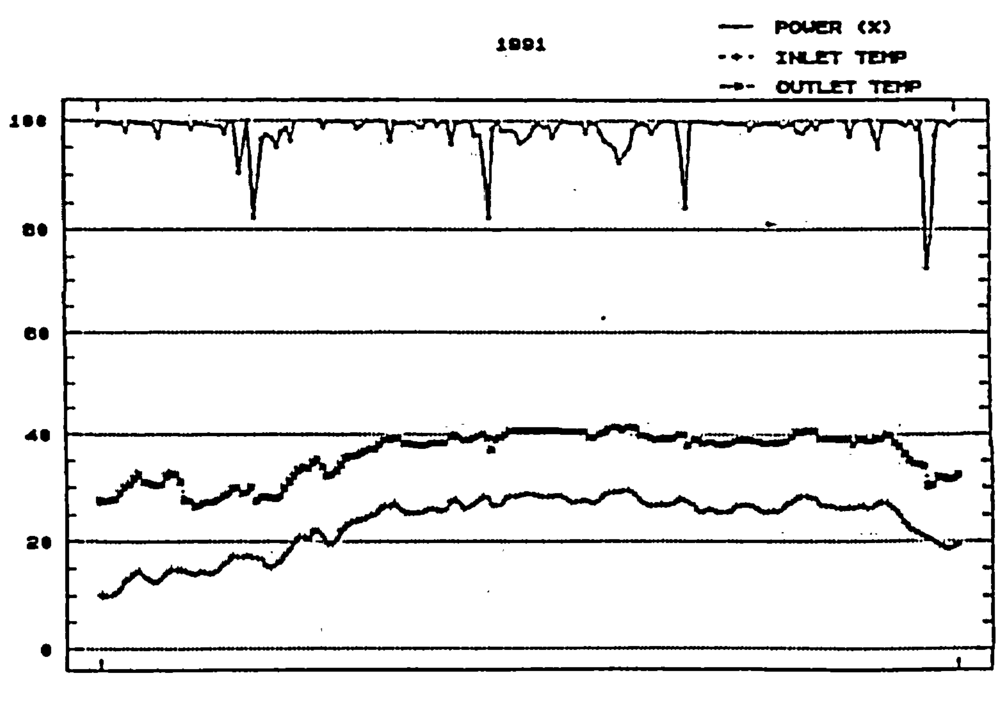


Figure 2. Percent operation of Clinton Power Station and water temperatures (C) at the inlet and outlet water boxes during February, 1990 through December, 1991.

6.3 History of the Water Quality Monitoring Program

The water quality monitoring program consisted of five phases which parallel the development of Clinton Lake. The Preconstruction Phase consisted of two related monitoring programs. Water samples were collected from Salt Creek and the North Fork from May 1972 to February 1973 and from May 1974 to August 1975 (Industrial Bio-Test Laboratories Inc. 1975 and Nalco Environmental Sciences 1976). The purpose of these monitoring programs was to provide baseline water quality data for Salt Creek and the North Fork before lake construction. The Construction Phase monitoring was performed during October 1975 to October 1977 to document water quality in Salt Creek and the North Fork during construction of the dam and preparation of the lake basin (Nalco Environmental Sciences 1976, 1977, and 1978). Water quality was monitored in Salt Creek, the North Fork and Clinton Lake from October 1977 to May 1978 to document changes during the Lake Filling Phase (Nalco Environmental Sciences 1978). The Lake Development Phase began when the lake reached normal pool elevation and continued until the NRC issued IPC a permit to operate the CPS. The Operational Phase began in February 1987 when CPS began power generation.

Data collection and evaluations associated with the Preconstruction and Construction Phases were contracted to independent consulting firms. Responsibility for the water quality monitoring program was assumed by IPC's Central Laboratory in January 1978 during the Lake Filling Phase. All subsequent monitoring has been performed by the Central laboratory of IPC. Water quality data were organized summarized, interpreted, and reported herein by the Environmental Affairs Department of IPC. Chronological listing of reports and consulting firms, as appropriate, for the preoperational monitoring is provided in Table 2.

Table 2. Chronological synopsis of environmental monitoring reports which contain environmental data pertinent to the Clinton Power Station, Clinton, Illinois.

Illinois Power Company. 1973. "Clinton Power Station Units 1 and 2. "Applicants Environmental Report, Construction Permit State," Vols. 1 through 4 and Supplements. Docket Nos. 50-361 and 50-462, Oct. 26, 1973.

United States Atomic Energy Commission. 1974. Final Environmental Statement Related to the Proposed Clinton Power Station Units 1 and 2. Illinois Power Company, Docket Nos. 50-461 and 50-462.

Industrial Bio-Test Laboratories, Inc. 1975. Clinton Preconstruction Environmental Monitoring May 1974 through April 1975. Annual Report to Sargent and Lundy Engineers. Chicago, Illinois. Nalco Environmental Sciences. 1976. Clinton Preconstruction

NALCO Environmental Sciences 1976. Clinton Preconstruction Environmental Monitoring May through April 1976. Annual Report to Sargent and Lundy Engineers. Chicago, Illinois.

_____ 1977. Environmental Monitoring May 1976 through April 1977 Construction Phase Clinton Power Station. Annual Report to Sargent and Lundy Engineers. Chicago, Illinois.

_____ 1978. Environmental Monitoring May 1977 through April 1978 Construction and Lake-filling Phases Clinton Power Station. Annual Report to Sargent and Lundy Engineers. Chicago, Illinois.

Illinois Power Company. 1979. Clinton Power Station Units 1 and 2. Environmental Report Operating License Stage.

Energy Impact Associates. 1980. Thermal Demonstration Pursuant to Illinois Pollution Control Board Rules and Regulations Chapter 3, Rule 203(i)(10). Prepared for Illinois Power Company, Clinton Power Station Unit 1. P.O. Box 1899, Pittsburgh, Penn. 15230.

U.S. Nuclear Regulatory Commission. 1982. Final Environmental Statement Related to the Operation of the Clinton Power Station, Unit No. 1. Illinois Power Company, Decatur, IL.

Table 2. (continued)

Illinois Power Company. 1986. Clinton Power Station Environmental Monitoring Program Water Quality Report 1978 through 1984. Environmental Affairs Department. Illinois Power Company, Decatur, IL.

_____ 1989. Clinton Power Station Environmental Monitoring Program Water Quality Report 1978 through 1988. Environmental Affairs Department. Illinois Power Company, Decatur, IL.

J. E. Edinger Assoc.,Inc. 1989. Hydrothermal Analyses of Clinton Lake for Clinton Power Station Unit 1 Operations. Prepared for Illinois Power Company, Environmental Affairs Department. Decatur, IL.

7.0 METHODS

7.1 Location of Sampling Sites

Water samples were collected monthly from lake sites 2, 4, 8, and 16 during 1978 through 1986 (Figure 3). Samples were collected from sites 2, 4, 8, 13, and 16 during 1987 through 1991. The frequency of sample collections was monthly during May through September; samples were collected quarterly during the remainder of each year.

Site 2 is approximately 100 m offshore from the cooling water discharge to Clinton Lake, and approximately 4 m deep. This site was chosen to characterize lake conditions at the point of thermal discharge to the lake.

Site 4 is approximately 91 m northwest of the CPS screen house and approximately 7 m deep. This site was chosen to characterize water quality in the vicinity of the CPS intake.

Site 8 is near the former confluence of Salt Creek and the North Fork and approximately 10 m deep. This site was chosen to characterize lake water quality approximately two-thirds of the way along the path between the discharge of cooling water to Clinton Lake and the cooling water intake (cooling loop).

Site 13 is approximately half way between Site 8 and Site 2 and approximately 7 m deep. This site was chosen to characterize water quality approximately one-third of the way along the path of the cooling loop. This site was added in September, 1986 to characterize transitional water quality between Site 8 and Site 2.

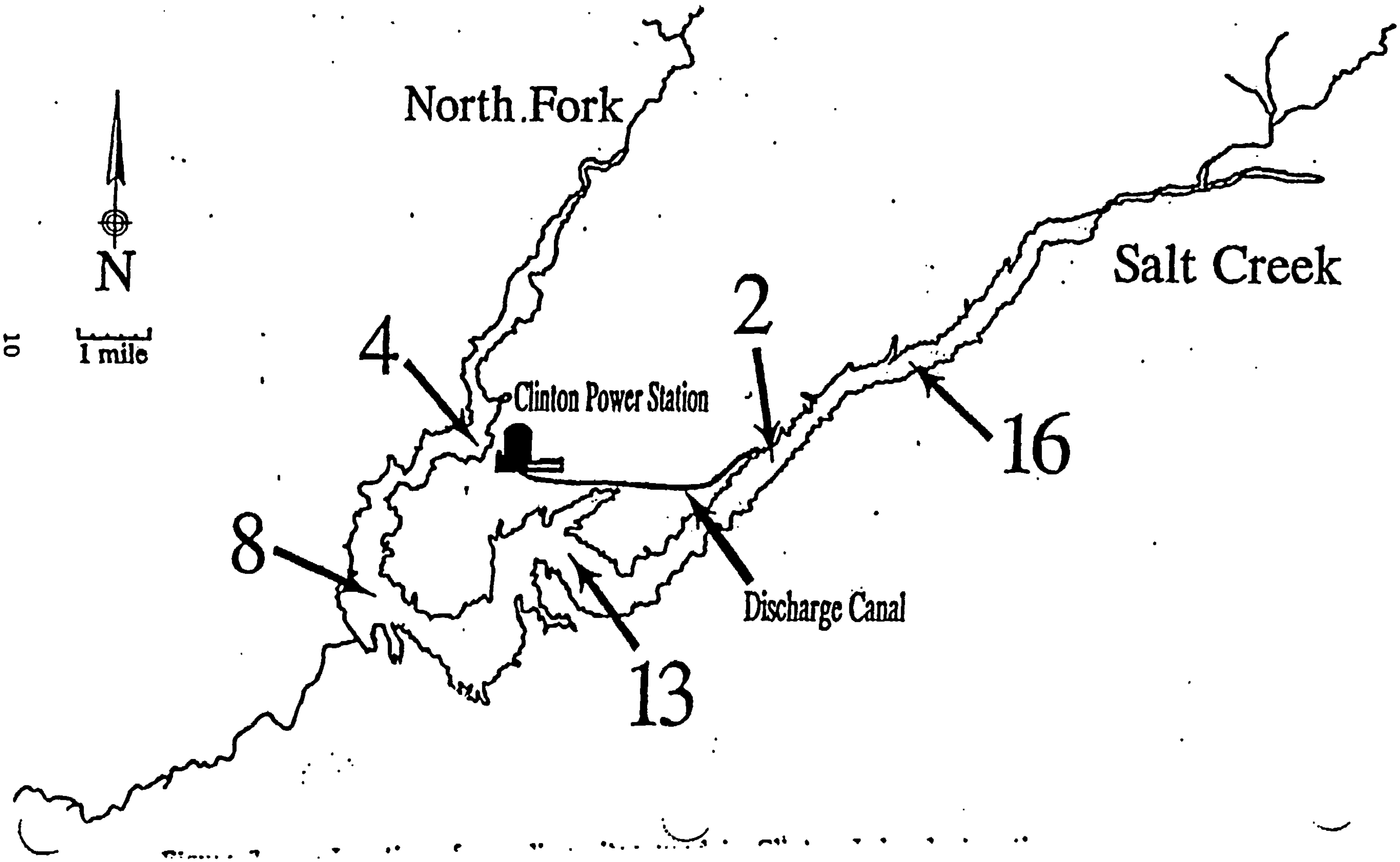
Site 16 is approximately 183 m east of the Illinois Route 48 bridge and approximately 3 m deep. This site was chosen to characterize conditions in the Salt Creek arm of the lake and is expected to receive minimal thermal enrichment. Samples were first collected at this site in May 1980.

Inclement winter conditions occasionally made sample sites inaccessible. When this occurred, samples were collected from alternate sites (Figure 4). Alternate Site 2 samples were collected from the east side of the northern span of the DeWitt County Highway 14 bridge. Alternate Site 4 samples were collected from the CPS screenhouse. Alternate Site 8 samples were collected from the Westside boat access near the Clinton Lake Dam. Alternate Site 16 water samples were collected from the east side of the Illinois Route 48 bridge.

7.2 Sampling Methods

Water samples were collected in non-metallic, 6.2 liter Beta bottles. Water samples from the Beta bottles were emptied into an 18 liter plastic compositing tank; a minimum of 12 liters of water was collected from each site.

CLINTON LAKE



CLINTON LAKE

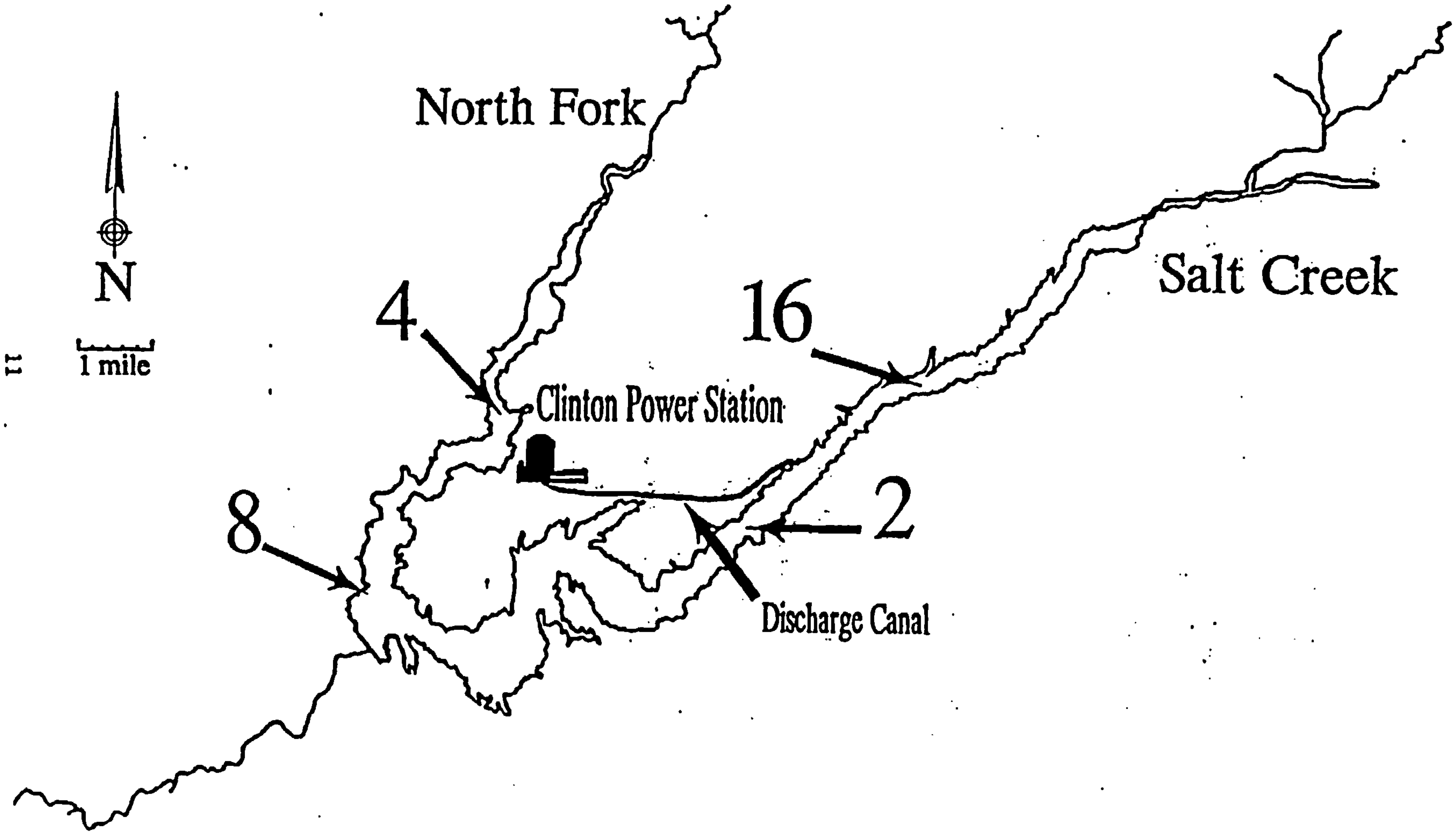


Figure 4. Location of alternate sampling sites used in Clinton Lake during the water quality Environmental Monitoring Program from January, 1978 through December, 1991.

Temperature, pH, dissolved oxygen, and specific conductance were measured at the surface and at one-meter depth intervals at each site during 1978 through 1985, and at 0.5 m intervals during 1986 through 1991. If thermal stratification (temperature gradient of at least 1° Celsius change per meter) was present, the water column was segmented into epilimnion, metalimnion and hypolimnion for sampling purposes, as appropriate. Samples for other water quality parameters were always collected at one meter below the surface, i.e., from the epilimnion. If thermal stratification was present, samples were also collected from meta- and hypolimnion strata. Metalimnion samples were taken at the midpoint between the upper and lower levels of the layer, as defined by the temperature gradient. If a hypolimnion layer existed, samples were collected midway between the lake bottom and the lower limit of the metalimnion. Samples requiring refrigeration (Table 3) were placed on ice in insulated chests.

Replicate sampling of water quality parameters at each site was required by the NRC. From January 1978 through April 1980 two water samples were collected at each site. When thermal stratification was present, two samples were collected from each stratified layer. Subsequent to April 1980, two samples were collected from one randomly selected site per month.

7.3 Methods for Sample Analyses

Samples taken during 1978 through 1986 were analyzed for the parameters listed in Table 3 (except calcium and magnesium). During 1987 through 1991 samples were not analyzed for BOD, TOC, copper, lead, zinc, fecal coliform, and fecal streptococcus. Concentrations for calcium and magnesium were determined for samples collected during 1987 through 1991. Analytical methods (Table 3) followed Standard Methods for the Examination of Water and Wastewater (APHA et al. 1976) or Methods for the Chemical Analysis of Water and Wastes (USEPA 1979). The numbers of observations used in statistical analysis for each chemical constituent monitored during the Clinton Lake EMP are presented in Table 4.

7.4 Statistical Analyses

Water quality data were loaded on an IBM PS2 Model 80 computer; dBase III Plus and dBase IV database management software were used to facilitate data organization. Statgraphics (Version 3.0) software was used to perform and graphically display statistical analyses. Summary statistics used in the evaluation of water quality data included maximum, minimum, range, arithmetic and geometric mean, median, variance, and standard deviation.

Data that were analytically indicated at the limit of detection (LOD) were assumed to be present at one-half the LOD. The LOD is the lowest concentration of a constituent that will register on the analytical equipment with any confidence. Therefore it is a qualitative indicator rather than a distinct concentration with a known degree of confidence.

Table 3. Methods, procedures, and preservatives used in the analyses of water samples collected during the water quality environmental monitoring program at Clinton Lake, Clinton, Illinois.

CONSTITUENT	METHOD	PRESERVATIVE	MAXIMUM HOLDING TIME	REFERENCES
Alkalinity Total ($CaCO_3$)	Potentiometric, Titrimetric	Refrigeration	24 Hr.	Method 310.1 USEPA 1979 Method 403 APHA et. al. 1975
Ammonia (NH_3-N)	Nesslerization following Distillation	Sulfuric Acid (0.8ml/l)	24 Hr.	Method 350.2 USEPA 1979 Method 418B APHA et. al. 1975
Fecal Coliform	Membrane Filtration	Refrigeration Sterile Bottle	6 Hr.	Method 909C APHA et. al. 1975
Fecal Streptococcus	Membrane Filtration	Refrigeration Sterile Bottle	6 Hr.	Method 909D APHA et. al. 1975
Biochemical Oxygen Demand (5 day)	Membrane Electrode	Refrigeration	24 Hr.	Method 405.1 USEPA 1979 Method 507 APHA et. al. 1975
Calcium	Atomic Absorption	Nitric Acid to pH 2	6 mo.	Method 215.1 USEPA 1983
Chloride	Mercuric Nitrate	Refrigeration	28 days	Method 407(B) APHA et. al. 1980 Method 325.3 USEPA 1983
Specific Conductance		Measured In Situ	Measured In Situ	Method 205 APHA et. al. 1975 Montedoro-Whitney Co.
Copper (Total)	Atomic Absorption Graphite Furnace following Digestion	Nitric Acid 5 ml/l	6 mo.	Method 220.2 USEPA 1979
Hardness	EDTA Titrimetric	Refrigeration or Nitric Acid if not analyzed within 24 hrs	6 mo.	Method 130.2 USEPA 1983 Method 2340C APHA et. al. 1989
Lead (Total)	Atomic Absorption Graphite Furnace following Digestion	Nitric Acid 5 ml/l	6 mo.	Method 239.2 USEPA 1979
Magnesium	Atomic Absorption	Nitric Acid to pH 2	6 mo.	Method 242.1 USEPA 1983

Table 3 (continued)

CONSTITUENT	METHOD	PRESERVATIVE	MAXIMUM HOLDING TIME	REFERENCES
Mercury (Total)	Atomic Absorption Cold Vapor, Manual following Digestion	Nitric Acid (mercury grade) 5 ml/l	38 days	Method 245.1 USEPA 1979
Nitrate (NO 3-N)	Cadmium Reduction (Manual)	Sulfuric Acid 0.8 ml/l Refrigeration Filtration, 0.45 u Membrane Filter	24 Hr.	Method 353.3 USEPA 1979
Organic Carbon Total (TOC)	Ocean Int. Analyzer Wet Oxidation	Refrigeration Sulfuric Acid 0.8 ml/l	24 Hr.	Method 415.1 USEPA 1979 Ocean Int. Corp.
Organic Nitrogen Total (NH 3-N)	Kjeldahl Nesslerization Subtract Ammonia	Sulfuric Acid 0.8 ml/l	24 Hr.	Method 351.3 USEPA 1979 Method 421 APHA et. al. 1975
Orthophosphate Soluble (PO 4-P)	Ascorbic Acid Single Reagent	Refrigeration Filtration, 0.45 u Membrane Filter	24 Hr.	Method 365.2 USEPA 1979 Method 425F APHA et. al. 1975
Oxygen Dissolved	Winkler, Modified Azide full bottle Technique	Manganous Sulfate Alkaline Iodide Azide		Method 360.2 USEPA 1979
Oxygen Dissolved		Measured In Situ	Measured In Situ	Method 422F APHA et. al. 1975 Montedoro Whitney C
Oxygen % Saturation	Calculated			Method 422B APHA et. al. 1975
pH		Measured In Situ	Measured In Situ	Method 424 APHA et. al. 1975 Method 150.1 USEPA et. al. 1975 Montedoro Whitney C
Phosphorus Total	Ascorbic Acid Single Reagent following digestion	Refrigerate Sulfuric Acid 0.8 ml/l	24 Hr.	Method 365.2 USEPA 1979 Method 425C APHA et. al. 1975
Total Dissolved Solids	Filtration Gravimetry at 180 Celcius	Refrigerate	7 days	Method 160.1 USEPA 1979 Method 208B APHA et al. 1975

Table 3 (continued)

CONSTITUENT	METHOD	PRESERVATIVE	MAXIMUM HOLDING TIME	REFERENCES
Total Suspended Solids	Filtration Gravimetry at 103-105 Celcius	Refrigerate	7 days	Method 160.2 USEPA 1979 Method 208D APHA et. al. 1975
Silica soluble (SiO 2)	Molybdosilicate	Refrigeration Filtration, 0.45 u Membrane Filter	7 days	Method 370.1 USEPA 1979 Method 426B APHA et. al. 1975
Sulfate	Turbidimetric	Refrigeration to 4 Celcius	28 days	Method 375.4 USEPA 1983
Temperature		Measured In Situ	Measured In Situ	Method 162 APHA et. al. 1975 Montedoro Whitney Co.
Turbidity	Hach Turbidimeter Nephelometric	Refrigeration	7 days	Method 180.1 USEPA 1979 Method 214A APHA et. al. 1975
Zinc Total	Atomic Absorption Direct Aspiration following digestion	Nitric Acid 5ml/l	6 mo.	Method 289.1 USEPA 1979

Table 4. Number of observations determined for each water quality constituent which was included in the Environmental Monitoring Program for Clinton Lake during 1978 through 1991.

Parameter	Preoperational*			Operational*			Total
	Epi	Meta	Hypo	Epi	Meta	Hypo	
Alkalinity	390	44	18	100	23	9	586
Ammonia	393	44	18	100	23	9	588
Calcium	5	0	0	100	23	9	137
Carbon – Total Organic	388	44	18	0	0	0	450
Chloride	277	22	8	80	22	9	439
Copper	387	44	18	0	0	0	449
Fecal Coliforms	390	43	17	0	0	0	450
Fecal Streptococci	388	44	18	0	0	0	450
Hardness	277	23	8	100	23	9	440
Lead	385	43	17	0	0	0	445
Magnesium	5	0	0	100	24	8	137
Mercury	390	42	18	100	23	9	582
Nitrate	398	43	18	190	55	21	725
Orthophosphate	393	44	18	100	23	9	587
Oxygen – Biochemical Demand	388	43	18	0	0	0	449
Oxygen – Dissolved	402	43	18	189	50	17	719
Oxygen – % Saturation	394	35	15	95	8	3	550
pH	402	42	16	189	50	17	716
Phosphorus – Total	398	44	17	189	58	19	725
Silica	392	44	18	100	23	9	587
Solids – Total Suspended	391	43	18	100	23	9	584
Solids – Total Dissolved	391	43	17	100	23	9	583
Sulfate	277	23	8	100	23	9	440
Temperature	402	43	18	189	50	18	720
Turbidity	392	44	18	100	23	9	587
Zinc	388	39	15	0	0	0	442

* Preoperational period (78–86) consisted of monthly monitoring at sites 2,4,8, and 16
* Operational period (87–91) consisted of q[illegible]arly monitoring at sites 2,4,8,13, and 16

Data recorded at the LOD indicate that the constituent is probably present but at a concentration less than the LOD. The practice chosen for handling Clinton Lake water quality monitoring data at the LOD has been used in other studies (Pader 1984, Gleit 1985).

One-way analysis of variance (Tukey's range test) technique was used to determine the effect of one or more variables on a single dependent variable. Confidence levels were determined for the 95% level. The probability level of 95% is used to reference significant differences in the text of this report.

Linear trend analysis was used to determine long-term trends in data for water quality parameters. The linear trend analysis fits a line through a time series of data using least squares, and extrapolates the trend line to generate forecasts. Multiple modified notched box-and-whisker plots and three dimensional scatterplots were used to illustrate spatial and temporal changes in data. The central box of each notched box-and- whisker plot includes the middle 50% of the data values, between the upper and lower quartiles. The "whiskers" extend to points that are within 1.5 times the interquartile range. Extreme points (outliers) beyond 1.5 times the box length are plotted as individual adjacent values. The central line across the box is at the median. The notch of each box corresponds to the width of the confidence interval for the median. The confidence level on the notches is set to allow pairwise comparisons at the 95% level by examining whether two notches overlap. The width of the box is proportional to the square root of the number of observations in the data set.

Data for phytoplankton, chlorophyll a, and Secchi disc transparency were determined as part of the Biological EMP. Sample collection methods, analytical methods, and data for these parameters are presented in Willmore (1982, 1985, 1987, and 1989).

The Trophic State Index (TSI) of Carlson (1977) was calculated for Secchi transparency, total phosphorus, and chlorophyll a data. Listed below are the formulas used to calculate TSIs:

Secchi Transparency TSI = 60-14.41 (Natural log Secchi in meters)

Chlorophyll a TSI = 9.81 (Natural log Chlorophyll a in ug/l)

Phosphorus TSI = 14.42 (Natural log Total Phosphorus in ug/l)+ 4.15

Spearman rank correlation coefficient values were calculated to determine relationships for all of the chemical/physical constituents monitored in Clinton Lake.

8.0 RESULTS AND DISCUSSION

Presentation and discussion of the results of each of the 28 water quality constituents are presented in this section. Depth profile data are presented for dissolved oxygen, pH, specific conductivity, and temperature. Because of the large volume of data generated to characterize the profiles, only those data collected during 1985 through 1991 are discussed in this report. This period allows comparisons of the two years previous to CPS operation (1985 and 1986) to the five years during which CPS was operational (1987 through 1991). Profile data from 1978 through 1984 are included in the appendix of the previous EMP water quality report (Illinois Power Company 1986 and 1989).

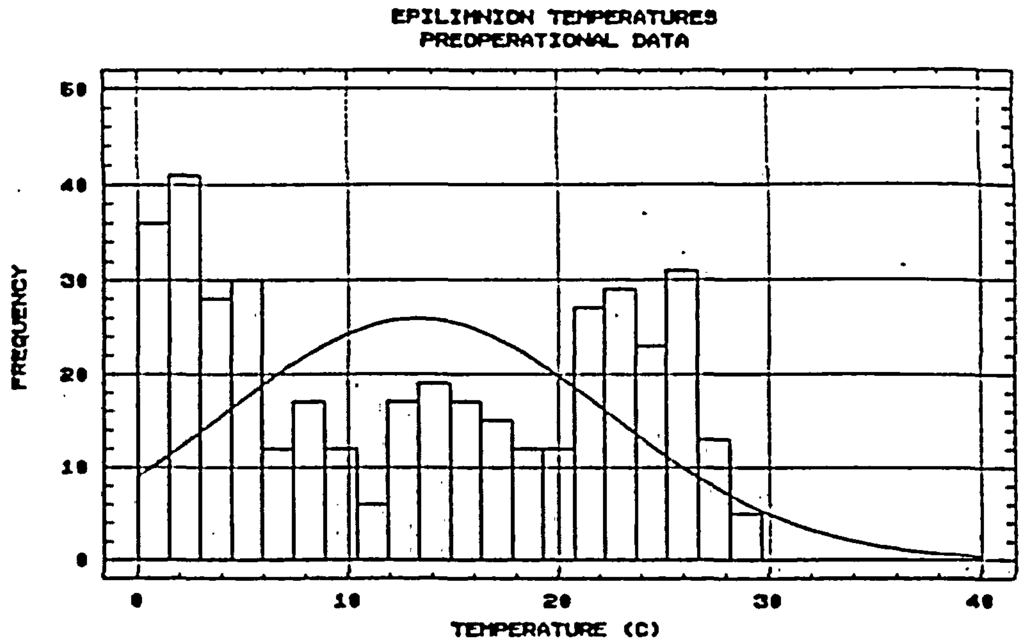
For the remaining 24 parameters samples were only taken from the epilimnion except when thermal stratification occurred. During periods of stratification additional samples were collected from metalimnion and hypolimnion strata. Data from 1978 through 1991 are utilized to assess results in the metalimnion and hypolimnion during periods of stratification.

8.1 Water Temperature

Water temperature is an important factor in the maintenance of a healthy aquatic environment. Temperature regulates the metabolism and composition of aquatic communities. Elevated temperatures increase metabolism, respiration, and oxygen demand for aquatic organisms. Th rate approximately doubles with every 10 C rise in temperature. Water temperatures influence the rates of chemical reactions occurring in the water and affect other physical properties such as density, solubility, and viscosity. Temperature influences carbonate equilibrium, photorespiration, oxygen solubility, water movement and stratification. Thermal stratification inhibits mixing within water columns, which may indirectly result in the depletion of dissolved oxygen and increased concentrations of nitrogen, phosphorus, manganese, and iron. Sustained periods of stratification result in greater volumes of water with low dissolved oxygen content, high carbon dioxide and high hydrogen sulfide concentrations. As a result of sustained periods of stratification only the upper strata may be capable of supporting a diverse, aerobic aquatic life. In some reservoirs, as much as 50% of the total volume may not be involved in the productivity cycle of the reservoir (Drew and Tilton 1970). Problems may also develop when stratification is broken and hypolimnion waters are recycled during the turnover period.

Epilimnion Temperature

The average epilimnion water temperature for 591 samples collected from Clinton Lake during 1978 through 1991 was 15.8° C. Epilimnion temperatures ranged from 0.2° to 36.2° C. Frequency histograms of epilimnion water temperatures during preoperational (1978 through 1986) and operational (1987 through 1991) periods illustrate changes in the distribution of temperature data (Figure 5). Both histograms have



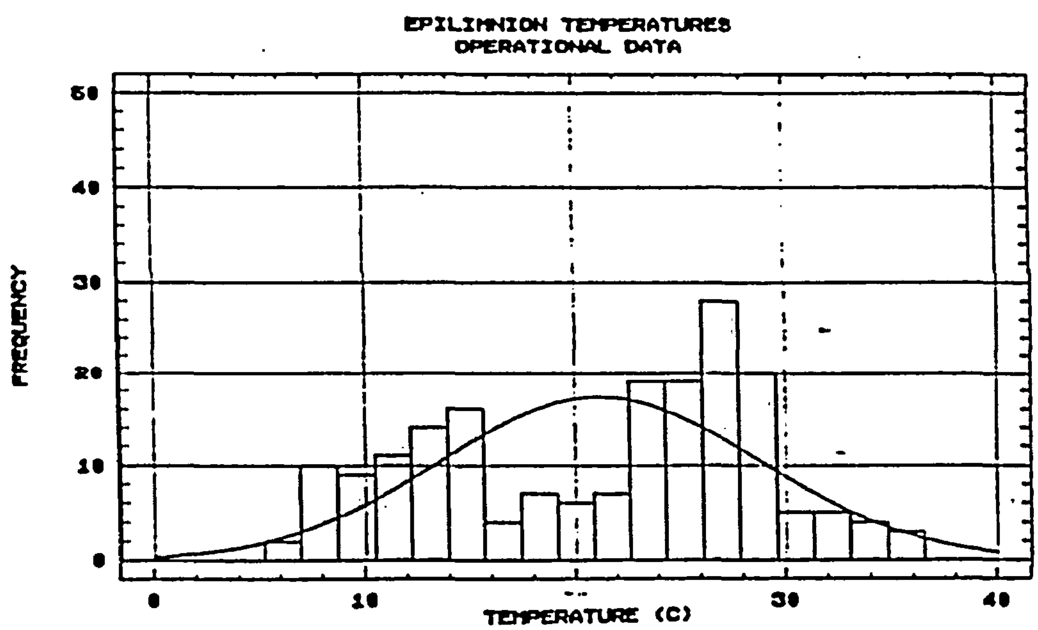


Figure 5. Frequency histograms of epilimnion temperatures (C) in Clinton Lake during periods prior to (1978 through 1986) (and during (1987 through 1991) Clinton Power Station operation.

bimodal peaks in frequency, however, the peaks occur at greater temperatures during the period when CPS was operational. Average temperatures increased from 13.3° C during the preoperational period to 21.1° C during the operational period. The greater average temperatures were partially due to a change in the sampling schedule. During the operational period temperatures were not determined during some of the winter months.

Temperatures were generally greater during June through September of each year (Figure 6). Temperatures were somewhat greater during 1987 through 1991, especially at Site 2 (Figures 6 and 7). There was no significant difference in the distribution of temperature data among sites during preoperational or operational periods (Figure 8). However, there were significant differences between preoperational and operational distributions of temperature data for each site (Figures 8 and 9). Temperatures for 1987 through 1991 were significantly greater than temperatures during 1978 through 1986 for all sites except Site 13 (Figure 9). Distribution of monthly temperatures during preoperational and operational conditions indicate median monthly operational conditions were generally greater (Figures 6 and 10). Distributions of temperature data by months indicate that operational temperatures were significantly greater during June, August, and November (Figure 10).

Plots of epilimnion temperatures during years when CPS was operational illustrate temperature gradients among sites during April through September of 1987 through 1991 (Figures 11 and 12). The differences between high and low temperatures within the cooling loop ranged from 1° to 8° Celcius during periods when CPS was operational.

Epilimnion temperatures during the operational period were: greater at all sites; more variable among sites; and were most variable near the discharge canal (Site 2).

Temperature Profiles

During warm weather, an upper, heated layer of water of low density may form at the surface. This layer floats over deeper, more dense, and cooler water which insulates the deeper layers from direct contact with atmospheric oxygen. When this layering or stratification stabilizes, the oxygen gradually becomes depleted in the deeper layer (hypolimnion) as a result of biological respiration. Stratification also affects those ions which may be influenced by oxidation and reduction. The reduced ion species often increase with depth during stratification.

Patterns of thermal stratification influence the physiological and chemical cycles of lakes, which in turn govern production, utilization, and decomposition. Typically, stratification is the result of absorption of solar energy by lake waters. Most light energy is absorbed and transformed to heat in the upper two meters of the lake water. Clinton Lake is affected by heat from solar radiation and from CPS heated discharges. Thus, dispersion of heat from the CPS discharge and its additive effect on the annual temperature regime of Clinton Lake is of particular interest. Analyses of the effects of stratification are limited to profile data collected from 1985 through 1991. This includes two years previous to CPS operation and five years when CPS was operational.

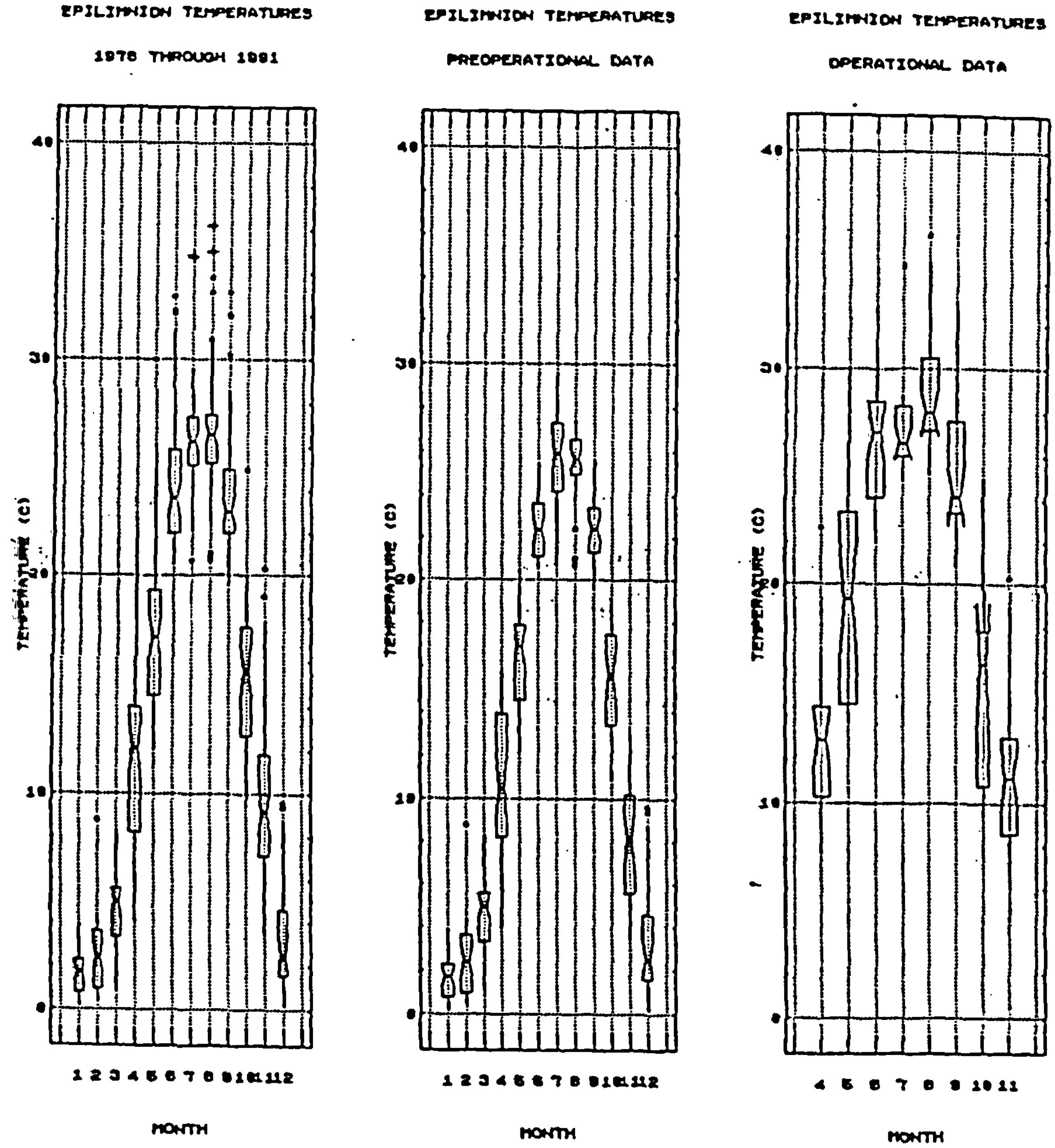


Figure 6. Distribution of epilimnion temperatures (C) in Clinton Lake during 1978 through 1991, during the period prior to Clinton Power Station operation (1978 through 1986), and during the period when Clinton Power Station was operational (1987 through 1991).

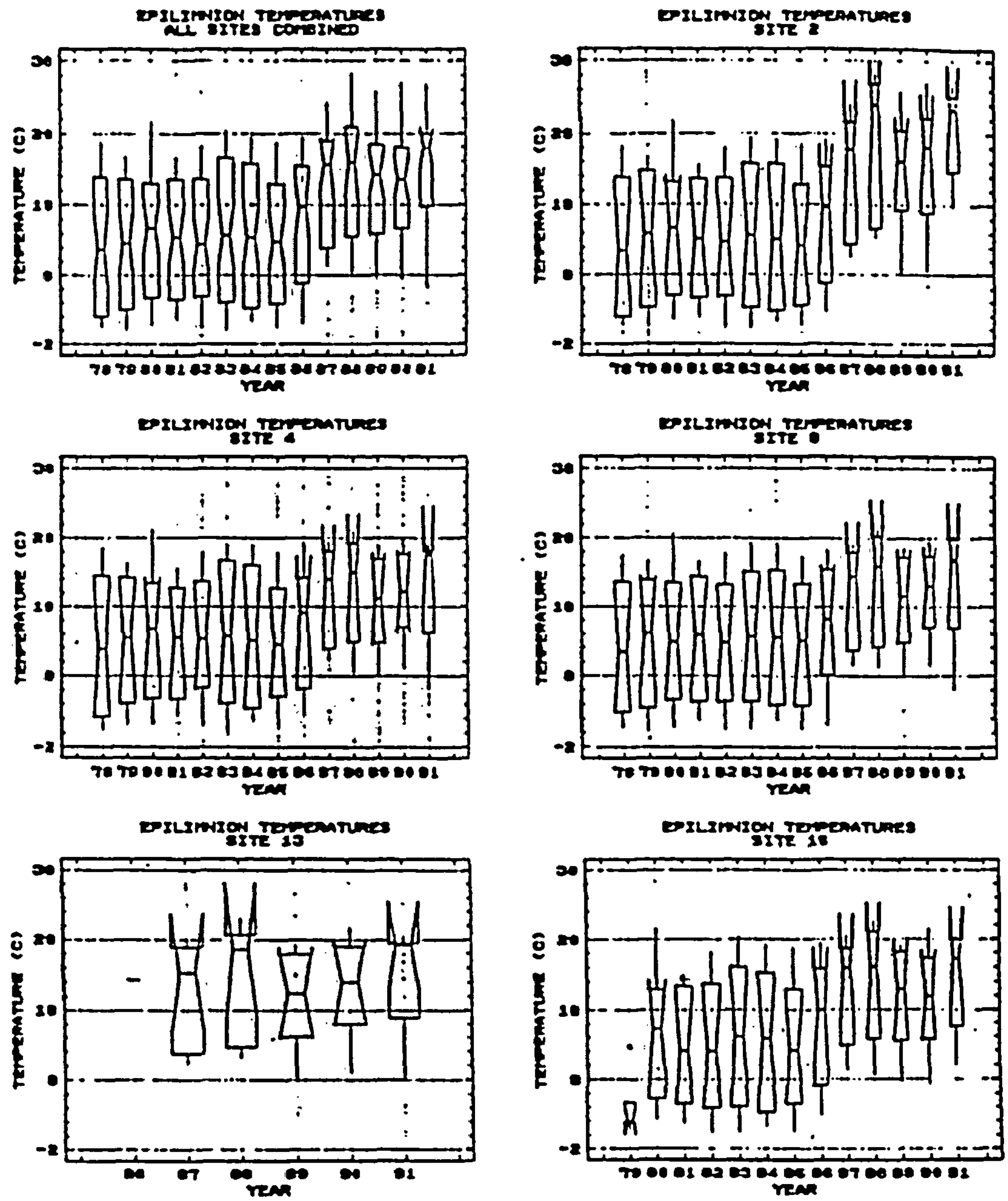


Figure 7. Distribution of epilimnion temperatures (C) at Clinton Lake sampling sites during 1978 through 1991.

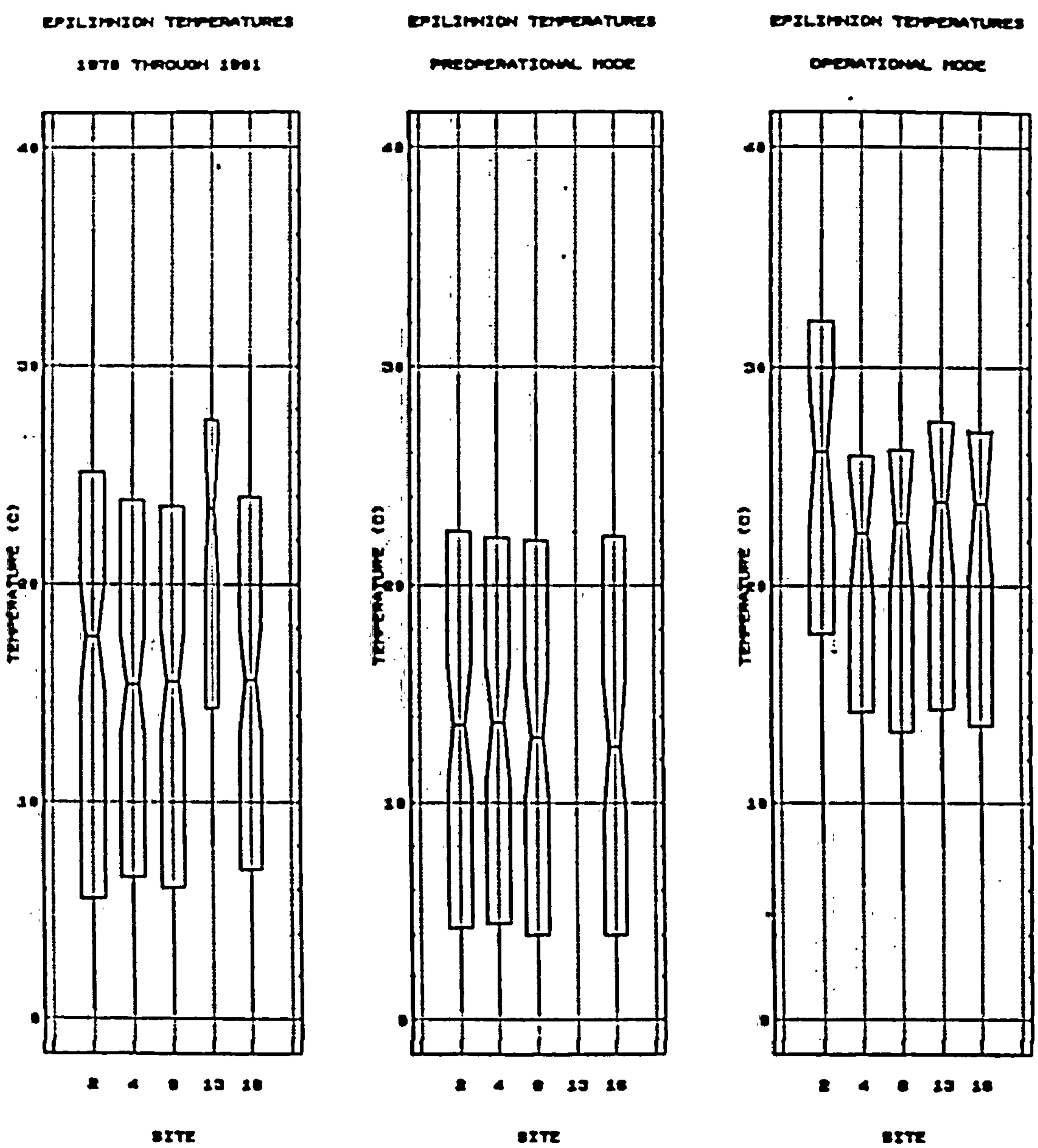


Figure 8. Distribution of epilimnion temperatures (C) for each Clinton Lake sampling site during 1978 through 1991 and during the periods prior to (preoperational) and during Clinton Power Station operation (operational).

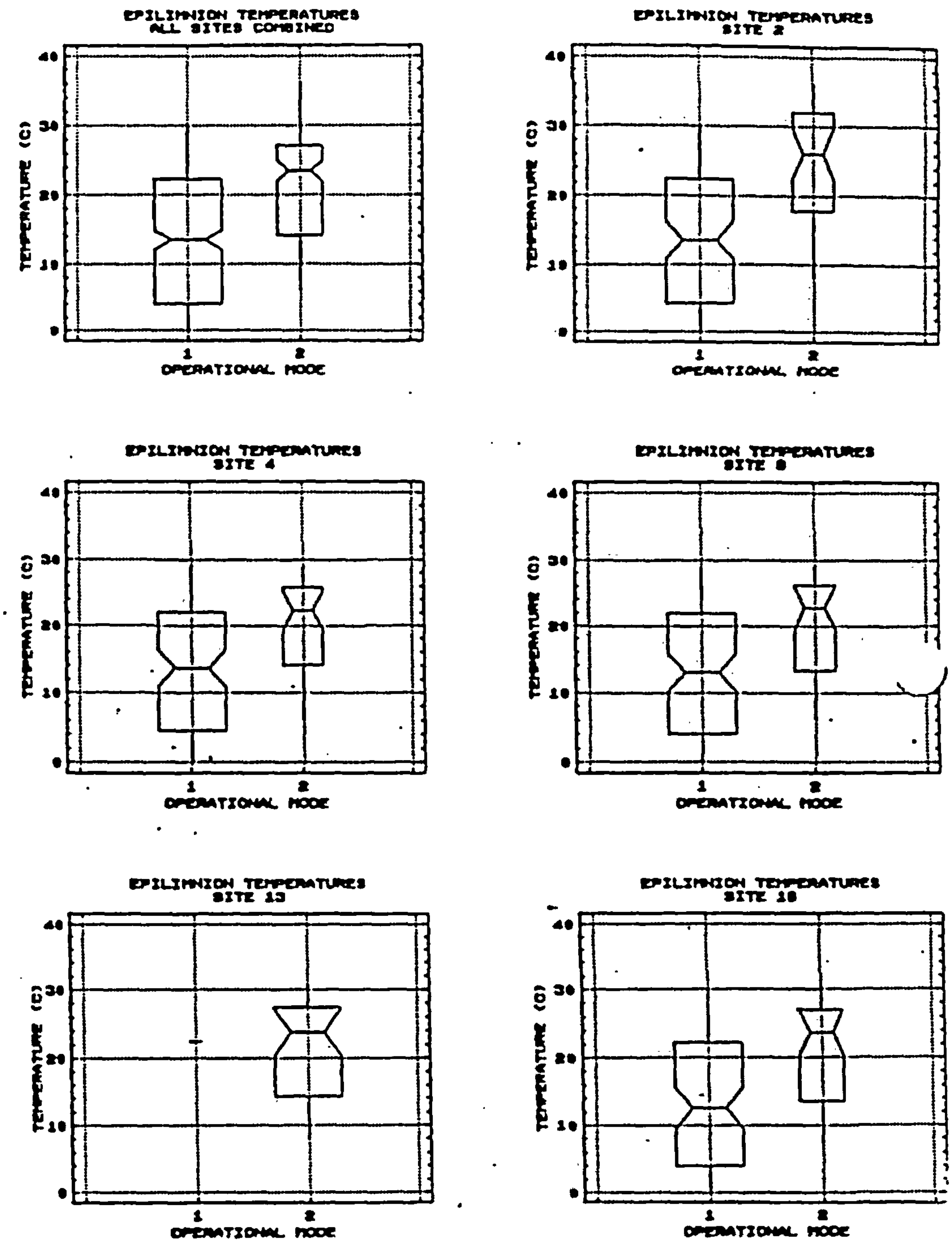


Figure 9. Distribution of epilimnion temperatures (C) for sampling sites in Clinton Lake for the periods prior to (Mode 1) and during (Mode 2) Clinton Power Station operation.

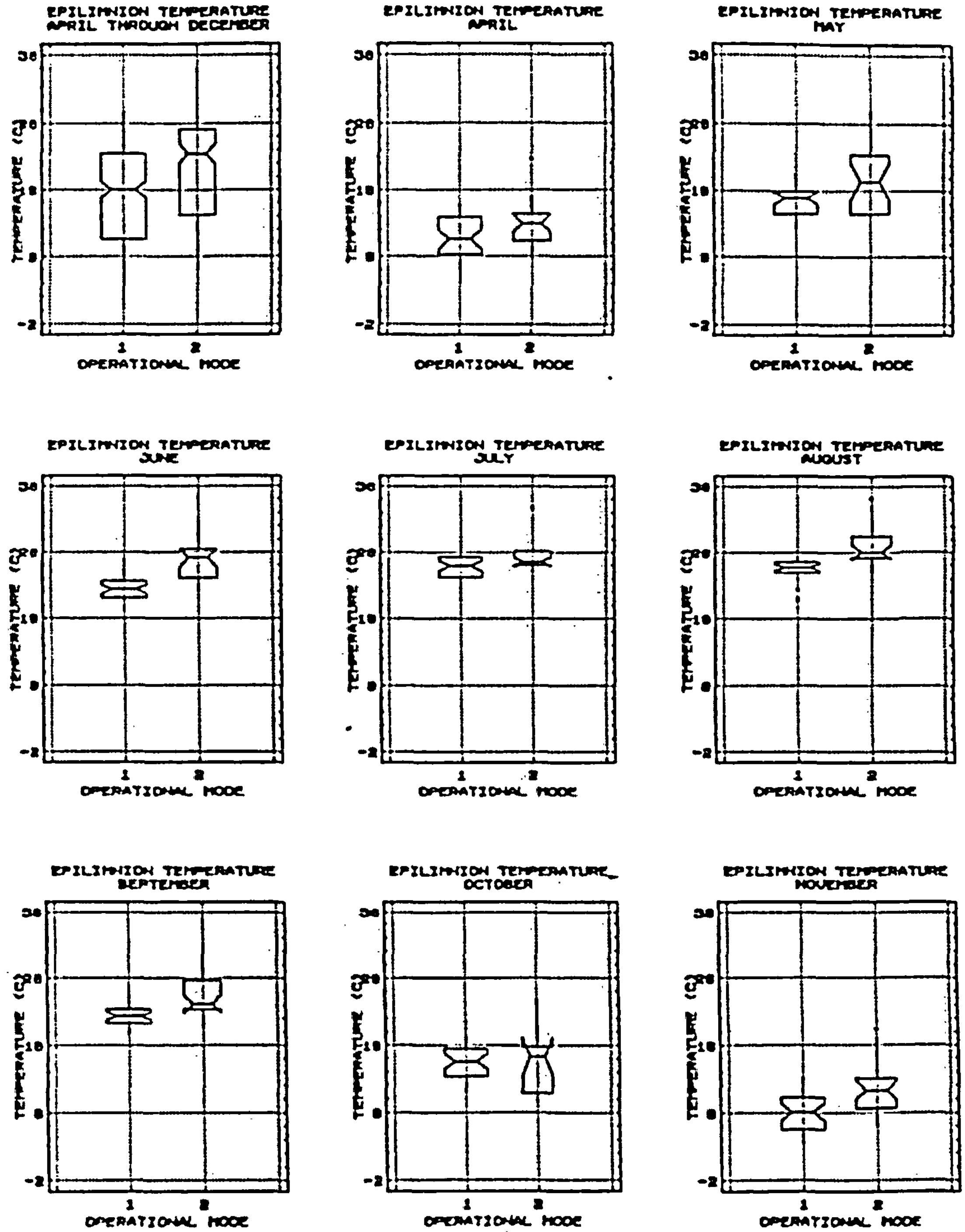
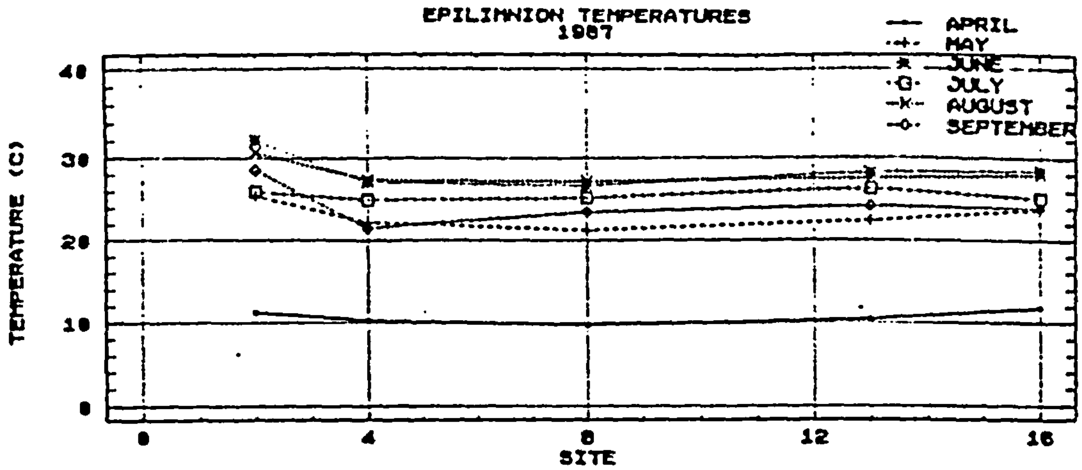
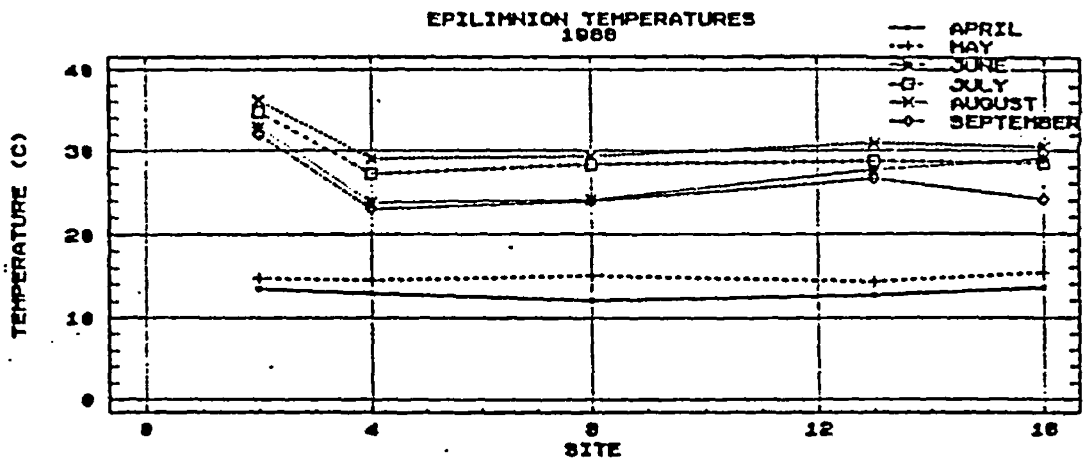


Figure 10. Distribution of epilimnion temperatures (C) in Clinton Lake for the periods prior to (Mode 1) and during (Mode 2) Clinton Power Station operation for April through December.





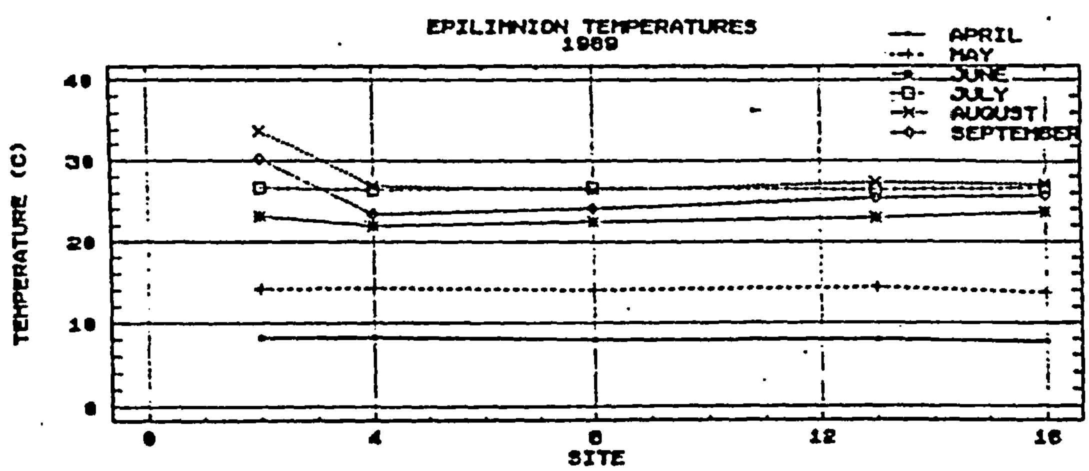
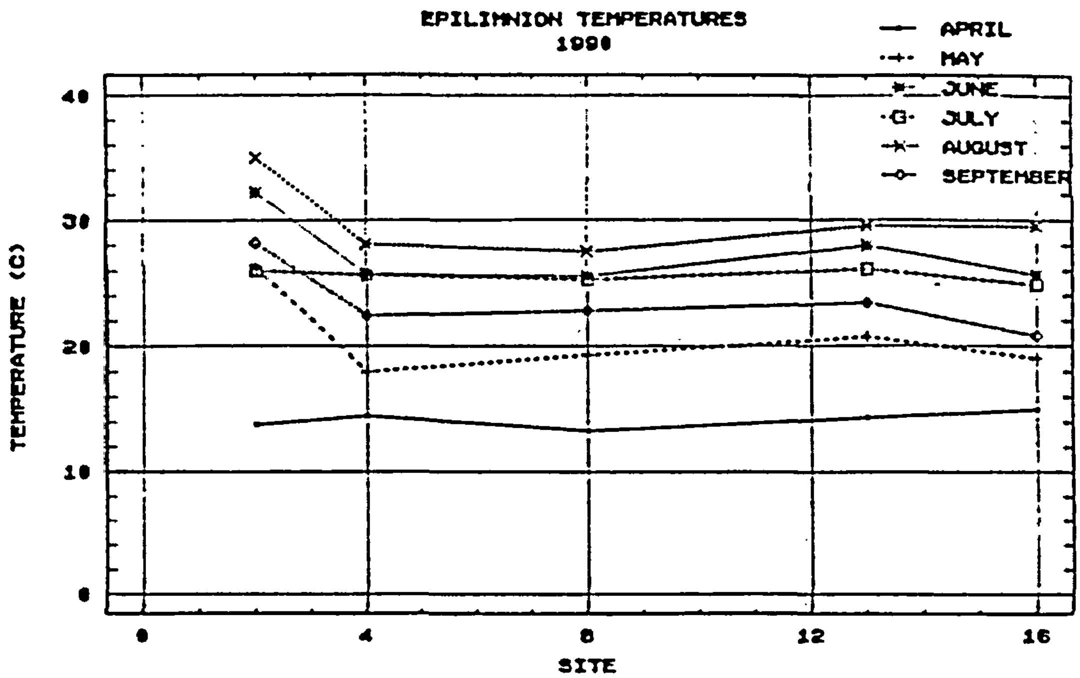


Figure 11. Epilimnion temperatures (C) for Clinton Lake sampling sites during April through September, 1987 through 1989.



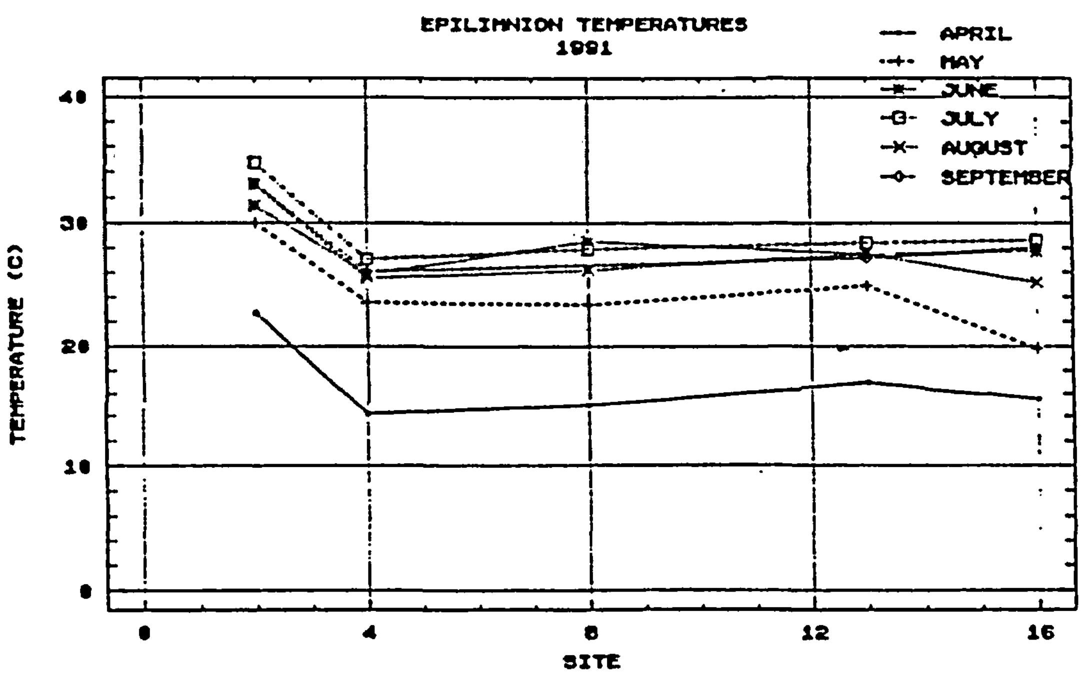


Figure 12. Epilimnion temperatures for (C) Clinton Lake sampling sites during April through September, 1990 and 1991.

Stratification occurred each year during 1978 through 1991 (Table 5). Due to the relative shallowness of several of the Clinton Lake sites, especially Site 16, complete thermal stratification was not developed. The deeper sites (sites 8, 4, and 13) were more likely to exhibit complete stratification.

Annual average temperatures were greater during years when CPS was operational (1987 through 1991)(Table 6). Average annual temperatures were greatest at Site 2 which is nearest the CPS outfall (Table 7). Average temperatures at all sites increased during the operational period (Table 8). Annual mean temperatures ranged from 14.4° to 21.9° C (Table 6). During the preoperational period (1985 and 1986), temperatures ranged from 0.5° to 27.5° C and there were no significant differences among sites (Figure 13). During the operational period (1987 through 1991), temperatures ranged from 8° to 36.5° C and there were significant differences between temperatures at Site 2 and the remaining sites (Figure 13).

Multiple plots of temperatures for each site and depths from one through four meters indicate temperatures were greater near the discharge (Site 2) and generally, temperatures decreased with depth. (Figures 14 through 17). Overlays of temperature plots for 1985 and 1986 illustrate similarities in the distributions of temperatures during the period prior to CPS operations (Figures 18 through 21).

Temperatures during CPS operation (1987 through 1991) were greater at all sites and all depth strata from one through four meters (Figures 18 through 21). Overlays of temperature plots for 1987 through 1991 illustrate distributions of temperatures during years wher CPS was operational (Figures 18 through 21).

Comparisons in distributions of temperature between preoperational years (1985 and 1986) and years when CPS was operational (1987 through 1991) indicate: temperatures for each depth stratum were greater for all sites, especially Site 2 during operational years; and the differences in temperatures between operational modes decreased with increasing depth strata. Thus, temperature differences between preoperational and operational conditions were most noticeable at Site 2 and at the one and two meter depth strata.

8.2 Oxygen and Oxygen Saturation

8.2.1 Dissolved Oxygen

Like temperature, the dissolved oxygen (DO) level is important in the protection and maintenance of desirable aquatic communities. Concentrations of DO are an important indicator of existing water quality and the ability of a waterbody to support a well balanced aquatic community. Concentrations of DO vary inversely with temperature and may be substantially affected by atmospheric exchange, photosynthesis, or contributions from tributary flows and groundwater.

Concentrations of DO in lake water can fluctuate greatly during the course of a day. The diurnal fluctuations are typically caused b··

Table 5. Months when stratification occurred at sampling sites in Clinton Lake during 1978 through 1991.

Year	Site 2	Site 4	Site 8	Site 13	Site 16
1978	6(a)	6-7	6-8	-(b)	NS(c)
1979	9	6,7&9	5-9	-	NS
1980	NS	4&7	6-8	-	NS
1981	5	5	6-9	-	NS
1982	NS	5-7	5-8	-	NS
1983	NS	NS	6-9	-	NS
1984	NS	6&8	8	-	NS
1985	NS	NS	7	-	NS
1986	NS	NS	6-7	NS	NS
1987	6	NS	6-7	6	6
1988	7-9	NS	7-8	7-9	NS
1989	8-11	NS	NS	NS	10
1990	5-6&8-10	6-8	4-5	5,6&8	6-8
1991	4-9	5	5-7	5-6	5,9,&11

a. Months are numerically represented, e.g., 6 equals June.
b. Site 13 was not sampled until September, 1986
c. NS indicates no stratification occurred.

Table 6. Descriptive statistics for water temperature (C) from depth profiles from Clinton Lake during 1985 through 1991.

Statistic	1985	1986	1987	1988	1989	1990	1991
Sample Size	258	258	498	376	462	486	428
Average	14.3	17.3	19.7	20.2	19.1	19.5	21.9
Median	15.8	20.5	22.6	22.9	21	20.2	25.3
Variance	65.7	50.3	51.9	57.9	43.1	43	55.3
Minimum	0.5	1	9.3	8	7.7	7.23	4.6
Maximum	26.6	27.5	32.4	36.5	33.8	35	34.7
Range	26.1	26.5	23.1	28.5	26.1	27.7	30.1

Table 7. Average water temperatures (C) from depth profiles for sampling sites in Clinton Lake during 1985 through 1991.

Year	Site 4	Site 8	Site 2	Site 16
1985	14.6	15.6	12.7	12.8
1986	17.1	16.9	18.0	17.7
1987	19.4	18.9	22.3	20.1
1988	19.4	19.2	23.8	19.9
1989	18.7	18.2	22.1	19.5
1990	19.5	19.1	20.9	18.0
1991	20.9	20.9	27.2	20.7

Table 8. Descriptive statistics of water temperature (C) depth profiles for Clinton Lake sampling sites prior to (1985 and 1986) and during Clinton Power Station operation (1987 through 1991).

Statistic	Site 2		Site 4		Site 8		Site 16	
	Pre	Op	Pre	Op	Pre	Op	Pre	Op
Sample Size	87	282	138	471	197	766	73	225
Average	15.0	23.1	15.8	19.6	16.3	19.2	15.2	19.7
Median	17.4	25.2	16.8	22.1	16.9	21.9	16.1	22.3
Variance	75.3	64.6	56.7	45.7	52.9	45.6	74.8	53.4
Minimum	0.8	8.1	0.9	6.1	0.5	6.1	0.5	4.6
Maximum	27.1	36.5	27.3	29	26.4	29.3	27.5	30.6
Range	26.3	28.4	26.4	22.9	25.9	23.2	27.0	26.0

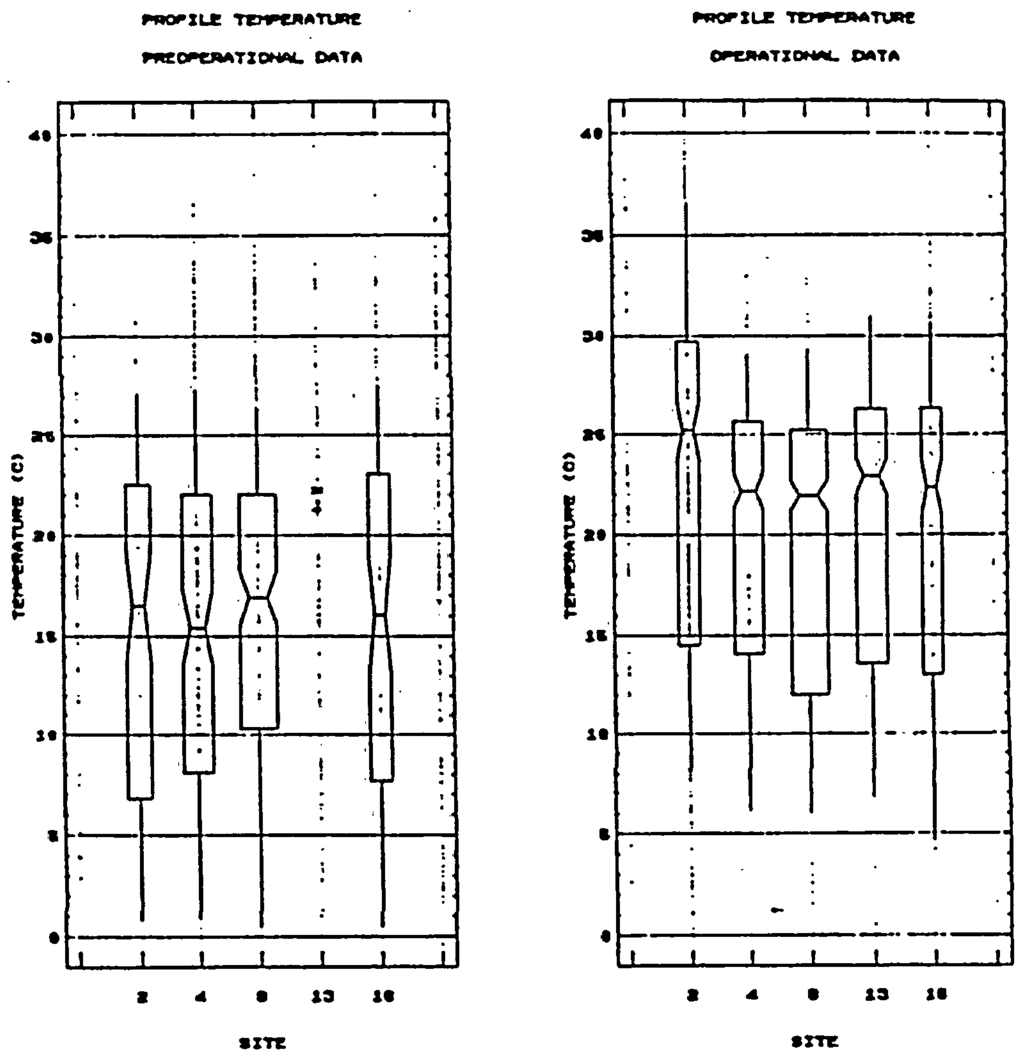


Figure 13. Distribution of temperatures (C) from Clinton Lake sampling sites for periods prior to (1985 and 1986) and during (1987 through 1991) Clinton Power Station operation.

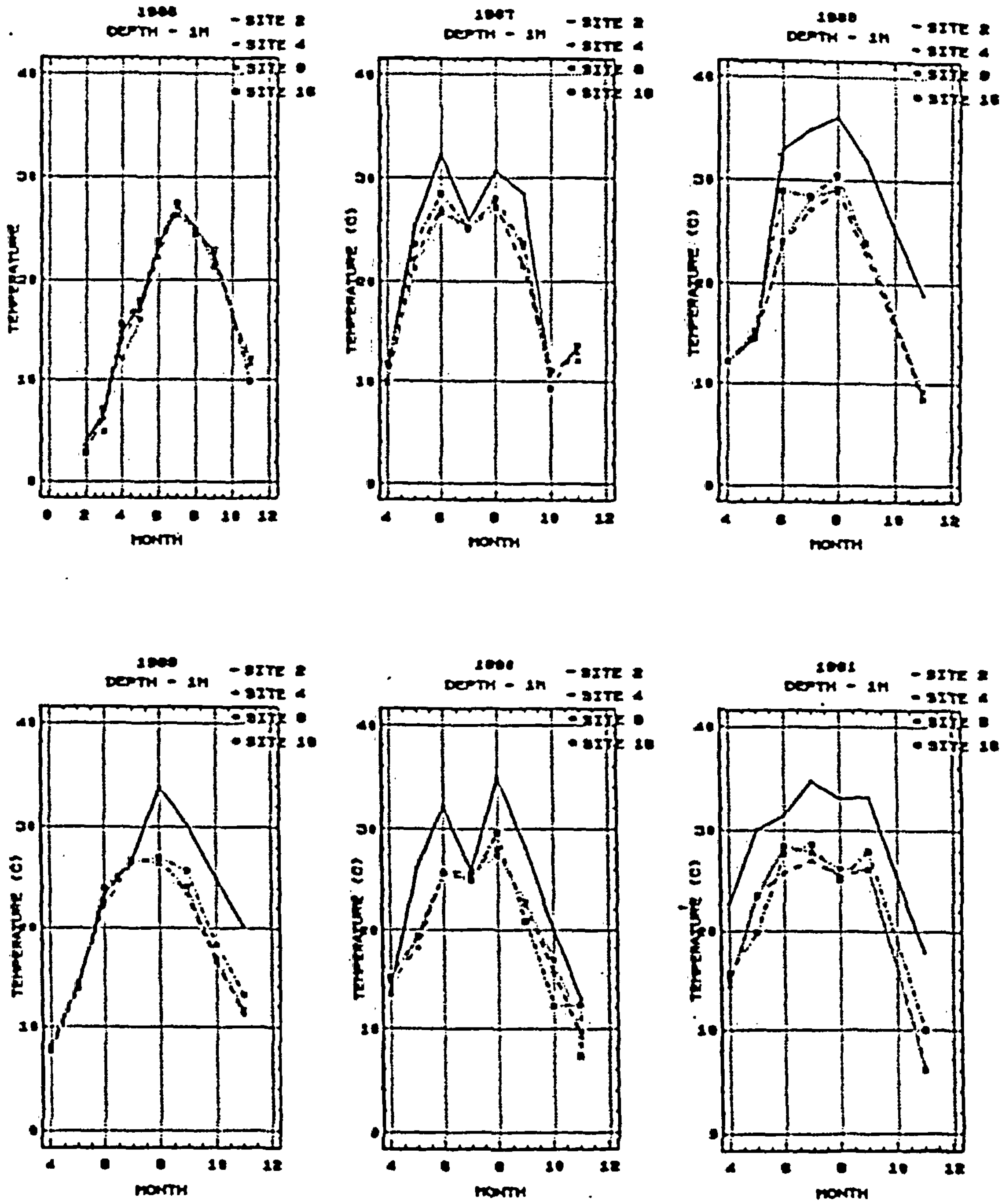


Figure 14. Distribution of temperatures (C) at the one meter depth stratum for Clinton Lake monitoring sites during 1985 through 1991.

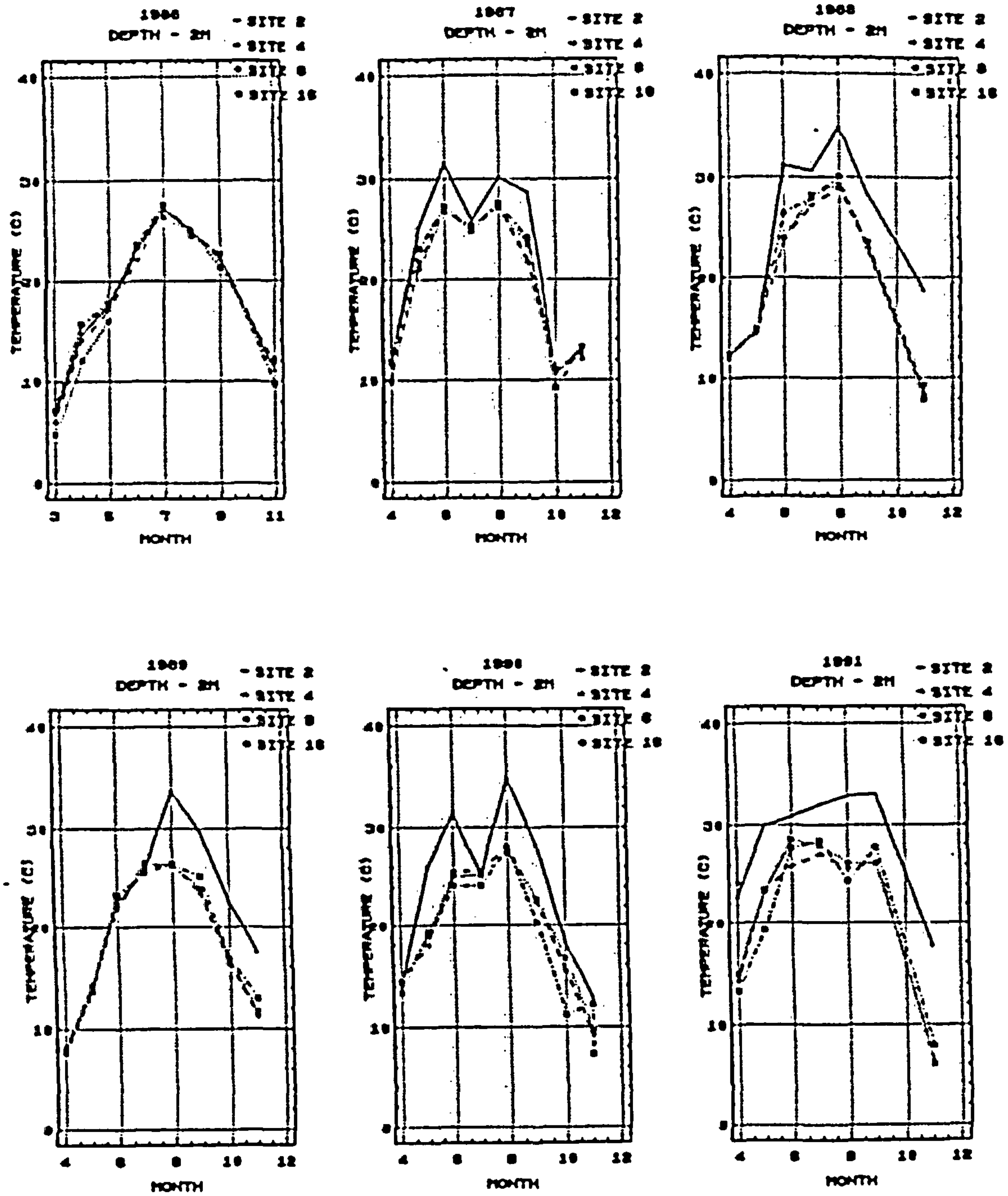


Figure 15. Distribution of temperatures (C) at the two meter depth stratum for Clinton Lake monitoring sites during 1985 through 1991.

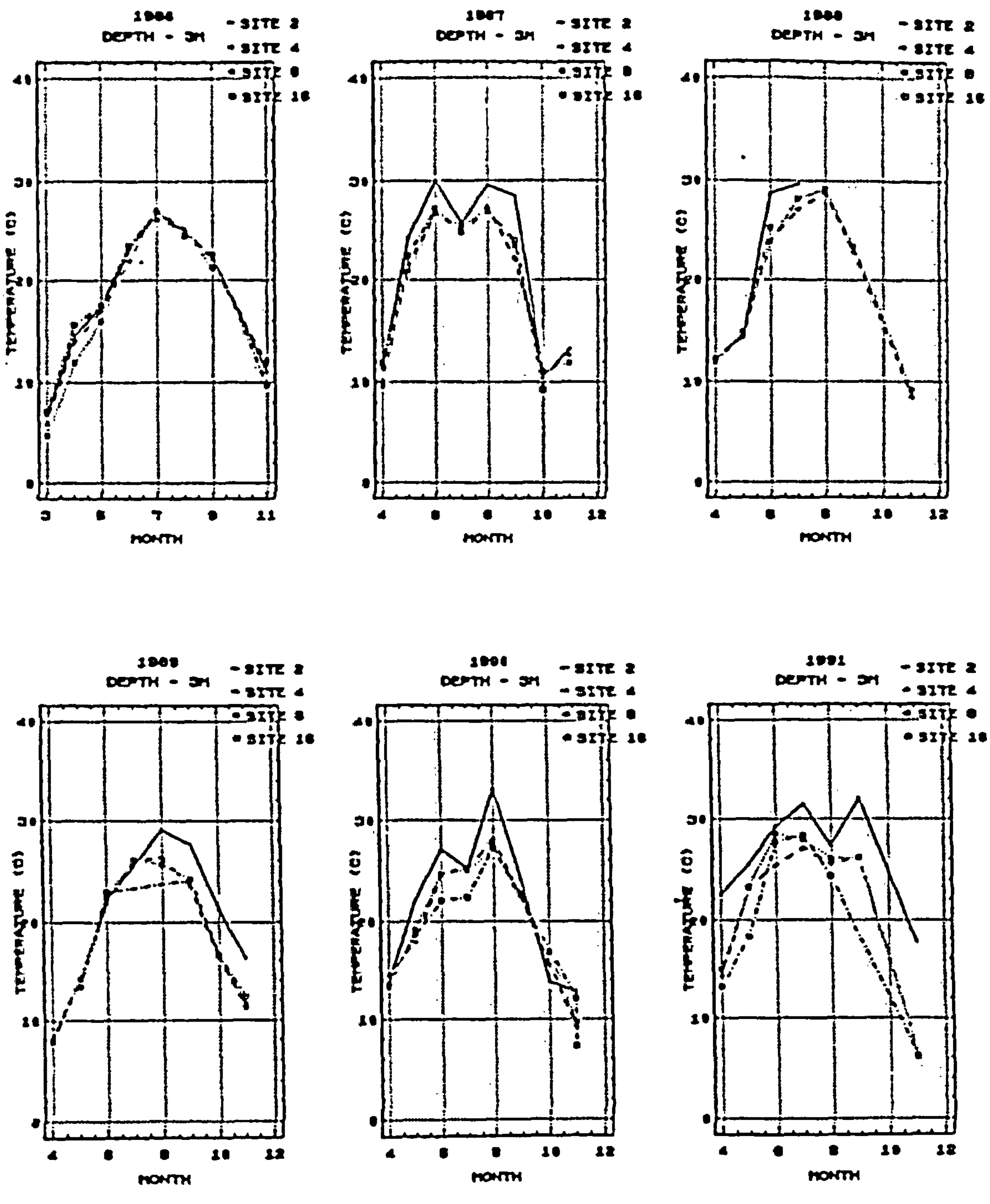


Figure 16. Distribution of temperatures (C) at the three meter depth stratum for Clinton Lake monitoring sites during 1985 through 1991.

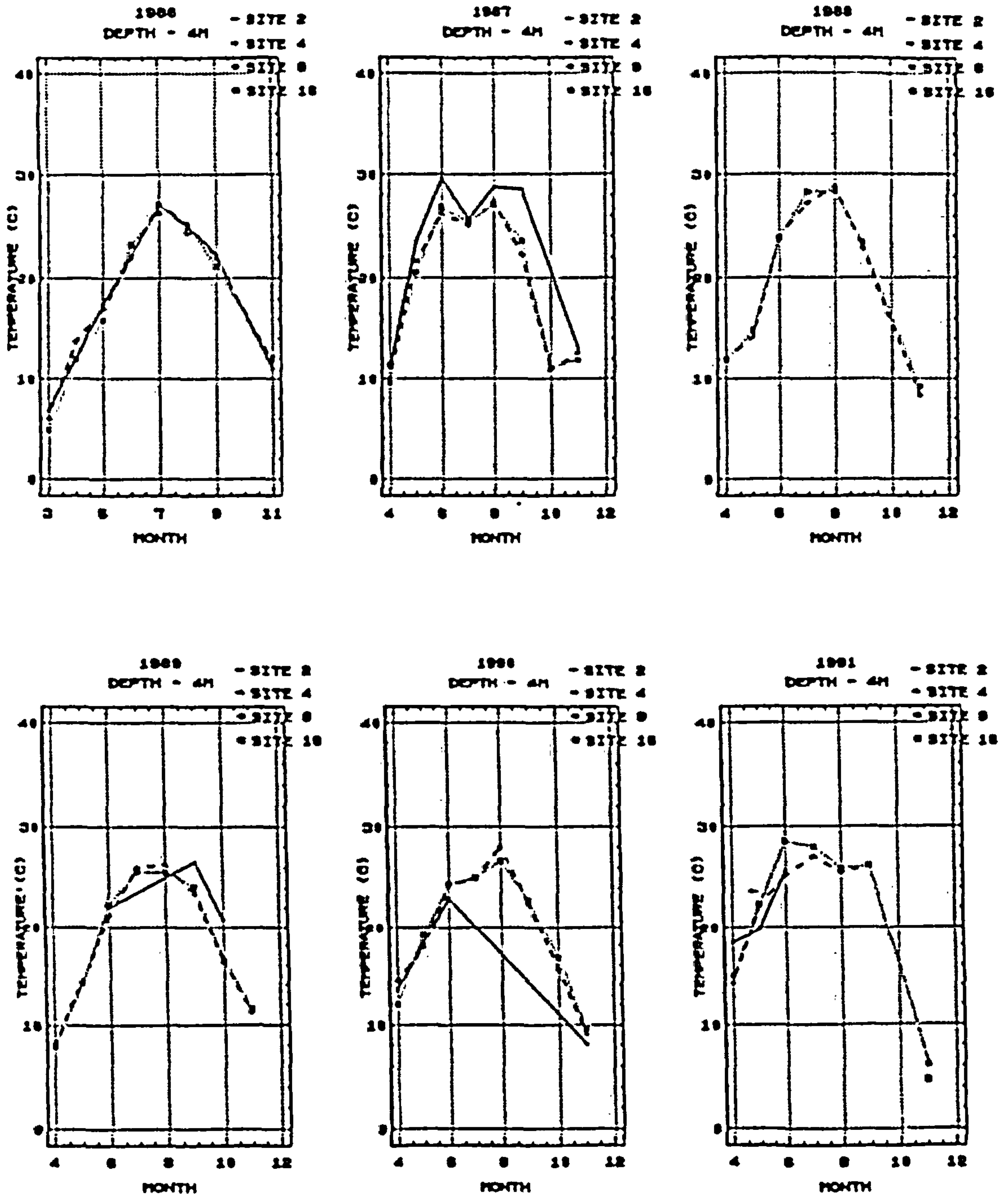


Figure 17. Distribution of temperatures (C) at the four meter depth stratum for Clinton Lake monitoring sites during 1985 through 1991.

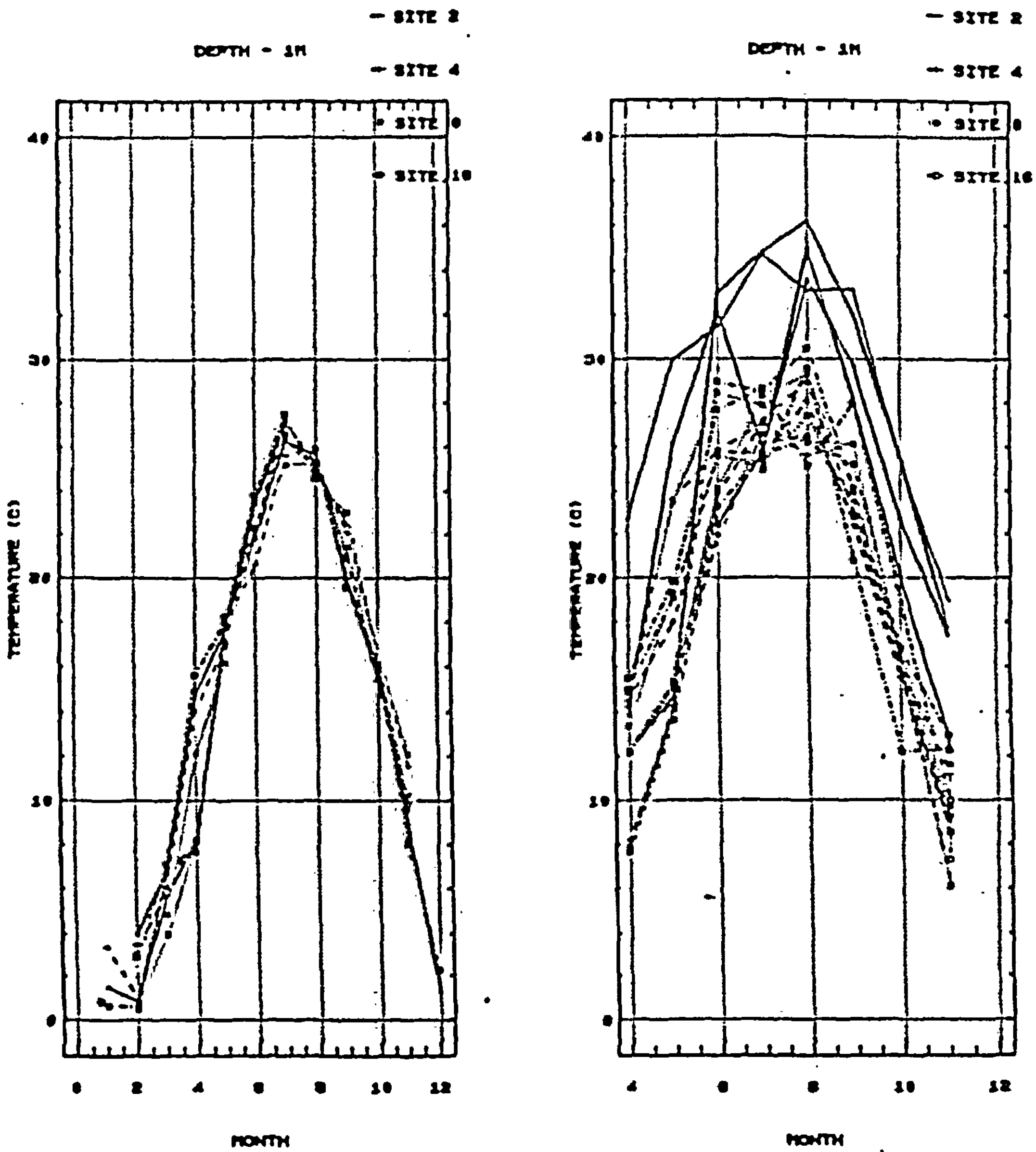


Figure 18. Composite distributions of temperatures (C) at the one meter depth stratum for Clinton Lake monitoring sites during 1985 and 1986 (left graph) and 1987 through 1991 (right graph).

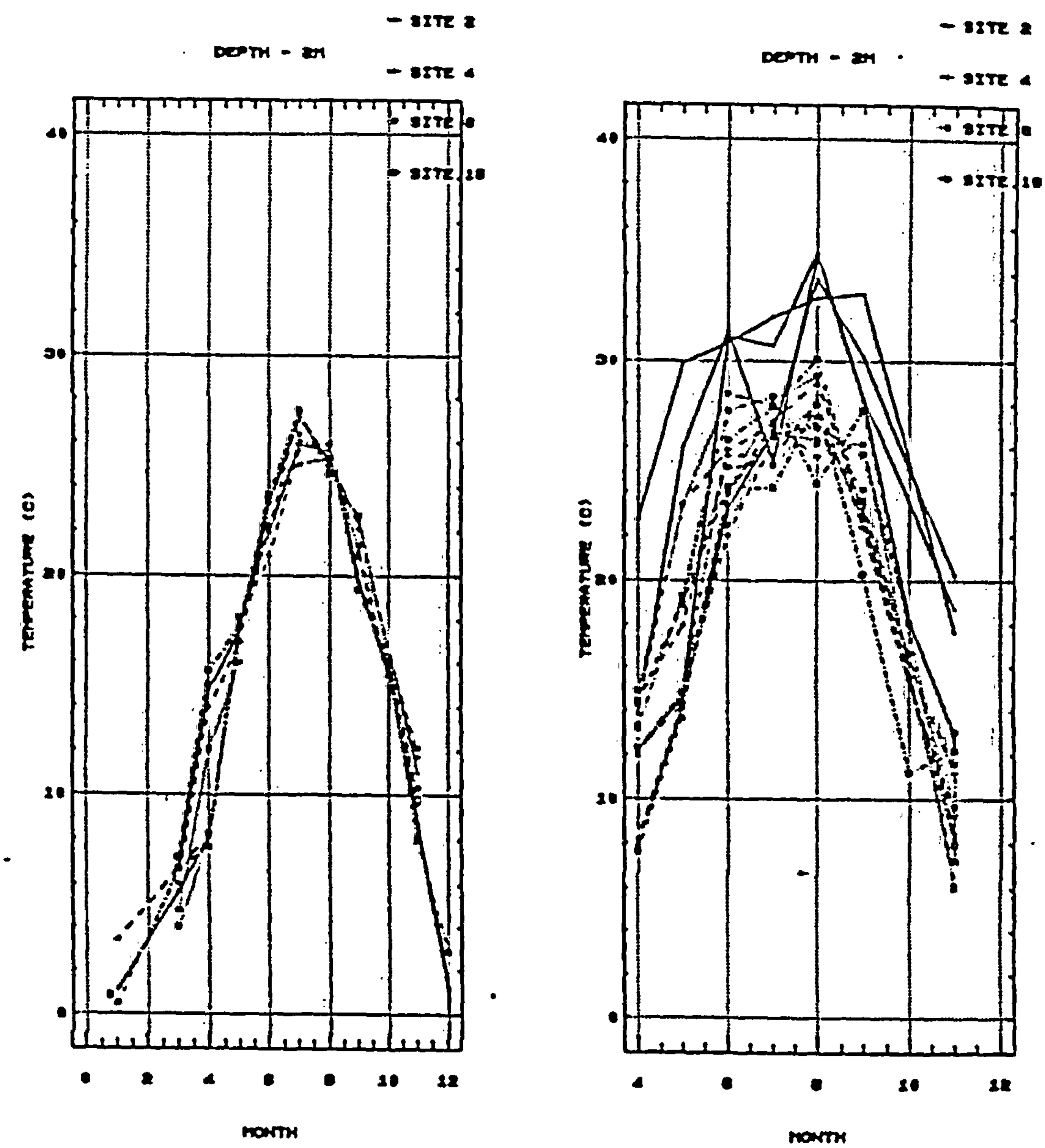


Figure 19. Composite distributions of temperatures (C) at the two meter depth stratum for Clinton Lake monitoring sites during 1985 and 1986 (left graph) and 1987 through 1991 (right graph).

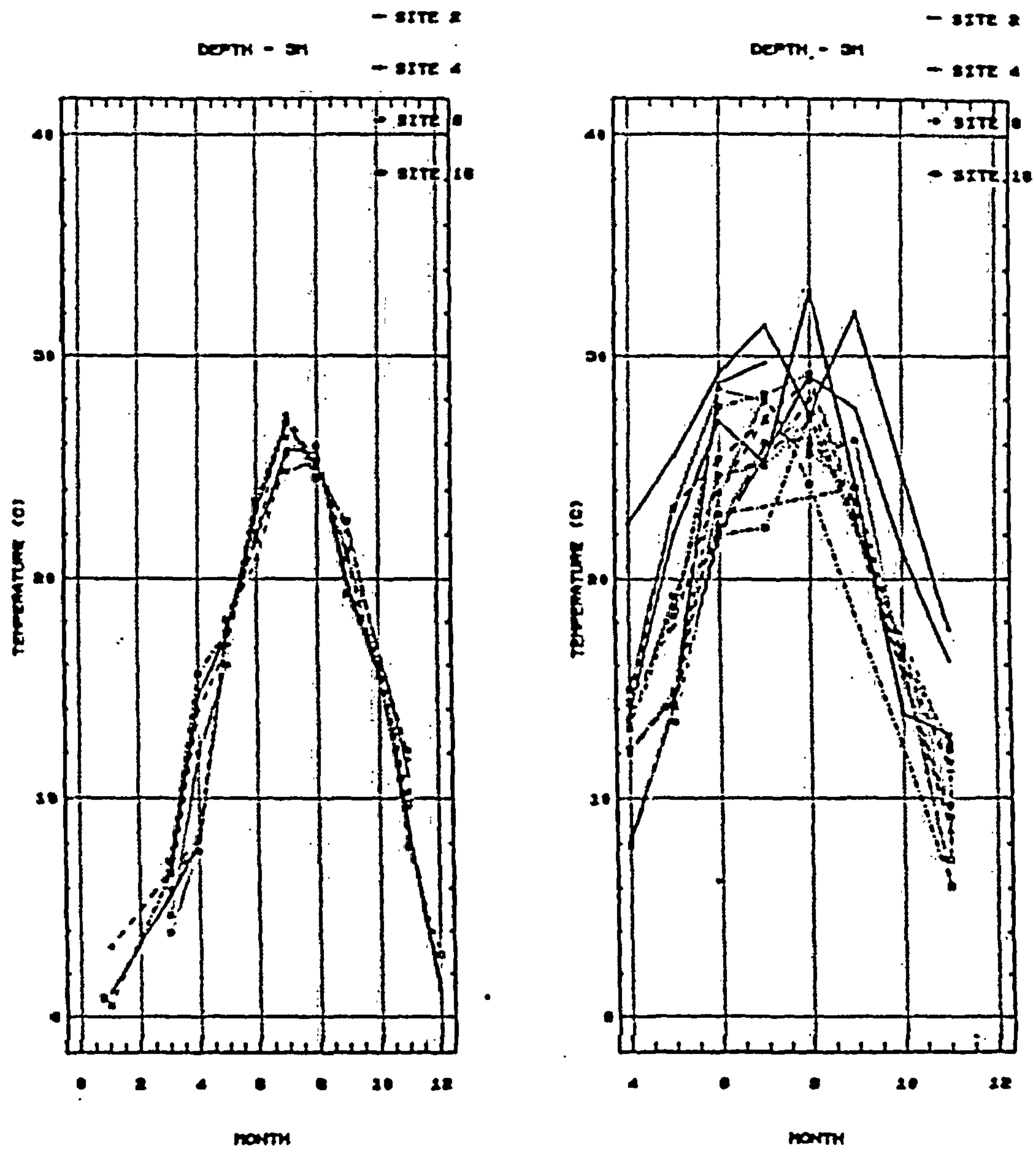


Figure 20. Composite distributions of temperatures (C) at the three meter depth stratum for Clinton Lake monitoring sites during 1985 and 1986 (left graph) and 1987 through 1991 (right graph).

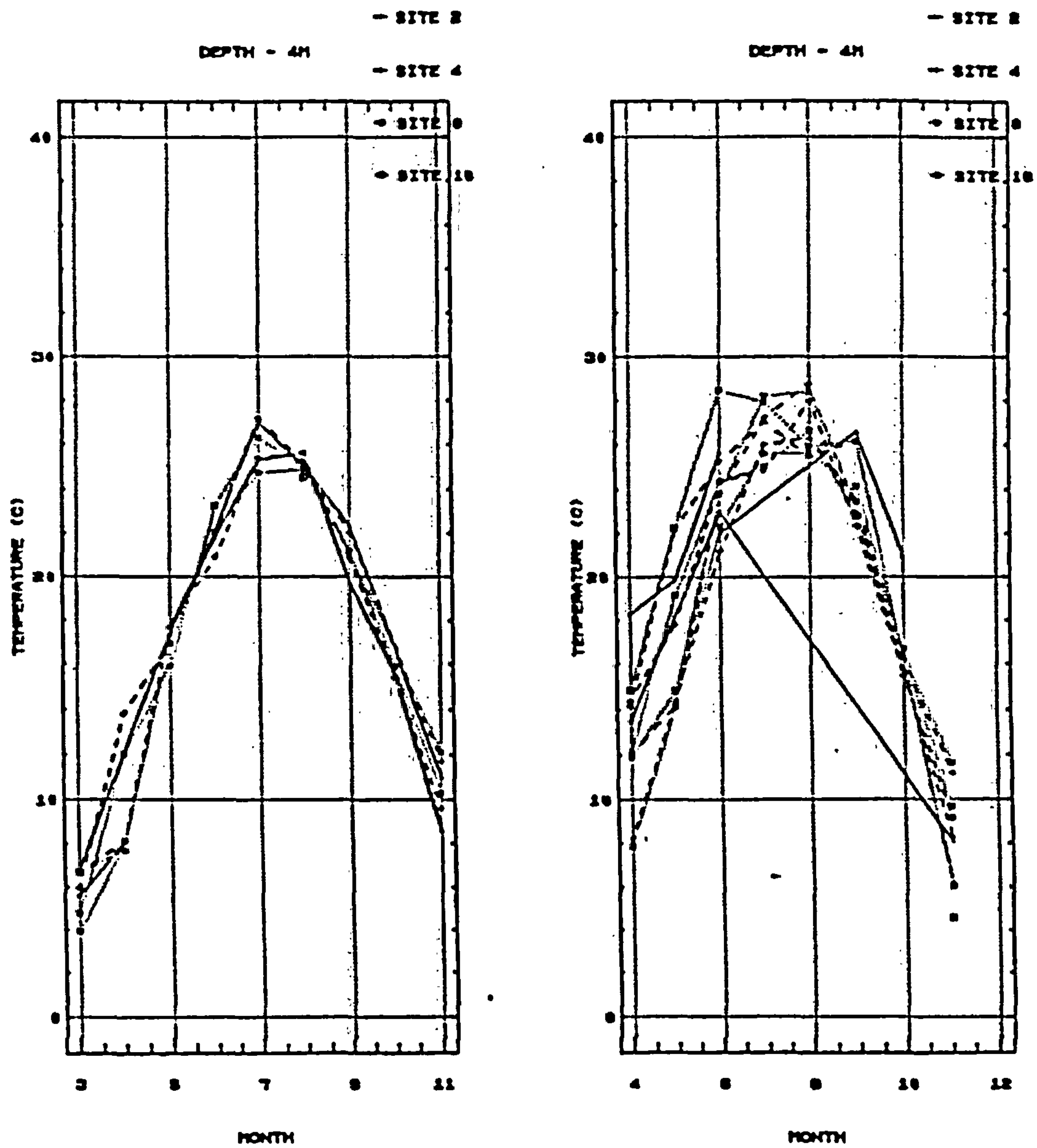


Figure 21. Composite distributions of temperatures (C) at the four meter depth stratum for Clinton Lake monitoring sites during 1985 and 1986 (left graph) and 1987 through 1991 (right graph).

photosynthetic effects associated with primary production. Concentrations of DO typically increase during the day when photosynthetic rates exceed respiration rates and decrease at night when only respiration occurs. Thus, the timing of sample collection is very important for comparisons of DO concentrations in lake water. All samples for the Clinton Lake Environmental Monitoring Program were collected during daylight hours.

Epilimnion Dissolved Oxygen

The average DO from 719 samples collected from Clinton Lake during 1978 through 1991 was 8.7 mg/l. During this time DO concentrations ranged from 0.05 to 25.7 mg/l.

Frequency histograms of epilimnion DO concentrations during preoperational and operational periods illustrate changes in the distributions of data (Figure 22). Concentrations of DO have decreased since CPS began operations. The average DO for the preoperational period (1978 through 1986) was 10.2 mg/l; the average DO concentration was 7.8 mg/l during the period when CPS was operational.

Average DO concentrations were lower during the warmer months (June through September) during the preoperational and operational periods (Figure 23). Concentrations of DO were lower during the operational period from May through November (Figure 24). Significantly lower DO concentrations between preoperational and operational periods occurred for August (Figure 24). Distributions of DO concentrations among sites were similar within the preoperational and operational periods (Figure 25). Concentrations of DO were somewhat lower for each site during the years when CPS was operational (Figure 26). However, only Site 2 had significantly lower DO concentrations during the operational period (Figure 27). Concentrations of DO usually varied less than 4 mg/l among sites during years when CPS was operational (Figures 28 and 29).

The IPCB General Use water quality standard for DO states "dissolved oxygen shall not be less than 6.0 mg/l during at least 16 hours of any 24 hour period, nor less than 5.0 mg/l at any time".

Thirty-one of the 591 epilimnion samples taken from 1978 through 1991 had DO concentrations less than 6.0 mg/l. Eleven of these 31 samples had DO concentrations less than 5.0 mg/l (Table 9). Twelve of the 31 samples occurred during preoperational conditions and nineteen occurred during operational years.

Dissolved Oxygen Profiles

Average annual DO concentrations were lower during the years when CPS was operational (Table 10 and Figure 30). The average annual DO concentration for each site was also generally lower during operational years (Table 11) and the average DO was lower during the operational period for each site (Table 12). Site 2 had the greatest average DO concentration during the preoperational years (1985 and 1986). Concentrations were significantly greater during the

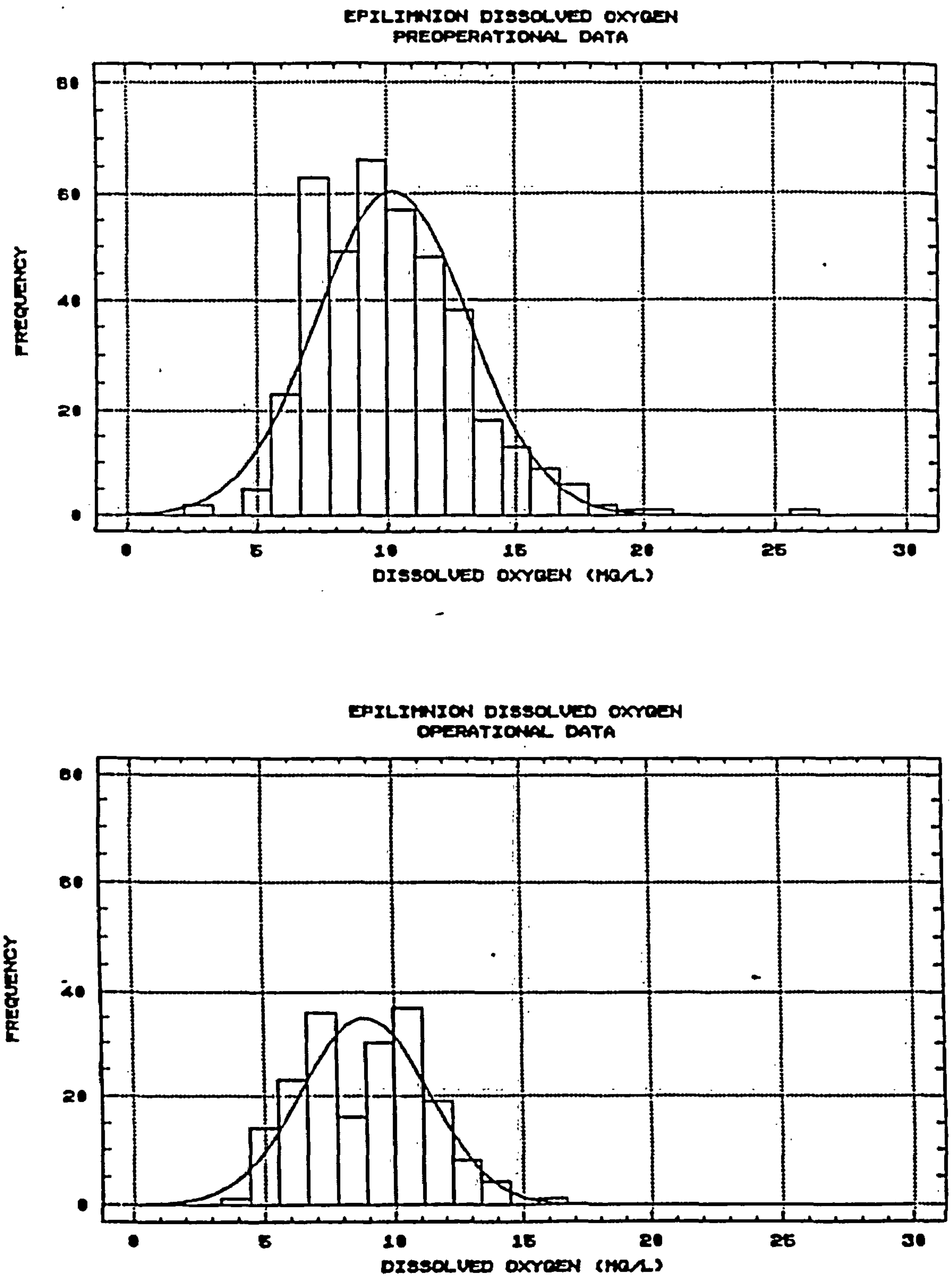


Figure 22. Frequency histograms of epilimnion dissolved oxygen concentrations in Clinton Lake during the preoperational period (1978 through 1986) and the operational period (1987 through 1991).

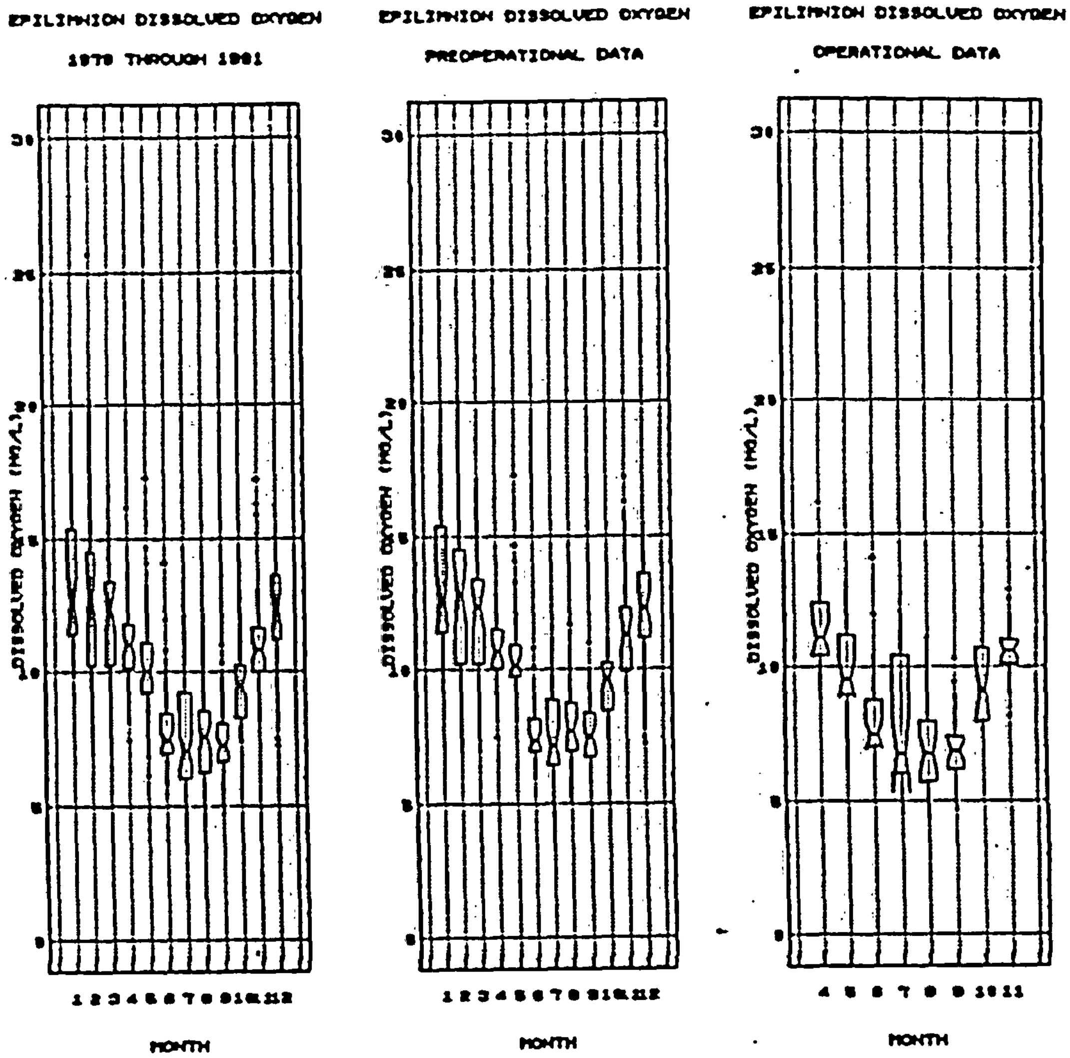


Figure 23. Distribution of epilimnion dissolved oxygen concentrations by months during 1978 through 1991, and during the periods prior to (1978 through 1986) and during Clinton Power Station operation (1987 through 1991).

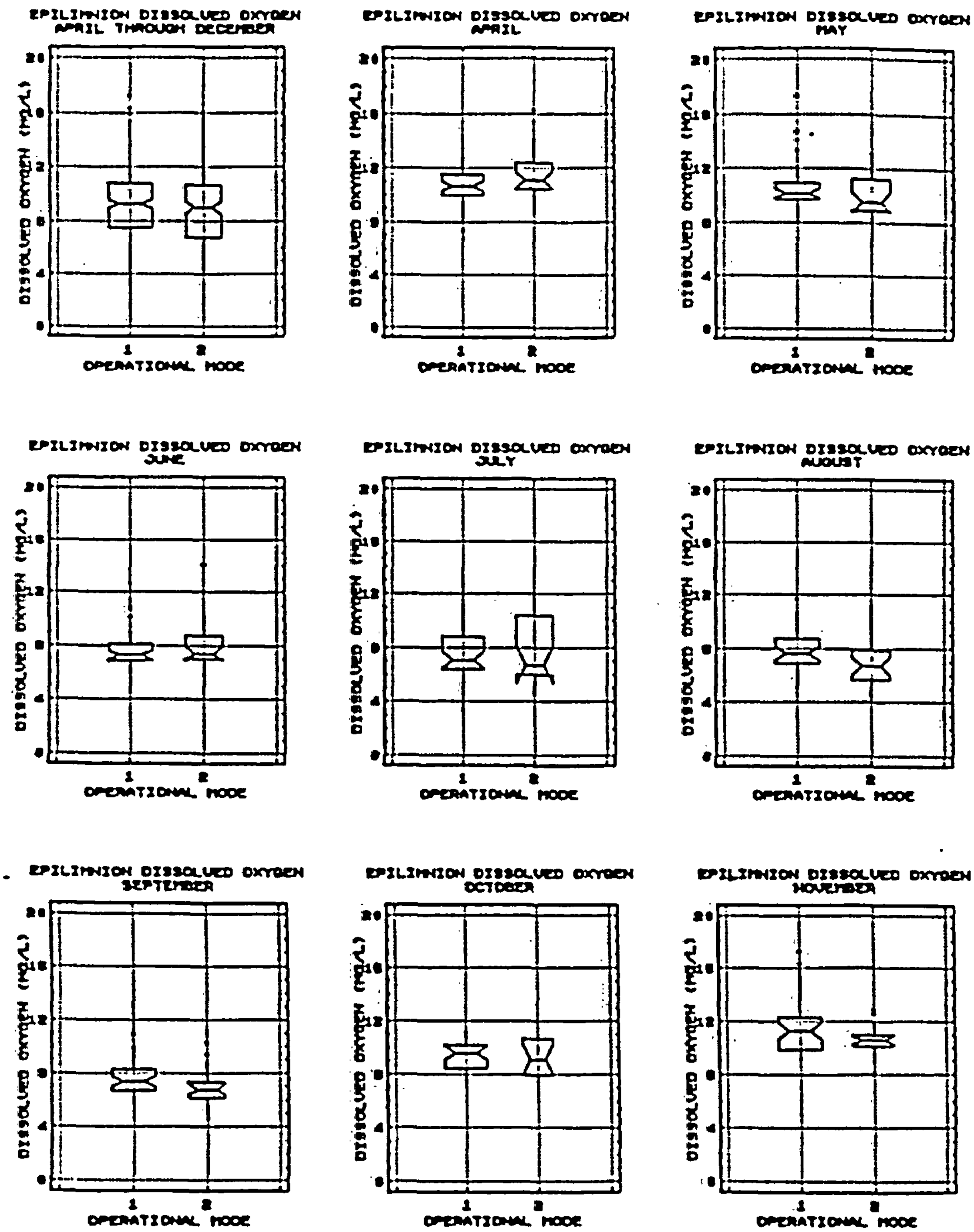


Figure 24. Distribution of epilimnion dissolved oxygen concentrations by months in Clinton Lake for the period prior to (Mode 1) and during (Mode 2) Clinton Power Station operation for April through December.

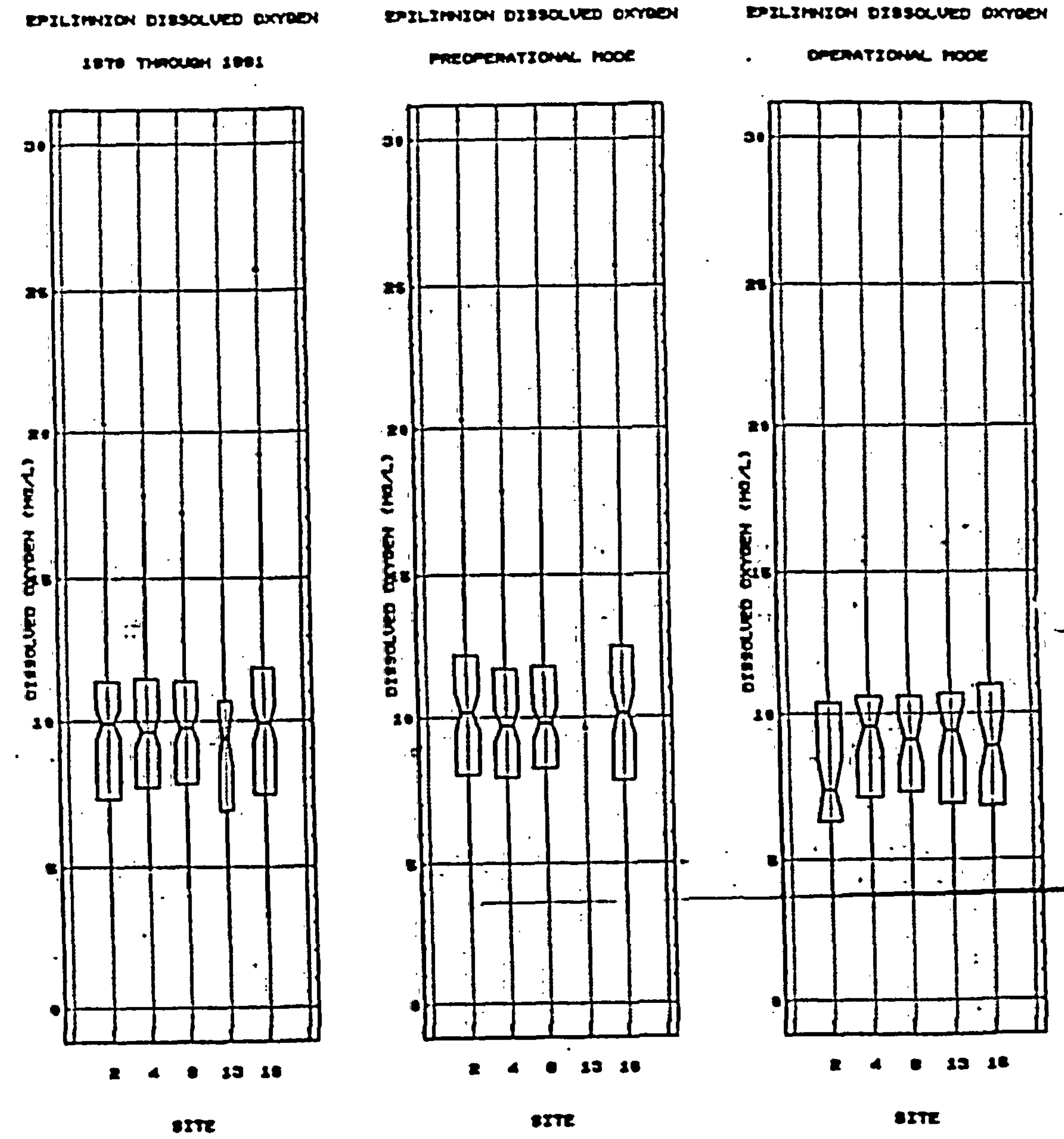


Figure 25. Distribution of epilimnion dissolved oxygen concentrations for each Clinton Lake monitoring site during 1978 through 1991 and for periods prior to and during Clinton Power Station operation.

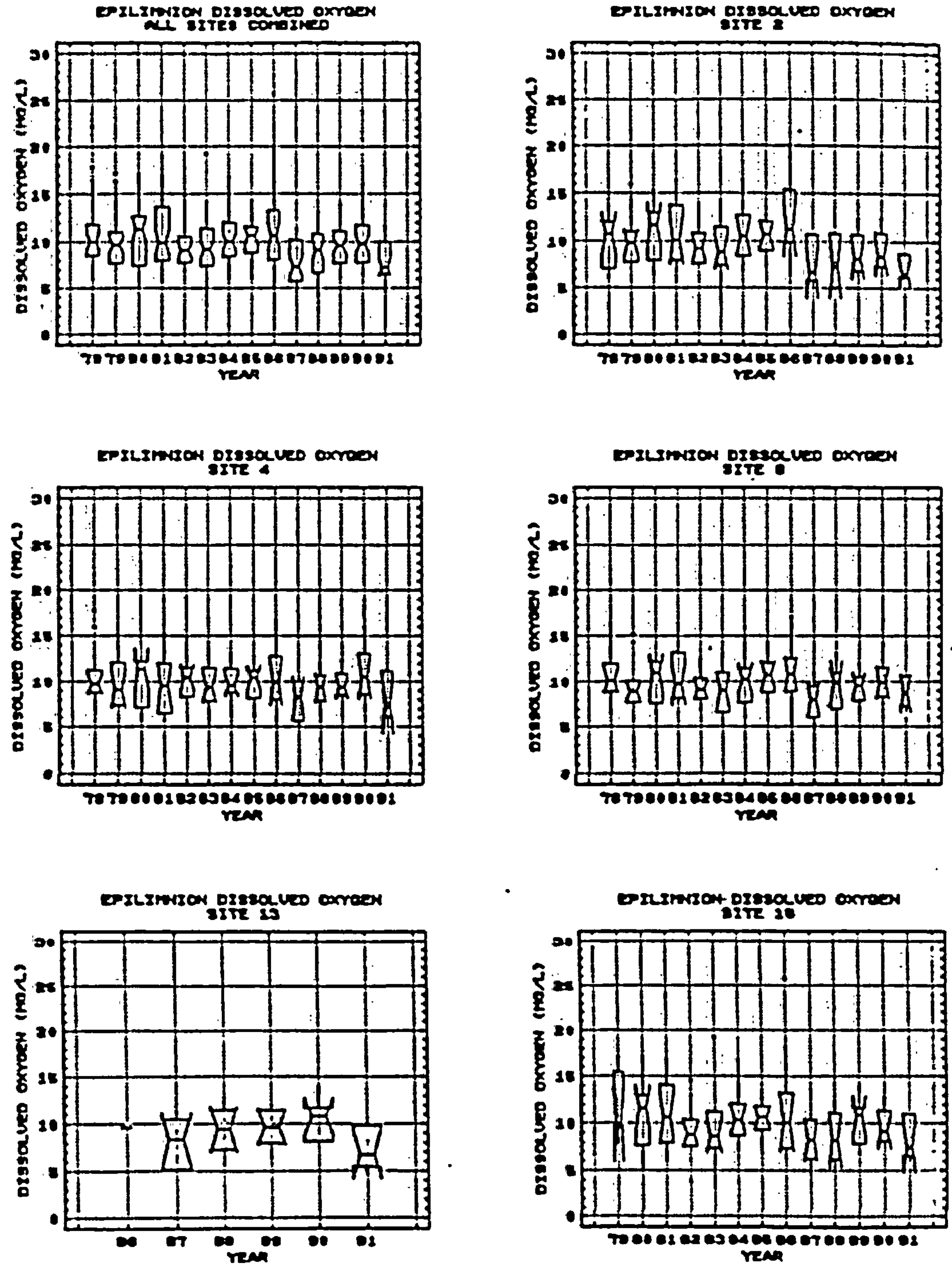


Figure 26. Distribution of epilimnion dissolved oxygen concentrations for Clinton Lake monitoring sites during 1978 through 1991.

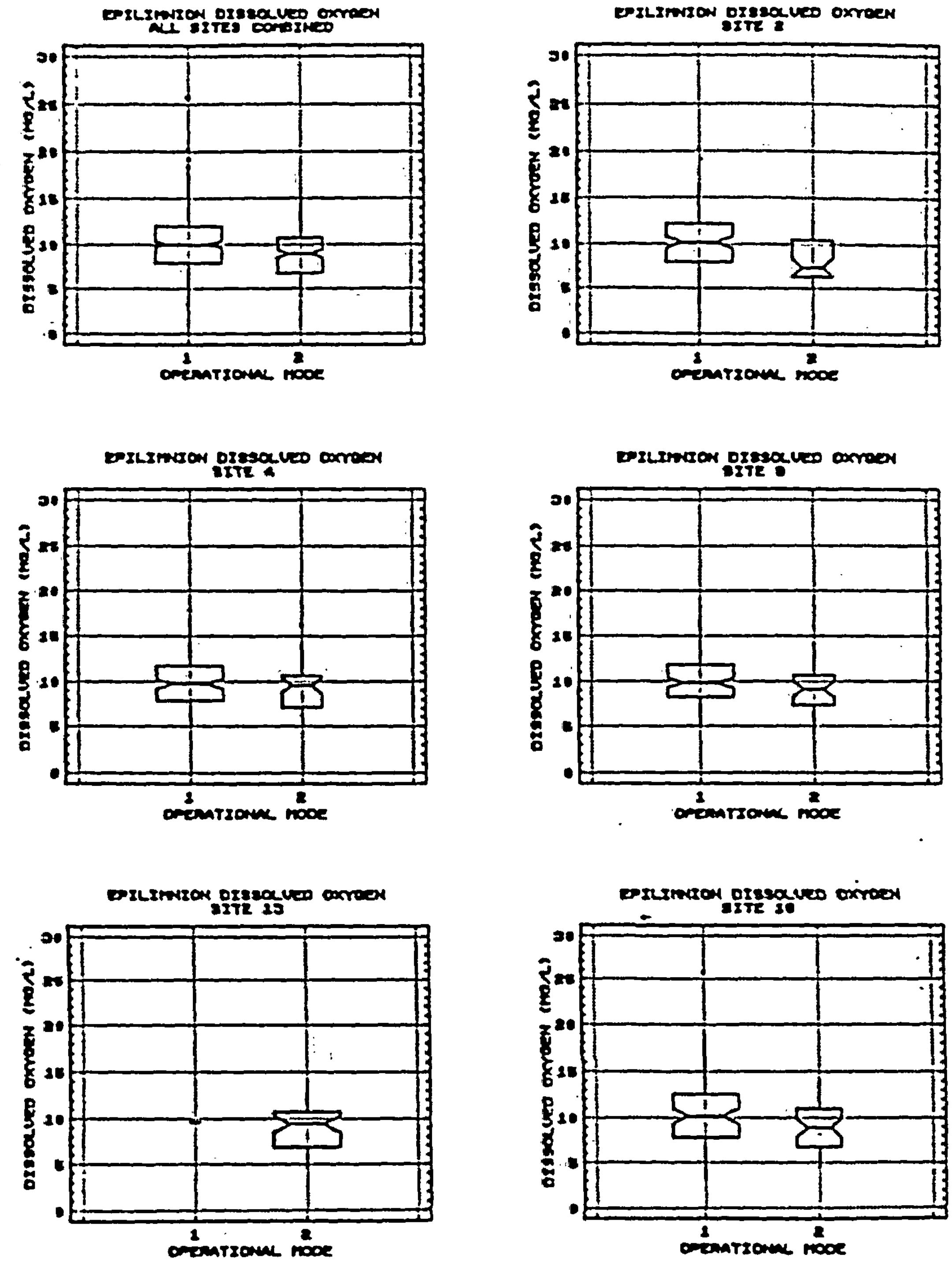


Figure 27. Distribution of epilimnion dissolved oxygen concentrations between preoperational (Mode 1) and operational (Mode 2 and periods for each Clinton Lake monitoring site.

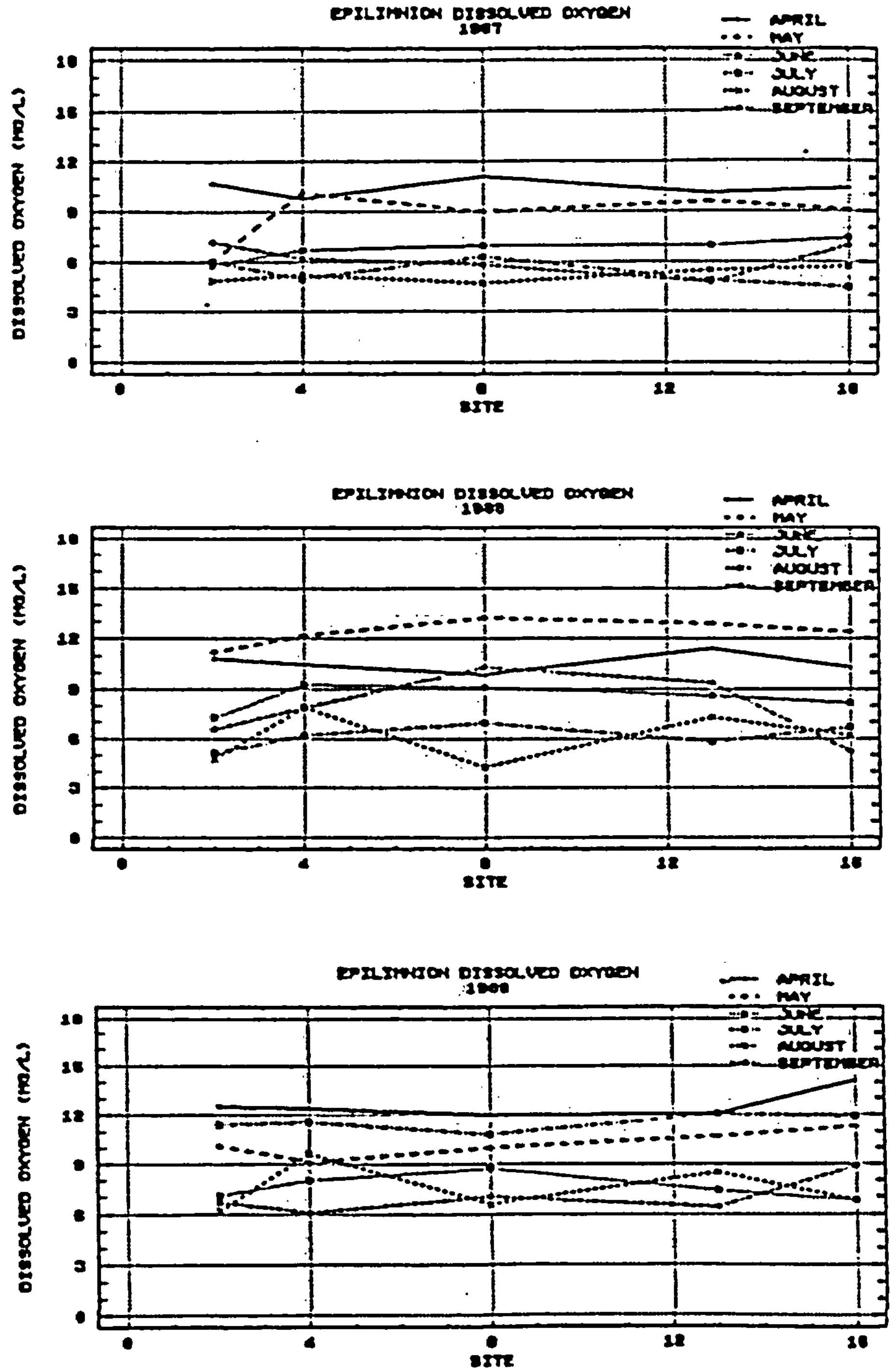


Figure 28. Epilimnion dissolved oxygen concentrations at Clinton Lake monitoring sites during April through September for 1987 through 1989.

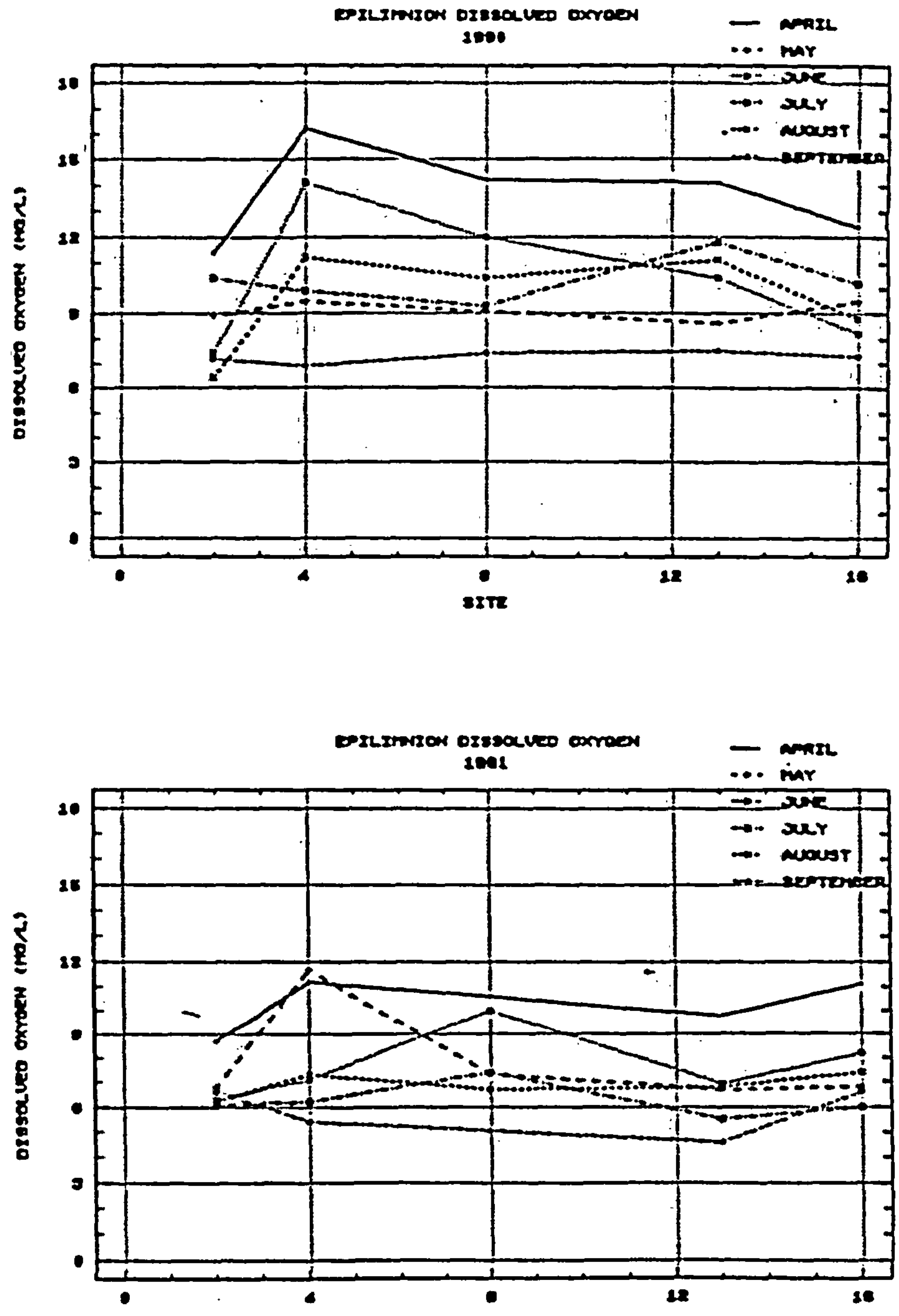


Figure 29. Epilimnion dissolved oxygen concentrations at Clinton Lake monitoring sites during April through September for 1990 and 1991.

Table 9. Number and percent of observations from epilimnion samples collected from Clinton Lake where data were not within General Use water quality standards set by the Illinois Pollution Control Board.

Parameter	IPCB (a) Standard	1978 Through 1991			Preoperational Period (78-86)(b)			Operational Period (87-91)(c)		
		Number Samples	Number in Exceedence	Percent in Exceedence	Number Samples	Number in Exceedence	Percent in Exceedence	Number Samples	Number in Exceedence	Percent in Exceedence
Dissolved Oxygen	5.0 mg/l	11	11	2	402	3	<1	189	8	4
pH	6.5-9.0	591	1	<1	402	1	<1	189	0	0
Total Dissolved Solids	1,000 mg/l	491	0	0	391	0	0	100	0	0
Chloride	500 mg/l	377	0	0	277	0	0	100	0	0
Sulfate	500 mg/l	377	0	0	277	0	0	100	0	0
Ammonia	1.5 mg/l	493	0	0	393	0	0	100	0	0
Nitrate	10 mg/l	588	8	3	398	6	1	190	2	1
Total Phosphorus	0.05 mg/l	587	429	73	398	269	68	189	160	85
Copper (d)	20 ug/l	387	0	0	387	0	0	-(e)	-	-
Lead (d)	100 ug/l	385	0	0	385	0	0	-	-	-
Mercury	0.5 ug/l	490	25	5	390	25	6	100	0	0
Zinc (d)	1,000 mg/l	387	0	0	387	0	0	-	-	-
Fecal Coliforms	200/100 ml	14		4	14		4	-	-	-

a. 35 Ill. Adm. Code Subtitle C, Chapter I.
b. Pre-Op Refers to data collected prior to operation of Clinton Power Plant
c. Operational Refers to data collected during period when Clinton Power Plant became operational
d. Data were only collected from 1978 through 1986.
e. Dash (-) indicates datum was not determined.

Table 10. Descriptive statistics for dissolved oxygen (mg/l) depth profiles from Clinton Lake during 1985 through 1991.

Statistic	1985	1986	1987	1988	1989	1990	1991
Sample Size	258	258	498	376	462	486	428
Average	9.4	9.2	7.1	7.7	8.0	8.5	6.9
Median	10.2	9.2	6.7	8.6	8.7	8.3	6.6
Variance	8.6	14.8	7.8	12.0	8.7	9.7	8.3
Minimum	0.2	0.4	0.1	0.03	0.04	0.26	0.16
Maximum	16.1	25.7	11.5	13.4	15.7	16.3	11.9
Range	15.9	25.3	11.4	13.4	15.7	16.0	11.7

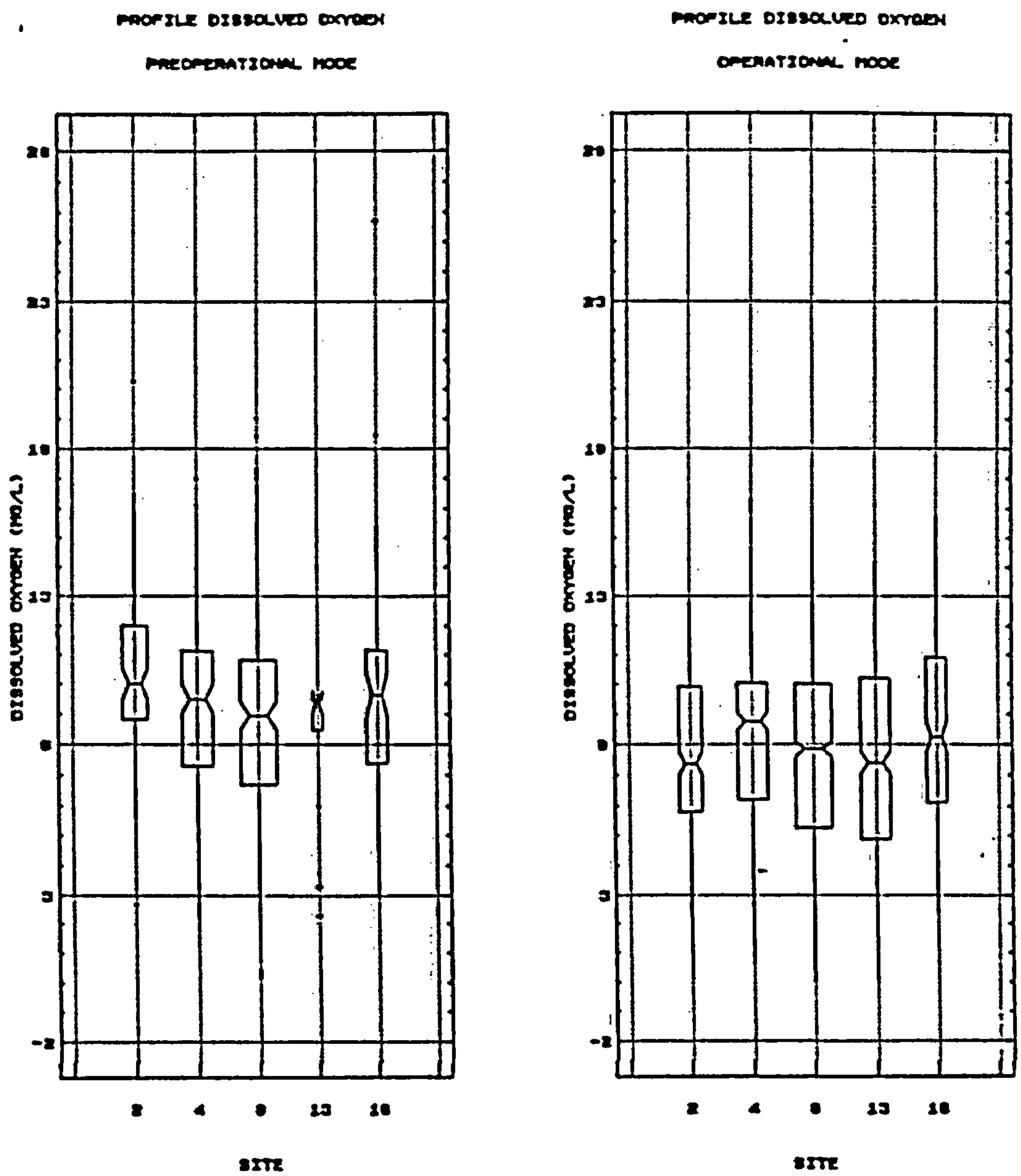


Figure 30. Distribution of dissolved oxygen concentrations (mg/l) from Clinton Lake monitoring sites for periods prior to (1985 and 1986) and during (1987 through 1991) Clinton Power Station operation.

Table 11. Average dissolved oxygen concentrations (mg/l) from profiles for monitoring sites in Clinton Lake during through 1991.

Year	Site 4	Site 8	Site 2	Site 16
1985	9.3	9.0	10.2	9.9
1986	9.5	8.7	10.1	9.7
1987	7.3	6.9	7.2	7.6
1988	8.6	7.6	7.3	8.3
1989	8.5	7.6	7.9	9.2
1990	9.6	7.7	8.6	9.0
1991	7.6	6.7	6.5	8.0

Table 12. Descriptive statistics of dissolved oxygen concentrations (mg/l) from depth profiles for Clinton Lake monitoring sites prior to (1985 and 1986) and during Clinton Power Station operation (1987 and 1991).

	Site 2		Site 8		Site 4		Site 13(c)		Site 16	
Statistic	Pre(a)	Op(b)	Pre	Op	Pre	Op	Pre	Op	Pre	Op
Sample Size	88	282	198	766	142	471	16	506	72	225
Average	10.2	7.5	8.9	7.3	9.4	8.3	8.2	7.4	9.8	8.4
Median	10.0	7.4	9.0	7.8	9.5	8.8	9.4	7.4	9.6	8.3
Variance	7.7	7.2	17.0	11.2	9.1	7.4	5.3	10.5	10.1	7.4
Minimum	2.7	0.1	0.2	0.03	2.2	0.6	2.3	0.06	2.9	2.4
Maximum	20.3	12.8	19.0	14.5	17.0	16.3	9.6	14.2	25.7	15.7
Range	17.6	12.7	18.8	14.5	14.8	15.7	7.3	14.2	22.8	13.3

a. Pre – Refers to data collected prior to the operation of Clinton Power station.
b. Op – Refers to data collected during the period after Clinton Power Station became operational.
c. Site 13 was not sampled prior to 1986.

preoperational period at all sampling sites (Figure 31). Average DO concentrations decreased at increased depth strata during preoperatio and operational periods (Table 13). Average DO concentrations w lower for each depth stratum during the operational period (Table 13). Differences between preoperational and operational DO concentrations ranged from 1.2 to 2.3 mg/l. Significant differences occurred in the distribution of DO concentrations for the one through six meter strata (Figures 32 and 33).

8.2.2 Percent Saturation

Epilimnion Dissolved Oxygen Percent Saturation

The percent saturation for DO averaged 95% in the 489 samples collected from 1978 through 1991. During this period the DO saturation ranged from 0.6 to 195%. Distributions of data were similar for preoperational and operational periods (Figure 34). There were no apparent patterns in the distribution of DO saturation data for sampling sites during preoperational or operational conditions (Figure 35). Plots of preoperational DO saturation by months indicate seasonal influences in the distribution of data (Figure 36). Percentages tend to increase from February through May; percentages are generally lower during June through September; and percentages are greater during October through January (Figure 36). Samples were collected quarterly during operational conditions. Thus, monthly distributions of operational DO percent saturation are relatively incomplete since data were only collected during April, June, July, September, October, and November. There were no significant differences between preoperational and operatior conditions among months (Figure 37). Also, there was no appare pattern in the distributions of percent saturation data by years (Figure 38).

Dissolved Oxygen Percent Saturation During Stratification

The average percent DO saturation for metalimnion and hypolimnion strata was 36 and 22%, respectively. This was considerably lower than the epilimnion average of 95%. The average percent saturation decreased with depth during periods of stratification (Figure 39). The percentages of DO saturation generally decreased with succeeding months during stratification, especially in the metalimnion and hypolimnion (Figure 40). Percentages were similar during preoperational and operational periods for each site at each respective stratum (Figure 41). Distributions of percentages for each stratum among years were variable and distributions when CPS was operational (1987 through 1991) were not significantly different from distributions prior to CPS operation (Figure 42).

8.2.3 Biochemical Oxygen Demand

Biochemical oxygen demand (BOD) is a parameter which is used to estimate the rate of oxygen depletion from biological activities on organic wastes. Oxygen demand of organic wastes is exerted by: aerobic metabolism of organic material; oxidizable nitrogen; and chemical reducing compounds which react with dissolved oxygen (e.g. ferro iron, sulfite, and sulfide).

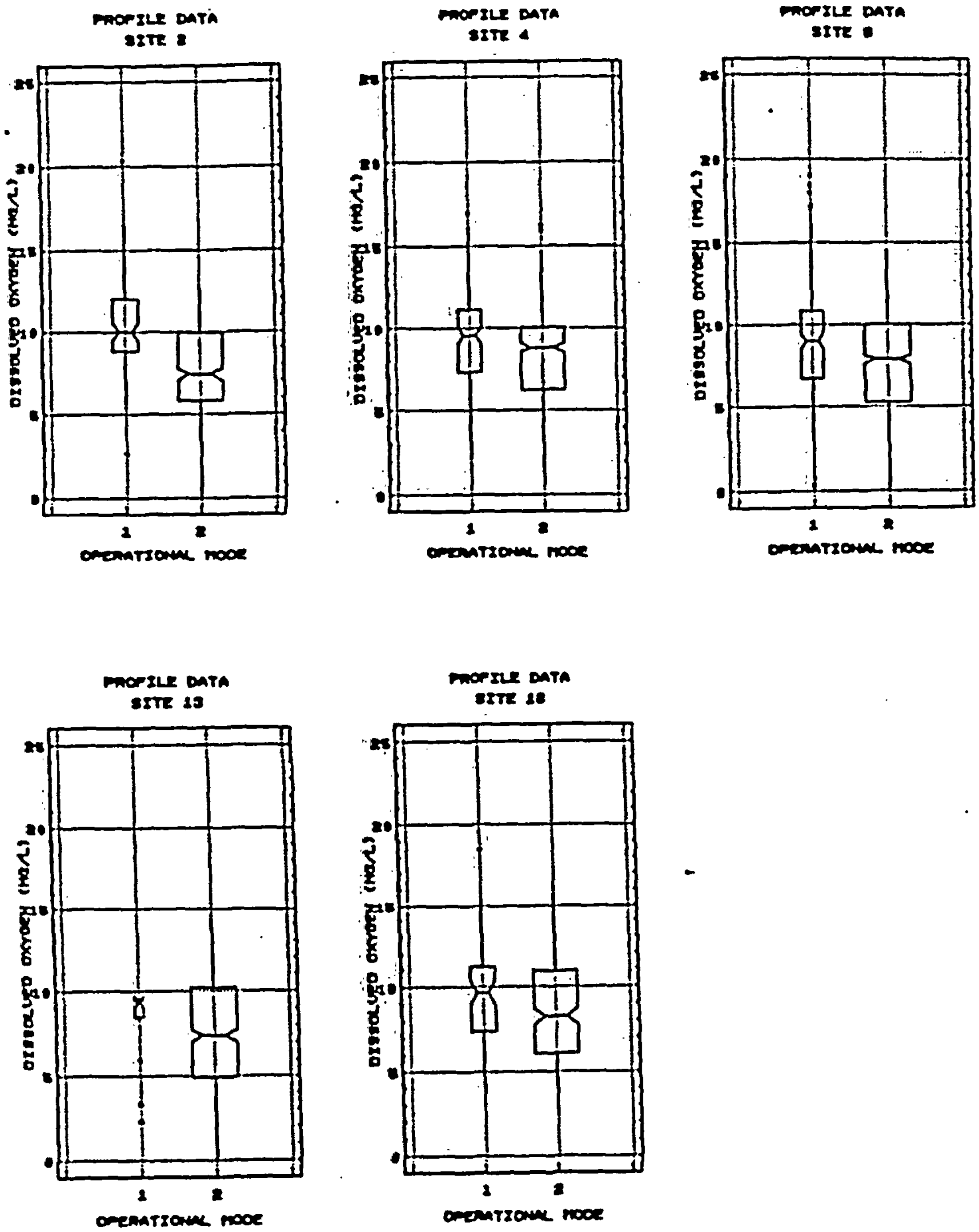


Figure 31. Distribution of dissolved oxygen concentrations (mg/l) for each Clinton Lake monitoring site during periods prior to (Mode 1) and during Clinton Power Station operation (Mode 2).

Table 13. Average dissolved oxygen concentrations (mg/l) for d strata (1 through 10 meters) in Clinton Lake during prior to (preoperational) and during Clinton Power operation (operational).

Depth (m)	Preoperational	Operational	Difference
1	10.4	8.9	1.5
2	9.6	8.4	1.2
3	9.5	7.9	1.6
4	9.4	7.7	1.7
5	9.5	7.3	2.2
6	8.8	6.5	2.3
7	8.3	6.3	2.0
8	7.8	6.2	1.6
9	7.4	5.3	2.1
10	6.7	5.2	1.5

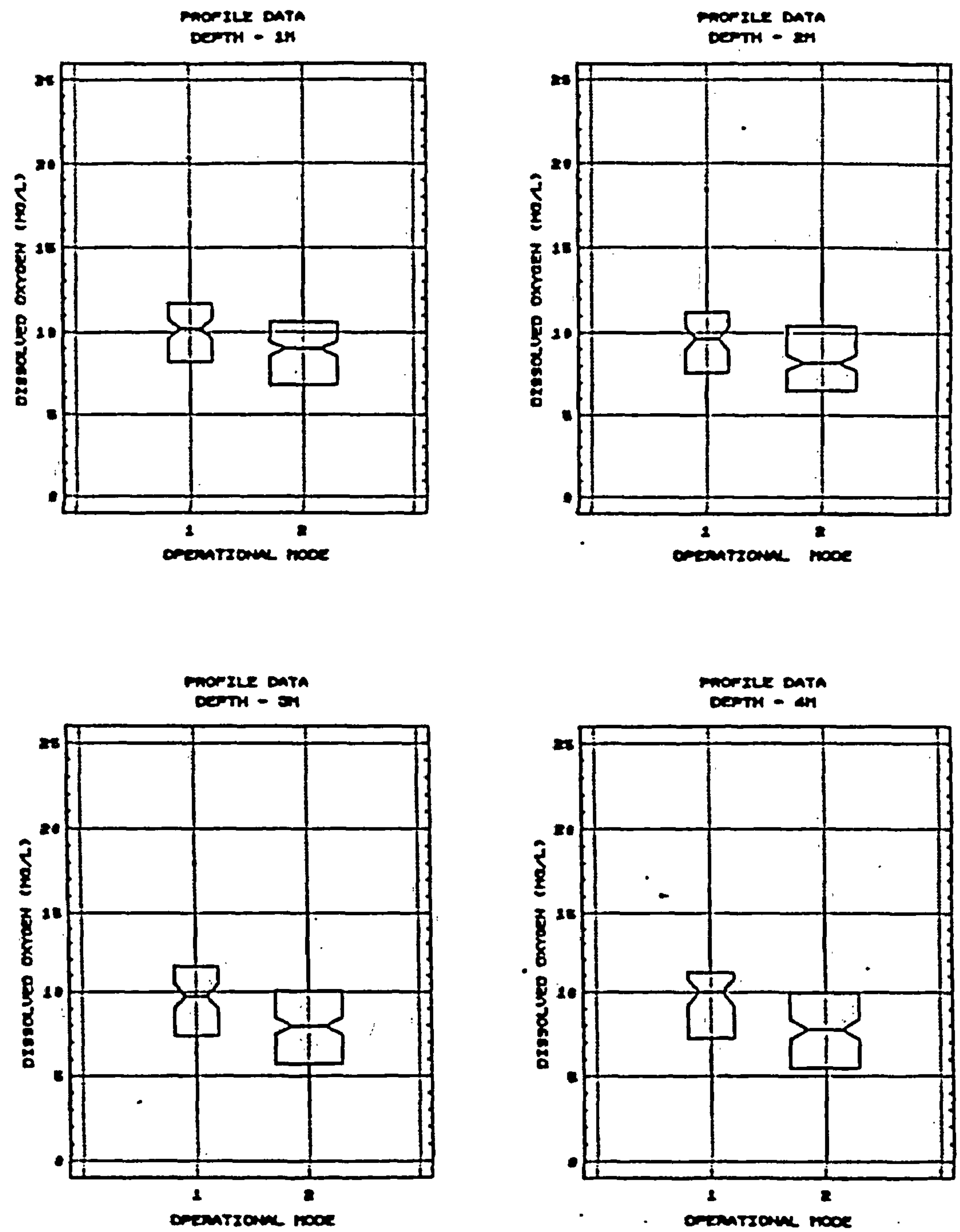


Figure 32. Distributions of dissolved oxygen concentrations (mg/l) in Clinton Lake for depth strata from 1 through 4m for periods prior to (Mode 1) and during Clinton Power Station operation (Mode 2).

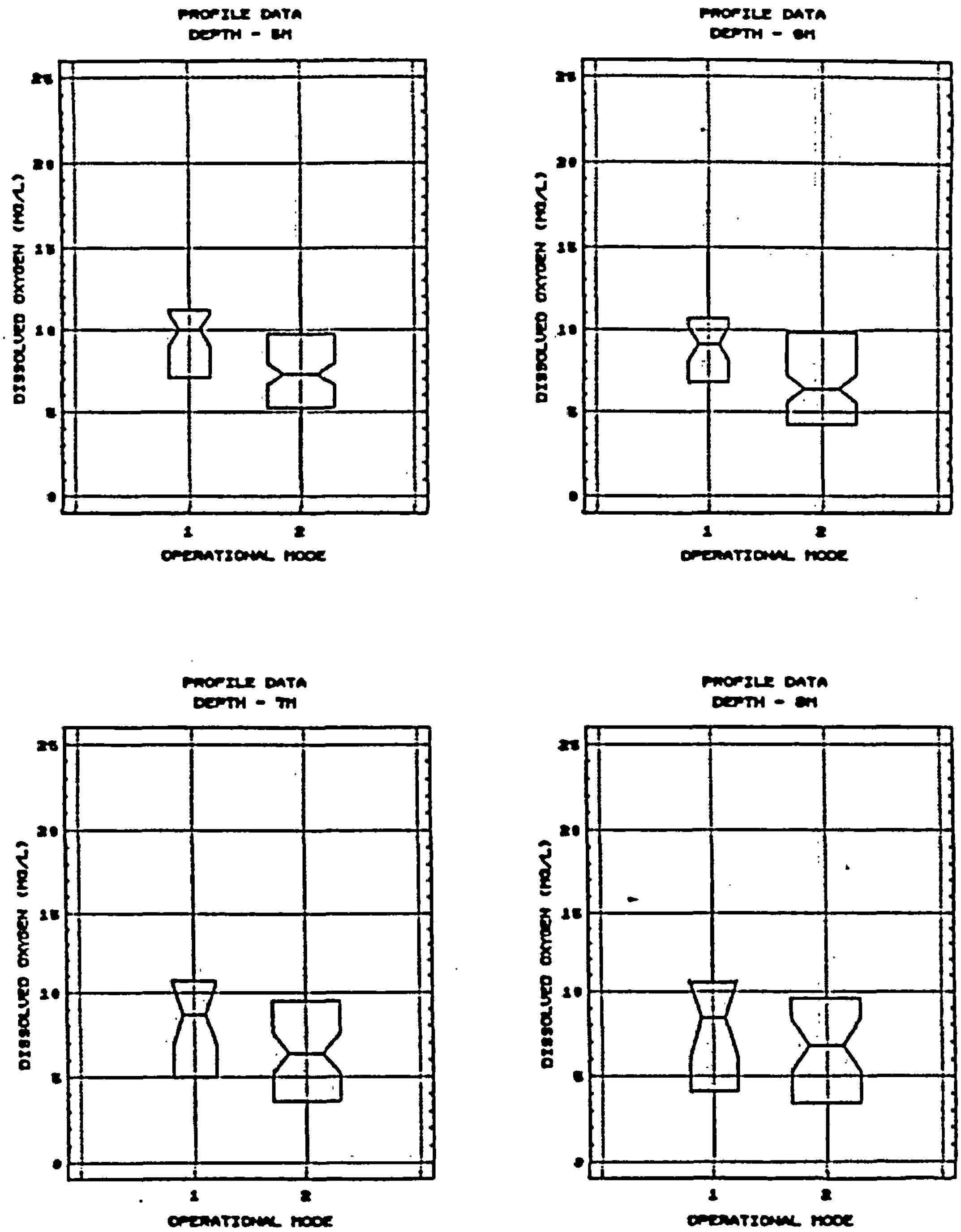
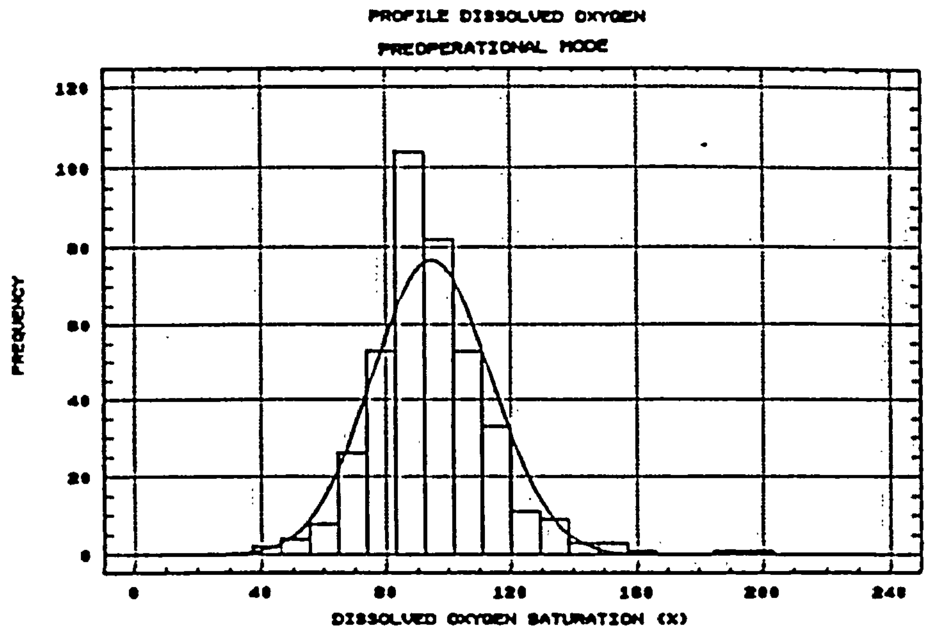


Figure 33. Distributions of dissolved oxygen concentrations (mg/l) i Clinton Lake for depth strata from 5 through 8m and fo periods prior to (Mode 1) and during Clinton Power Stati operation (Mode 2).



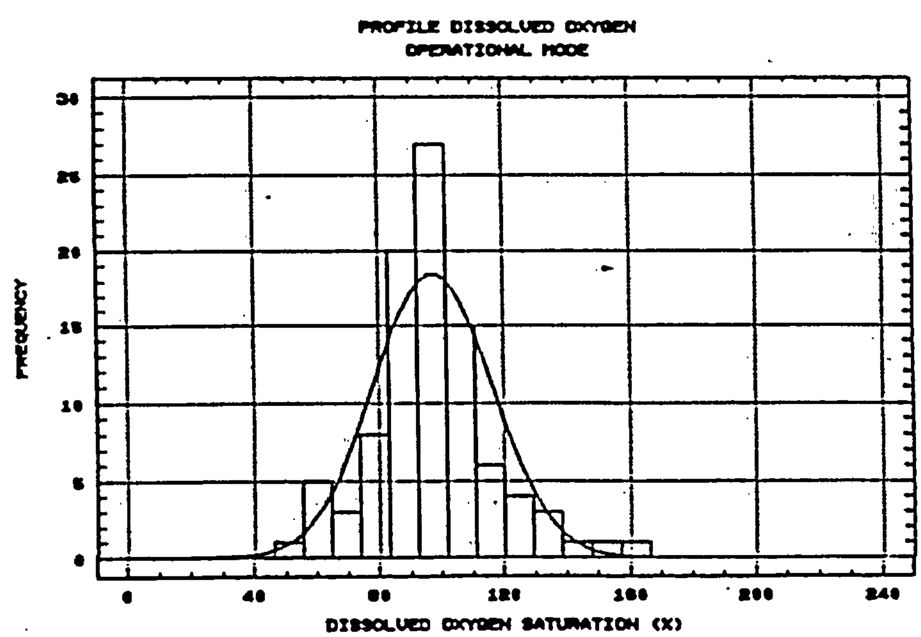


Figure 34. Frequency histograms of dissolved oxygen saturation (%) in Clinton Lake during periods prior to (top graph) and during Clinton Power Station operation (bottom graph).

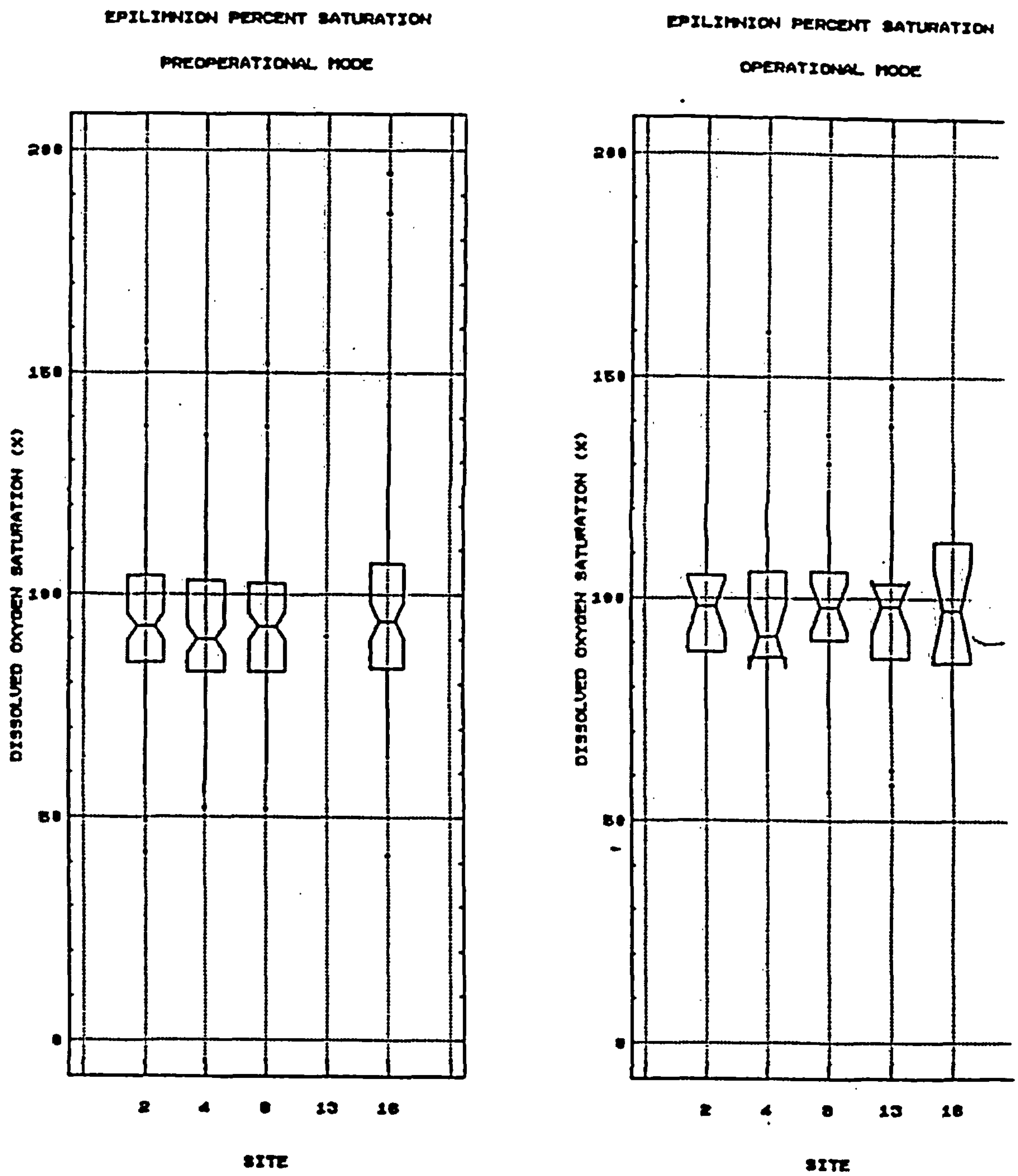


Figure 35. Distribution of epilimnion dissolved oxygen saturation (% for each Clinton Lake monitoring site during periods pri to (left graph) and during Clinton Power Station operati (right graph).

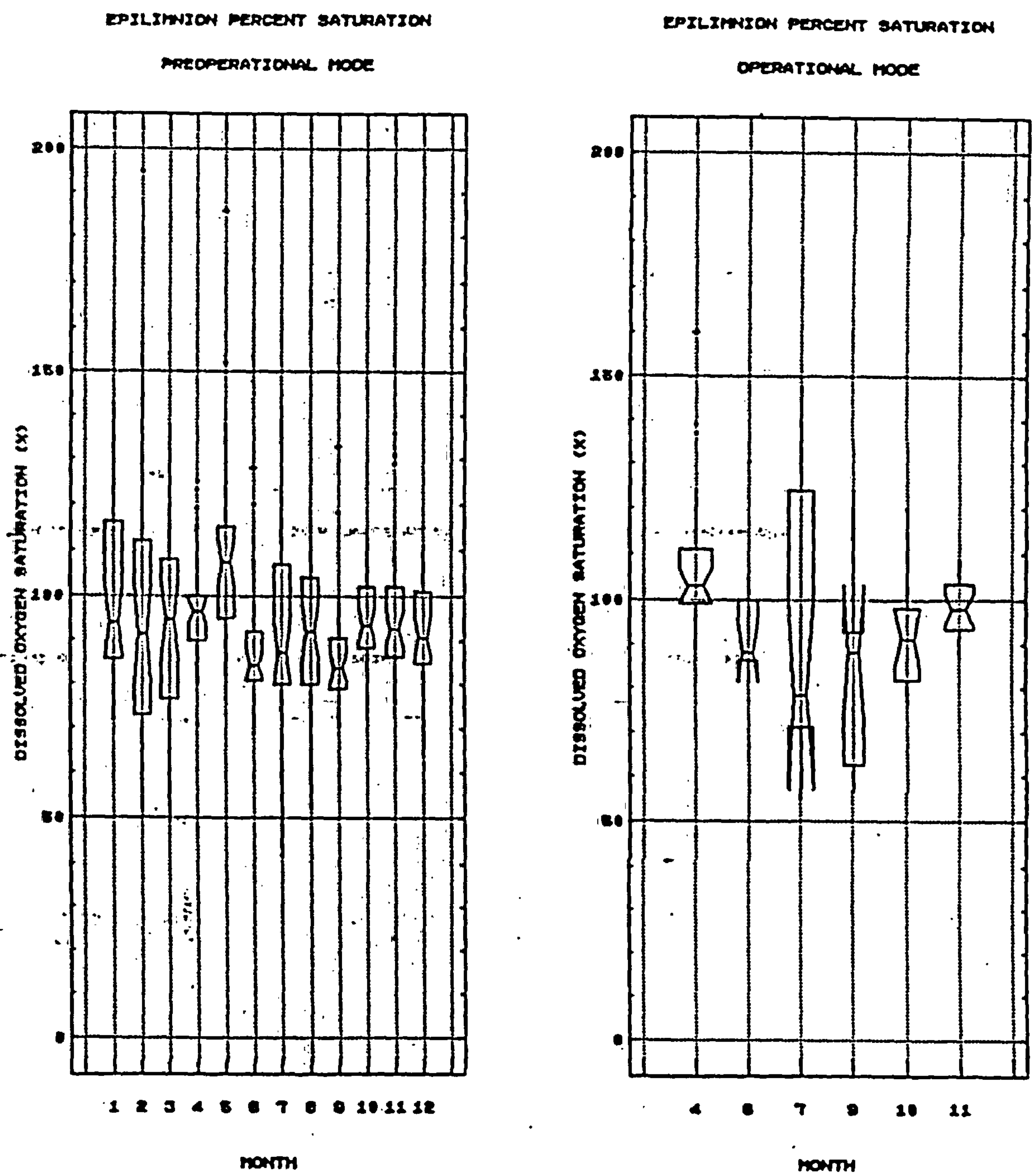


Figure 36. Distribution of dissolved oxygen saturation (%) by months in Clinton Lake during the periods prior to (left graph) and during Clinton Power Station operation (right graph).

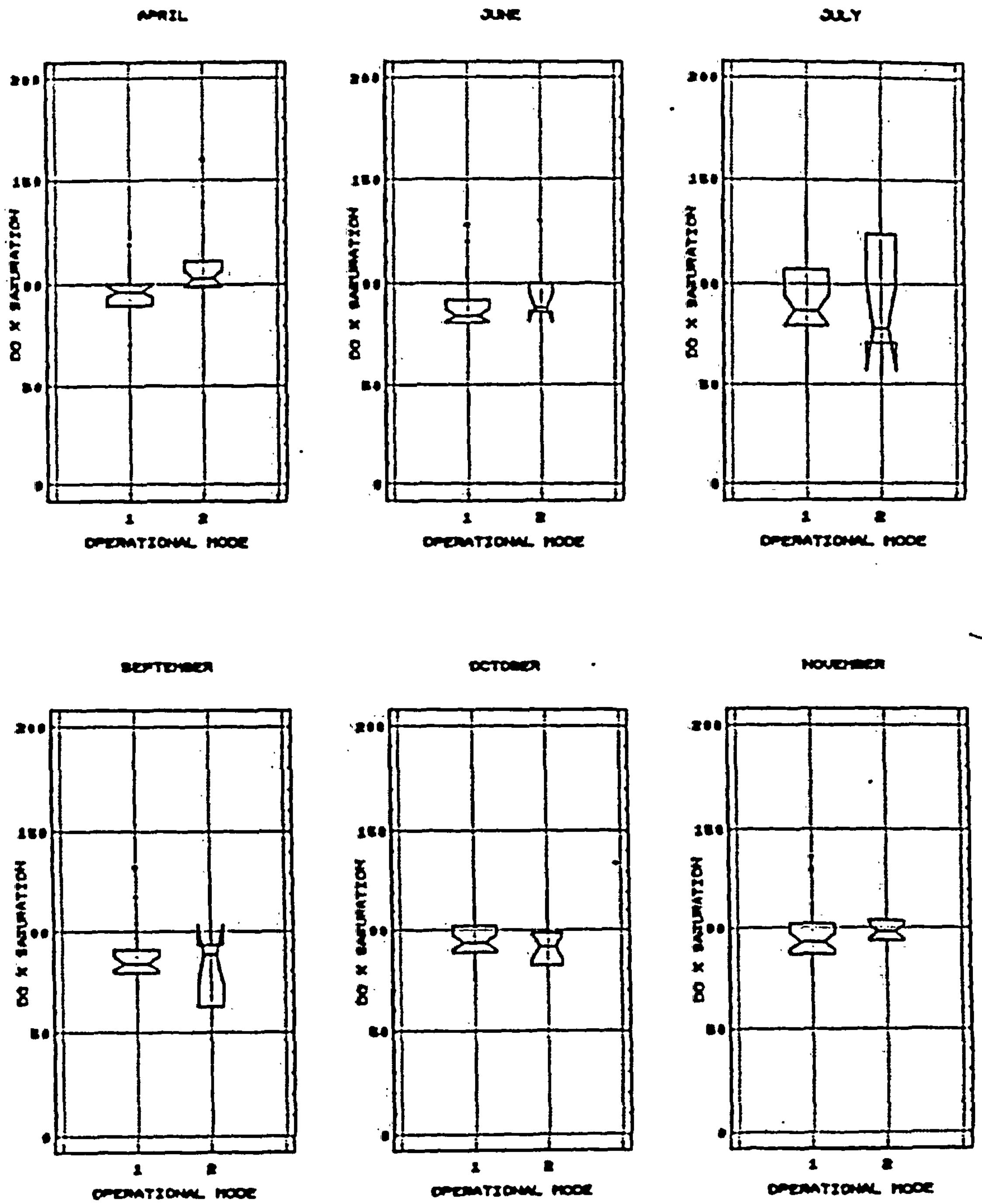


Figure 37. Distributions of epilimnion dissolved oxygen saturation (%) for April, June, July, September, October, and Novemb during periods prior to (Mode 1) and during Clinton Po Station operation (Mode 2).

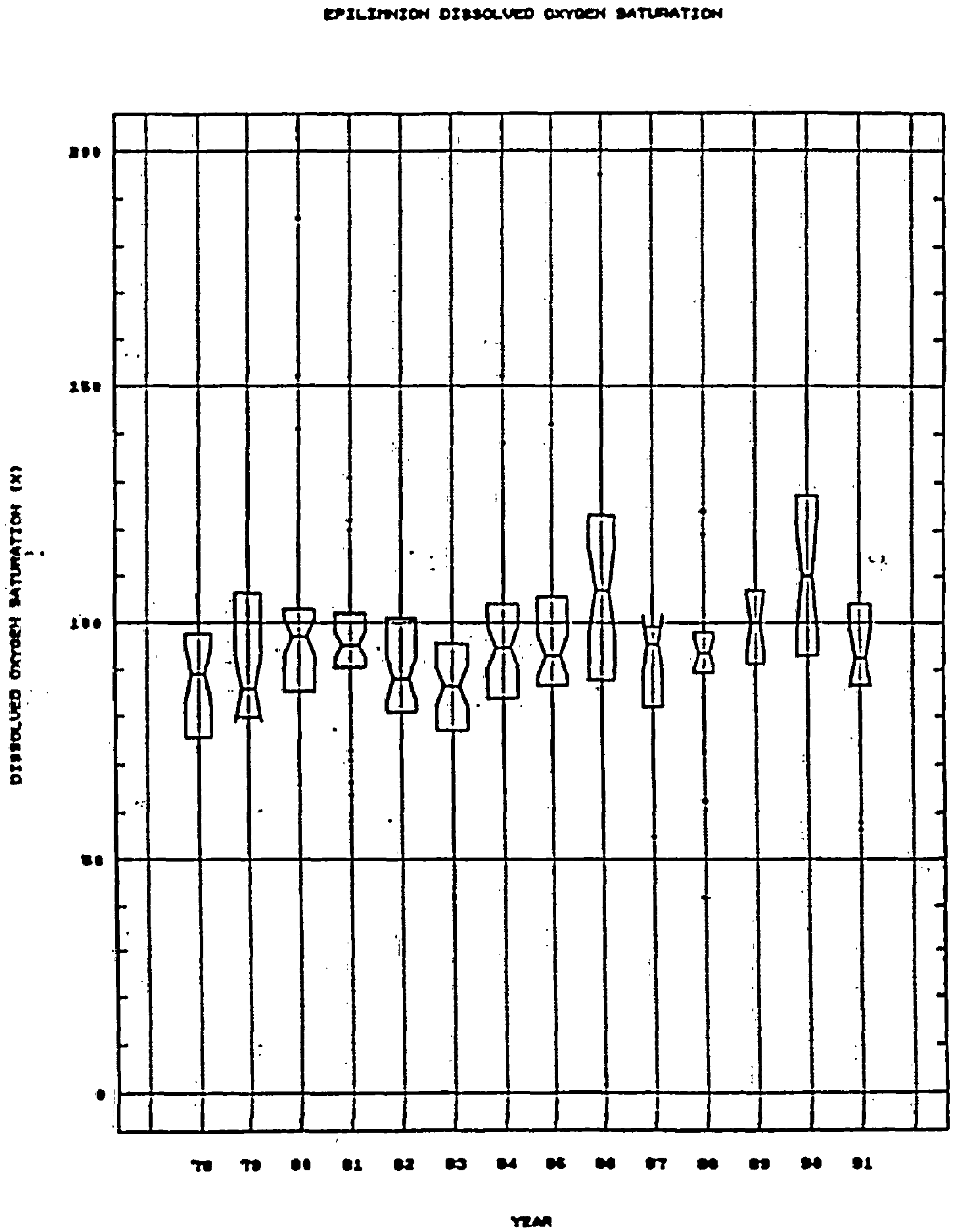


Figure 38. Distribution of epilimnion dissolved oxygen saturation (%) for Clinton Lake during 1978 through 1991.

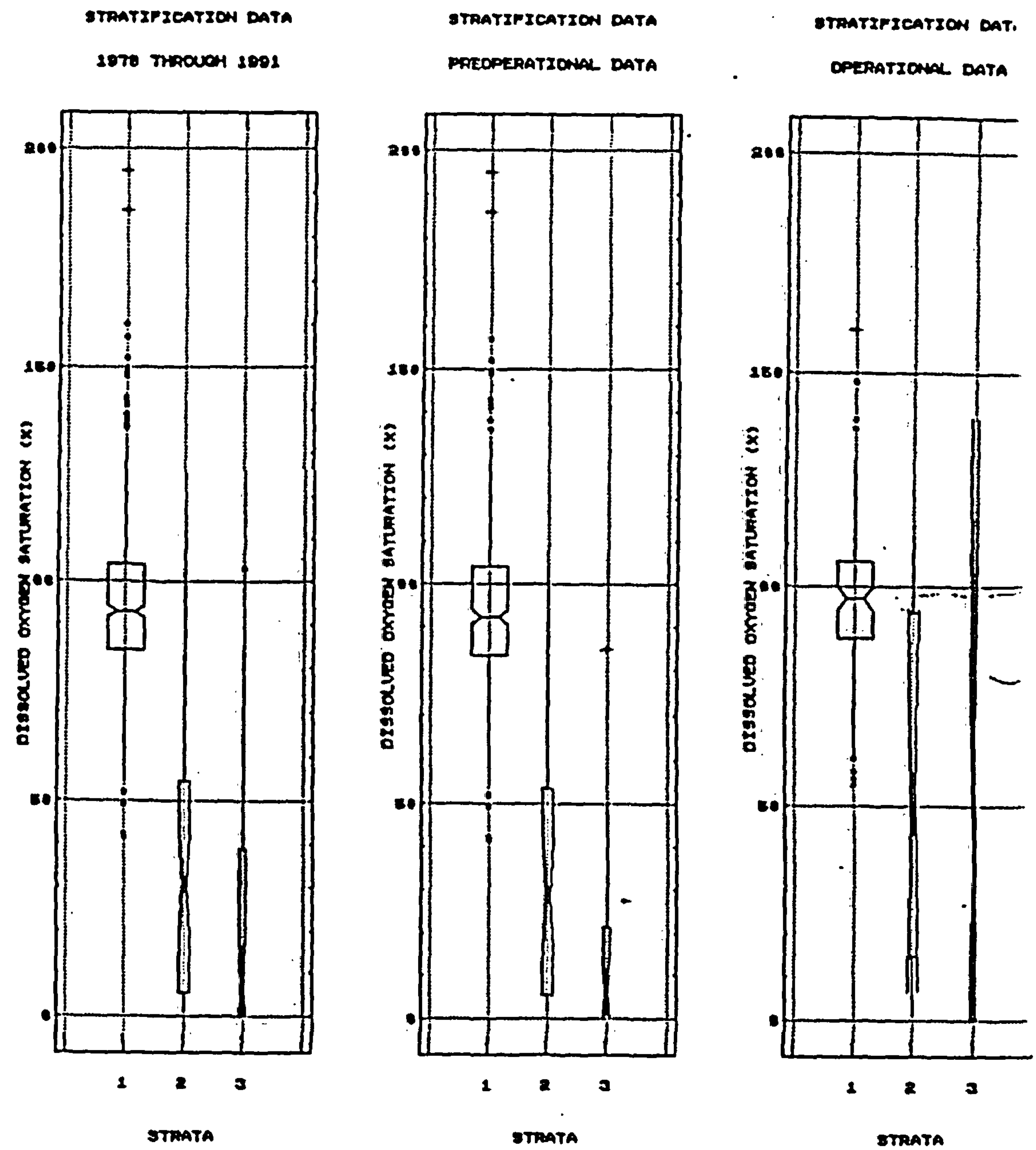


Figure 39. Distribution of dissolved oxygen saturation (%) in Clinton Lake for epilimnion (1), metalimnion (2), and hypolimnion (3) strata during 1978 through 1991 and during the period prior to and during Clinton Power Station operation.

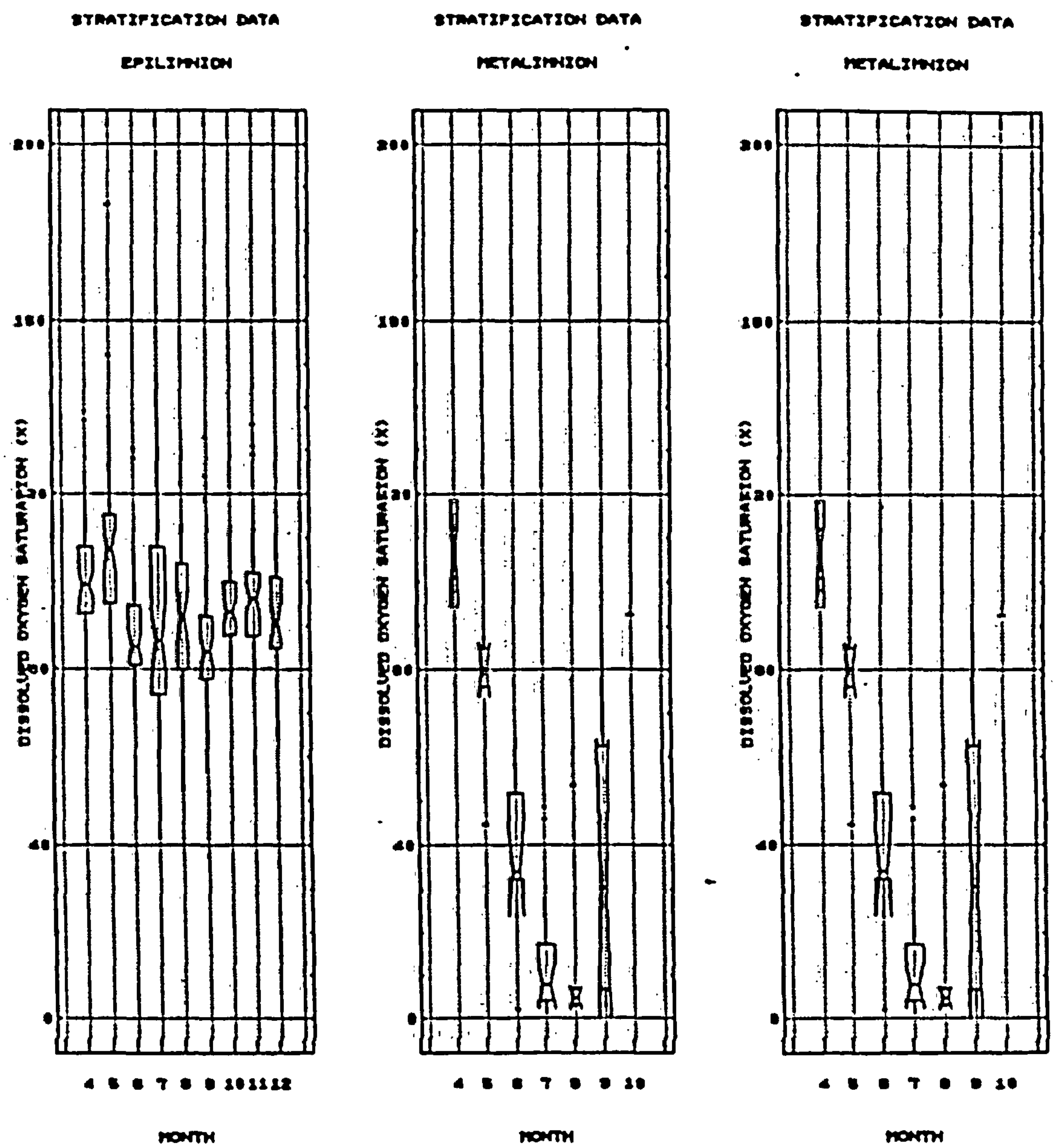


Figure 40. Monthly distributions of dissolved oxygen saturation (%) in Clinton Lake for epilimnion, metalimnion, and hypolimnion strata during 1978 through 1991.

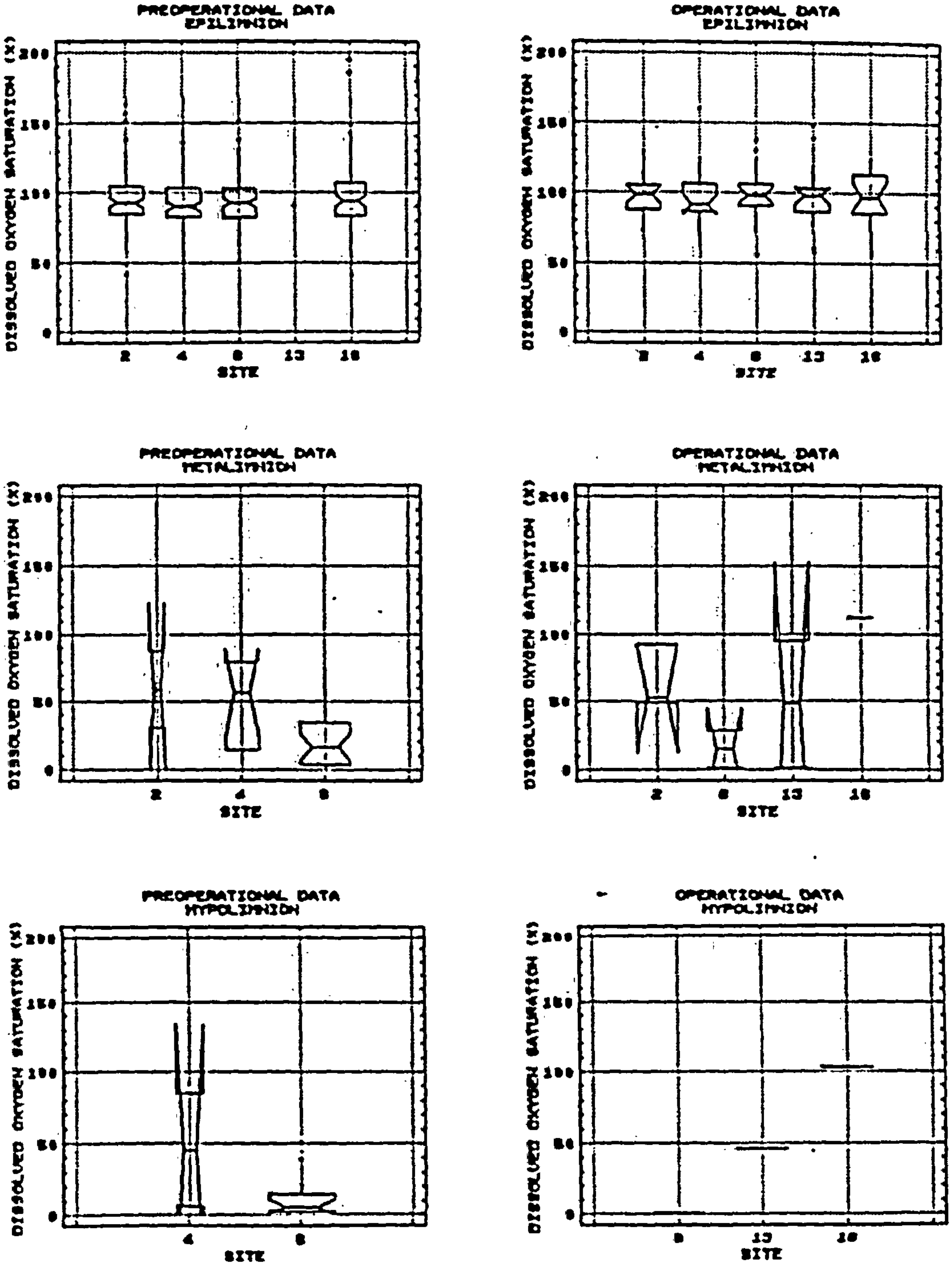


Figure 41. Distribution of dissolved oxygen saturation (%) by site i Clinton Lake for epilimnion, metalimnion, and hypolim strata during the period prior to and during Clinton P Station operation.

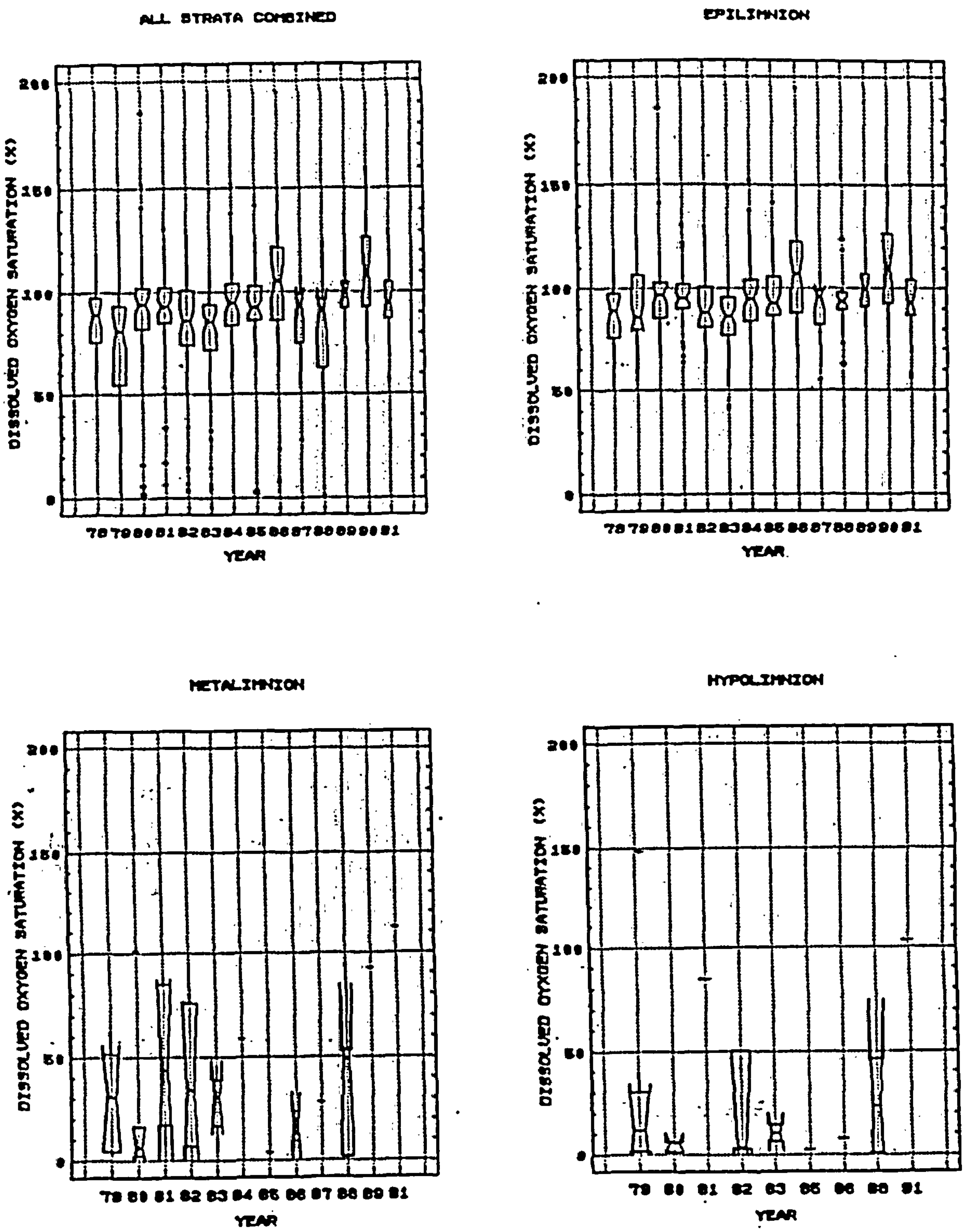


Figure 42. Distribution of dissolved oxygen saturation (%) in Clinton Lake for epilimnion, metalimnion, and hypolimnion strata during 1978 through 1991.

Epilimnion Biochemical Oxygen Demand

The average BOD for 388 samples collected from Clinton La during 1978 through 1986 was 2.86 mg/l. During this period BO ranged from 0.5 to 10.0 mg/l. Approximately 80% of the BOD values were less than 4 mg/l (Figure 43). The maximum BOD occurred at Site 16 in July, 1980 (Figure 44). Site 16 had significantly greater BOD values compared to the remaining sampling sites (Figure 44). BOD values tended to be greater during the warmer months and lower during colder months (Figure 44). Distribution of yearly mean BOD data indicate inconsistent trends among years (Figure 44).

Metalimnion and Hypolimnion Biochemical Oxygen Demand

Average BOD for 103 samples taken during periods of stratification was 2.59 mg/l. Data ranged from 0.5 to 5.4 mg/l. The maximum concentration occurred at Site 8 during July, 1985. Average BOD concentrations were similar among stratification levels. Averages were 2.68, 2.41, and 2.66 mg/l for epilimnion, metalimnion, and hypolimnion strata, respectively. Distributions of BOD data were similar among sites and stratification levels (Figure 45). The BOD values tended to increase in succeeding months during stratification (Figure 46). There were no consistent trends in the distribution of BOD data among years for each stratum (Figure 47).

8.3 Nitrogen

Nitrogen, phosphorus, carbon, and hydrogen comprise the maj constituents of cellular protoplasm. Nitrogen is important because of its role in the synthesis and maintenance of protein. Nitrogen is also a major nutrient which effects primary productivity in fresh waters. Sources of nitrogen include the atmosphere, biological nitrogen fixation, and runoff from surface and ground waters. Forms of nitrogen in freshwater include total organic nitrogen, ammonia, nitrates, and nitrites. The sources of organic nitrogen are the inputs of nitrogenous debris from the watershed and production through biological activities. Watershed inputs in Clinton Lake include sewage treatment effluents (from CPS and Farmer City), livestock wastes, fertilizer, and crop residues.

8.3.1 Total Organic Nitrogen

Total Organic Nitrogen (TON) is a valuable indicator of productivity in fresh waters. Algal blooms typically will not occur when organic nitrogen concentrations are below 0.6 mg/l (USEPA 1979).

Epilimnion Total Organic Nitrogen

The average TON from 588 samples collected from Clinton Lake from 1978 through 1991 was 0.9 mg/l. The average of 63 Illinois lakes surveyed in 1979 was 0.970 mg/l (Sefton et al. 1980). Concentrations of TON in Clinton Lake ranged from 0.05 to 2.8 mg/l. Distributions of TON concentrations were similar during preoperational and operational

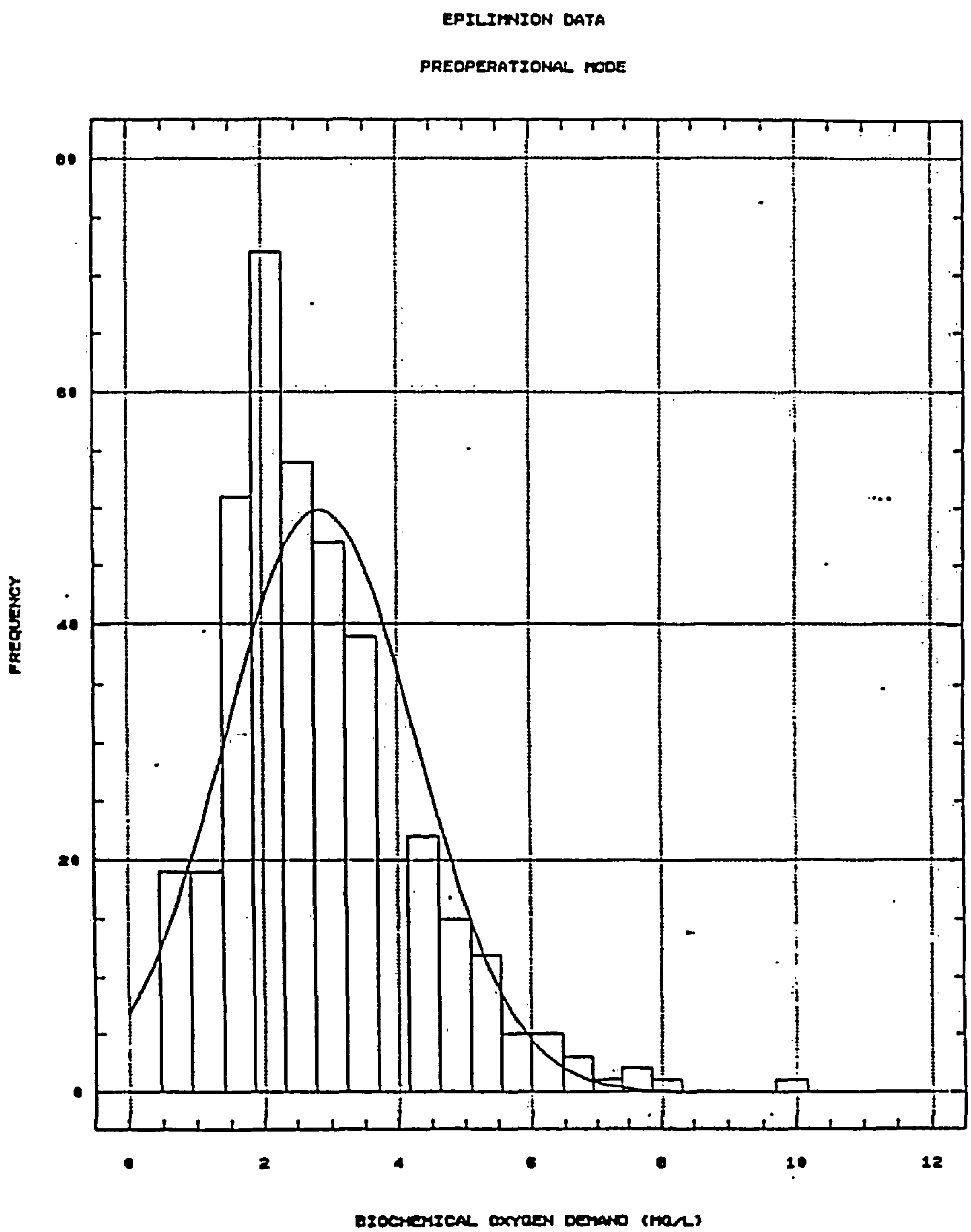


Figure 43. Frequency histogram of biochemical oxygen demand (mg/l) in (mg/l) in Clinton Lake during 1978 through 1986.

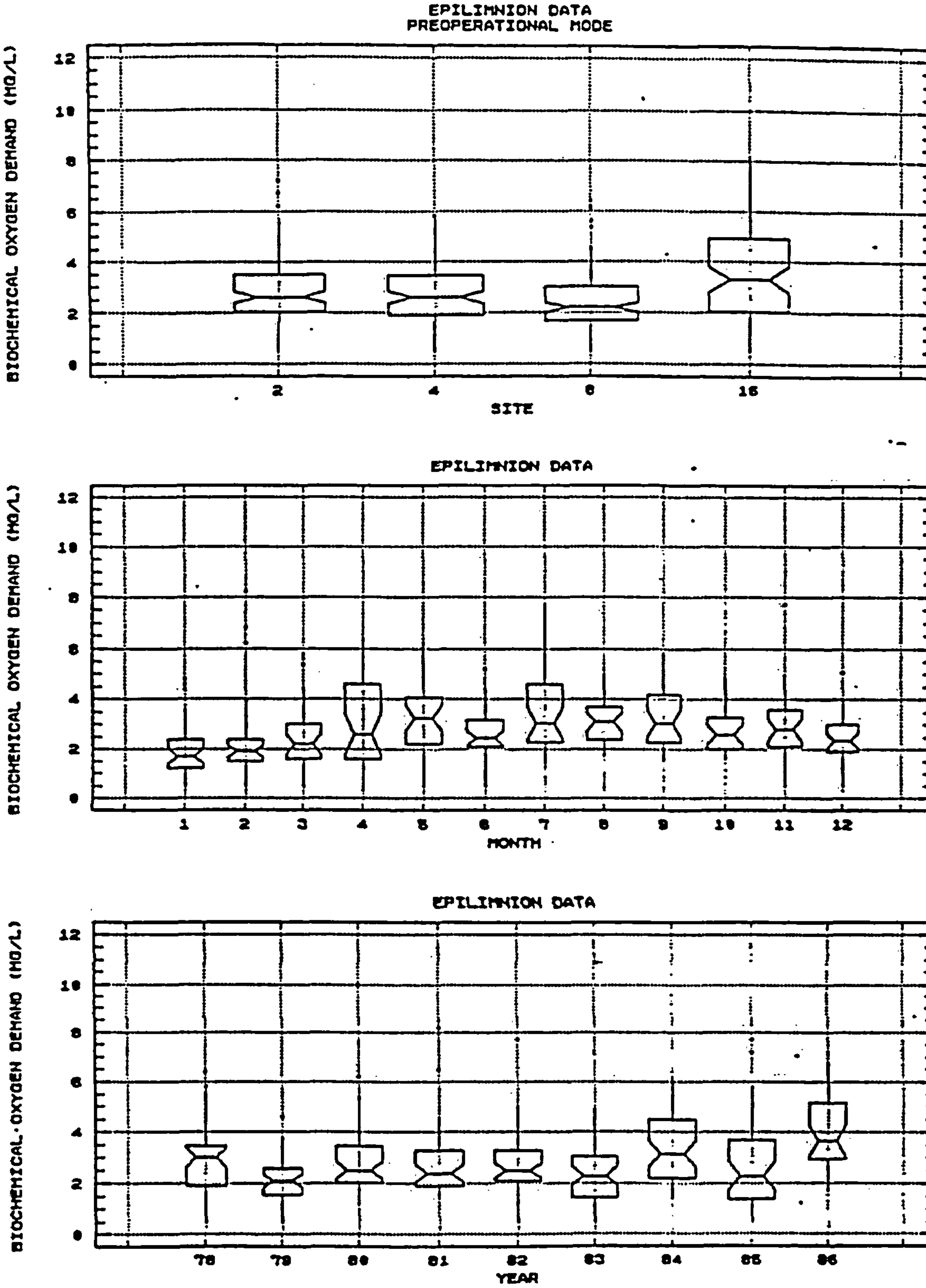


Figure 44. Distributions of epilimnion biochemical oxygen deman (mg/l) in Clinton Lake for monitoring sites, months, an years.

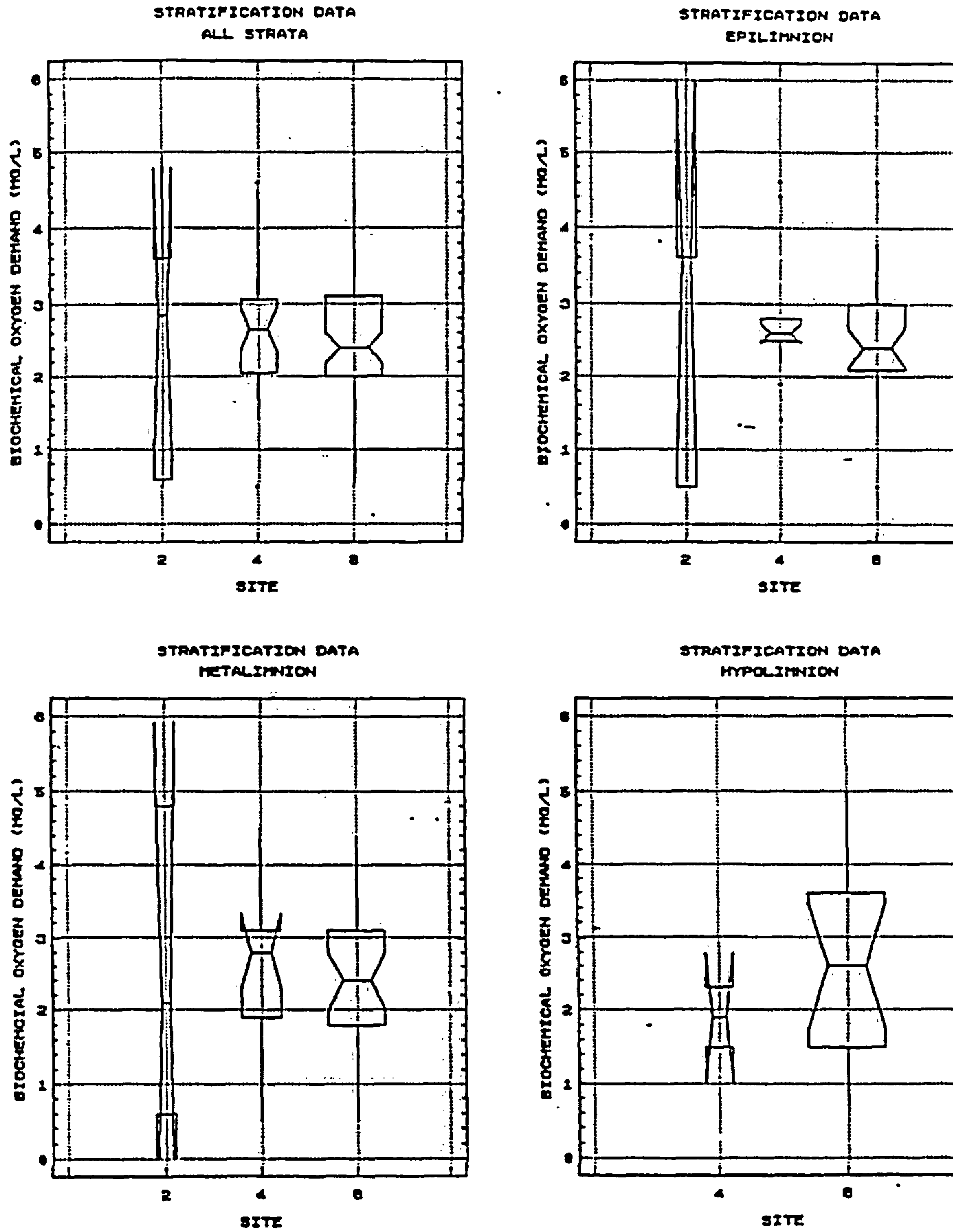


Figure 45. Distribution of biochemical oxygen demand (mg/l) for epilimnion, metalimnion, and hypolimnion strata for monitoring sites in Clinton Lake during 1978 through 1986.

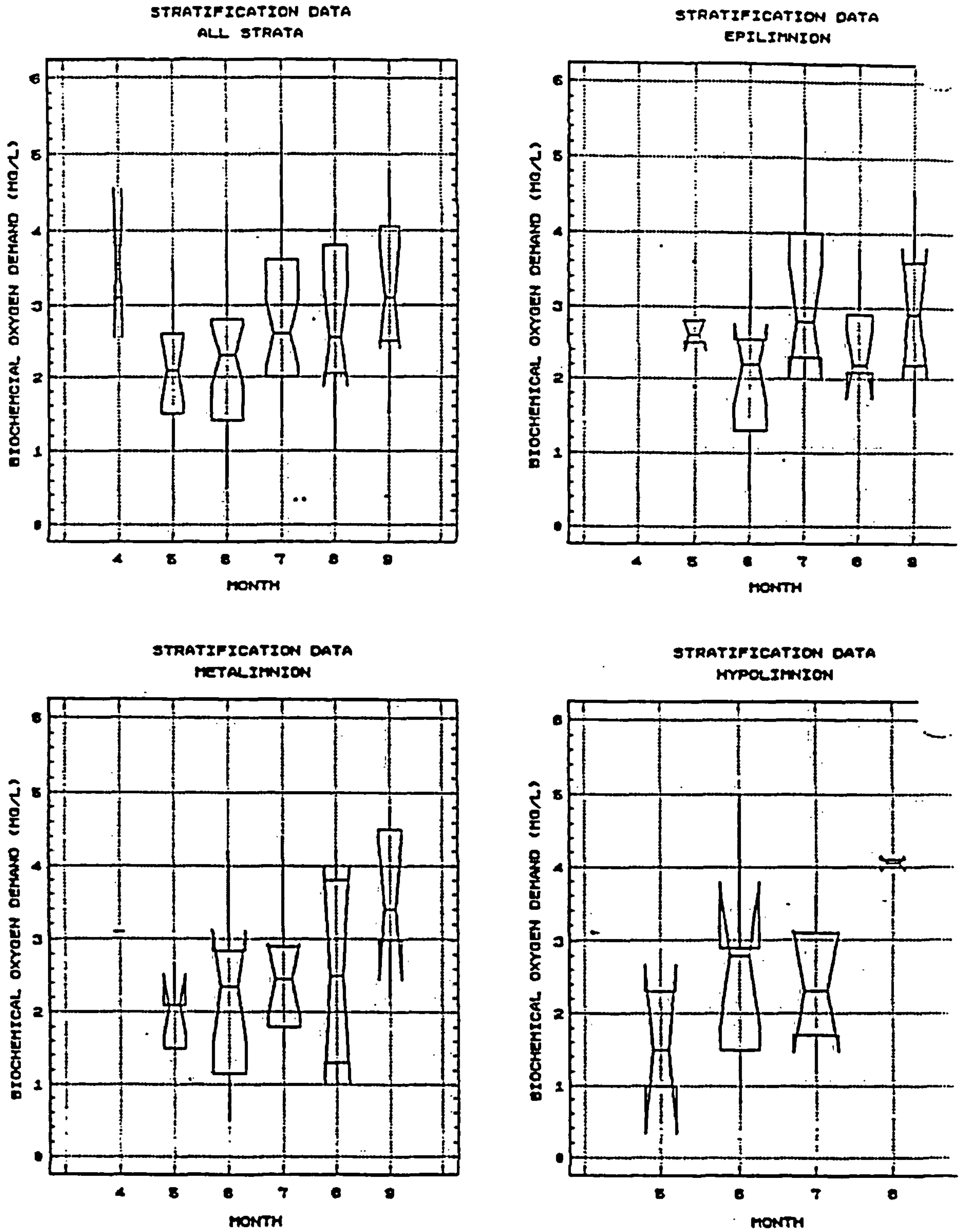


Figure 46. Distribution of biochemical oxygen demand (mg/l) Clinton Lake epilimnion, metalimnion, and hypolimnic strata for April through September during 1978 throug 1986.

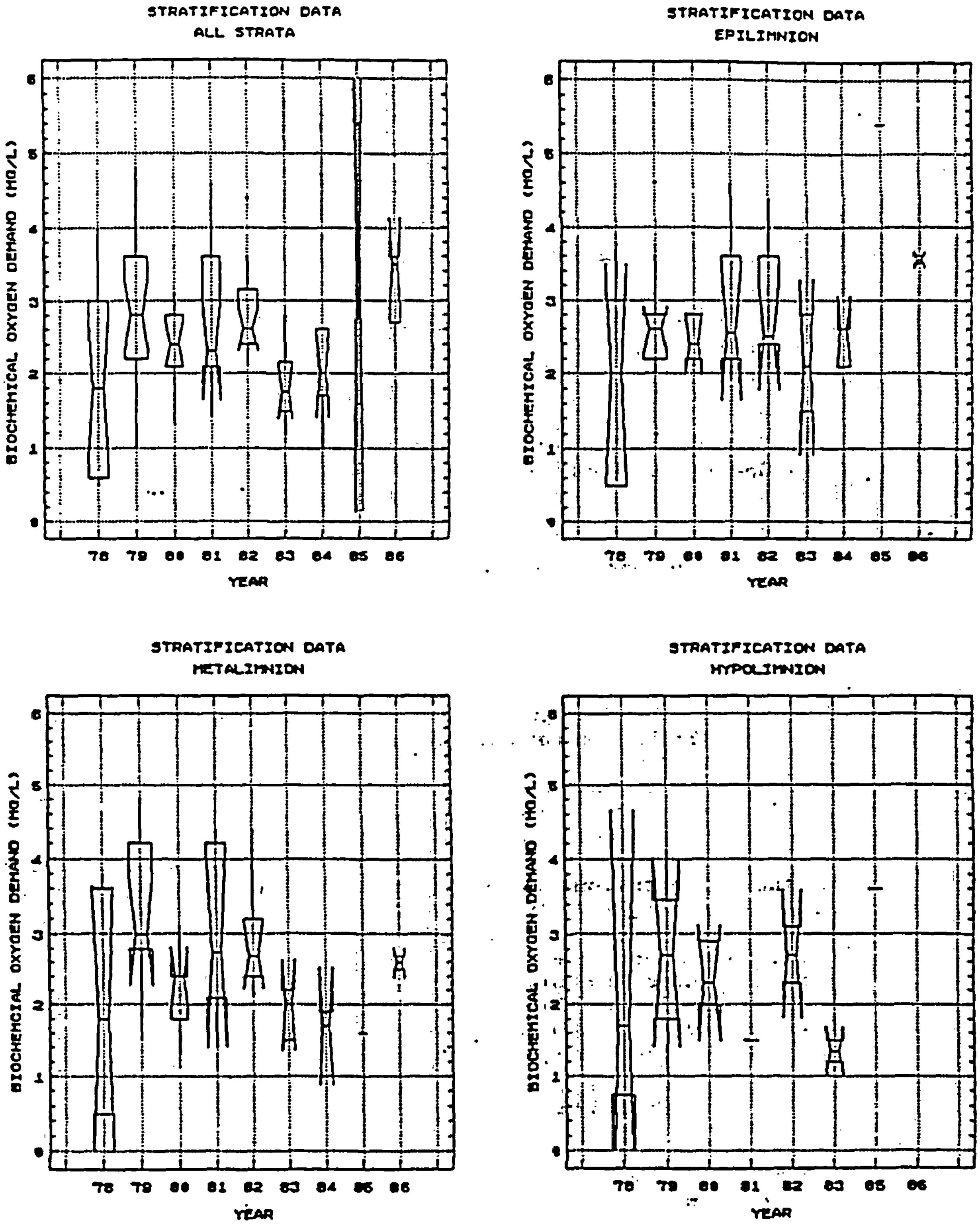


Figure 47. Distribution of biochemical oxygen demand (mg/l) in Clinton Lake for epilimnion, metalimnion, and hypolimnion strata during 1978 through 1986.

periods (Figure 48). There was a down-lake trend for TON concentrations to decrease from the headwaters (Site 16) to midlake (Site 8) (Figure 49). Distribution of annual mean TON densities and trend analysis indicate a decreasing trend for TON concentrations (Figure 50). The distributions of TON concentrations were somewhat lower during the operational period for sites 2, 4, 8, and 16 (Figure 49). Distributions of monthly TON concentrations indicate a general increase in TON concentrations from January through May; thereafter mean TON concentrations tend to decrease through December (Figure 49).

Total Organic Nitrogen During Stratification

The average total organic nitrogen (TON) for metalimnion and hypolimnion strata was 0.75 and 0.76 mg/l, respectively. The average organic nitrogen in bottom water samples for 63 Illinois lakes was 0.751 mg/l (Sefton et al. 1980). Minimum and maximum concentrations in Clinton Lake were 0.05 and 2.8 mg/l. Site 16 had greater concentrations of TON during the preoperational period compared to the remaining sites (Figure 51). Concentrations of TON were similar at each site during the preoperational and operational periods. Distributions of data for epilimnion and metalimnion strata indicate TON concentrations decrease from May through August (Figure 52). Annual average concentrations for TON were greater during 1978 and 1979 which were the initial two years after lake formation (Figure 53). Since 1980, TON annual averages were similar during stratification.

8.3.2 Ammonia

Ammonia is highly soluble in water and occurs as a normal end product of the decomposition of nitrogenous organic matter by bacteria (USEPA 1976). Ammonia is an important water quality parameter because of its potential conversion to nitrogen compounds which may be readily assimilated by plants. It may also be an indicator of the presence of decomposing organic matter. Ammonia in water exists as ionized (NH4) and unionized (NH3) ammonia in equilibrium with water and hydroxide ions. The toxicity of ammonia is directly related to pH and temperature. Lethal concentrations for a variety of fish species range from 0.2 to 2.0 mg/l (NH3) (USEPA 1976). In unpolluted waters ammonia generally is less than 1 mg/l. In polluted waters with the uptake of oxygen, ammonia may increase to 12 mg/l or more. The USEPA (1976) criterion for un-ionized ammonia for freshwater aquatic life is 0.02 mg/l. The IPCB General Use water quality standard requires that ammonia-nitrogen not exceed 1.5 mg/l when water temperatures are greater than 15° Celcius and pH values are greater than or equal to 8.0.

Epilimnion Ammonia

The average concentration for ammonia in Clinton Lake during 1978 through 1991 was 0.117 mg/l. Ammonia concentrations in Clinton Lake ranged from 0.01 to 1.4 mg/l (Figure 54). The maximum value occurred at Site 4 on March 21, 1978. The mean ammonia concentration in surface waters of 63 Illinois lakes surveyed during 1979 was 0.051 mg/l (Sefton et al. 1980). The IPCB General Use water quality standard for ammonia-nitrogen was not exceeded at any of the Clinton Lake monitoring sites.

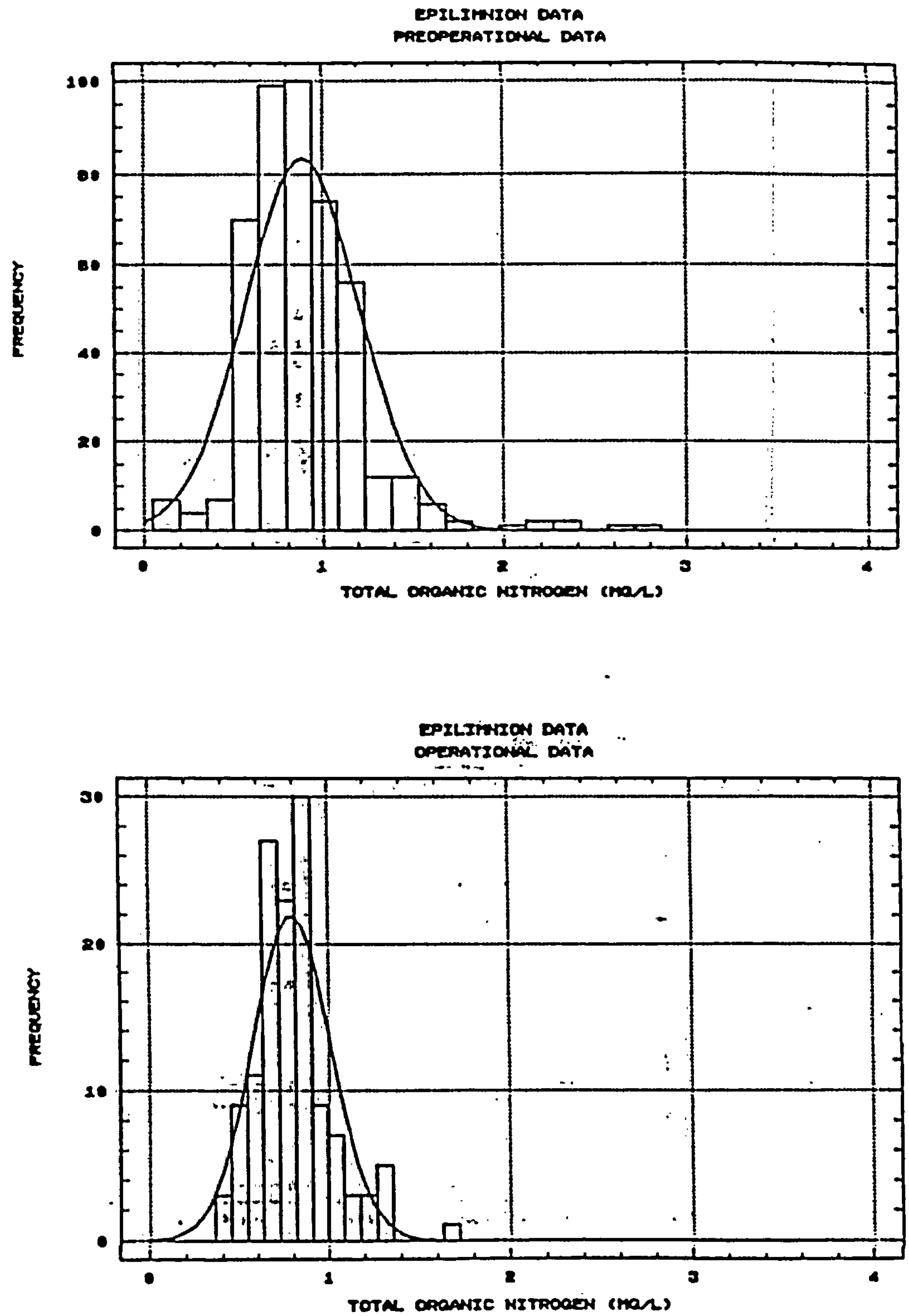


Figure 48. Frequency histograms of total organic nitrogen (mg/l) in Clinton Lake during periods prior to (top graph) and during Clinton Power Station operation (bottom graph).

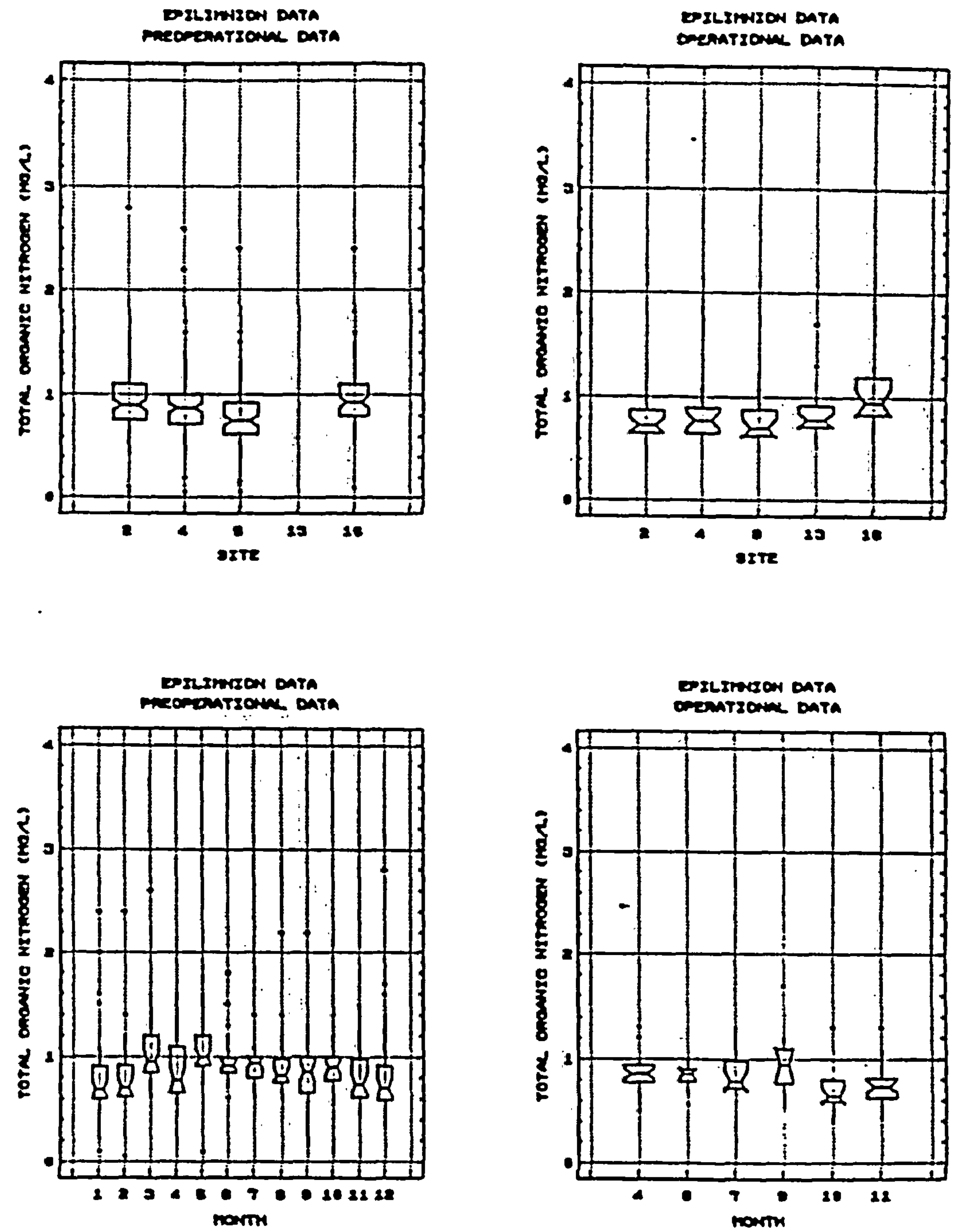


Figure 49. Distributions of total organic nitrogen (mg/l) in Clinton Lake for monitoring sites and months during periods prior to (preoperational mode) and during (operational mode) Clinton Power Station operation.

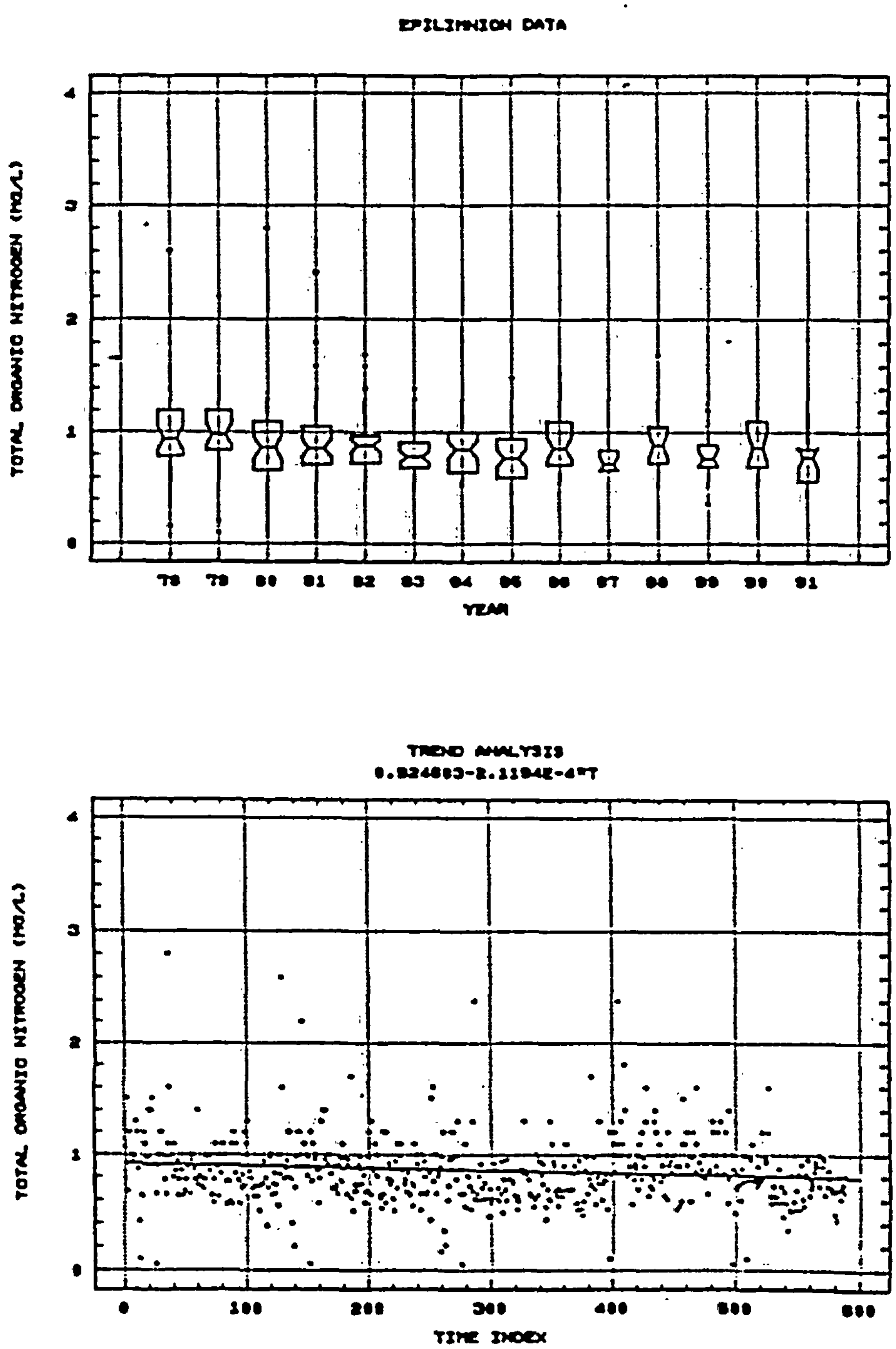


Figure 50. Yearly distributions (top graph) and trend analysis (bottom graph) of total organic nitrogen concentrations (mg/l) in Clinton Lake during 1978 through 1991.

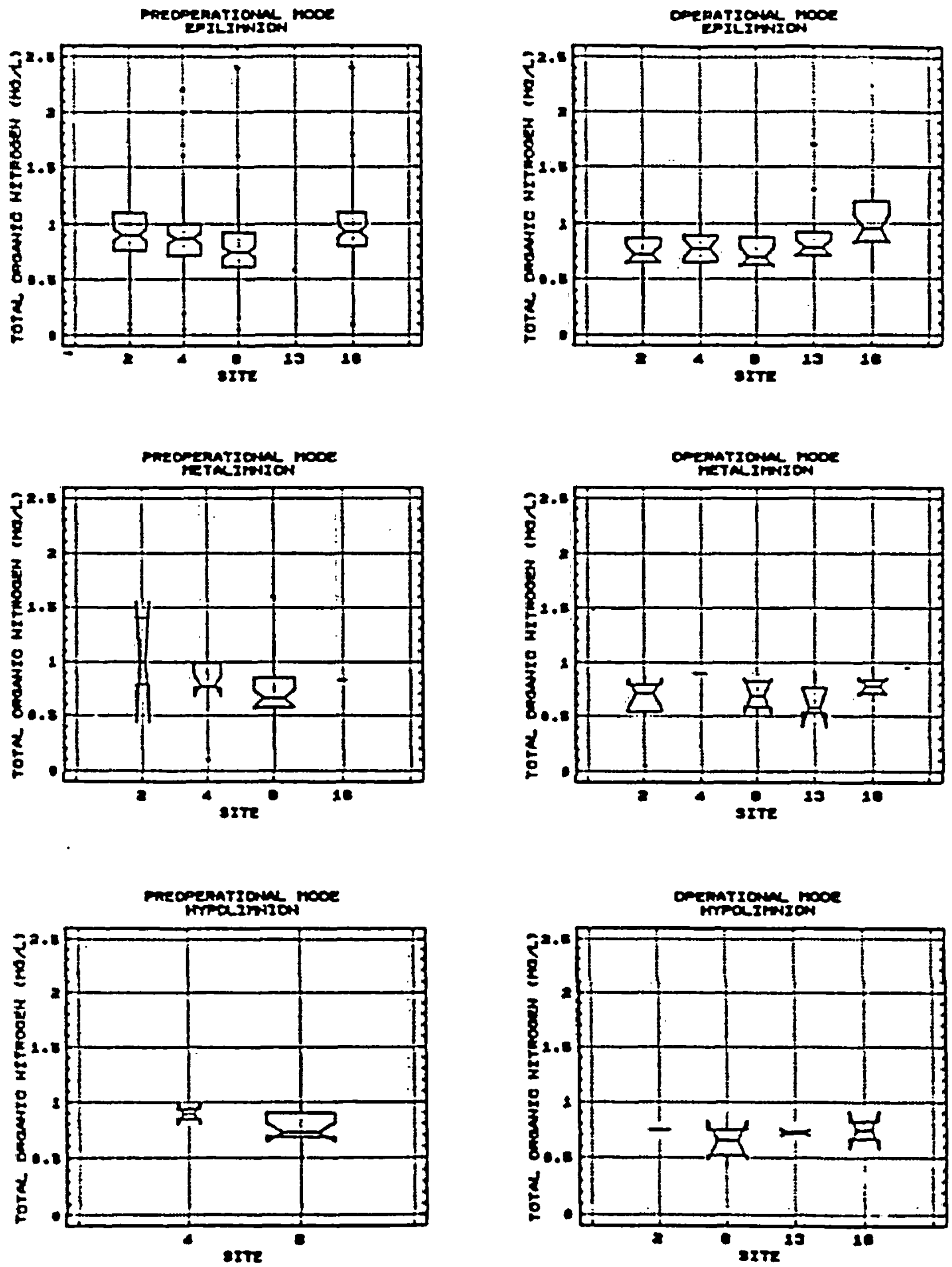


Figure 51. Distributions of total organic nitrogen (mg/l) in Clinton Lake for epilimnion, metalimnion, and hypolimnion strata during the period prior to (preoperational mode) [illegible] during Clinton Power Station operation (operational mod

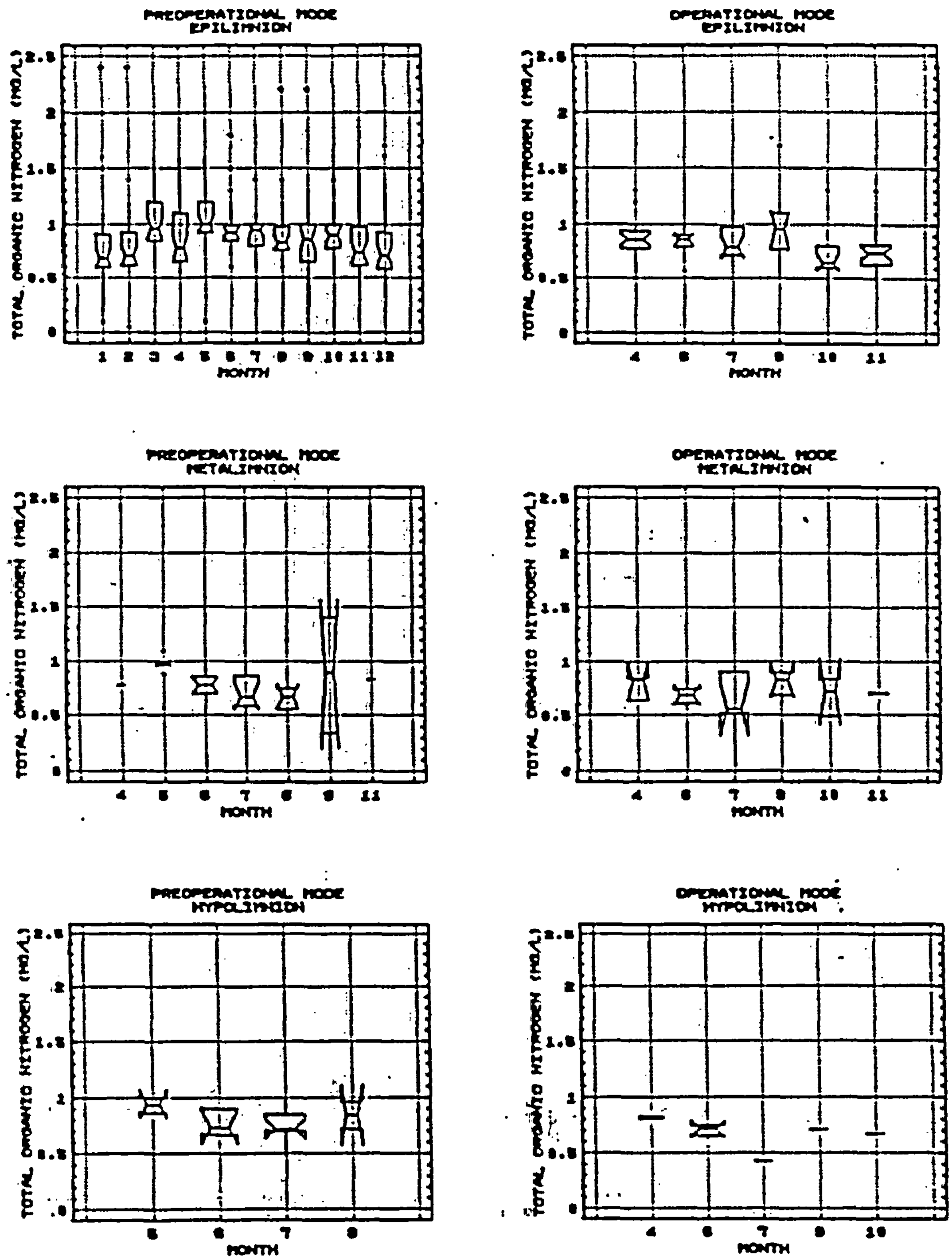


Figure 52. Distributions of total organic nitrogen (mg/l) in Clinton Lake for epilimnion, metalimnion, and hypolimnion strata for periods prior to (preoperational mode) and during Clinton Power Station operation (operational mode).

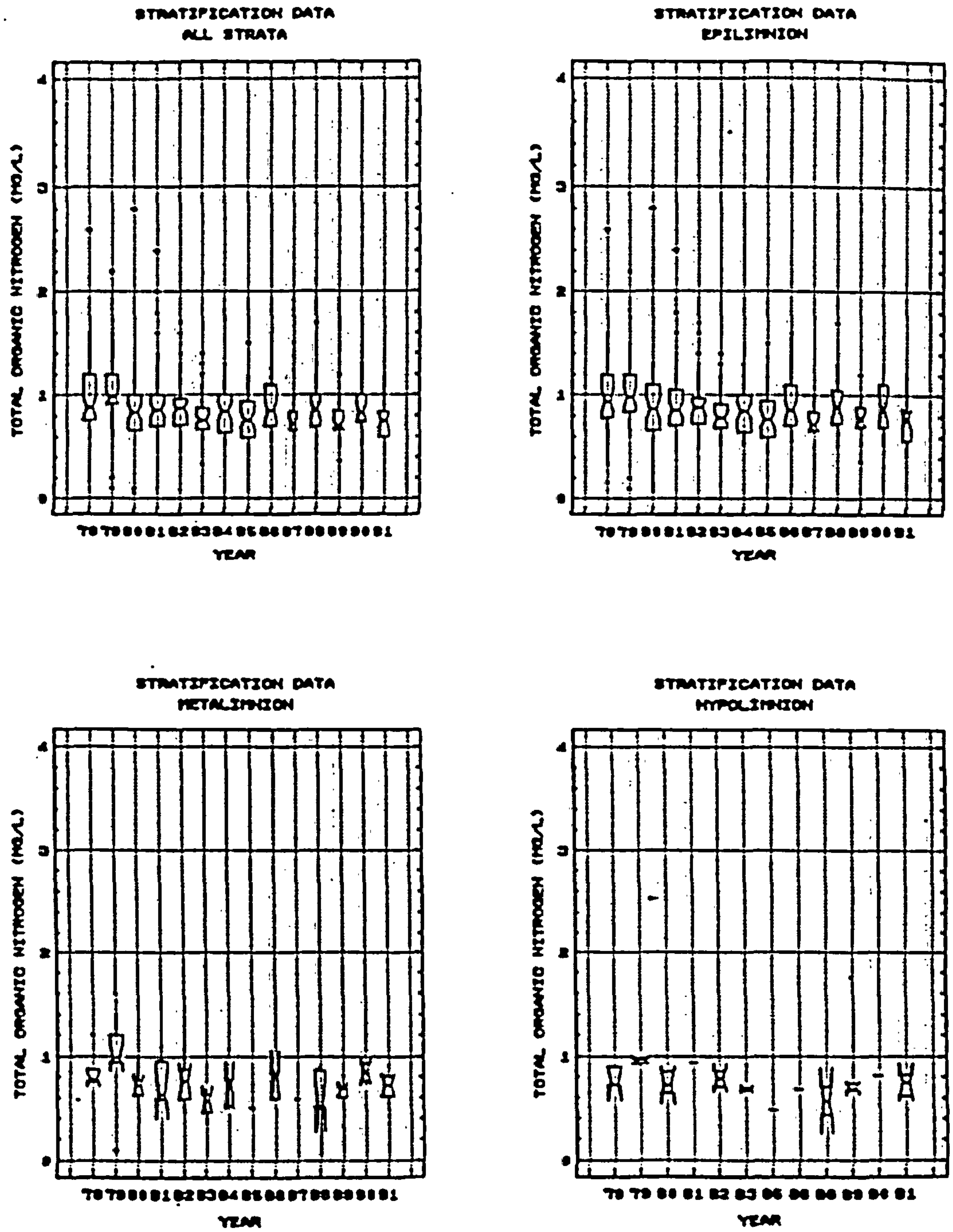


Figure 53. Distributions of total organic nitrogen (mg/l) in Clinton Lake for epilimnion, metalimnion, and hypolimnion strata during 1978 through 1991.

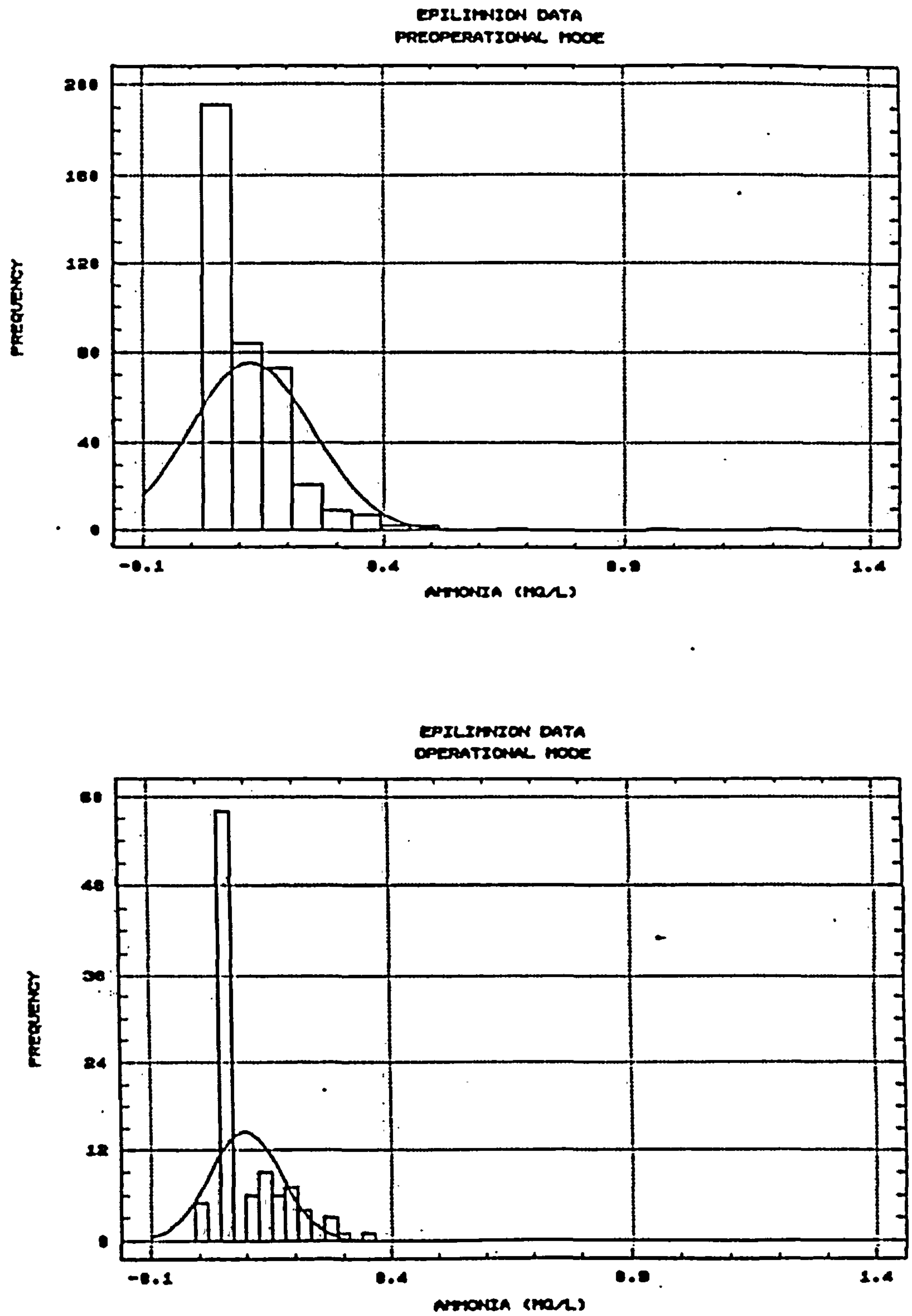


Figure 54. Frequency histograms of ammonia (mg/l) in Clinton Lake during periods prior to (top graph) and during Clinton Power Station operation (bottom graph).

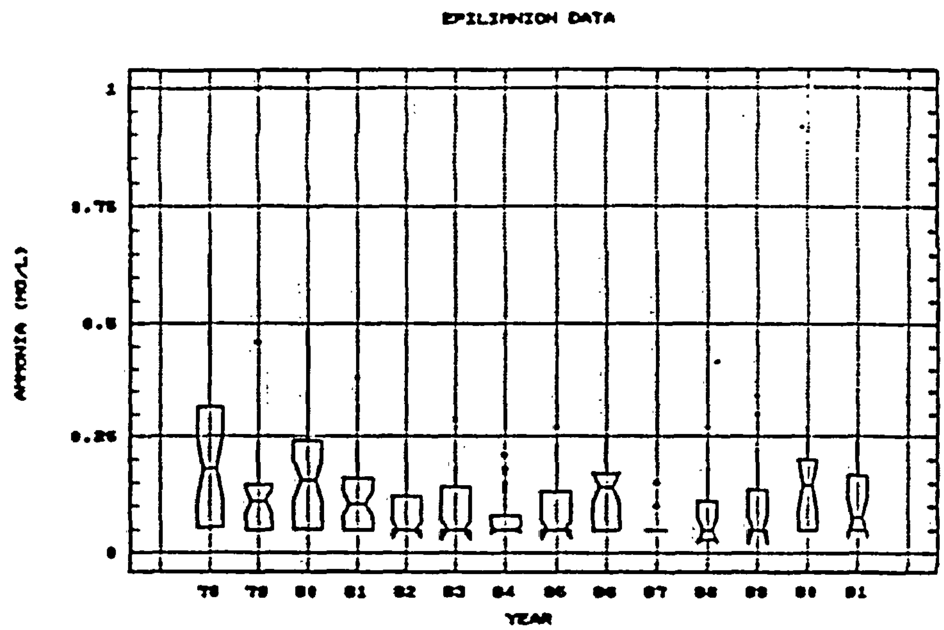
Only four of 493 samples analyzed for ammonia had concentrations greater than 0.6 mg/l (Figure 54). These four samples were collected relatively early during the history of Clinton Lake (1978 and 1979) and were probably reflective of bacterial decomposition of inundated organic materials. Since 1981 all samples have had less than 0.4 mg/l ammonia (Figure 55). Approximately 87% of the epilimnion samples analyzed for ammonia had concentrations between 0.0 and 0.2 mg/l. There were no apparent changes in ammonia concentrations during years when Clinton Power Station was operational (1987 through 1991). Inter-site and inter-month comparisons do not suggest significant spatial or seasonal patterns in distributions of ammonia data (Figure 56).

Ammonia During Stratification

Average ammonia concentrations (0.34, and 0.45 mg/l for metalimnion and hypolimnion strata, respectively) were greater than that for the epilimnion stratum (0.117mg/l). Ammonia is typically present in greater concentrations when DO concentrations are low or depleted, thus it is not surprising for increased ammonia concentrations to occur at greater depths where DO is decreased (Sefton et al. 1980). The average ammonia concentration for the hypolimnion stratum in Clinton Lake is almost identical to that reported for bottom waters in 63 other Illinois lakes (0.455 mg/l)(Sefton et al. 1980). Ammonia data for the metalimnion and hypolimnion were significantly greater than that for the epilimnion during the preoperational period (Figure 57). Distribution of data by months indicate seasonal effects for metalimnion and hypolimnion strata (Figure 58). Seasonal trends are not apparent in distributions of epilimnion data for ammonia. Stratification during summer may result in the depletion of ammonia in the epilimnion and concentration in th hypolimnion. During the preoperational period metalimnion and hypolimnion ammonia tended to increase from April through August, then decrease in September (Figure 58). Ammonia concentrations during the operational period for metalimnion and hypolimnion strata were lower. Seasonal distributions during operational years were similar but not as distinctive as during the preoperational period. Average concentrations for the metalimnion were 0.41 and 0.21 mg/l for preoperational and operational periods, respectively. Average concentrations for hypolimnion were 0.57 and 0.21 mg/l for preoperational and operational periods, respectively. There were no apparent long term trends in the distribution of ammonia concentrations among years (Figure 59). Distribution of ammonia data by site indicated there were no significant differences among sites (Figure 60).

8.3.3 Nitrate

Nitrification is the biological conversion of reduced nitrogenous compounds to a more oxidized state. Nitrates represent the most oxidized and readily available form of nitrogen in oxygenated waters. Nitrates and phosphates are generally considered the two nutrients most essential to plant growth. Nitrates in unpolluted waters generally average less than 0.30 mg/l. High concentrations of nitrates constitute a hazard when, under certain conditions, nitrate can be reduced to nitrite in the gastrointestinal tract. Nitrites can then interact with hemoglobin to produce methemoglobin which impairs oxygen transport.



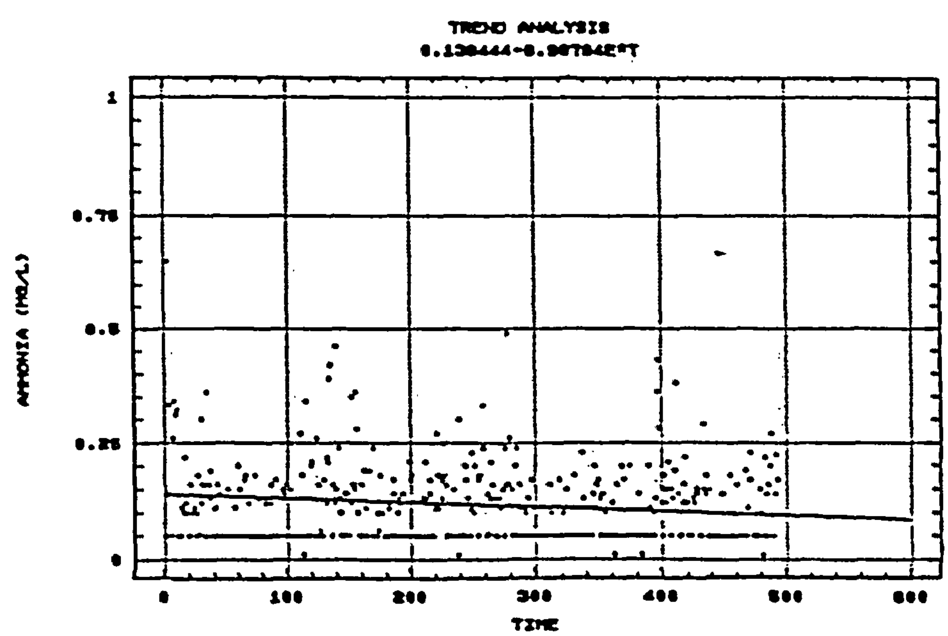


Figure 55. Yearly distributions (top graph) and trend analysis (bottom graph) of ammonia concentrations (mg/l) in Clinton Lake during 1978 through 1991.

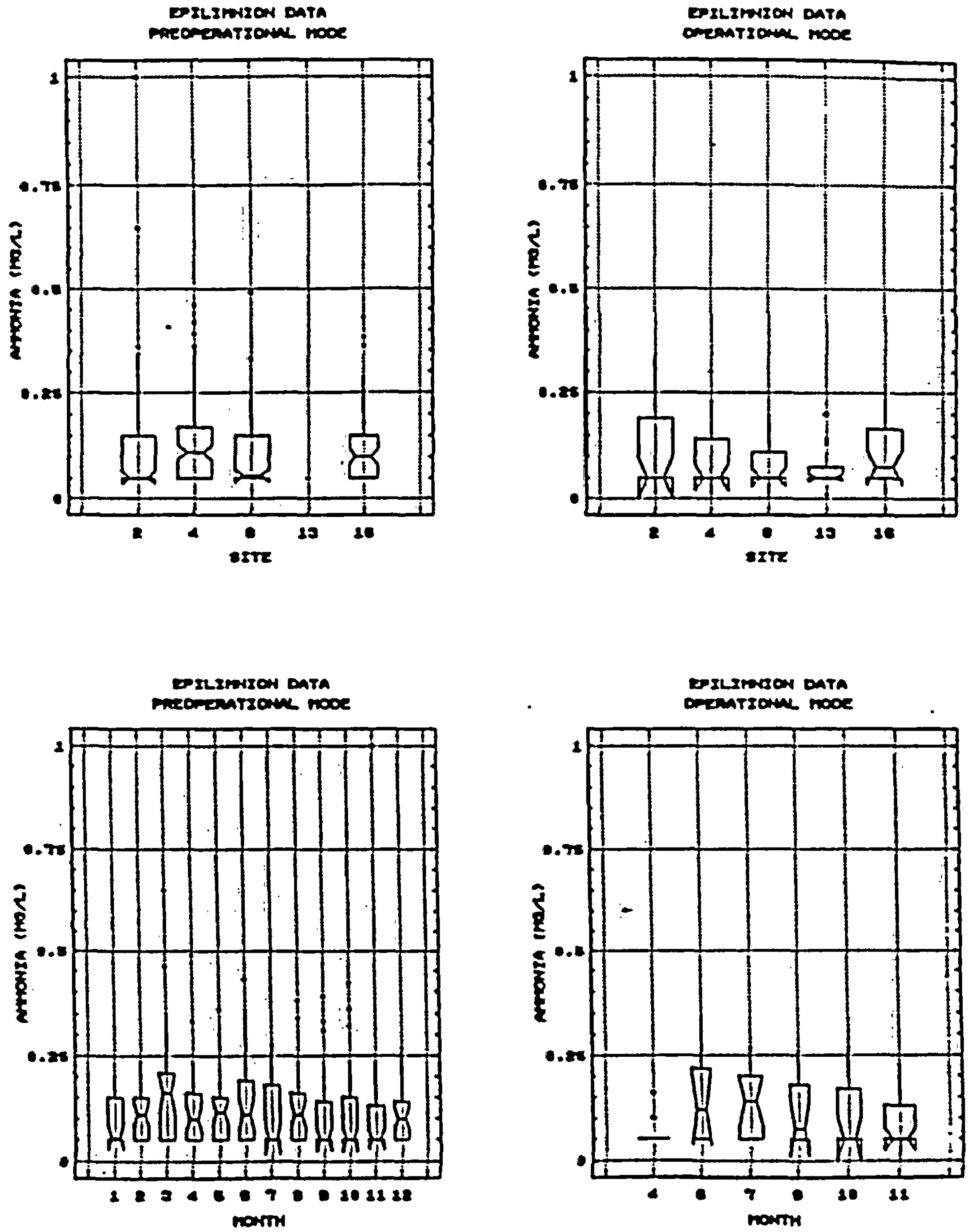


Figure 56. Distributions of ammonia (mg/l) in Clinton Lake fo[r] monitoring sites and months during periods prior t[o] (preoperational mode) and during (operational mode) Clinton Power Station operation.

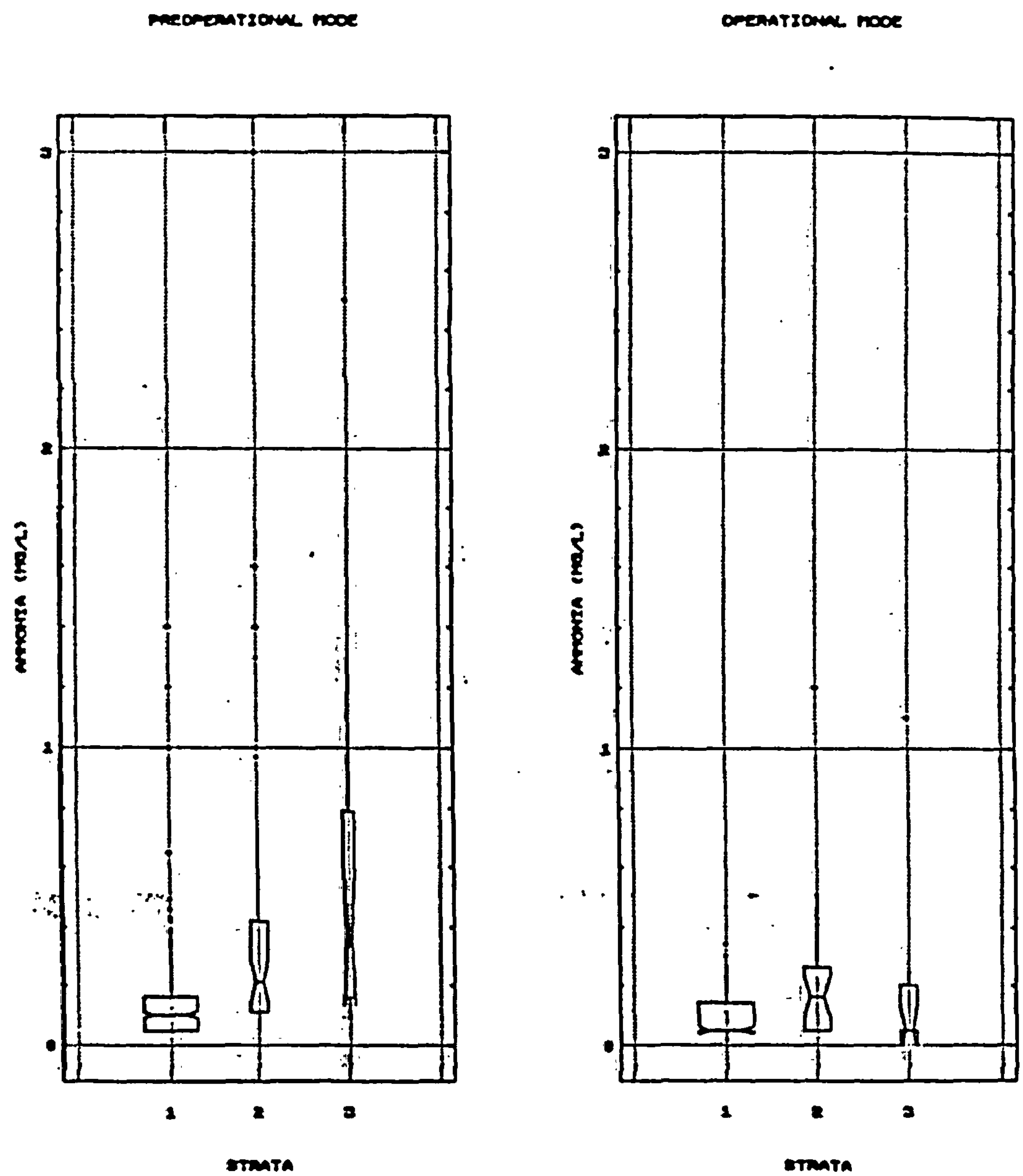


Figure 57. Distribution of ammonia concentrations (mg/l) in Clinton Lake for epilimnion (1), metalimnion (2), and hypolimnion (3) strata during preoperational and operational periods during 1978 through 1991.

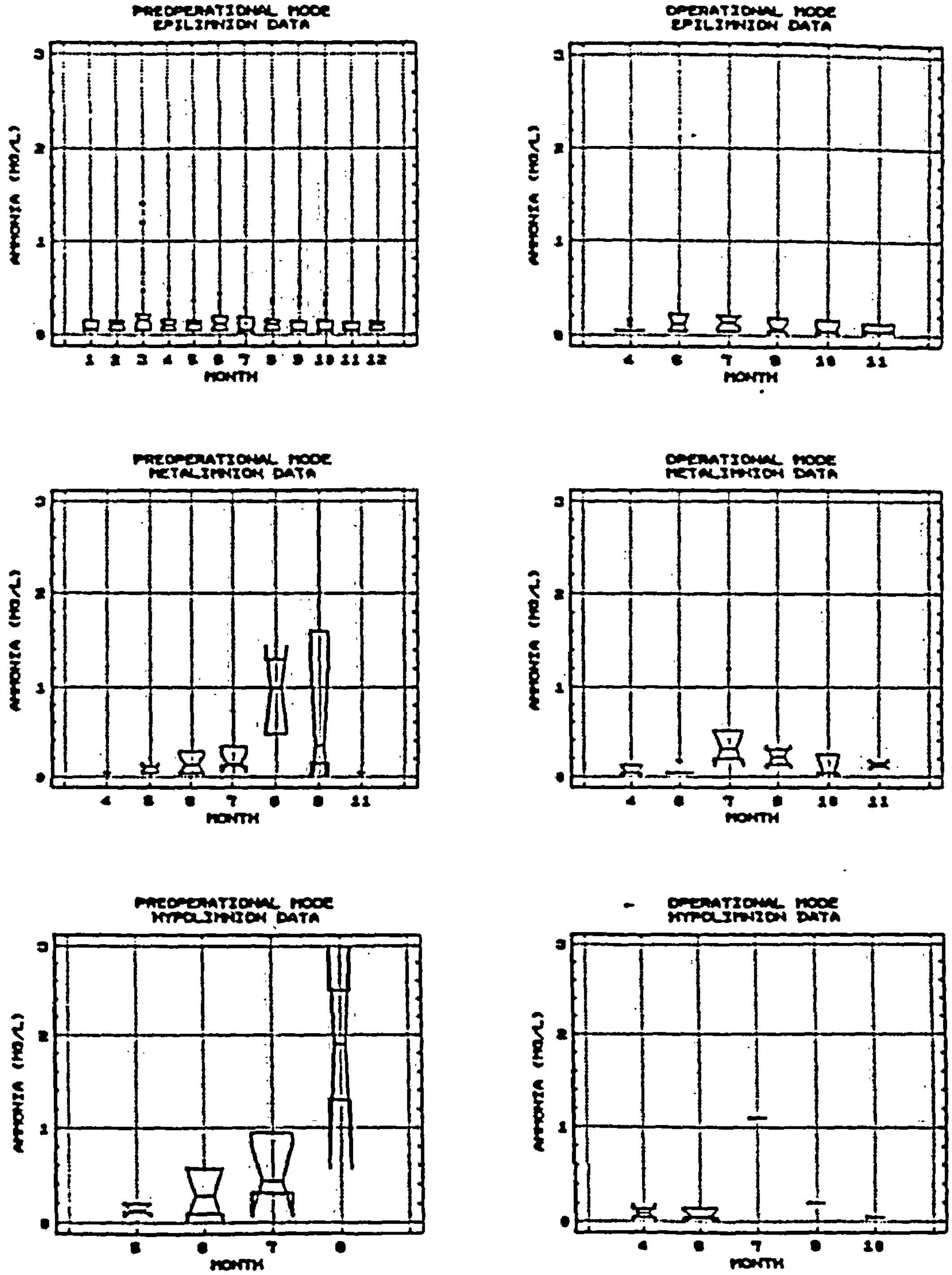


Figure 58. Distributions of ammonia concentrations (mg/l) in Clinton Lake for epilimnion, metalimnion, and hypolimnion str... during 1978 through 1991.

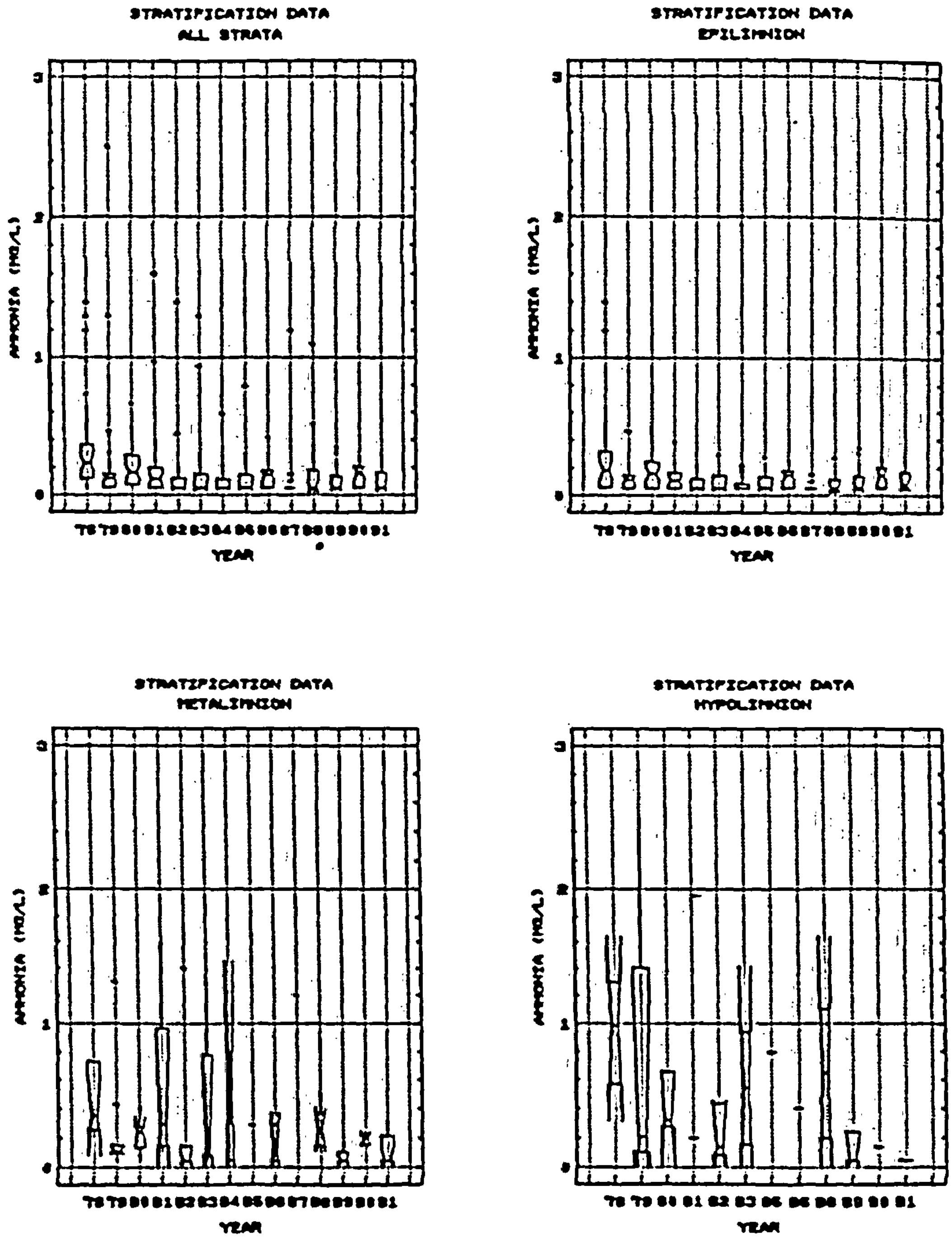


Figure 59. Distributions of ammonia concentrations (mg/l) in Clinton Lake for epilimnion, metalimnion, and hypolimnion strata during 1978 through 1991.

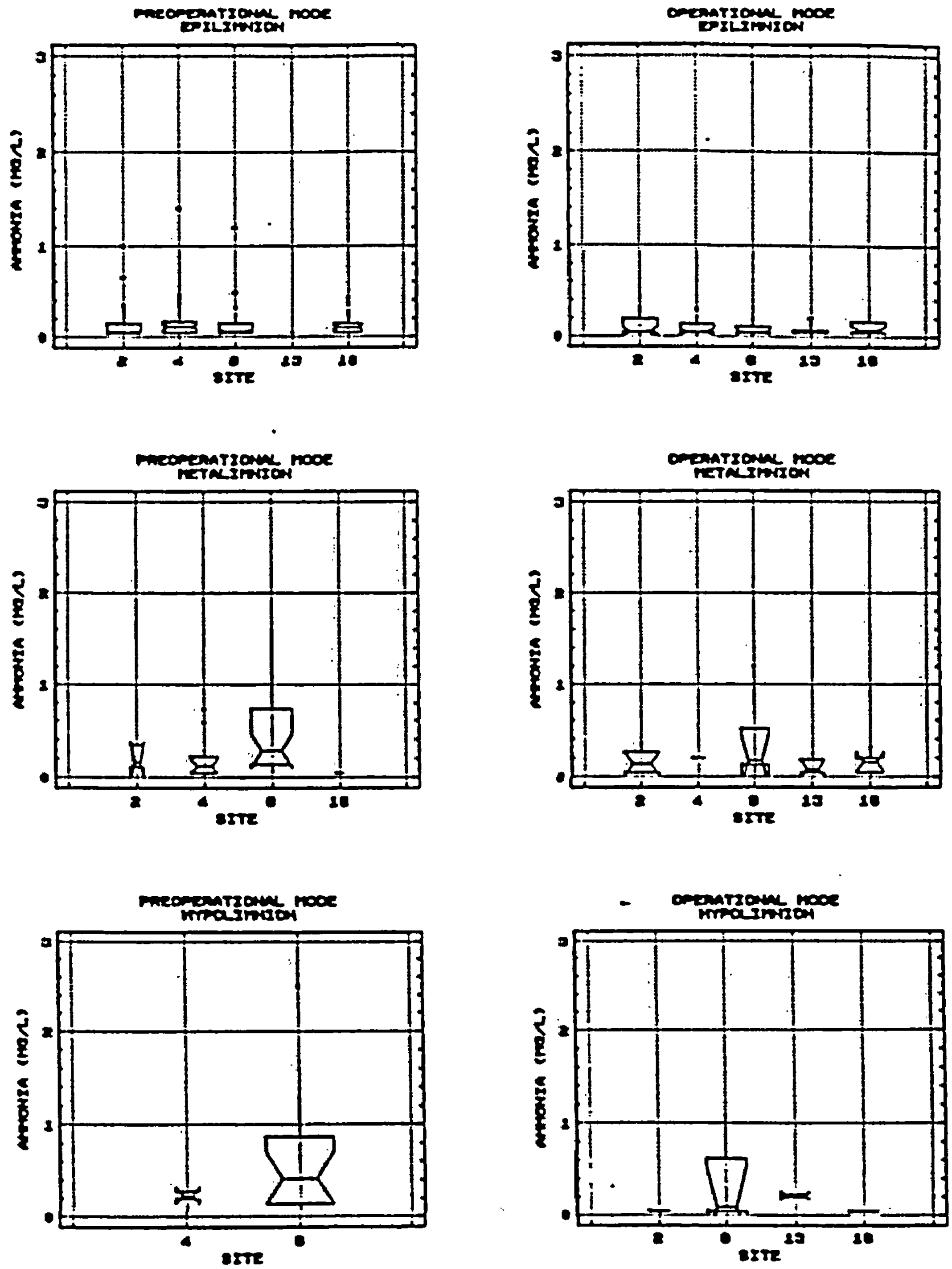


Figure 60. Distributions of ammonia concentrations (mg/l) fo epilimnion, metalimnion, and hypolimnion strata at Cli--to Lake monitoring sites during 1978 through 1991.

This risk is especially hazardous to bottle-fed infants. The digestive tracts of infants are not acidic enough to prevent the conversion of nitrates to nitrites (Sefton et al. 1980).

Largemouth bass and channel catfish can be maintained at concentrations of up to 400 mg/l nitrate without significant effect on their growth or feeding activities (USEPA 1976). Nitrates, like phosphates, are removed from the water by planktonic organisms and as in the case of phosphates, the lowest concentrations of nitrates should be observed in the areas of greatest planktonic densities and primary productivity. Nitrate concentrations may become quite low at the end of the growing season. Nitrate concentrations may increase during precipitation events due to land surface runoff.

The IPCB does not have a General Use water quality standard for nitrates. However, the IPCB public and food processing water supply standards require that nitrate concentrations not exceed 10 mg/l.

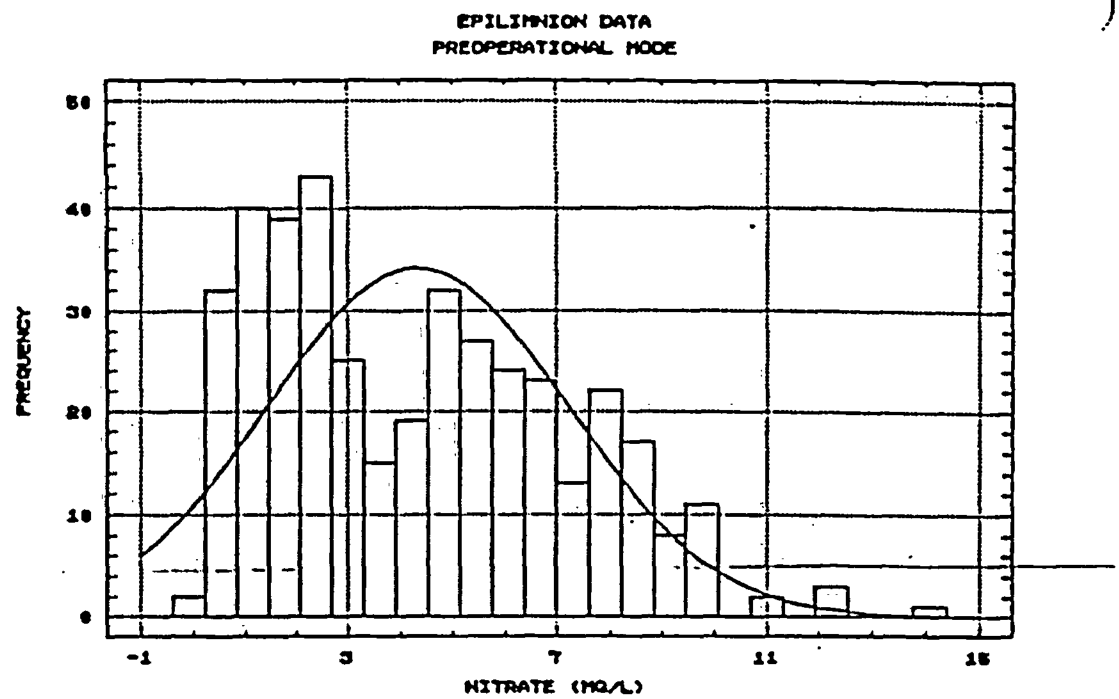
Epilimnion Nitrate

Nitrate concentrations averaged 3.78 mg/l and ranged from 0 to 14.0 mg/l. The maximum occurred at Site 2 on May 6, 1981. Nitrate concentrations tended to be lower during the period when CPS was operational (Figure 61). Nitrate concentrations increased from November through May and decreased sharply from May through September (Figure 62). This decrease is typically coincident with lake summer population peaks of blue-green algae (Willmore 1989), when total organic nitrogen is the principal nitrogen form in most lakes. Nitrate concentrations typically increase in late fall through early spring when populations of blue-green algae decrease. Increased nitrate concentrations in late winter and spring may also be due to nitrates leached from soil by percolation and runoff.

Intersite comparisons indicate Site 13 had significantly lower concentrations of nitrates during the preoperational period (Figure 62). There were no significant differences among sites during the operational period. Site 16 generally had greater concentrations of nitrates than the remaining sites. This site is closest to the headwaters of Salt Creek and higher concentrations of nitrate are probably indicative of runoff from agricultural lands. Most of the samples from Site 13 were collected during the operational period when the distribution of nitrate concentrations was similar to the remaining sites. Concentrations of nitrates were significantly lower during 1987 through 1989 (Figure 63). Nitrate concentrations increased during 1990 and 1991 and were within the range of data collected during preoperational years.

Nitrate During Stratification

Average nitrate concentrations for samples collected in the metalimnion and hypolimnion were identical at 3.9 mg/l. Concentrations ranged from 0.025 to 14.0 mg/l in the metalimnion and from 0.025 to 11 mg/l in the hypolimnion. There were no significant differences in the distributions of nitrate concentrations for sites between operational and preoperational periods for metalimnion and hypolimnion data (Figure 64).



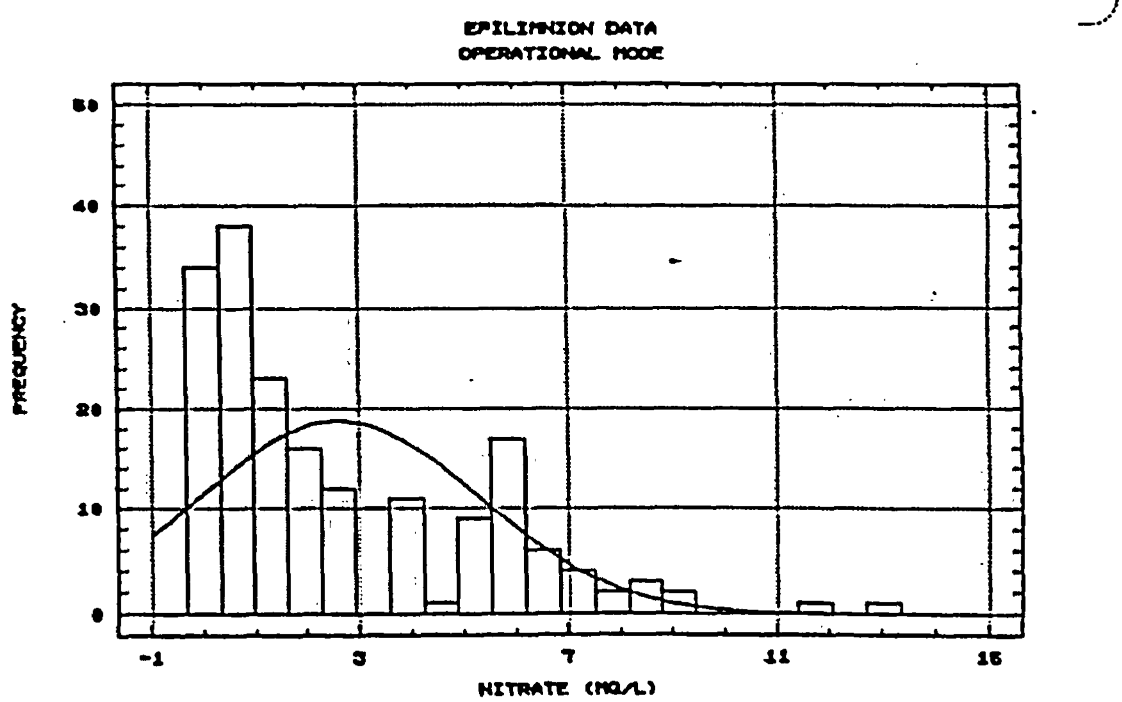


Figure 61. Frequency histograms of nitrate concentrations (mg/l) in Clinton Lake during periods prior to (top graph) during Clinton Power Station operation (bottom graph).

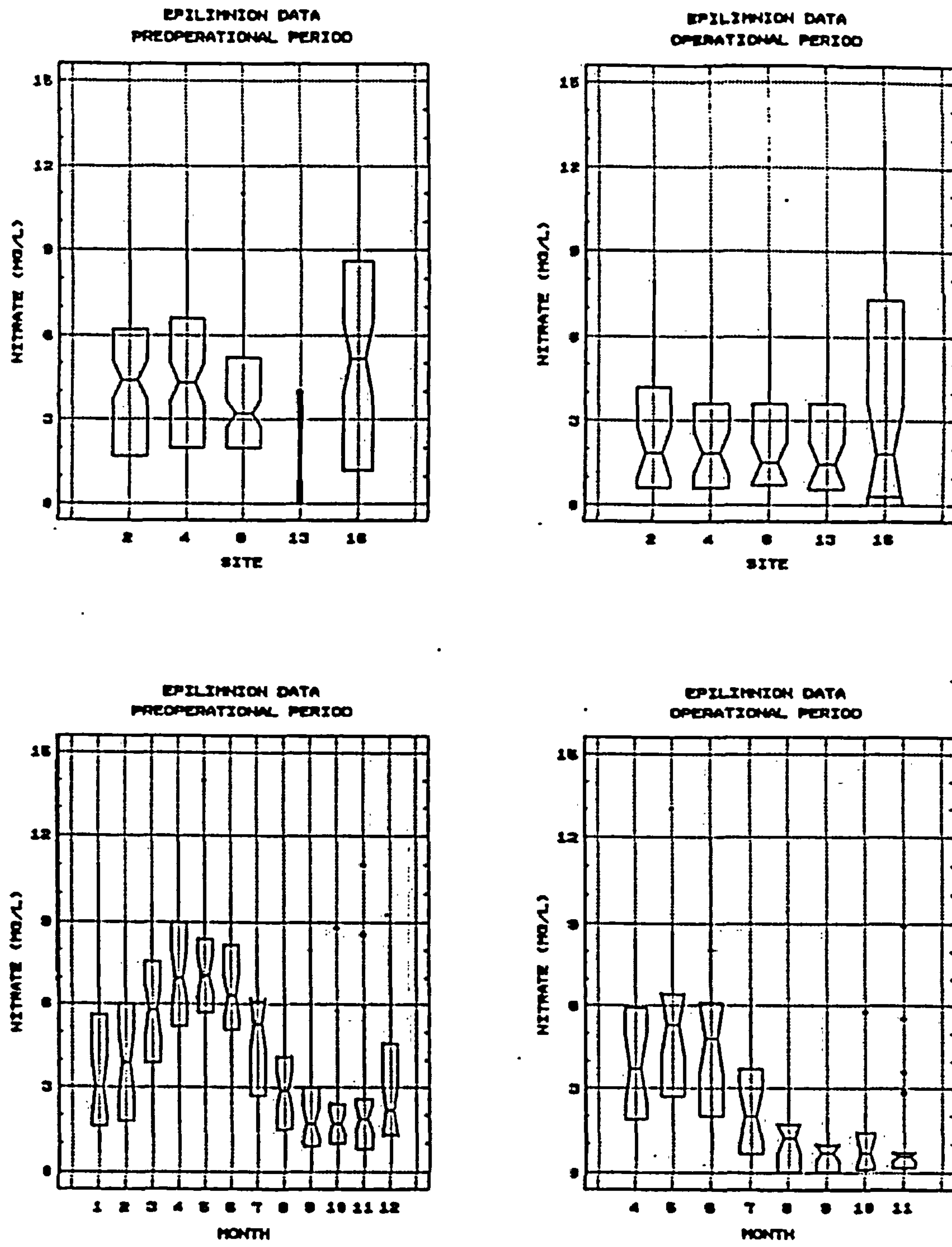
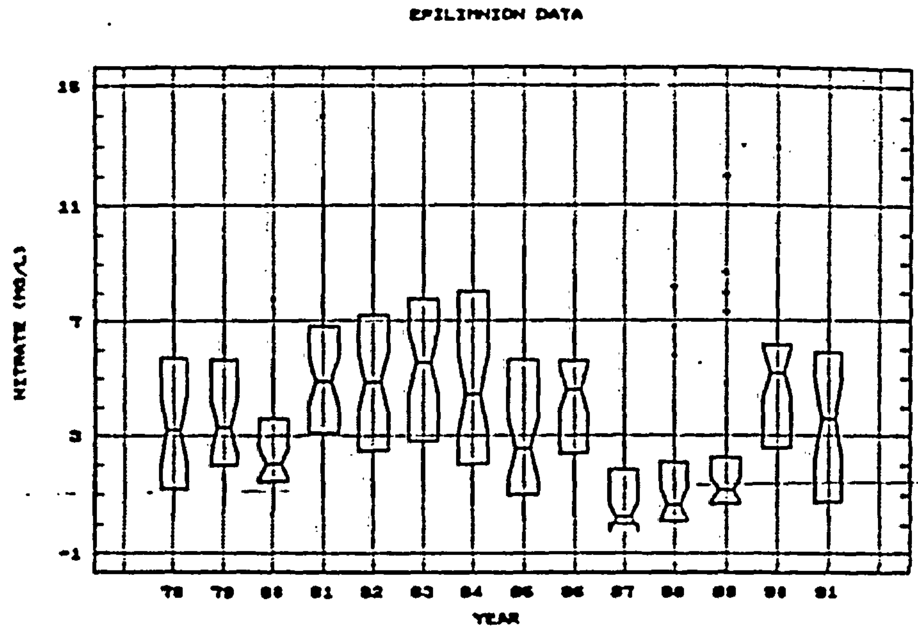


Figure 62. Distributions of nitrate concentrations (mg/l) in Clinton Lake for monitoring sites and months during periods prior to (preoperational mode) and during (operational mode) Power Station operation.



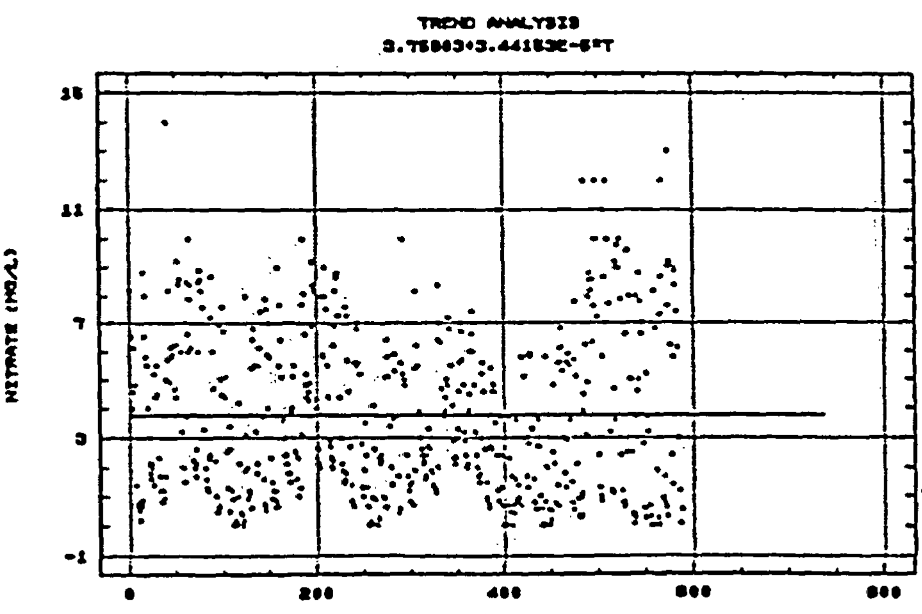


Figure 63. Yearly distributions (top graph) and trend analysis (bottom graph) of nitrate concentrations (mg/l) in Clinton Lake during 1978 through 1991.

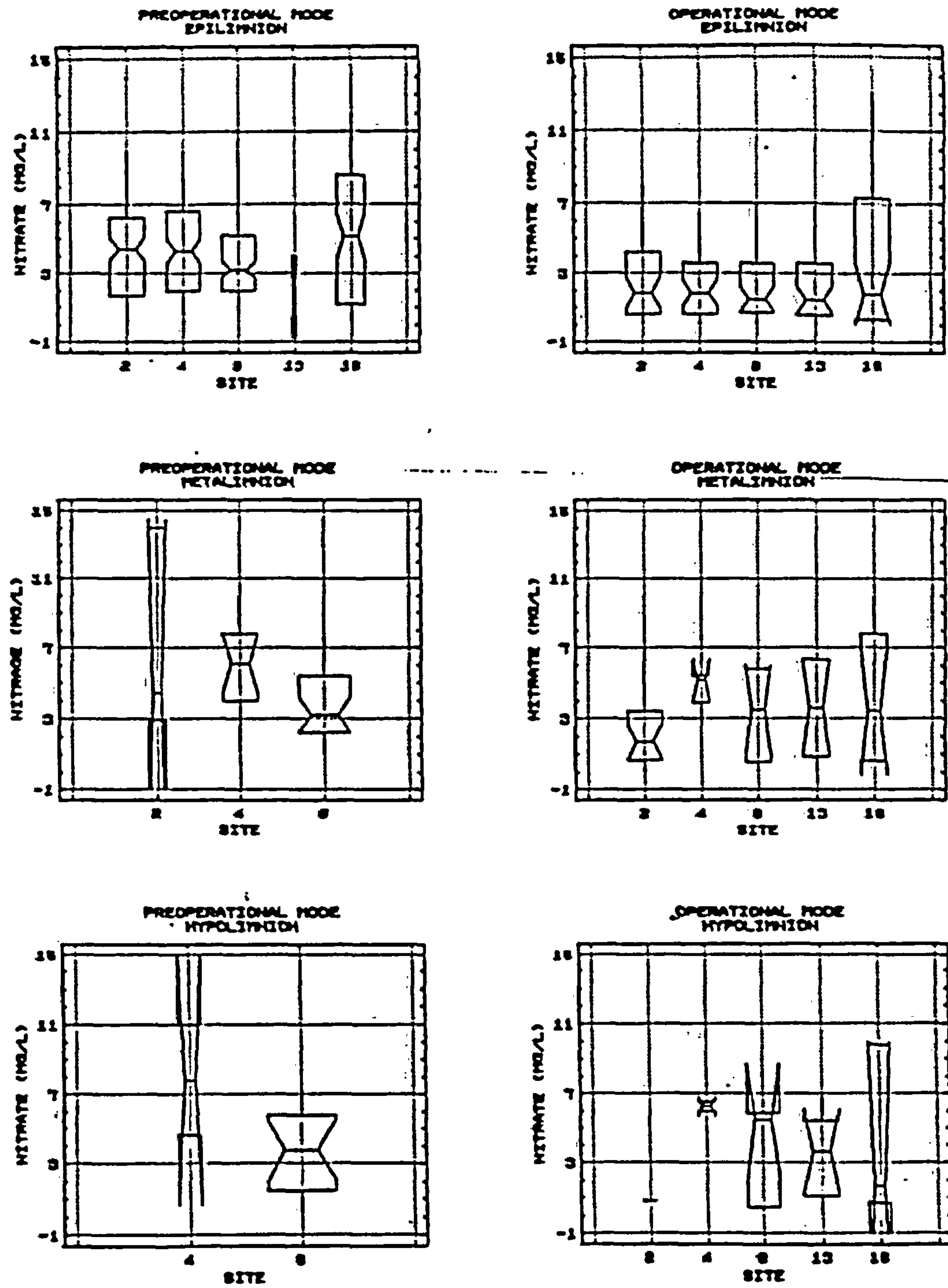


Figure 64. Distributions of nitrate concentrations (mg/l) in Clinton Lake for epilimnion, metalimnion, and hypolimnion strata during periods prior to (preoperational mode) and during Power Station operation (operational mode).

Distribution of concentrations by months indicate nitrate data are influenced by seasons (Figure 65). Nitrate concentrations tend to decrease from May through August. Nitrate concentrations were lower for the metalimnion stratum during operational conditions from May through September. There was no apparent change in nitrate concentrations among years representing preoperational and operational conditions (Figure 66).

8.4 Phosphorus

Phosphorus is found in water in the form of phosphates, which include orthophosphates, polyphosphates, and organic phosphates in dissolved and particulate forms. Phosphorus is a constituent of fertile soil and the protoplasm and tissues of plants and animals. Like nitrogen, it is an essential nutrient for plants and animals and it is essential for energy transfer in cellular metabolism. It functions in cycles of photosynthesis and decomposition.

8.4.1 Total Phosphorus

In natural waters where runoff from agricultural land is not great, orthophosphates predominate and are dependent on the geochemical nature of the lake and watershed. Orthophosphates applied to agricultural cultivated land as fertilizers are carried into surface waters with stream runoff and melting snow. The mean total phosphorus content of most lakes ranges from about 0.010 to 0.030 mg/l (Reid and Wood 1976). The IPCB General Use water quality standard requires that total phosphorus not exceed 0.050 mg/l in any reservoir or lake with a surface area of 20 acres or more.

Epilimnion Total Phosphorus

The mean total phosphorus for epilimnion samples was 0.086 mg/l for 1978 through 1991. Concentrations ranged from 0 to 0.73 mg/l during 1978 through 1991. Distributions of total phosphorus concentrations were similar for preoperational and operational periods (Figure 67).

The average concentration for total phosphorus in Clinton Lake exceeded the IPCB standard of 0.05 mg/l. Out of the 587 epilimnion samples collected from 1978 through 1991, 429 (73%) exceeded the standard. Total phosphorus is the most common IPCB standard for which the mean and more than 25% of the individual analyses are exceeded in inland Illinois lakes (IEPA 1988). The average total phosphorus from surface waters of 63 Illinois lakes was 0.119 mg/l (Sefton et al. 1980). Allum et al. (1977) classified eutrophic lakes as those with total phosphorus values greater than 0.02 mg/l. Thus, Clinton Lake could be classified as highly eutrophic based on its total phosphorus concentrations. Fifty-six of 63 Illinois lakes had mean surface total phosphorus concentrations which exceeded 0.02 mg/l, and thus were also classified as eutrophic (Sefton et al. 1980). Another survey of 31 Illinois lakes indicated phosphorus loadings were generally high and from nonpoint sources (Allum et al. 1977).

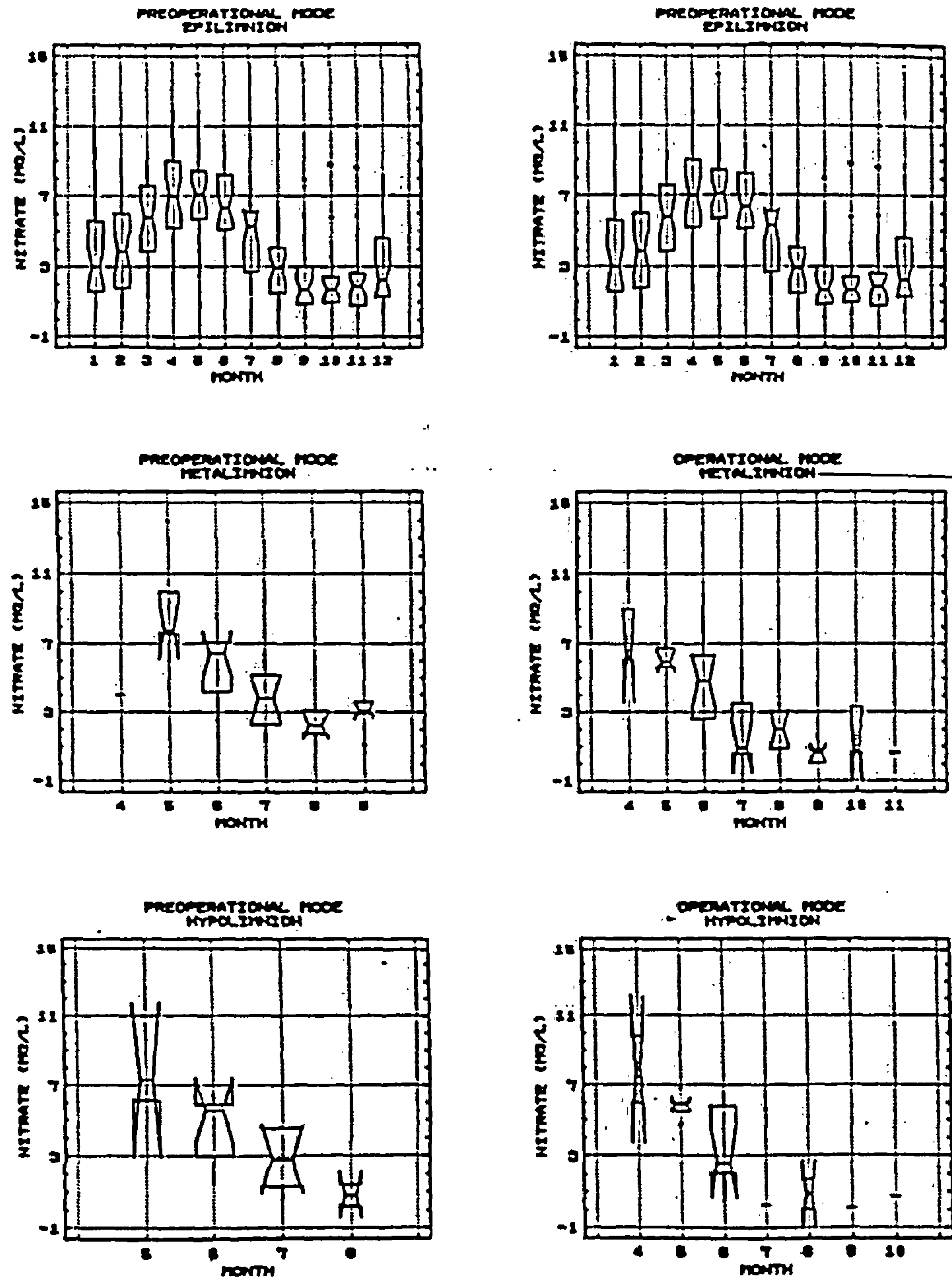


Figure 65. Distributions of nitrate concentrations (mg/l) in Clinton Lake by months for epilimnion, metalimnion, and hypolimnion strata for the periods prior to (preoperational mode) and during Clinton Power Station operation (operational mode).

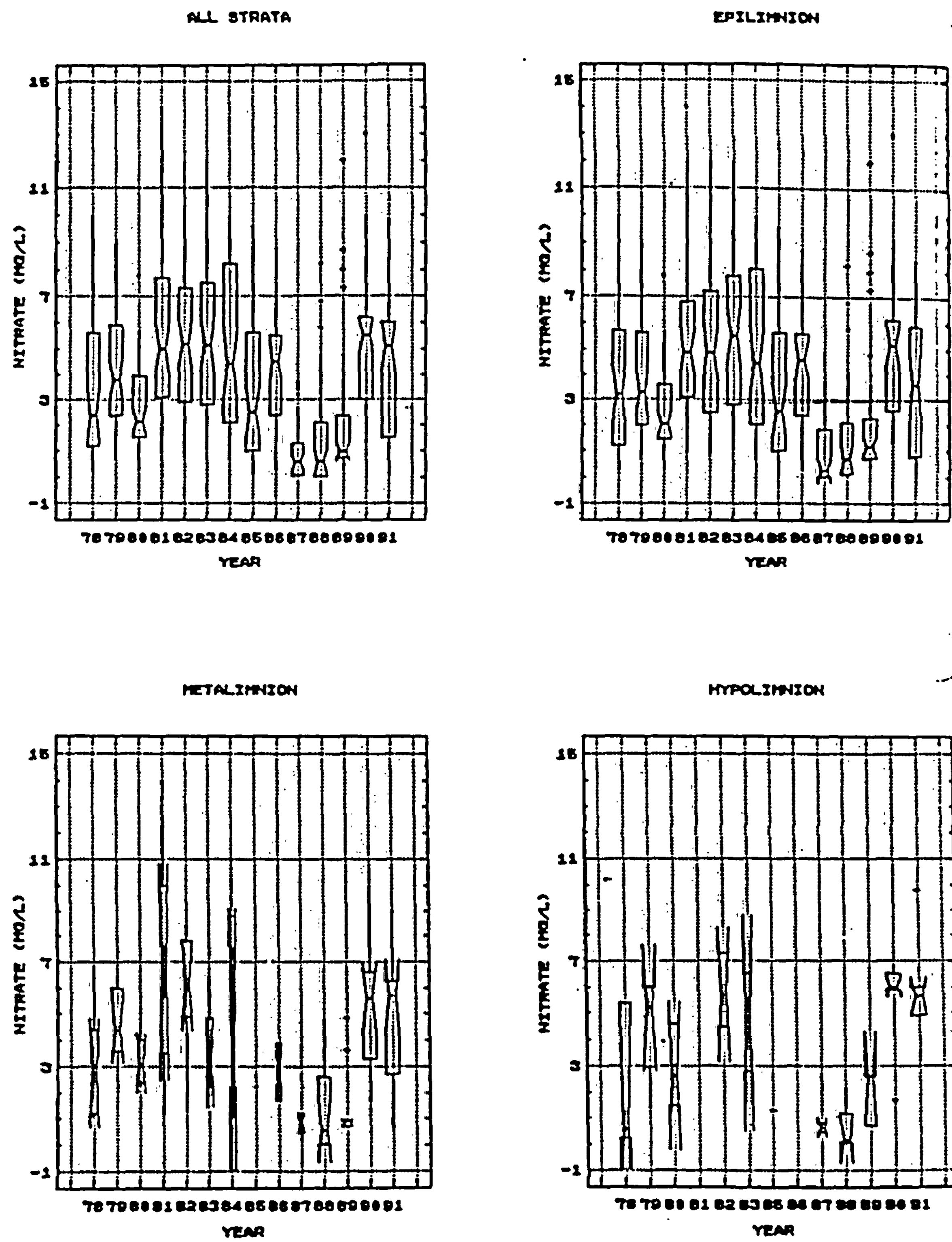
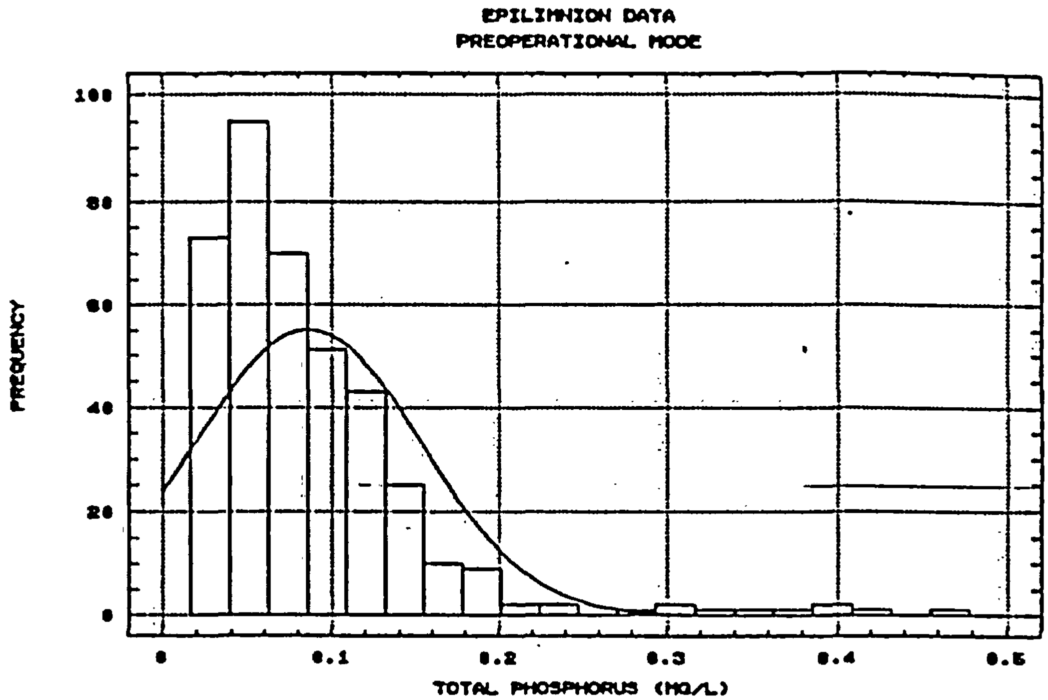


Figure 66. Yearly distributions of nitrate concentrations (mg/l) in Clinton Lake for epilimnion , metalimnion, and hypolimnion strata during 1978 through 1991.



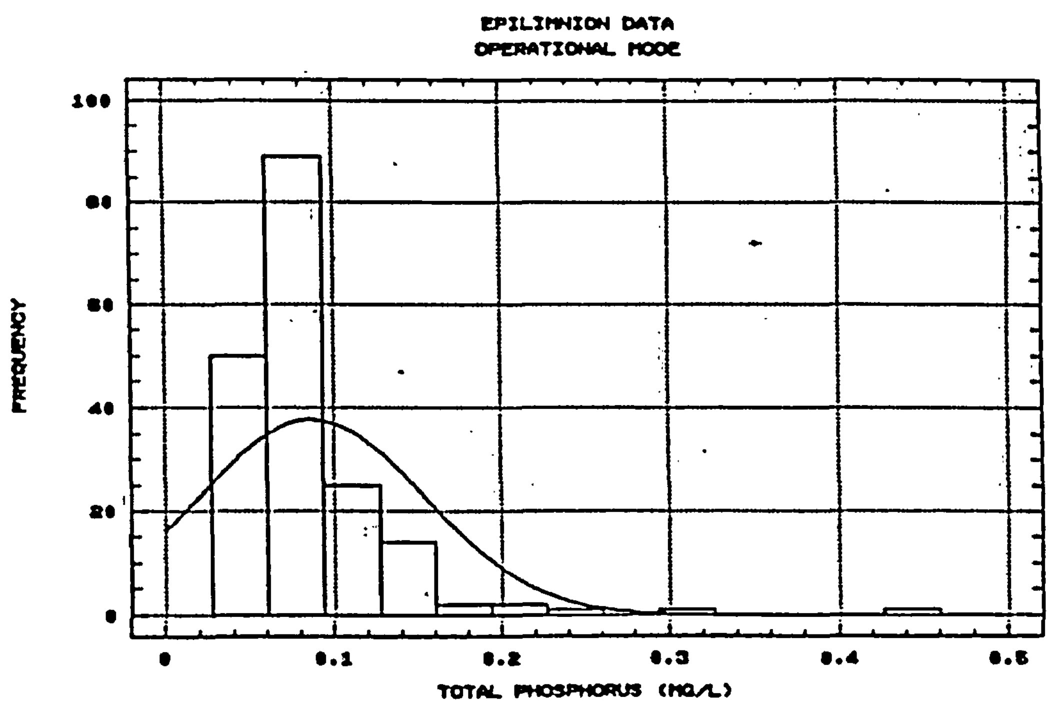


Figure 67. Frequency histograms of total phosphorus concentrations (mg/l) in Clinton Lake during periods prior to (top graph) and during Clinton Power Station operation (bottom graph).

Intersite comparisons indicated a decreasing trend in phosphorus concentrations from headwaters to mid-lake sites (Figure 68). Site 16 had the greatest average total phosphorus concentrations (0.12 mg/l). This site is closest to the headwaters of Salt Creek and higher concentrations of total phosphorus are probably indicative of runoff from agricultural lands.

Plots of monthly concentrations during preoperational years indicate a seasonal effect on the distribution of total phosphorus data (Figure 68). Phosphorus concentrations increased from January through March then tended to decrease throughout the rest of the year (Figure 68). This may be due to influx of phosphorus from spring runoff and redistribution of phosphorus during spring turnover. Phosphorus concentrations may be influenced by influx of surface waters from stream discharges, particularly following high rainfall. This seasonal pattern was not apparent from a distribution of data during operational years (Figure 68).

Trend analysis and plots of annual concentrations indicate an increasing trend in phosphorus concentrations in the epilimnion from 1978 through 1986 (Figure 69). Distributions of phosphorus during operational conditions (1987 through 1991) did not contribute to the trend for increasing phosphorus concentrations. Concentrations during operational years were within the range of concentrations experienced during preoperational years.

Total Phosphorus During Stratification

Average concentrations for metalimnion and hypolimnion were 0.09, and 0.081 mg/l, respectively. The maximum value (0.72 mg/l) occurred at Site 8 shortly after lake formation (September, 1978). The average total phosphorus concentration in bottom waters of 63 Illinois lakes was 0.138 mg/l (Sefton et al. 1980).

Epilimnion values for total phosphorus typically decreased from early spring through late summer for the preoperational period (Figure 70). This pattern of decreasing concentrations from spring through late summer also occurred in the metalimnion and hypolimnion during the preoperational period. This seasonal pattern was not apparent in the distribution of data in metalimnion and hypolimnion strata during the operational period. In eutrophic lakes during summer stratification, phosphorus in the hypolimnion typically increases following dissolved oxygen depletion.

Distribution of total phosphorus concentrations were similar among years for samples from the epilimnion stratum (Figure 71). Phosphorus concentrations increased in the metalimnion during the years when CPS was operational. Distributions of total phosphorus data from hypolimnion samples were variable among years with no apparent patterns.

There was a down-lake trend for total phosphorus concentrations to decrease in the metalimnion (Figure 72).

8.4.2 Orthophosphate

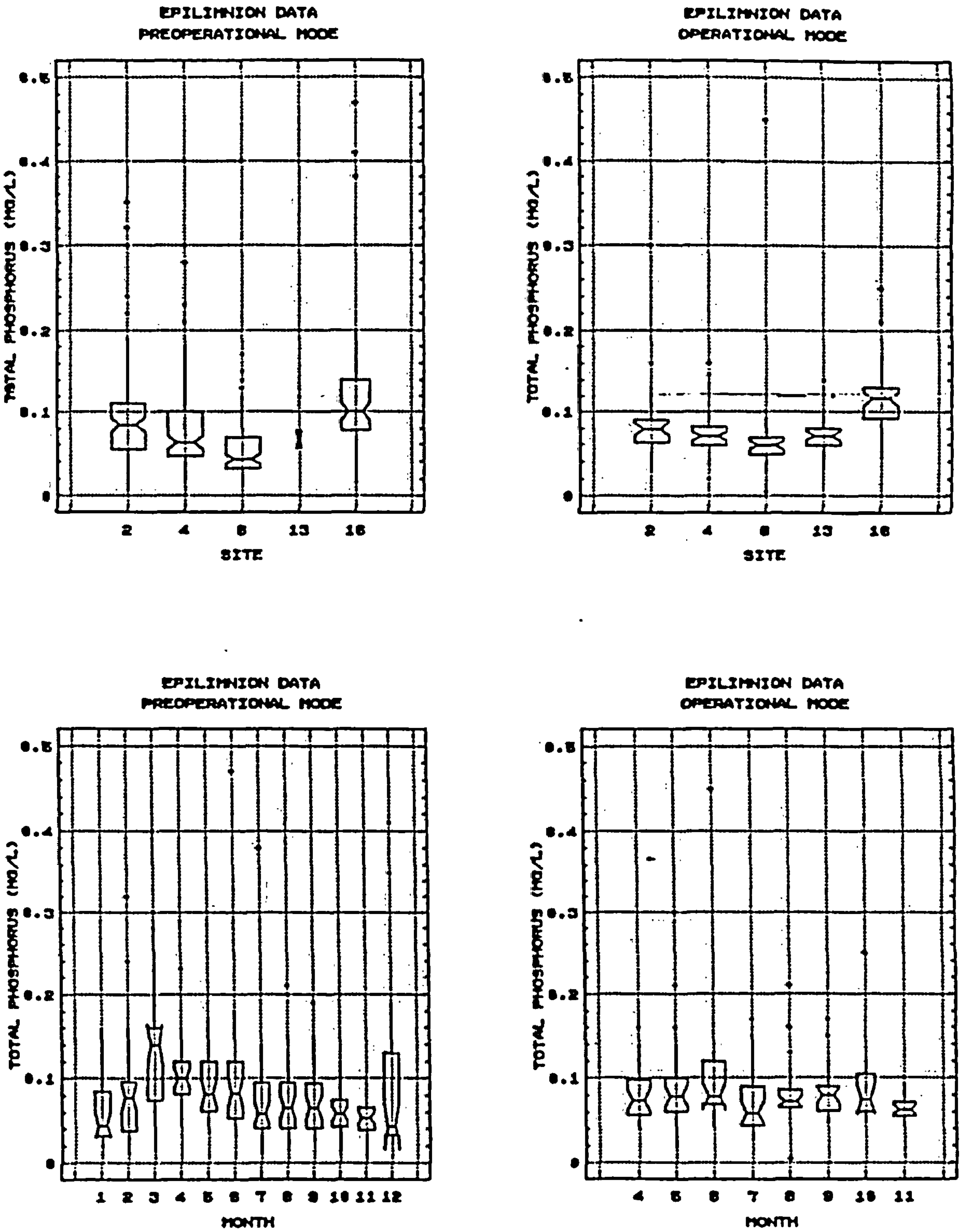


Figure 68. Distributions of total phosphorus concentrations (mg/l) in Clinton Lake for monitoring sites and months during periods prior to (preoperational mode) and during (operational mode) Clinton Power Station operation.

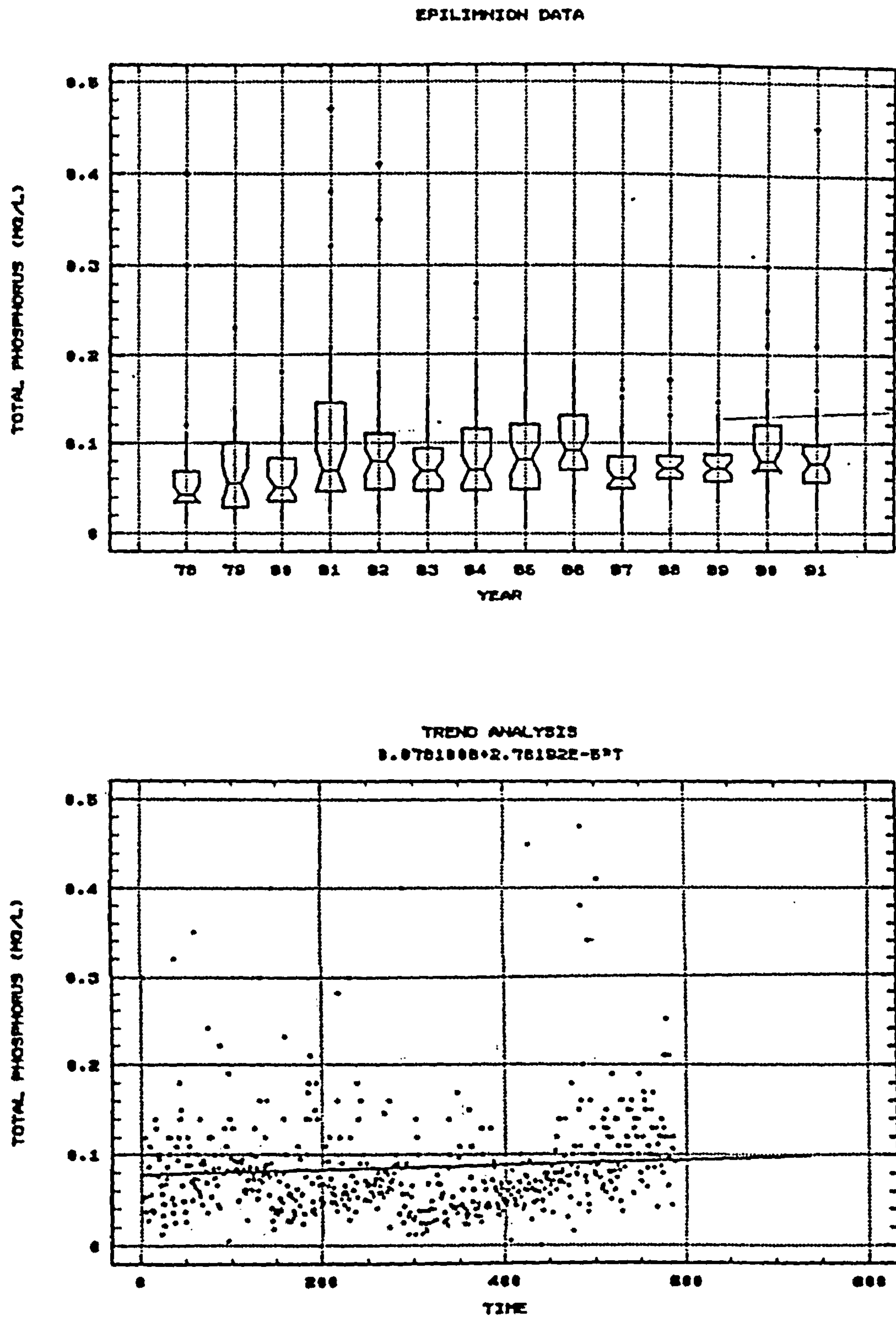


Figure 69. Yearly distributions (top graph) and trend analysis (bottom graph) of total phosphorus concentrations (m in Clinton Lake during 1978 through 1991.

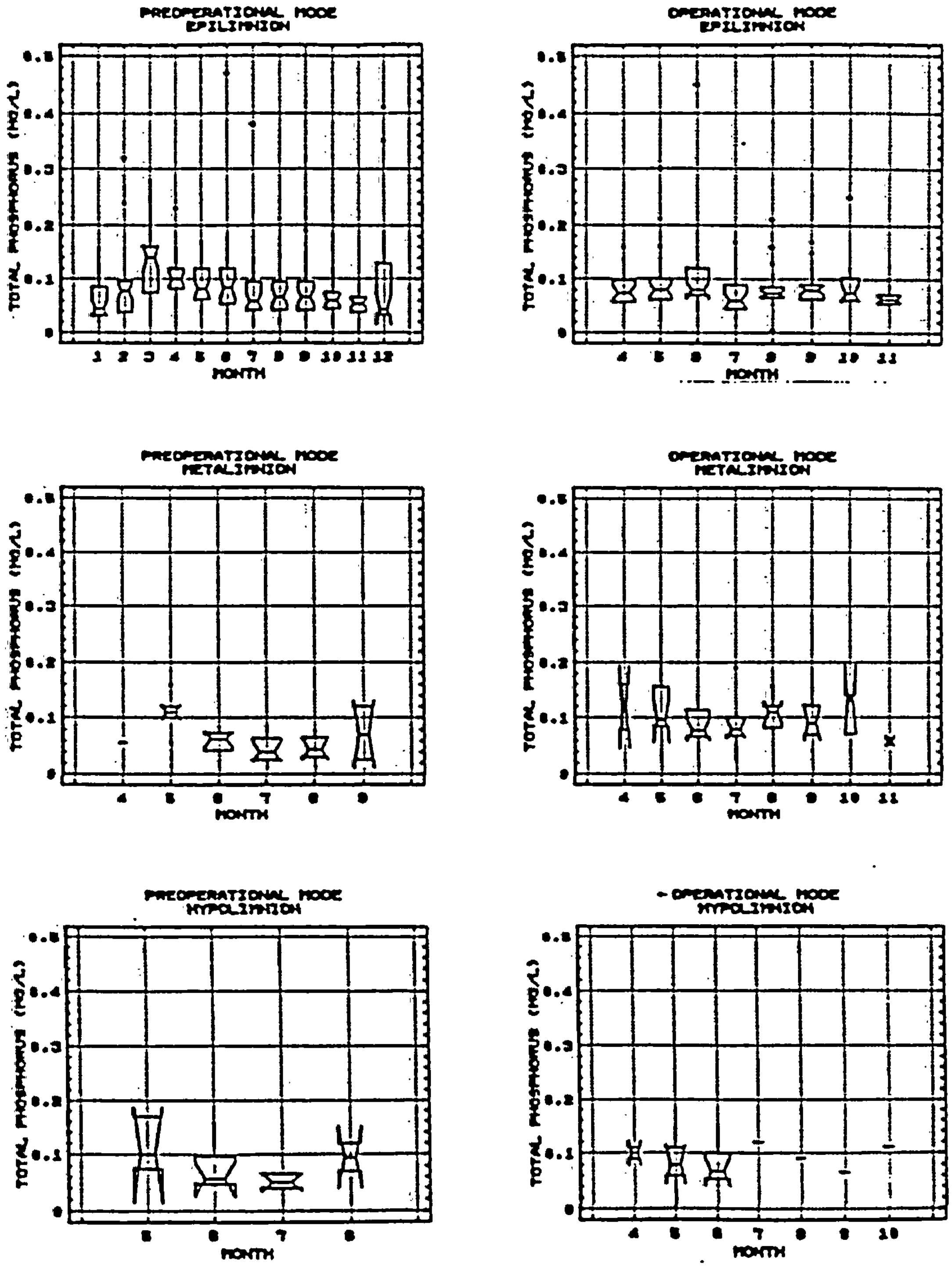


Figure 70. Distributions of total phosphorus concentrations (mg/l) in Clinton Lake for epilimnion, metalimnion, and hypolimnion for the periods prior to (preoperational mode) and during Clinton Power Station operation (operational mode).

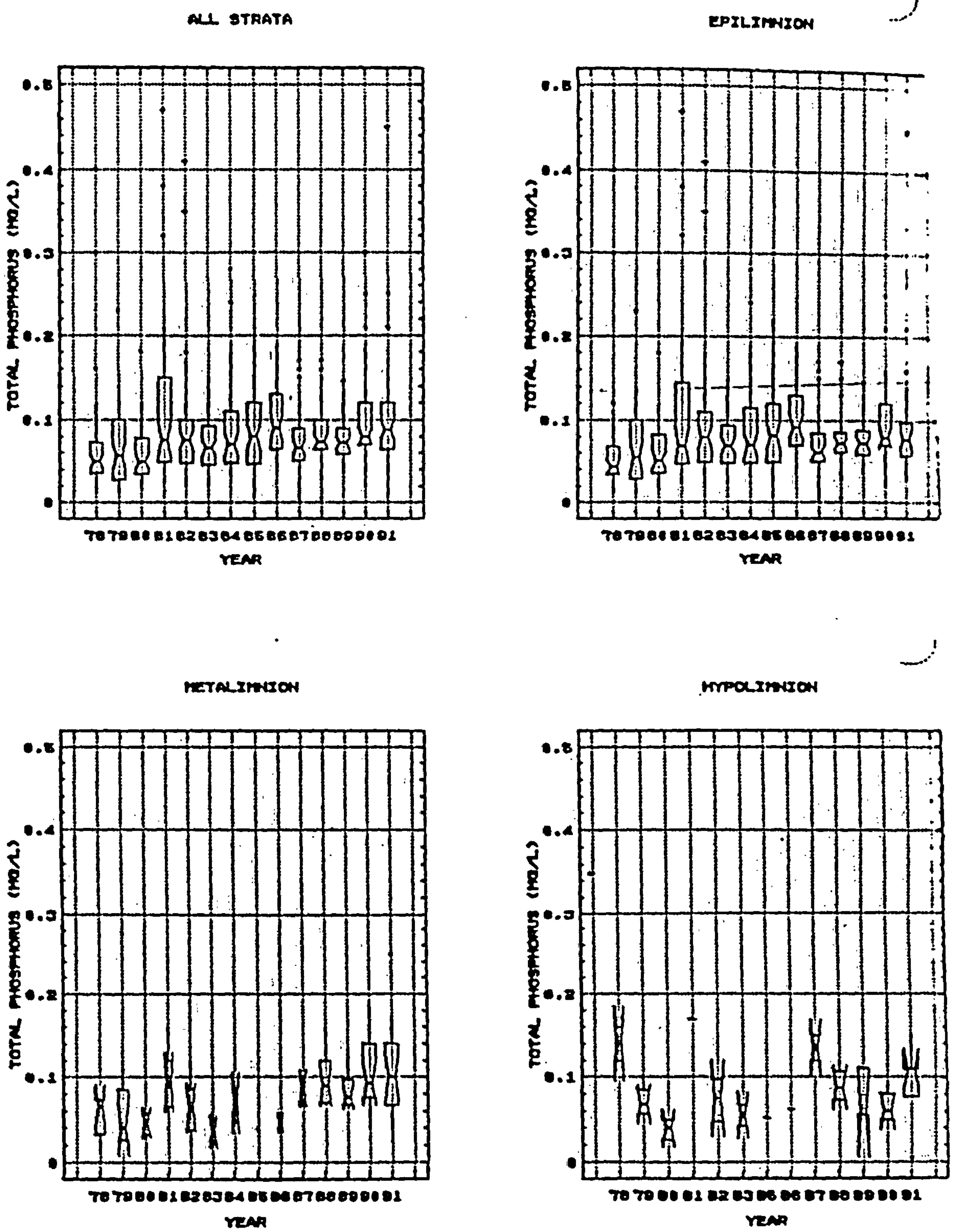


Figure 71. Distributions of total phosphorus concentrations (mg/l) Clinton Lake for epilimnion, metalimnion, and hypolimnic strata during 1978 through 1991.

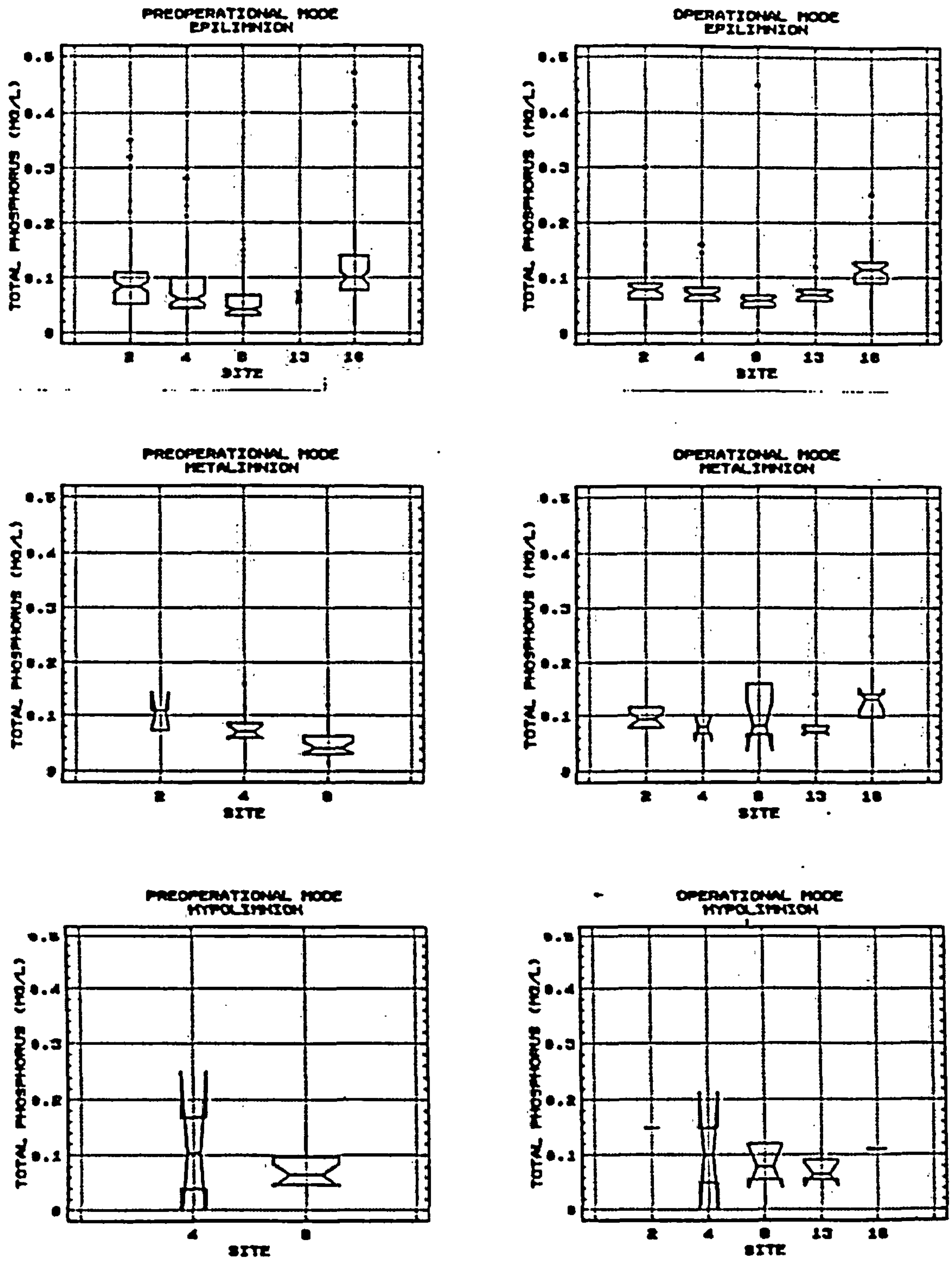


Figure 72. Distributions of total phosphorus concentrations (mg/l) for epilimnion, metalimnion, and hypolimnion strata at Clinton Lake monitoring sites during 1978 through 1991.

Ortho, or hydrated, phosphates are very soluble and therefore most readily assimilated by aquatic plants. It is the nutrient primarily responsible for lake eutrophication.

Epilimnion Orthophosphate

The average orthophosphate concentration for 493 epilimnion samples collected from Clinton Lake was 0.025 mg/l. Distributions of orthophosphate concentrations were similar between preoperational and operational periods (Figure 73). The maximum soluble orthophosphate concentration measured in Clinton Lake epilimnion water (0.28 mg/l) occurred at sites 4 and 8 on March 21, 1978. There was no apparent pattern in plots of orthophosphate concentrations among years (Figure 74). Plots among months indicate orthophosphate concentrations increased from January through April and decreased thereafter (Figure 75). There were no significant differences among sites for orthophosphate data collected during 1978 through 1991 (Figure 75). Trend analyses indicate a slight decrease in orthophosphate concentrations from 1978 through 1991 (Figure 74). The decrease is slight and not apparent in distribution of orthophosphate data by years for 1978 through 1991 (Figure 74).

Orthophosphate During Stratification

The average orthophosphate concentration for metalimnion and hypolimnion strata was 0.029 and 0.036 mg/l, respectively. Results ranged from 0.0005 to 0.41 mg/l in the metalimnion and from 0.0005 to 0.14 mg/l in the hypolimnion.

Distributions of orthophosphate concentrations among sites were similar for all strata (Figure 76). Distributions of orthophosphate data were similar at each depth stratum during and between preoperational and operational periods (Figure 77). Distribution of orthophosphate concentrations among months were similar during preoperational and operational periods (Figure 78).

8.4.3 Total Nitrogen : Total Phosphorus Ratio

The total nitrogen : total phosphorus (N/P) ratio is indicative of nutrient limiting conditions. High N/P ratios indicate phosphorus concentrations are insufficient, thus limiting the utilization of all of the nitrogen available for primary production. The average total nitrogen and phosphorus concentrations for epilimnion samples from Clinton Lake during 1978 through 1991 were 0.88 and 0.087 mg/l, respectively. The N/P ratio of these average values is 10.11. This ratio indicates the amount of total phosphorus limits the utilization of all of the nitrogen in Clinton Lake. It does not, however, indicate that phosphorus levels limit growth of aquatic plants in Clinton Lake. Concentrations of phosphorus in Clinton Lake exceeded the IPCB General Use standard, thus, phosphorus levels are sufficient to sustain nuisance populations of algae and aquatic vascular plants in Clinton Lake. The average N/P ratio for Clinton Lake was lower than that for 63 Illinois lakes (44) (Sefton et al. 1980).

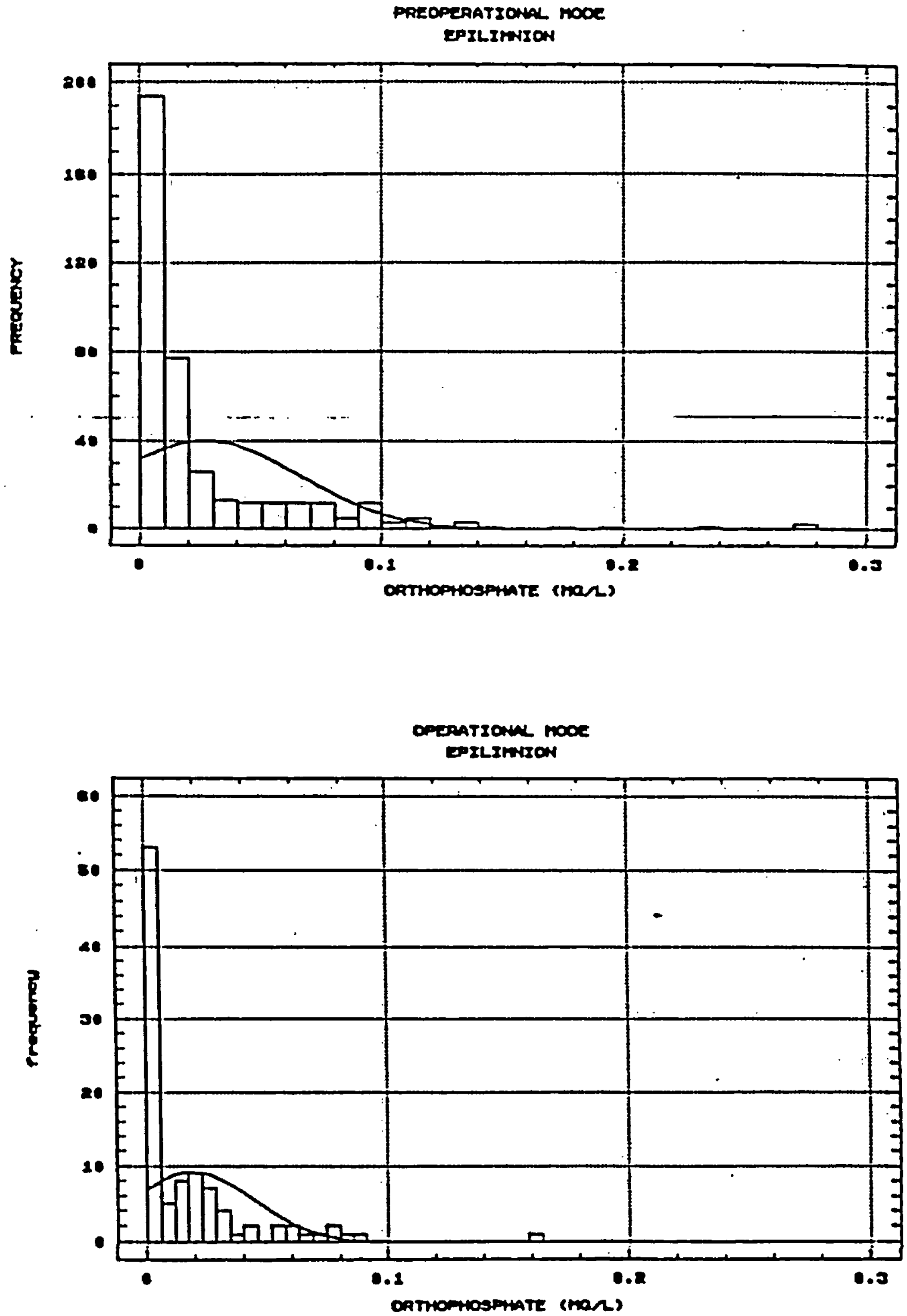
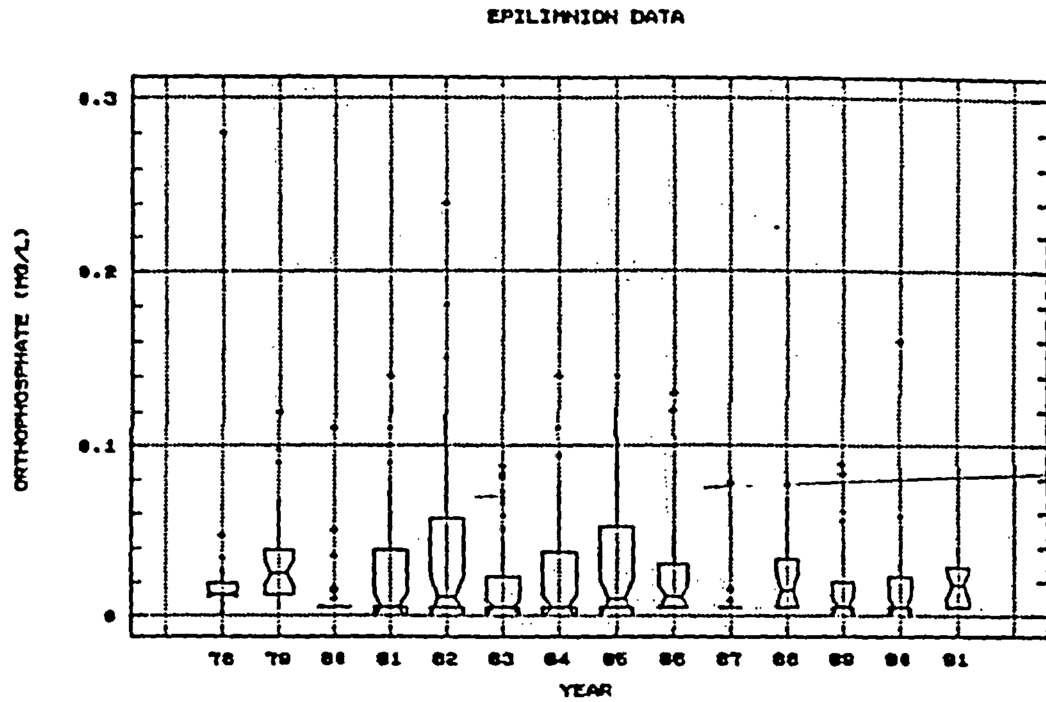


Figure 73. Frequency histograms of epilimnion orthophosphate concentrations (mg/l) in Clinton Lake during periods prior to (top graph) and during Clinton Power Station operation (bottom graph).



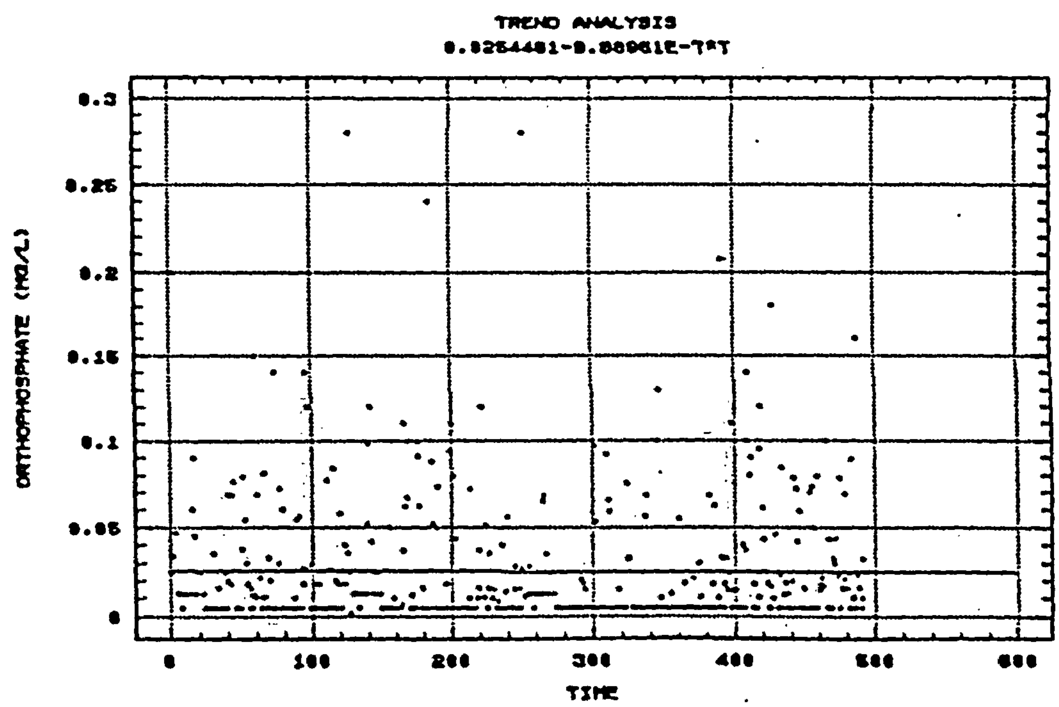


Figure 74. Yearly distributions (top graph) and trend analy (bottom graph) of orthophosphate concentrations (mg/l) Clinton Lake during 1978 through 1991.

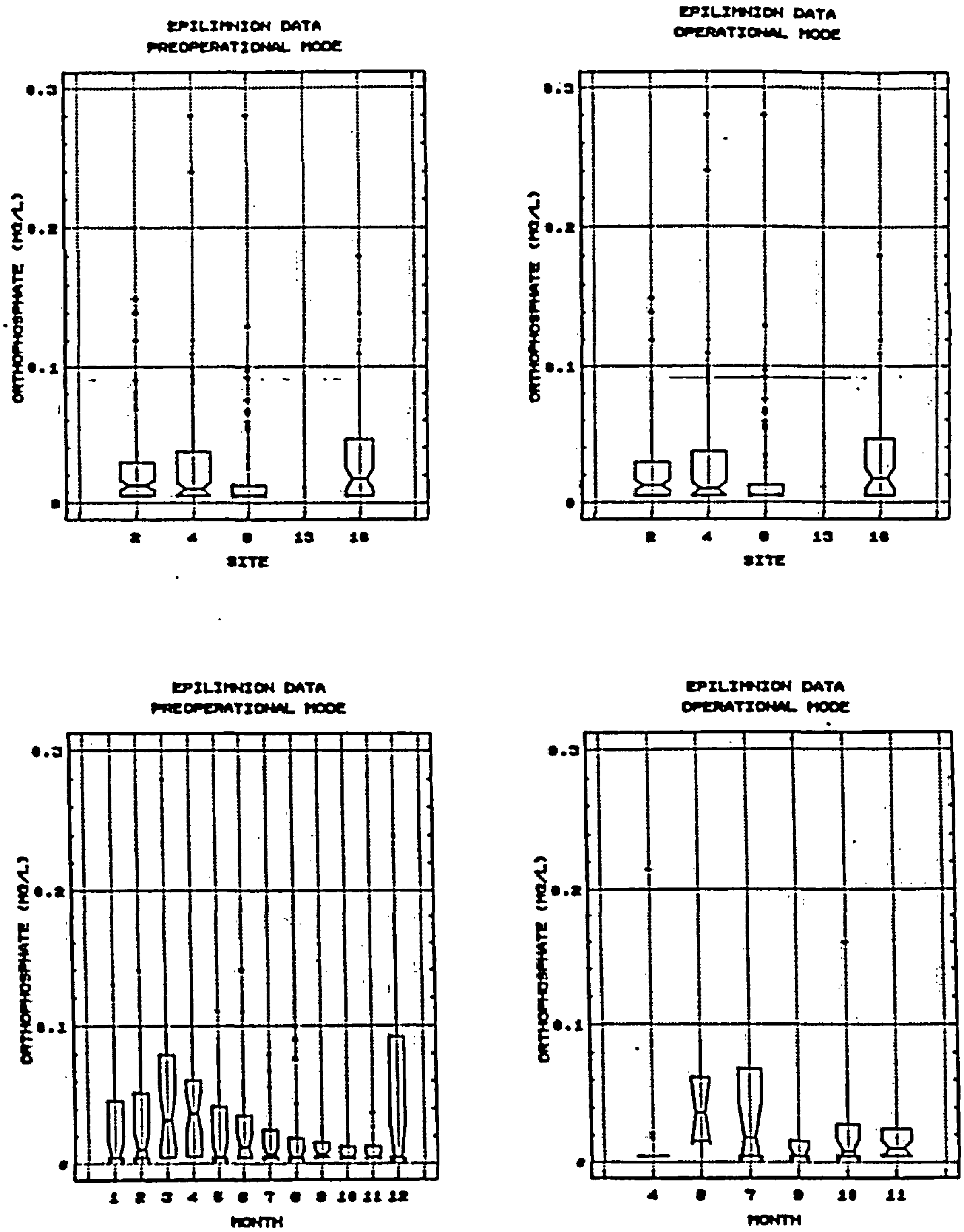


Figure 75. Distributions of epilimnion orthophosphate concentrations (mg/l) for Clinton Lake monitoring sites and by months during periods prior to (preoperational mode) and during (operational mode) Clinton Power Station operation.

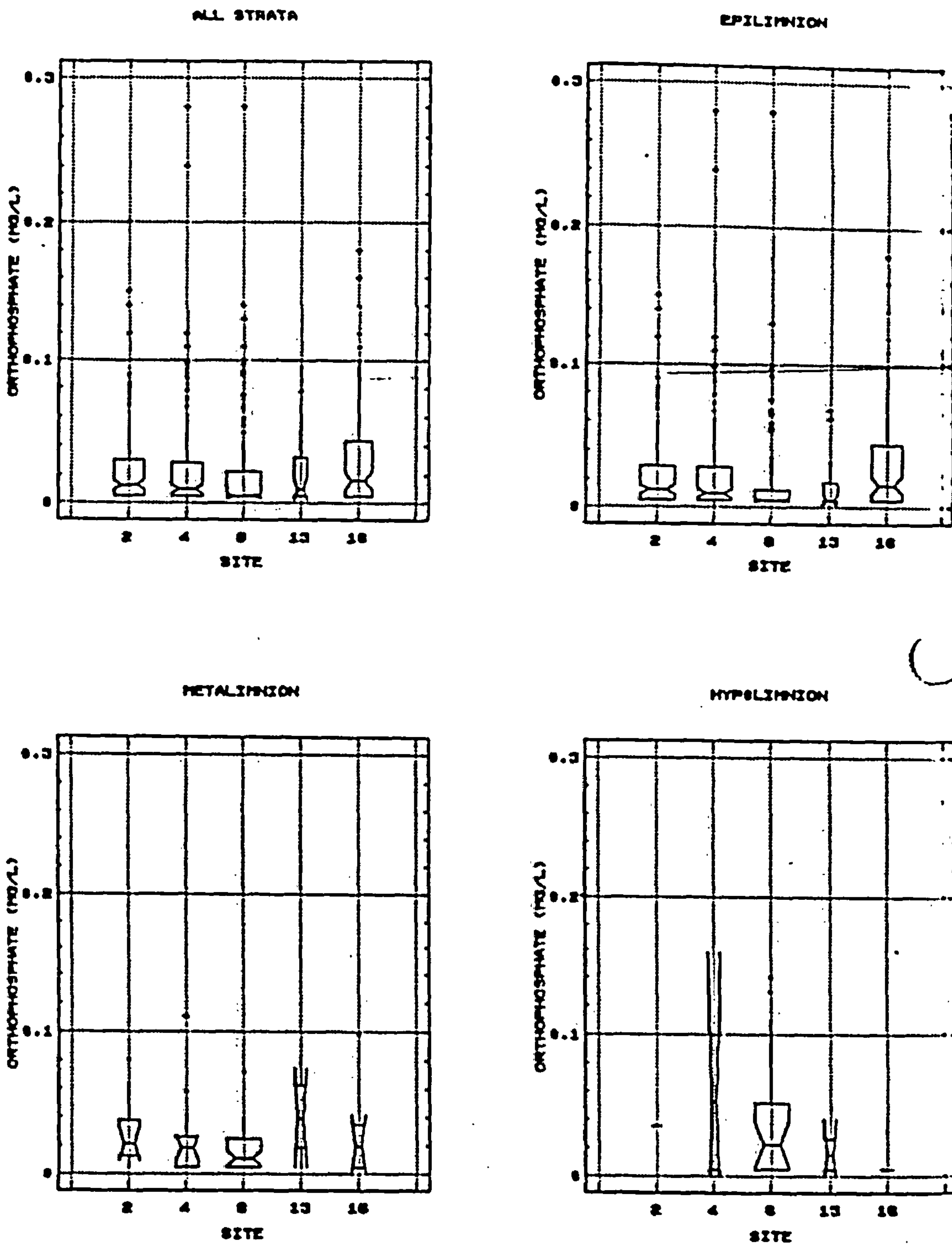


Figure 76. Distributions of orthophosphate concentrations (mg/l) for epilimnion, metalimnion, and hypolimnion strata at Clinton Lake monitoring sites during 1978 through 1991.

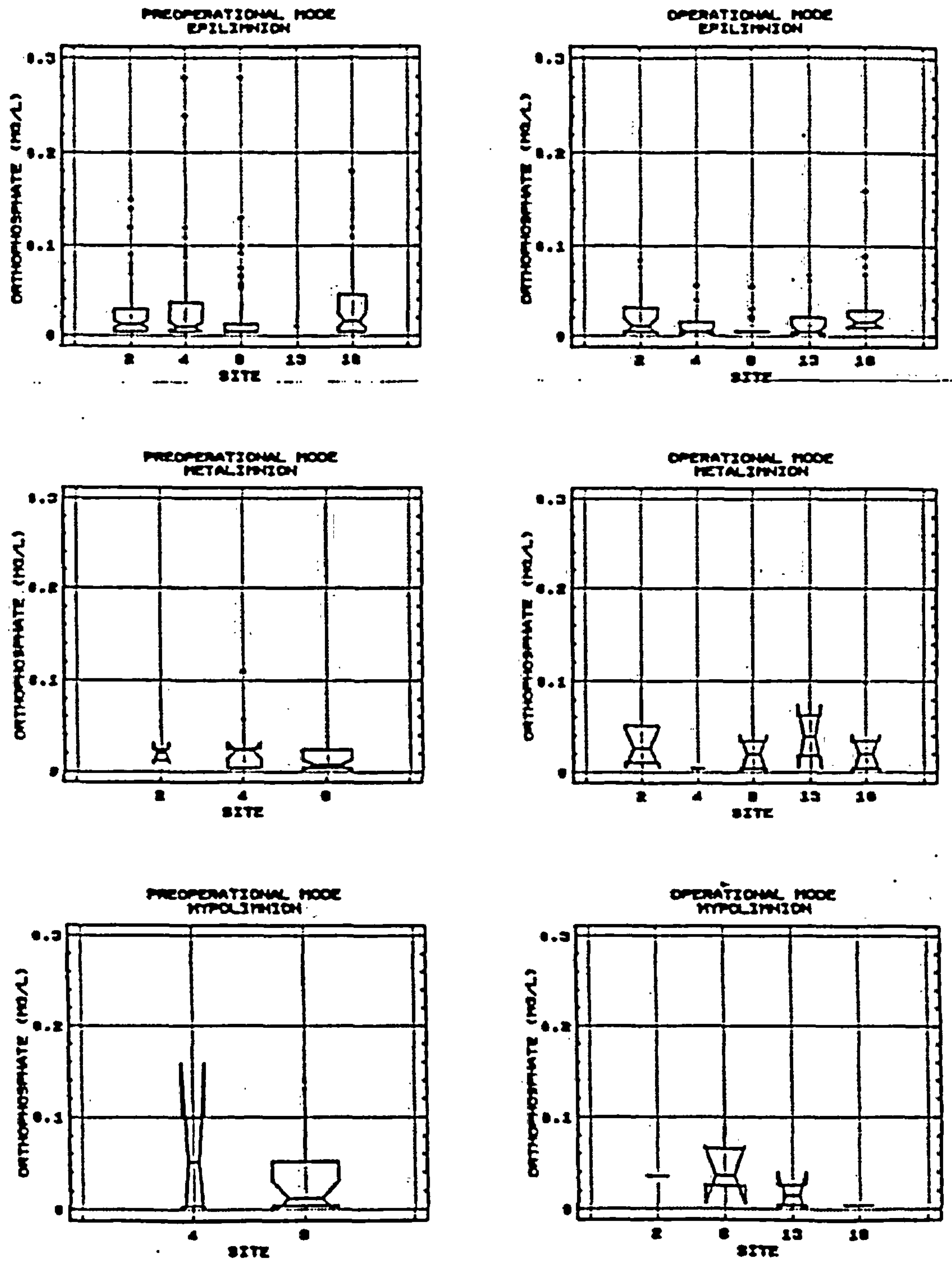


Figure 77. Distributions of orthophosphate concentrations (mg/l) at Clinton Lake monitoring sites for epilimnion. metalimnion, and hypolimnion strata during periods prior to (preoperational mode) and during (operational mode) Clinton Power Station operation.

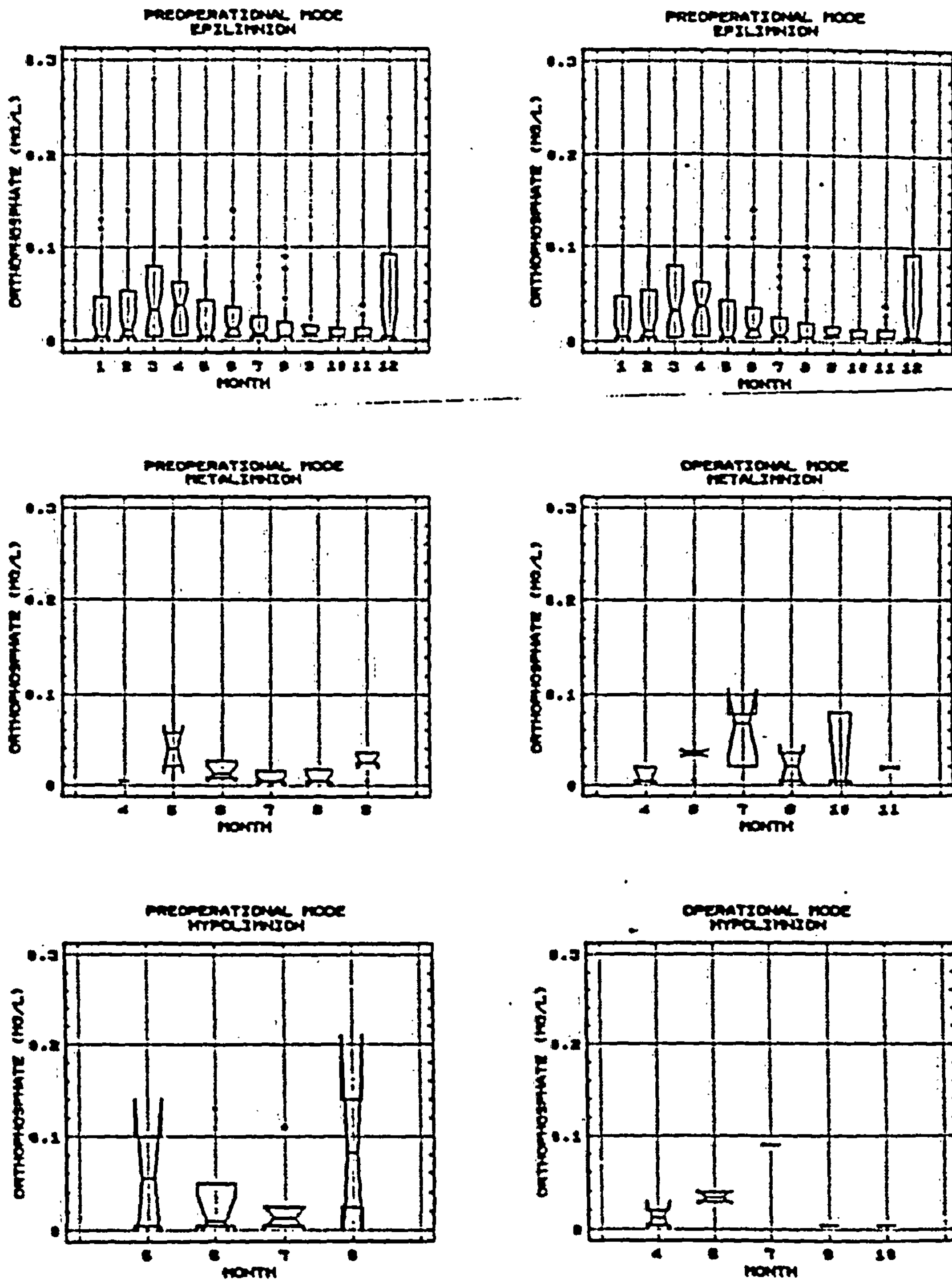


Figure 78. Distributions of orthophosphate concentrations (mg/l) in Clinton Lake for epilimnion, metalimnion, and hypolimnion strata for the periods prior to (preoperational mode) and during Clinton Power Station operation (operational mode).

8.5 Metals

8.5.1 Copper

Copper is an essential micro-nutrient for plants and animals. It is commonly found in natural waters in trace amounts. The amount of copper in ionic solution is generally very small in aerated surface waters. Copper is vital in chlorophyll synthesis and is a constituent of several enzymes. In animals, copper is functional in blood chemistry and hemoglobin synthesis. High concentrations of copper are toxic; concentrations greater than 25 ug/l may be toxic to fish species (Sefton et al. 1980). The average concentration of copper for most lakes is 10 ug/l (Wetzel 1975). Most copper is transported as crystalline solids and adsorbed solid phases. Copper forms stable complexes with organic compounds. The abundance of copper may vary more than twenty-fold during the course of a year. Concentrations of copper may increase during fall and winter.

Epilimnion Copper

Samples collected from Clinton Lake after 1986 were not analyzed for copper. The average copper concentration in 387 epilimnion samples collected from Clinton Lake was 3.6 ug/l. The maximum copper concentration measured in epilimnion water was 13.0 ug/l at Site 16 on February 18, 1981. Approximately 90% of the samples had copper concentrations less than 5 ug/l (Figure 79). Copper concentrations in all epilimnion samples were less than the IPCB General Use standard (20 ug/l) at 200 mg/l hardness. Only nine percent of the 558 samples from 63 Illinois lakes had copper concentrations which exceeded the IPCB General Use water quality standard (Sefton et al. 1980).

There was an apparent down-lake decrease in copper concentrations. Mean concentrations for copper decreased from 4.0 to 3.6 to 3.1 ug/l at sites 16, 2, and 8, respectively. However, there were no significant differences among sites during the monitoring program (Figure 80). There were no significant differences in the distribution of copper data among months (Figure 80). Copper concentrations during 1984 through 1986 were significantly greater than all preceding years, except 1981 (Figure 80).

Copper During Stratification

The average concentration of copper from 106 samples collected during periods of stratification was 2.8 ug/l. Copper concentrations ranged from 0.25 to 21.0 ug/l. The maximum concentration occurred in the hypolimnion at Site 8 during August, 1980. This was the only instance where the IPCB General Use water quality standard was exceeded during 1978 through 1986. This standard was exceeded in six percent of the samples collected from bottom waters of 63 Illinois lakes (Sefton et al. 1980).

Average copper concentrations for epilimnion and metalimnion data were similar; 2.69 and 2.61 ug/l, respectively. Average hypolimnion data were greater at 3.6 ug/l. Distributions of copper concentrations

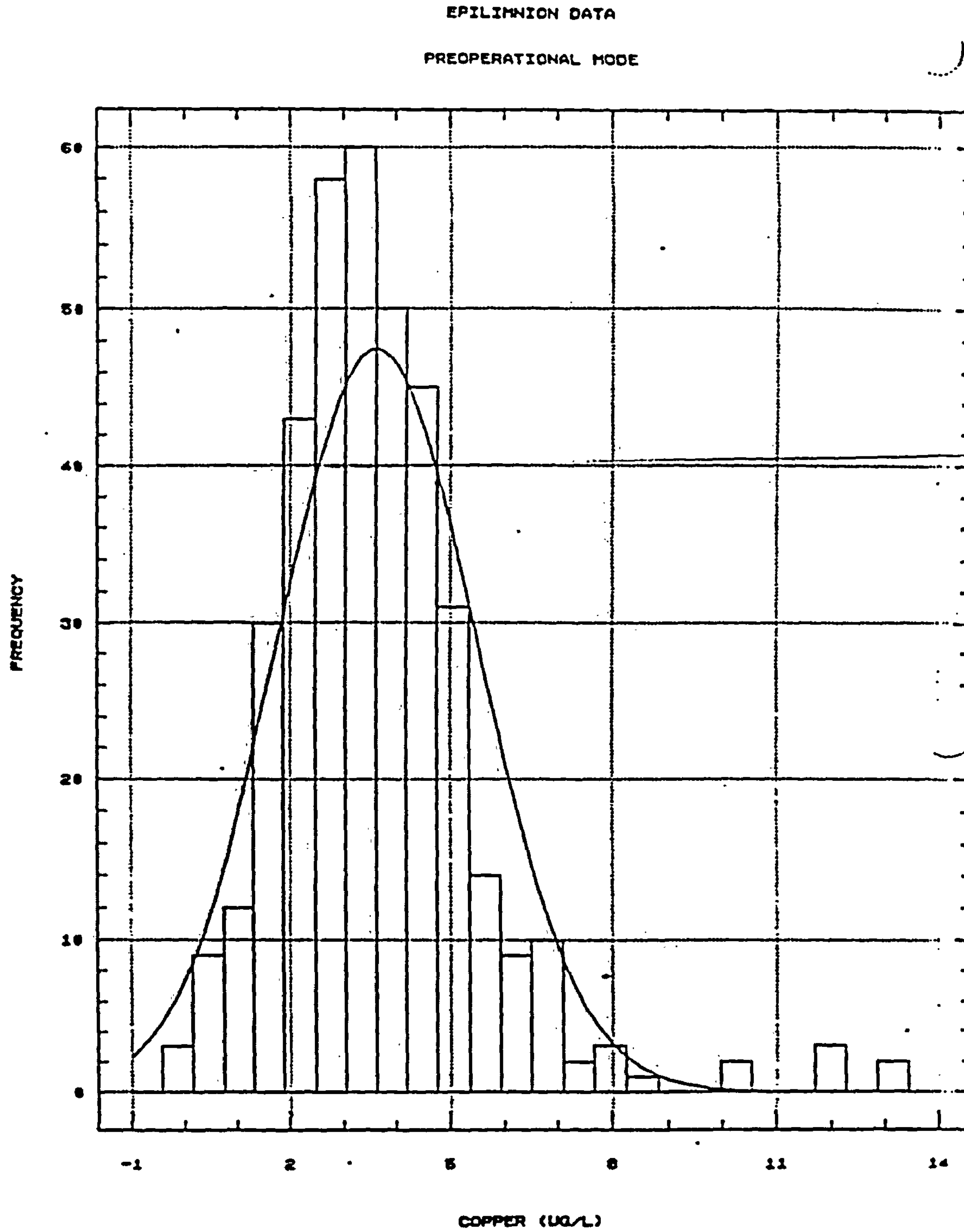


Figure 79. Frequency histogram of epilimnion copper concentration (ug/l) in Clinton Lake during 1978 through 1986.

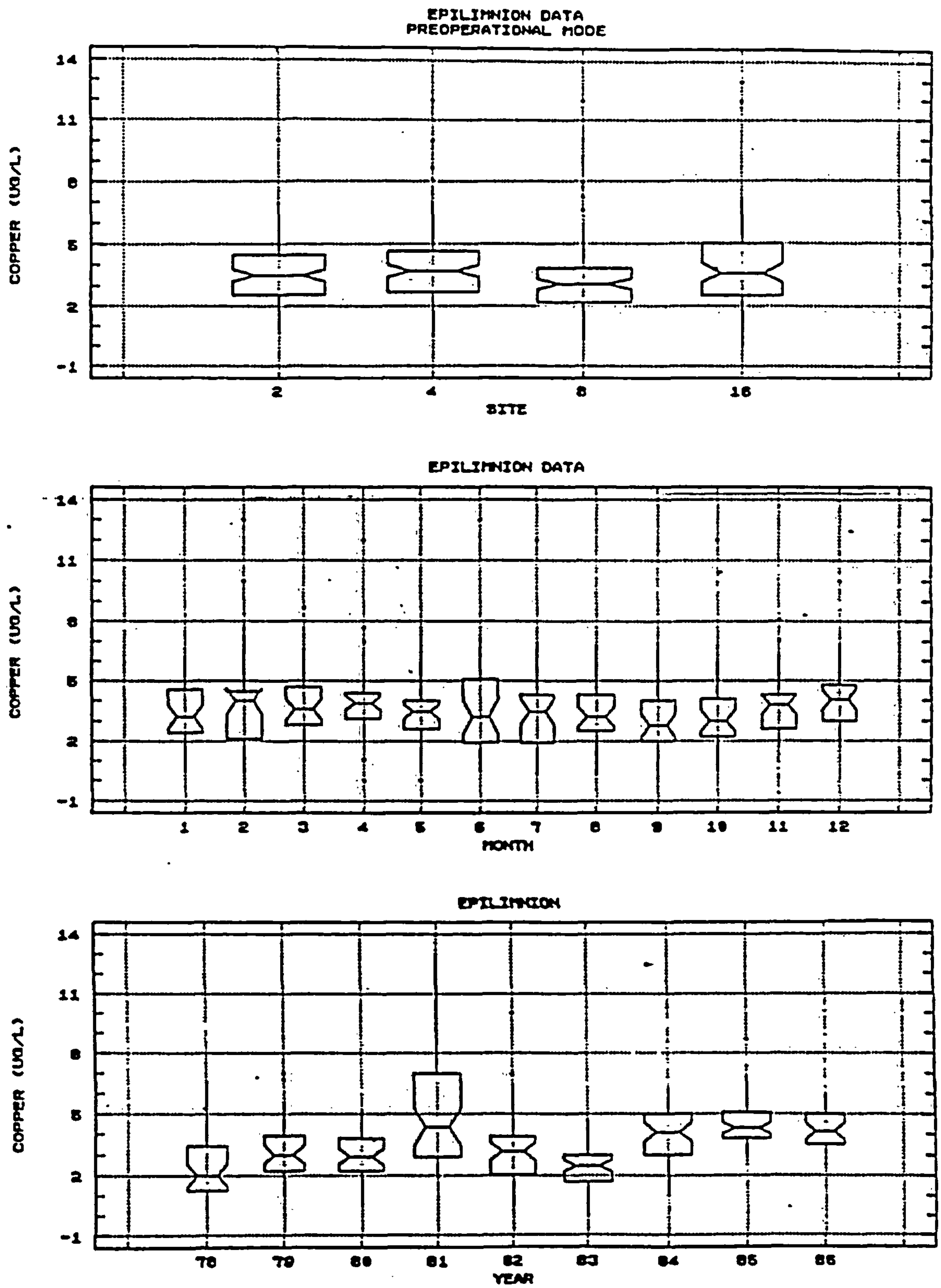


Figure 80. Distributions of copper concentrations (ug/l) in Clinton Lake for each monitoring site (top graph), by months (middle graph), and during 1978 through 1986 (bottom graph).

were similar within epilimnion and metalimnion strata (Figure 81). Copper concentrations in the hypolimnion tended to decrease with succeeding months during stratification, however, there were no significant differences among months (Figure 81). Distributions of copper concentrations were similar among sites for all strata (Figure 82). There was a tendency for copper concentrations to increase with succeeding years for each strata during 1978 through 1986 in the metalimnion and hypolimnion (Figure 83).

8.5.2 Lead

The presence of lead in natural waters may be attributed to precipitation, lead dust fallout, erosion and leaching of soil, industrial waste discharges, and storm water runoff from roads. Lead concentrations in water are generally not high, due to the low solubility of lead salts. The mean natural lead content in lakes and rivers ranges from 1.0 to 10.0 ug/l (USEPA 1976). Lead concentrations in 63 Illinois lakes were generally below the limit of detection. Only two surface water samples had lead concentrations greater than the detectable level (Sefton et al. 1980).

Lead is not an essential biological element; it is toxic and lead is bioaccumulative. Concentrations greater than 0.1 ug/l are considered deleterious to fish and aquatic life. The toxicity of lead in water is affected by pH, hardness, organic materials, and the presence of other metals. The 96-hour LC50 for fathead minnows in hard water is 482 ug/l (USEPA 1976). The solubility of lead ranges from 500 ug/l in soft water to 3 ug/l in hard water.

Epilimnion Lead

The average lead concentration for 385 Clinton Lake water samples collected from 1978 through 1986 was 1.5 ug/l. During this period lead data ranged from 0.1 to 62 ug/l. Approximately 90% of the lead concentrations were less than 2 ug/l (Figure 84). All but 5 of the 385 samples had lead concentrations less than 10 ug/l and four of the 5 samples occurred at Site 16. The maximum occurred at Site 8 on September 7, 1983. All samples collected from Clinton Lake had lead concentrations less than the IPCB General Use water quality standard (200 ug/l at 200 mg/l hardness). Distributions of lead data were similar among sampling sites, years and months (Figure 85).

Lead During Stratification

The average concentration of lead in the 104 samples collected from Clinton Lake during stratification was 2.13 ug/l. Concentrations for lead during stratification ranged from 0.12 to 62.0 ug/l. Lead concentrations were greatest in epilimnion and metalimnion samples at Site 8 during August, 1983. Average concentrations for epi-, meta-, and hypolimnion strata were 2.23, 2.79, and 1.04 ug/l, respectively. Distributions of lead data in epilimnion, metalimnion and hypolimnion strata were similar among months (Figure 86) and sites (Figure 87). Distributions of lead concentrations among years for each strata did not indicate any obvious

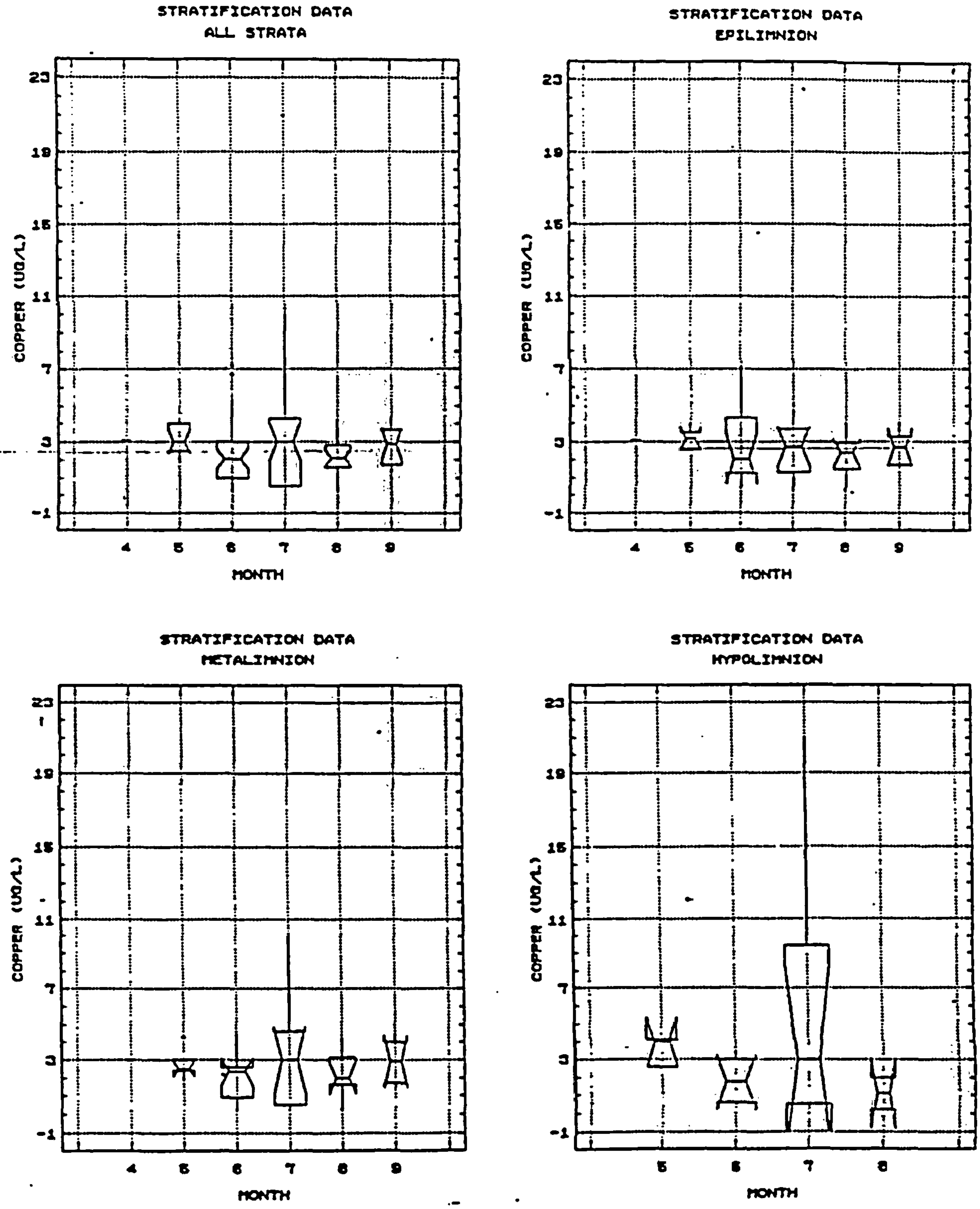


Figure 81. Distributions of copper concentration (ug/l) by months in Clinton Lake for epilimnion, metalimnion, and hypolimnion strata.

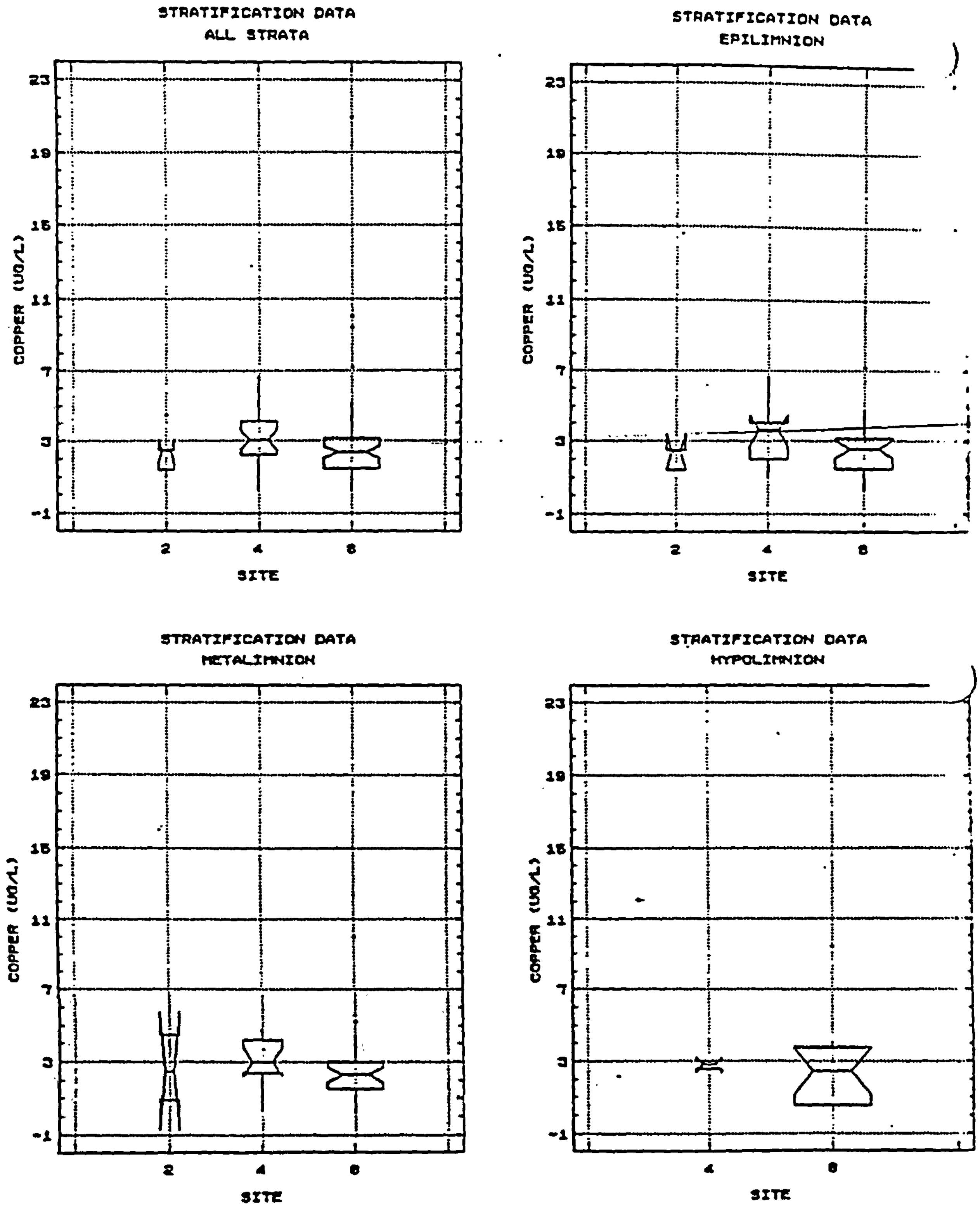


Figure 82. Distributions of copper concentration (ug/l) by monitoring sites in Clinton Lake for epilimnion, metalimnion, and hypolimnion strata.

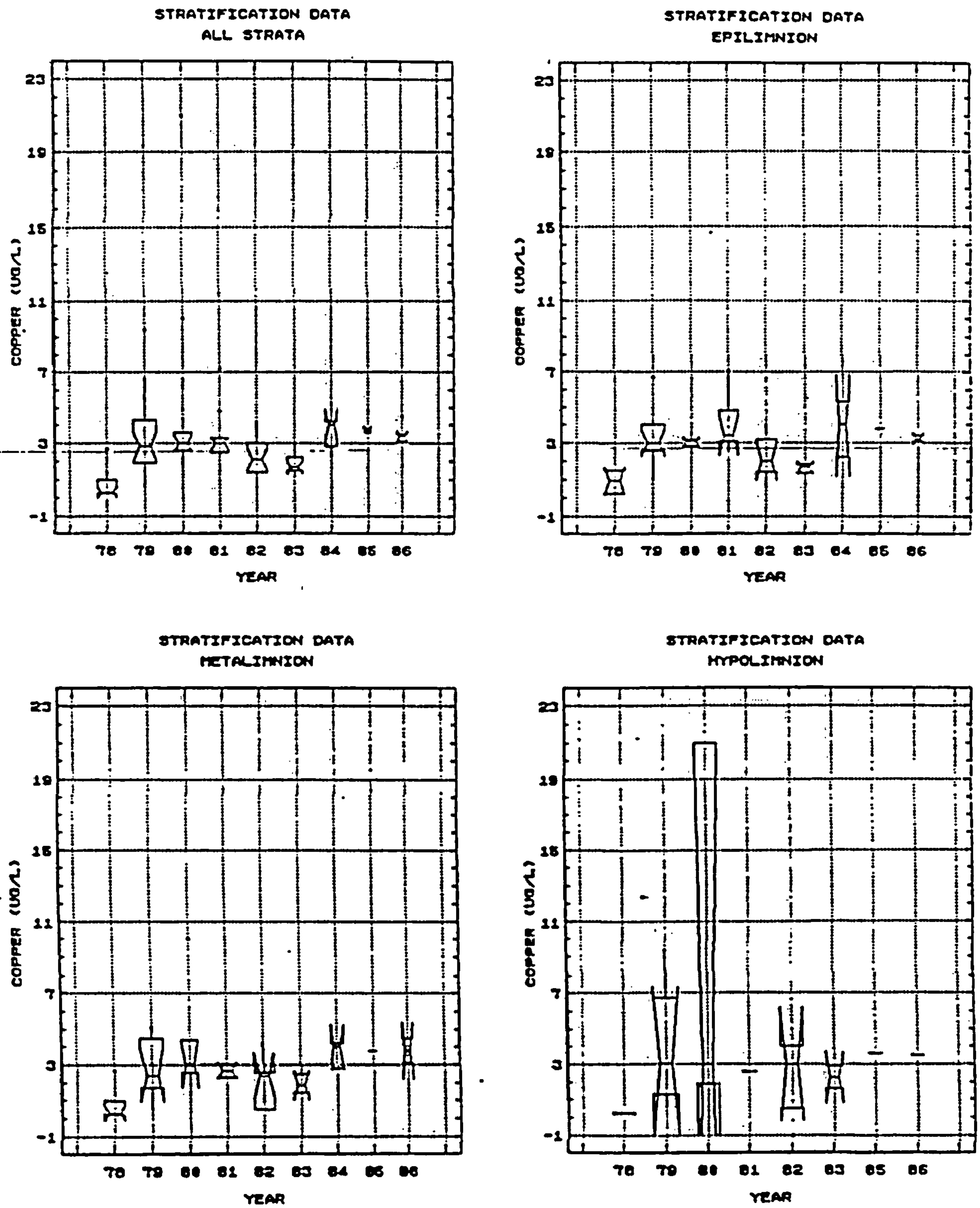


Figure 83. Distributions of copper concentrations (ug/l) from 1978 through 1986 in Clinton Lake for epilimnion, metalimnion, and hypolimnion strata.

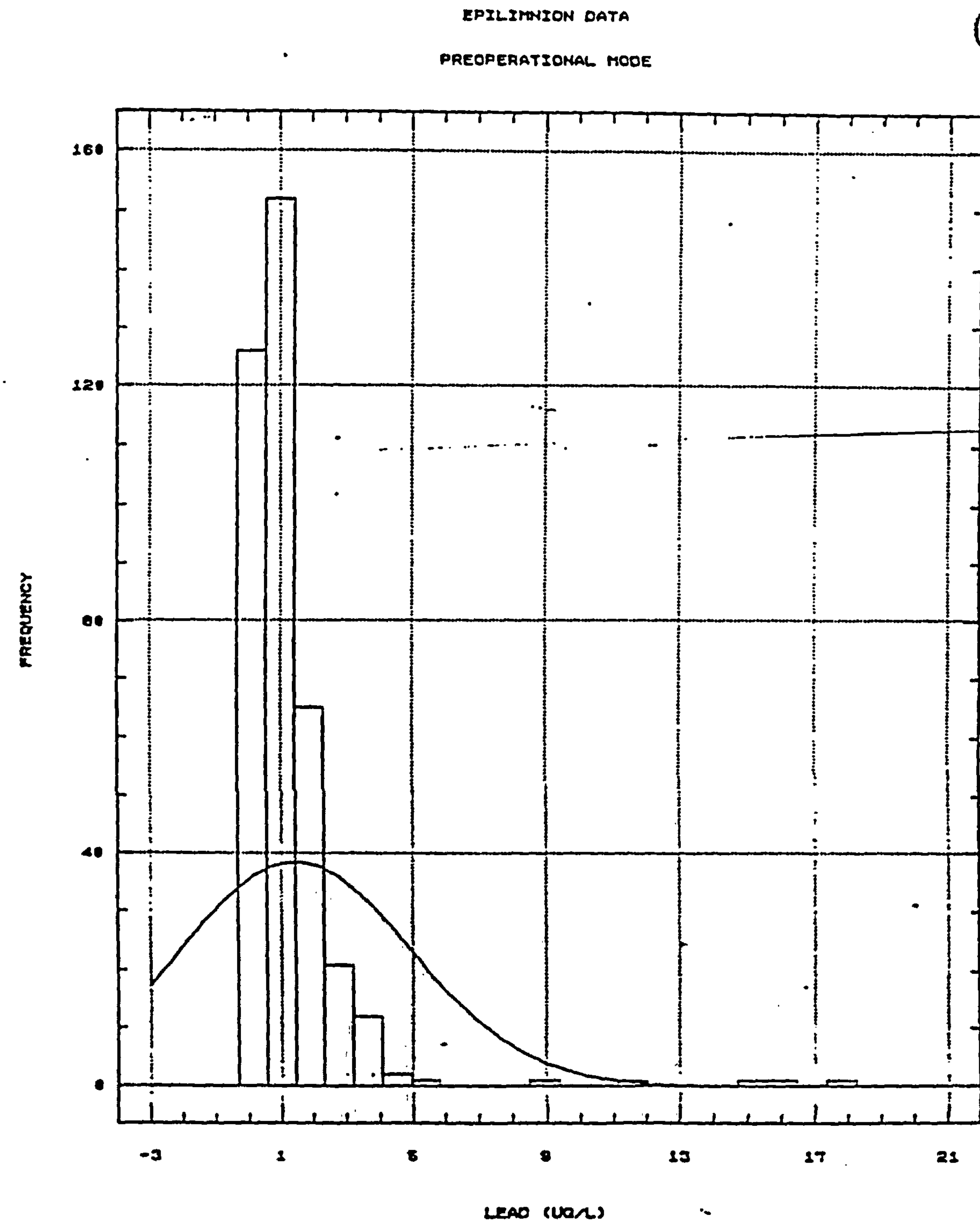


Figure 84. Frequency histogram of epilimnion lead concentrations (ug/l) in Clinton Lake during 1978 through 1986.

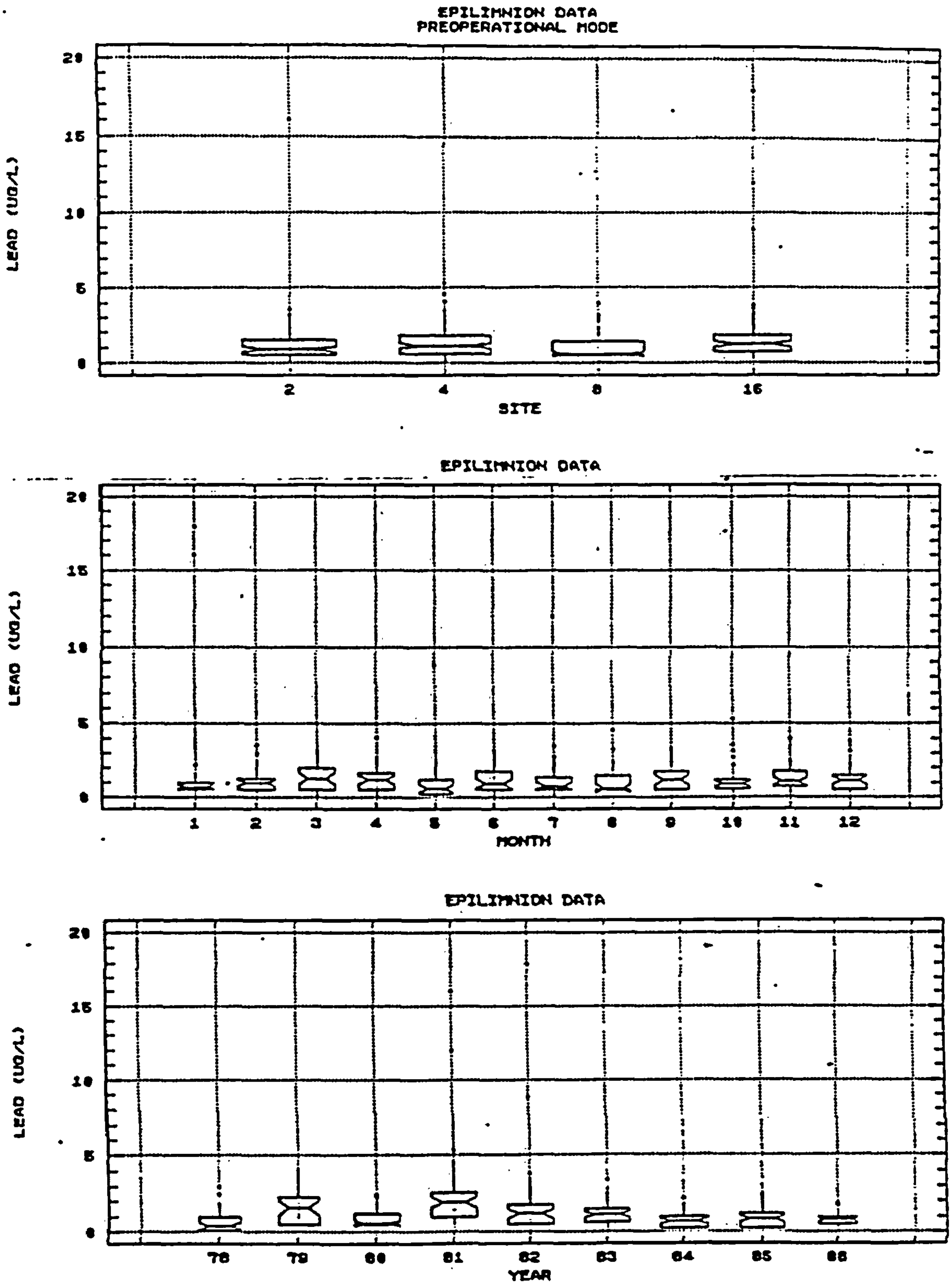


Figure 85. Distributions of lead concentrations (ug/l) in Clinton Lake for each monitoring site (top graph), by months (middle graph), and during 1978 through 1986 (bottom graph).

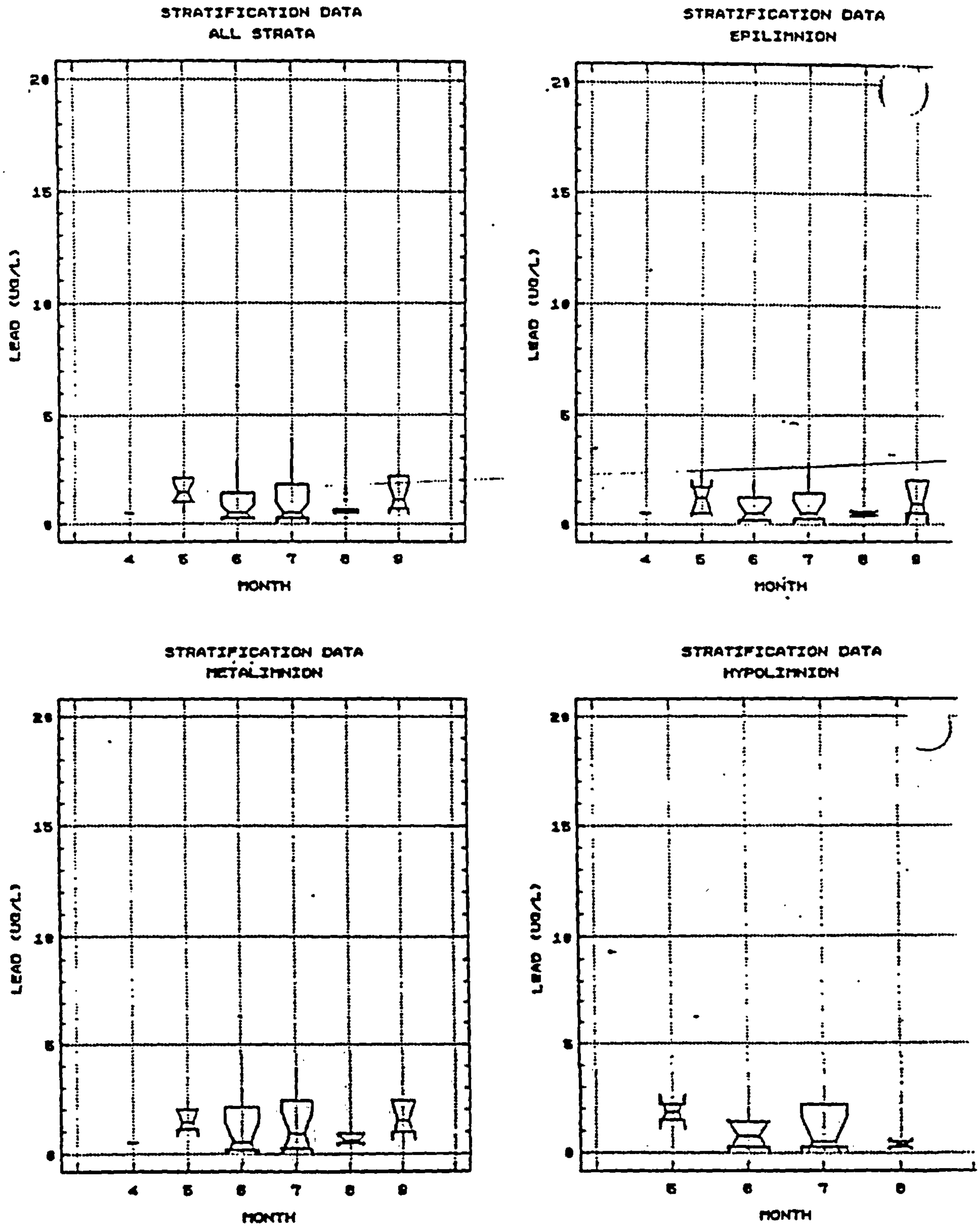


Figure 86. Distributions of lead concentrations (ug/l) by months in Clinton Lake for epilimnion, metalimnion, and hypolimnion strata during 1978 through 1986.

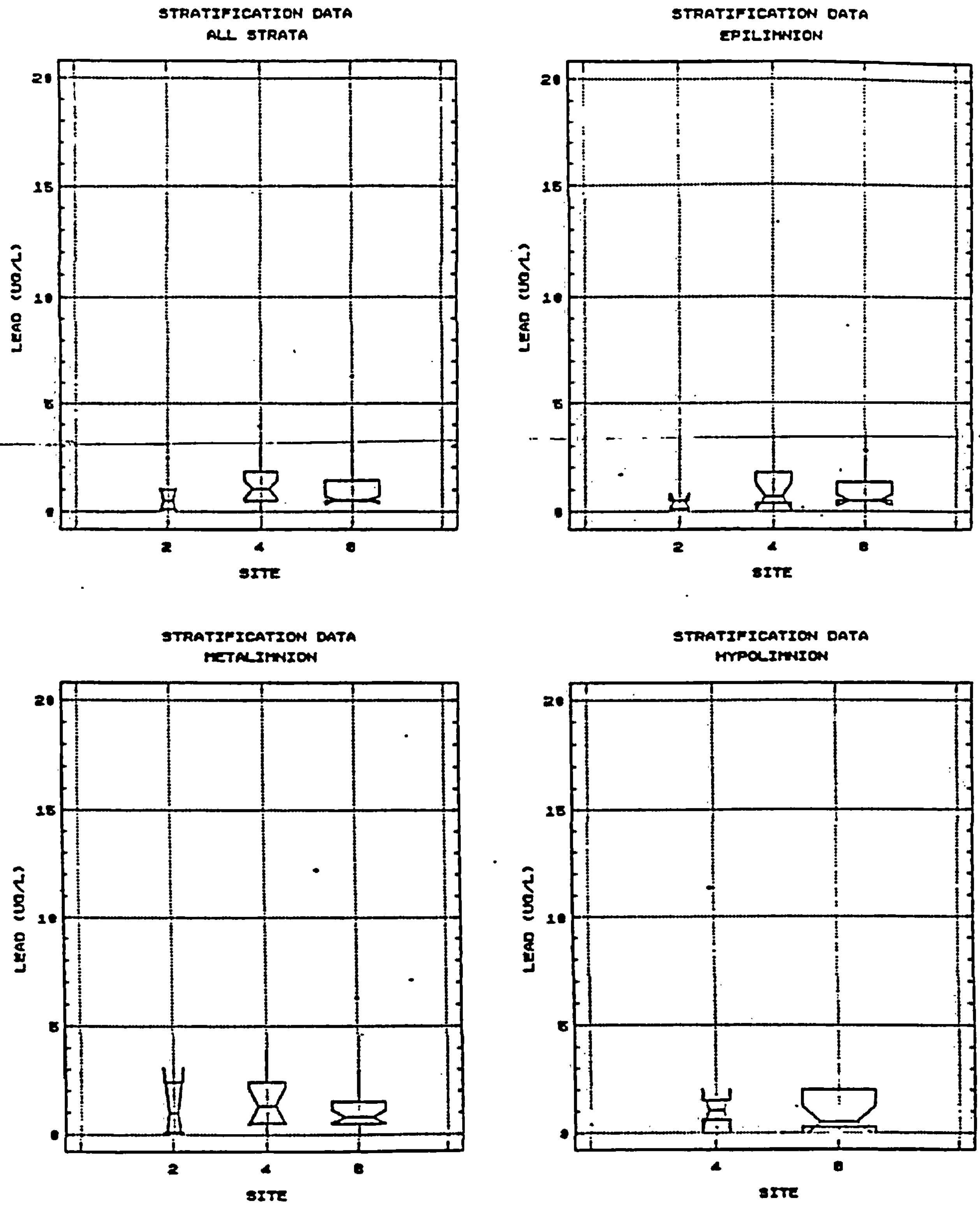


Figure 87. Distributions of lead concentrations (ug/l) in Clinton Lake for epilimnion, metalimnion, and hypolimnion strata at sites where stratification occurred during 1978 through 1986.

long term trends (Figure 88). Samples were not analyzed for lead during years when CPS was operating.

8.5.3 Magnesium

Magnesium is a common constituent of natural waters. It is usually second in abundance to calcium as the predominant cation in inland waters. Magnesium salts contribute to the hardness of water and when heated, form scale in boilers and condensers. Concentrations greater than 125 mg/l can exert a cathartic and diuretic action. Magnesium concentrations vary from zero through several hundred milligrams per liter in natural waters. Magnesium is an important factor in aquatic primary productivity since it forms the core of the chlorophyll molecule.

Epilimnion Magnesium

The average magnesium concentration of 105 epilimnion samples collected during 1986 through 1991 was 32.2 mg/l. Magnesium concentrations ranged from 23 to 46 mg/l during 1986 through 1991. Magnesium concentrations increased from 1986 through 1988 and then decreased through 1991 (Figure 89). Analyses of data from 1986 through 1991 indicate there is a slight trend for increased concentrations of magnesium. Distributions of magnesium concentrations among sites were similar during the operational period (Figure 90). Magnesium concentrations were greater during fall months (Figure 90).

Magnesium During Stratification

The average concentration of magnesium in metalimnion and hypolimnion strata was 30.8 and 33.3 mg/l, respectively. Magnesium concentrations increased from 1986 through 1988 and, since 1988, decreased for all strata (Figure 91). Distribution of magnesium data among sites were similar for metalimnion and hypolimnion strata (Figure 92). There were no apparent patterns in seasonal distributions of magnesium data (Figure 93).

8.5.4 Mercury

Mercury is a biologically non-essential trace element. Mercury and mercuric salts are highly toxic to humans and mercuric ions are highly toxic to aquatic life. Metallic mercury is insoluble in water, however, in bottom sediments mercury may be converted to organic methyl mercury which can be assimilated and concentrated in the food chain with toxic effects. Mercury may be bioaccumulated in fish tissue 10,000 times the level in water (USEPA 1976). The majority of unpolluted lakes and rivers in the United States contain less than 0.1 ug/l mercury.

Epilimnion Mercury

The average mercury concentration during 1978 through 1991 was 0.251 ug/l. Concentrations ranged from the 0.0003 to 3.1 ug/l (Figure 94). The maximum concentration occurred at Site 4 on August 15, 1984. The IPCB General Use water quality standard for mercury is 0.5 ug/l.

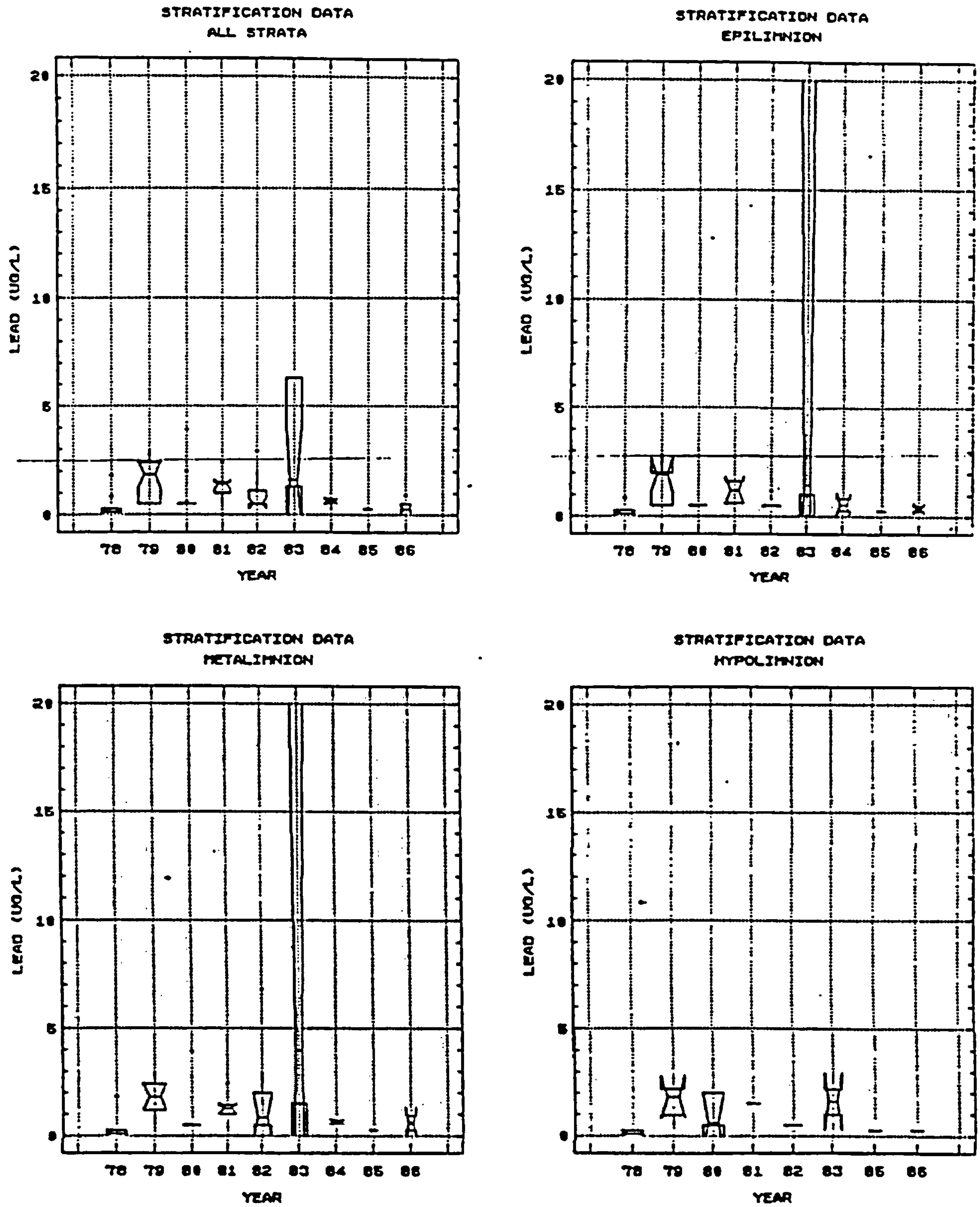
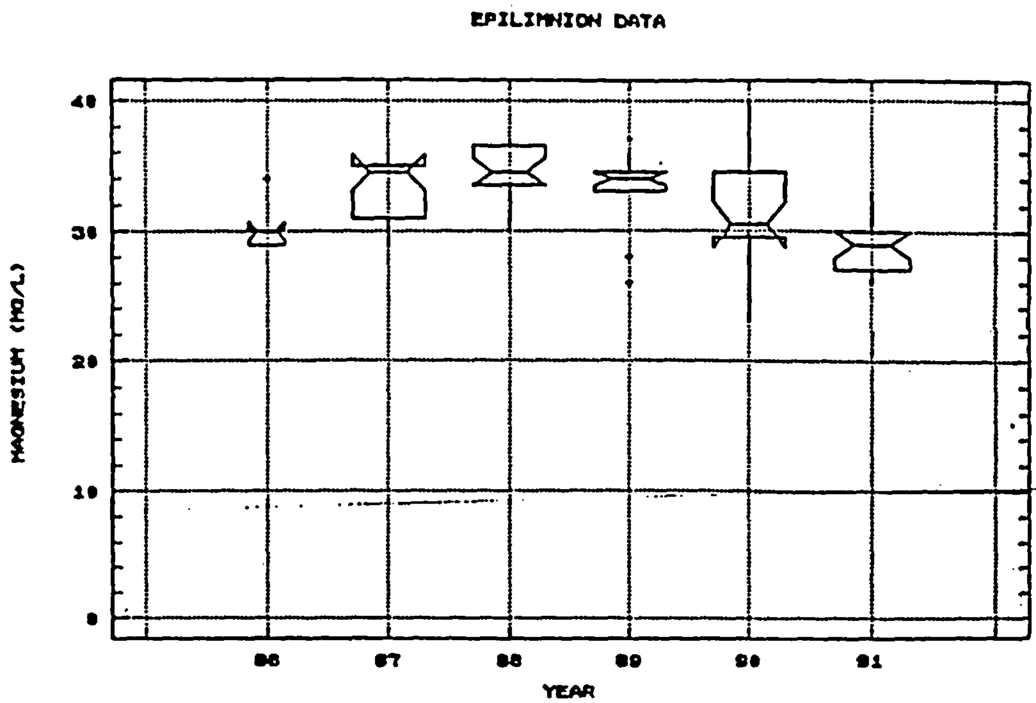


Figure 88. Distributions of lead concentrations (ug/l) in Clinton Lake for epilimnion, metalimnion, and hypolimnion strata during 1978 through 1986.



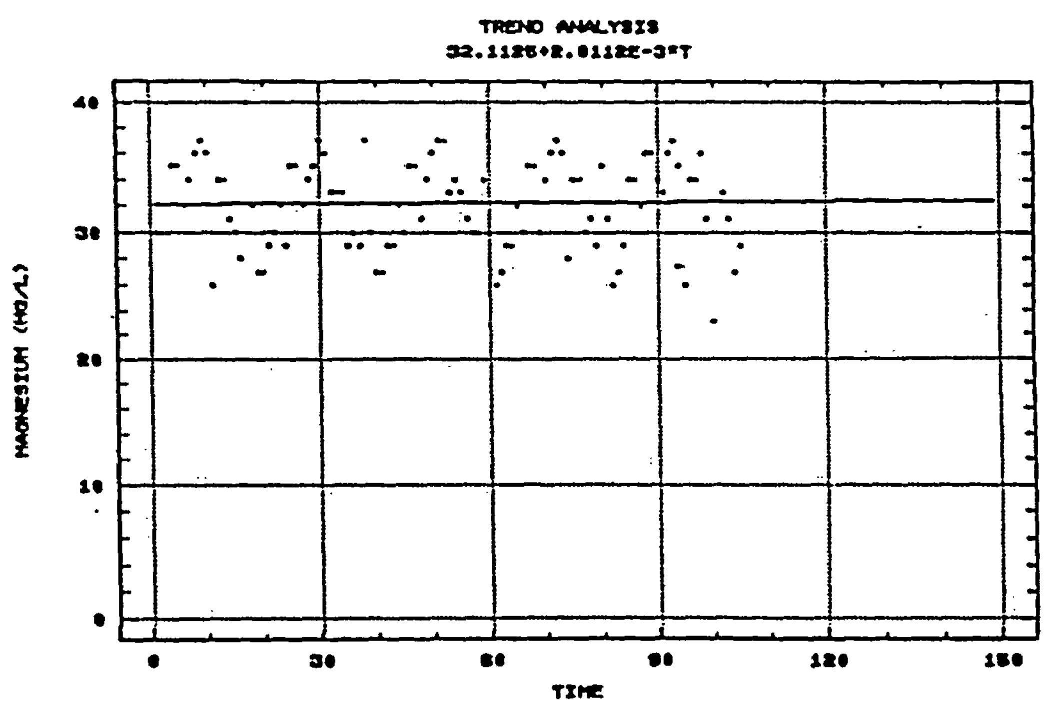


Figure 89. Yearly distributions (top graph) and trend analysis (bottom graph) of magnesium concentrations (mg/L) in Clinton Lake during 1986 through 1991.

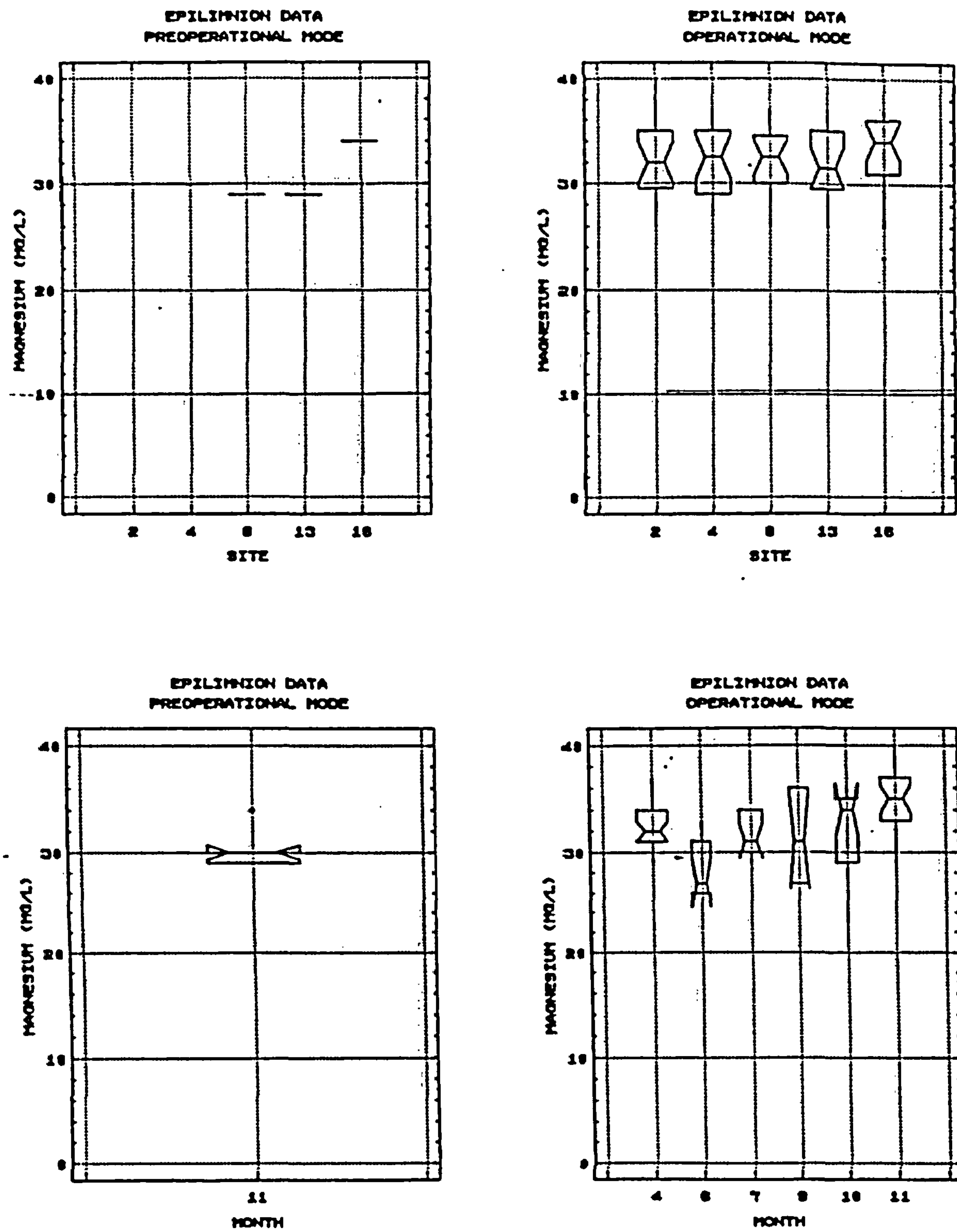


Figure 90. Distributions of epilimnion magnesium concentrations (mg/l) in Clinton Lake for sampling sites (top graphs) and by months (bottom graphs) during 1986 (preoperational mode) and 1987 through 1991 (operational mode).

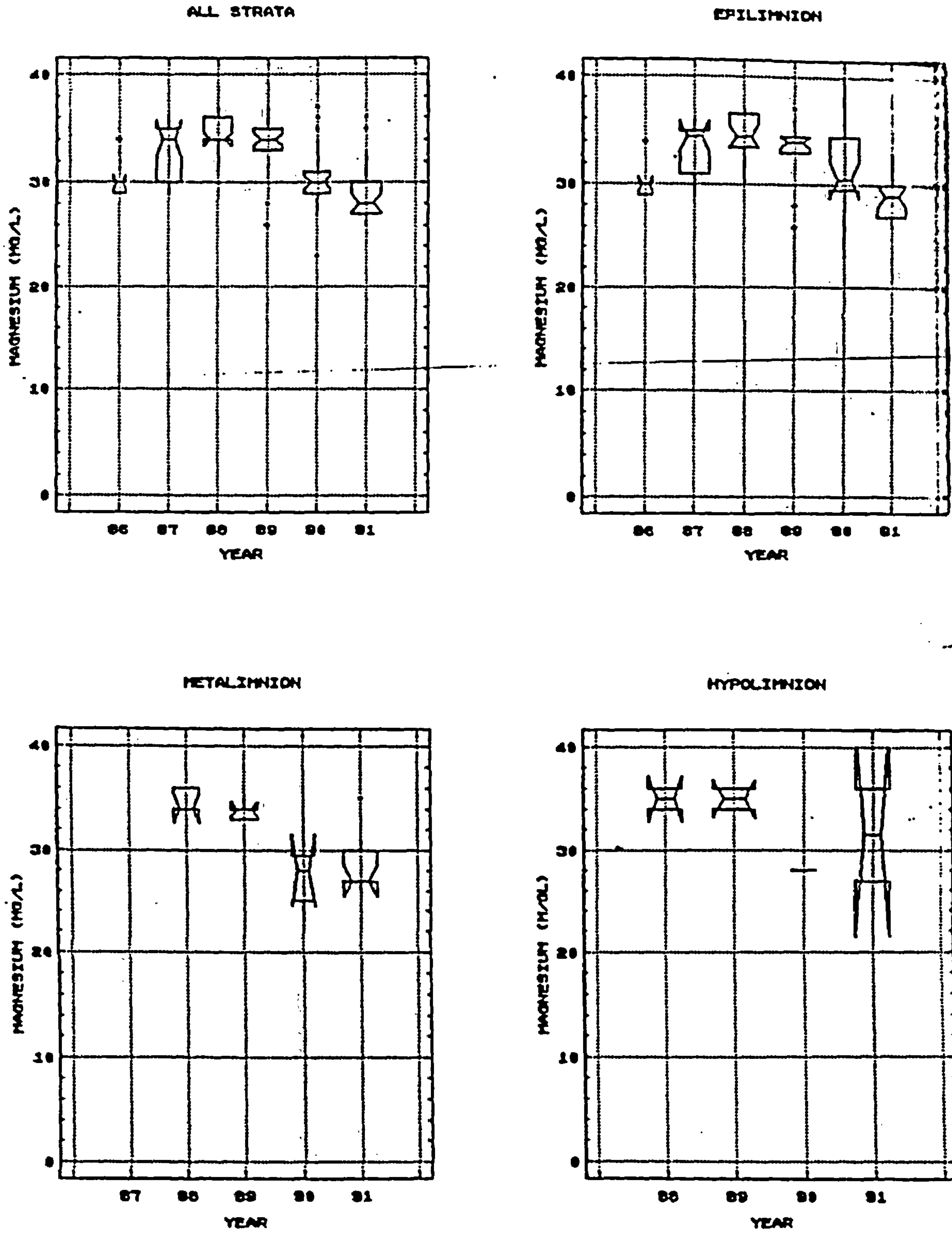


Figure 91. Distributions of magnesium concentrations (mg/l) years in Clinton Lake for epilimnion, metalimnion, and hypolimnion strata during 1986 through 1991.

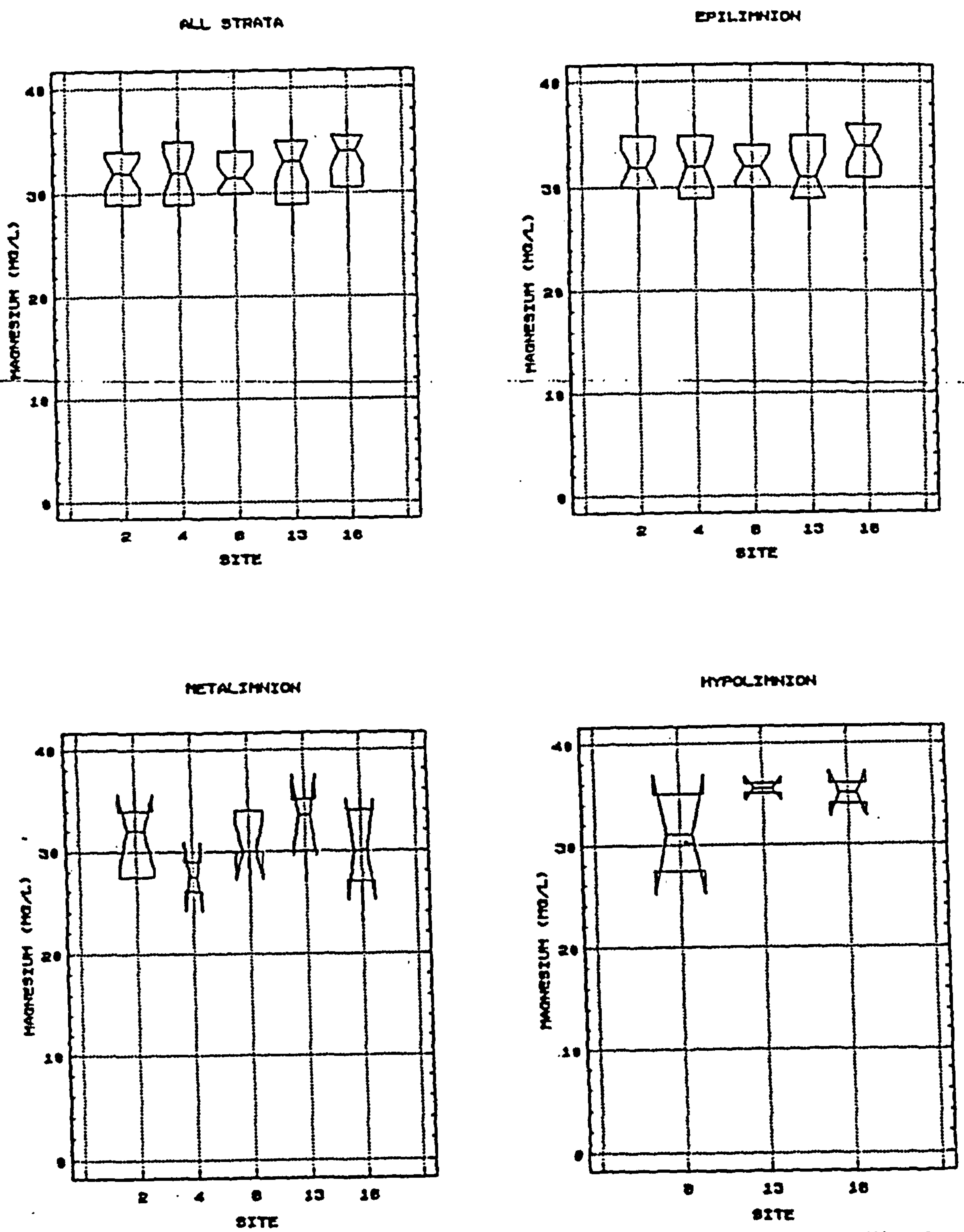


Figure 92. Distributions of magnesium concentrations (mg/l) by monitoring sites in Clinton Lake for epilimnion, metalimnion and hypolimnion strata during 1986 through 1991.

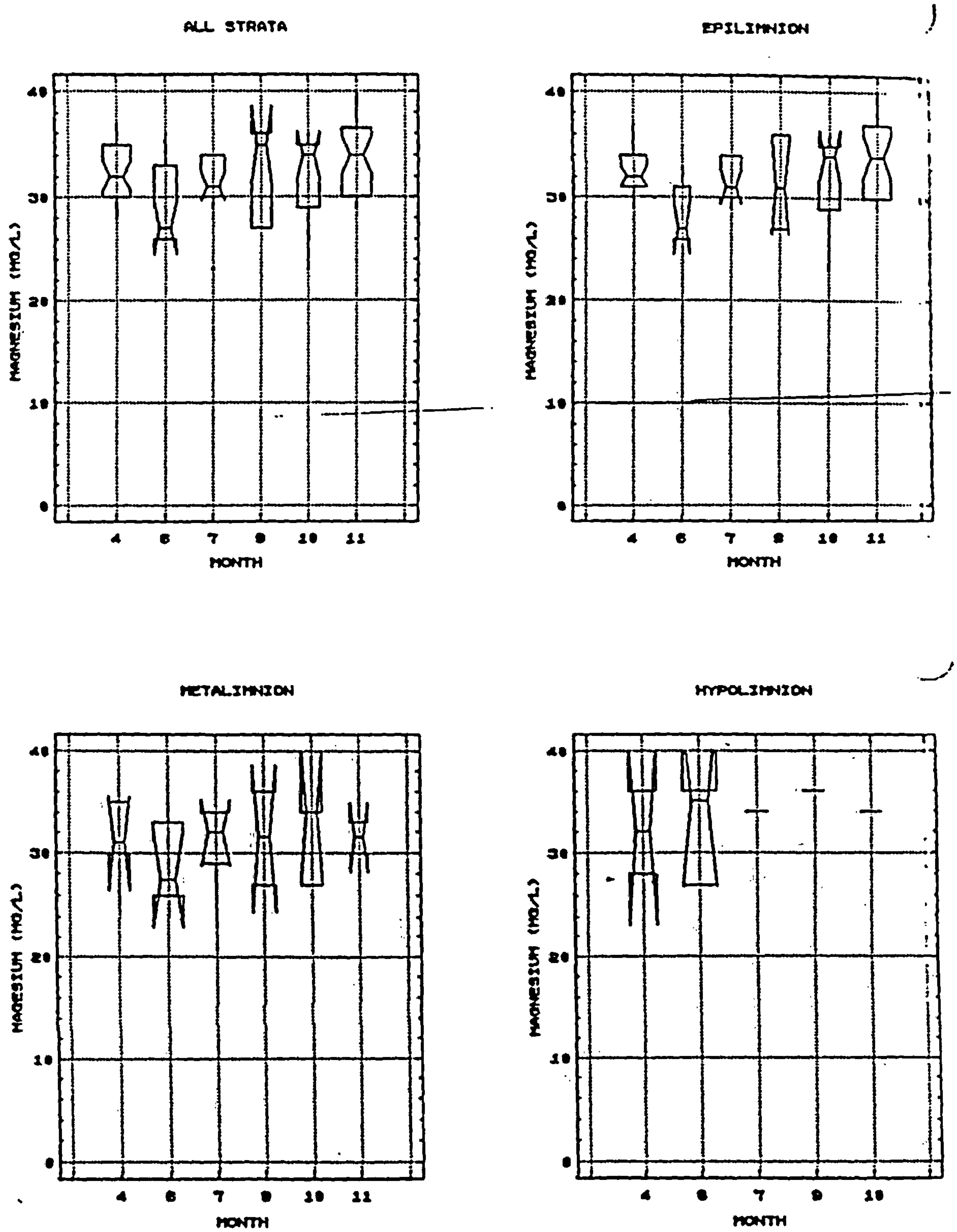
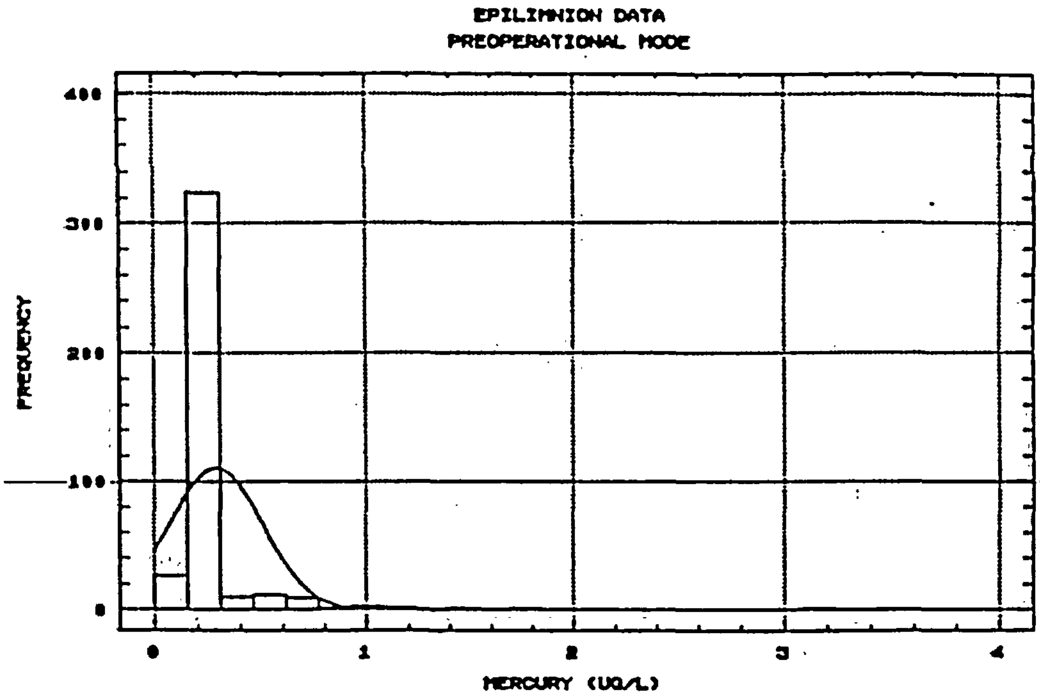


Figure 93. Distributions of magnesium concentrations (mg/l) by months in Clinton Lake for epilimnion, metalimnion, and hypolimnion strata during 1986 through 1991.



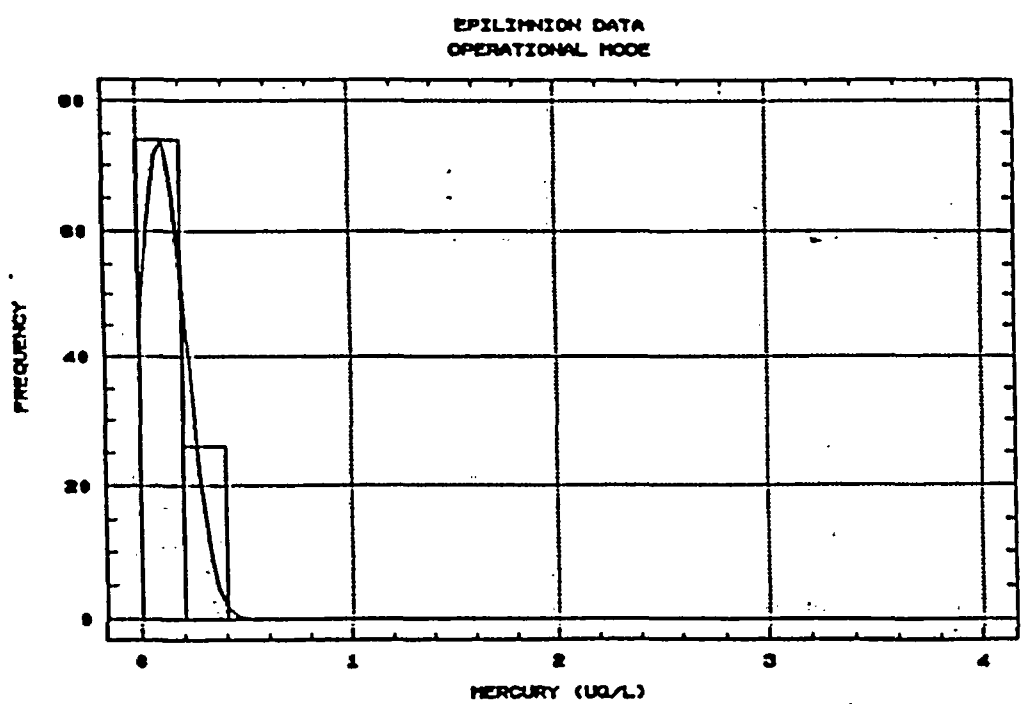


Figure 94. Frequency histograms of epilimnion mercury concentrations (ug/l) in Clinton Lake during periods prior to (top graph) and during Clinton Power Station operation (bottom graph).

Sefton et al. (1980) detected mercury in only two of 63 Illinois lakes that they monitored; concentrations were less than 0.5 ug/l.

Analytical results of 490 epilimnion water samples revealed 2 mercury concentrations (5.0%) were greater than the IPCB standard (0.5 ug/l; Table 9); all of these occurred during the preoperational period. There is no apparent explanation, other than sampling or analytical error(s), for those elevated concentrations. Mercury results from samples collected from the epilimnion during 1987 through 1991 have not exceeded the IPCB standard. The average mercury concentration from 100 samples collected during the operational period (1987 through 1991) was 0.11 ug/l.

There were no significant differences in monthly or intersite distributions of mercury concentrations (Figure 95). Distributions of mercury concentrations during 1978 through 1991 indicate a trend for decreasing mercury concentrations in Clinton Lake (Figure 96).

Mercury During Stratification

Average mercury concentrations for metalimnion and hypolimnion strata were 0.22 and 0.33 ug/l, respectively. Concentrations ranged from 0.0003 to 0.75 ug/l in the metalimnion and from 0.0003 to 3.7 ug/l in the hypolimnion. The maximum in the hypolimnion occurred at Site 16 in October 1989. Mercury concentrations were greater during 1978 through 1984 and in 1989 (Figure 97). Distributions of mercury concentrations were similar among sites (Figure 98) and months (Figure 99) during stratification.

8.5.5 Zinc

Zinc is an essential micro-nutrient that occurs naturally as zinc sulfide. It is required for photosynthesis, as an agent of hydrogen transfer, and is important in the synthesis of proteins. Zinc is relatively nontoxic to humans but it is acutely toxic to many aquatic biota, especially fish (USEPA 1976). Concentrations as low as 1.0 mg/l may be lethal to fish eggs and larvae. Amounts of zinc in ionic solution is generally very small in aerated surface waters. The worldwide average concentration of zinc in natural waters is 10 ug/l (Wetzel 1975). The zinc concentration of US drinking waters varies between 0.06 and 7.0 mg/l with a mean of 1.33 mg/l (APHA 1980). Water samples were not analyzed for zinc during 1987 through 1991.

Epilimnion Zinc

The average concentration of zinc in epilimnion samples was 7.3 ug/l during 1978 through 1986. Zinc concentrations ranged from 0.5 to 92 ug/l. All samples had much lower concentrations of zinc than the IPCB General Use water quality standard (1000 ug/l). Approximately 75% of the samples had zinc concentrations less than 10 ug/l (Figure 100). Site 16 had a greater median value for zinc, although there was no significant difference in zinc concentrations among sites (Figure 101). There was no apparent seasonal trend in the distribution of monthly median values for zinc data (Figure 101).

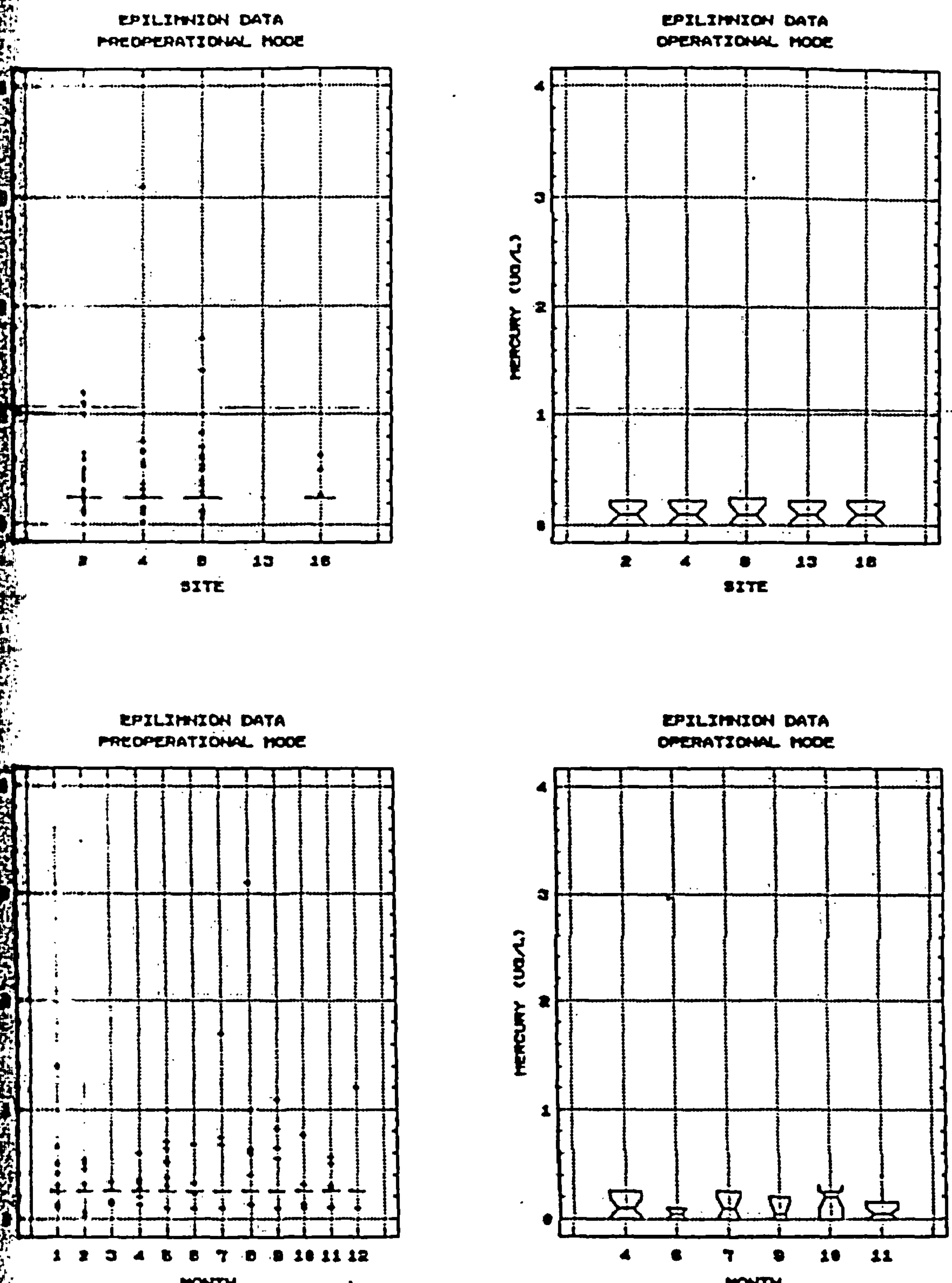
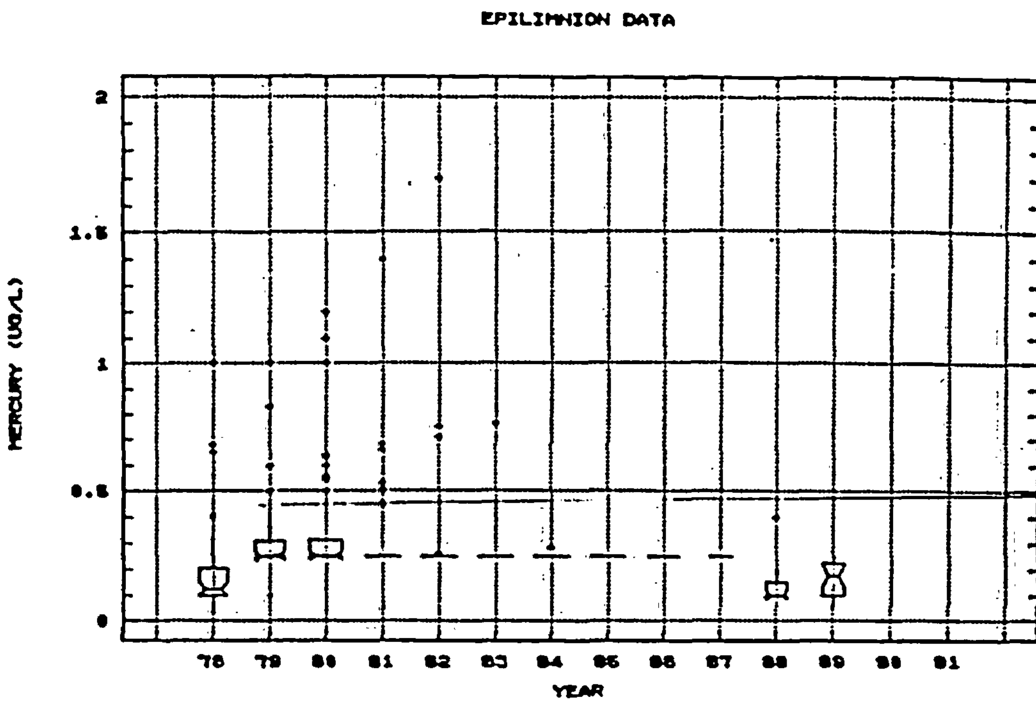


Figure 95. Distributions of mercury concentrations (ug/l) in Clinton Lake for monitoring sites and months during periods prior to (preoperational mode) and during (operational mode) Power Station operation.



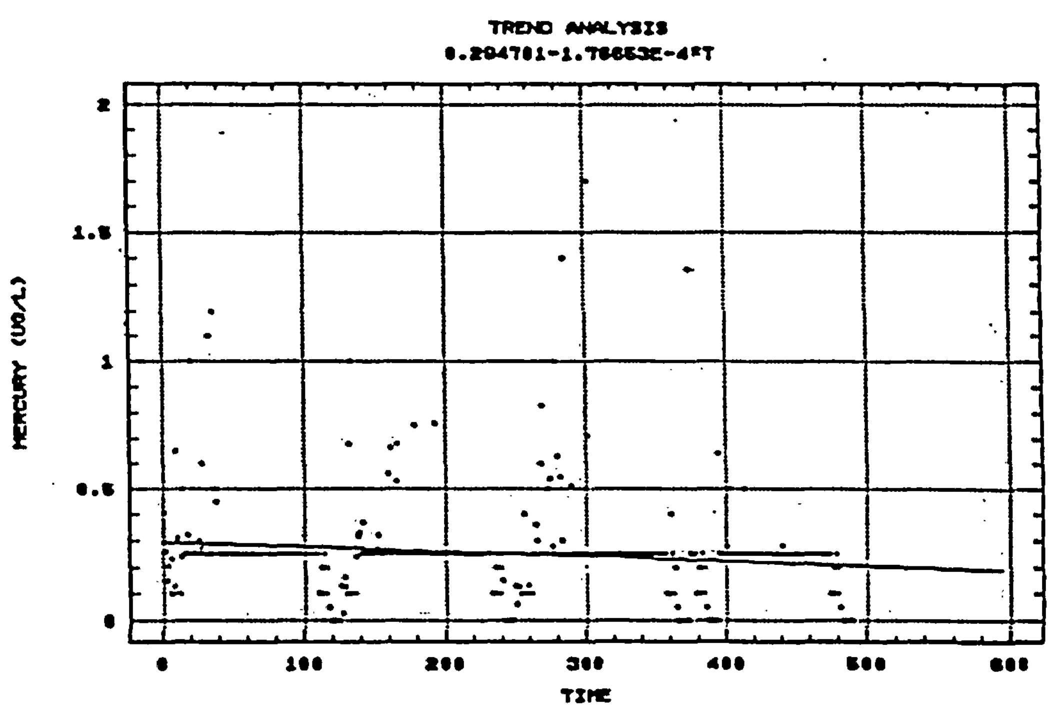


Figure 96. Yearly distributions (top graph) and trend analysi (bottom graph) of mercury concentrations (ug/l) in C' Lake during 1978 through 1991.

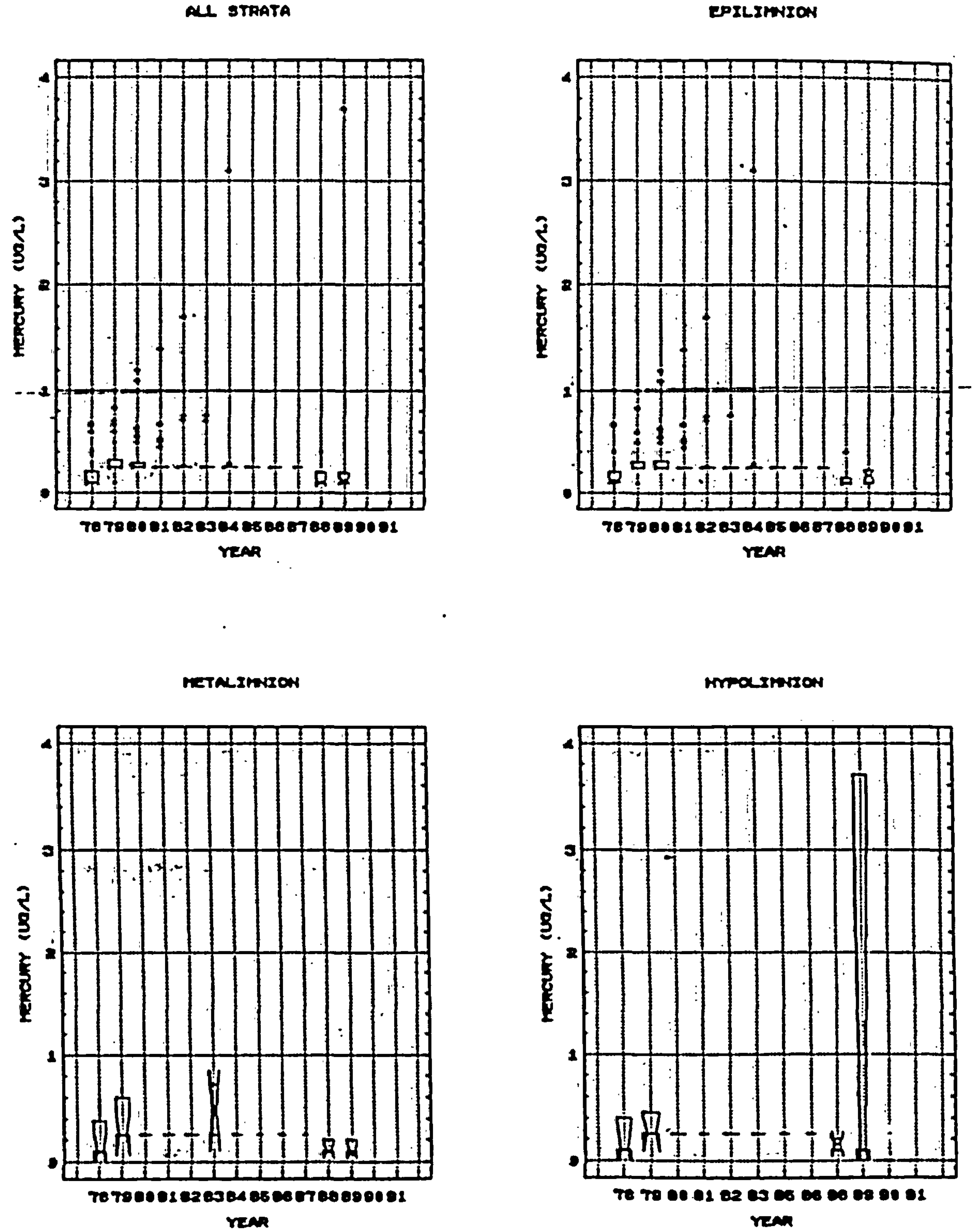


Figure 97. Distributions of mercury concentrations (ug/l) by years in Clinton Lake for epilimnion, metalimnion, and hypolimnion strata during 1978 through 1991.

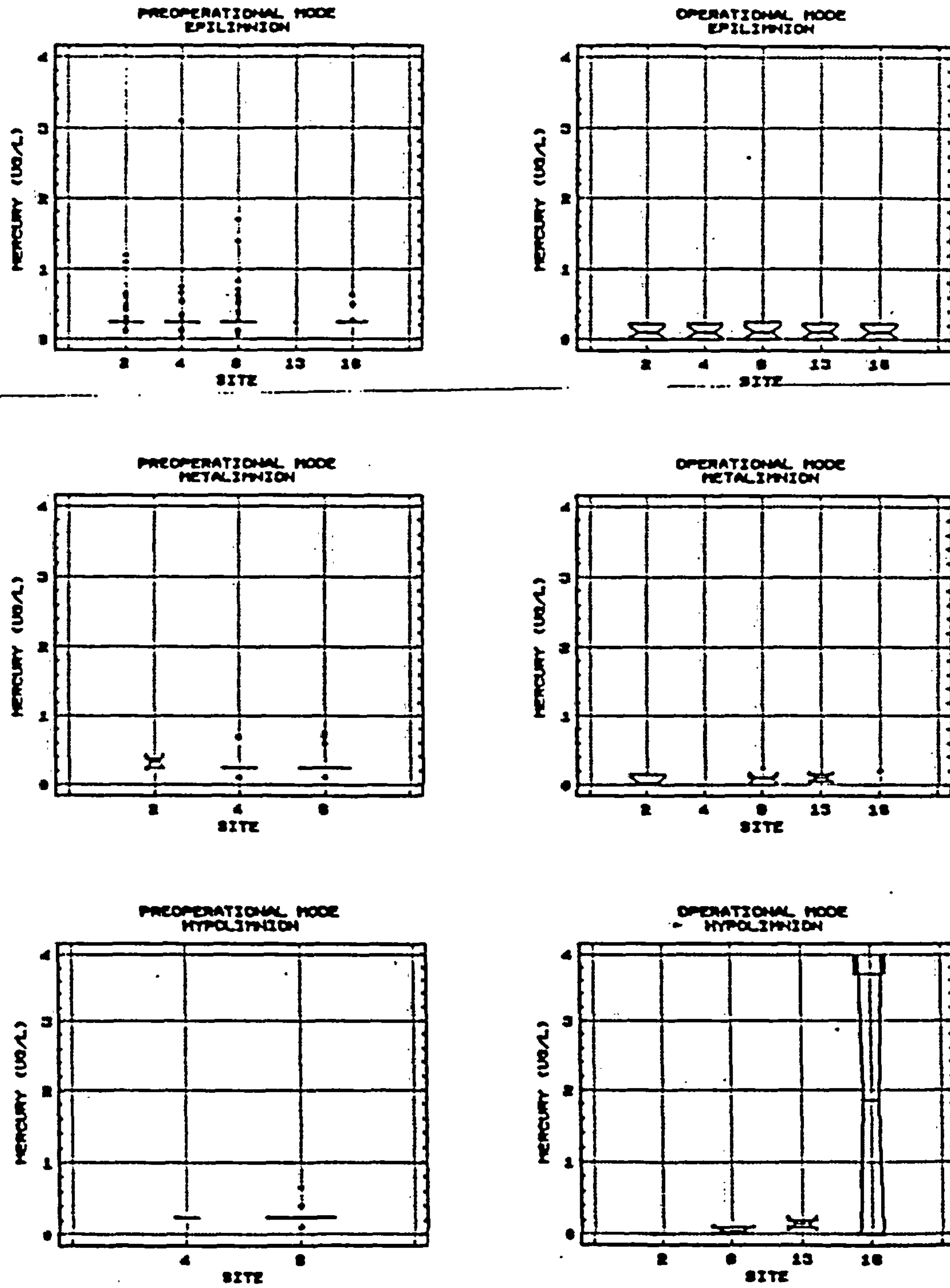


Figure 98. Distributions of mercury concentrations (ug/l) at Clinton Lake monitoring sites for epilimnion, metalimnion, and hypolimnion strata during periods prior to (preoperational mode) and during Clinton Power Station operation (operational mode).

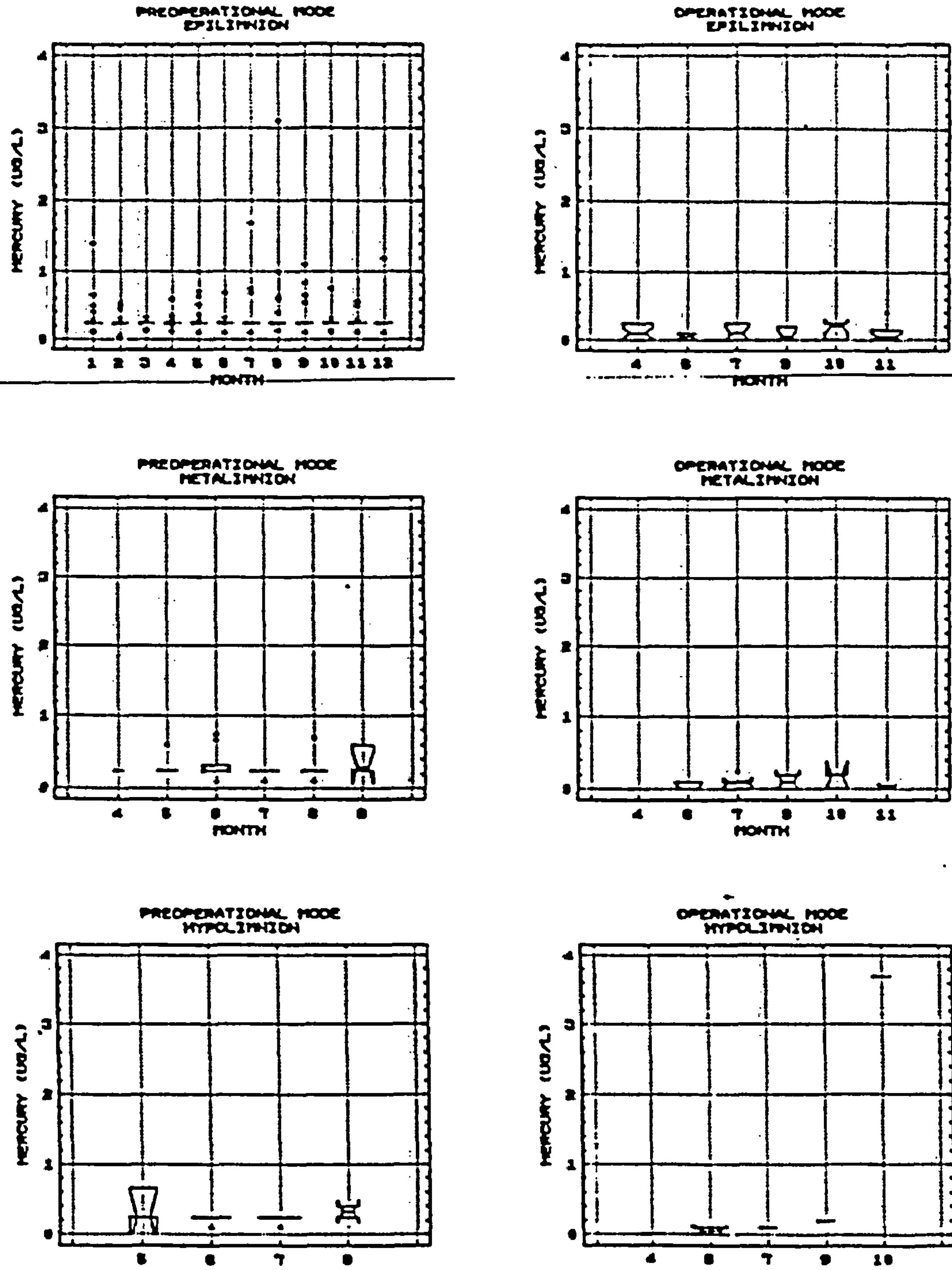


Figure 99. Monthly distributions of mercury concentrations (ug/l) in Clinton Lake for epilimnion, metalimnion, and hypolimnion strata during periods prior to (preoperational mode) and during Clinton Power Station operation (operational mode).

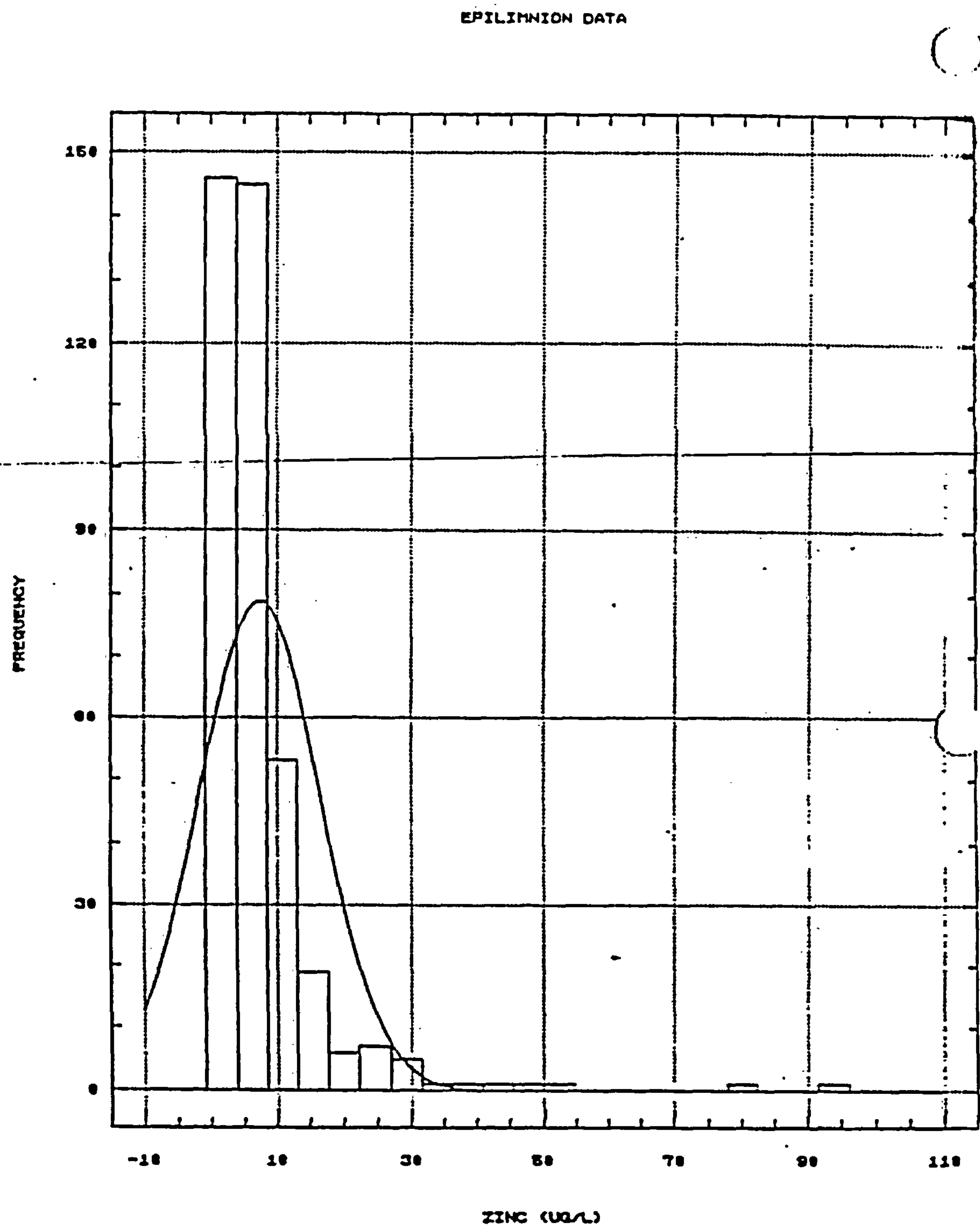


Figure 100. Frequency histogram of epilimnion zinc concentration (ug/l) in Clinton Lake during 1978 through 1986.

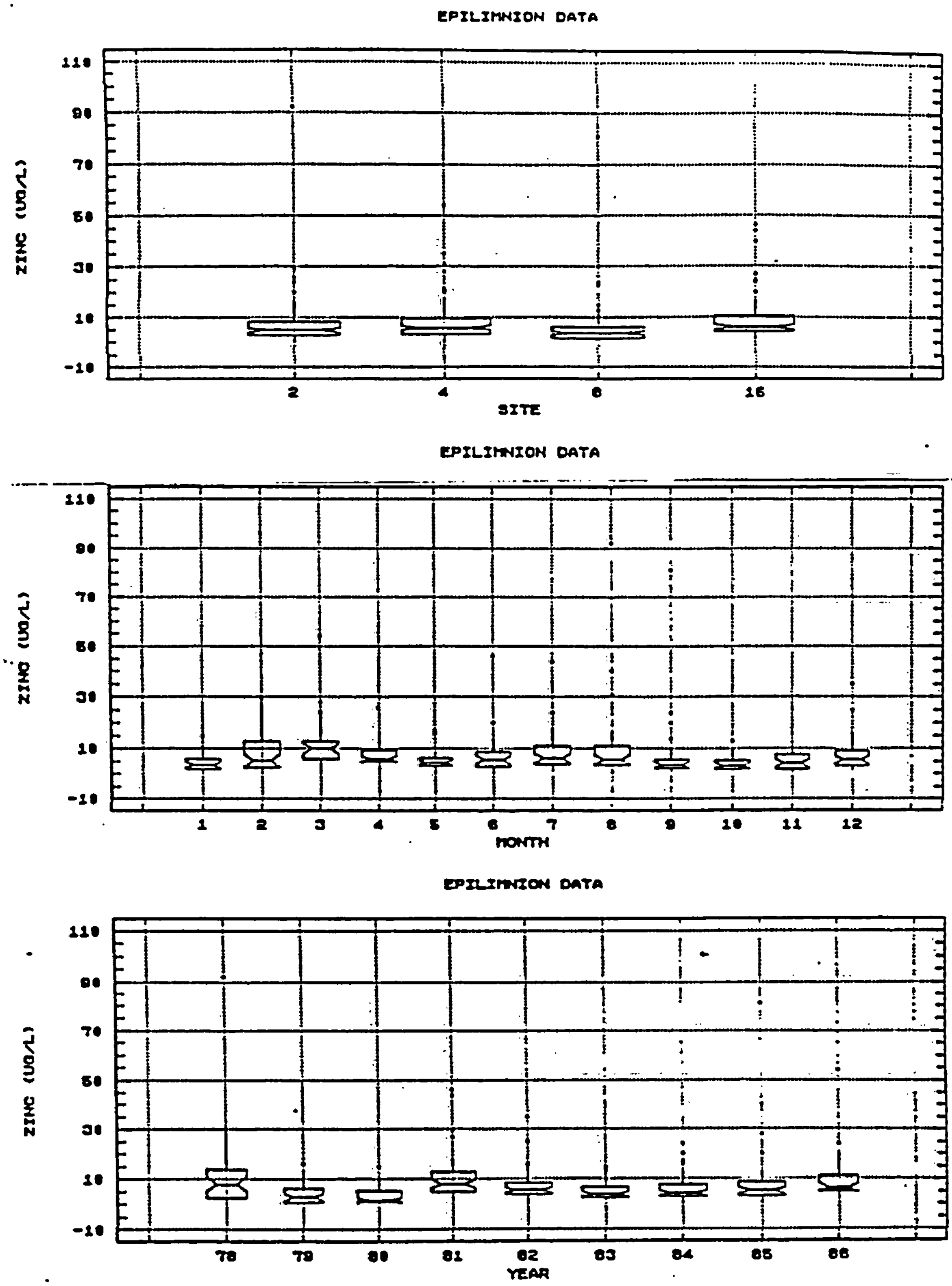


Figure 101. Distributions of zinc concentrations (ug/l) in Clinton Lake for each monitoring site (top graph), by month (middle graph), and during 1978 through 1986 (bottom graph).

Zinc During Stratification

The average zinc concentration for 93 samples collected during periods of stratification was 5.3 ug/l. Zinc concentrations ranged from 0.5 to 49.0 ug/l. The greatest zinc concentrations occurred in the hypolimnion at Site 8 during September, 1978. There were no significant differences in zinc data by months for epi-, meta-, or hypolimnion strata (Figure 102). Distributions of zinc concentrations among sites were similar during stratification (Figure 103). Samples collected during periods of CPS operation were not analyzed for zinc. Distributions of zinc concentrations for each stratum during 1978 through 1986 were similar (Figure 104).

8.6 Hardness

Hardness is a characteristic of water resulting from the presence of polyvalent metallic ions such as calcium, magnesium, iron, manganese, copper, barium, lead and zinc, which cause curdling of soap and deposition of scale on heated surfaces. In natural waters most hardness may be attributed to calcium and magnesium bicarbonates.

Epilimnion Hardness

The average hardness for Clinton Lake epilimnion samples during 1981 through 1991 was 237 mg/l. The minimum and maximum hardness values in epilimnion samples were 102 and 372 mg/l. The maximum occurred at Site 16 in November 1990. Distributions of hardness data were similar for preoperational and operational periods (Figure 105) Hardness was greater at Site 16. especially during the preoperational period (Figure 106). Mean hardness at Site 16 during the preoperational period was 262 mg/l. Greater values at Site 16 may be attributable to greater influence from agricultural land runoff. Monthly distributions indicated hardness concentrations were greater during spring, then declined through summer, and increased again during fall months (Figure 106). Trend analyses for hardness data collected from 1981 through 1991 indicate a tendency for hardness concentrations to increase (Figure 107). Plots of annual hardness data do not support a consistent tendency for increased hardness (Figure 107).

Hardness During Stratification

Average hardness concentrations for metalimnion and hypolimnion strata were 236 and 246 mg/l, respectively. Concentrations ranged from 186 to 300 mg/l in the metalimnion and from 223 to 322 mg/l in the hypolimnion. Hardness values tended to decrease from May through September in the metalimnion (Figure 108). Distribution of hardness values among sites were similar for metalimnion and hypolimnion strata during preoperational and operational periods (Figure 109). Hardness values for metalimnion and hypolimnion strata were similar among years (Figure 110).

8.7 Other Selected Parameters

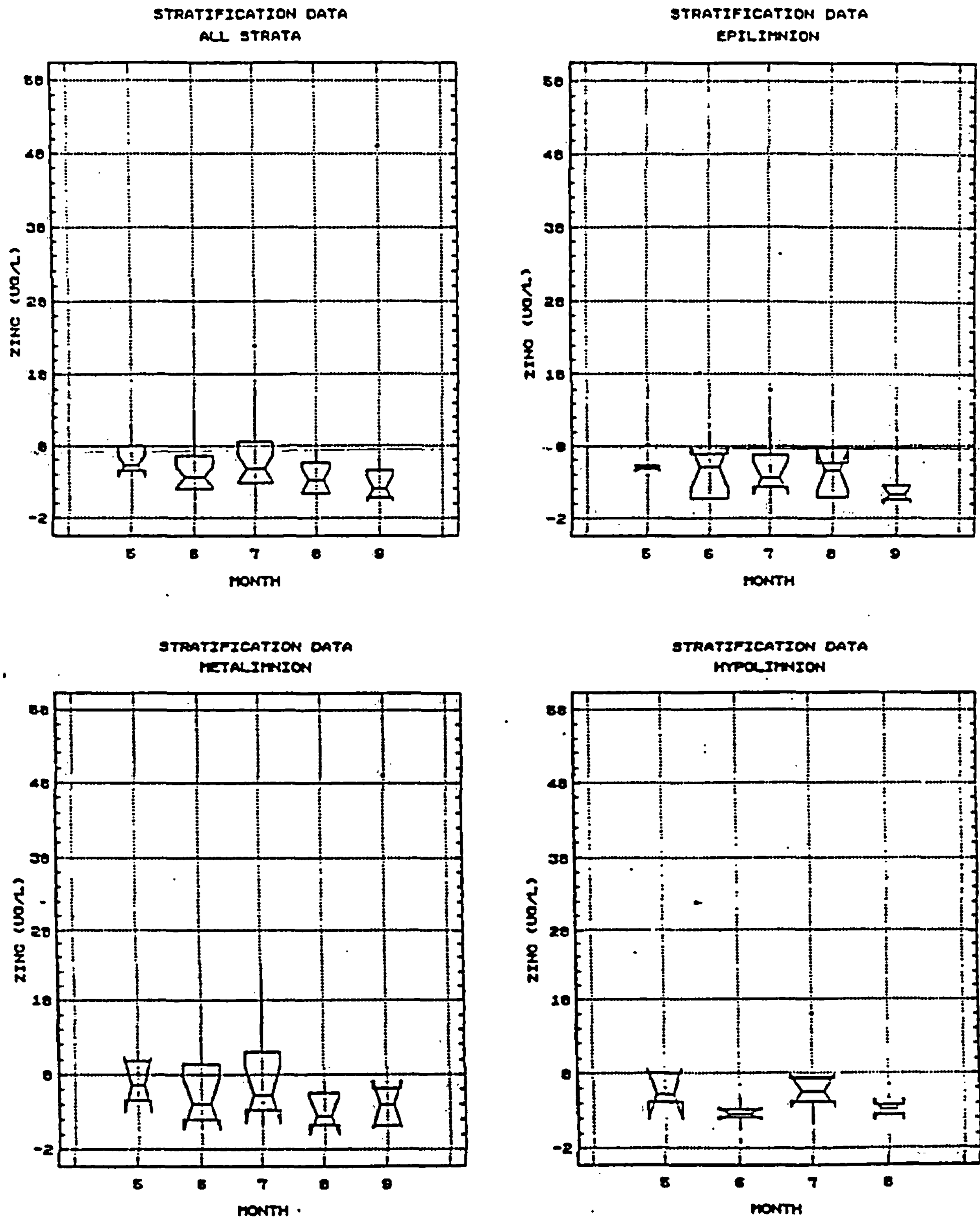


Figure 102. Distributions of zinc concentrations (ug/l) in Clinton Lake for epilimnion, metalimnion, and hypolimnion strata during months when stratification occurred.

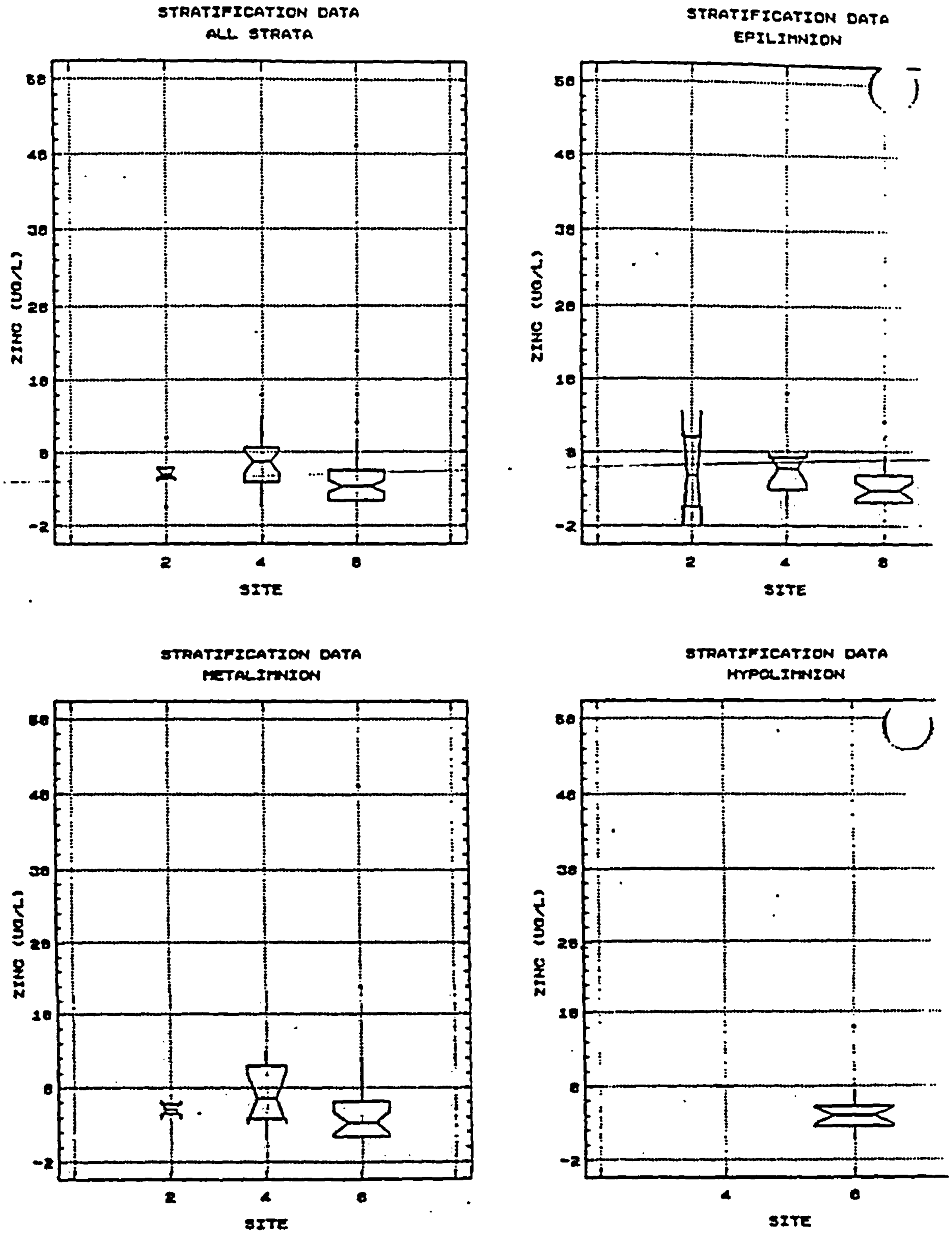


Figure 103. Distributions of zinc concentrations (ug/l) in Clinton Lake for epilimnion, metalimnion, and hypolimnion strata at monitoring sites where stratification occurred.

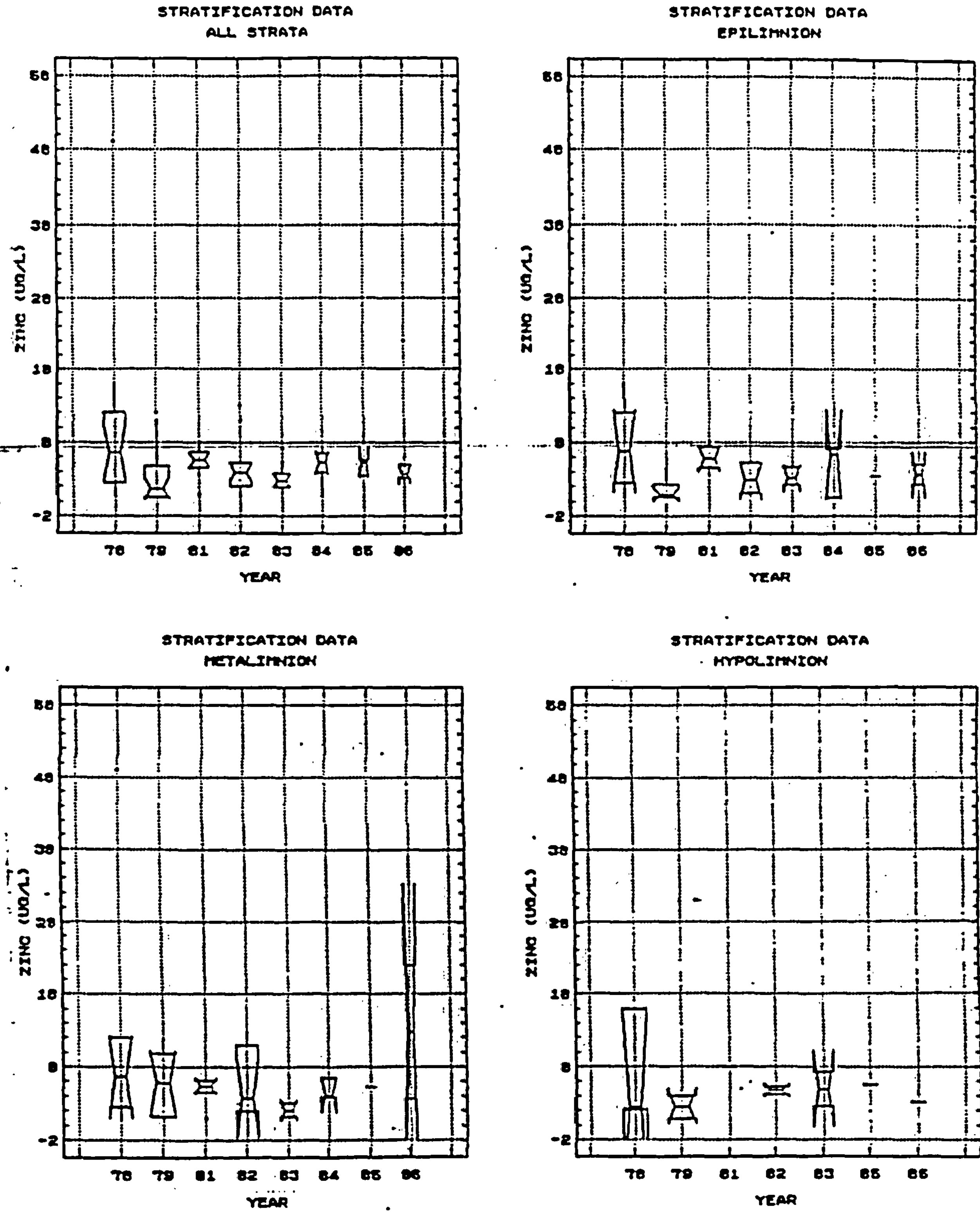
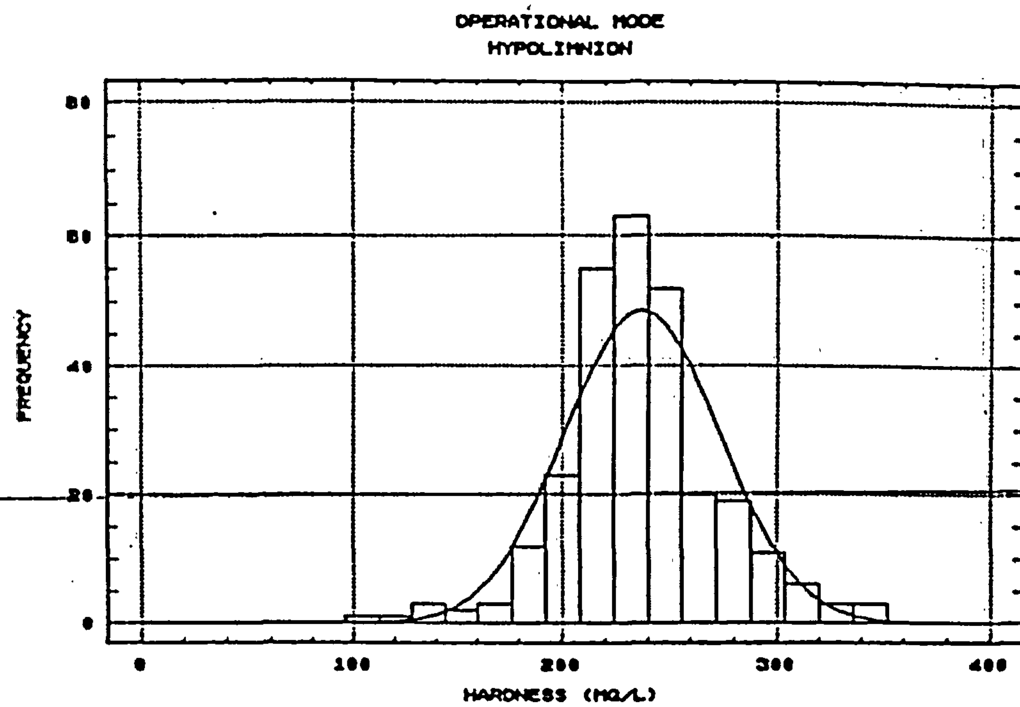


Figure 104. Distributions of zinc concentrations (ug/l) by years in Clinton Lake for epilimnion, metalimnion, and hypolimnion strata during 1978 through 1986.



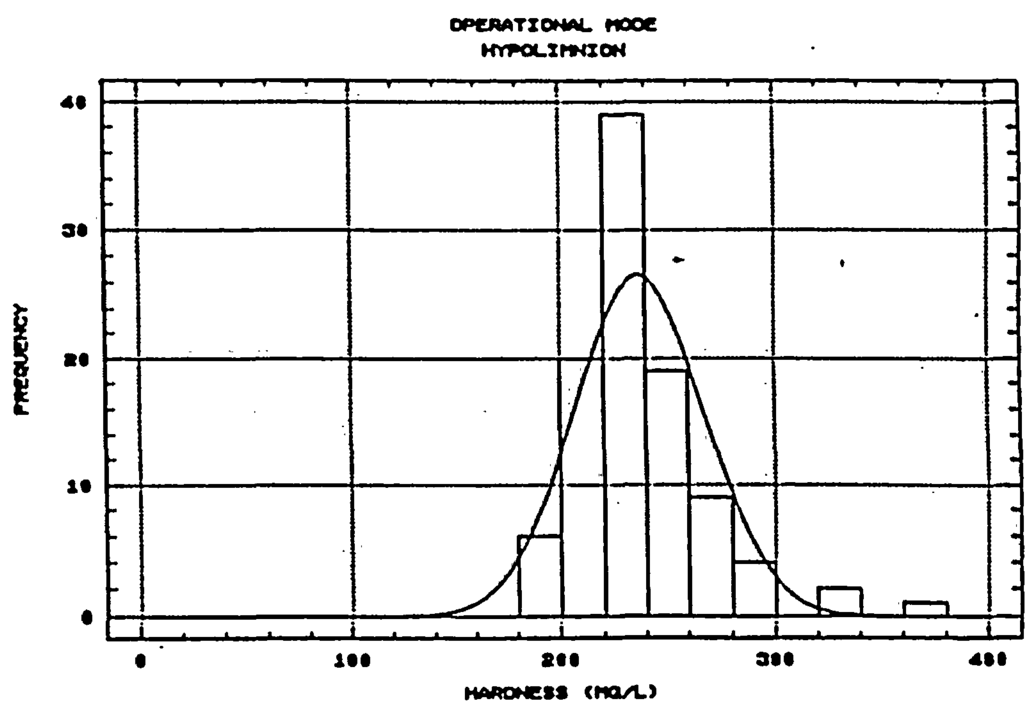


Figure 105. Frequency histograms of epilimnion hardness concentrations (mg/l) in Clinton Lake during periods prior to (top gr) and during Clinton Power Station operation (bo m graph).

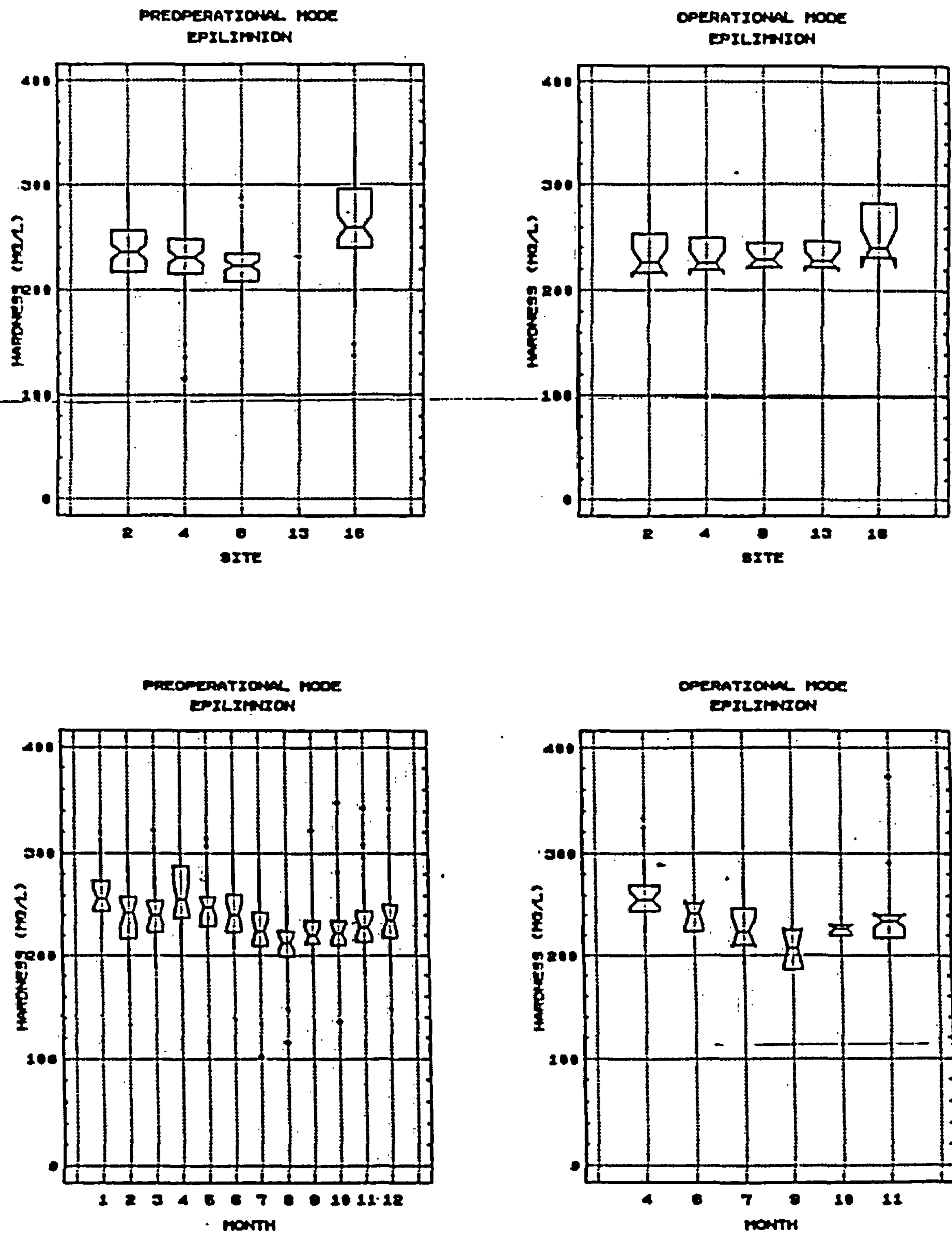
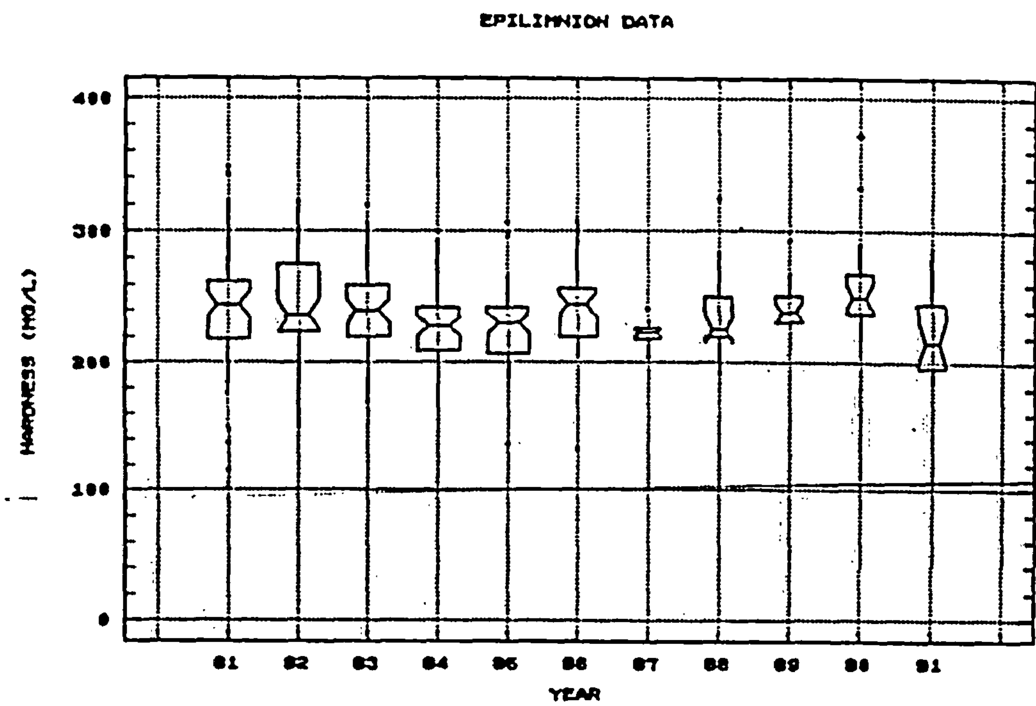


Figure 106. Distributions of hardness concentrations (mg/l) in Clinton Lake for monitoring sites and months during periods prior to (preoperational mode) and during (operational mode) Clinton Power Station operation.



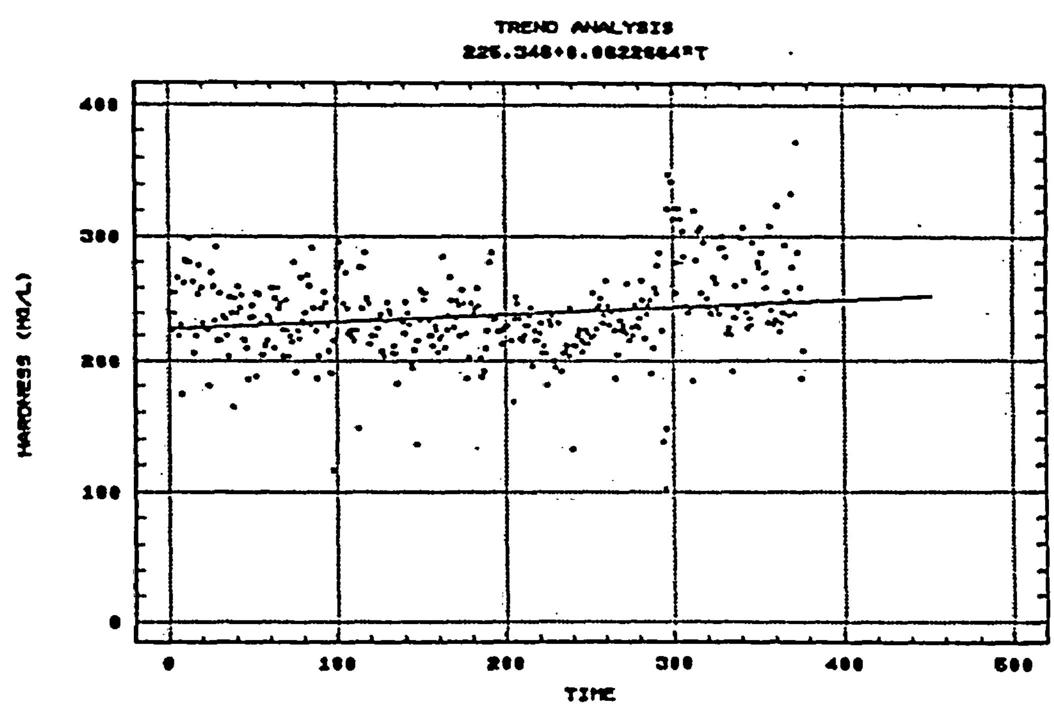


Figure 107. Yearly distributions (top graph) and trend analysis (bottom graph) of hardness concentrations (mg/l) in Clinton Lake during 1981 through 1991.

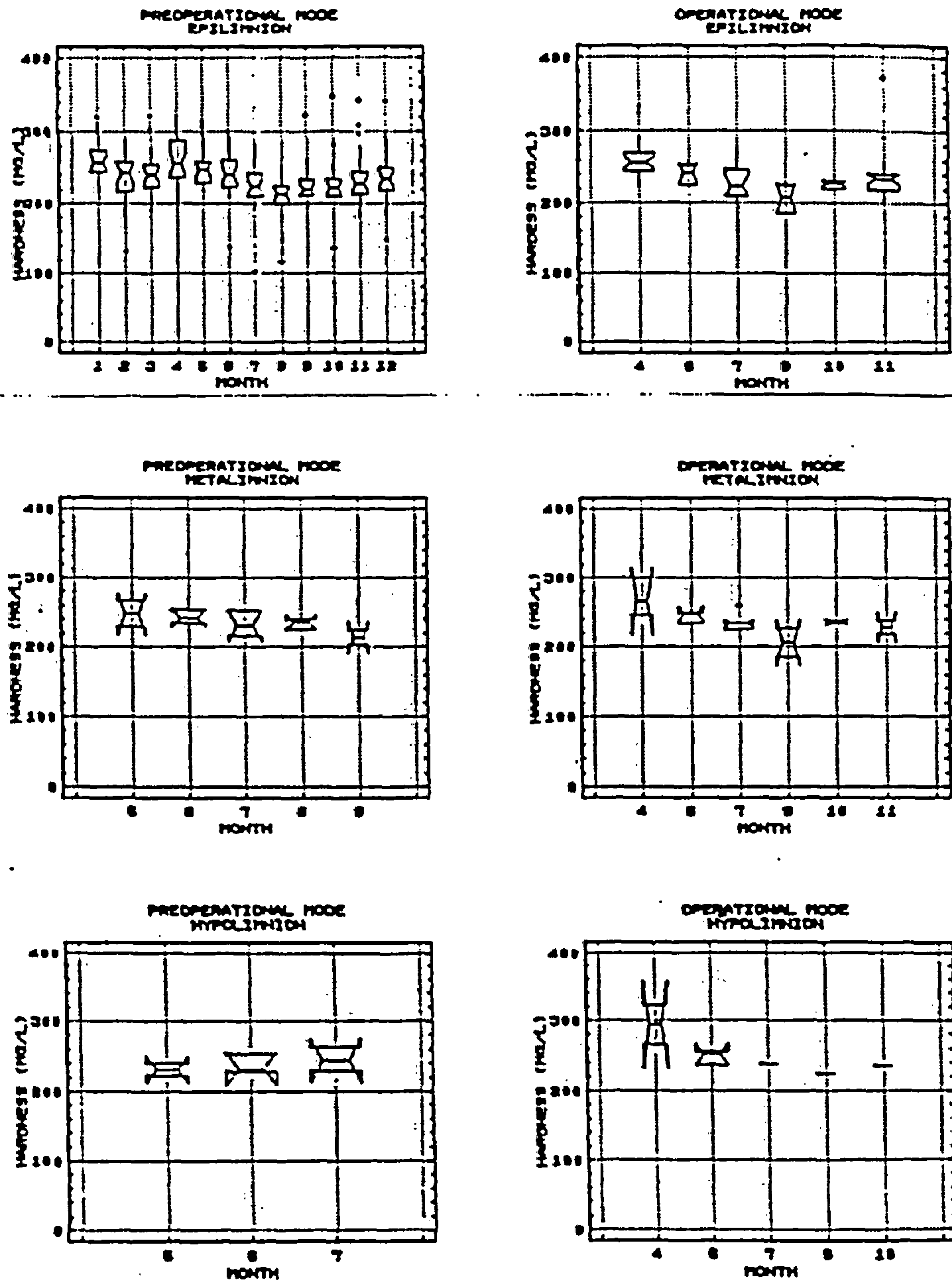


Figure 108. Distributions of hardness concentrations (mg/l) in Clinton Lake for epilimnion, metalimnion, and hypolimnion strata for the periods prior to (preoperational mode) and during Power Station operation (operational mode).

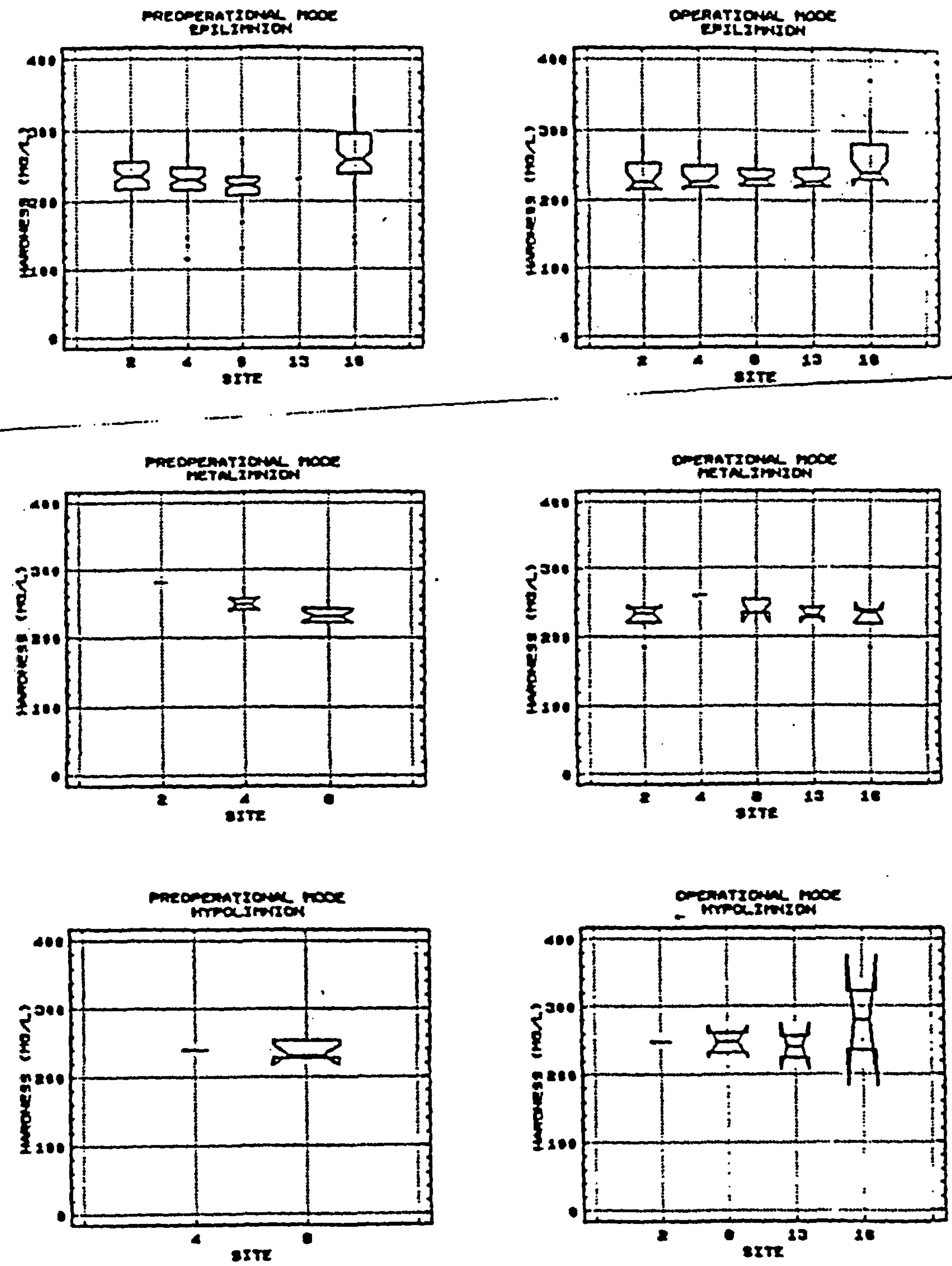


Figure 109. Distributions of hardness concentrations (mg/l) at monitoring sites in Clinton Lake for epilimnion, metalimnion, and hypolimnion strata during the periods prior to (preoperational mode) and during Clinton Power Station operation (operational mode).

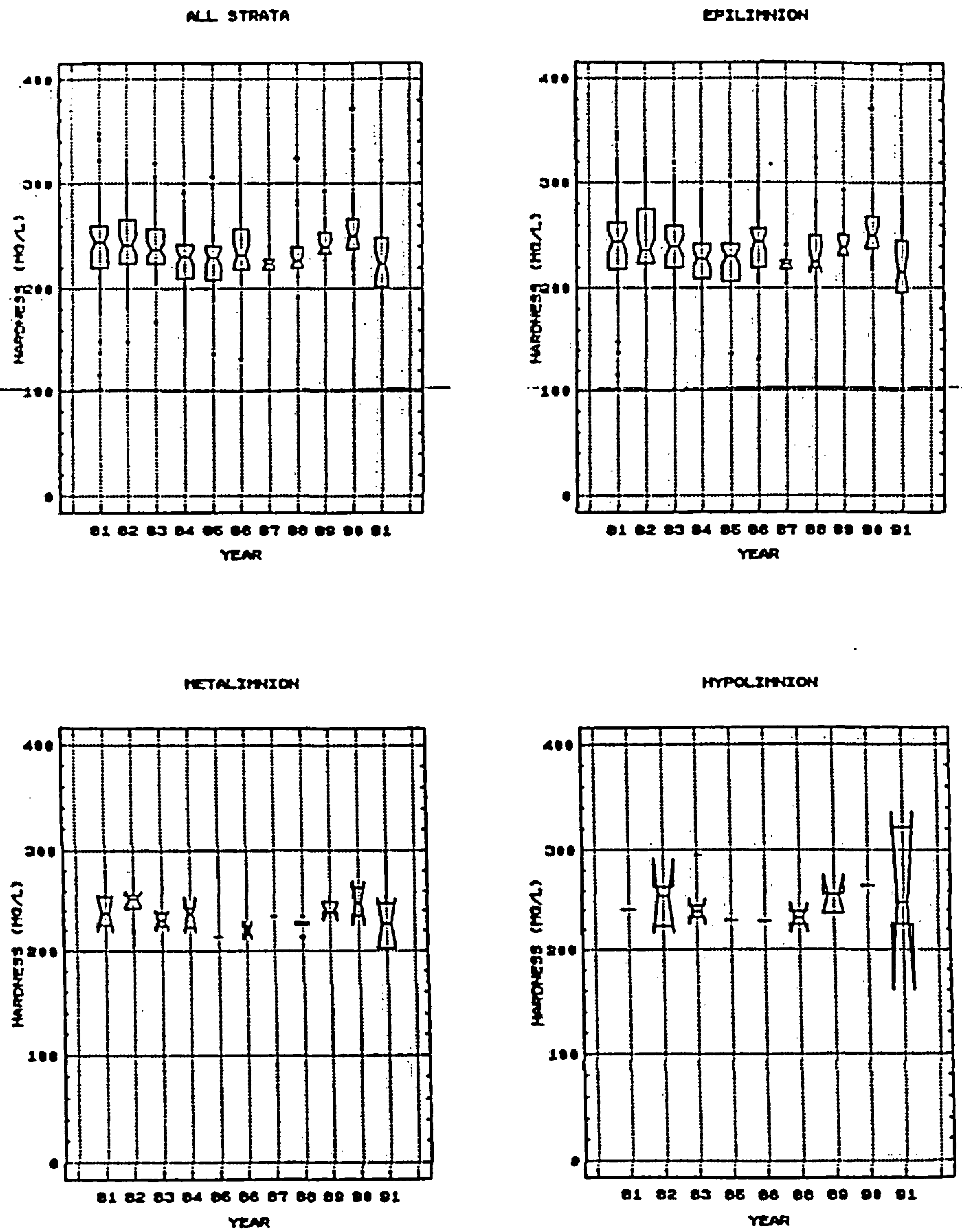


Figure 110. Yearly distributions of hardness concentrations (mg/l) in Clinton Lake for epilimnion, metalimnion, and hypolimnion strata during 1978 through 1991.

8.7.1 Total Dissolved Solids

In natural waters, dissolved solids consist of carbonates, bicarbonates, chlorides, phosphates and nitrates of calcium, magnesium, sodium, and potassium, as well as iron and other trace constituents. Dissolved solids are related to electrical conductivity (APHA 1971). Total dissolved solids (TDS) are useful in describing a general measure of primary productivity. Most lakes have a TDS between 100 and 200 mg/l. Excess dissolved solids are objectionable because of potential physiological effects, disagreeable palatability, increased corrosion and encrustation of metallic surfaces. Dissolved solid concentrations affect the osmoregulation (water balance) of aquatic organisms. The quality of dissolved solids determines the nutrients and minerals available for aquatic organisms. Lakes with dissolved solids greater than 15,000 mg/l are unsuitable for most freshwater fishes (USEPA 1976).

Epilimnion Total Dissolved Solids

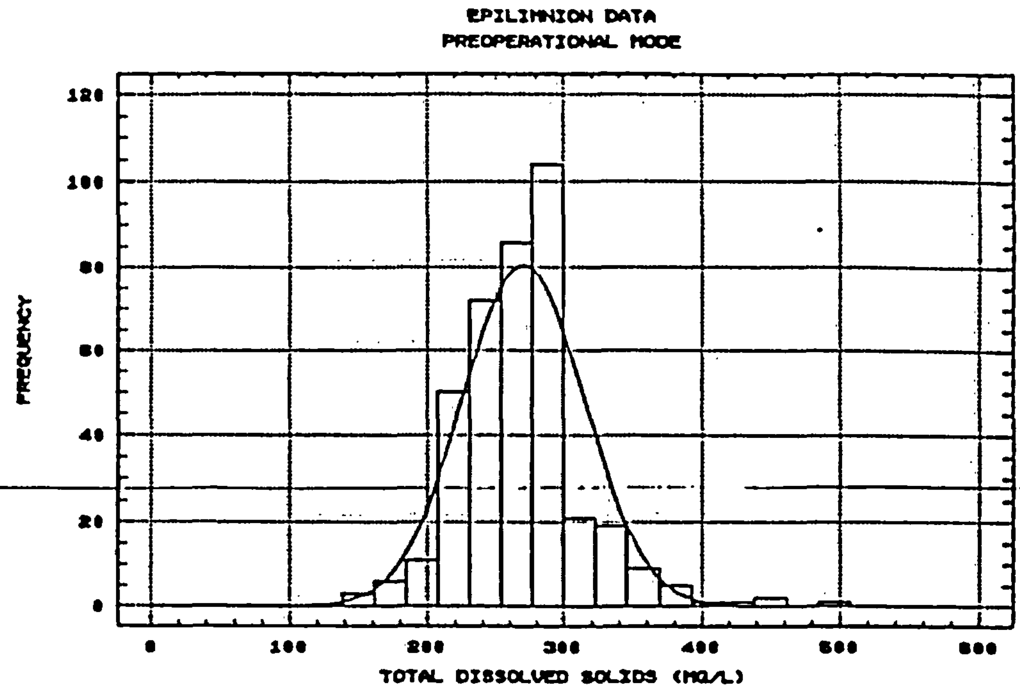
The average concentration of TDS in 491 samples collected from Clinton Lake during 1978 through 1991 was 272 mg/l. During this period TDS ranged from 140 to 490 mg/l (Figure 111). The distributions of TDS data were similar for preoperational and operational periods (Figure 111). Plots of TDS data indicated Site 16 had greater TDS concentrations compared to the other sites. Concentrations of TDS were lower during summer months (Figure 112). All of the epilimnion samples had lower TDS values than the IPCB General Use water quality standard (1000 mg/l). Site 16 had significantly greater TDS concentrations (Figure 112). Concentrations decreased in a downlake trend from Site 16 to sites 2, 13, and 8. Distribution of annual values does not indicate consistent long term trends in TDS concentrations (Figure 113). Monthly distribution of TDS data indicate a seasonal influence (Figure 112). Concentrations are greater during winter and spring months; concentrations then decline from spring through summer, and increase during fall months.

Total Dissolved Solids During Stratification

The average TDS concentration for metalimnion samples was 264 mg/l and concentrations ranged from 190 to 380 mg/l. Average TDS concentrations in the hypolinion was 272 mg/l and concentrations ranged from 200 to 400 mg/l. The greatest TDS concentration in metalimnion or hypolimnion samples occurred at Site 8 in July, 1978. There were no significant differences in the distribution of TDS data among sites (Figure 114). Distributions of TDS values were similar among months for metalimnion and hypolimnion strata (Figure 115). There were no consistent patterns in the distributions of TDS data among years (Figure 116). Annual distributions of TDS concentrations were similar from 1978 through 1991 (Figure 116).

8.7.2 Specific Conductance

A measure of the total amount of ionized materials in water can be obtained through specific conductance, which is a measure of the resistance of water to electrical flow. This parameter closely



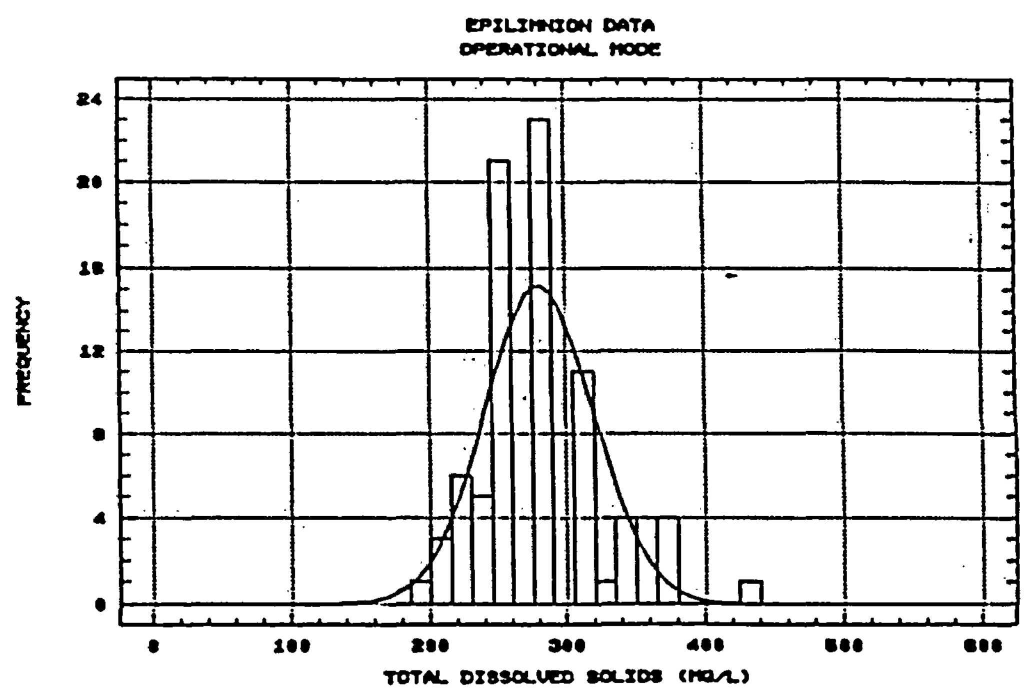


Figure 111. Frequency histograms of epilimnion total dissolved solids concentrations (mg/l) in Clinton Lake during periods prior to (top graph) and during Clinton Power Station operation (bottom graph).

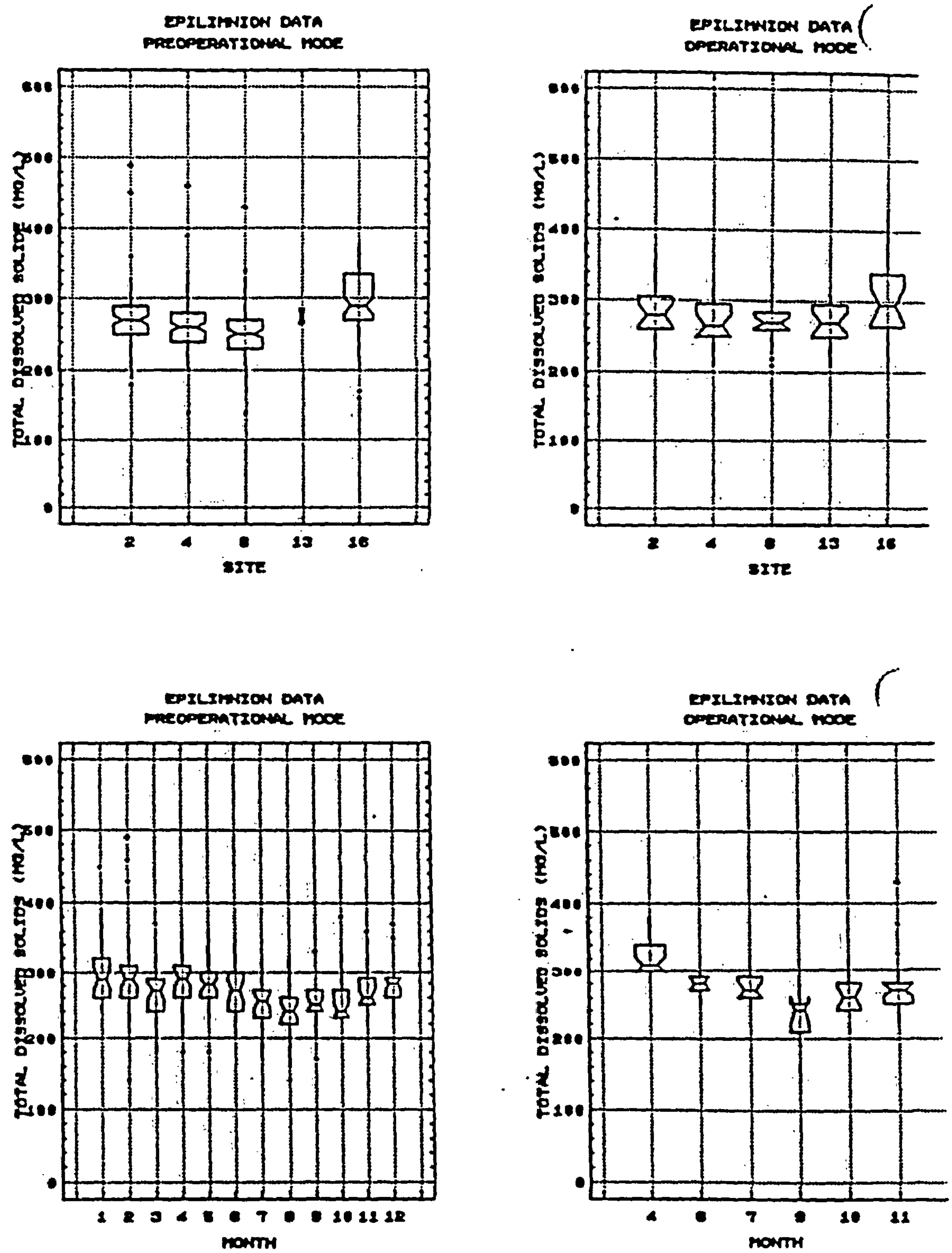


Figure 112. Distributions of total dissolved solids concentrations (mg/l) in Clinton Lake for monitoring sites and months prior to (preoperational mode) and during (operational m) Clinton Power Station operation.

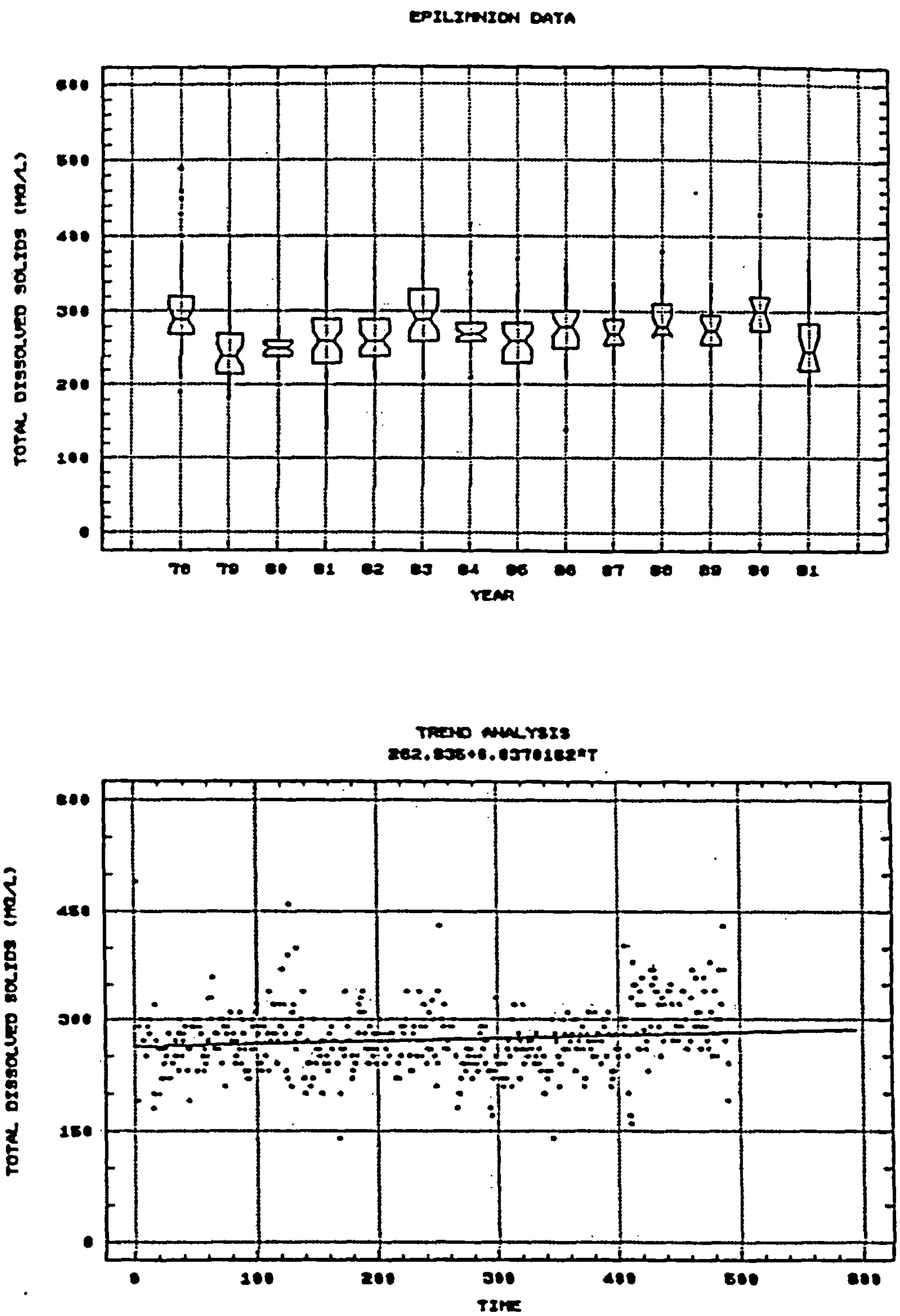


Figure 113. Yearly distributions (top graph) and trend analysis (bottom graph) of total dissolved solids concentrations (mg/l) in Clinton Lake during 1978 through 1991.

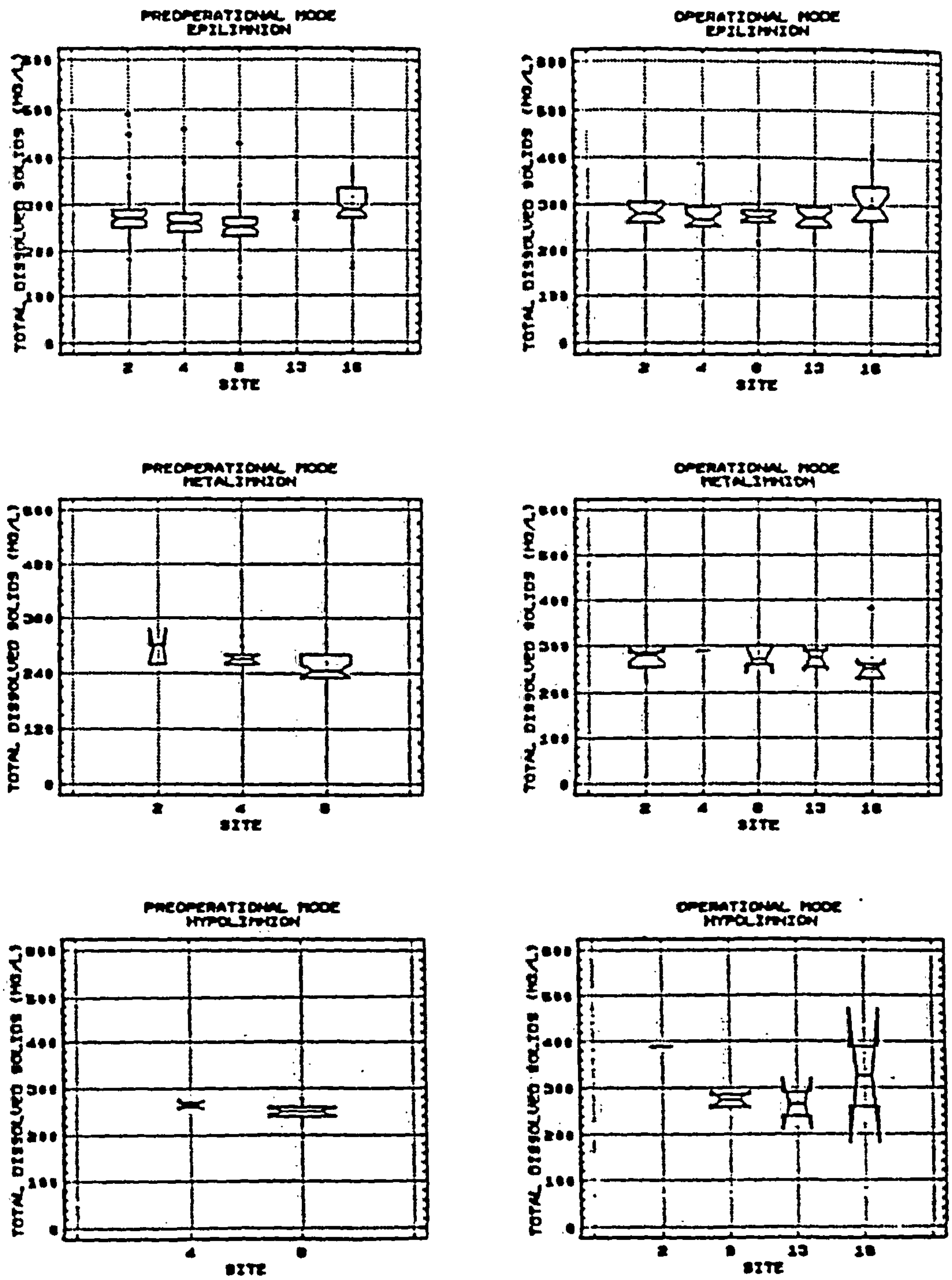


Figure 114. Distributions of total dissolved solids concentrations (mg/l) for Clinton Lake monitoring sites for epilimnion, metalimnion, and hypolimnion strata.

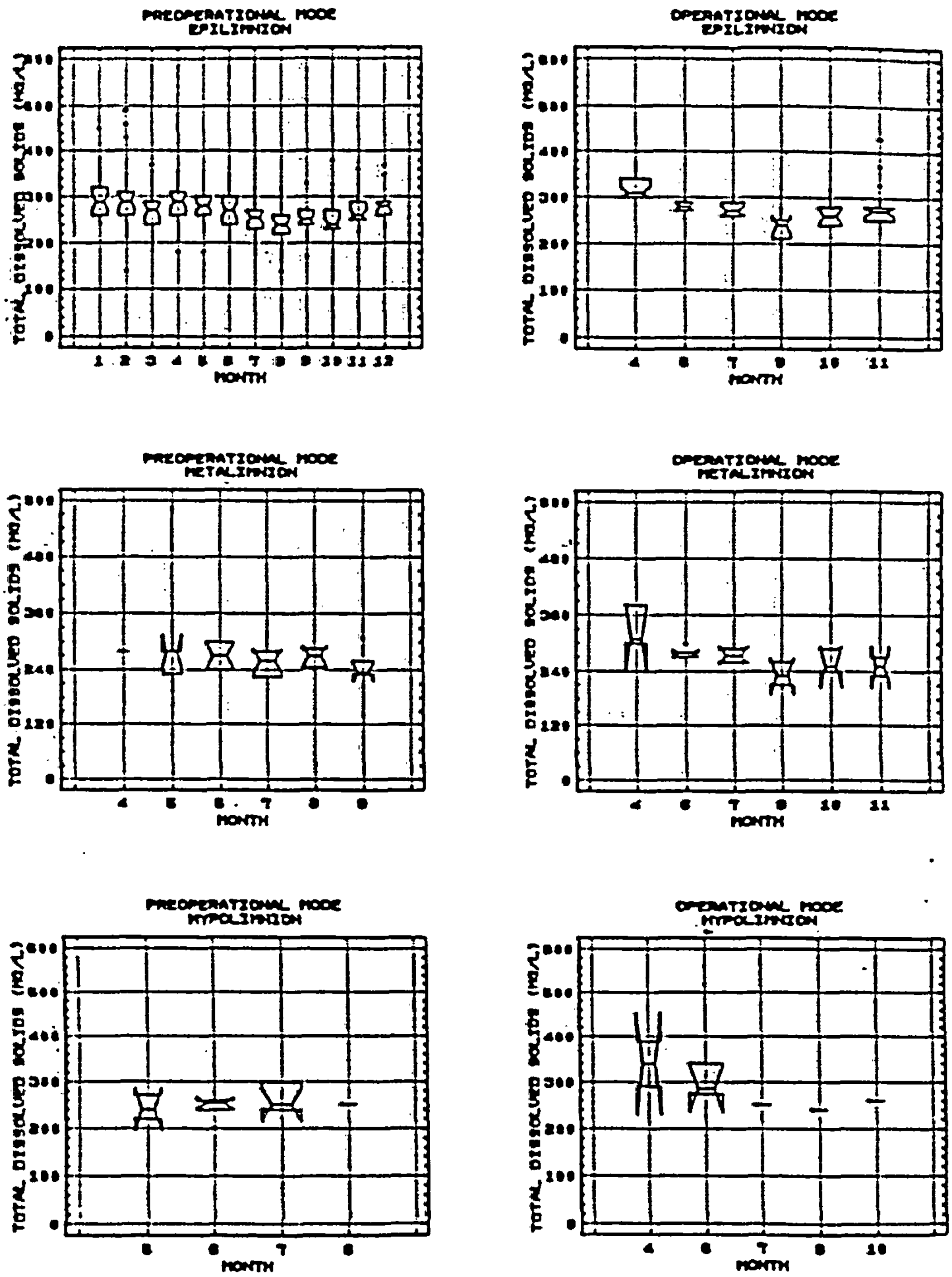


Figure 115. Monthly distributions of total dissolved solids concentrations (mg/l) in Clinton Lake for epilimnion, metalimnion, and hypolimnion strata for the periods prior to (preoperational mode) and during Clinton Power Station operation (operational mode).

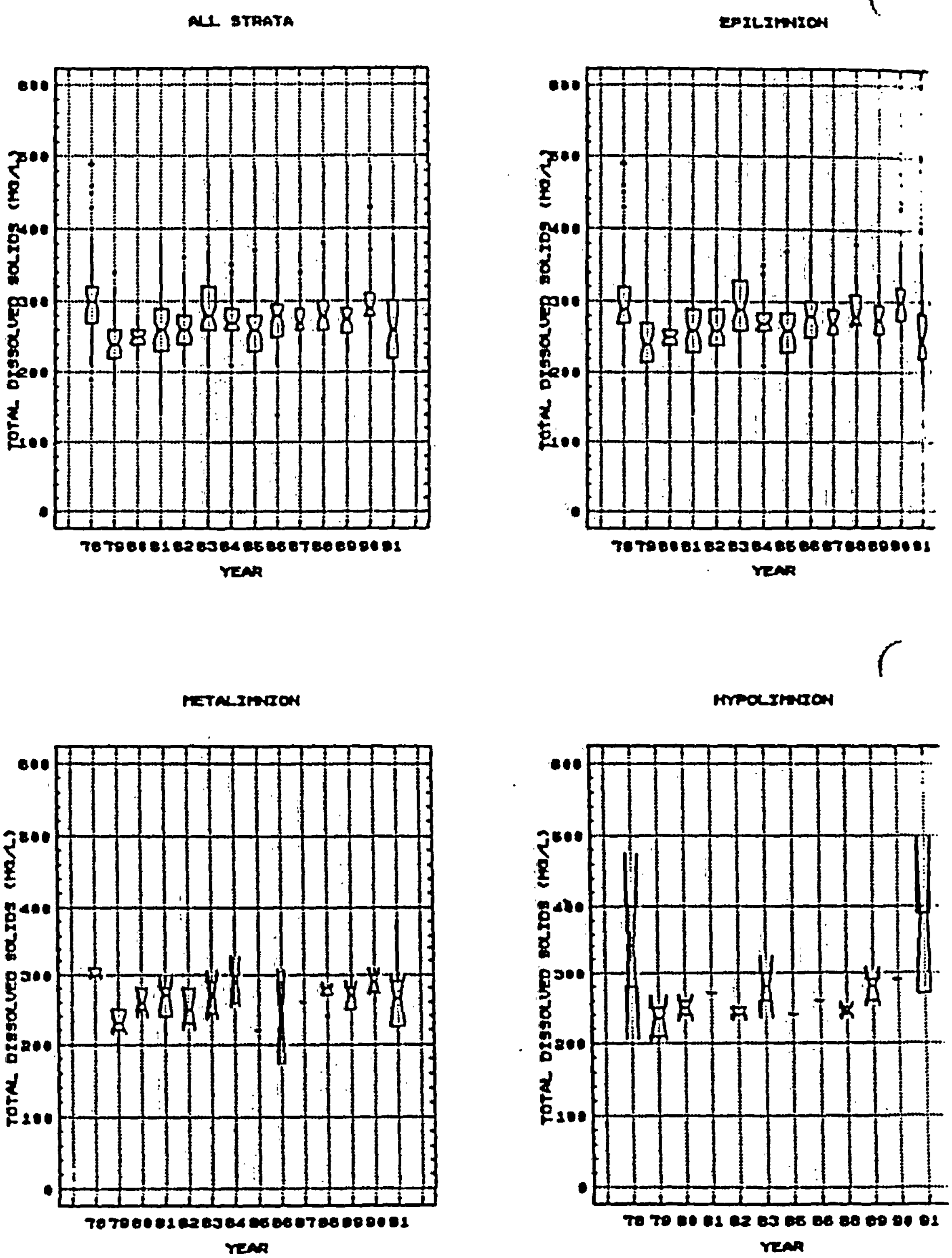


Figure 116. Yearly distributions of total dissolved solids concentrati (mg/l) in Clinton Lake for epilimnion, metalimnion . hypolimnion strata during 1978 through 1991.

approximates the amount of residue in solution and is correlated with total dissolved solids. Resistance of water is reduced with increasing content of ionized salts. The purer the water is, i.e. the lower its salinity, the greater the resistance to electrical flow. There is a direct correlation between conductance and pH in the intermediate pH range of bicarbonate fresh waters. There is also a well defined relationship between specific conductance and total dissolved solids, chlorides, and sulfates. Temperature of an electrolyte affects ionic velocities; conductance increases about two percent for each degree Celcius. Specific conductivities measured in Clinton Lake are referenced to 25° C. The types of substances dissolved in the water and their concentrations and ionic strengths strongly influence the specific conductivity of water.

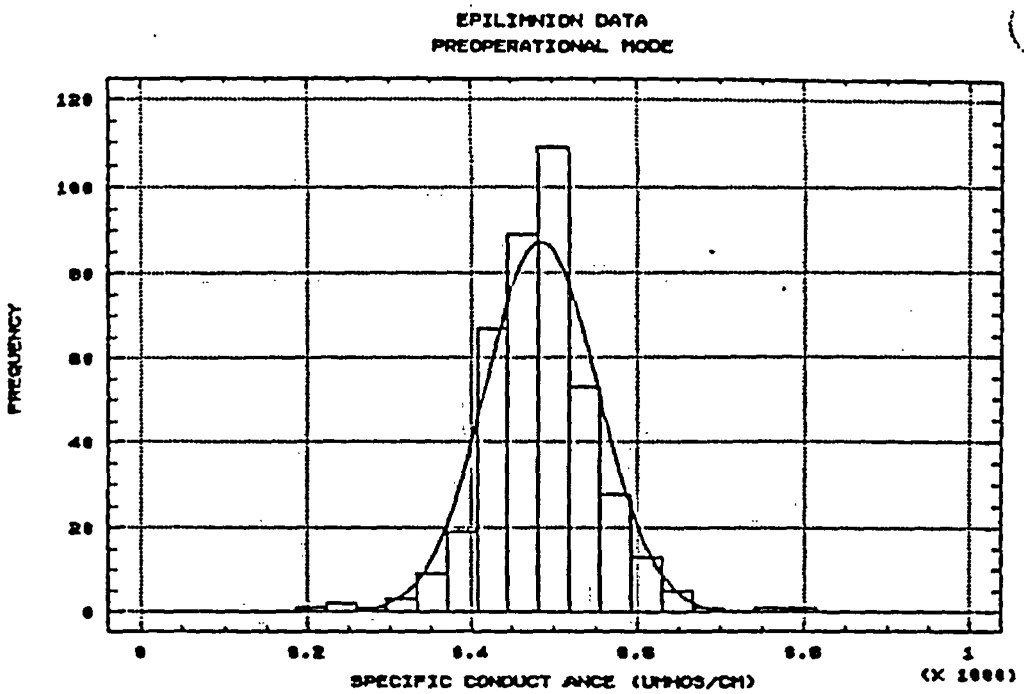
Epilimnion Specific Conductance

The average specific conductance from 592 epilimnion samples taken from 1978 through 1991 was 487 umhos/cm. During this time conductance ranged from 202 to 780 umhos/cm. The average specific conductance for 63 Illinois lakes was 362 umhos/cm and the range was 82 to 1800 umhos/cm (Sefton et al. 1980). The maximum specific conductance in Clinton Lake occurred at Site 4 in February 1978. Distributions of specific conductance were similar for preoperational and operational periods (Figure 117). Distribution of specific conductance from 1978 through 1991 by sites indicated a downlake trend for decreasing values. Specific conductance was greatest at Site 16 and lowest at Site 8 during the preoperational period (Figure 118). Distribution of data by months indicated a seasonal influence in specific conductance data (Figure 118). Conductance decreased from April through August and then increased through November. There was no apparent pattern in the distribution of specific conductance data among years (Figure 119). Plots for 1987 through 1991 illustrate the decrease in specific conductance from April through August and the variability among sites during years when CPS was operational (Figures 120 and 121).

Specific Conductance Profiles

Specific conductance for lake bottom waters are generally greater than conductivities for surface waters (Sefton et al. 1980). Mean lake bottom conductivities for 63 Illinois lakes ranged from 86 to 2072 umhos (Sefton et al. 1980).

Site 16 had significantly greater specific conductance during the preoperational period (Figure 122). During the operational period distributions of specific conductance were similar among sites. The specific conductance was greater at most sites during the operational period (Figure 123). During the preoperational period there was a tendency for specific conductance to decrease with increasing depth (Figure 124). During the operational period the distribution of specific conductance was significantly greater at all depths and there was a tendency for values to increase with depth. During periods of stratification there was a tendency for specific conductance to decrease from April through September at epilimnion and metalimnion strata (Figure 125). Specific conductance tended to increase during stratification in the hypolimnion during the preoperational period. The



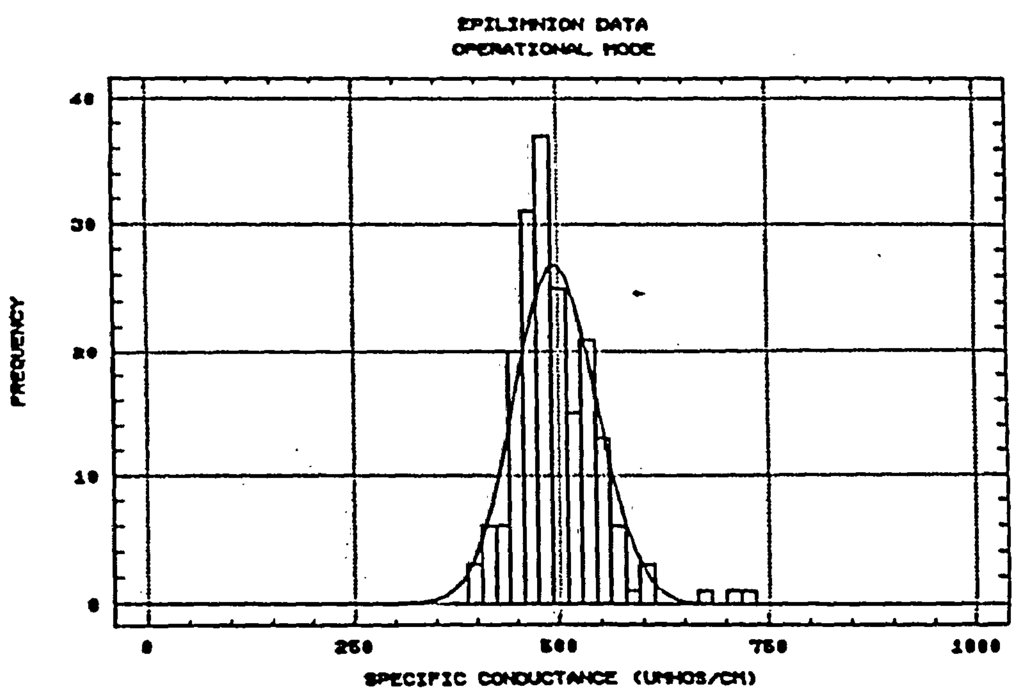


Figure 117. Frequency histograms of epilimnion specific conductance concentrations (umhos/cm) in Clinton Lake during periods prior to (top graph) and during Clinton Power St[...] operation (bottom graph).

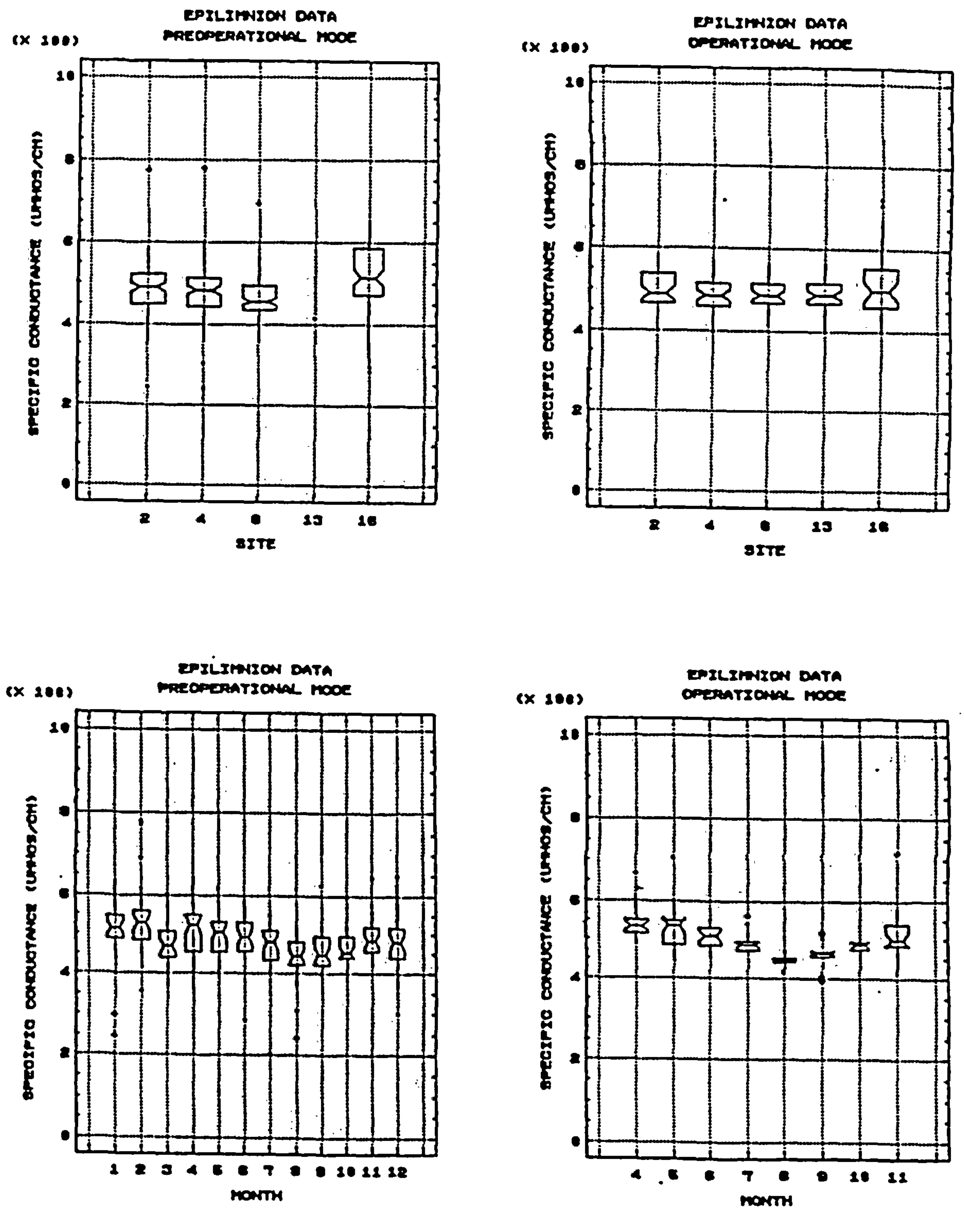
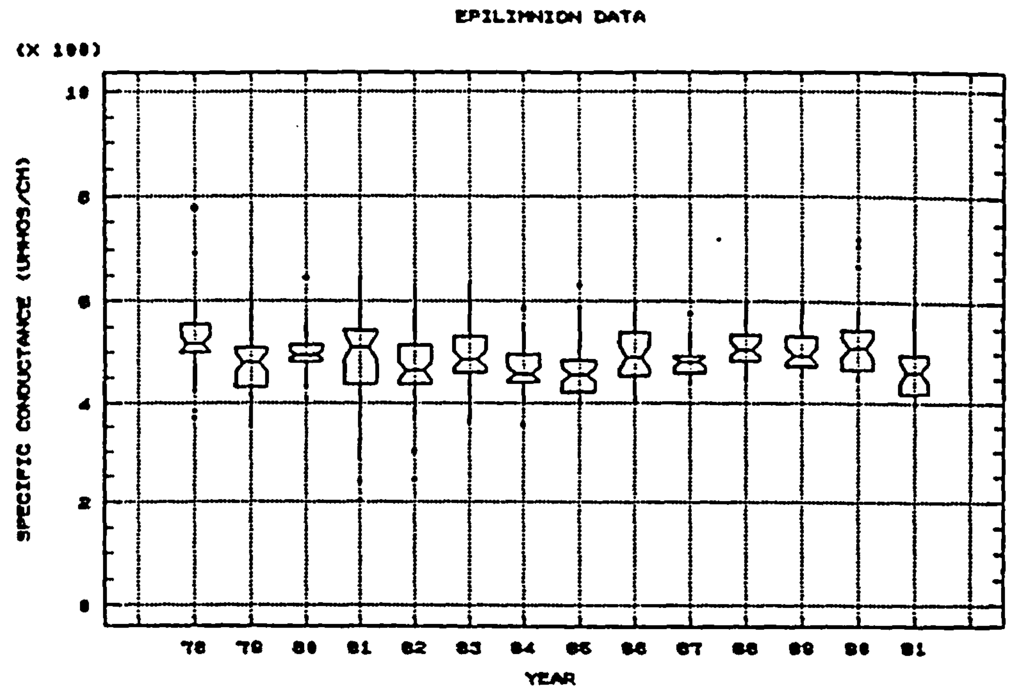


Figure 118. Distributions of specific conductance concentrations (umhos/cm) in Clinton Lake for monitoring sites and months during periods prior to (Preoperational Mode) and during (Operational Mode) Clinton Power Station operation.



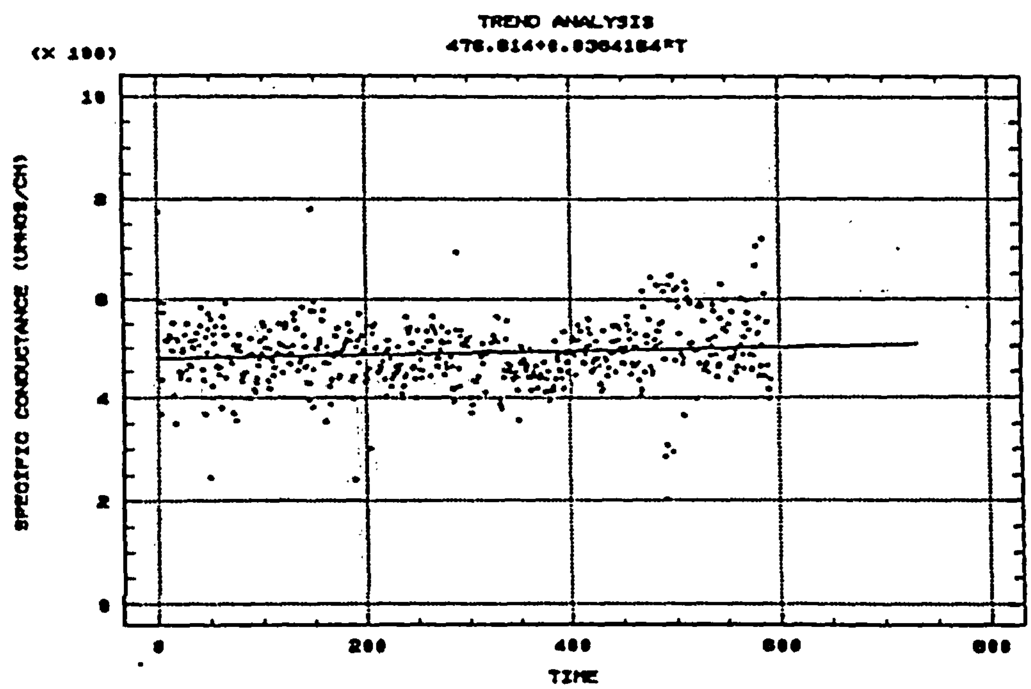


Figure 119. Yearly distributions (top graph) and trend analysis (bottom graph) of specific conductance concentrations (umhos/cm) in Clinton Lake during 1978 through 1991.

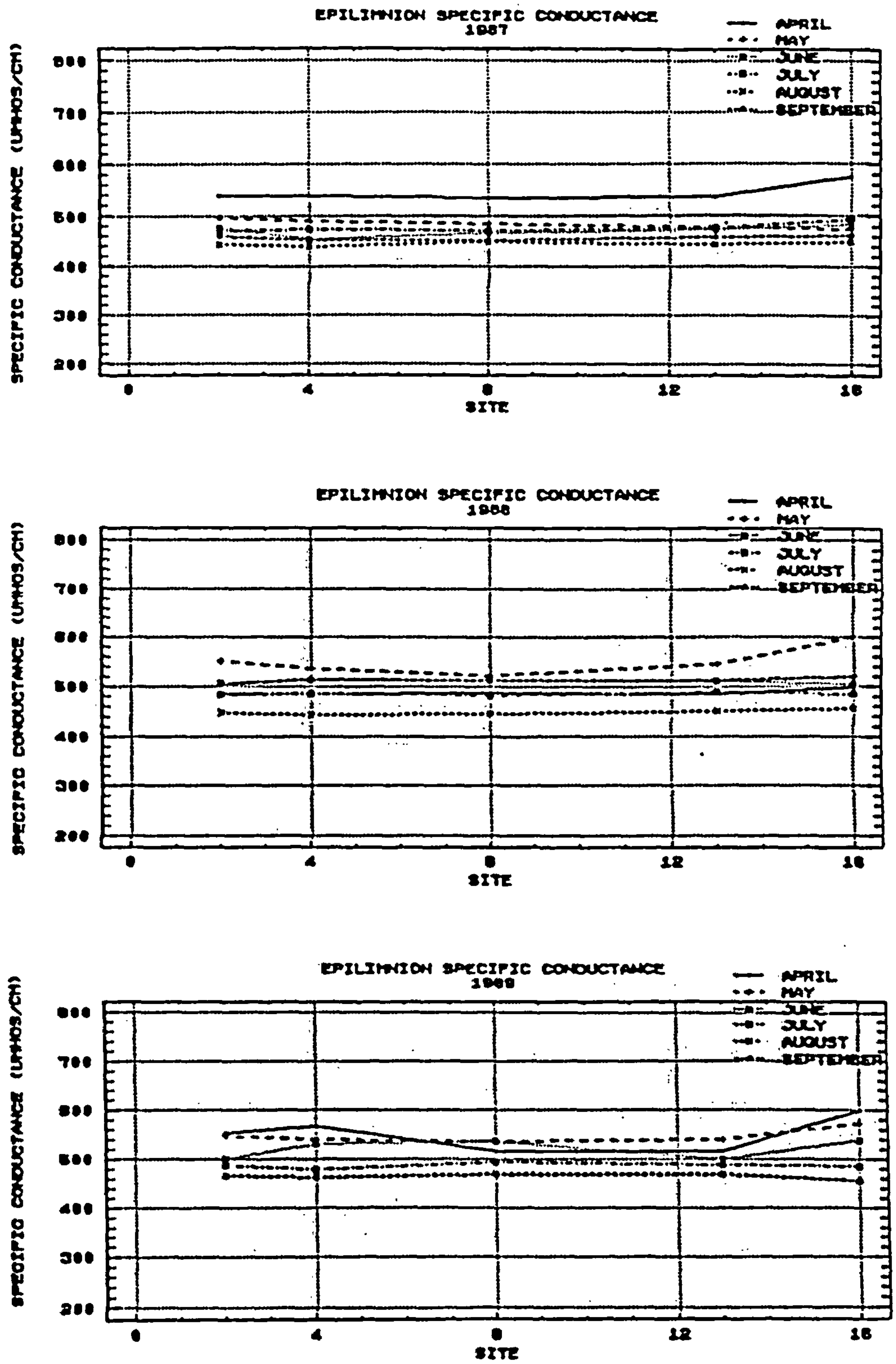
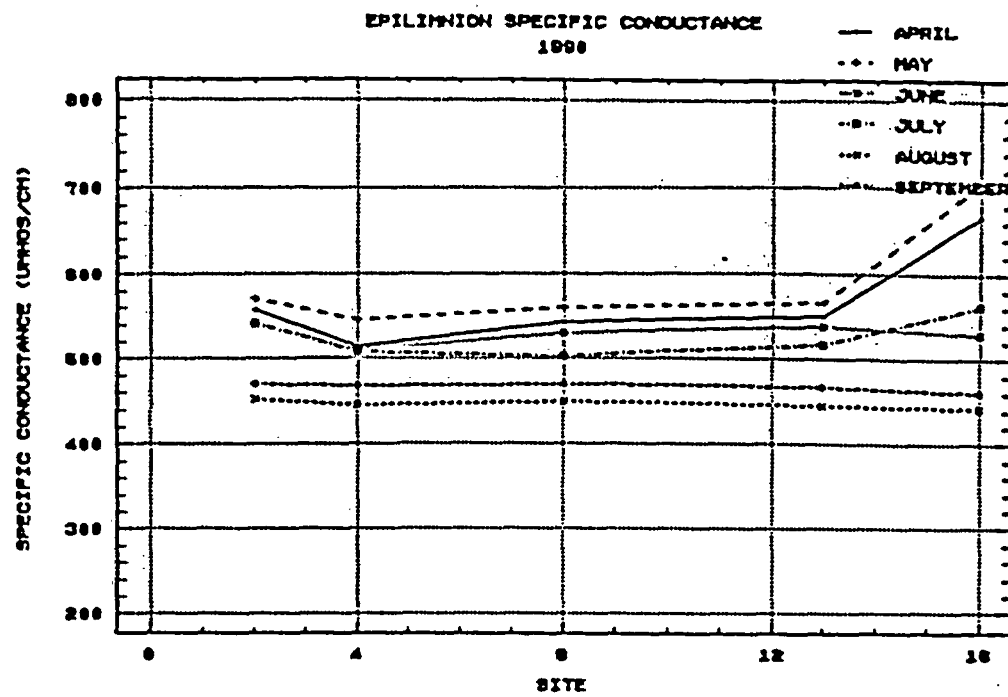


Figure 120. Epilimnion specific conductance concentrations (umhos/cm) for Clinton Lake sampling sites during April through September for 1987, 1988, and 1989.



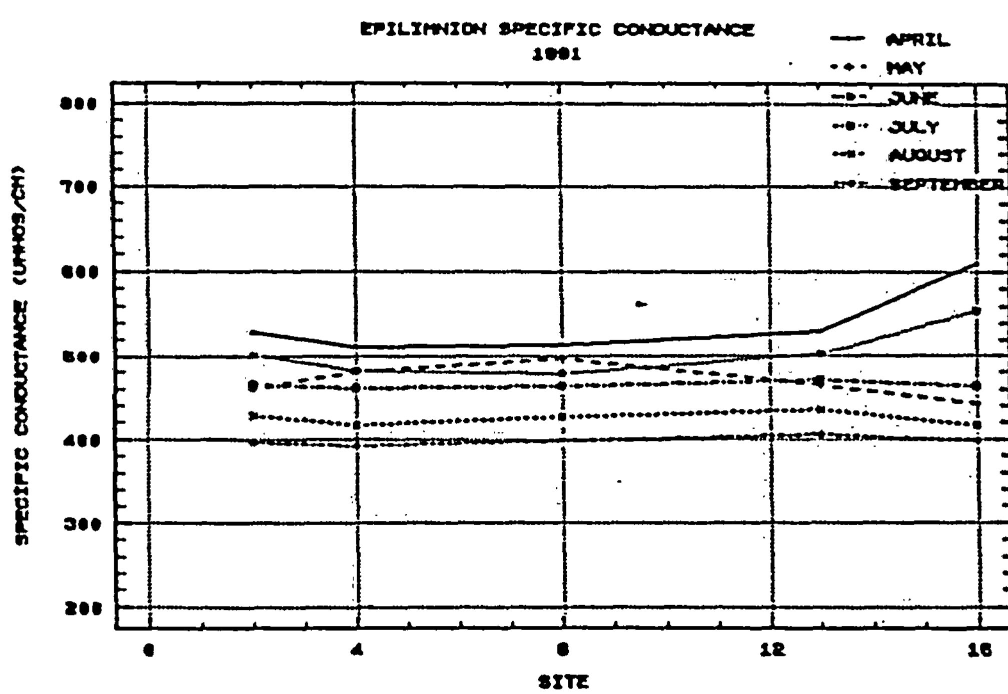


Figure 121. Epilimnion specific conductance concentrations (umhos/cn for Clinton Lake sampling sites during April throug September for 1990 and 1991.

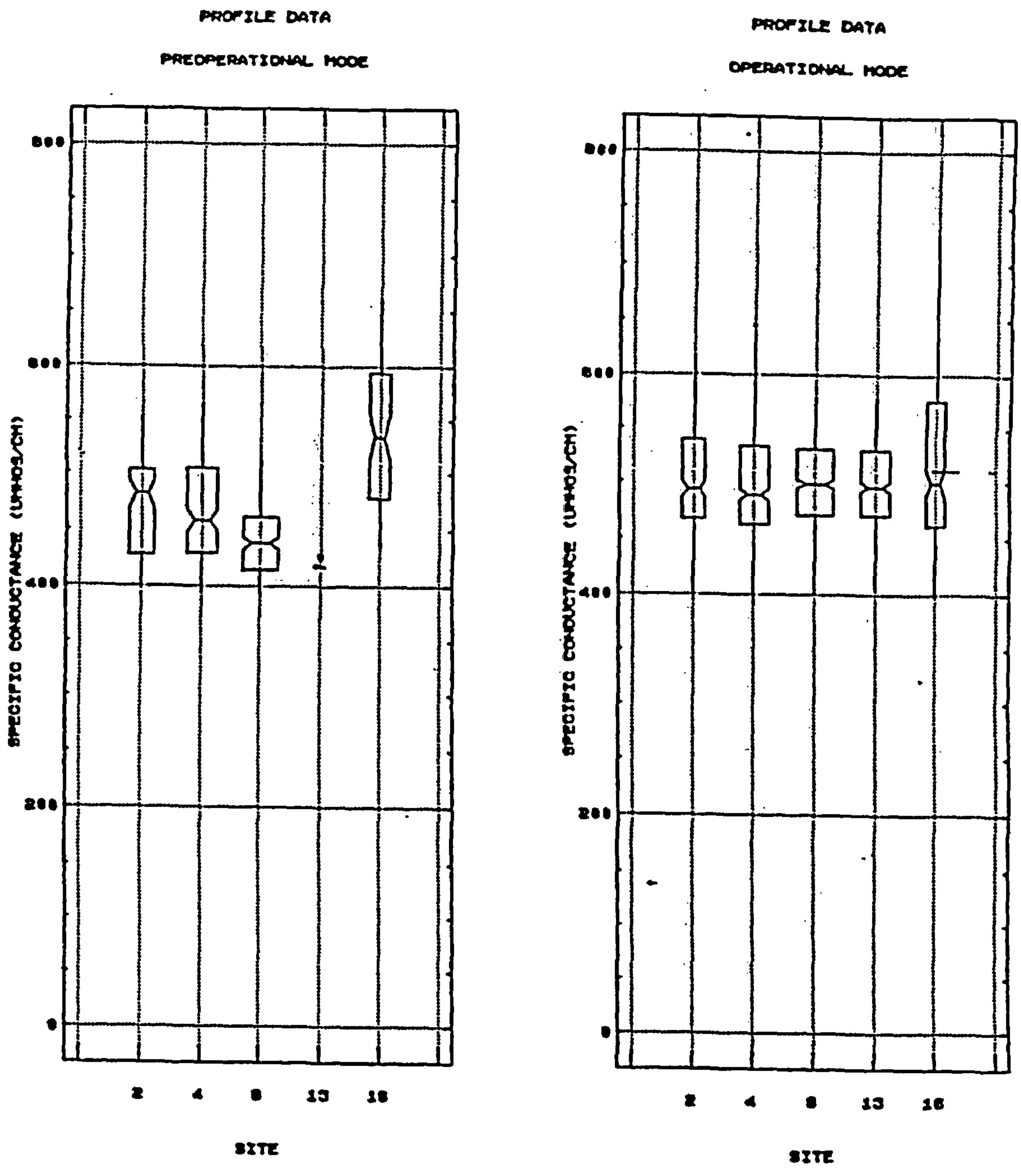


Figure 122. Distribution of specific conductance concentrations (umhos/cm) for each Clinton Lake monitoring site during periods prior to (preoperational mode) and during Clinton Power Station operation (operational mode).

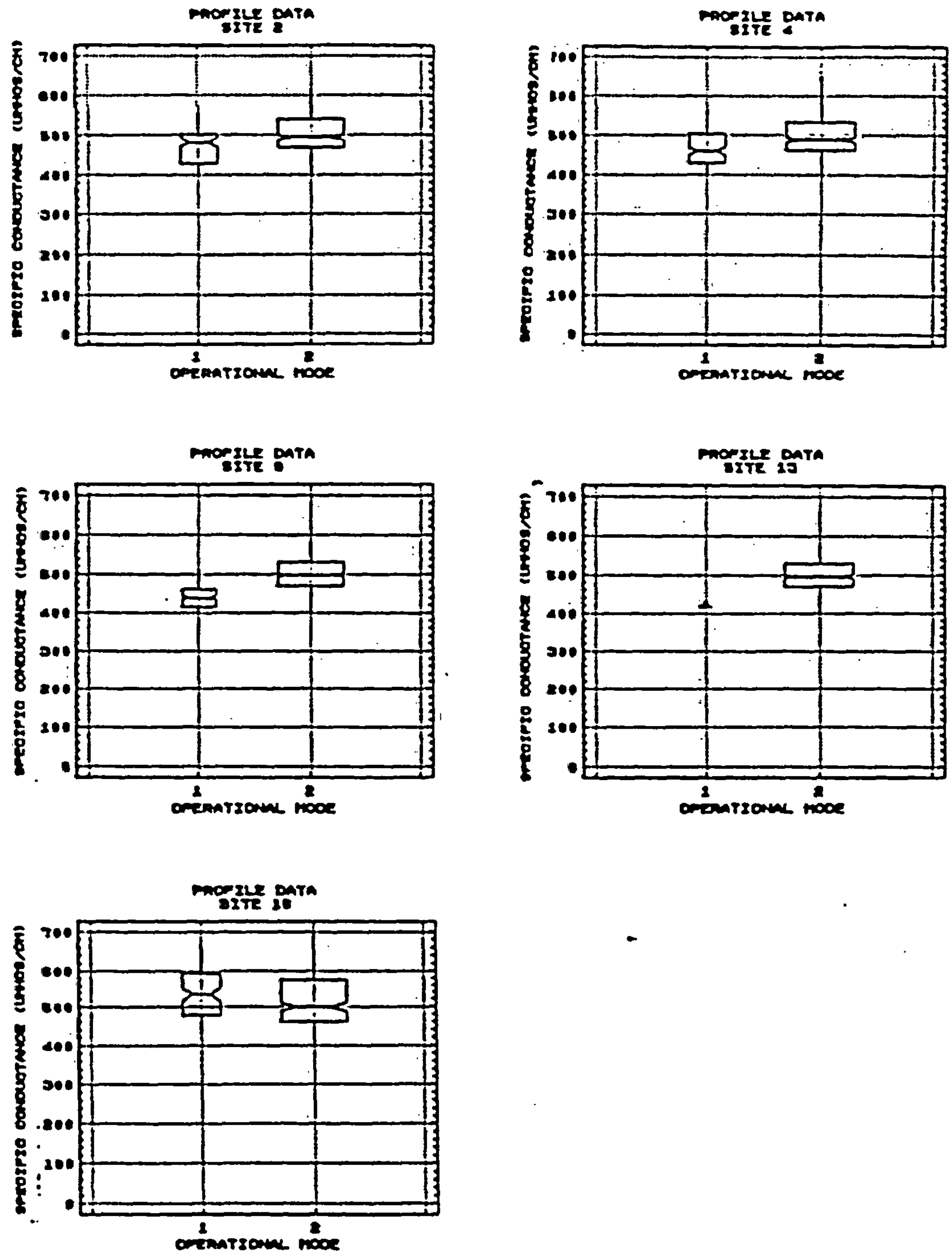


Figure 123. Distribution of specific conductance concentrations (umhos/cm) for each Clinton Lake monitoring site during periods prior to (Mode 1) and during Clinton Power Station operation (Mode 2).

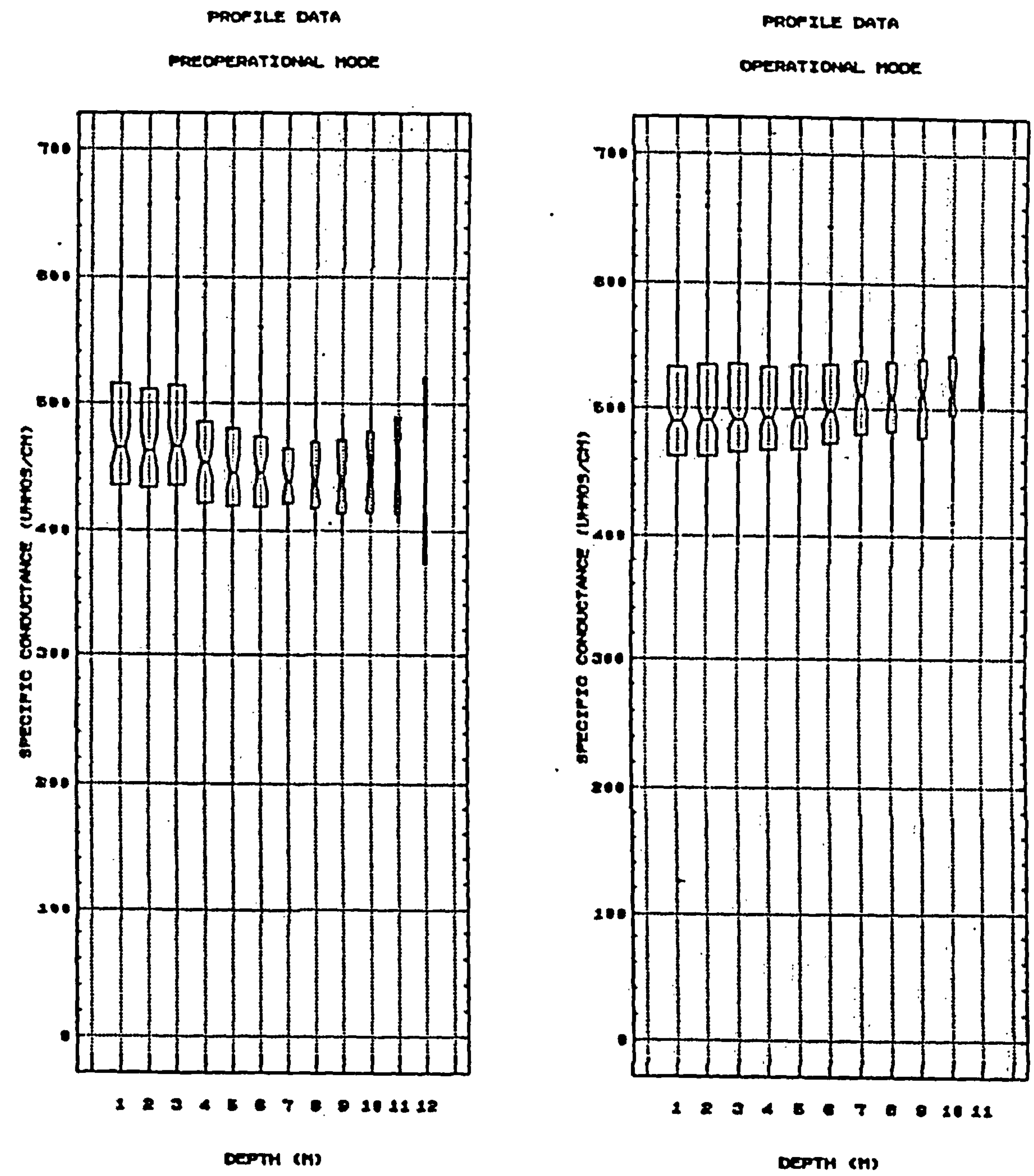


Figure 124. Distribution of specific conductance concentrations (umhos/cm) in Clinton Lake by one meter depth intervals during periods prior to (Preoperational Mode) and during Clinton Power Station operation (Operational Mode).

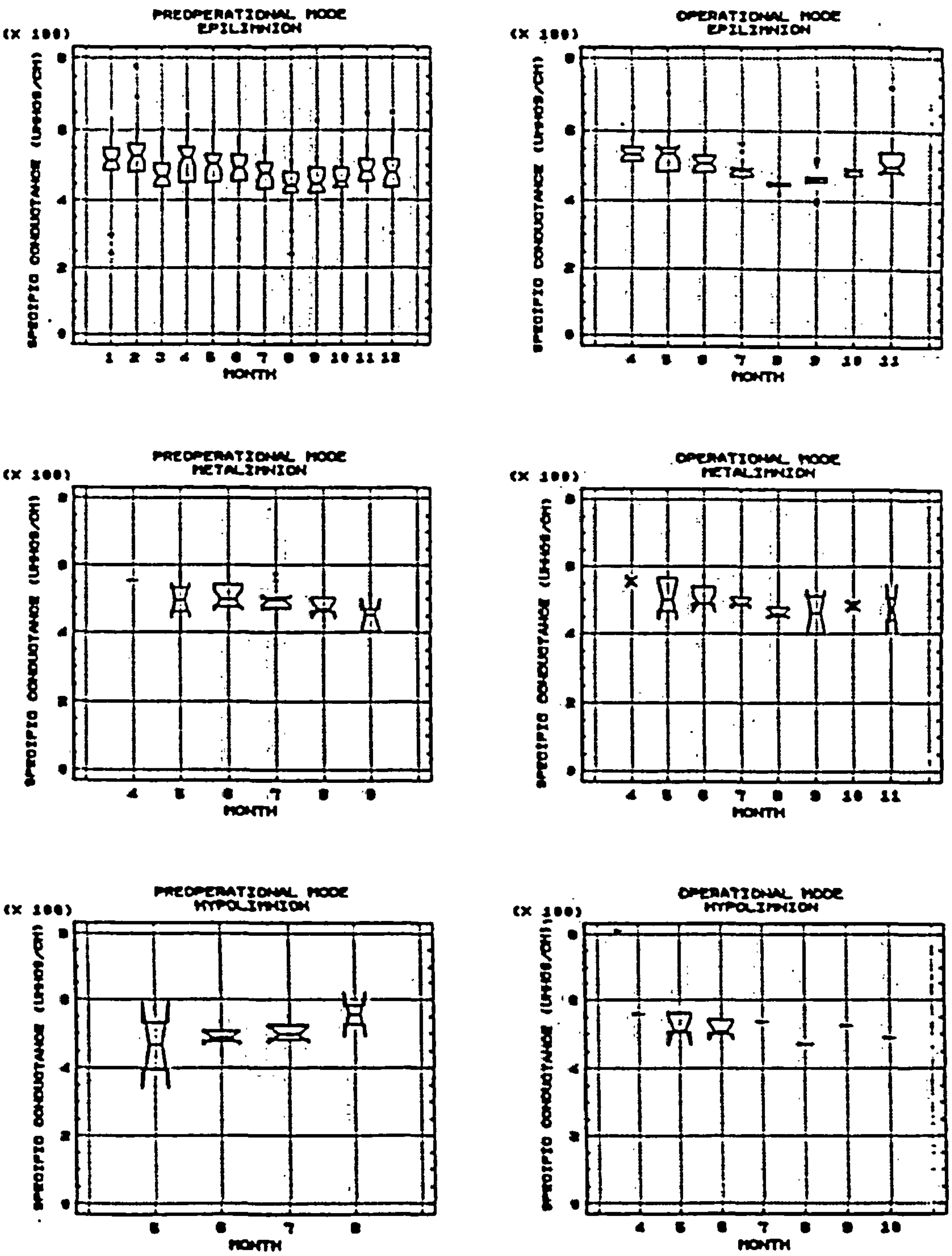


Figure 125. Monthly distributions of specific conductance concentrations (umhos/cm) in Clinton Lake for epilimnion, metalimnion, and hypolimnion strata for the periods prior to (Preoperational Mode) and during Clinton Power Station operation (Operational Mode).

seasonal distribution of profile data was similar to that for epilimnion data (Figure 126). Specific conductance was greater for each month during the operational period (Figure 126).

8.7.3 Hydrogen Ion Activity

The hydrogen ion activity in water is often represented by pH. For most purposes pH is defined as the negative logarithm of the hydrogen ion activity. A pH of 7 is neutral, while a pH less than 7 is acid and a pH greater than 7 is alkaline. The principal system which regulates pH in natural waters is the carbonate system, which is composed of carbon dioxide, carbonic acid, bicarbonate ion, and carbonate ion. Hydrogen ion activity is temperature dependent, however, pH values for Clinton Lake are referenced to 25° C. The pH is important in biological systems because the toxicity of many compounds is affected by pH; biological decomposition and respiration tend to decrease pH; and photosynthesis tends to increase pH.

Epilimnion pH

The average pH of 591 epilimnion samples collected during 1978 through 1991 was 8.09. During this period the minimum pH value was 6.4 and the maximum was 9.0. Distributions of pH values were similar for preoperational and operational periods (Figure 127). Most Illinois lakes are alkaline and very few of the 63 Illinois lakes monitored by the IEPA had pH values below 7 and only a few had pH values greater than 9 (Sefton et al. 1980).

Values for pH were similar among sites during preoperational and operational periods (Figure 128). Distributions of pH values were similar among months and there were no apparent seasonal effects (Figure 128). There was no apparent trend in the distribution of pH data by years (Figure 129). Distributions of pH data during operational years were within the range of distributions for yearly data during preoperational conditions (Figure 129). Plots for 1987 through 1991 illustrate the distribution of pH data during the warmest months of each year (April through September) and the variability among sites during years when CPS was operational (Figures 130 and 131).

The IPCB General Use water quality standard for pH is "... not less than 6.5 or greater than 9.0 except for natural causes." One sample out of 477 failed to meet the IPCB standard. This occurred at Site 2 in June, 1983 when the pH was 6.4.

pH Profiles

The vertical distribution of pH in lakes typically has greater pH values near the surface and lower pH values in bottom waters. This is due to reduction of carbon dioxide by photosynthesis in surface waters and the generation of carbon dioxide by microbial decomposition in and near bottom sediments.

Values for pH decreased with increasing depth during preoperational and operational periods (Figure 132). With succeeding

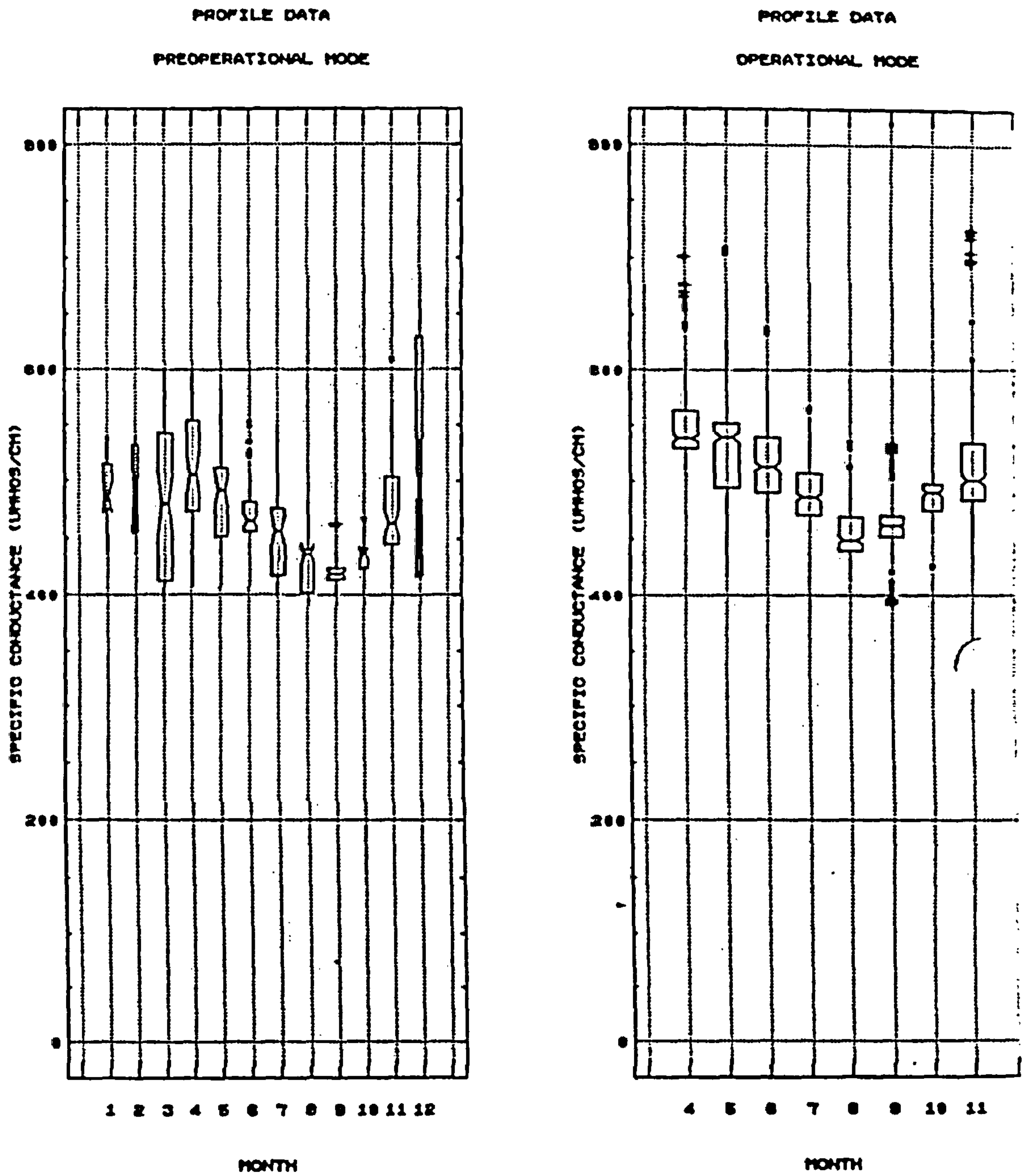


Figure 126. Monthly distributions of specific conductance concentration (umhos/cm) in Clinton Lake during periods prior t (Preoperational Mode) and during Clinton Power Statio operation (Operational Mode).

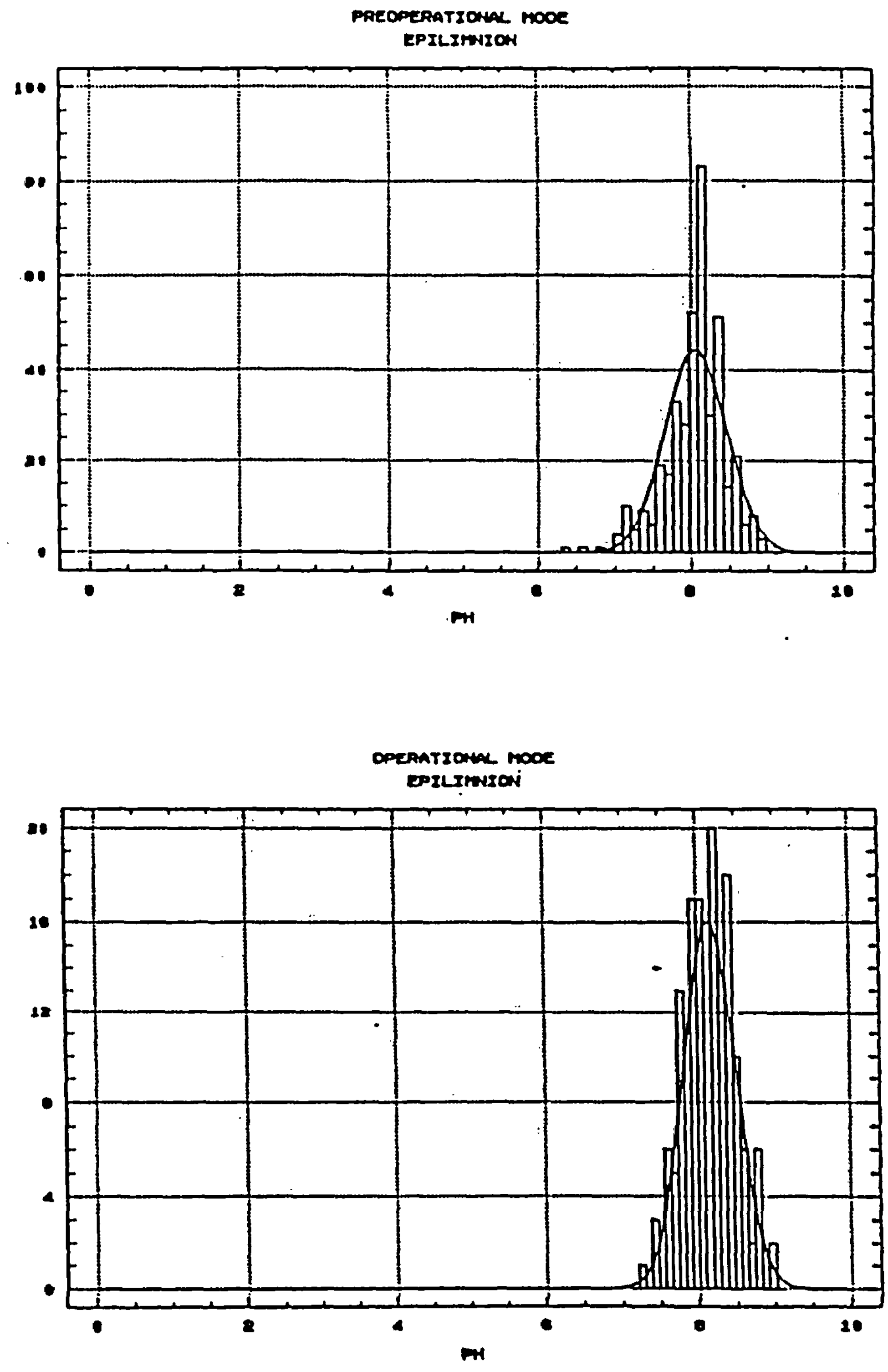


Figure 127. Frequency histograms of epilimnion pH in Clinton Lake during periods prior to (top graph) and during Clinton Power Station operation (bottom graph).

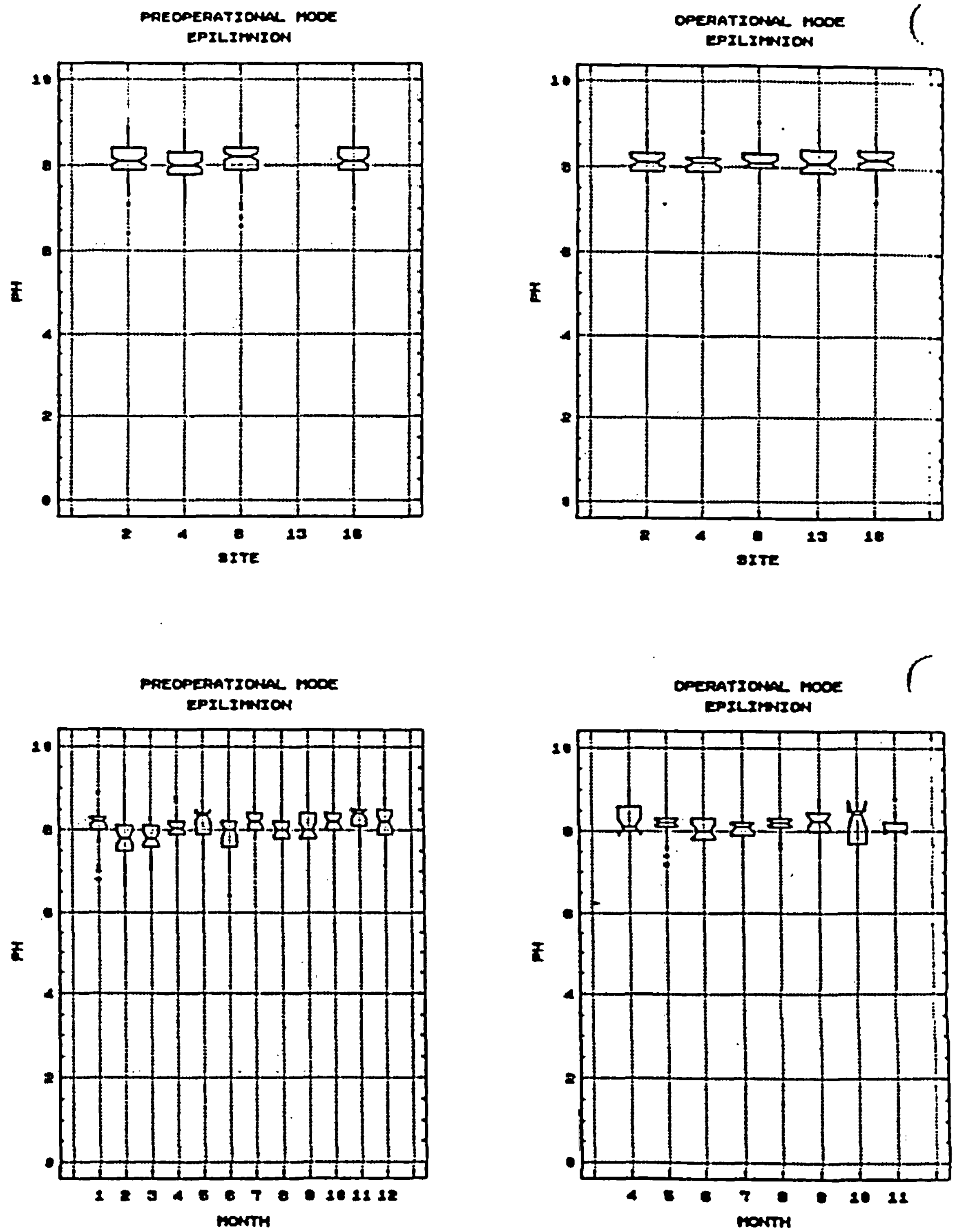


Figure 128. Distributions of pH in Clinton Lake for monitoring sites and months during periods prior to (Preoperational Mode) and during (Operational Mode) Clinton Power St[illegible] operation.

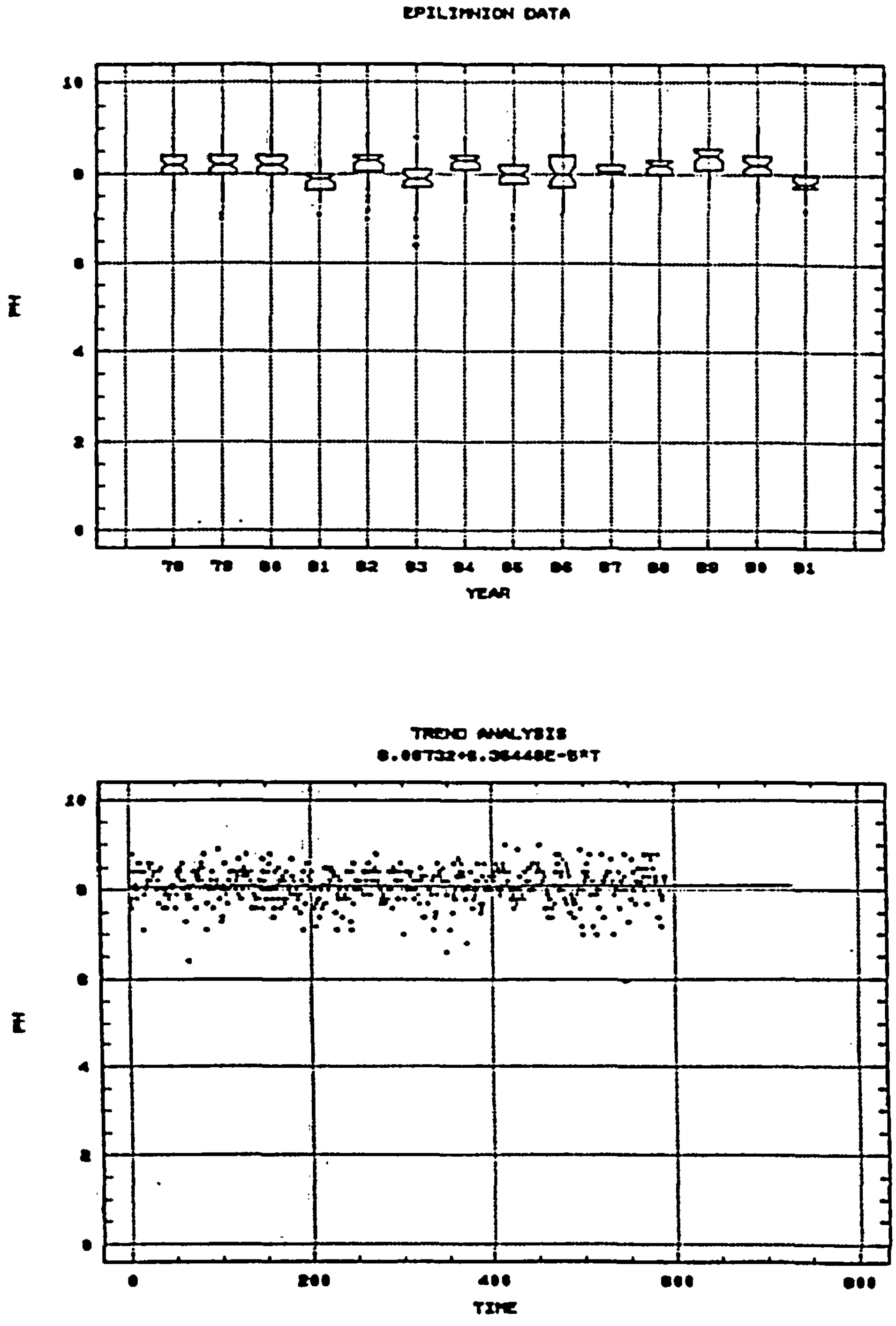


Figure 129. Yearly distributions (top graph) and trend analysis (bottom graph) of pH in Clinton Lake during 1978 through 1991.

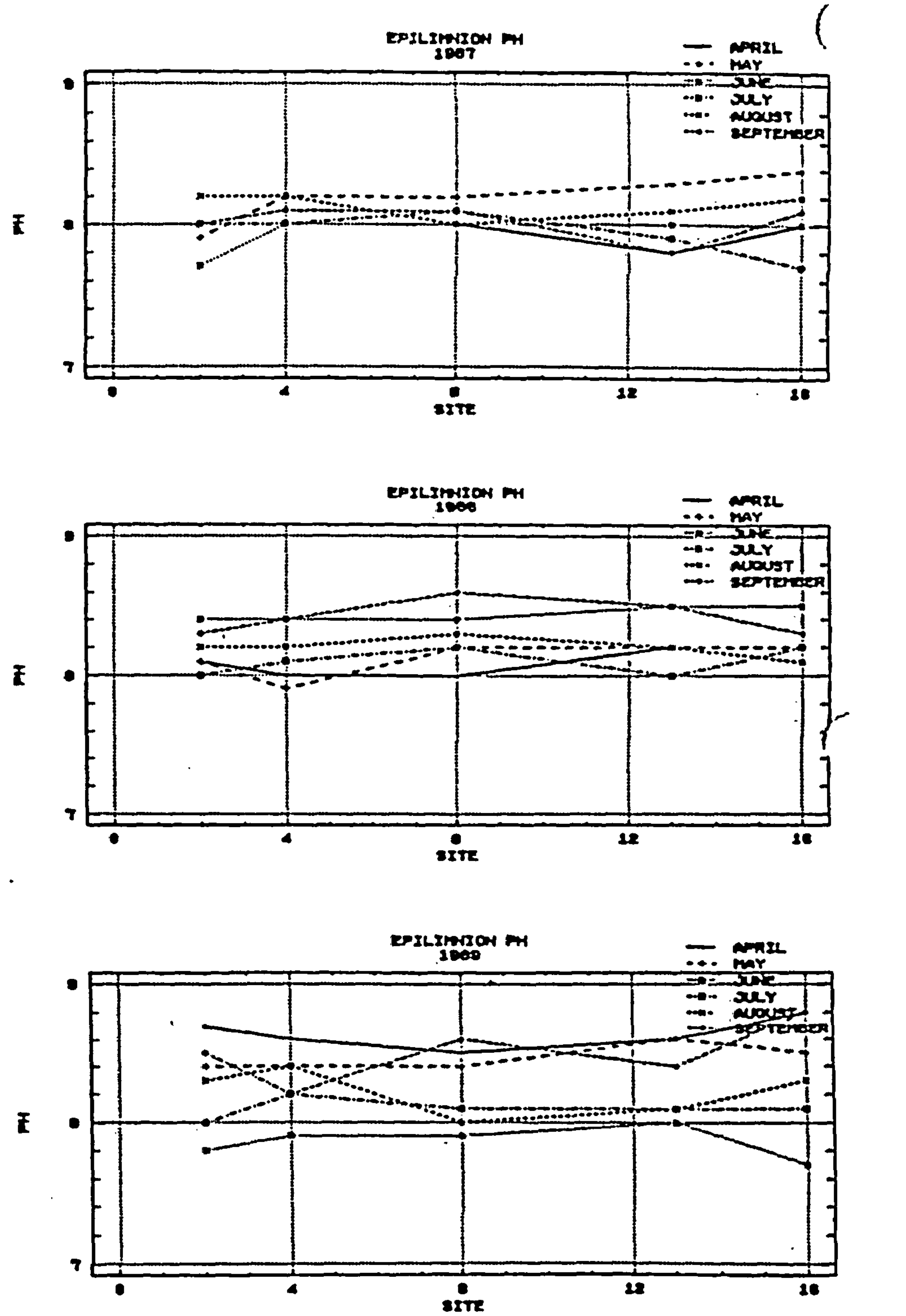
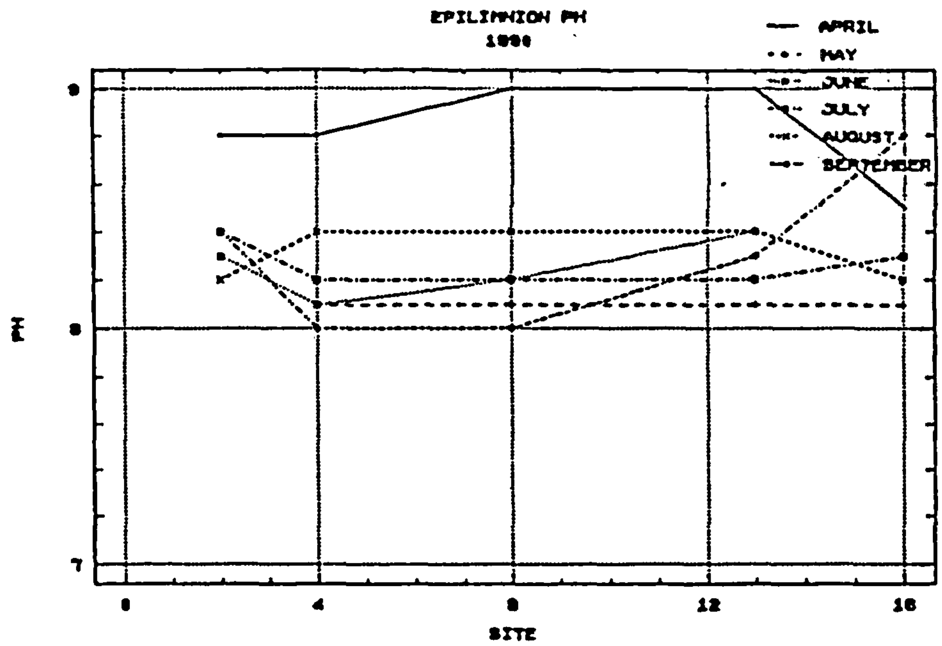


Figure 130. Epilimnion pH for Clinton Lake sampling sites during A through September for 1987, 1988 and 1989.



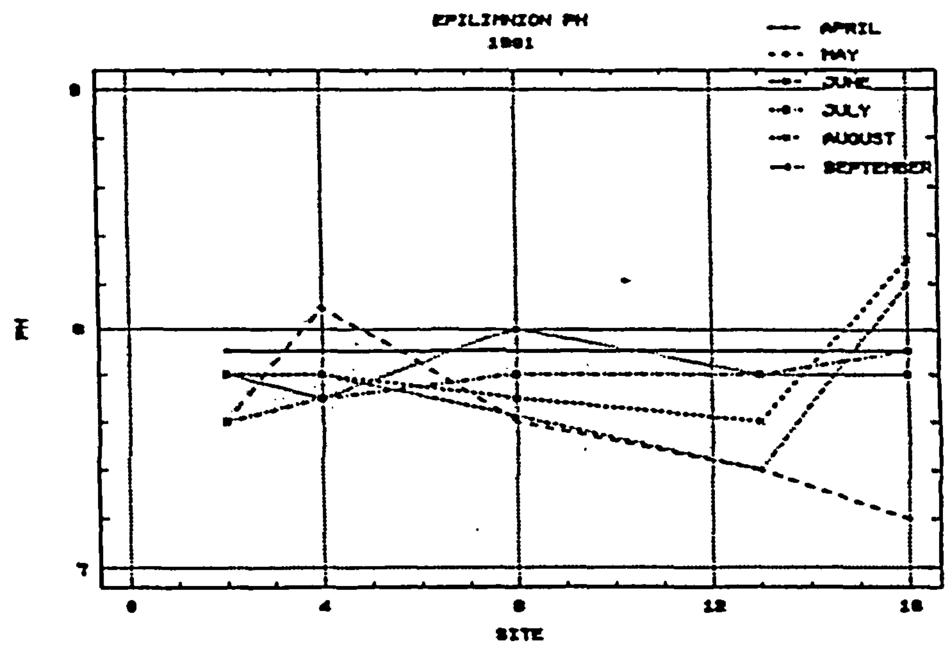
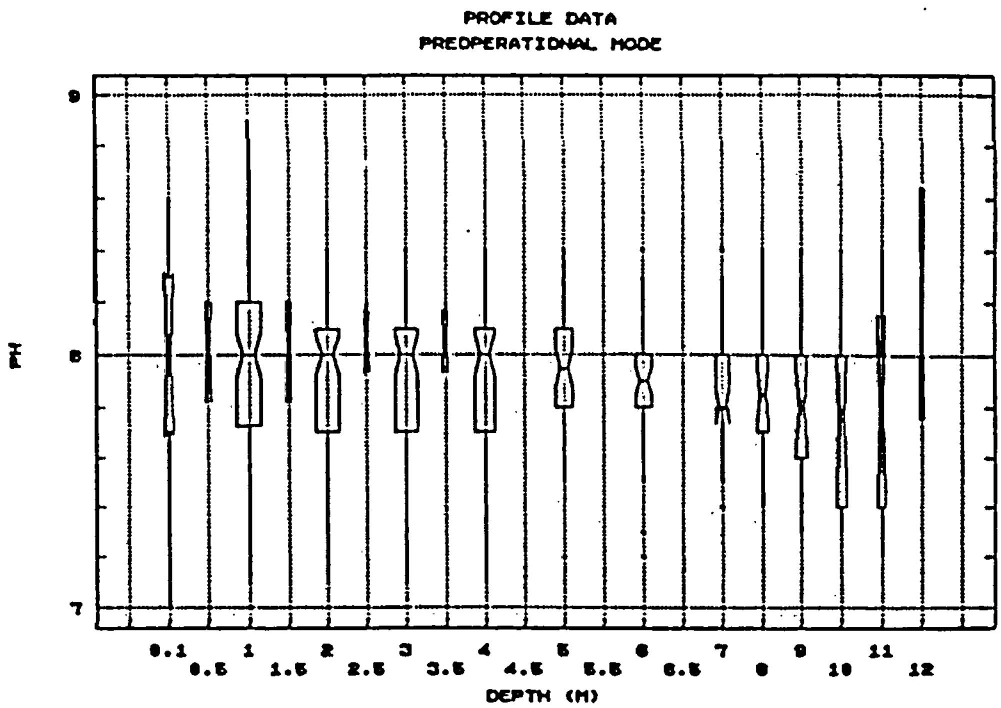


Figure 131. Epilimnion pH for Clinton Lake sampling sites during April through September for 1990 and 1991.



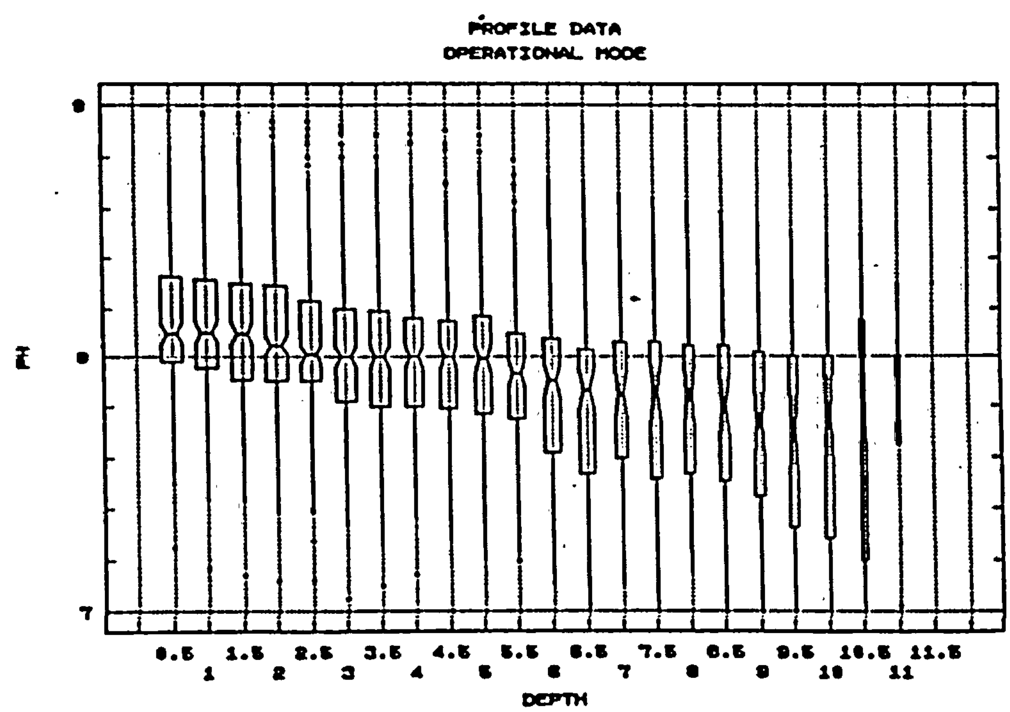


Figure 132. Distribution of pH in Clinton Lake for 0.5 meter depth intervals during periods prior to (Preoperational) and during Clinton Power Station operation (Operational M

months during stratification pH tended to increase in the epilimnion and decrease in the meta- and hypolimnion for the preoperational period (Figure 133). During the operational period pH tended to increase in the metalimnion (Figure 133). Distributions of profile data for pH were similar among sites during the preoperational and operational periods (Figure 134). Profile pH data were variable and there were no consistent trends among months during preoperational or operational periods (Figure 135).

8.7.4 Alkalinity

Alkalinity is the ability of water to neutralize an acid. This acid-neutralizing capability is due primarily to bicarbonate and carbonate salts of weak acids or the hydroxides of strong bases. Alkalinity may be thought of as a measure of the buffering capacity of water, which is generally dictated by the geochemistry of the watershed. The carbonate system is the major component of this buffering capacity. The carbonate system is also a source of carbon for photosynthesis and is thus related to the biological productivity of a waterbody. Phosphates and hydroxides may also increase alkalinity. Daily fluctuations in alkalinity concentrations are usually negligible. Generally, changes associated with photosynthesis and respiration on the carbonate-carbonic acid system are visible in terms of pH changes. Since pH has a direct effect on aquatic organisms and an indirect effect on the toxicity of certain contaminants, alkalinity is an important water quality parameter. The IPCB has not established a standard for alkalinity in natural waters. The USEPA (1976) criterion for freshwater aquatic life is a minimum of 20 mg/l, except where natural conditions are less. Highly alkaline waters have a distinct unpleasant taste, which is probably due to associated high values for pH, hardness, and total dissolved solids.

Epiliminion Alkalinity

The average alkalinity of 490 epilimnion samples during 1978 through 1991 was 168 mg/l. During this period alkalinity ranged from 72 to 302 mg/l. The average alkalinity for 63 Illinois lakes was 100 mg/l as calcium carbonate; concentrations ranged from 20 to 207 mg/l (Sefton et al. 1980). Distributions of alkalinity were similar for preoperational and operational periods (Figure 136). Concentrations of alkalinities for most Clinton Lake sites during preoperational conditions were slightly less than the averages during operational conditions (Figure 137). During preoperational conditions Site 16 had significantly greater alkalinity concentrations compared to the remaining sites (Figure 137). There were no significant differences among sites during operational conditions. Distributions of data for months indicates there were seasonal influences on alkalinity concentrations (Figure 137). Alkalinity tended to decrease from spring through summer months, then increase during fall months. Distributions of alkalinity concentrations for years do not indicate any apparent long term trends (Figure 138). Distribution of alkalinity during operational years was similar to preoperational years (Figure 138). Trend analysis indicates a slight decreasing trend for alkalinity concentrations (Figure 138).

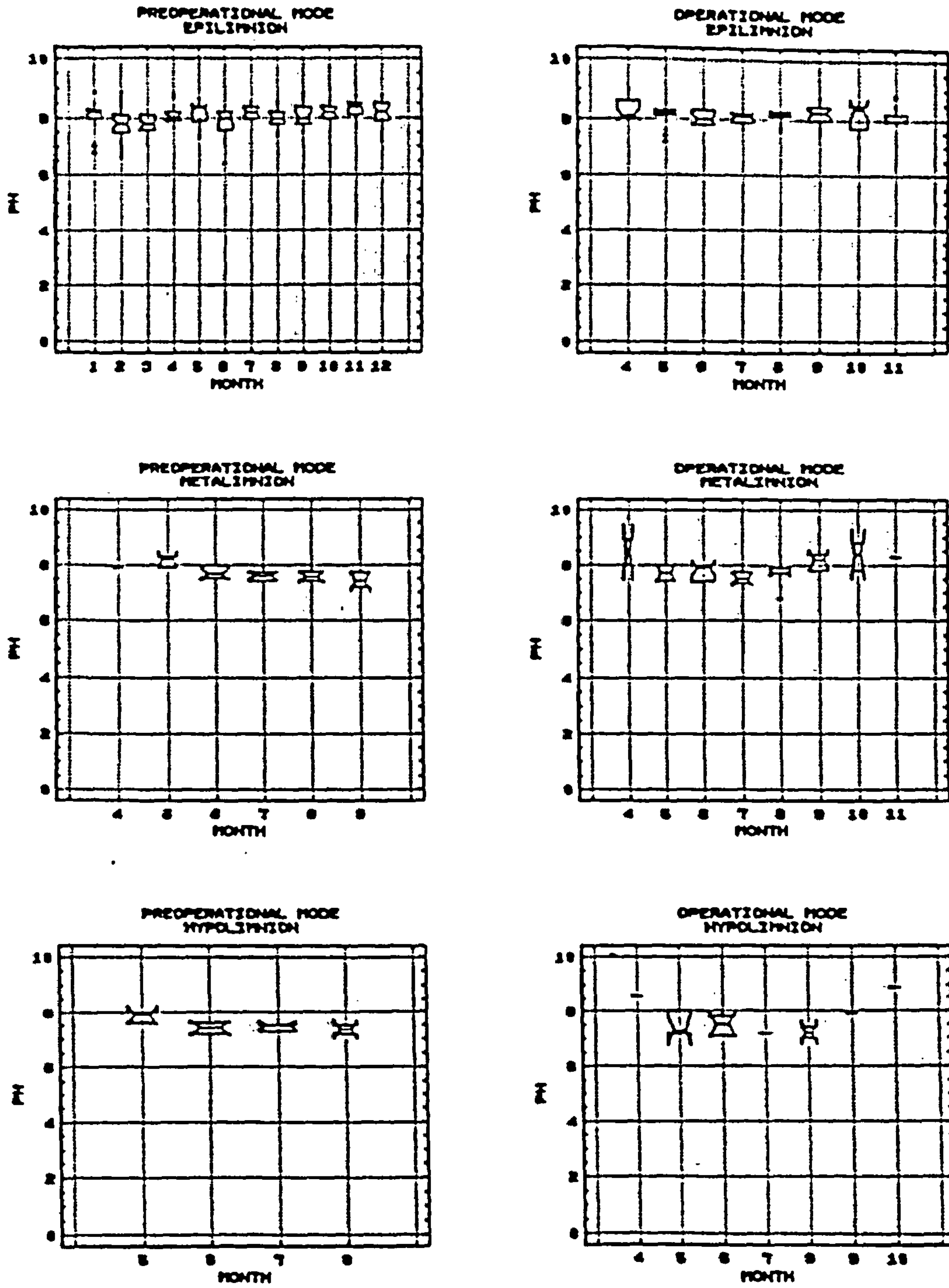


Figure 133. Monthly distributions of pH in Clinton Lake for epilimnion, metalimnion, and hypolimnion strata for the periods prior to (Preoperational Mode) and during Clinton Power Station operation (Operational Mode).

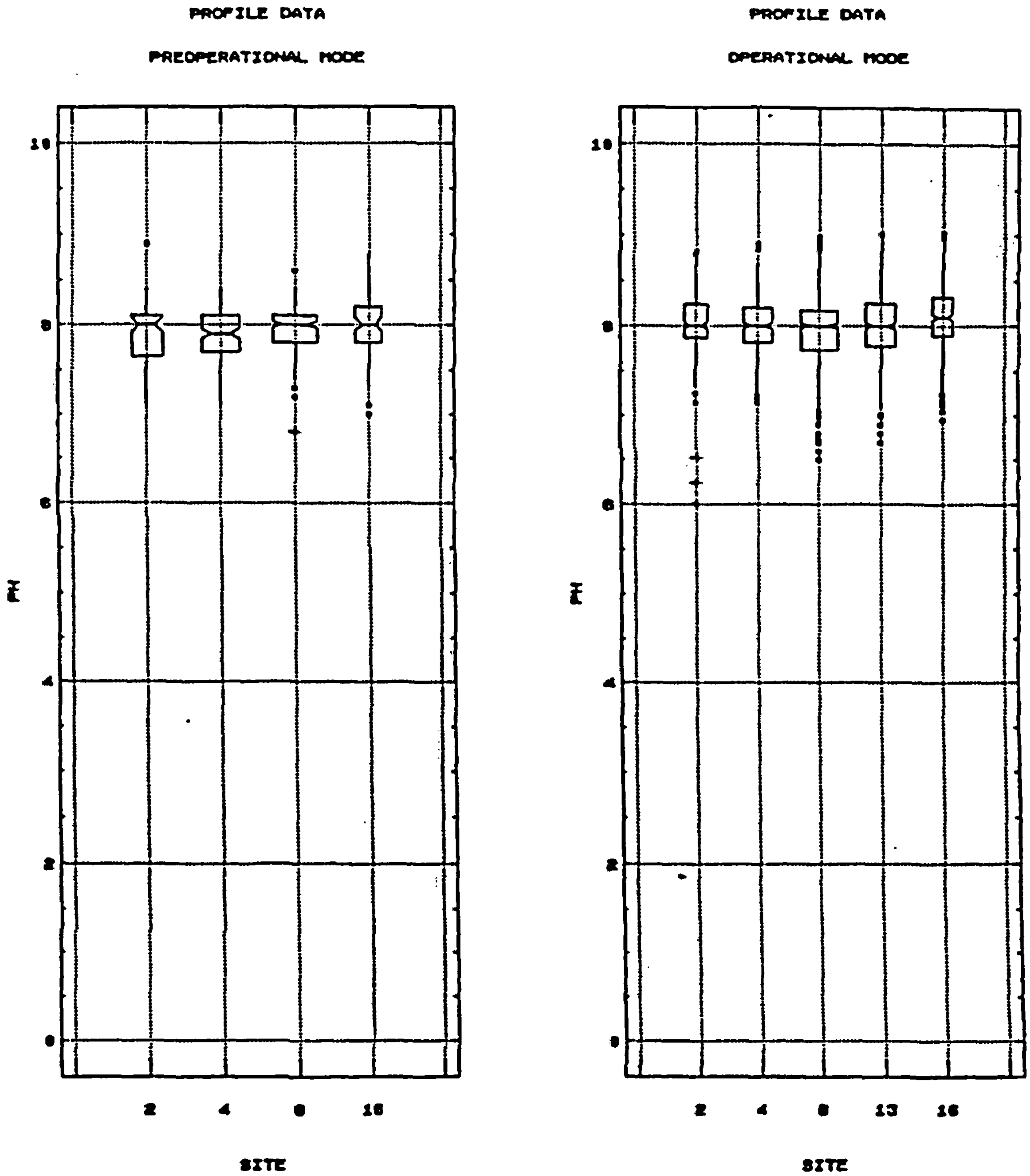


Figure 134. Distribution of pH from Clinton Lake sampling sites for period prior to (1985 and 1986) and during (1987 through 1991) Clinton Power Station operation.

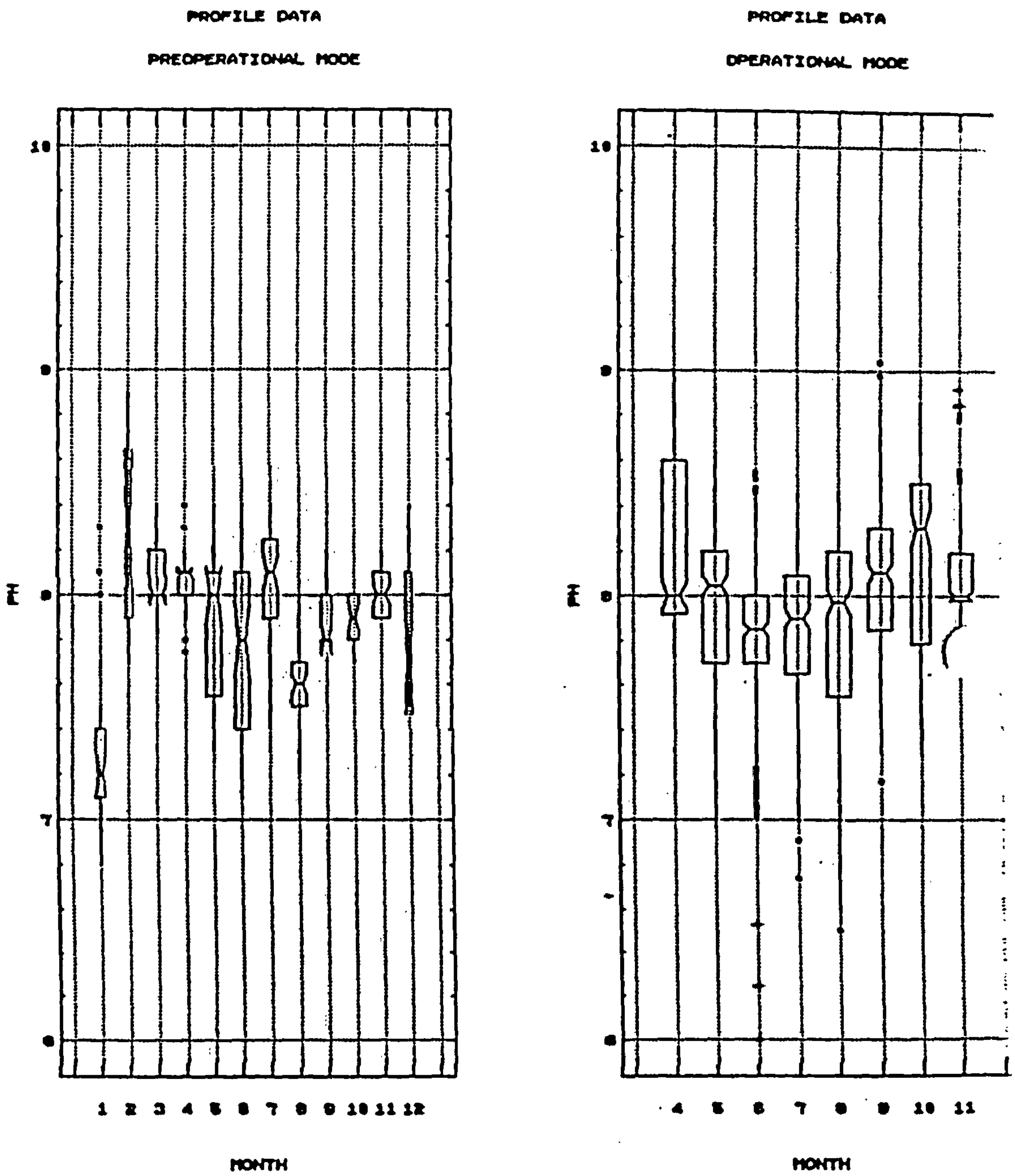
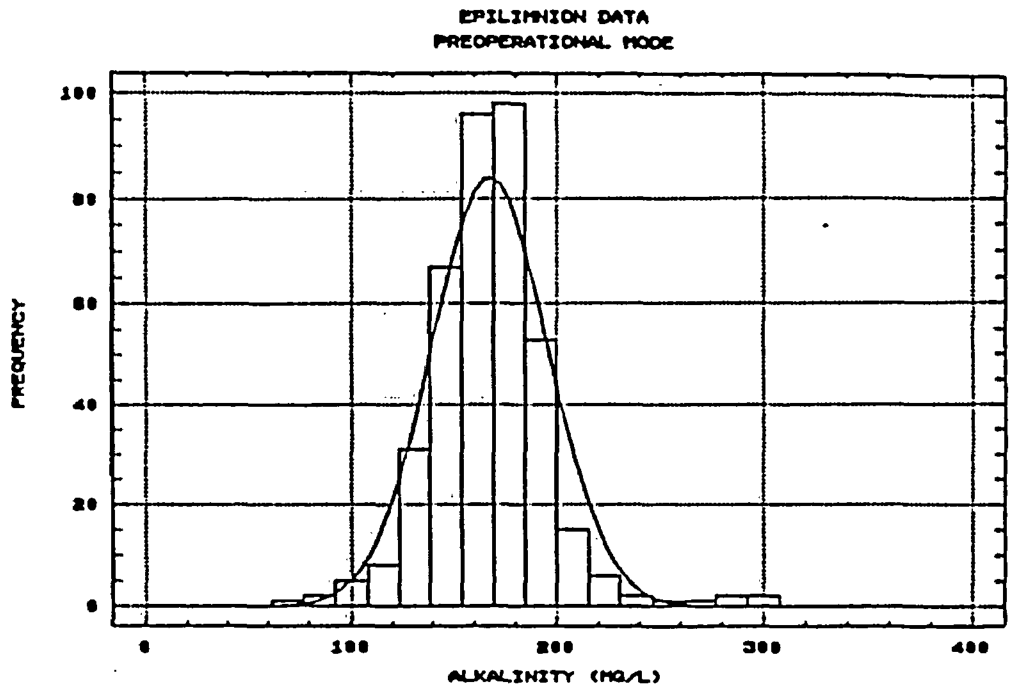


Figure 135. Monthly distributions of pH in Clinton Lake during perio prior to (Preoperational Mode) and during Clinton Pow Station operation (Operational Mode).



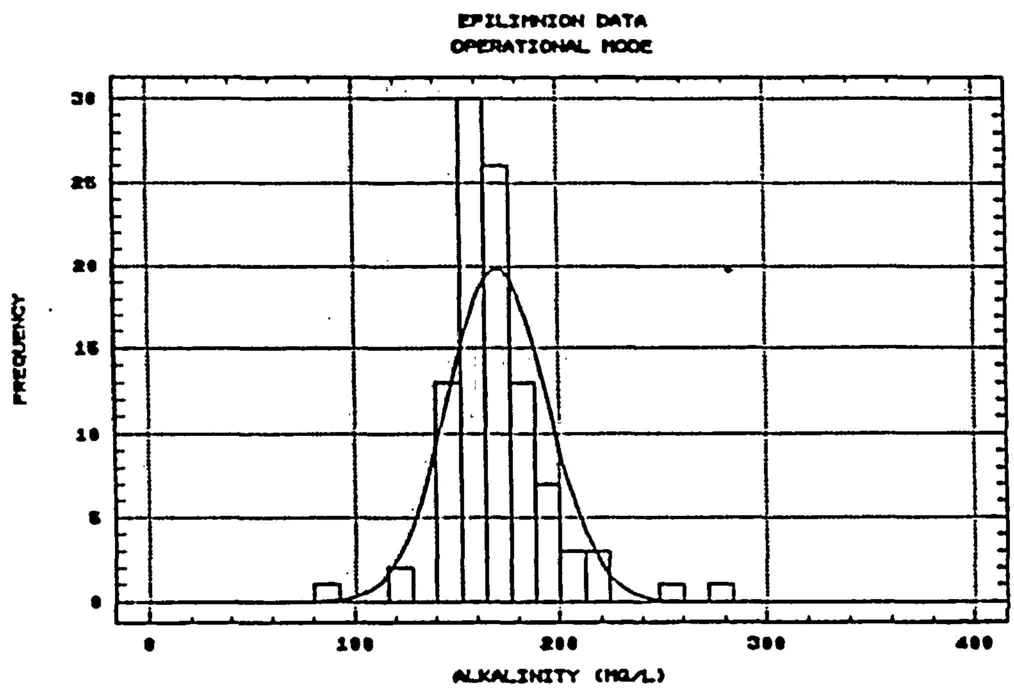


Figure 136. Frequency histograms of epilimnion alkalinity concentrations (mg/l) in Clinton Lake during periods prior to (top graph) and during Clinton Power Station operation (bottom graph).

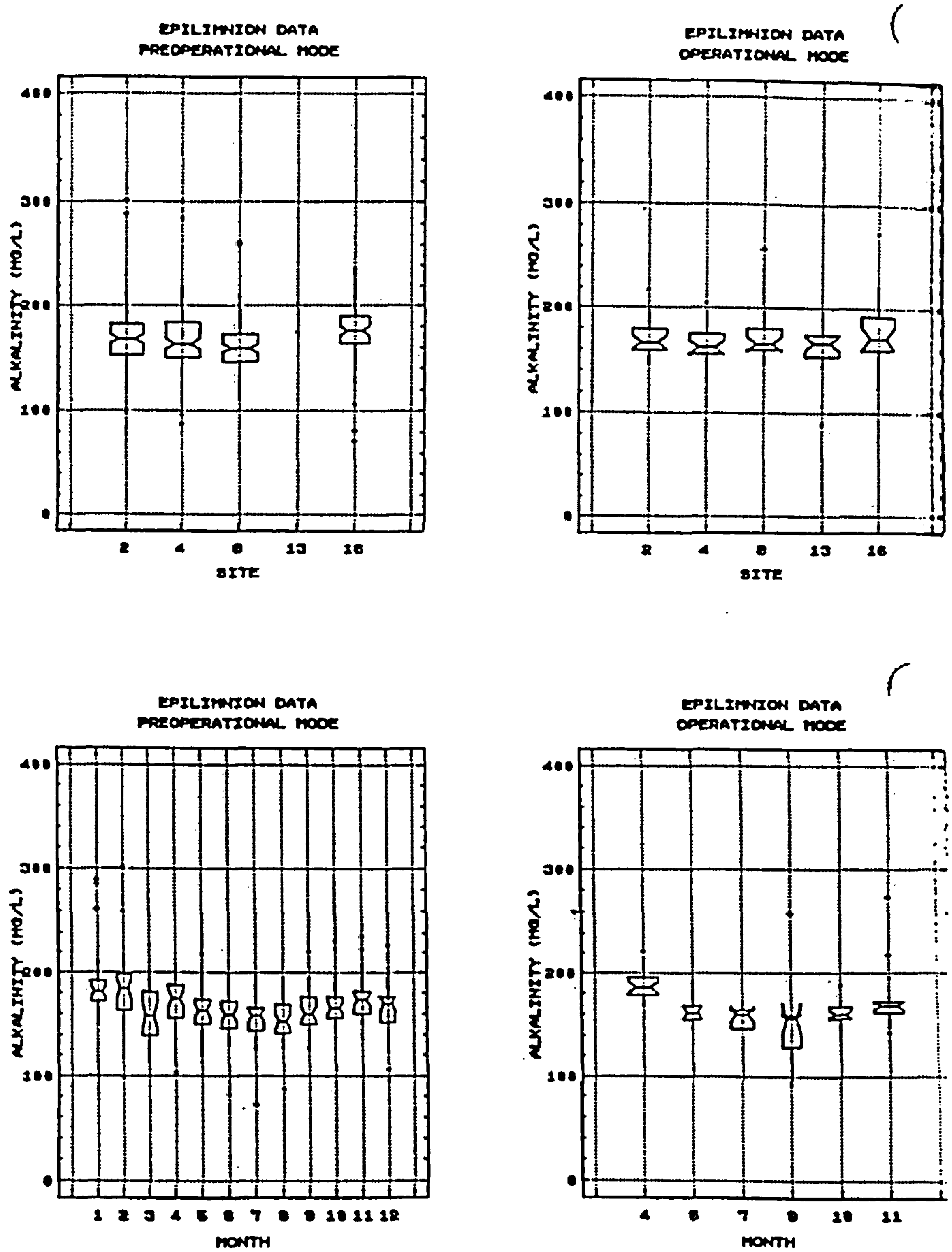
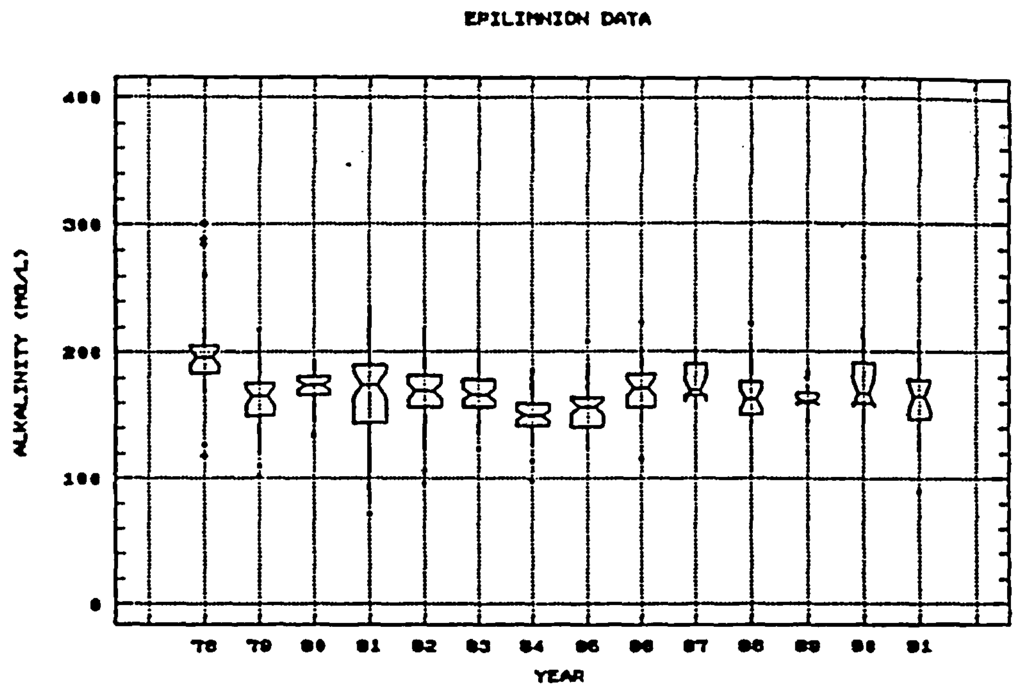


Figure 137. Distributions of alkalinity concentrations (mg/l) in Clinto: Lake for monitoring sites and months during periods prio to (Preoperational Mode) and during (Operational I : Clinton Power Station operation.



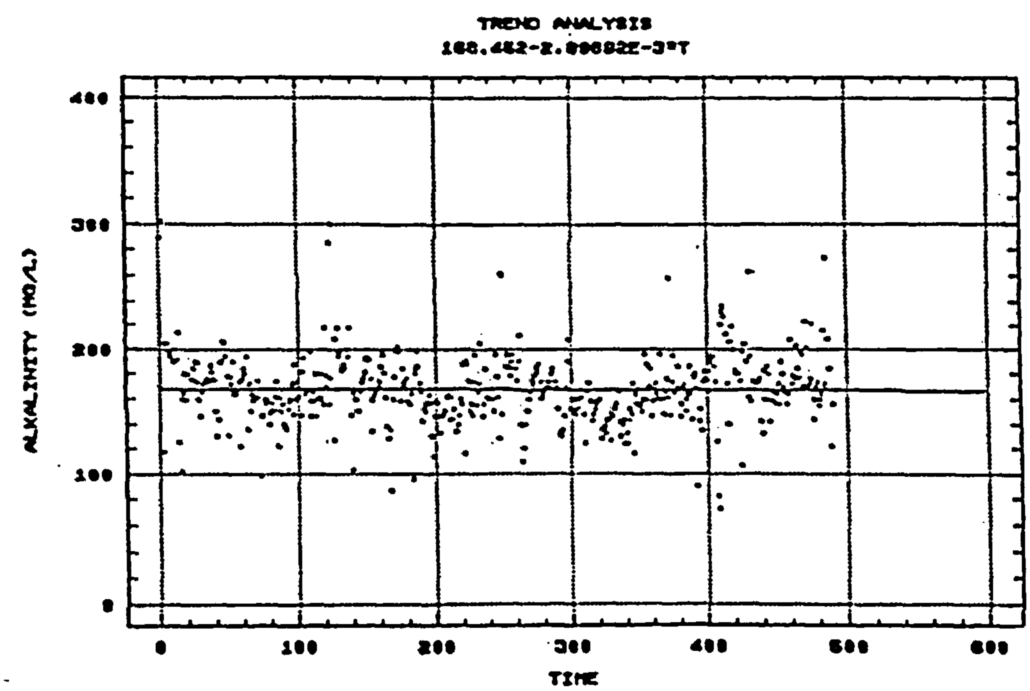


Figure 138. Yearly distributions (top graph) and trend analysis (bottom graph) of alkalinity concentrations (mg/l) in Clinton Lake during 1978 through 1991.

Alkalinity During Stratification

Average alkalinity concentrations for metalimnion and hypolimnion strata were 168 and 175 mg/l, respectively. Metalimnion alkalinity concentrations ranged from 108 to 279 mg/l; hypolimnion alkalinity concentrations ranged from 120 to 242 mg/l. Average bottom water alkalinities for 63 Illinois lakes ranged from 27.5 to 255 mg/l (Sefton et al. 1980). During the preoperational period alkalinity values tended to increase during succeeding months of stratification (Figure 139). Conversely, during the operational period alkalinity decreased. This is expected under anaerobic conditions, and when dissolved oxygen becomes progressively depleted during stratification (Sefton et al. 1980). Alkalinity values were greatest for each stratum during the first year after lake formation (1978) (Figure 140). Distribution of alkalinity data during periods when CPS was operational (1987 through 1991) were similar to preoperational alkalinity data (Figure 140). Distributions of alkalinity were similar among sites during preoperational and operational periods (Figure 141).

8.7.5 Calcium

In most fresh water, calcium is the principal cation. Calcium is widely distributed in the common minerals of rocks and soils. Samples were analyzed for calcium beginning in November 1986.

Epilimnion Calcium

Samples were analyzed for calcium during 1986 through 1991. The average calcium concentration from 105 epilimnion samples was 45.4 mg/l. There was a downlake decrease in the average concentration of calcium. Site 16 had the greatest mean concentration (52.2 mg/l); average concentrations for succeeding downlake sites were 45.7, 43.3, and 42.1 mg/l for sites 2, 13, and 8, respectively. There were no significant differences in the distribution of calcium data among sites (Figure 142). Calcium concentrations decreased from April through September during the operational period (Figure 142). There is no apparent pattern in the distribution of annual calcium data (Figure 143). Trend analyses for data from 1986 through 1991 indicate calcium contentrations have increased (Figure 143).

Calcium During Stratification

Samples were analyzed for calcium during periods of stratification during 1987 through 1991. The average concentration of calcium in the metalimnion was 43.7 mg/l; concentrations ranged from 28 to 73 mg/l. The average concentration in the hypolimnion was 48.9 mg/l; concentrations ranged from 35 to 77 mg/l. Calcium concentrations generally decreased through time during periods of stratification (Figure 144).

8.7.6 Total Organic Carbon

Total organic carbon (TOC) is composed of dissolved and particulate organic carbon. Sources of TOC include excretions of metabolites by

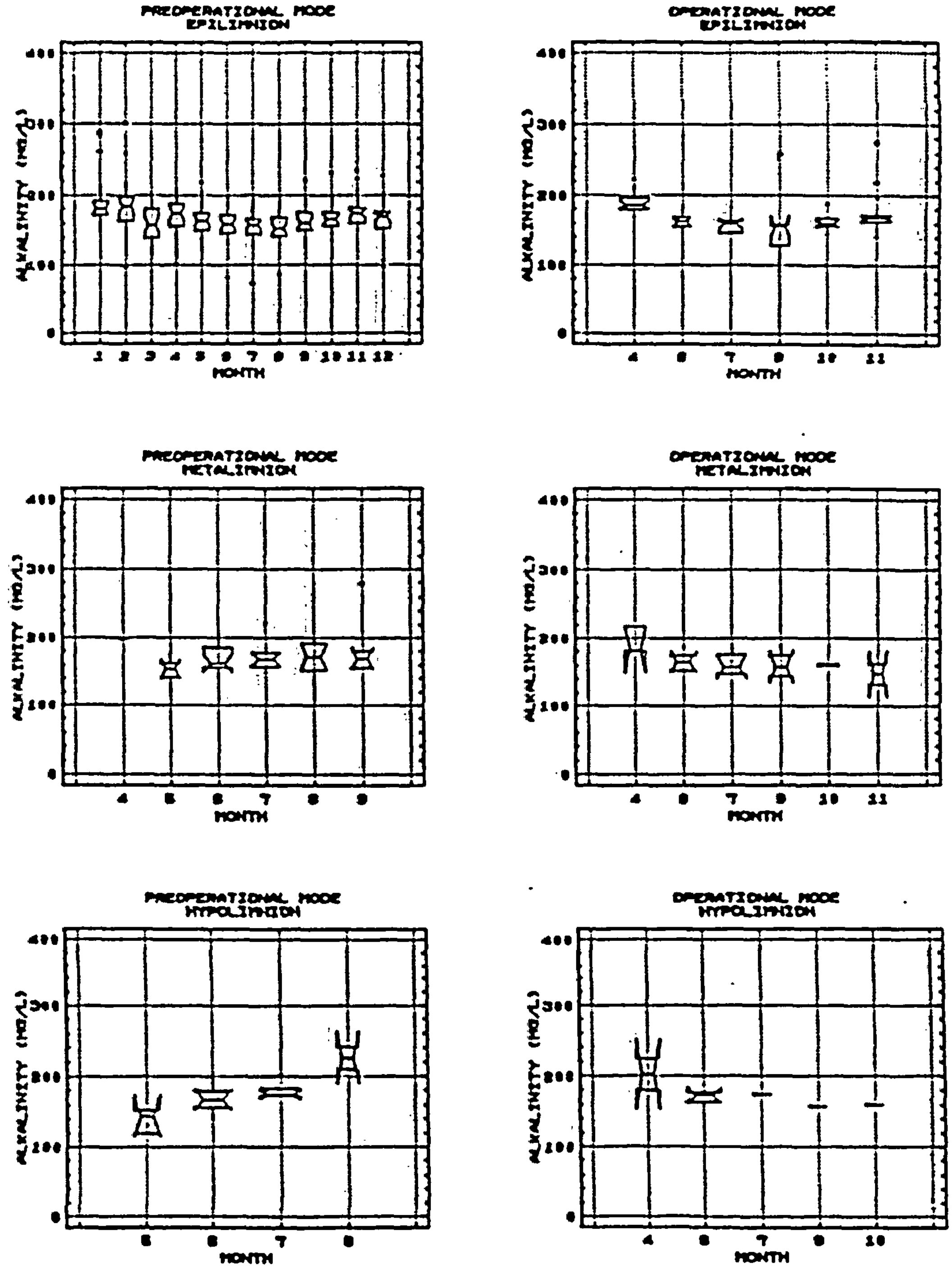


Figure 139. Distributions of alkalinity concentrations (mg/l) in Clinton Lake for epilimnion, metalimnion, and hypolimnion strata for the periods prior to (Preoperational Mode) and during Clinton Power Station operation (operational mode).

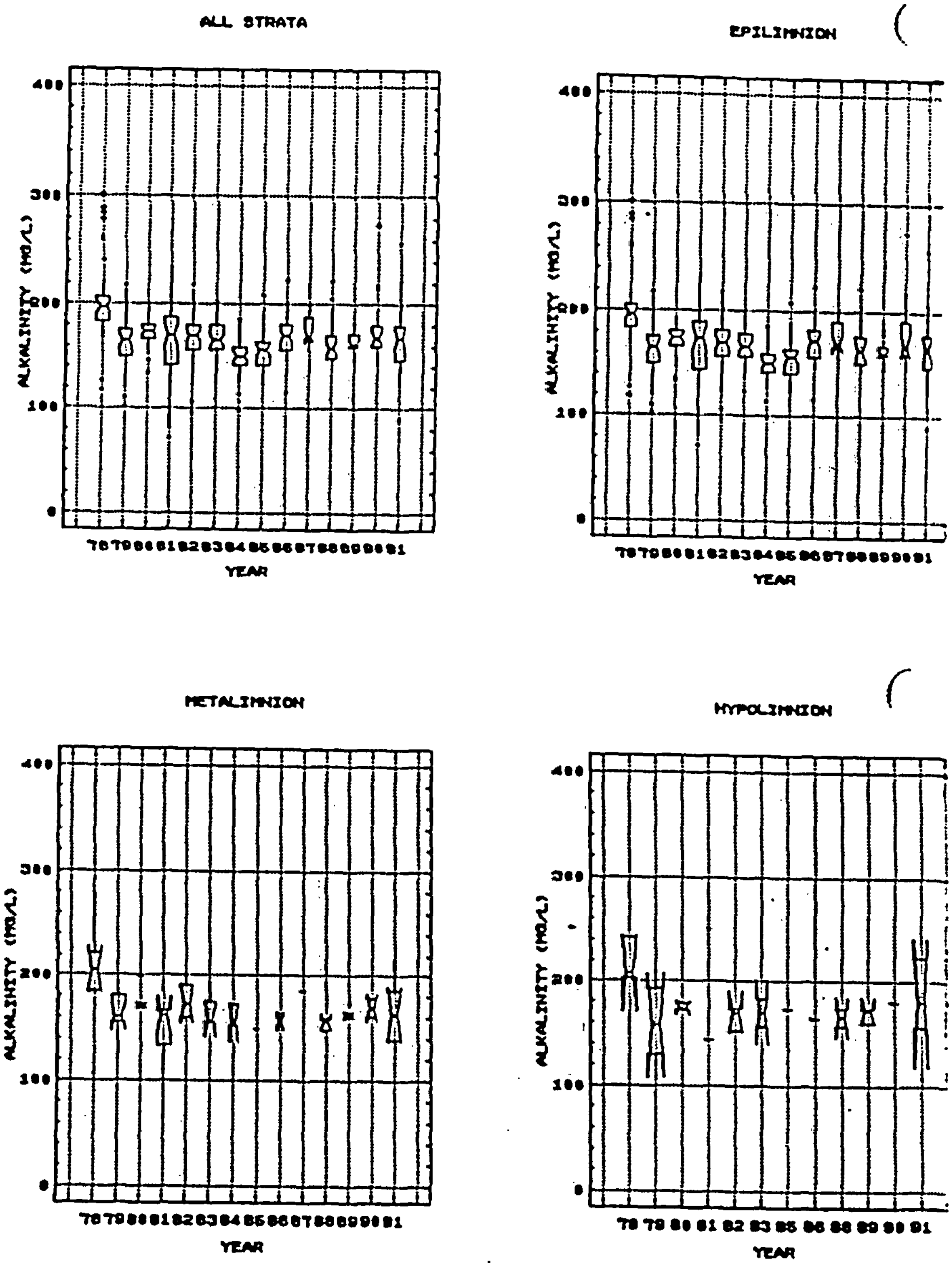


Figure 140. Yearly distributions of alkalinity concentrations (mg/l) Clinton Lake for epilimnion, metalimnion, and hypolimni strata during 1978 through 1991.

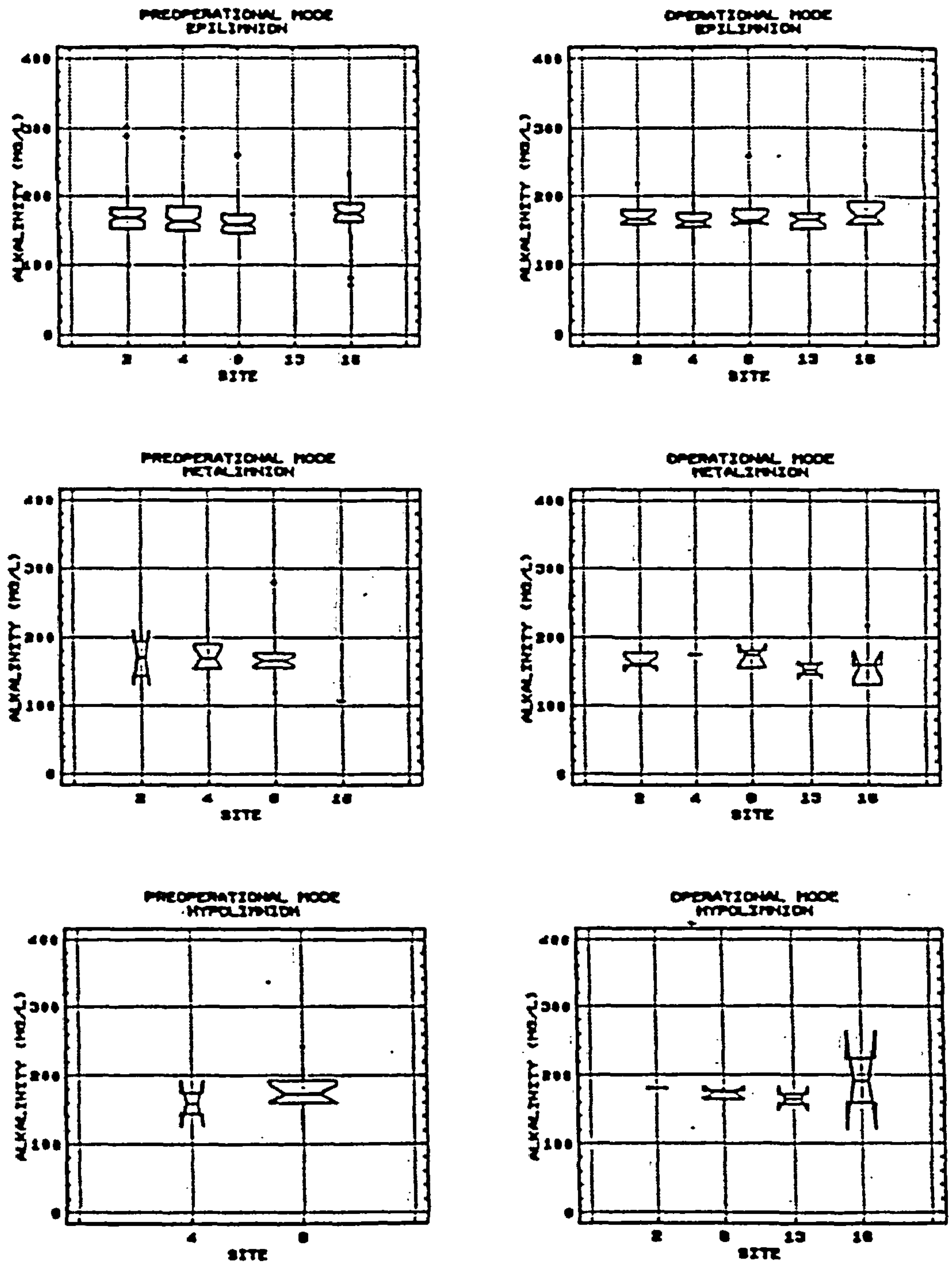


Figure 141. Distributions of alkalinity concentrations (mg/l) in Clinton Lake for epilimnion, metalimnion and hypolimnion strata at monitoring sites where stratification occurred during 1978 through 1991.

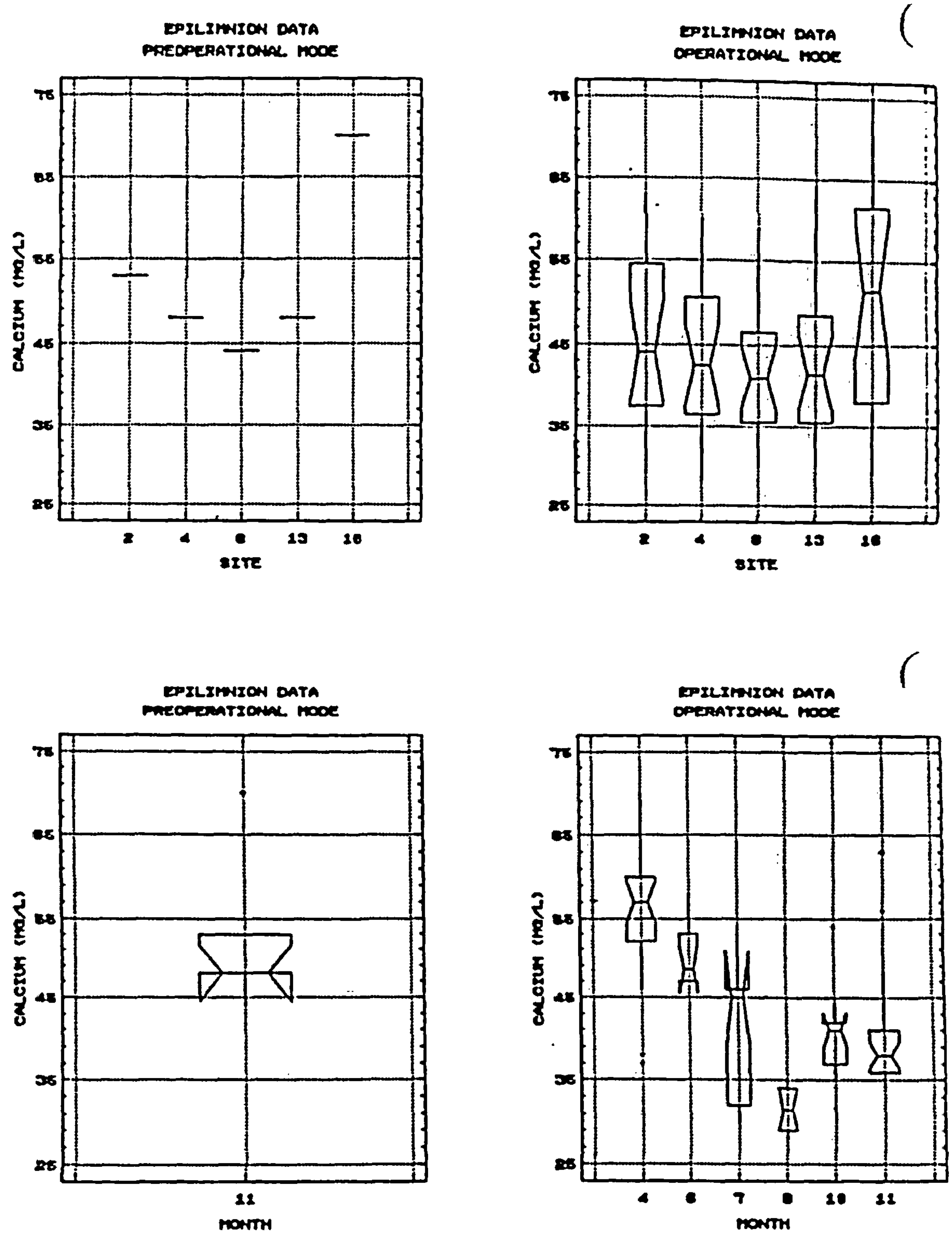
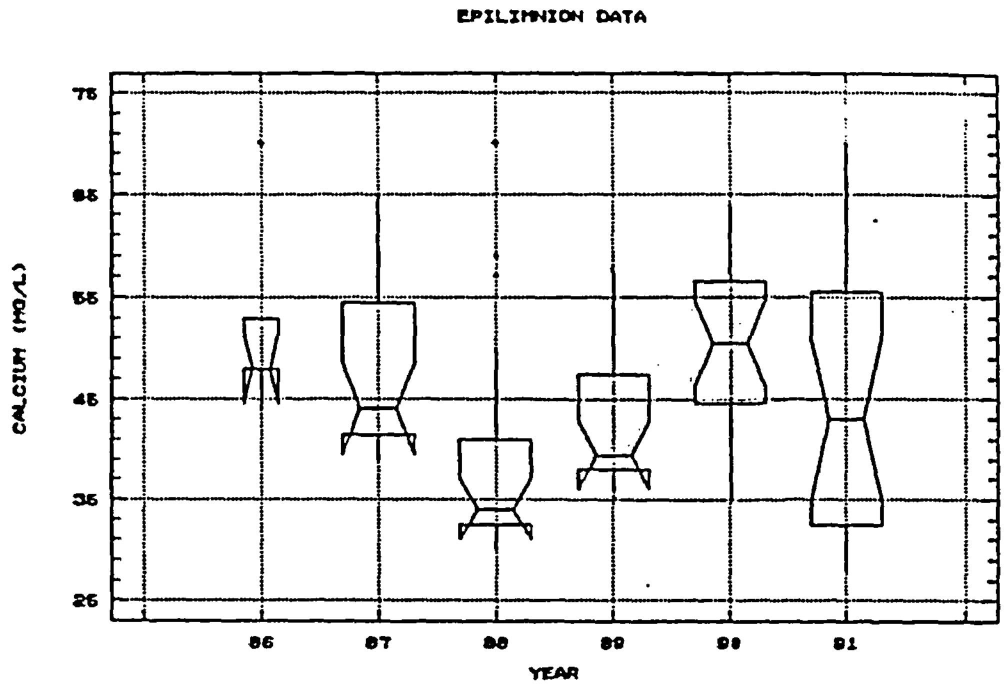


Figure 142. Distributions of calcium concentrations (mg/l) in Clinton Lake for monitoring sites and months during periods prior to (Preoperational Mode) and during (Operational Mode) Clinton Power Station operation.



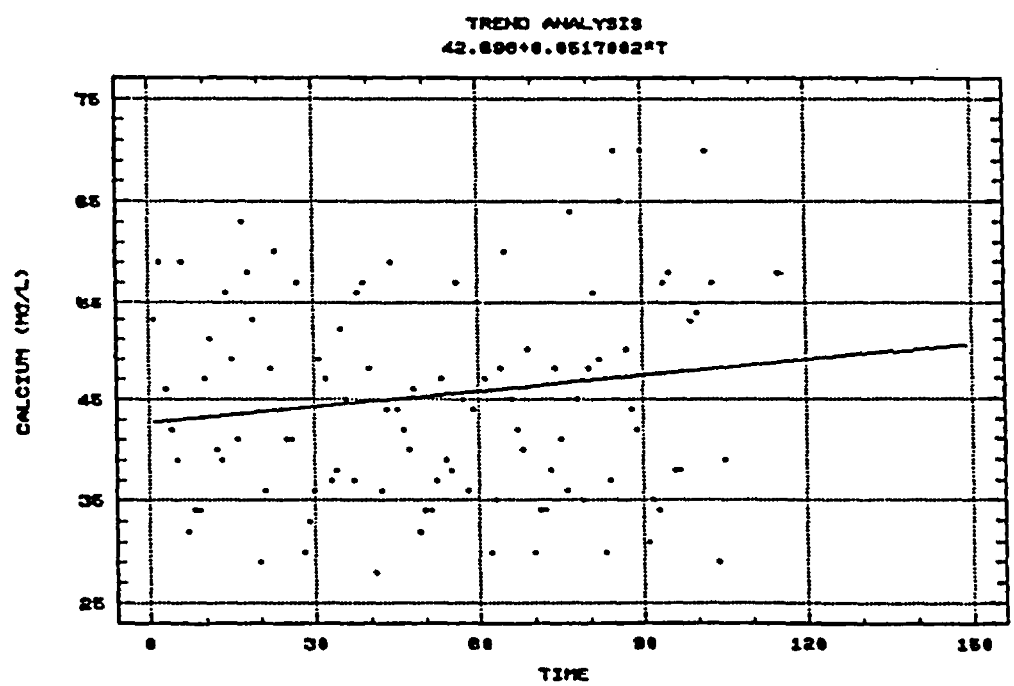


Figure 143. Yearly distributions (top graph) and trend analysis (bottom graph) of calcium concentrations (mg/l) in Clinton Lake during 1986 through 1991.

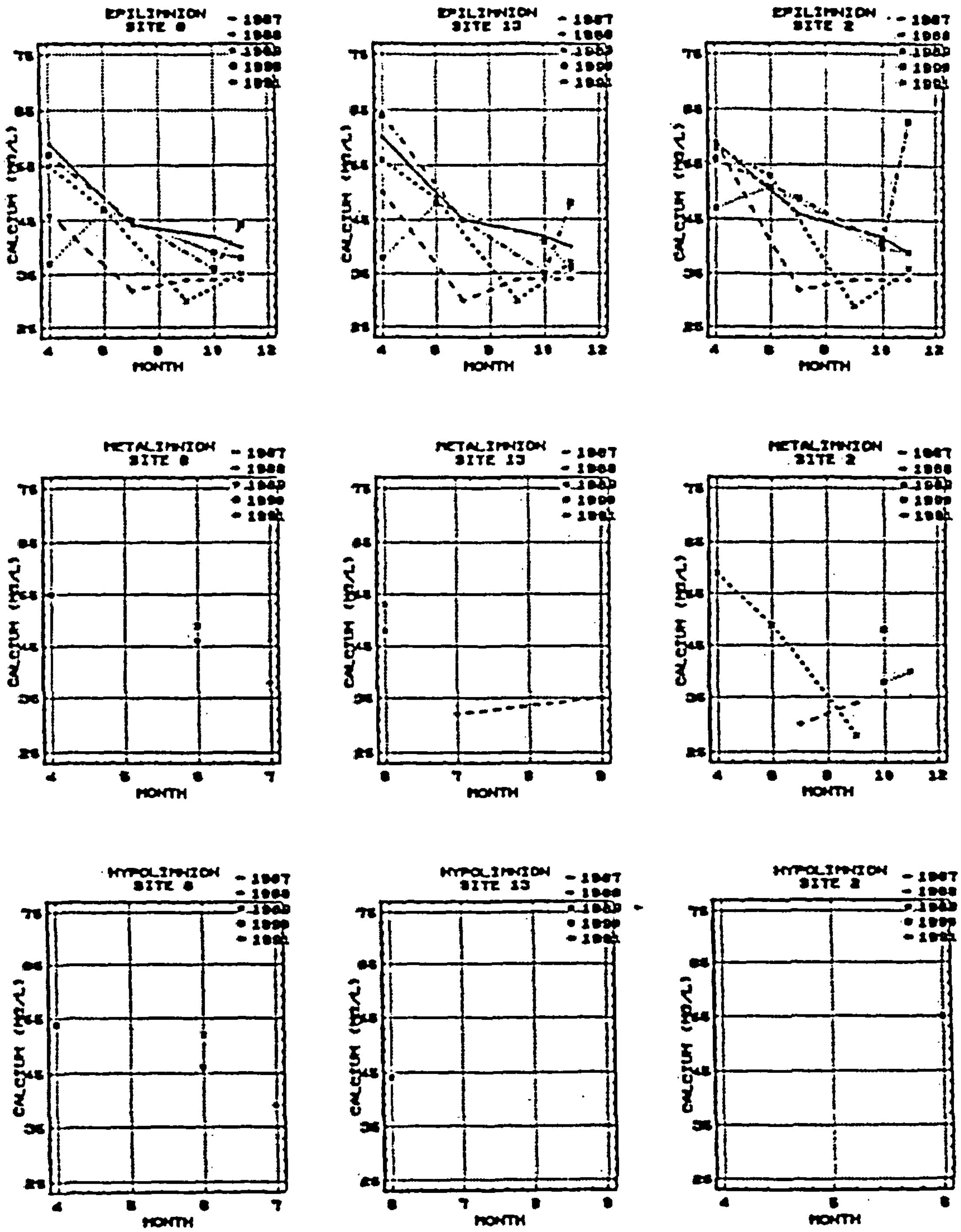


Figure 144. Plots of calcium concentrations (mg/l) by months for each Clinton Lake monitoring site during years when Clinton Power Station was operational (1987 through 1991).

aquatic organisms, and humic substances generated by plants, which is mostly leaf litter. The TOC concentration of a water body is directly related to the biochemical oxygen demand of the system. Excessive amounts of TOC cause depletions of dissolved oxygen.

Epilimnion Total Organic Carbon

The average epilimnion TOC concentration for 388 epilimnion samples collected from Clinton Lake during 1978 through 1986 was 4.13 mg/l. The average TOC in surface waters of 63 Illinois lakes was 7.6 mg/l (Sefton et al. 1980). Seventy percent of these lakes had TOC concentrations between 4 and 10 mg/l. Approximately 70% of the TOC concentrations in Clinton Lake ranged from 1 to 4 mg/l (Figure 145). Mean lake values for the 63 other Illinois lakes ranged from 2.5 to 18.8 mg/l (Sefton et al. 1980). The TOC concentrations in Clinton Lake ranged from 1.0 to 15.0 mg/l during 1978 through 1986. There were no significant differences in the distribution of TOC data among sites or months (Figure 146). Distribution of TOC data among years suggest concentrations have decreased, especially since 1980 (Figure 146). Analyses for TOC were not performed during periods when CPS was operational.

Total Organic Carbon During Stratification

The average TOC concentration of 106 samples collected during periods of stratification was 3.8 mg/l. The average TOC concentration in bottom waters of 63 Illinois lakes was 6.7 mg/l (Sefton et al. 1980). Seventy-one percent had values from 4 to 10 mg/l and lake means ranged from 2 to 12.7 mg/l (Sefton et al. 1980). Minimum and maximum values in Clinton Lake were 2.4 and 10.0 mg/l. The maximum concentration occurred at Site 8 during September, 1981. Distribution of TOC among epilimnion, metalimnion, and hypolimnion strata were similar and there were no significant differences among strata. Distributions of TOC data among sites were also similar and there were no significant differences (Figure 147). Concentrations of TOC tended to decrease from April through June; concentrations were similar from June through August; and then increased during September (Figure 148). Distribution of data among years indicate a trend for TOC concentrations to decrease slightly (Figure 149).

8.7.7 Sulfate

The sulfate ion usually ranks second to carbonate as the principle anion in fresh waters. Sulfate concentrations in natural waters range from a few to several thousand mg/l. It is important in public water supplies because of its cathartic effect on humans. The USPHS (1962) and USEPA (1976) recommend less than 250 mg/l sulfate in drinking water. The IPCB General Use water quality standard for sulfate is 500 mg/l. Sulfate is also important in industrial water supplies because it causes sulfate-noncarbonate hardness scaling in boilers and heat exchangers. Sulfate concentrations greater than 100 mg/l may cause concerns for industrial users. Sulfates occur naturally in waters as a result of leaching from minerals, and as the final oxidized state of

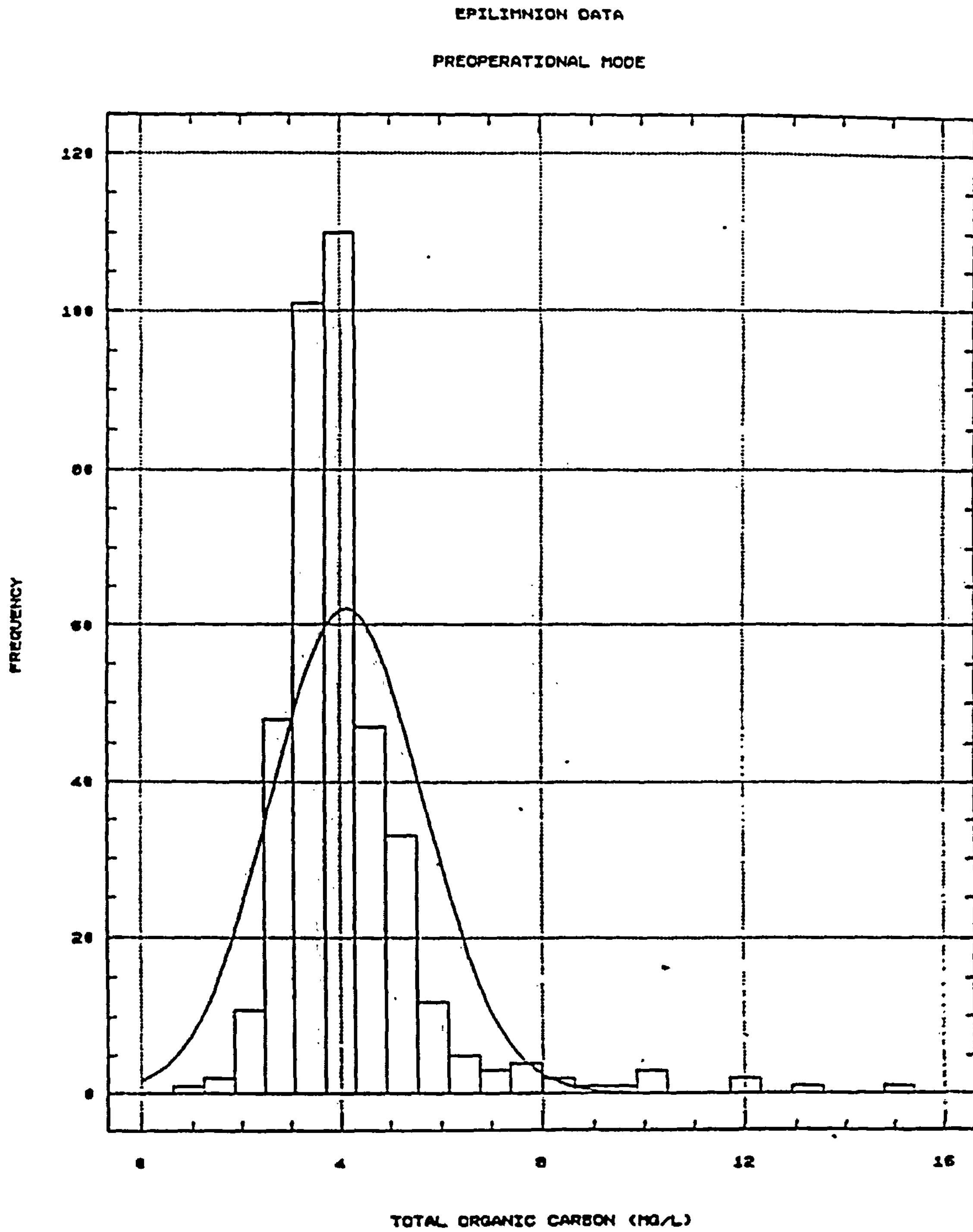


Figure 145. Frequency histogram of epilimnion total organic carbon concentrations (mg/l) in Clinton Lake during 1978 through 1986.

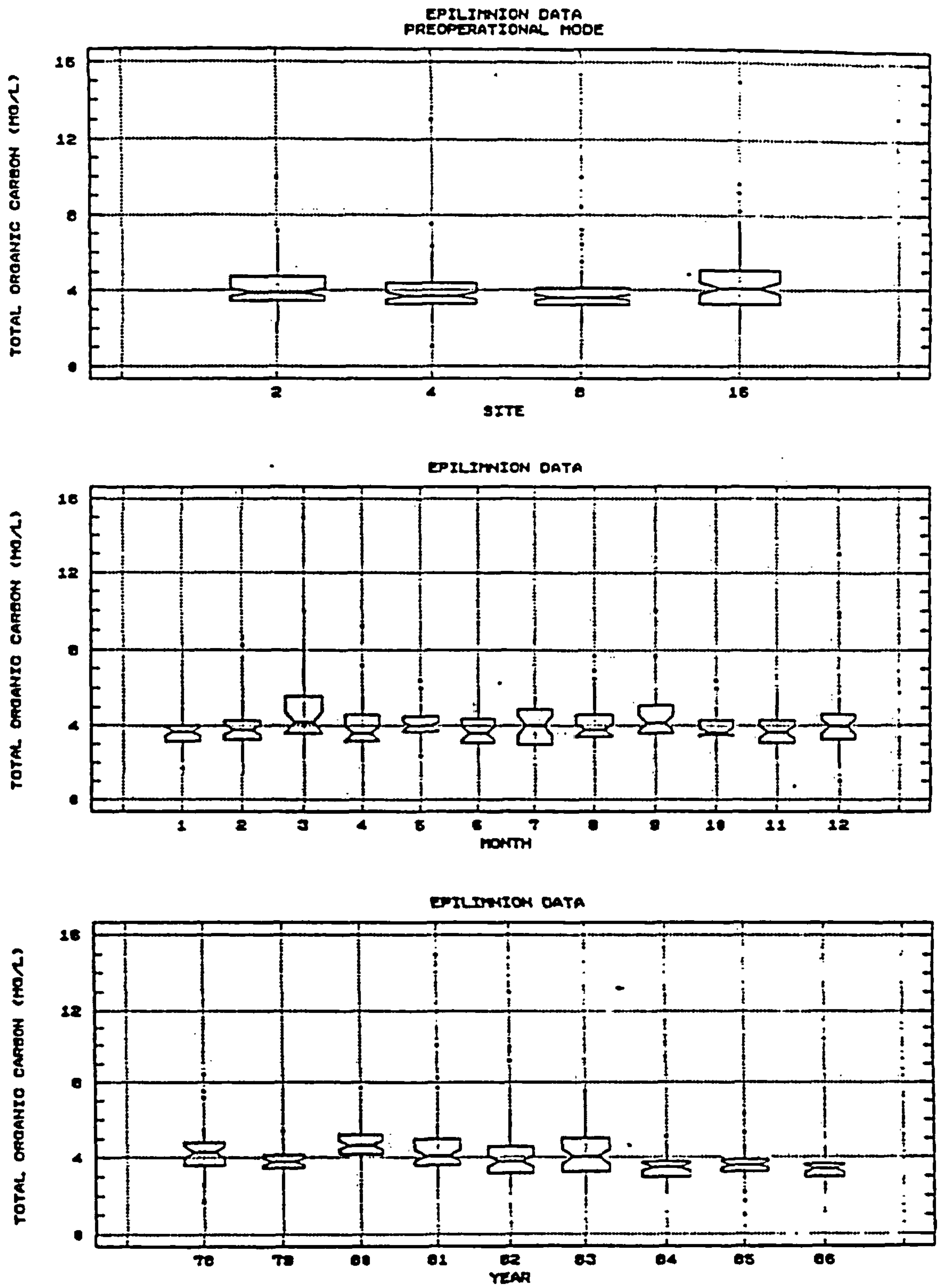


Figure 146. Distributions of epilimnion total organic carbon concentration (mg/l) in Clinton Lake for monitoring sites, months, and years.

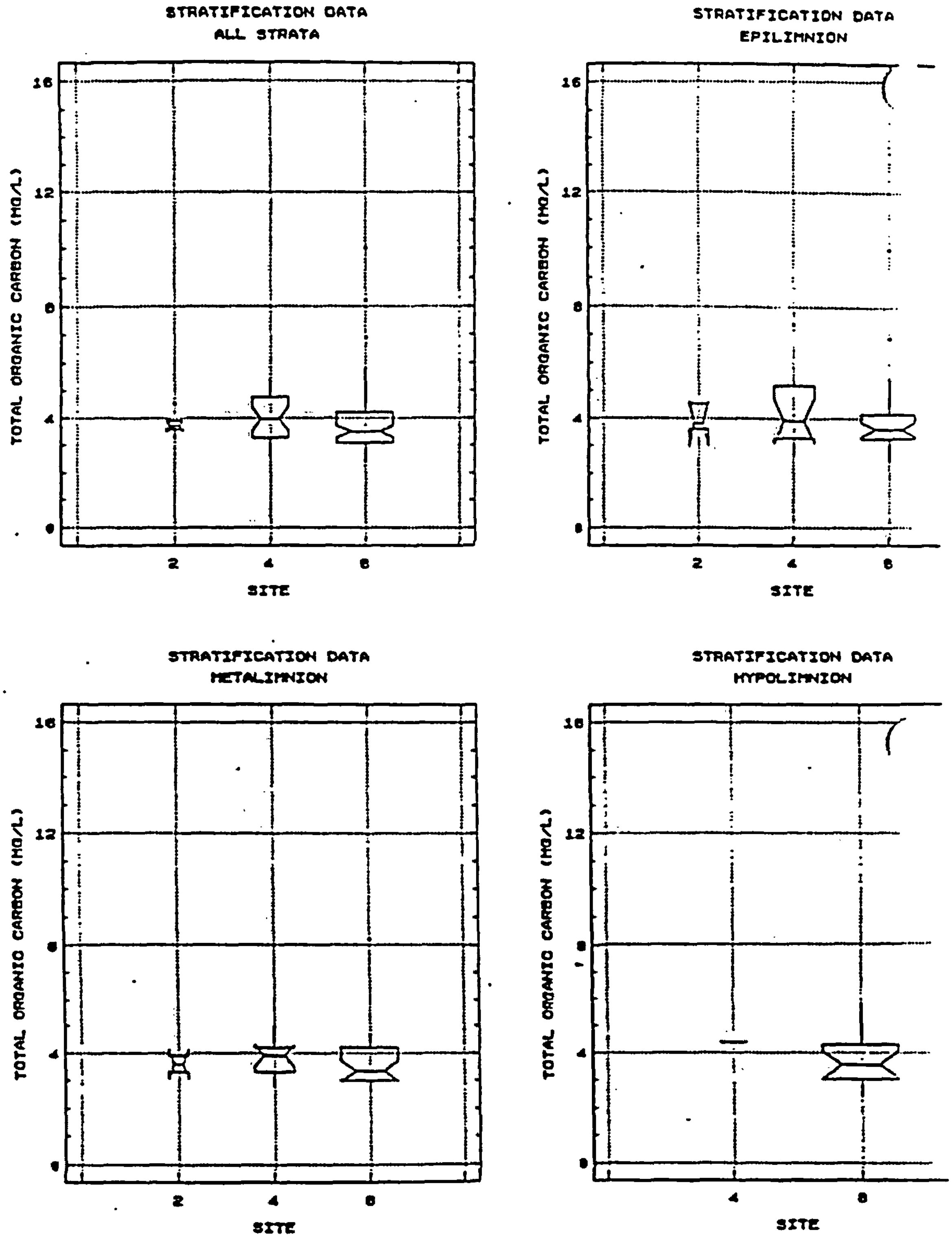


Figure 147. Distribution of total organic carbon concentrations (mg/l) for epilimnion, metalimnion, and hypolimnion strata for monitoring sites in Clinton Lake during 1978 through 19[illegible]

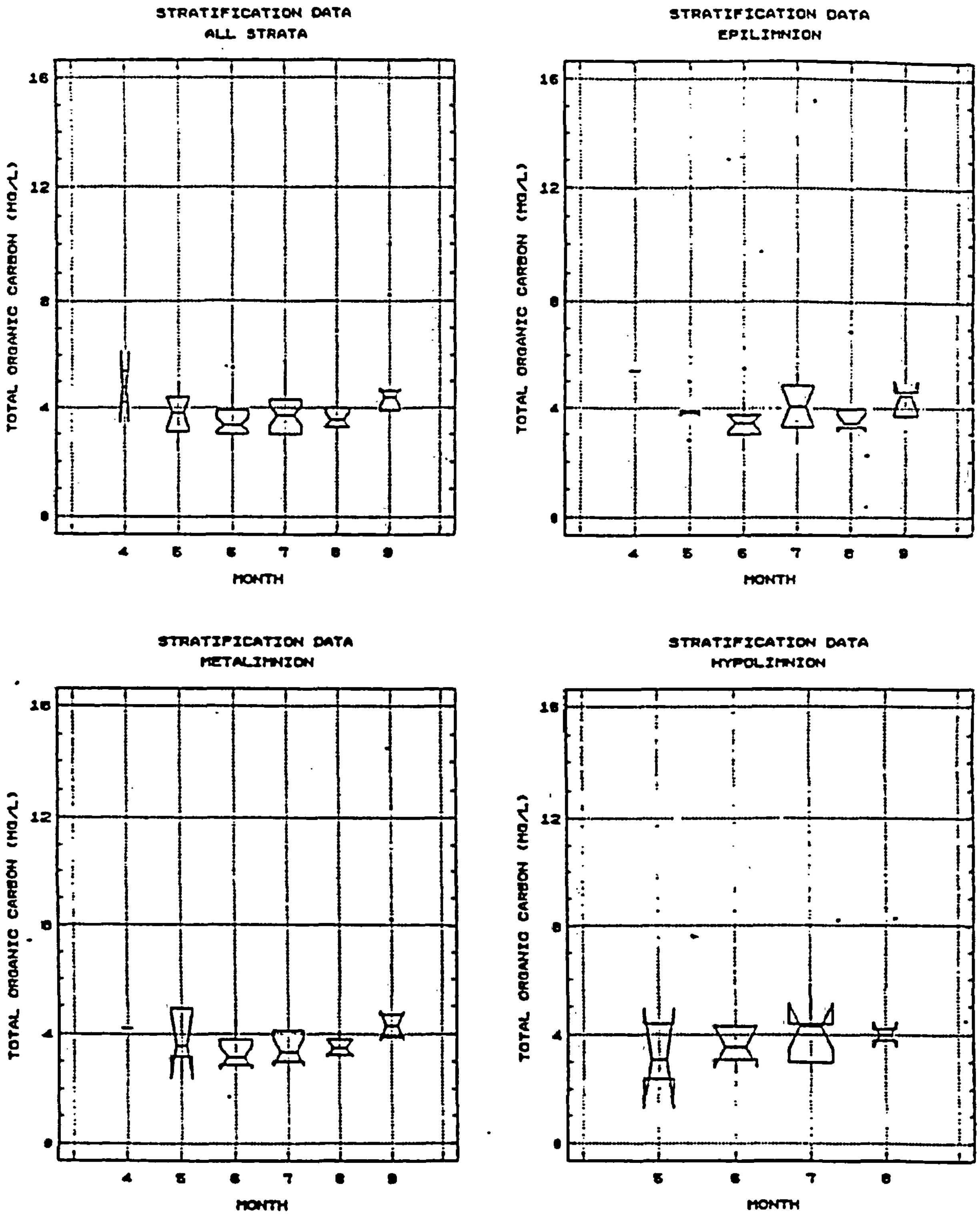


Figure 148. Distribution of total organic carbon concentrations (mg/l) for epilimnion, metalimnion, and hypolimnion strata for April through September in Clinton Lake during 1978 through 1986.

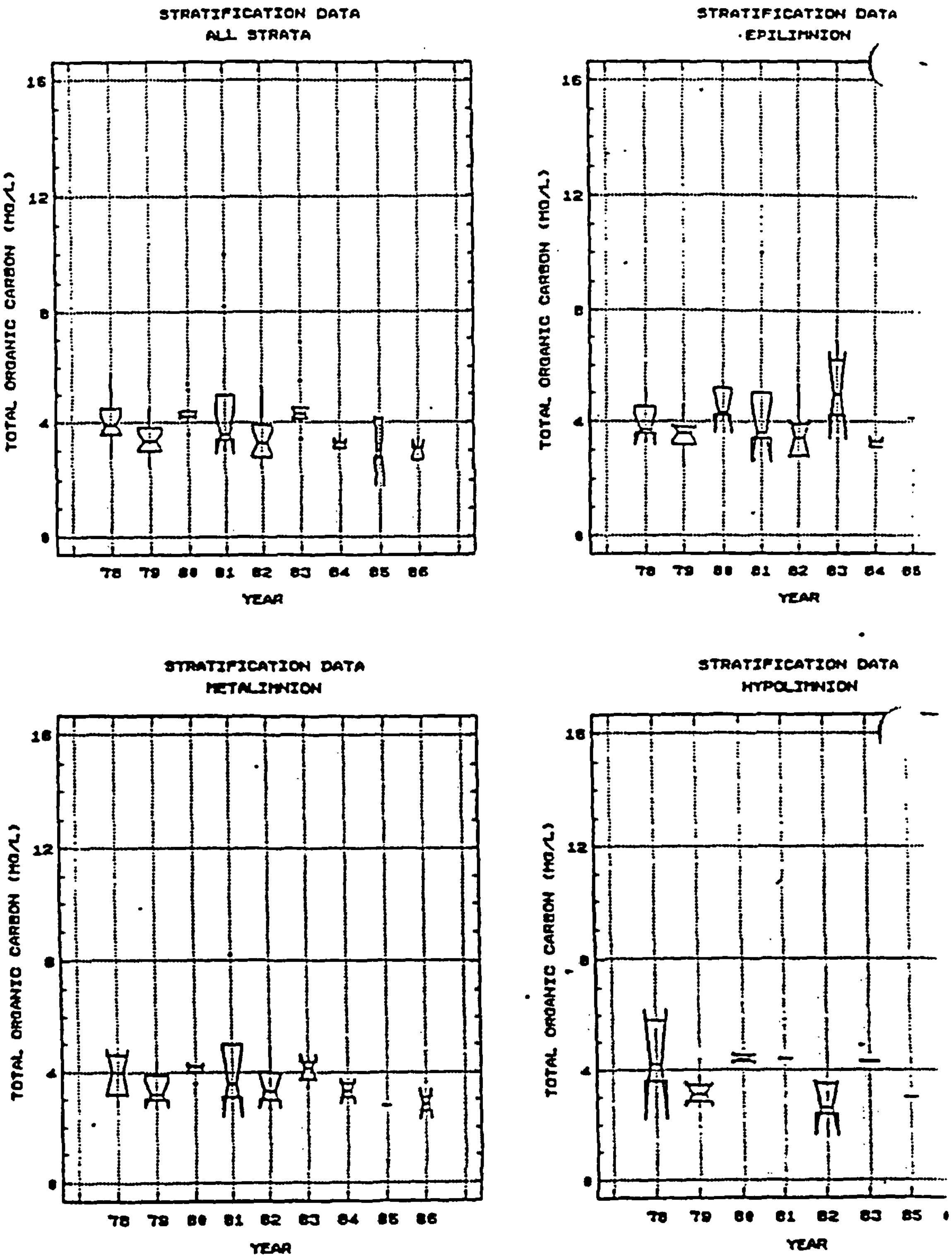


Figure 149. Distribution of total organic carbon concentrations (mg/ for epilimnion, metalimnion, and hypolimnion strata : Clinton Lake during 1978 through 1986.

sulfides, sulfites, and thiosulfates. They are also discharged in industrial wastes, and contained in some fertilizers.

Epilimnion Sulfate

Sulfate averaged 38.5 mg/l for the 377 samples collected from Clinton Lake during 1981 through 1991. During this time sulfate concentrations ranged from 13 to 60 mg/l. The average sulfate concentration in the surface waters of 63 Illinois lakes was 53.8 mg/l; and concentrations ranged from 6.2 to 891.2 mg/l (Sefton et al. 1980). None of the samples analyzed for sulfate from Clinton Lake had concentrations which exceeded either the USPHS drinking water standard (250 mg/l) or the IPCB General Use water quality standard (500 mg/l).

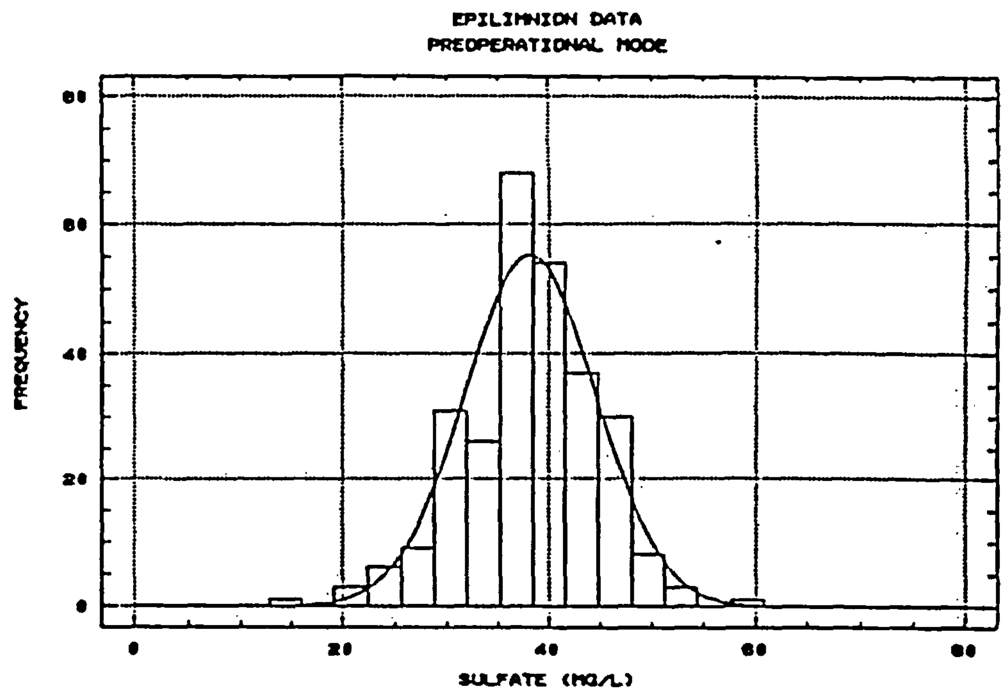
Distributions of sulfate concentrations were slightly greater during the operational period (Figure 150). Distributions of monthly averages do not indicate any apparent seasonal effects in the distribution of sulfate concentrations (Figure 151). There was a downlake trend for sulfate concentrations to decrease from headwater midlake sites during the preoperational period; however, this trend was not apparent during the operational period (Figure 151). Trend analysis (Figure 152) indicate sulfate concentrations are increasing in Clinton Lake; however comparisons of sulfate concentrations among years do not support a consistent increasing trend.

Sulfate During Stratification

Most of the 63 Illinois lakes (80%) had mean concentrations of sulfate in bottom waters which were less than 50 mg/l (Sefton et al. 1980). Sulfate concentrations were generally vertically and horizontally homogeneous, except where diluted by runoff from precipitation (Sefton et al. 1980). Average sulfate concentration in Clinton Lake metalimnion samples was 35.9 mg/l; concentrations ranged from 20 to 55 mg/l. Average concentration in the hypolimnion samples was 37.8 mg/l and concentrations ranged from 30 to 48 mg/l. Distributions of sulfate concentrations were similar among stratification levels (Figure 153). Sulfate concentrations for metalimnion and hypolimnion strata are similar among preoperational and operational years (Figure 153). Monthly distributions of sulfate concentrations yielded no apparent seasonal trend in metalimnion and hypolimnion strata (Figure 154). Sulfate concentrations were similar for each site during the preoperational and operational periods (Figure 155).

8.7.8 Chloride

This anion is usually not dominant in open lake systems. Chlorides are present in nearly all natural waters to some extent. Chlorides frequently occur due to leaching from mineral deposits, agricultural sources, treated sanitary wastewater, road salt, and industrial wastewater discharges. Chloride content normally increases as the mineral content of a water increases. When chloride concentrations exceed 100 mg/l, waters exhibit a salty taste. Chloride influences osmotic salinity balance and ion exchange, but metabolic utilization does not cause appreciable variations in spatial and seasonal distributions



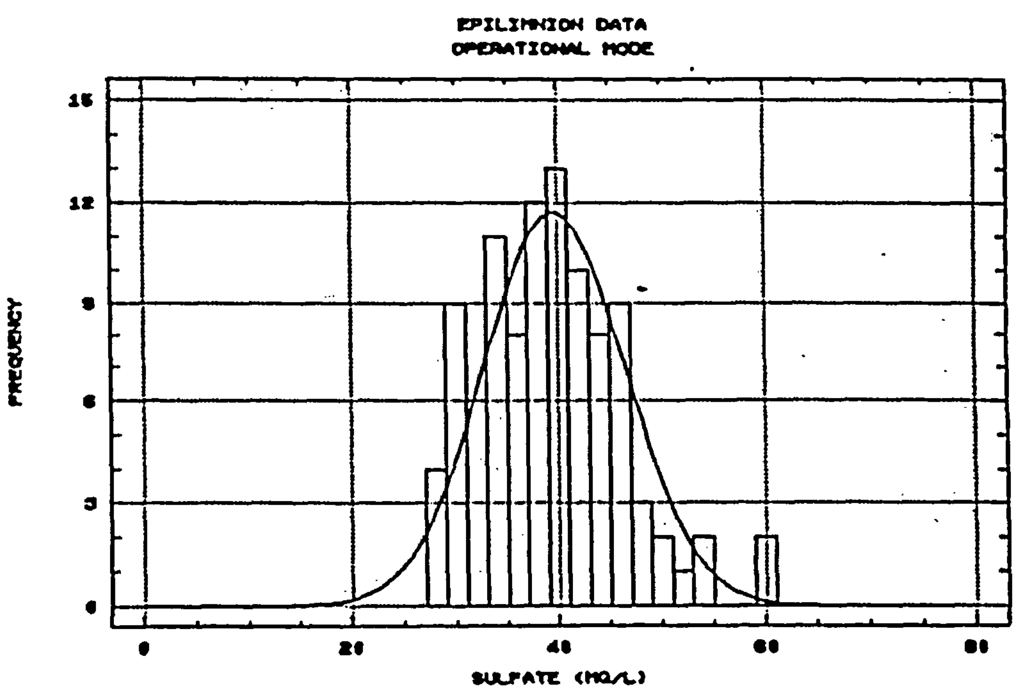


Figure 150. Frequency histograms of epilimnion sulfate concentration (mg/l) in Clinton Lake during periods prior to (top graph and during Clinton Power Station operation (b graph).

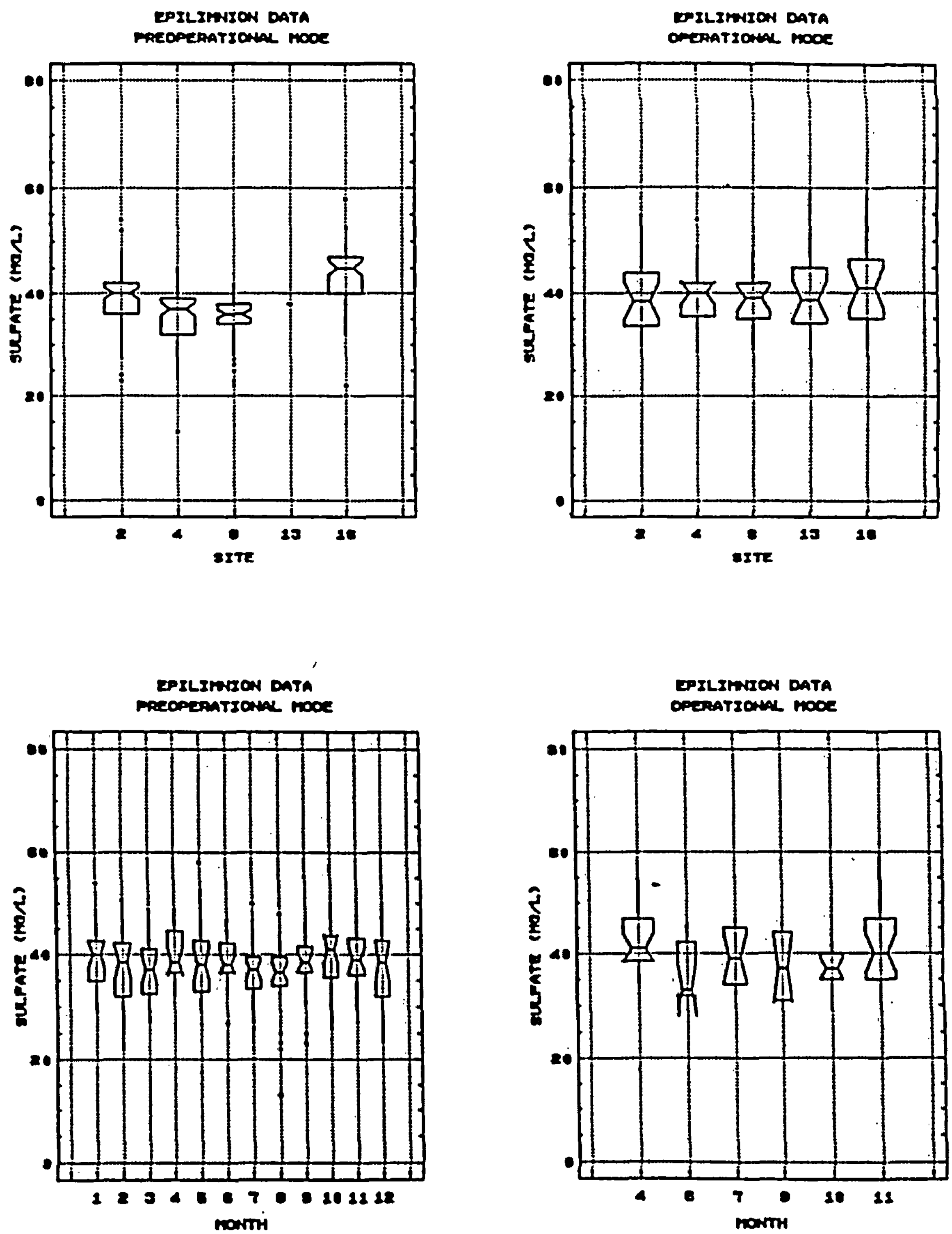
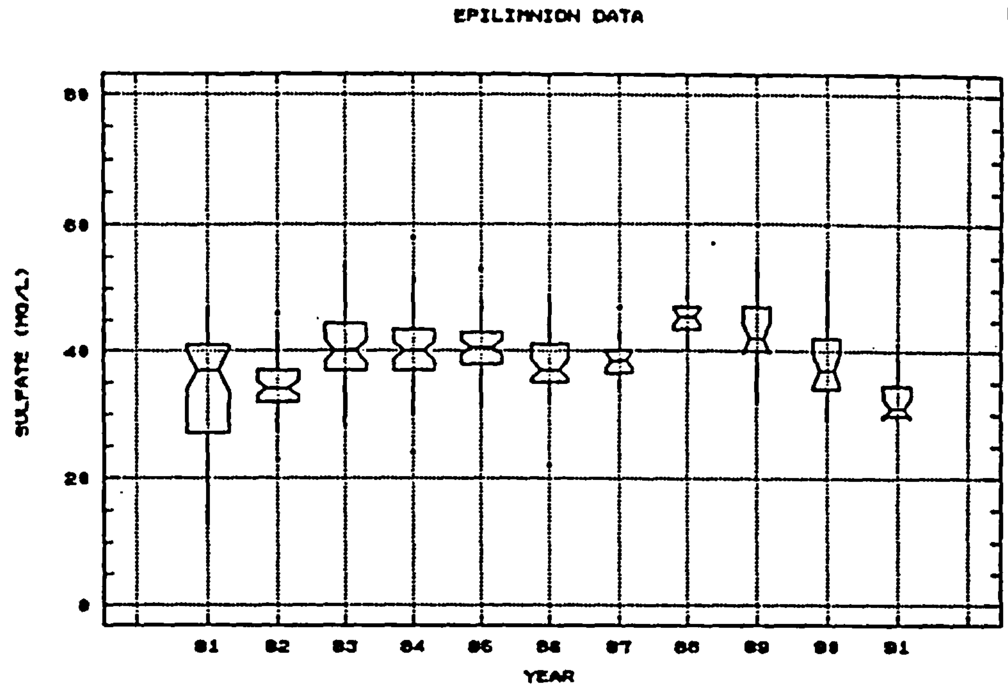


Figure 151. Distributions of sulfate concentrations (mg/l) in Clinton Lake for monitoring sites and months during periods prior to (Preoperational Mode) and during (Operational Mode) Clinton Power Station operation.



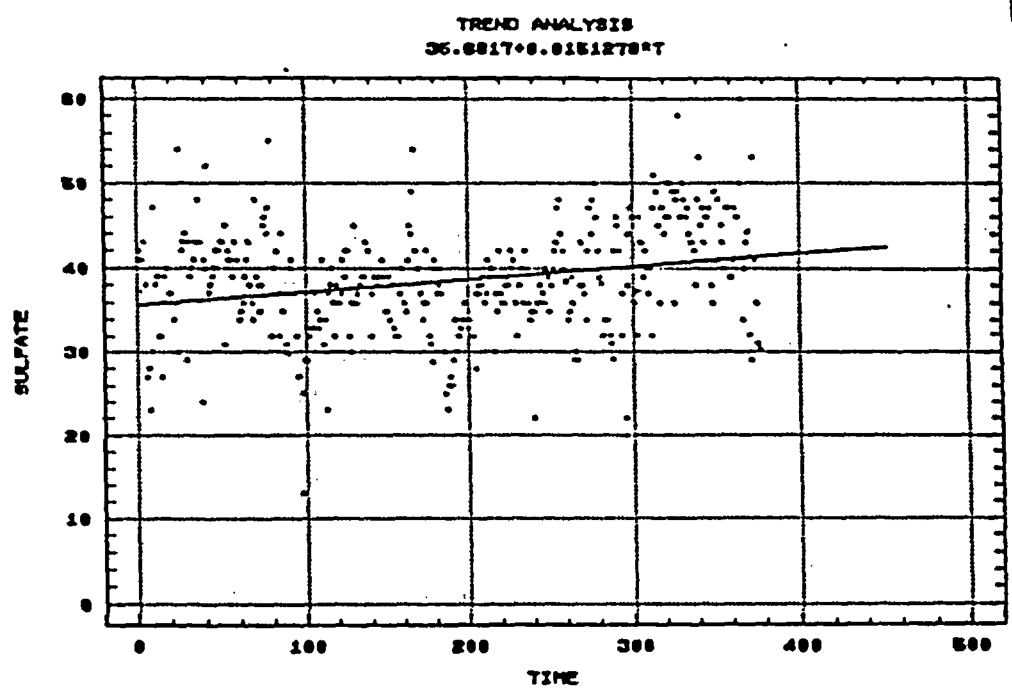


Figure 152. Yearly distributions (top graph) and trend analysis (bottom graph) of sulfate concentrations (mg/l) in Clinton Lake during 1981 through 1991.

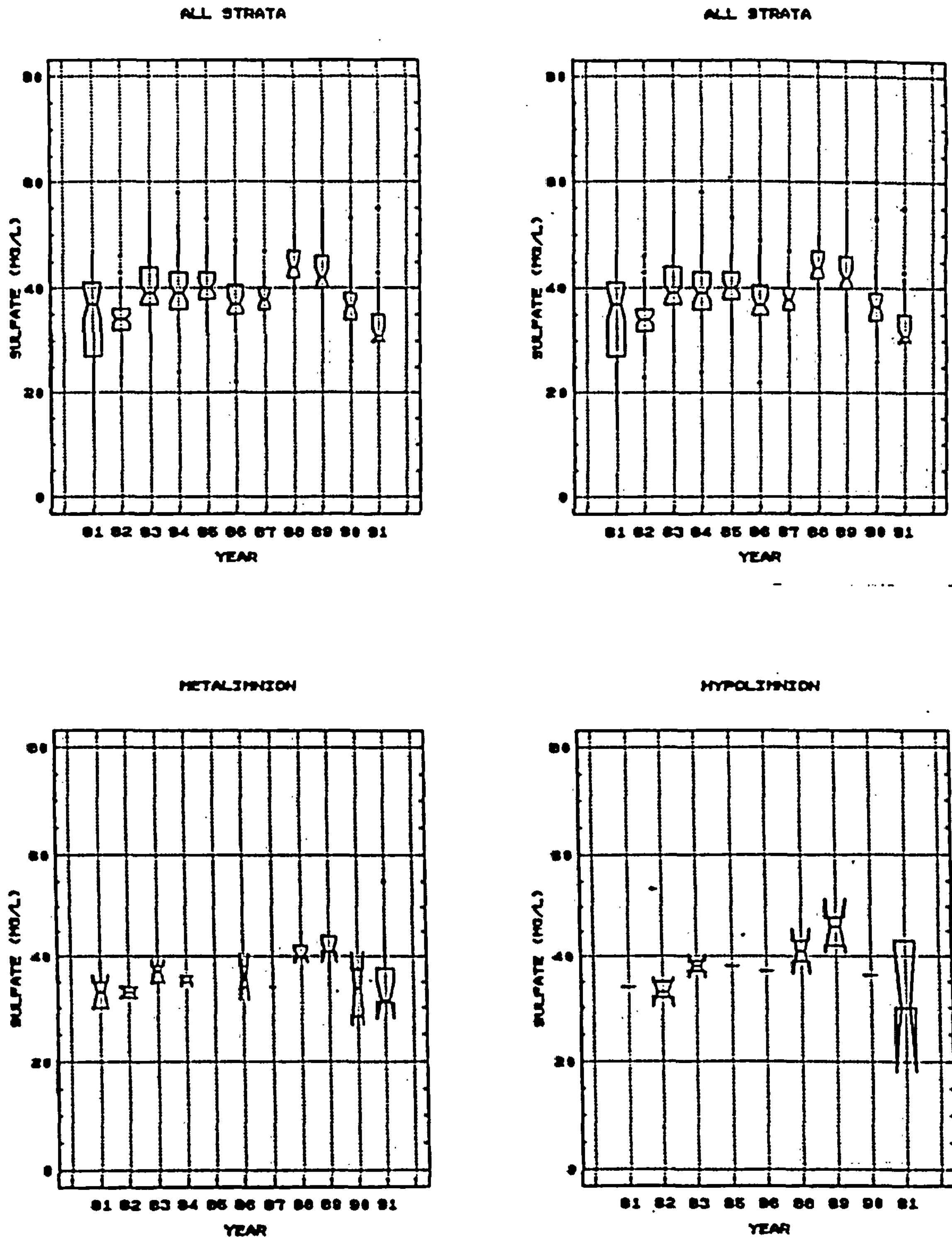


Figure 153. Yearly distributions of sulfate concentrations (mg/l) in Clinton Lake for epilimnion, metalimnion, and hypolimnion strata during 1981 through 1991.

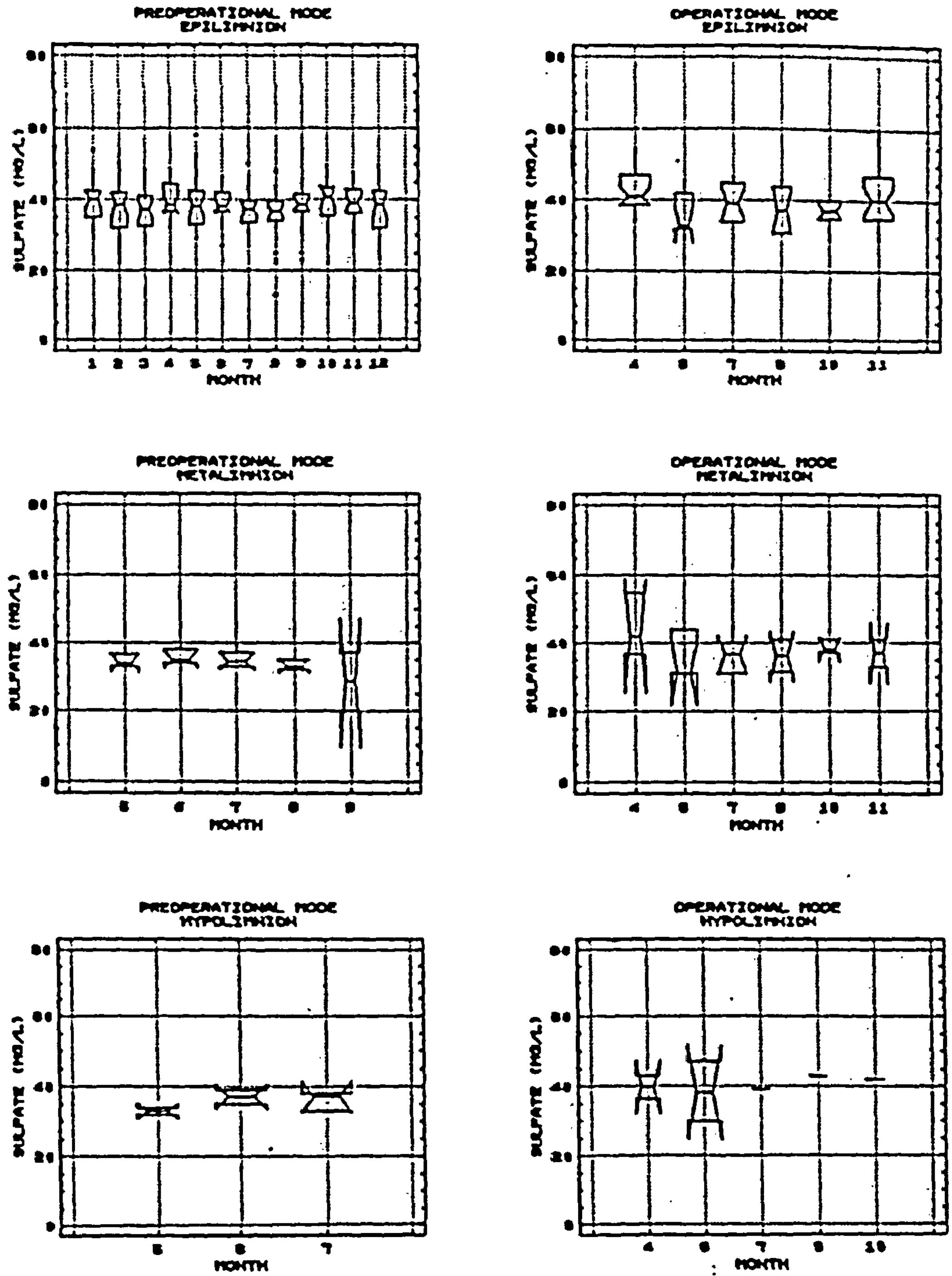


Figure 154. Monthly distributions of sulfate concentrations (mg/l) i Clinton Lake for epilimnion, metalimnion, and hypolimnio strata for the periods prior to (Preoperational Mode) an during Clinton Power Station operation (Operational Mo

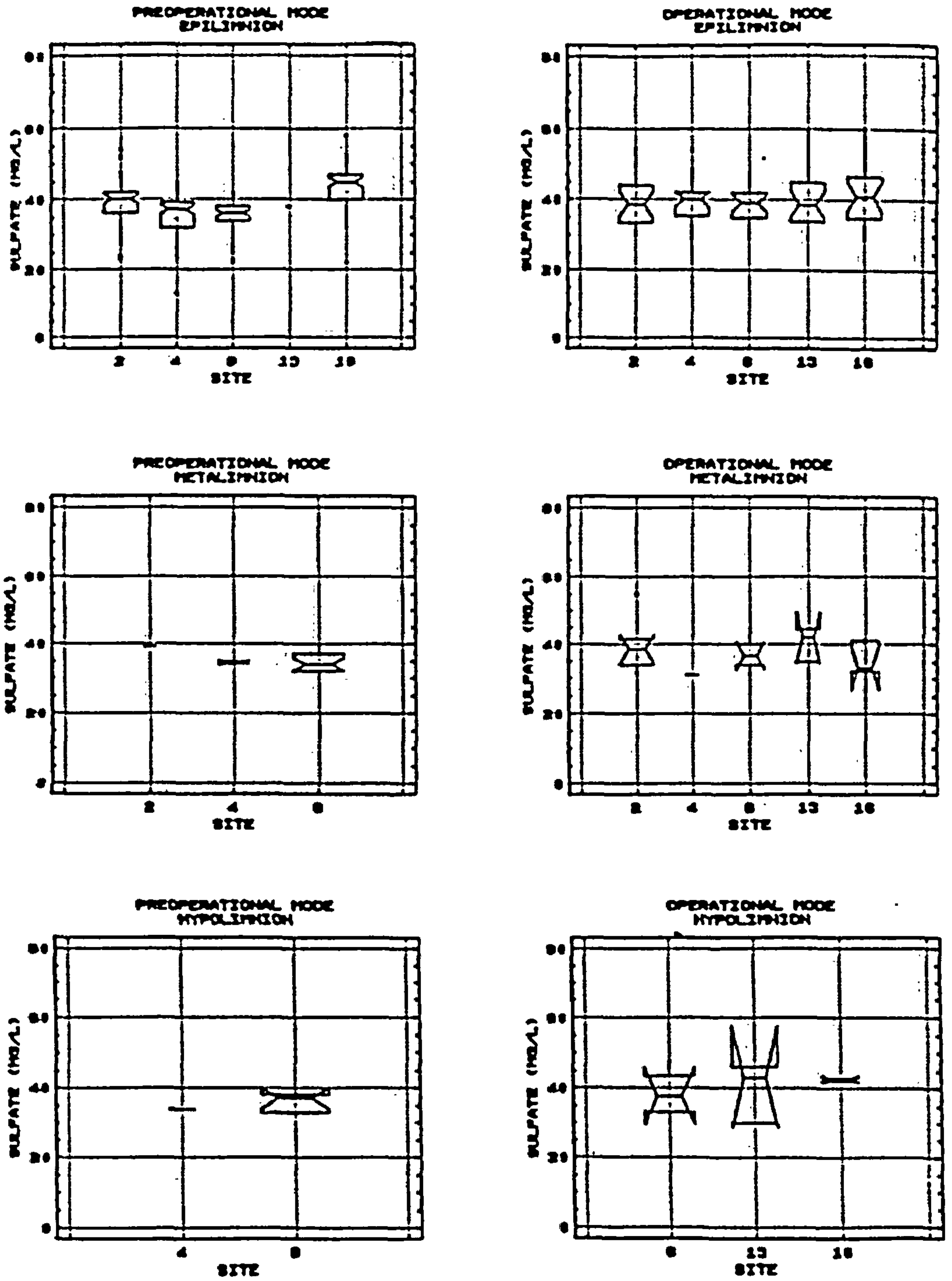


Figure 155. Distributions of sulfate concentrations (mg/l) in Clinton Lake for epilimnion, metalimnion and hypolimnion strata at monitoring sites where stratification occurred.

within a lake. Chloride is the major halide stored in most freshwater algal cells. The USEPA (1976) recommends less than 250 mg/l for chlorides in domestic water supplies.

Epilimnion Chloride

Chloride concentrations averaged 22.2 mg/l for the 377 epilimnion samples collected from Clinton Lake during 1981 through 1991. During this time chloride concentrations ranged from 6.5 to 37.2 mg/l. All samples had chloride concentrations which were much lower than the IPCB General Use water quality standard (500 mg/l). The average chloride concentration of surface waters from 63 Illinois lakes was 17.7 mg/l and average lake concentrations for chloride ranged from 1.3 to 82.7 mg/l (Sefton et al. 1980). The majority of these lakes (57%) had mean concentrations less than 15 mg/l (Sefton et al. 1980).

Chloride concentrations in Clinton Lake increased sharply during the operational period (Figure 156). Comparisons in annual distributions of chloride concentrations indicate there were significant differences between years representing preoperational (1981 through 1986) and operational (1987 through 1991) data (Figure 157).

Site 16 had significantly greater concentrations of chloride during the preoperational period, but not during the operational period (Figure 158). Chloride concentrations were similar among months (Figure 158).

Chloride During Stratification

The average chloride in bottom water in 63 Illinois lakes was essentially equal to surface values (Sefton et al. 1980). Very little vertical or spatial variation in chloride concentrations was noted in these lakes (Sefton et al. 1980). The average chloride concentration in metalimnion samples was 23 mg/l; concentrations ranged from 10.7 to 33.2 mg/l. In the hypolimnion, the average chloride concentration was 24.4 and concentrations ranged from 17.8 to 33.5 mg/l. Chloride concentrations were greater during the operational period for each stratum (Figure 159). Distributions of chloride concentrations during the preoperational and operational period were similar among months (Figure 159) and sites (Figure 160). Distributions of chloride data by years were similar for epilimnion, metalimnion, and hypolimnion strata (Figure 161).

8.8 Bacteria

8.8.1 Fecal Coliforms

The presence of fecal coliforms indicates fecal contamination of water and a probable occurrence of waterborn pathogens which pose a relative risk of disease transmission. Fecal coliform bacteria are restricted to the intestinal tract of warmblooded animals.

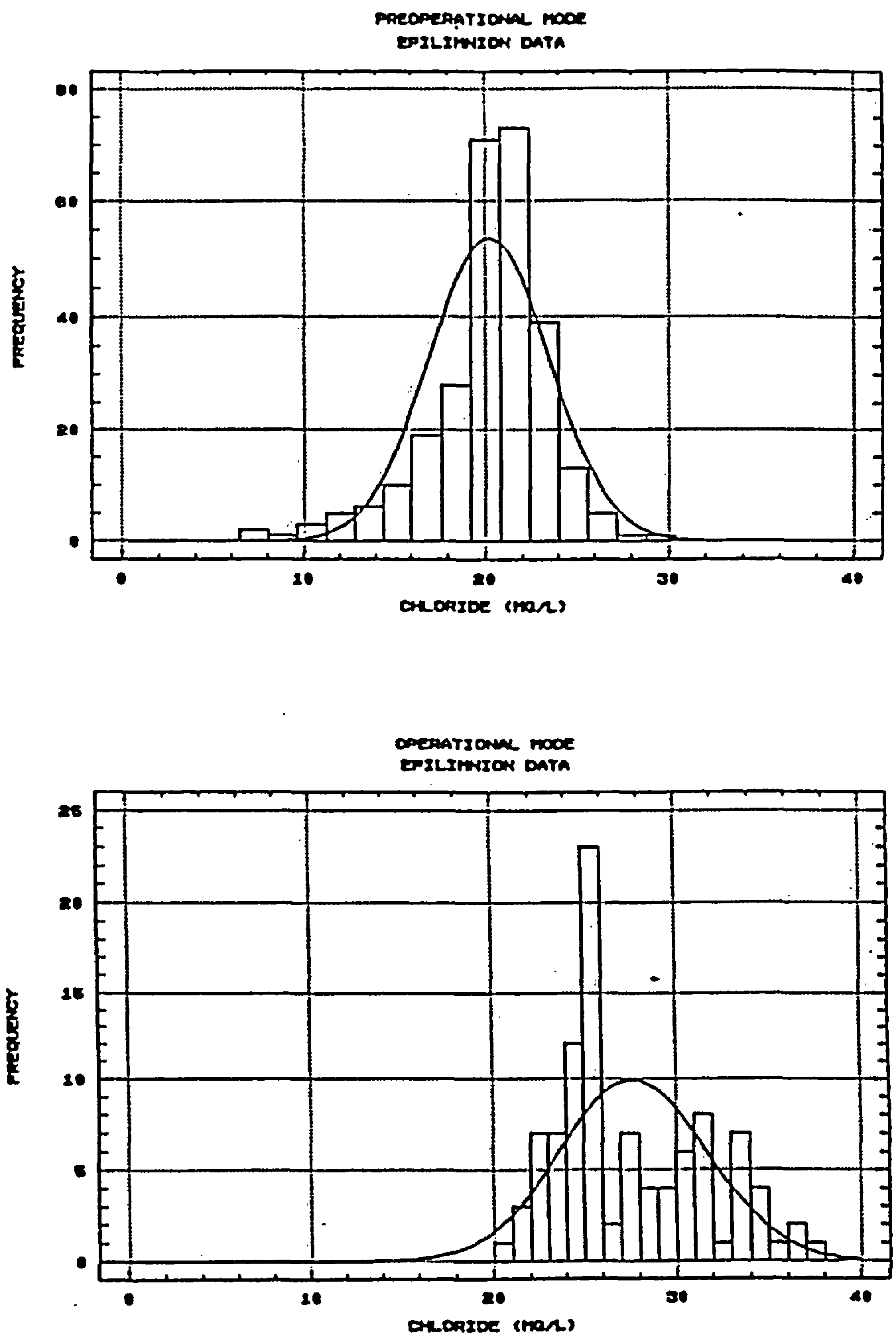
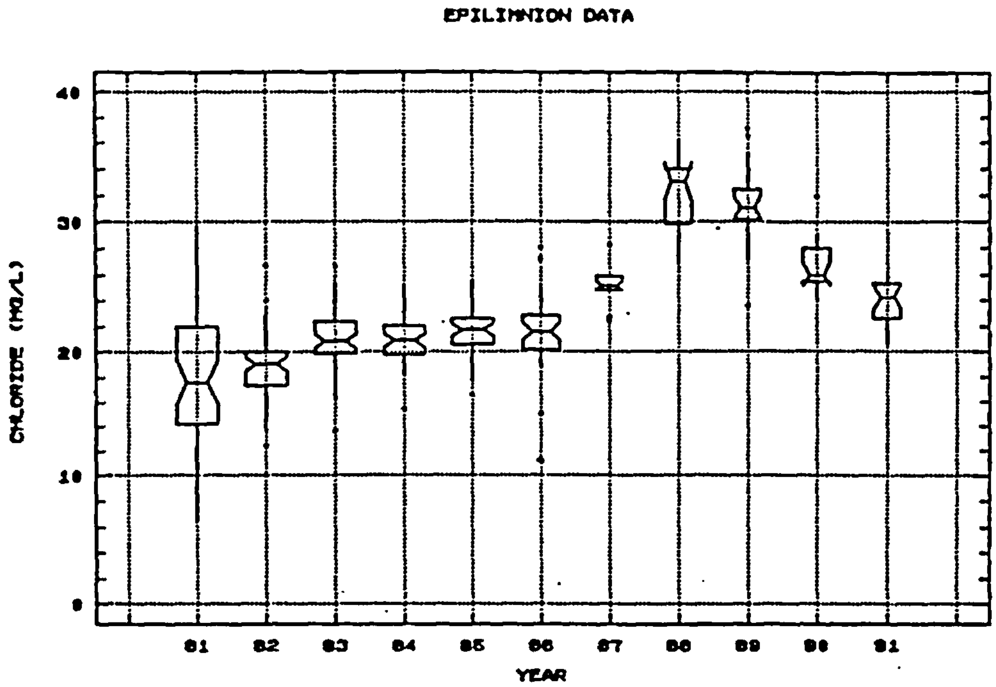


Figure 156. Frequency histograms of epilimnion chloride concentrations (mg/l) in Clinton Lake during periods prior to (top graph) and during Clinton Power Station operation (bottom graph).



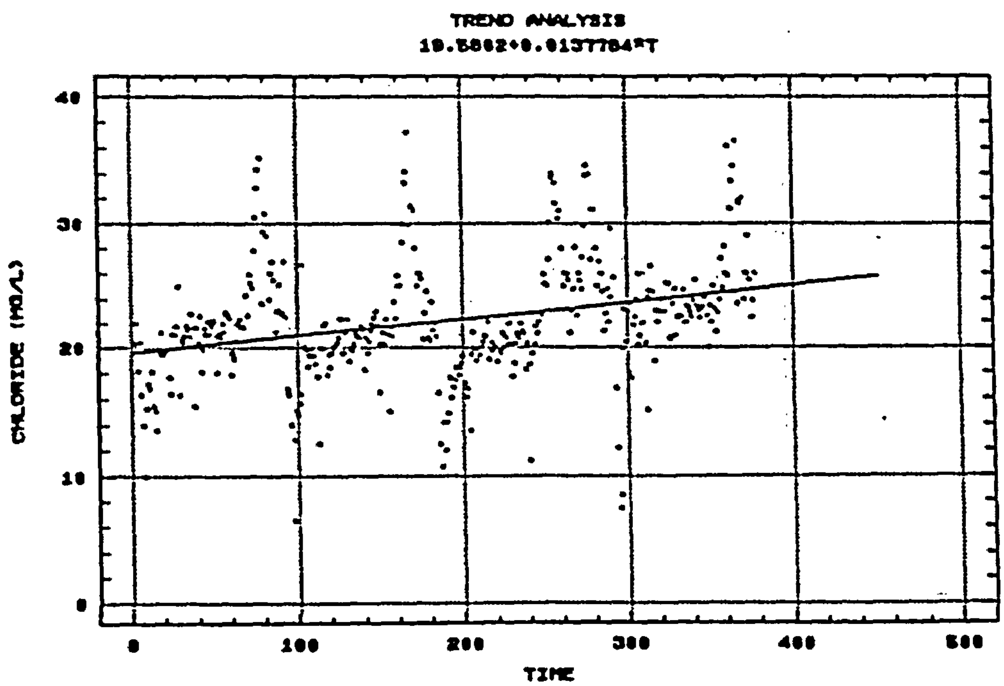


Figure 157. Yearly distributions (top graph) and trend analysis (bottom graph) of chloride concentrations (mg/l) in Cl[illegible] Lake during 1981 through 1991.

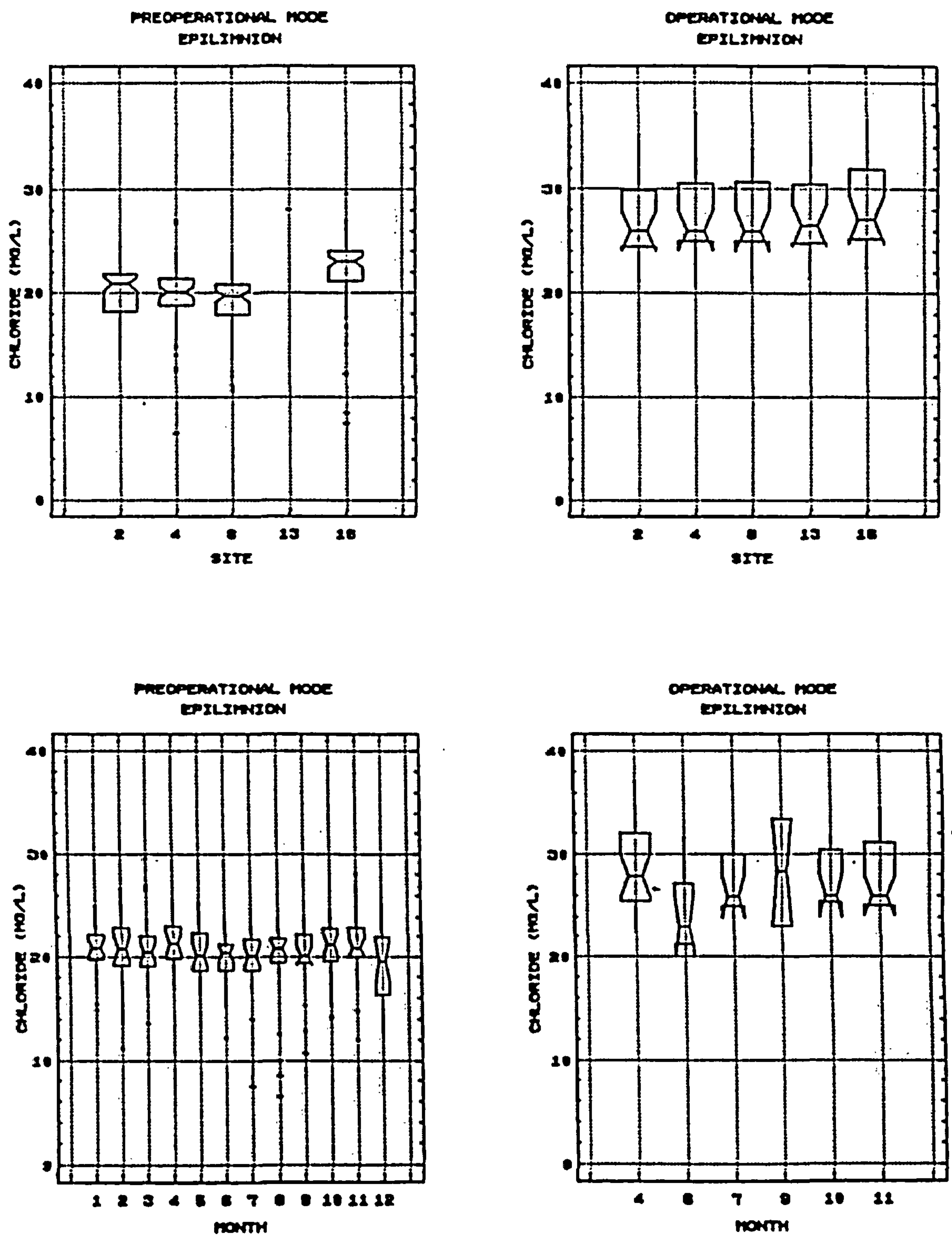


Figure 158. Distributions of chloride concentrations (mg/l) in Clinton Lake for monitoring sites and months during periods prior to (Preoperational Mode) and during (Operational Mode) Clinton Power Station operation.

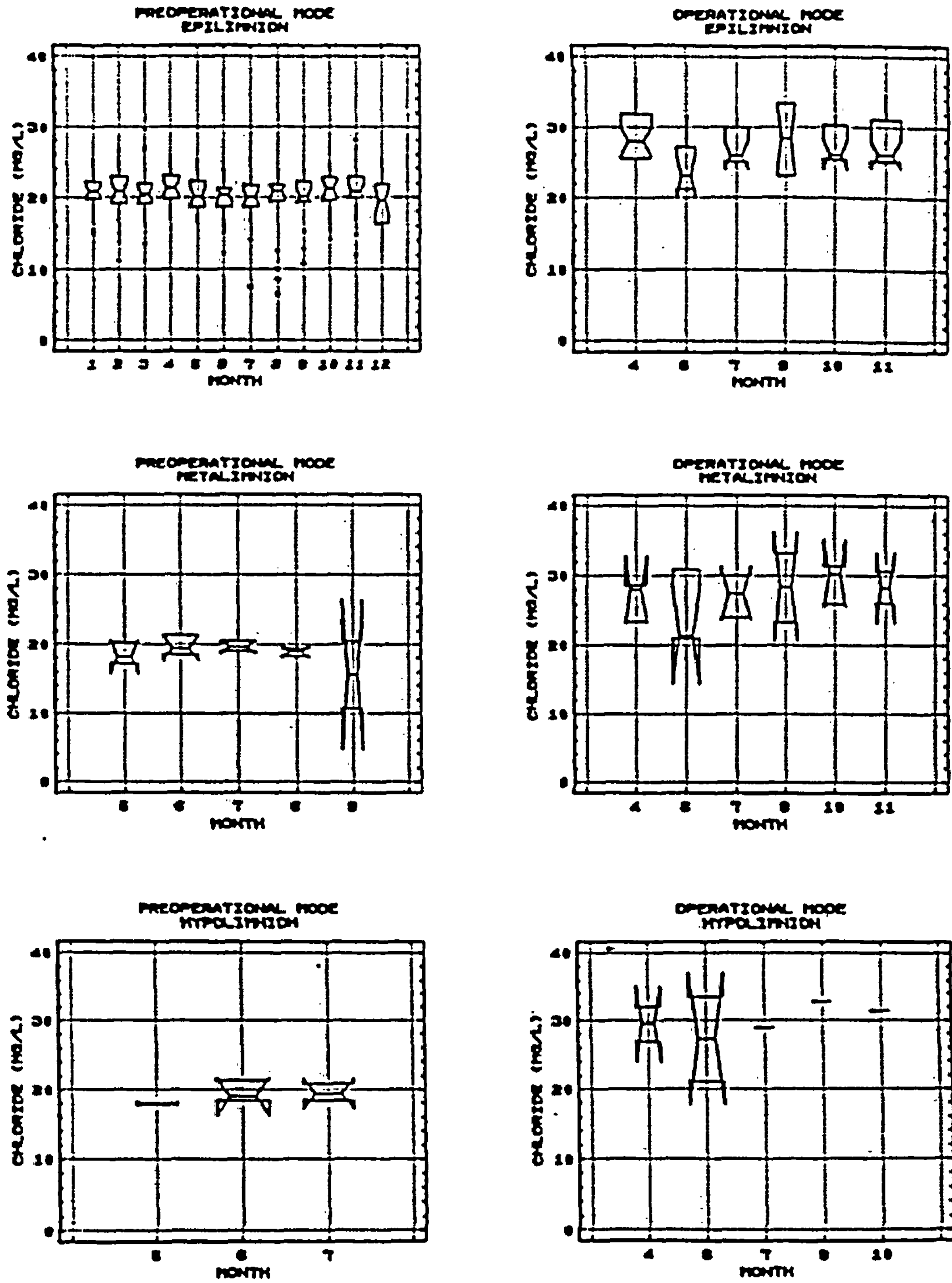


Figure 159. Distributions of chloride concentrations (mg/l) in Clinto Lake for epilimnion, metalimnion, and hypolimnion strat for the periods prior to (Preoperational Mode) and ... n Clinton Power Station operation (Operational Mode).

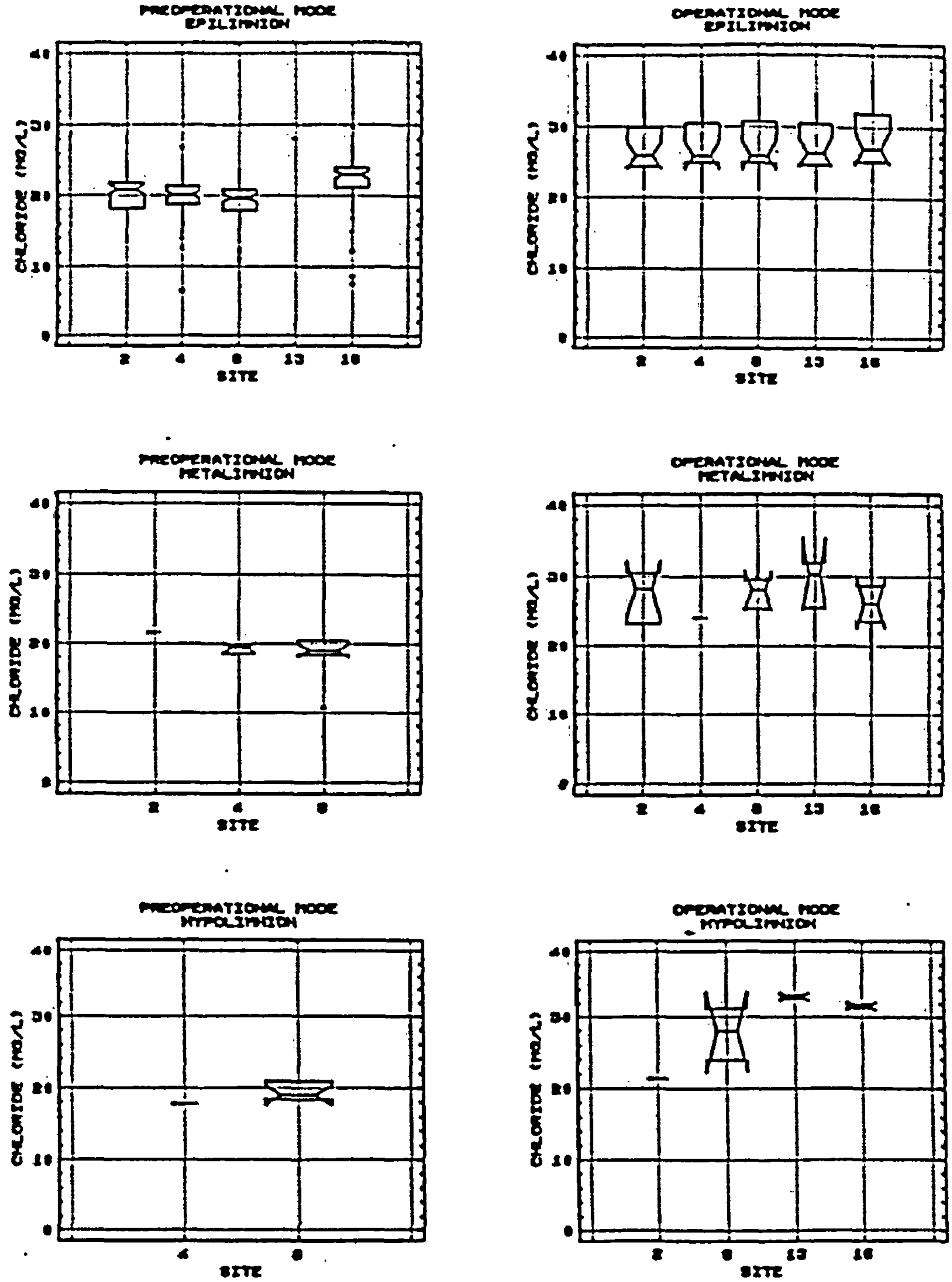


Figure 160. Distributions of chloride concentrations (mg/l) in Clinton Lake for epilimnion, metalimnion and hypolimnion strata at monitoring sites where stratification occurred during the periods prior to (Preoperational Mode) and during Clinton Power Station operation (Operational Mode).

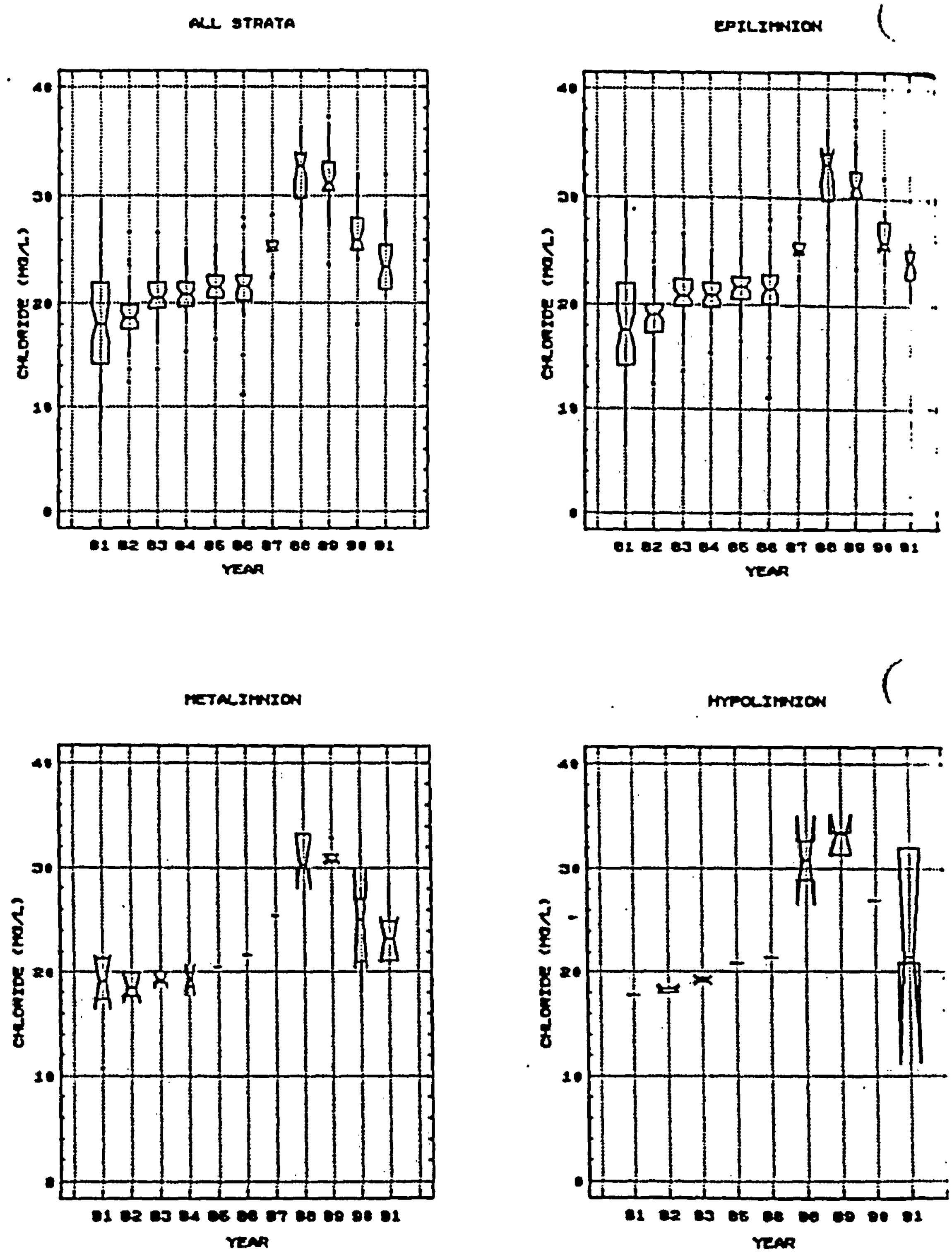


Figure 161. Yearly distributions of chloride concentrations (mg/l) i Clinton Lake for epilimnion, metalimnion, and hypoli[illegible]io strata during 1981 through 1991.

Epilimnion Fecal Coliforms

The maximum fecal coliform count (1200/100 ml) was measured at sites 2 and 4 in September, 1978 and December, 1982, respectively. The geometric mean of fecal coliform counts for 390 samples collected from Clinton Lake during 1978 through 1986 was 3.6/100 ml. Water samples were not analyzed for fecal coliforms after 1986. The IPCB General Use water quality standard for fecal coliform is 200/100 ml. Of the 390 samples, there were 376 (96%) which did not exceed the IPCB standard (Figure 162). This standard however, was exceeded at all Clinton Lake sampling sites at least once during 1978 through 1986. Site 16 had the greatest geometric mean fecal coliform count (6.8/100 ml), however, there were no significant differences in the distribution of coliform count data among sites (Figure 163). There was no apparent seasonal pattern in the distribution of monthly means for coliform counts (Figure 163). Likewise, there was no apparent trend in the distribution of mean annual counts for fecal coliforms (Figure 163).

Fecal Coliforms During Stratification

The maximum fecal coliform count in the 103 samples collected during periods of stratification was 220/100 ml. The maximum count occurred in the epilimnion at Site 8 during September, 1978. The six greatest counts of fecal coliforms occurred at Site 8 (Figure 164). Distributions of fecal coliform count data among stratification levels at each site were similar (Figure 164). There was no consistent pattern in the distribution of count data among years (Figure 165). Data were most variable during 1985. Count data were more variable during the warmer months, i.e. July and August (Figure 166).

8.8.2 Fecal Streptococcus

The presence of fecal streptococcus is another indicator of fecal contamination. This test is generally performed concurrently with the fecal coliform test to more precisely define the extent and type of fecal contamination of a water. Distributions of fecal coliforms are not restricted to humans, and species have been associated with vegetation, insects, soils and other warmblooded animals. Unlike coliforms, streptococci do not multiply in surface waters. Species of fecal streptococcus were not identified during the water quality monitoring program for Clinton Lake.

Epilimnion Fecal Streptococcus

The geometric mean of fecal streptococcus was 9.7/100 ml during 1978 through 1986. Counts ranged from 0.5 to 13,000/100 ml. Approximately 95% of the samples had counts less than 100/100 ml (Figure 167). The maximum count occurred at Site 16 in March, 1984. Site 16 also had the greatest geometric mean count value (25.8/100 ml). Site 16 is nearest the outlet for the Farmer City sewage treatment facility and is near an area where cattle are pastured. There was a downlake decreasing trend for mean fecal streptococcus counts on the Salt Creek arm of Clinton Lake. Geometric mean counts were 25.8, 6.8 and 5.5 for sites 16, 2 and 8, respectively. There were no significant

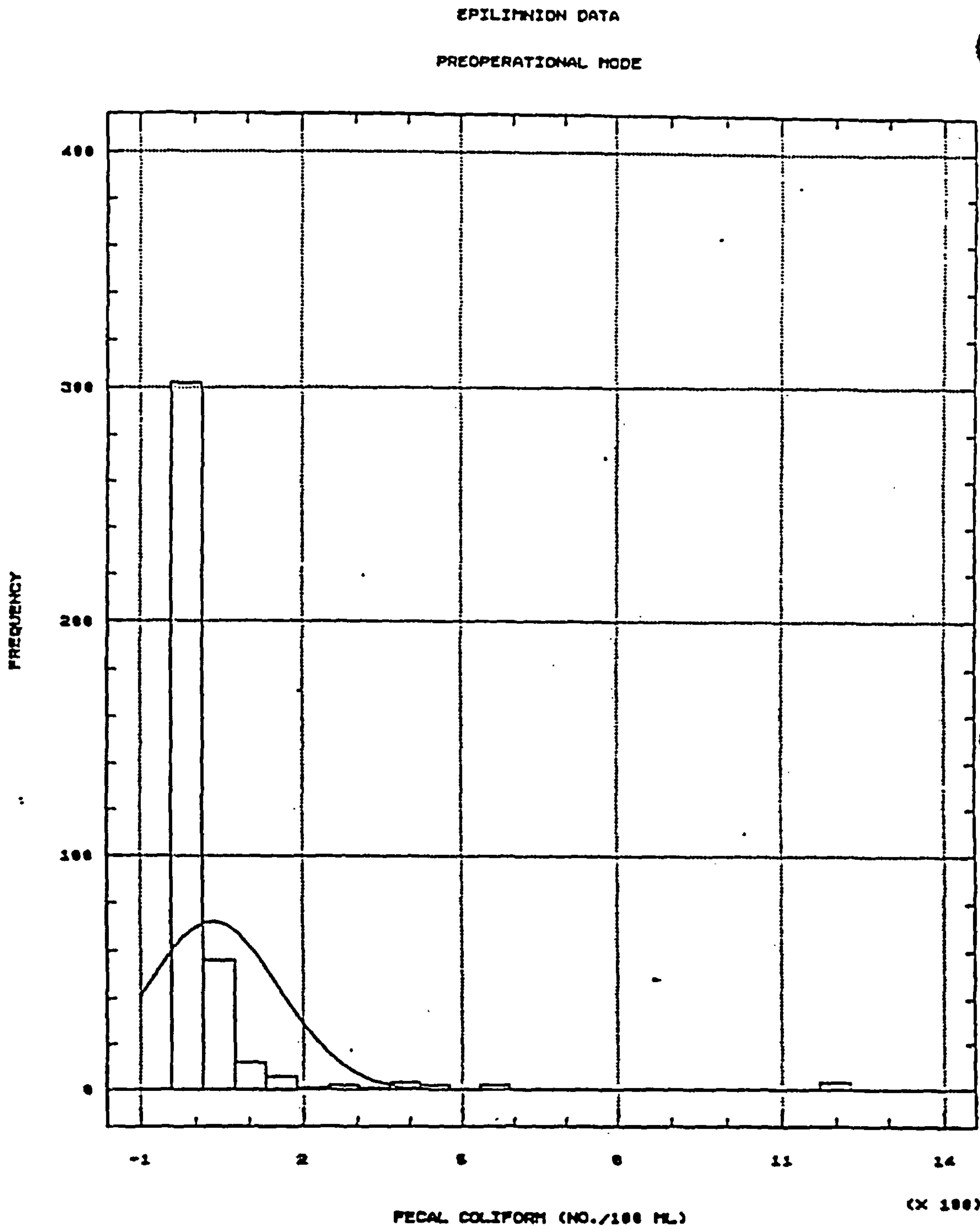


Figure 162. Frequency histogram of epilimnion fecal coliform concentration (no./100 ml) in Clinton Lake during 1978 through 1986.

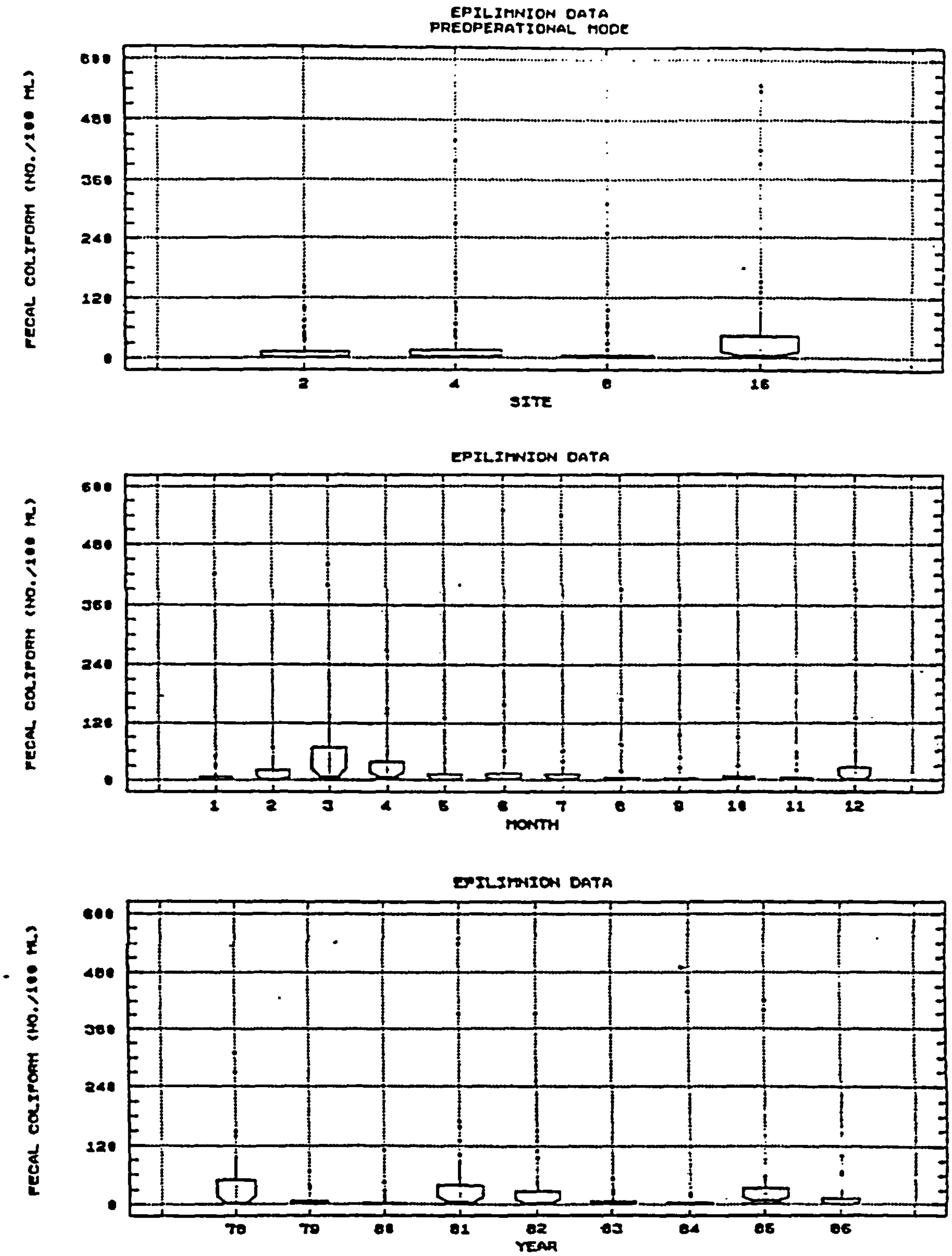


Figure 163. Distributions of epilimnion fecal coliform concentrations (no./100 ml) in Clinton Lake for monitoring sites, months, and years.

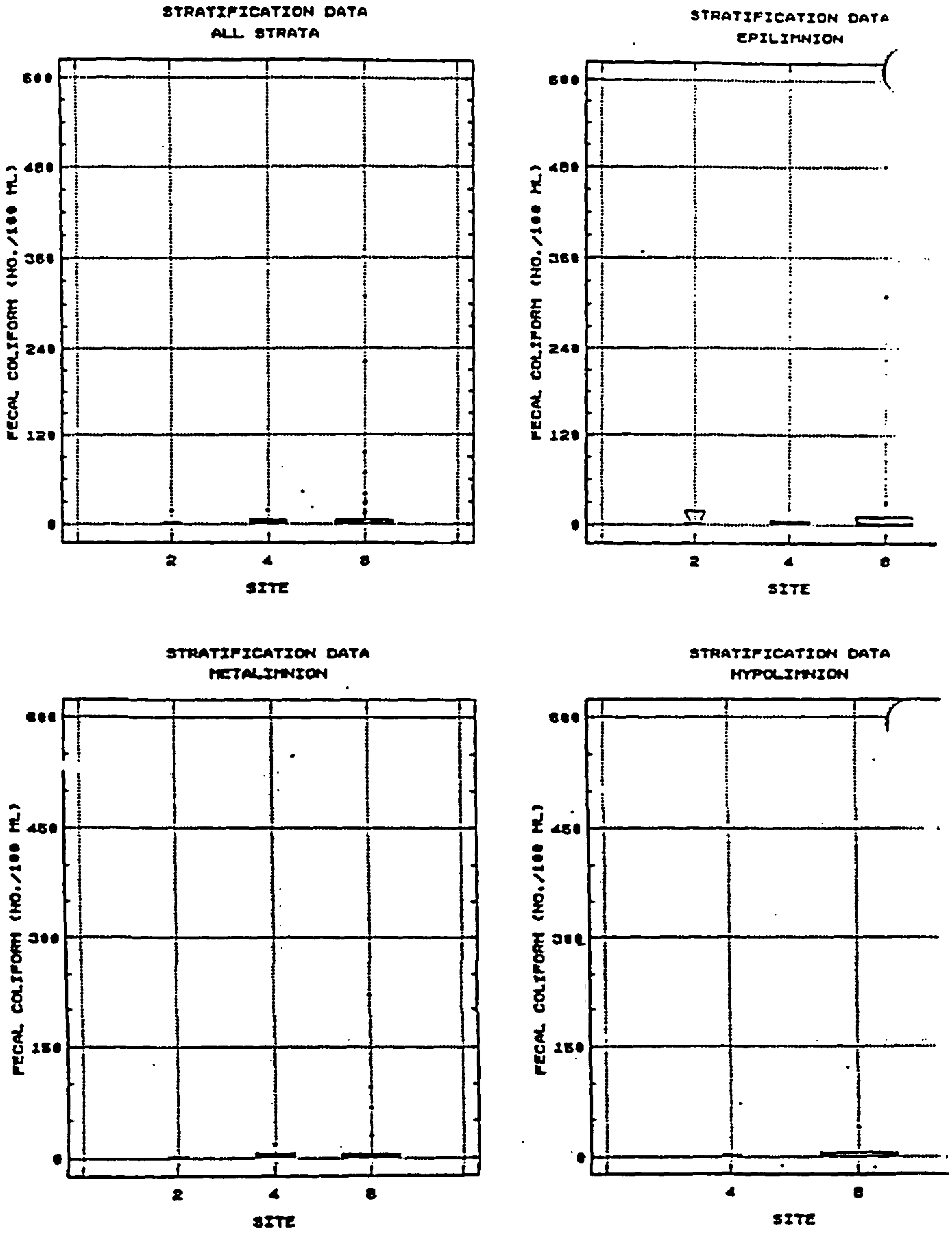


Figure 164. Distribution of fecal coliform concentrations (no./100 ml) for epilimnion, metalimnion, and hypolimnion strata for monitoring sites in Clinton Lake during 1978 through 1986.

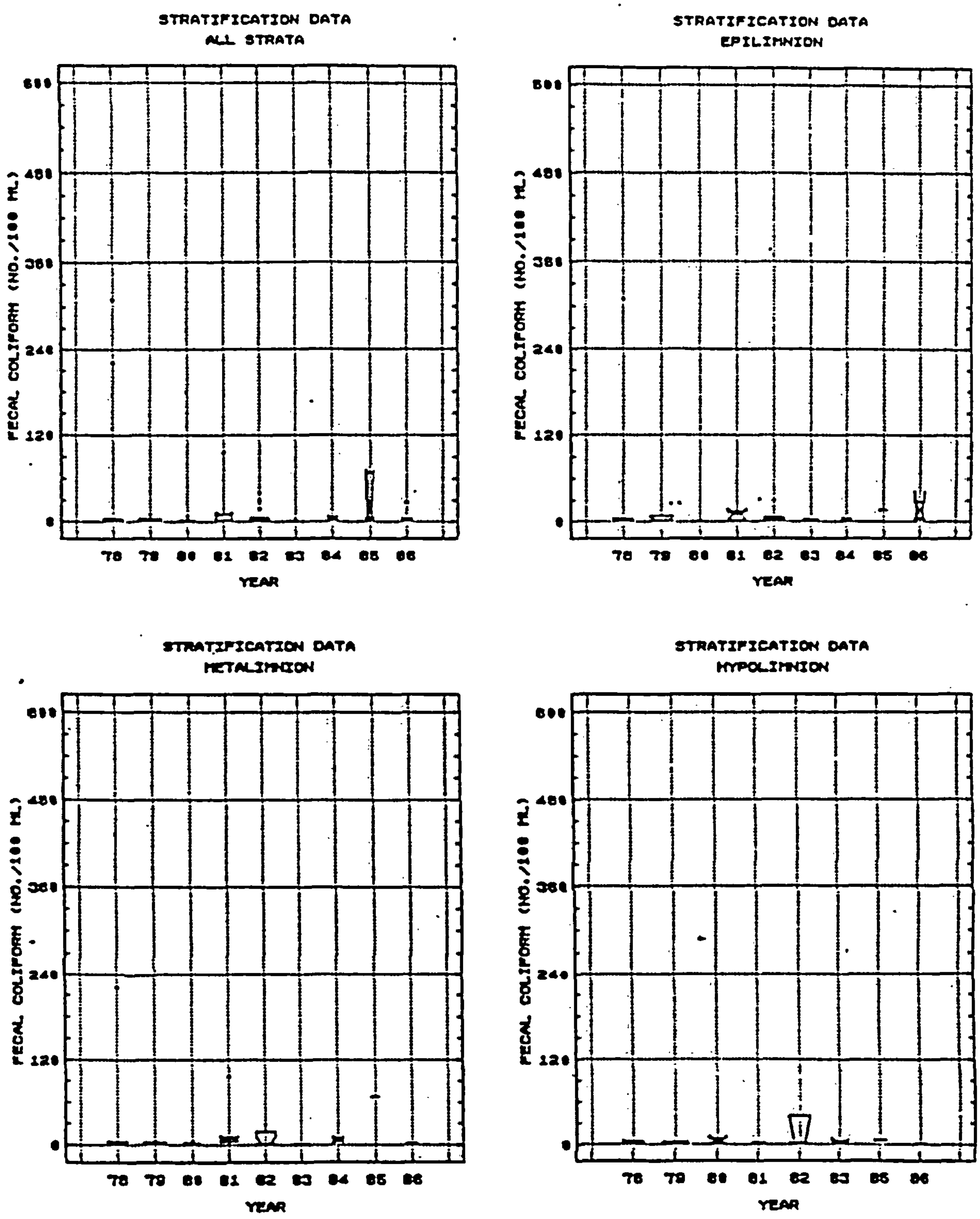


Figure 165. Distribution of fecal coliform concentrations (no./100 ml) for epilimnion, metalimnion, and hypolimnion strata in Clinton Lake during 1978 through 1986.

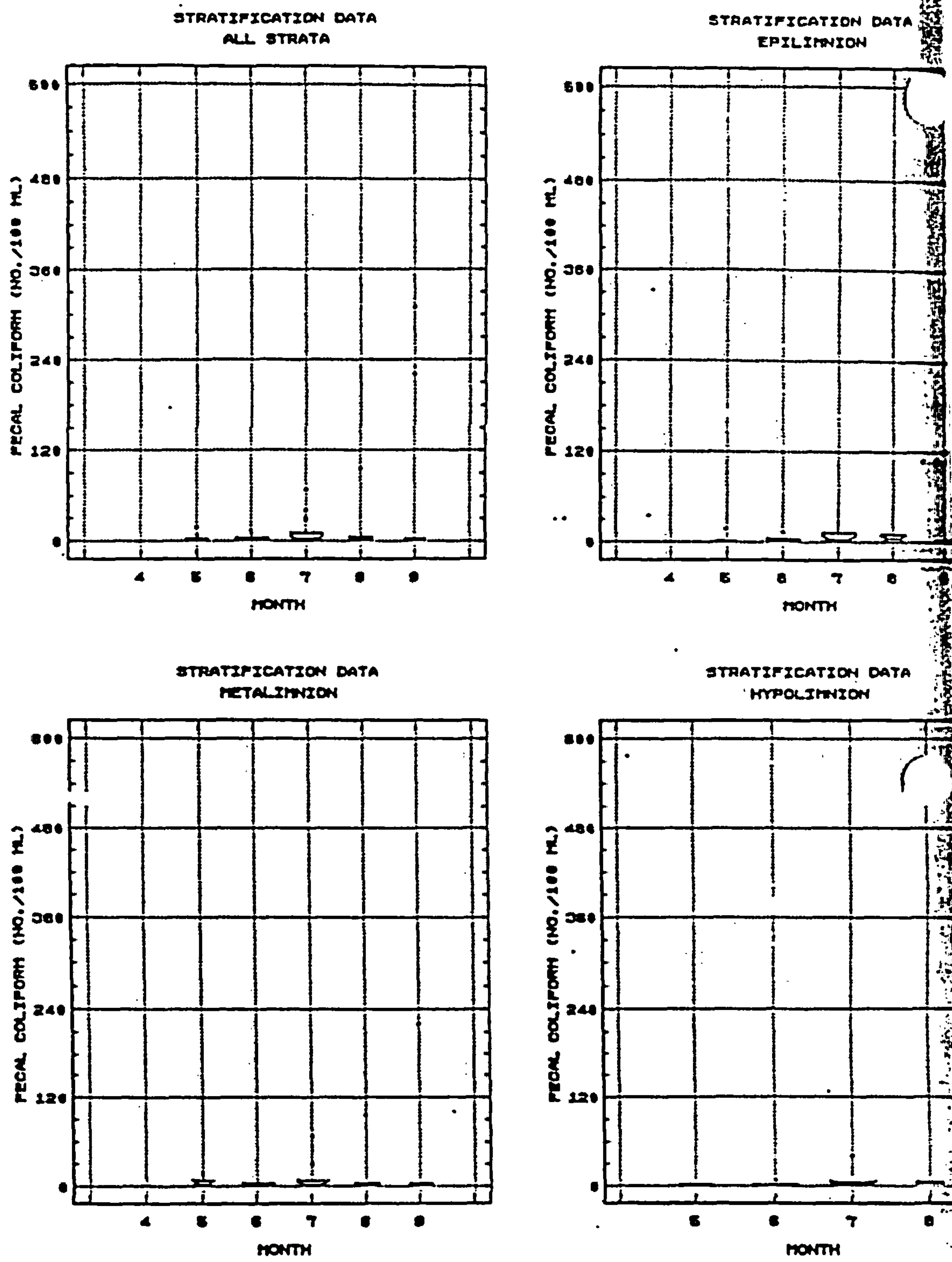


Figure 166. Distribution of fecal coliform concentrations (no./100 ml) for epilimnion, metalimnion, and hypolimnion strata for April through September in Clinton Lake during 1978 through 1986.

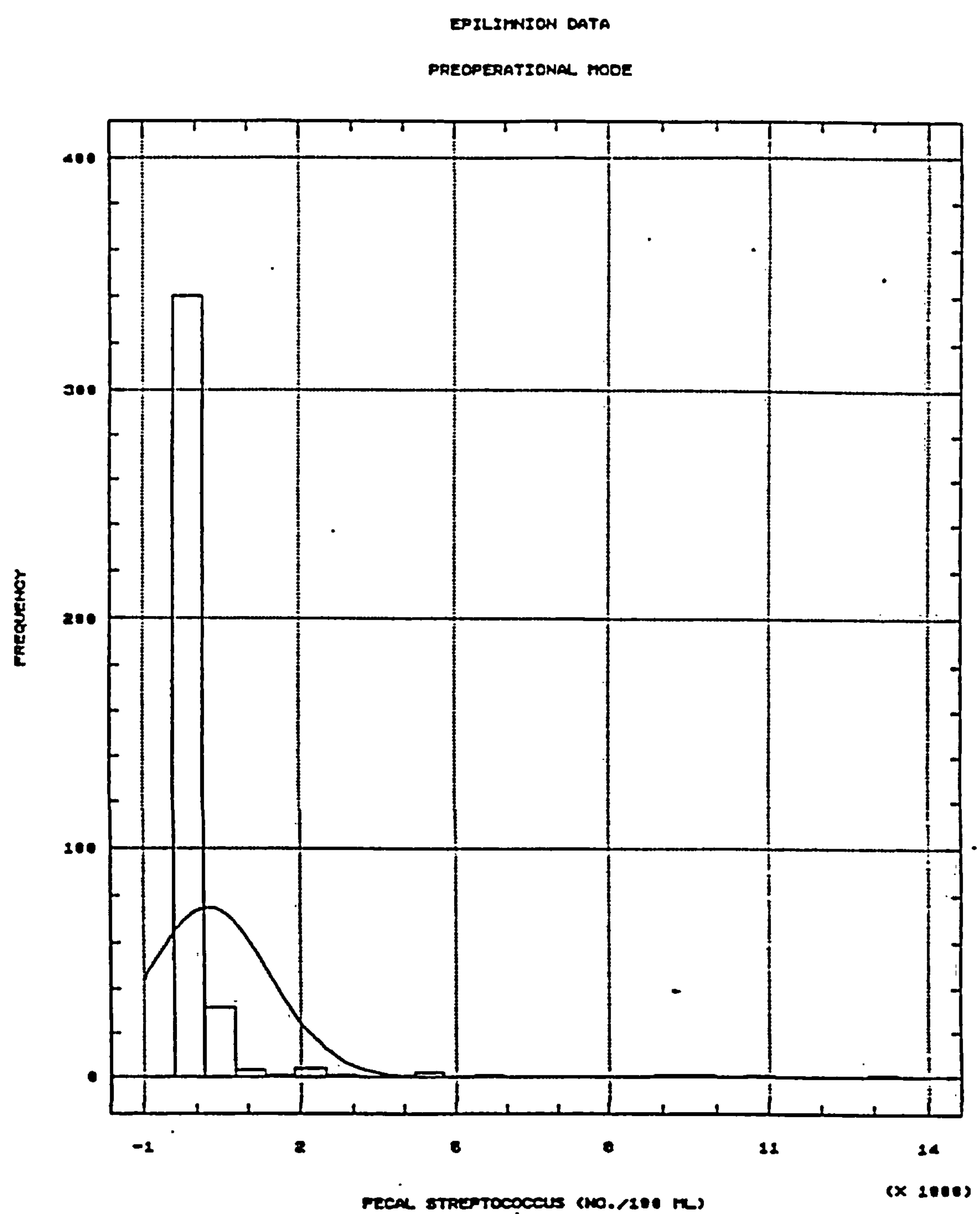


Figure 167. Frequency histogram of epilimnion fecal streptococcus concentrations (no./100 ml) in Clinton Lake during 1978 through 1986.

differences among sites, months, or years (Figure 168).

The most valuable application of the fecal streptococcus test is in the development of fecal coliform/fecal streptococcus ratios. Fecal coliform/fecal streptococcus ratios of 4.0 or greater typically indicate domestic waste while ratios of 0.6 or less are common to discharges from farm animals or stormwater runoff. The mean ratio of average counts for fecal coliform/fecal streptococcus in Clinton Lake was 0.142 with a range of 0.102 to 0.224. These ratios indicate that contamination by fecal bacteria in Clinton Lake more likely originated from farm animals or stormwater runoff than from human fecal contamination.

Fecal Streptococcus During Stratification

The maximum count (340/100 ml) for fecal streptococcus during stratification occurred in the metalimnion at Site 8 in July, 1981. Distribution of fecal streptococcus counts among stratification levels was similar. Distribution of counts among sites indicated Site 8 tended to have more outlying data, while data for Site 2 were more widely distributed (Figure 169). Outlying data occurred most frequently in July (Figure 170), otherwise distributions of count data were similar among months during stratification. Count data for fecal streptococcus were more widely distributed during 1981, 1982 and 1985, otherwise distributions were similar among the other years (Figure 171).

8.9 Water Transparency

Turbidity and suspended solids are water quality constituents which affect water transparency and estimate the amount of material suspended in the water. Poor water transparency affects the aesthetic quality, and degrades recreational and domestic uses of water.

8.9.1 Turbidity

Measurements of turbidity quantify the degree of opaqueness of a water due to the scattering and absorption of light caused by suspended particulates in the water. Turbidity is caused by suspended matter, such as clay, silt, fine organic and inorganic particles, plankton, and other microscopic organisms. The effects of turbidity include reduced photosynthesis and increased water temperatures. Turbid water interferes with recreational use and aesthetic enjoyment of water. Turbidity may influence aquatic biota directly or indirectly. Turbidity may reduce the depth of the euphoric zone, thus reducing primary productivity. Turbidity may also influence growth, disease resistance, movement, food availability, and respiration in aquatic organisms.

Epilimnion Turbidity

Illinois lakes are markedly turbid (Sefton et al. 1980). The average turbidity value of the 493 epilimnion samples collected from Clinton Lake during 1978 through 1991 was 14.3 NTU. During this time values ranged from 0.9 to 250.0 NTU. The mean surface turbidity for 63 Illinois lakes was 13.1 NTU and values ranged from 0.8 to 91.7 NTU (Sefton et al. 1980). Distributions of turbidity data were similar for

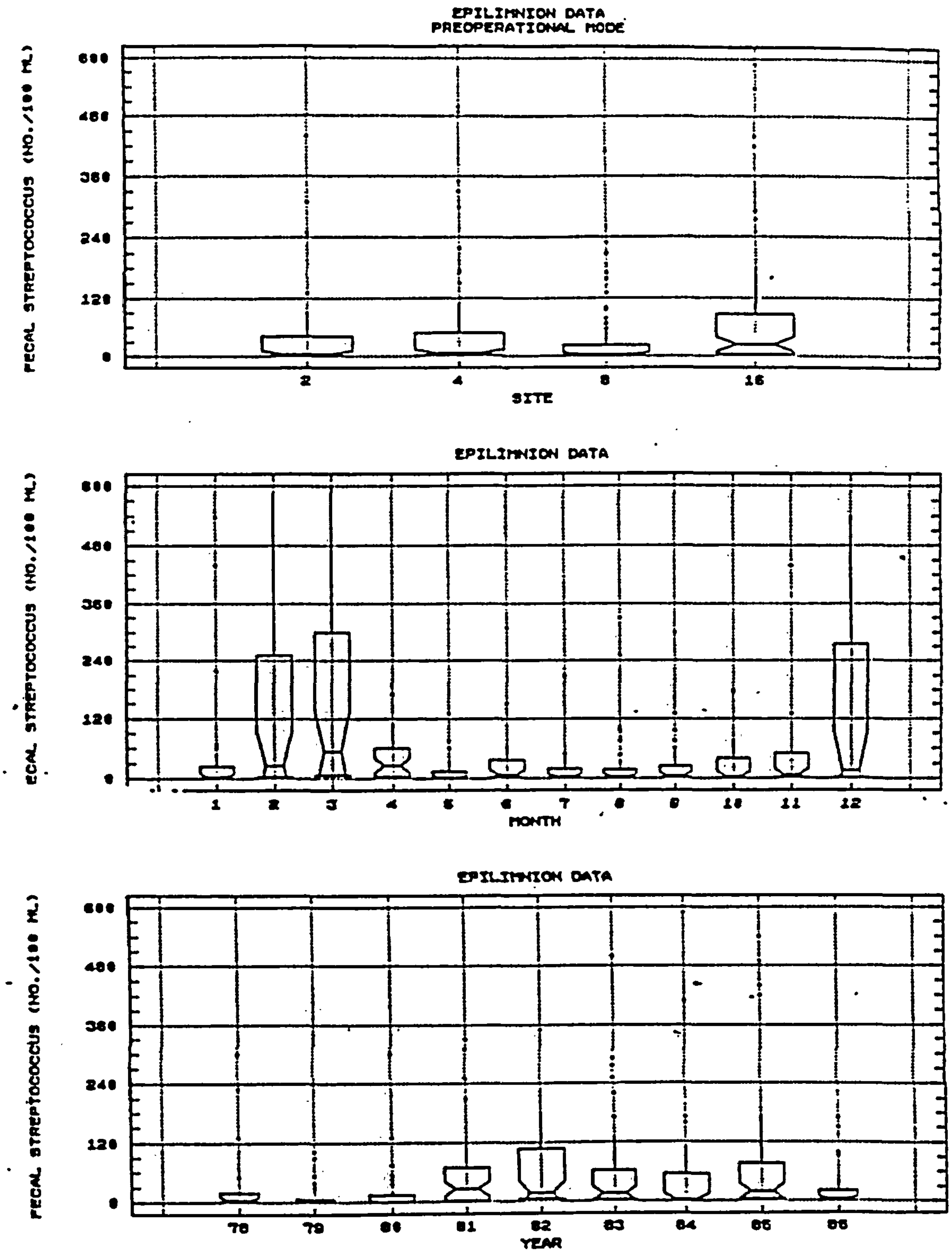


Figure 168. Distributions of epilimnion fecal streptococcus concentrations (no./100 ml) in Clinton Lake for monitoring sites, months, and years.

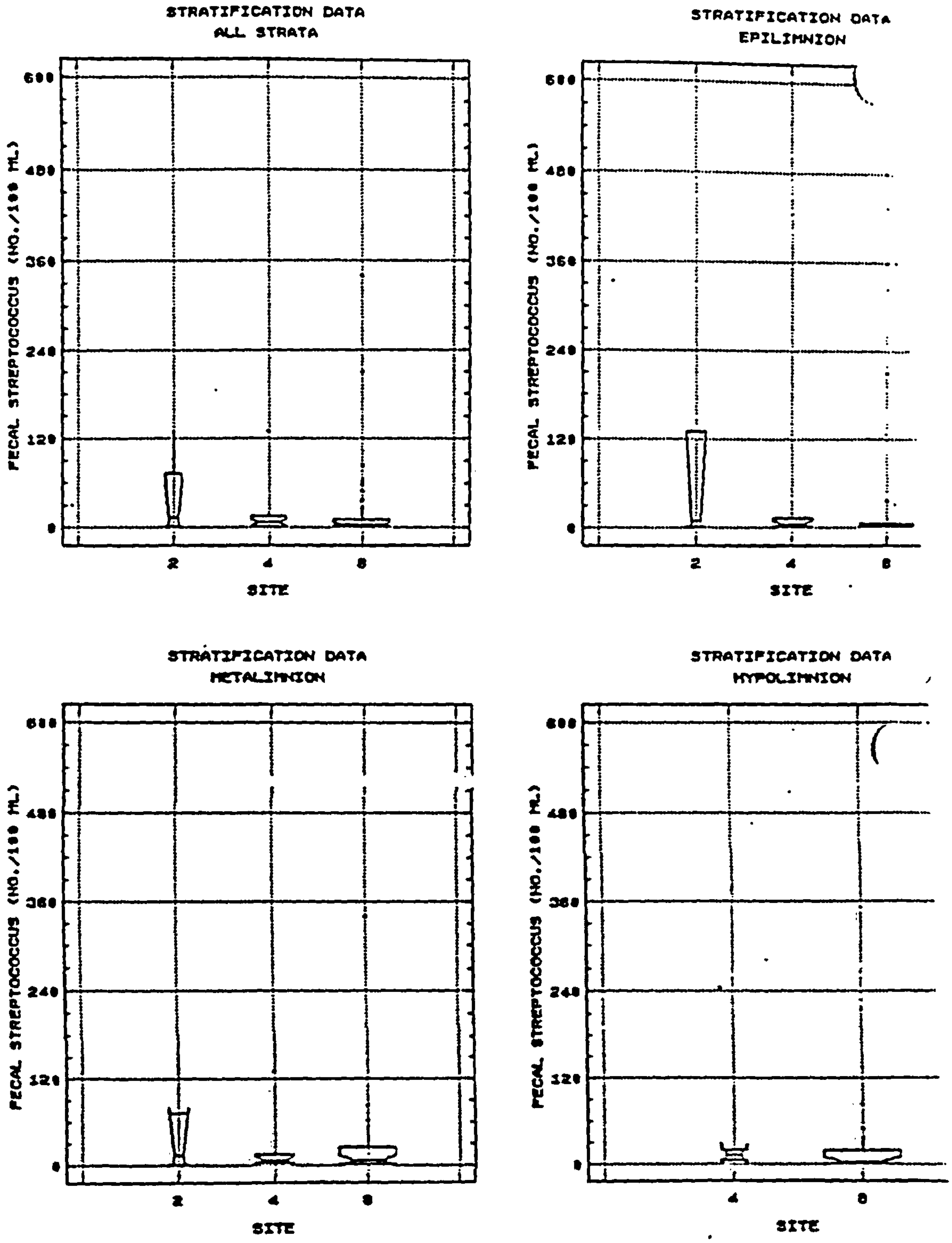


Figure 169. Distribution of fecal streptococcus concentrations (no./100 ml for epilimnion, metalimnion, and hypolimnion strata for monitoring sites in Clinton Lake during 1978 through 1986.

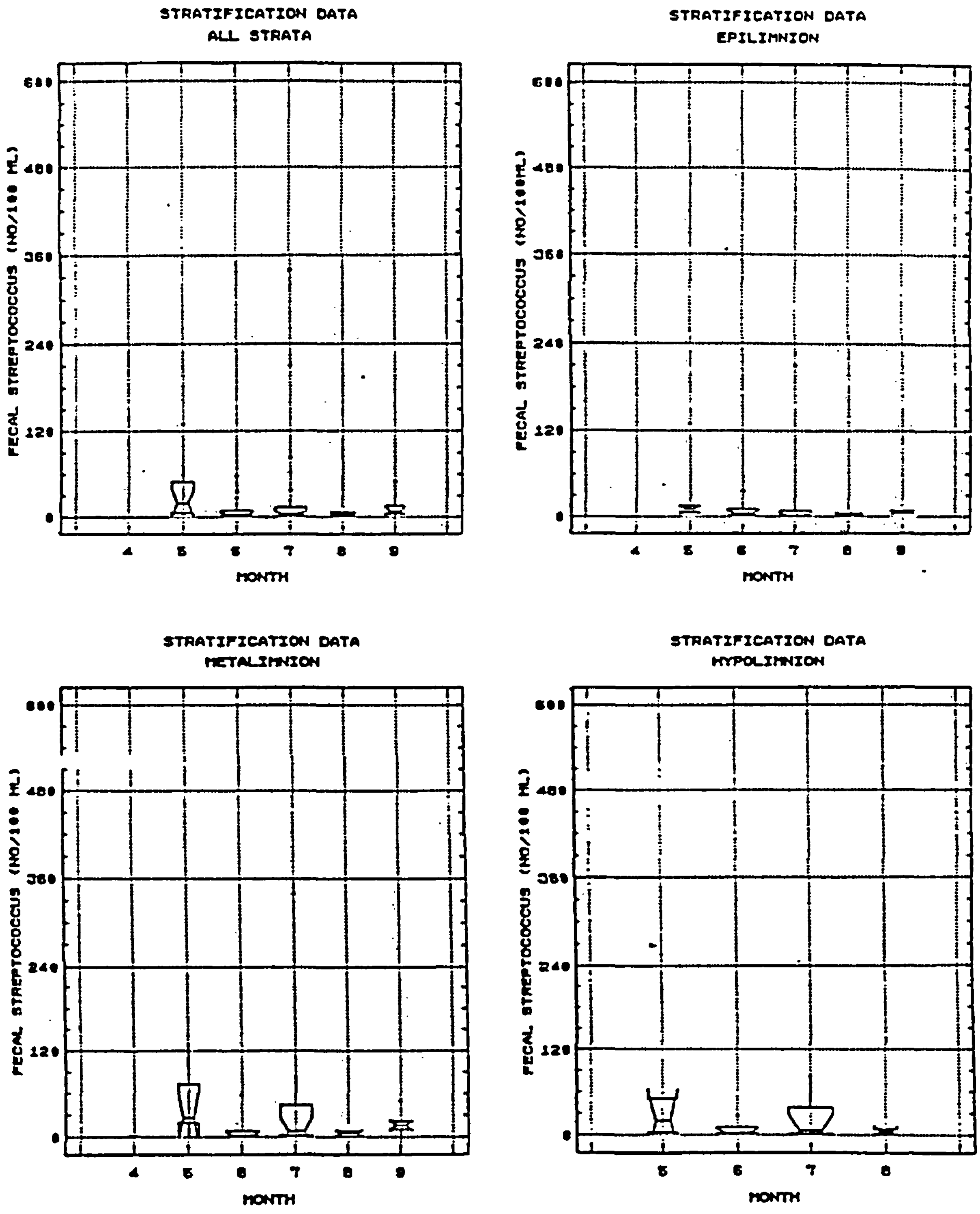


Figure 170. Distribution of fecal streptococcus concentrations (no./100 ml for epilimnion, metalimnion, and hypolimnion strata for April through September in Clinton Lake during 1978 through 1986.

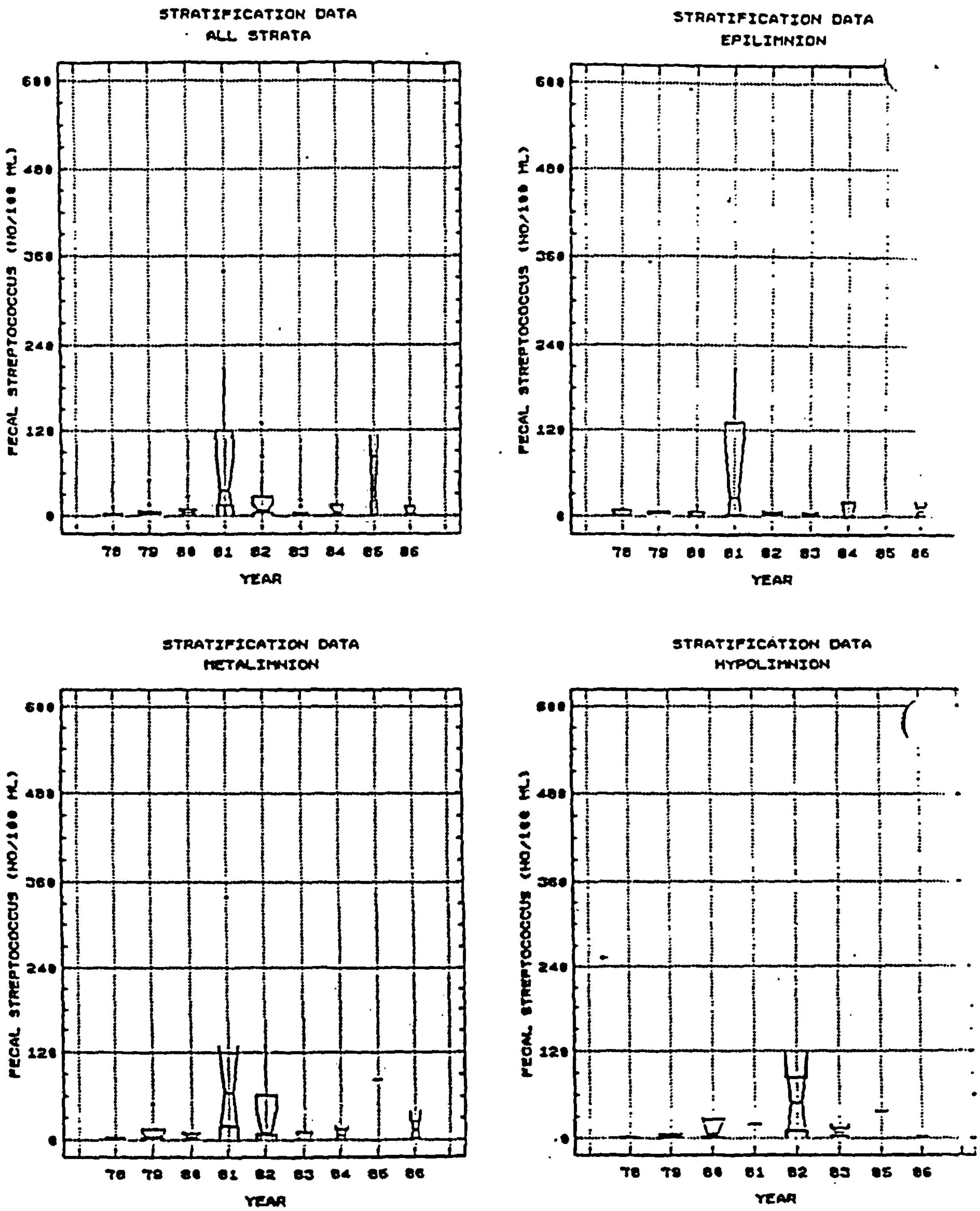


Figure 171. Distribution of fecal streptococcus concentrations (no./100 ml for epilimnion, metalimnion, and hypolimnion strata in Clinton Lake during 1978 through 1986.

preoperational and operational periods (Figure 172). Turbidity data in Clinton Lake were less variable at the deeper sites. This is expected since turbidity is dependent on local conditions at the time of sampling and is more likely to be increased by resuspension of silt and clay sediments by wind or storm events at the shallower sites. The shallowest site (Site 16) had significantly greater turbidity values compared to the remaining Clinton Lake sampling sites (Figure 173). There is a trend for turbidity to decrease from headwater to midlake sites (Figure 173). This trend for turbidity to decrease in a downlake direction is common for Illinois reservoirs (Sefton et al. 1980). Distribution of monthly turbidity values indicate greater values from March through June (Figure 173). Turbidity values are lower during early spring and winter months. Distribution of annual mean turbidity values does not indicate an apparent long term trend in turbidity for Clinton Lake (Figure 174). Trend analysis of data from 1978 through 1991 indicate a slight trend for turbidity values to increase.

Turbidity During Stratification

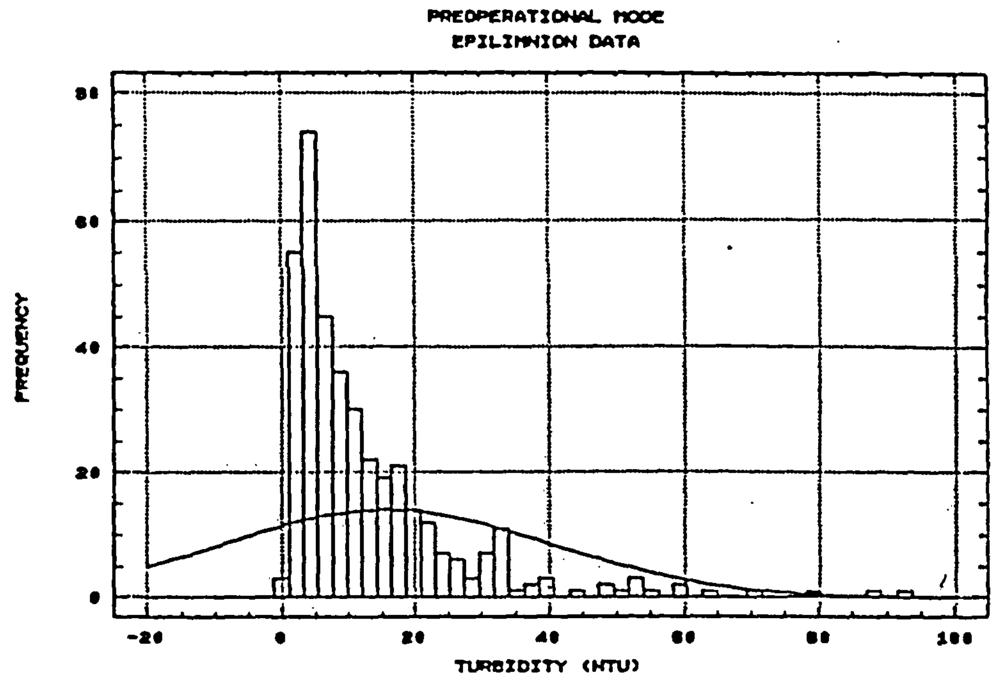
In Illinois lakes there is a tendency for bottom water turbidities to have greater variability and for bottom turbidities to be greater than their surface counterparts (Sefton et al. 1980). Average turbidity values for Clinton Lake were similar among stratification levels. Epi-, meta-, and hypolimnion average values were 14.3, 12.7, and 13.5 NTU, respectively. Distributions of turbidity data by months indicate that turbidity levels were less variable during the operational period for all depth strata (Figure 175). Distribution of turbidity values among years was variable (Figure 176). Turbidity distributions among sites for metalimnion and hypolimnion strata indicate values were less variable during the operational period (Figure 177).

8.9.2 Total Suspended Solids

Suspended solids (TSS) are undissolved substances in water. Suspended solids are primarily due to inorganic and organic inputs from the watershed and planktonic organisms. Suspended solids in many Illinois lakes result largely from soil erosion and runoff into reservoir tributaries. Significant suspended solids concentrations may also result from resuspension of bottom materials from wind action and boating, especially at the more shallow locations (Sefton et al. 1980). High concentrations of suspended solids reduce transparency, affect aesthetic quality, and degrade recreational and domestic uses of water.

Epilimnion Total Suspended Solids

The greatest TSS concentrations occurred at Site 16 in June (290 mg/l) and July (210 mg/l) during 1981. Otherwise TSS concentrations were less than 100 mg/l during 1978 through 1991 (Figure 178). The average concentration was 16.6 mg/l. Distributions of TSS concentrations were similar for preoperational and operational periods. TSS concentrations were greater during spring and summer months and lower during winter months during the preoperational period (Figure 179). Distribution of TSS data during the operational period did not exhibit seasonal trends. Concentrations of TSS decreased in a



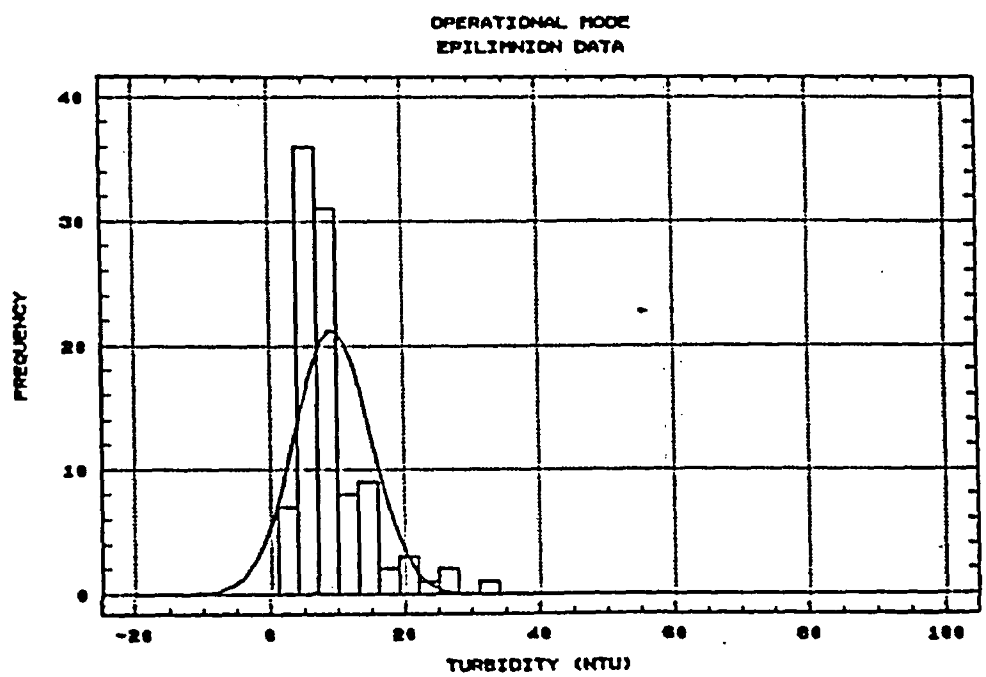


Figure 172. Frequency histograms of epilimnion turbidity concentrations (NTU) in Clinton Lake during periods prior to (top graph) and during Clinton Power Station operation (bottom graph).

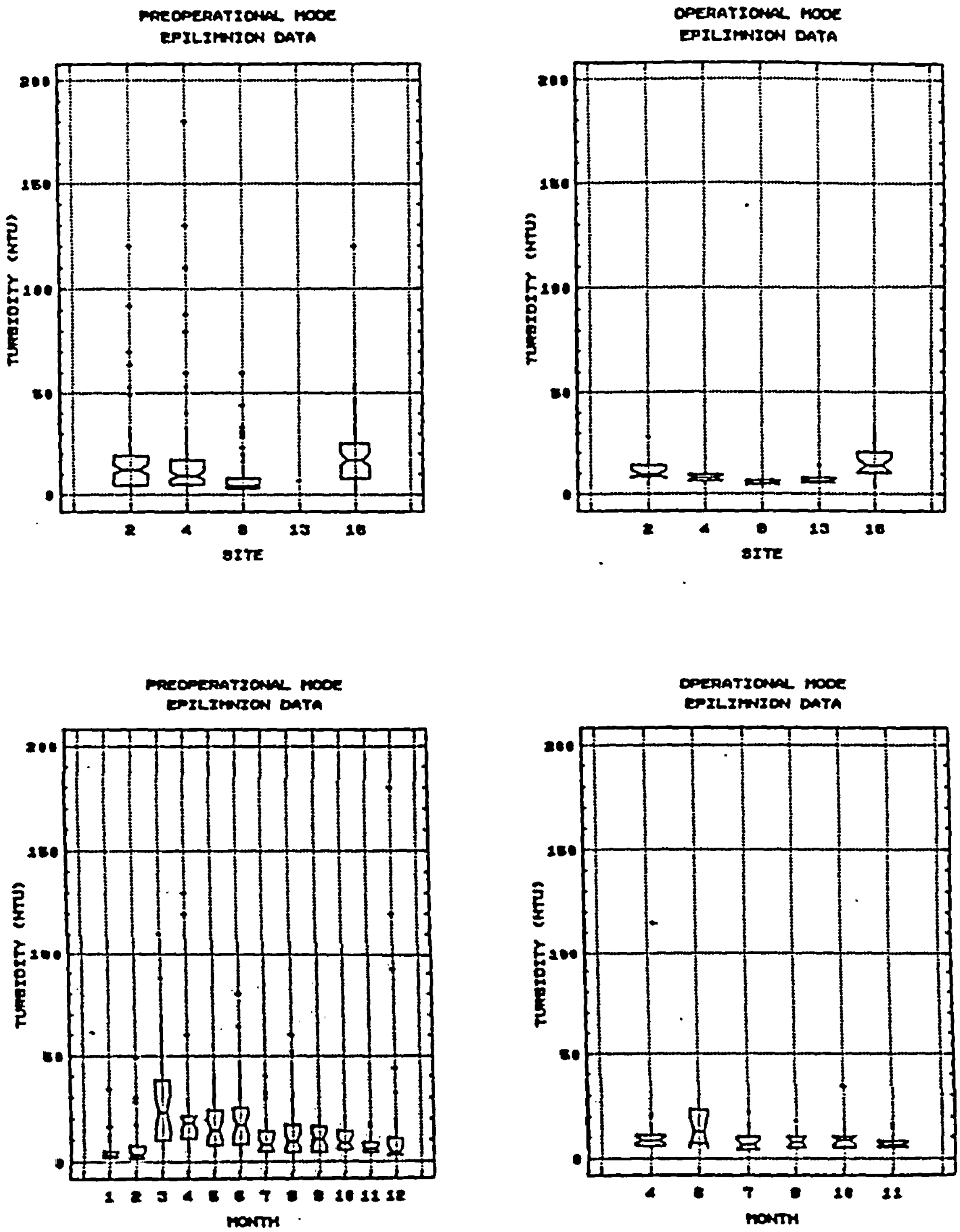


Figure 173. Distributions of turbidity concentrations (NTU) in Clinton Lake for monitoring sites and months during periods prior to (Preoperational Mode) and during (Operational Mode) Clinton Power Station operation.

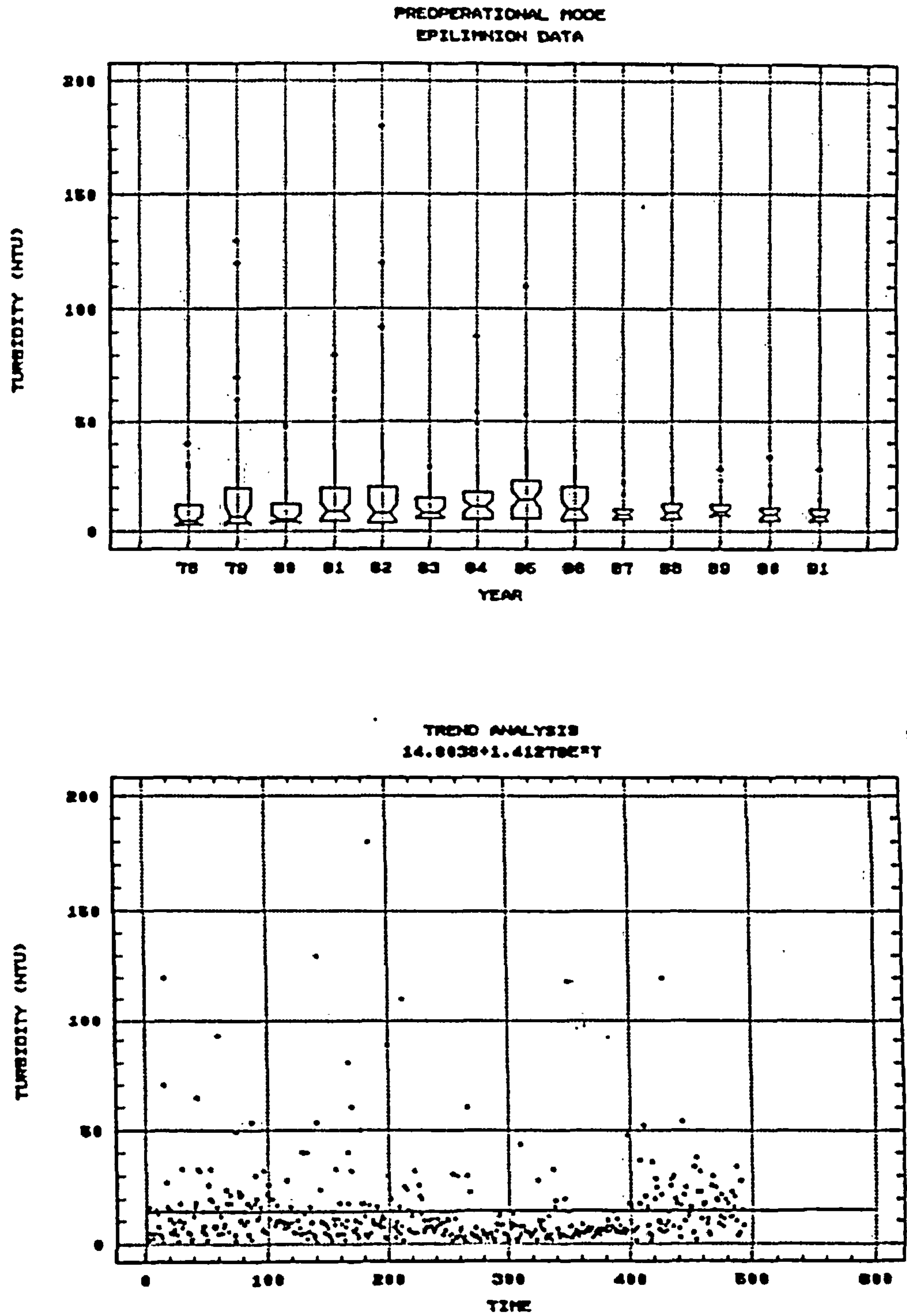


Figure 174. Yearly distributions (top graph) and trend analys (bottom graph) of turbidity concentrations (NTU) Clinton Lake during 1978 through 1991.

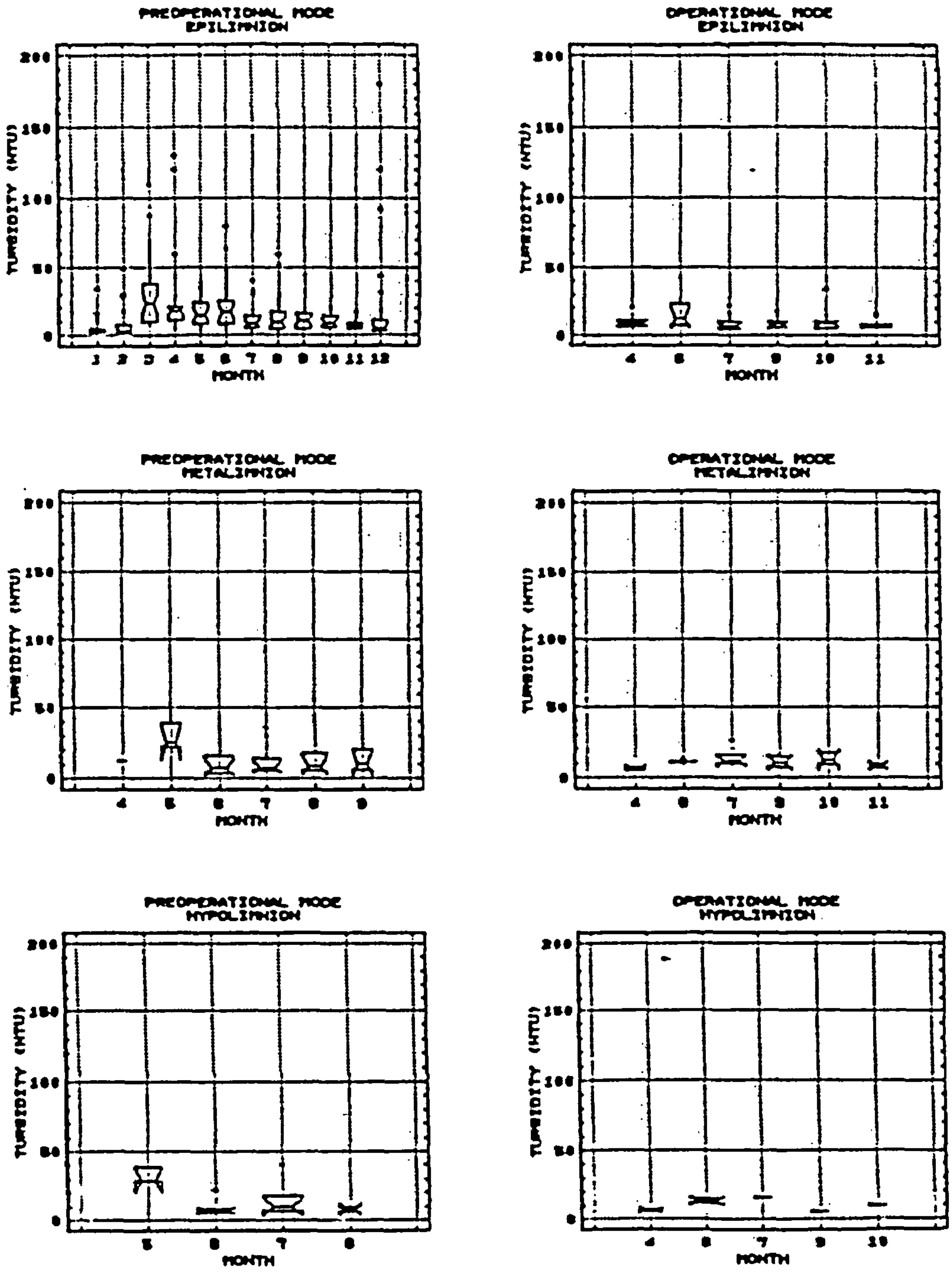


Figure 175. Monthly distributions of turbidity concentrations (NTU) in Clinton Lake for epilimnion, metalimnion, and hypolimnion strata for the periods prior to (Preoperational Mode) and during Clinton Power Station operation (Operational Mode).

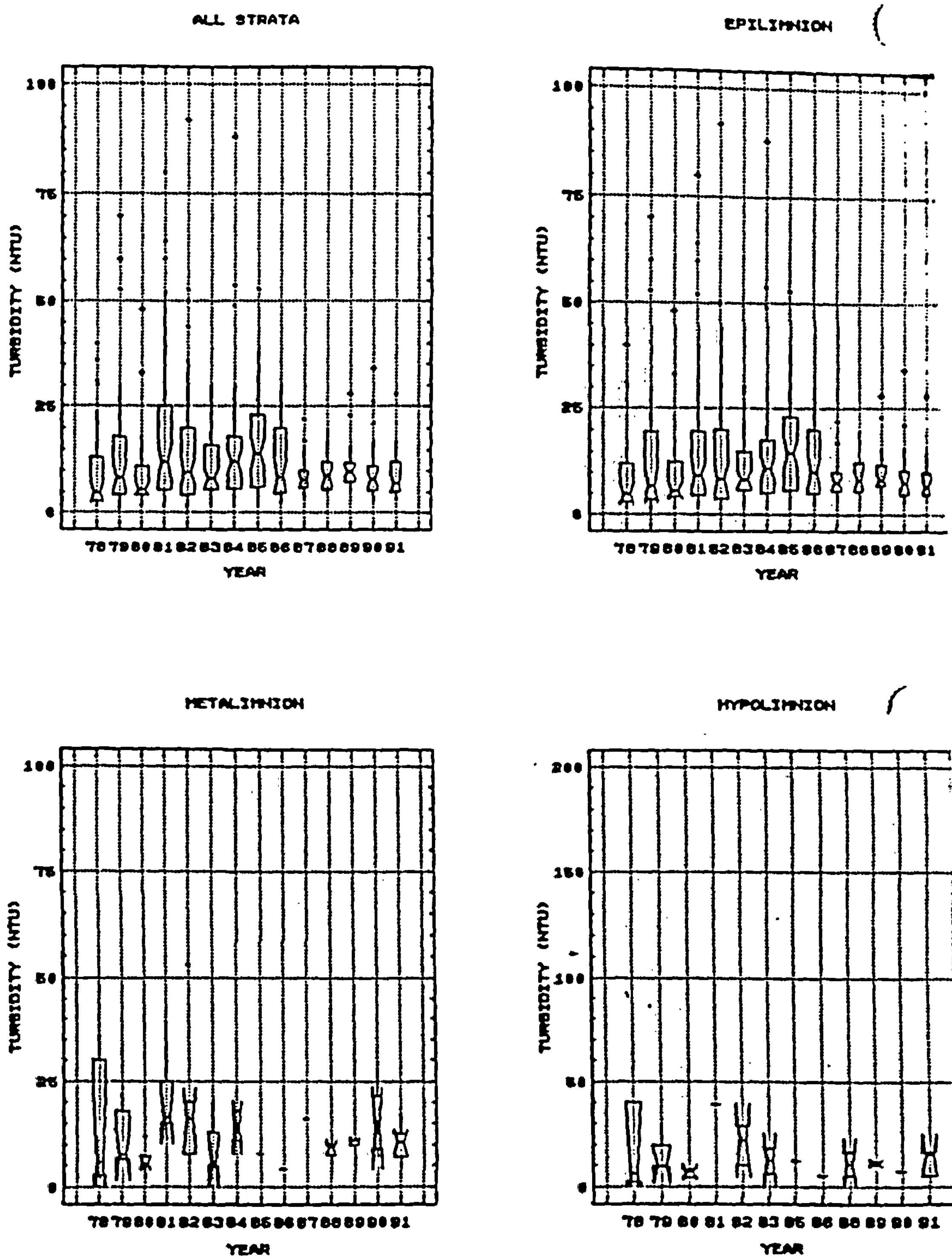


Figure 176. Yearly distributions of turbidity concentrations (NTU) in Clinton Lake for epilimnion, metalimnion, and hypolimnion strata during 1978 through 1991.

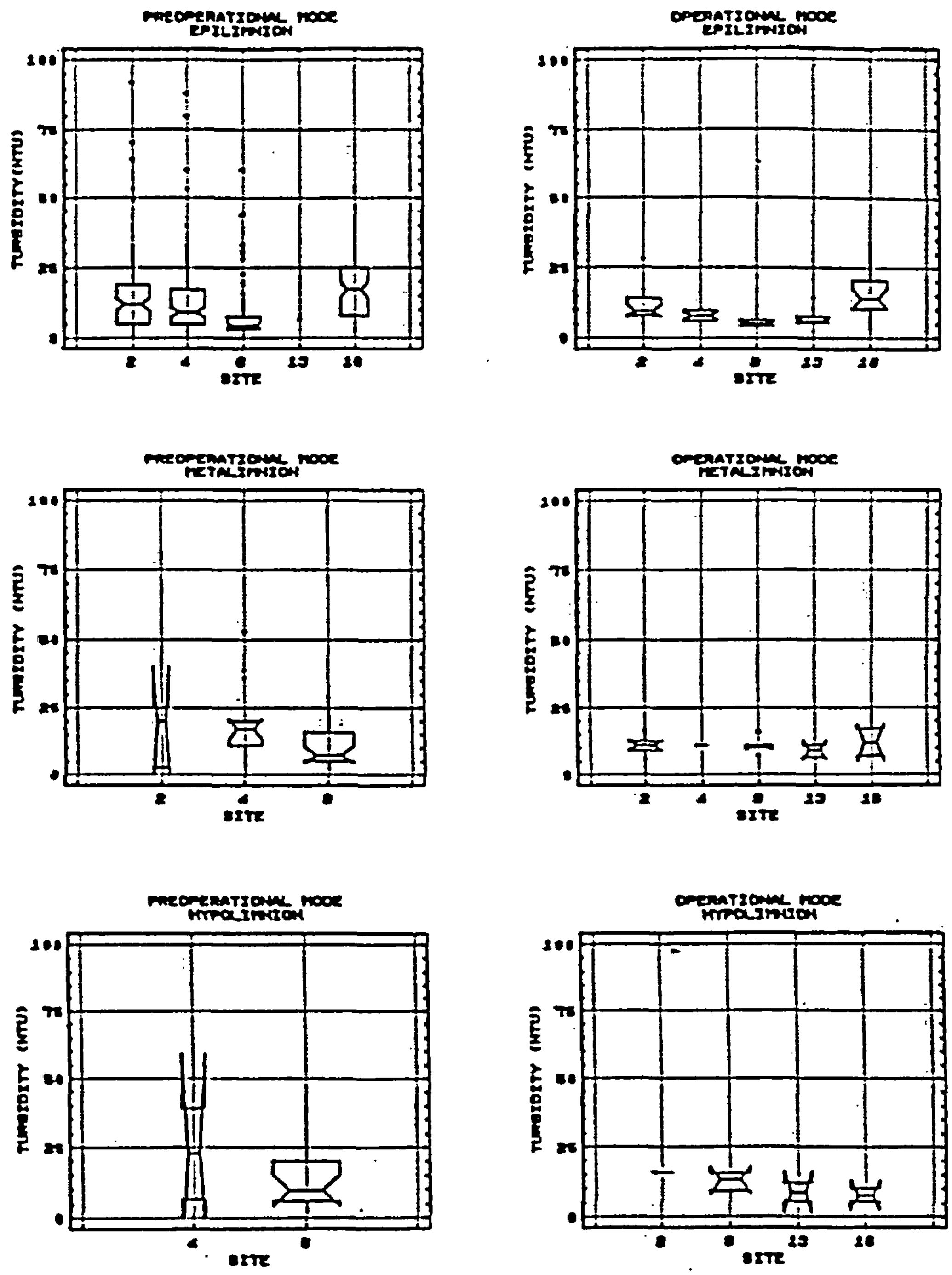


Figure 177. Distributions of turbidity concentrations (NTU) in Clinton Lake for epilimnion, metalimnion and hypolimnion strata at monitoring sites where stratification occurred.

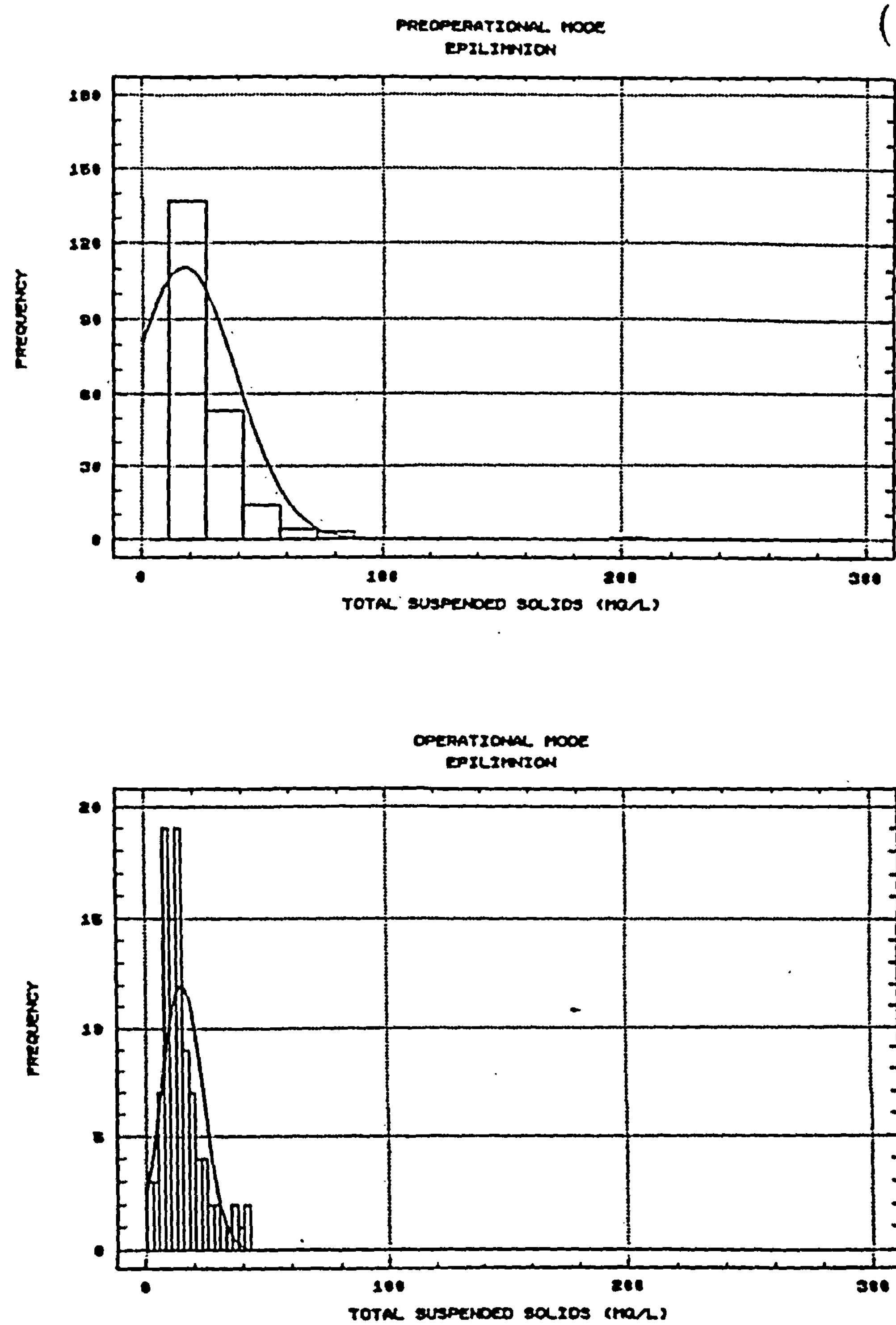


Figure 178. Frequency histogram of epilimnion total suspended solids concentrations (mg/l) in Clinton Lake during 1978 through 1991.

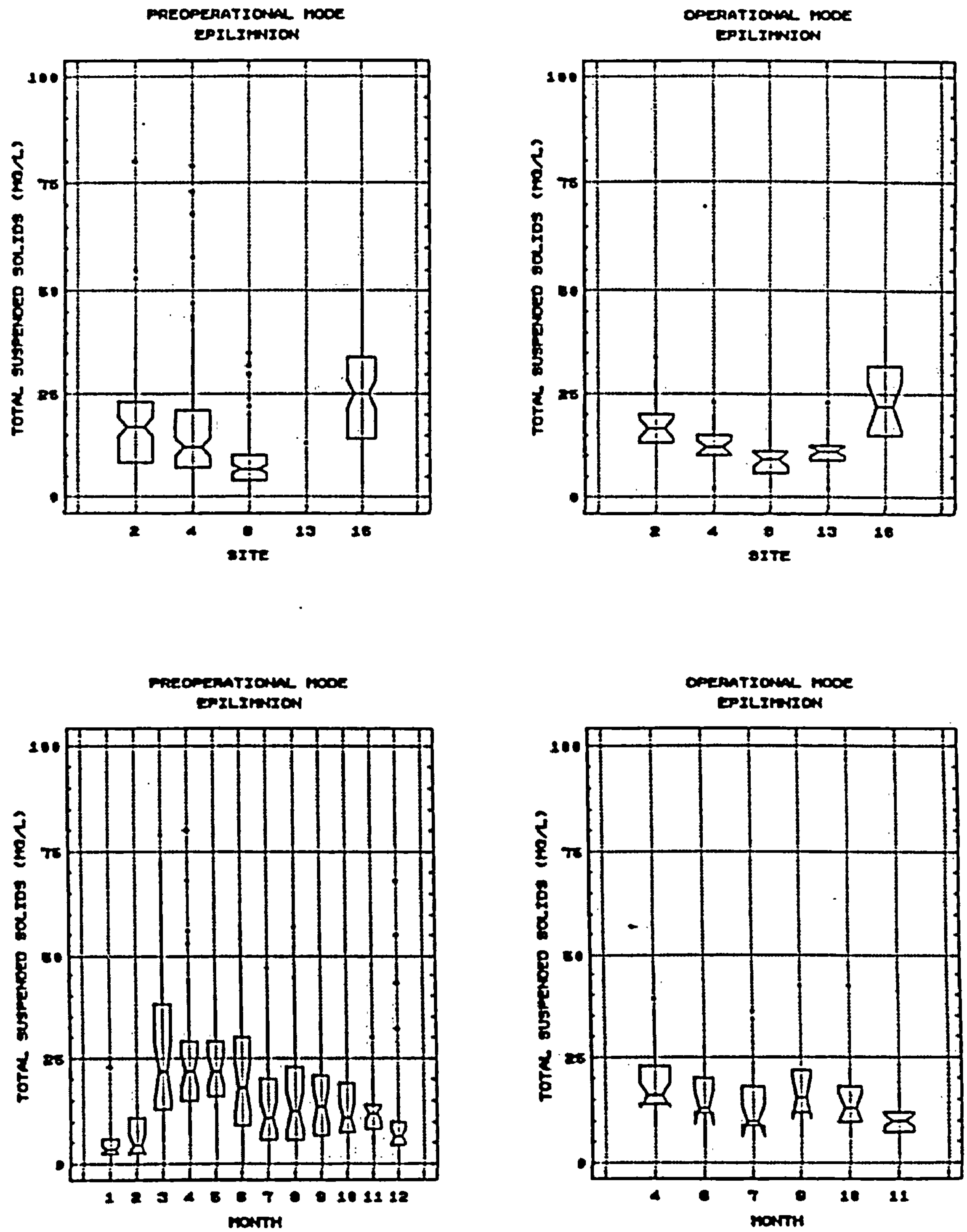


Figure 179. Distributions of total suspended solids concentrations (mg/l) in Clinton Lake for monitoring sites and months during periods prior to (Preoperational Mode) and during (Operational Mode) Clinton Power Station operation.

slightly during 1978 through 1991 (Figure 180). The IPCB has not specified a General Use water quality standard for TSS.

Total Suspended Solids During Stratification

Average TSS concentration for metalimnion was 15.9 mg/l; concentrations ranged from 1.9 to 72 mg/l. Average TSS in the hypolimnion was 16.6 mg/l and concentrations ranged from 0.8 to 43.2 mg/l. Average epilimnion TSS concentration was 8.8 mg/l. Concentrations of TSS were similar among sites and strata during preoperational and operational periods (Figure 181). Concentrations of TSS were variable among years without any apparent long term patterns in distribution (Figure 183).

8.10 Silica

Silica ranks next to oxygen in abundance in the earth's crust. Degradation of silica-containing rocks results in the presence of silica in natural waters. Most natural waters contain less than 10 mg/l silica, although some may approach 60 mg/l (Cole 1975). The solubility of silica increases as water temperatures rise. Biological use of silica may result in noticeable decreases in surface waters of lakes and reservoirs.

Epilimnion Silica

Silica averaged 2.8 mg/l in the 587 samples which were collected from 1978 through 1991. During this time silica concentrations ranged from 0.02 to 11.0 mg/l (Figure 184). Concentrations of silica were lower during the operational period (Figure 184). Solubility of silica increases directly with temperature. However, concentrations of dissolved silica Clinton Lake were typically greater during March and April and low during the remaining warmer months despite the greater solubility of silica in warmer water (Figure 185). This was probably due to the use of silica by diatom populations. Silica is an important constituent in the frustules of diatoms. Population development of diatoms such as Asterionella, Melosira, and Tabellaria is limited, at least partially by silica concentrations of 0.5 to 0.8 mg/l silica. Silica may be depleted from water during diatom "blooms". Diatom populations are typically much greater during cooler months. Decreased silica during summer months probably resulted from depletions of soluble silica by diatom populations. The minimum level of silica for diatom and algal blooms to occur is 0.5 mg/l.

Concentrations of silica decreased slightly in a down-lake direction (Figure 185). Silica concentrations for operational data (especially 1987) were lower compared to concentrations for preoperational years (Figure 186). Trend analysis indicate silica concentrations have decreased (Figure 186).

Silica During Stratification

The greatest concentration of silica (11.0 mg/l) occurred at Site 4 in December, 1982 and at Site 8 in September, 1981. Concentrations of silica in metalimnion and hypolimnion waters were greater than

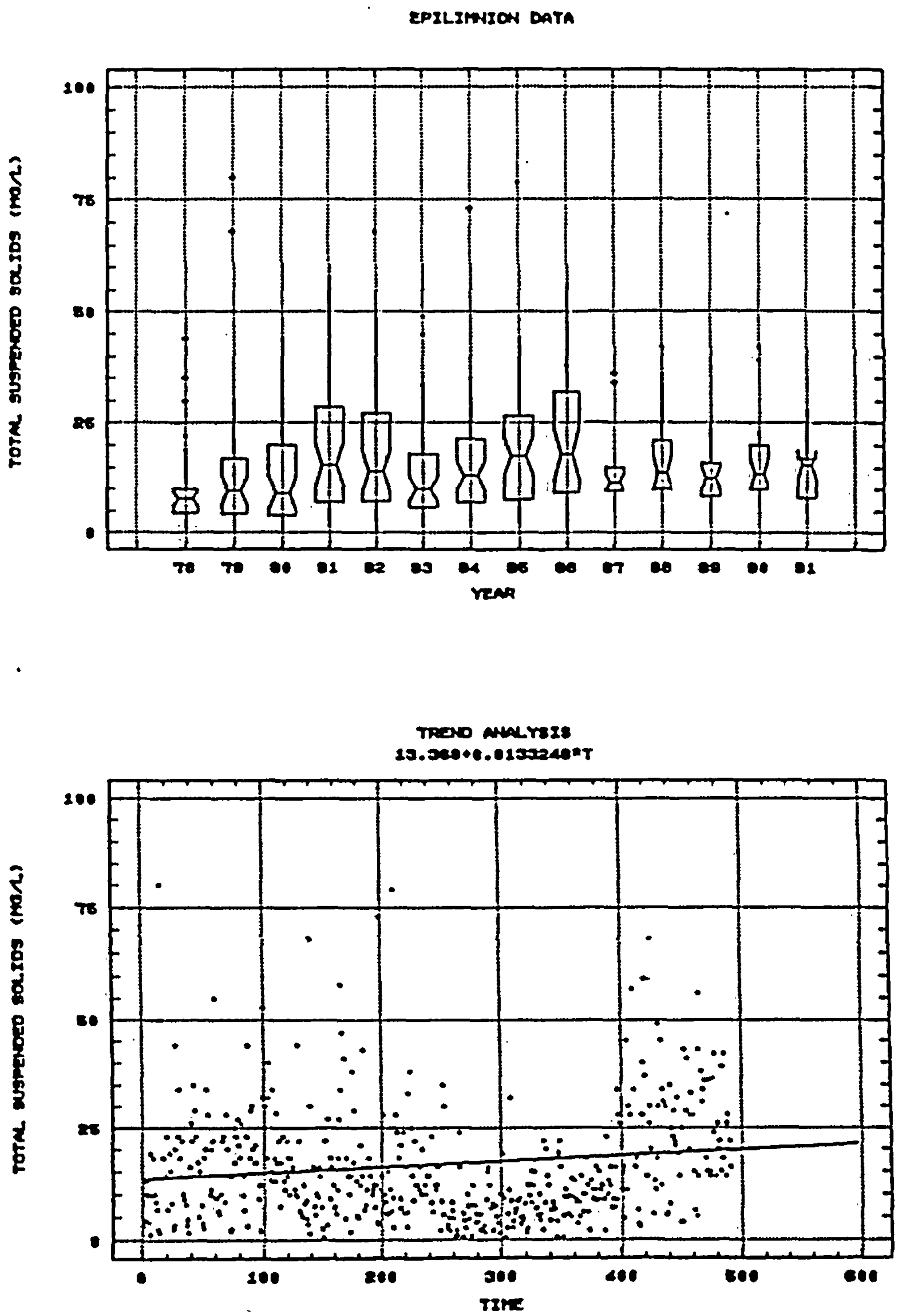


Figure 180. Yearly distributions (top graph) and trend analysis (bottom graph) of total suspended solids concentrations (mg/l) in Clinton Lake during 1978 through 1991.

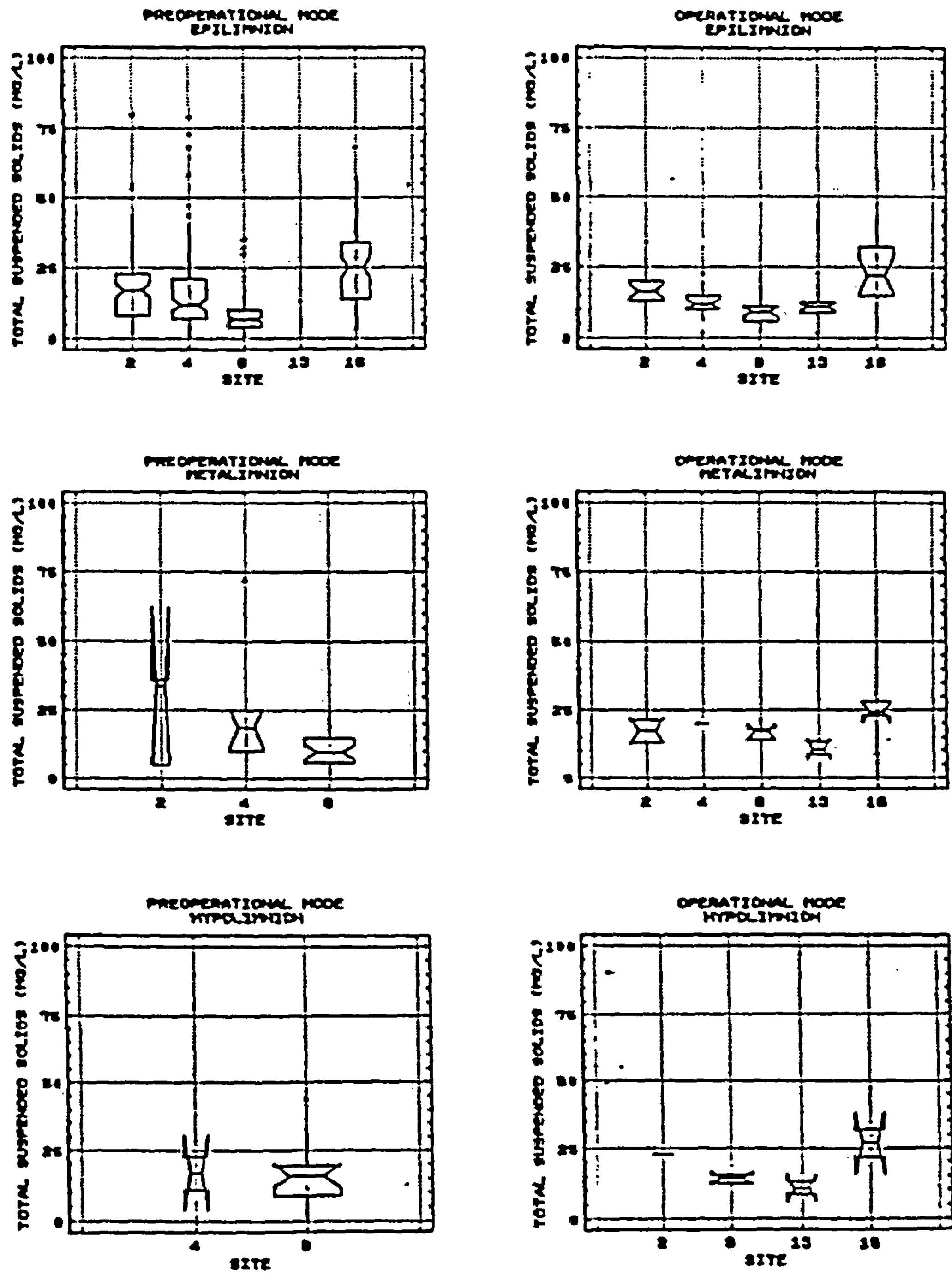


Figure 181. Distributions of total suspended solids concentrations (mg/l) in Clinton Lake for epilimnion, metalimnion and hypolimnion strata at monitoring sites where stratification occurred.

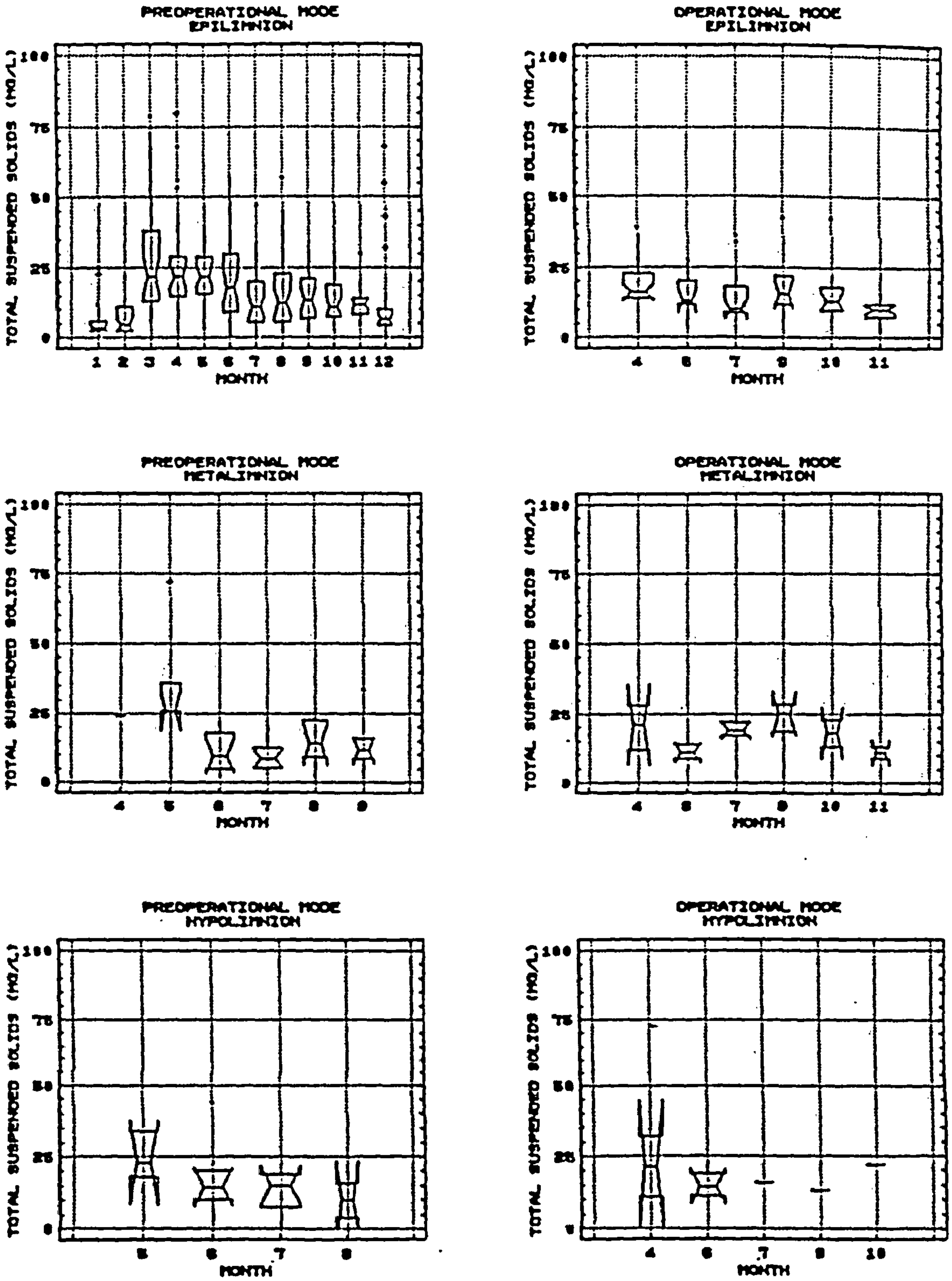


Figure 182. Monthly distributions of total suspended solids concentrations (mg/l) in Clinton Lake for epilimnion, metalimnion, and hypolimnion strata for the periods prior to (Preoperational Mode) and during Clinton Power Station operation (Operational Mode).

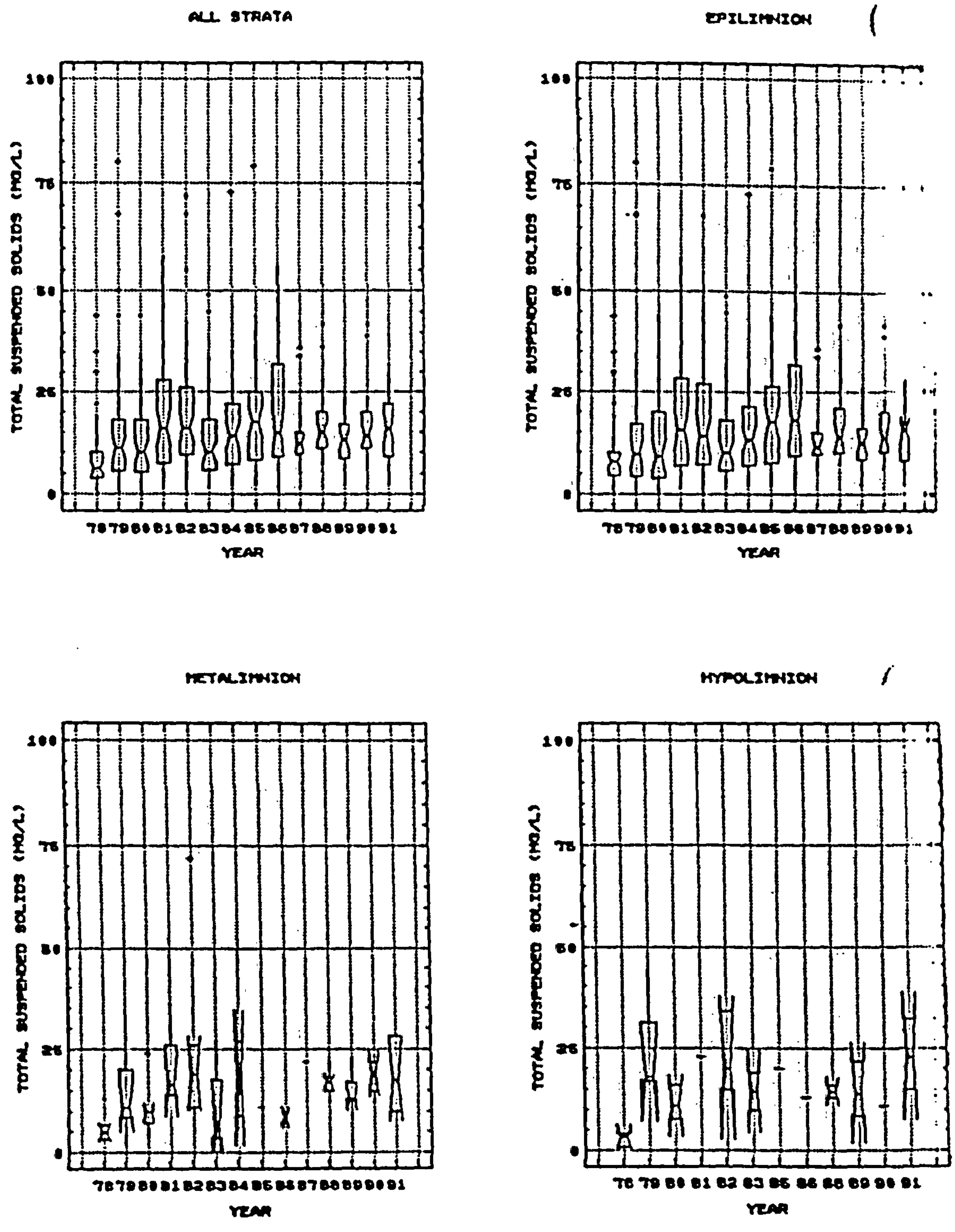
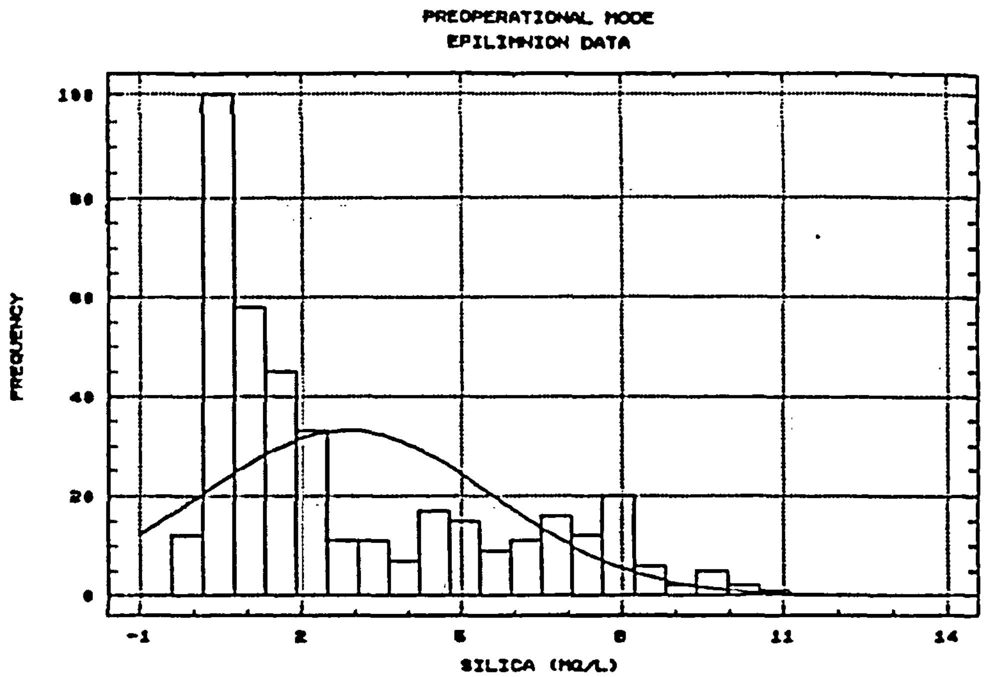


Figure 183. Yearly distributions of total suspended solid concentrations (mg/l) in Clinton Lake for epilimnion metalimnion, and hypolimnion strata during 1978 througl 1991.



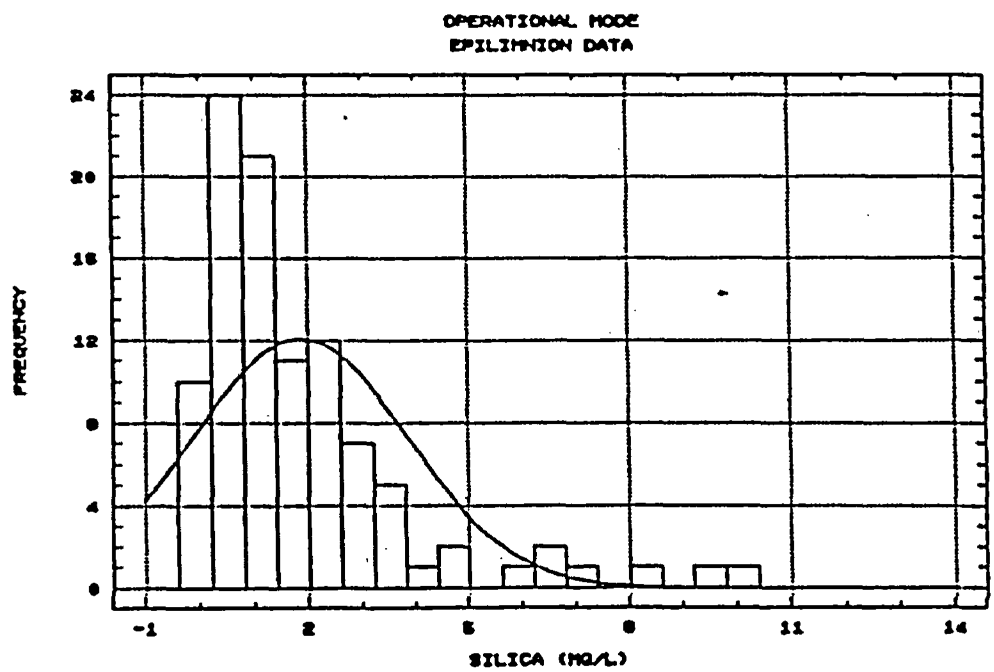


Figure 184. Frequency histograms of epilimnion silica concentrations (mg/l) in Clinton Lake during periods prior to (top graph) and during Clinton Power Station operation (bottom graph).

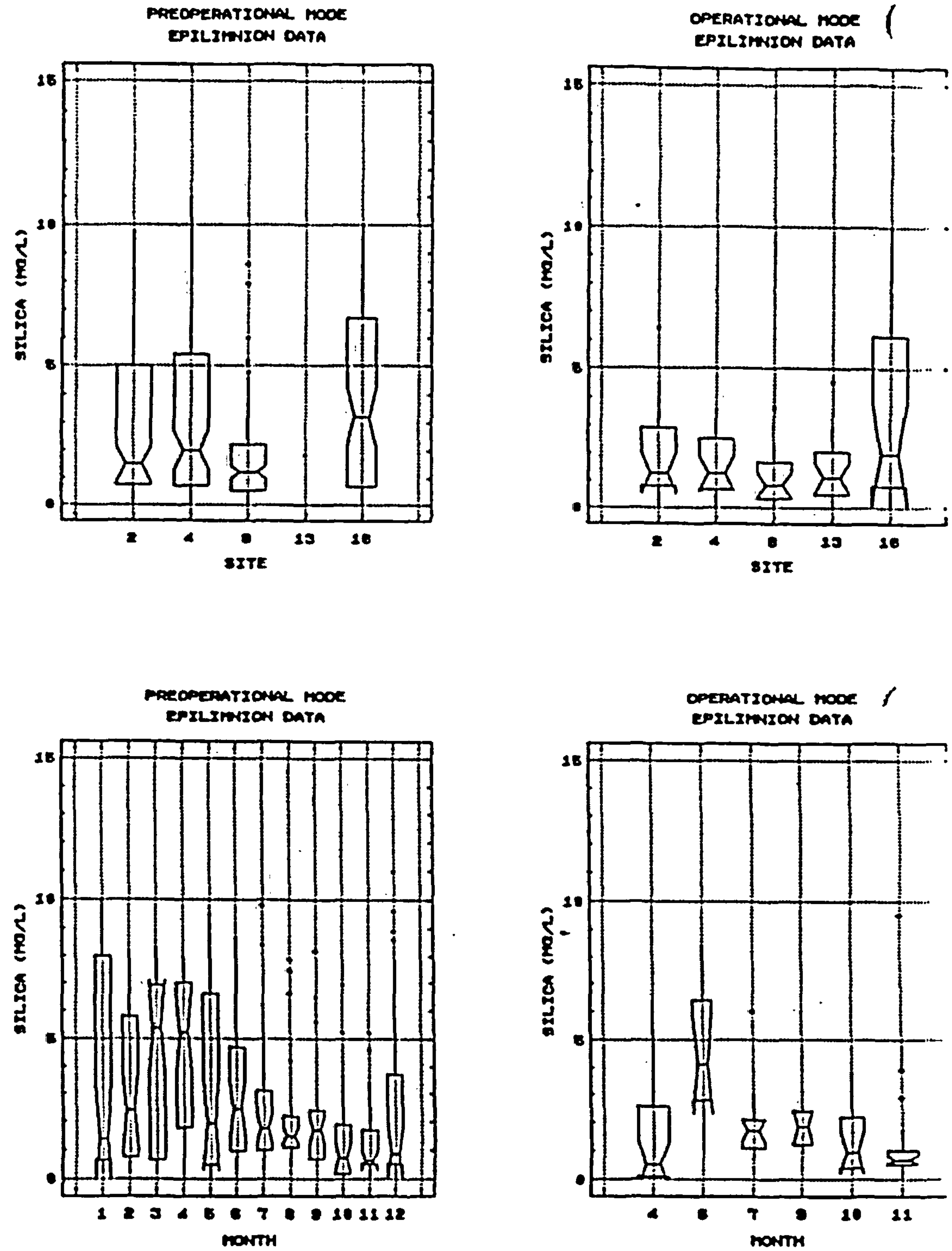
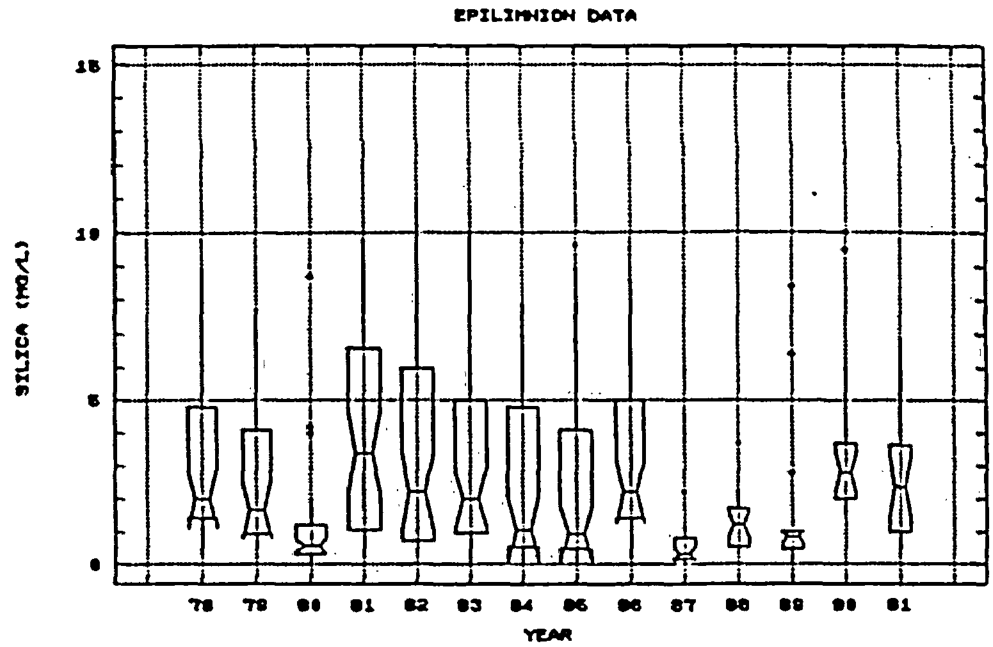


Figure 185. Distributions of silica concentrations (mg/l) in Clinton La for monitoring sites and months during periods prior (Preoperational Mode) and during (Operational Mod Clinton Power Station operation.



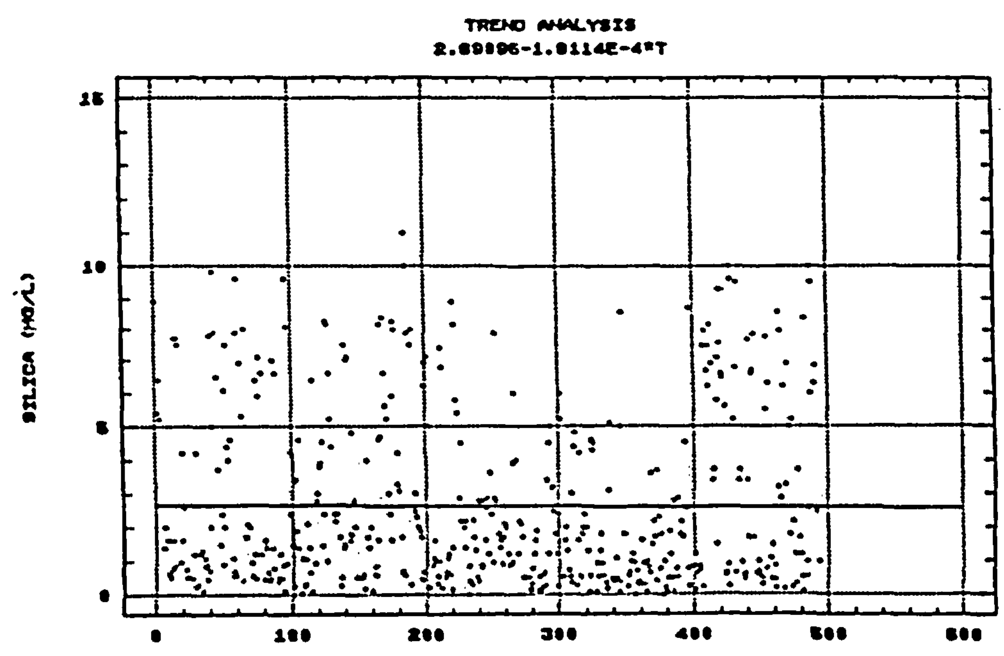


Figure 186. Yearly distributions (top graph) and trend analysis (bottom graph) of silica concentrations (mg/l) in Clinton Lake during 1978 through 1991.

concentrations in the epilimnion. Waters at depths which delimit the metalimnion and hypolimnion are not within the euphoric zone. Thus silica concentrations in the metalimnion and hypolimnion are not influenced by diatom populations as they are in the epilimnion. Concentrations were progressively greater in the metalimnion and hypolimnion. Stratification generally occurred during May through September and silica concentrations were generally greatest in metalimnion and hypolimnion waters during August and September (Figure 187). Annual distributions of silica were variable and distributions when CPS was operational (1987 through 1991) overlap annual ranges prior to CPS operation (1978 through 1986) (Figure 188). Distributions of silica data were similar among sites and strata for preoperational and operational periods (Figure 189).

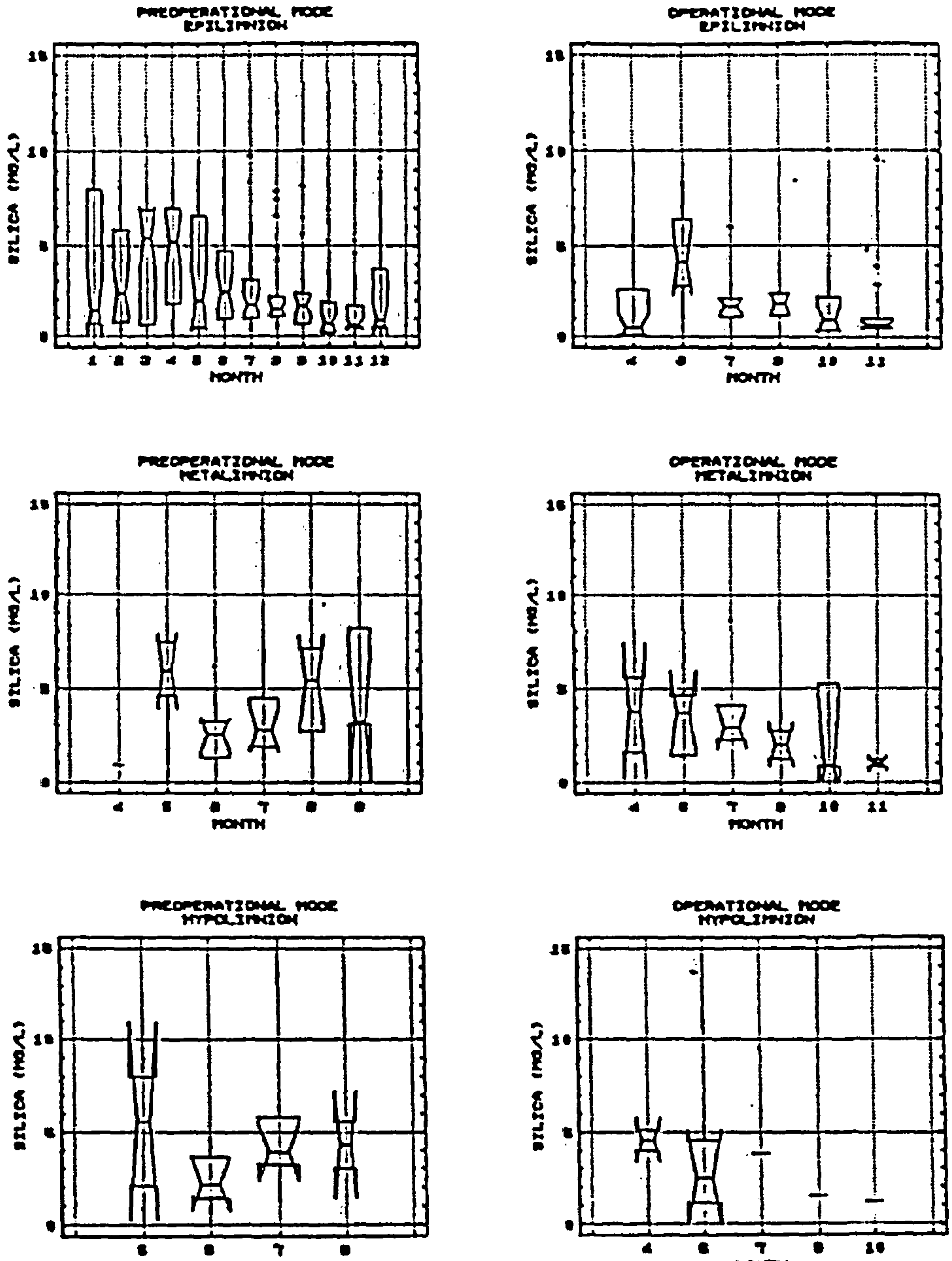


Figure 187. Monthly distributions of silica concentrations (mg/l) in Clinton Lake for epilimnion, metalimnion, and hypolimnion strata for the periods prior to (Preoperational Mode) and during Clinton Power Station operation (Operational Mode).

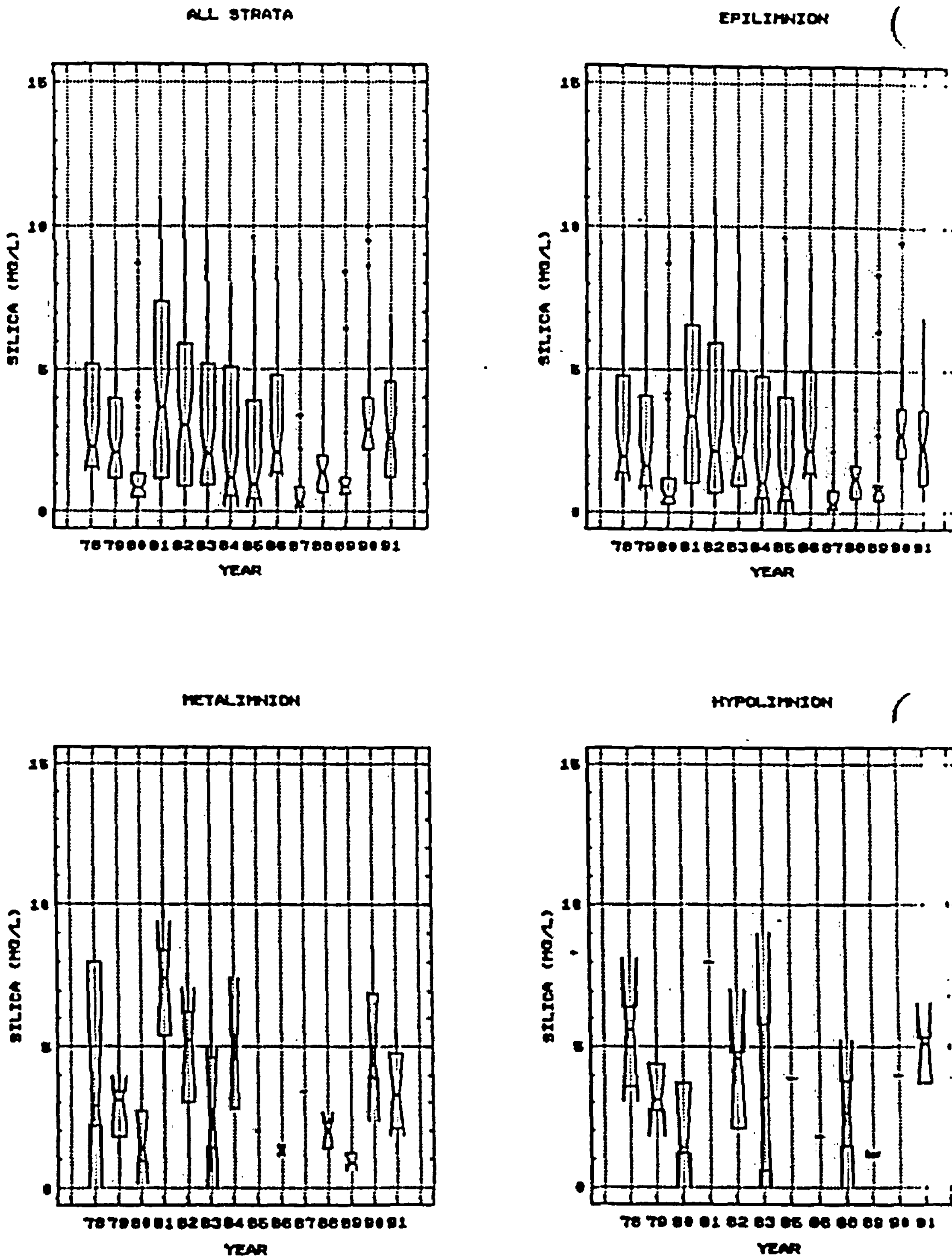


Figure 188. Yearly distributions of silica concentrations (mg/l) in Clinton Lake for epilimnion, metalimnion, and hypolimnion strata during 1978 through 1991.

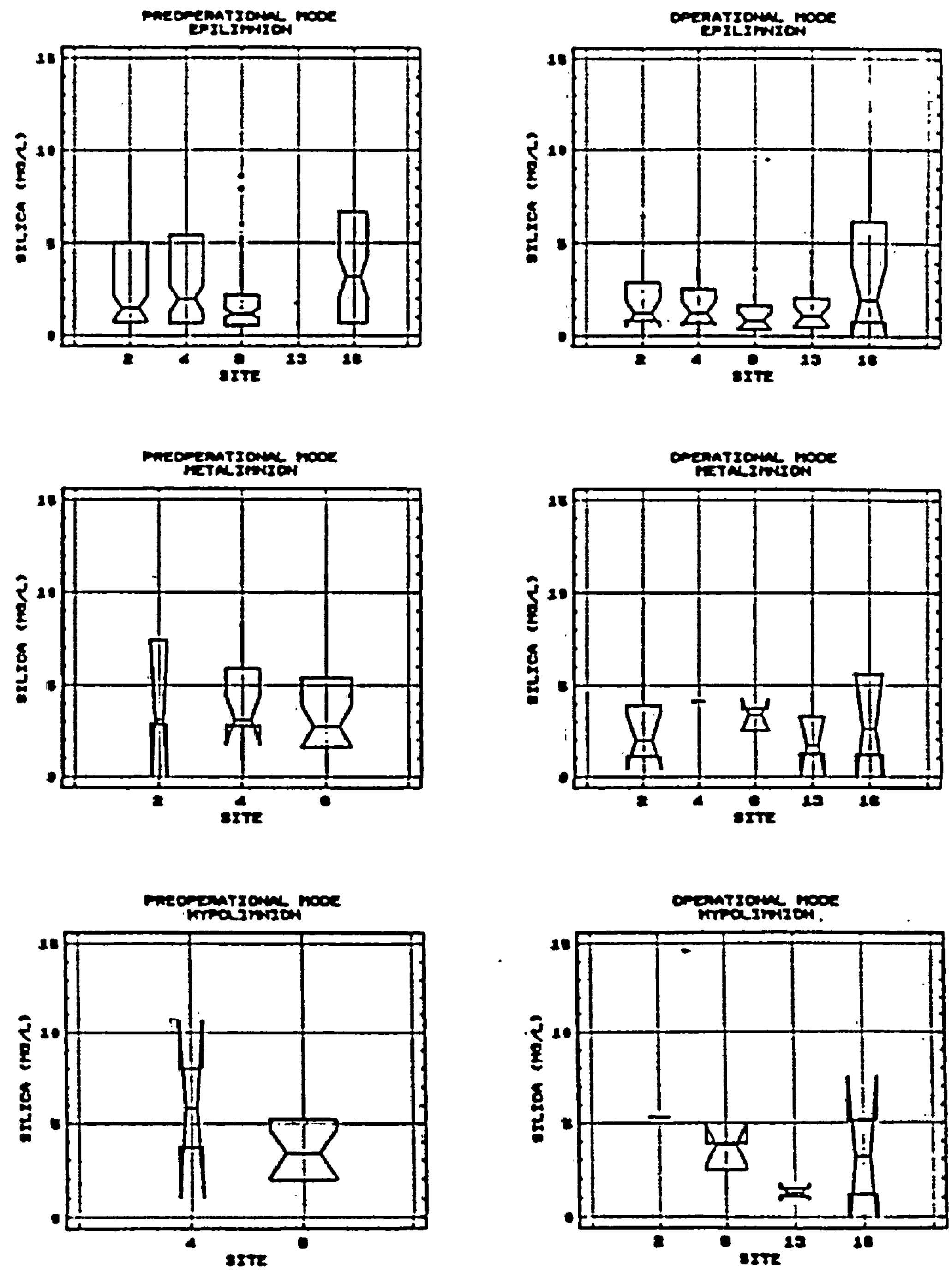


Figure 189. Distributions of silica concentrations (mg/l) in Clinton Lake for epilimnion, metalimnion and hypolimnion strata at monitoring sites where stratification occurred.

9.0 DISCUSSION

9.1 Comparisons with Other Illinois Lakes

Average values (1987 through 1991) of chemical and physical analyses were compared to determine the relative similarity of Clinton Lake with 12 other central Illinois lakes (Table 14). Data for the 12 other lakes were obtained from the STORET database developed by the EPA lake program staff (Greg Good, IEPA Division of Water Pollution Control, Springfield, IL). Results among lakes were compared using cluster analysis methods which were illustrated as dendogram plots. Cluster analyses are systematic methods used to present patterns of similarities among databases. A matrix of listwise comparisons using an index formed the basis of the cluster analyses for this comparison of Illinois lakes. A matrix of percent similarities (Pinkham and Pearson 1974) and a matrix of Chord Distance (E. C. Pielou 1984) were calculated from all listwise interlake comparisons of chemical/physical results. Unweighted pair group, average linkage method of cluster analysis was calculated for each matrix and presented as a dendogram plot to depict clustering of lakes with similar levels of chemical/physical constituents (Figure 190).

Physical/chemical constituent values for the 13 lakes used in this comparison were similar; all lakes clustered at the 74% percent similarity level. Clustering patterns varied between the two dendograms, but there were several consistencies. Carlinville and Pittsfield lakes clustered closely in both dendograms; as did Springfield and Taylorville lakes. Lake Bloomington was an outlier in both dendograms. There were three cooling lakes in this comparison; i.e. Coffeen, Sangchris and Clinton lakes. Coffeen and Sangchris lakes clustered closely in both dendograms but, collectively, they clustered with the remaining lakes as an outlying group. Clinton Lake did not cluster closely with the other two cooling lakes. Clinton Lake was most similar to Jacksonville and Lake of the Woods in the Chord Distance dendogram. Clinton Lake was most similar to Lake-of-the-Woods and Lake Decatur in the percent similarity dendogram. This procedure illustrates that the physiochemical characteristics of Clinton Lake are not unique, but are similar to other non-cooling lakes in Illinois.

9.2 Compliance with Illinois Pollution Control Board Standards

The Illinois Pollution Control Board has established State-wide General Use water quality standards for 13 of the 28 constituents which were monitored in the EMP during 1978 through 1991. The General Use water quality standards were not met for six of these constituents (Table 9).

Dissolved Oxygen

The General Use water quality standard requires DO concentrations to be greater than 5.0 mg/l at all times. There were three epilimnion samples (1%) during the preoperational period which had DO

Table 14. Comparisons of water quality constituents for Clinton Lake (1987 through 1991) and twelve other Illinois Lakes.

Lakes	Secchi (inches)	Turbidity (NTU)	TSS (mg/l)	Cond. (uhmos/cm)	Alkalinity (mg/l)	pH	Total Phos. (mg/l)	Ammonia (mg/l)	Nitrate (mg/l)
Clinton	25	13.4	18	488	164	8.0	0.086	0.12	2.69
Decatur	12	18.1	40	566	204	8.0	0.238	0.12	2.21
Bloomington	25	5.8	18	487	155	8.1	0.065	0.10	4.37
Carlinville	14	15.7	18	393	125	8.0	0.102	0.13	0.40
Argyle	72	7.5	4	333	126	8.4	0.050	0.22	0.20
Jacksonville	34	5.8	12	390	148	8.0	0.041	0.12	2.38
Pittsfield	20	9.2	20	329	150	8.0	0.106	0.17	0.30
Weldon Springs	76	4.0	10	403	146	8.2	0.094	0.12	0.78
Taylorville	15	14.5	25	491	131	8.6	0.159	0.10	1.23
Springfield	16	10.6	23	461	142	8.7	0.191	0.12	1.91
Lake of the Woods	43	3.2	7	472	199	8.1	0.066	0.12	0.12
Coffeen	42	2.4	12	648	76	7.9	0.170	0.25	0.15
Sangchris	33	2.9	10	785	118	8.2	0.040	0.30	1.48
AVERAGE	33	8.7	16.7	480	145	-	0.113	0.14	1.32

a Data obtained from STORET Database provided by G. Good, IEPA – Division of Water Pollution Control, Springfield

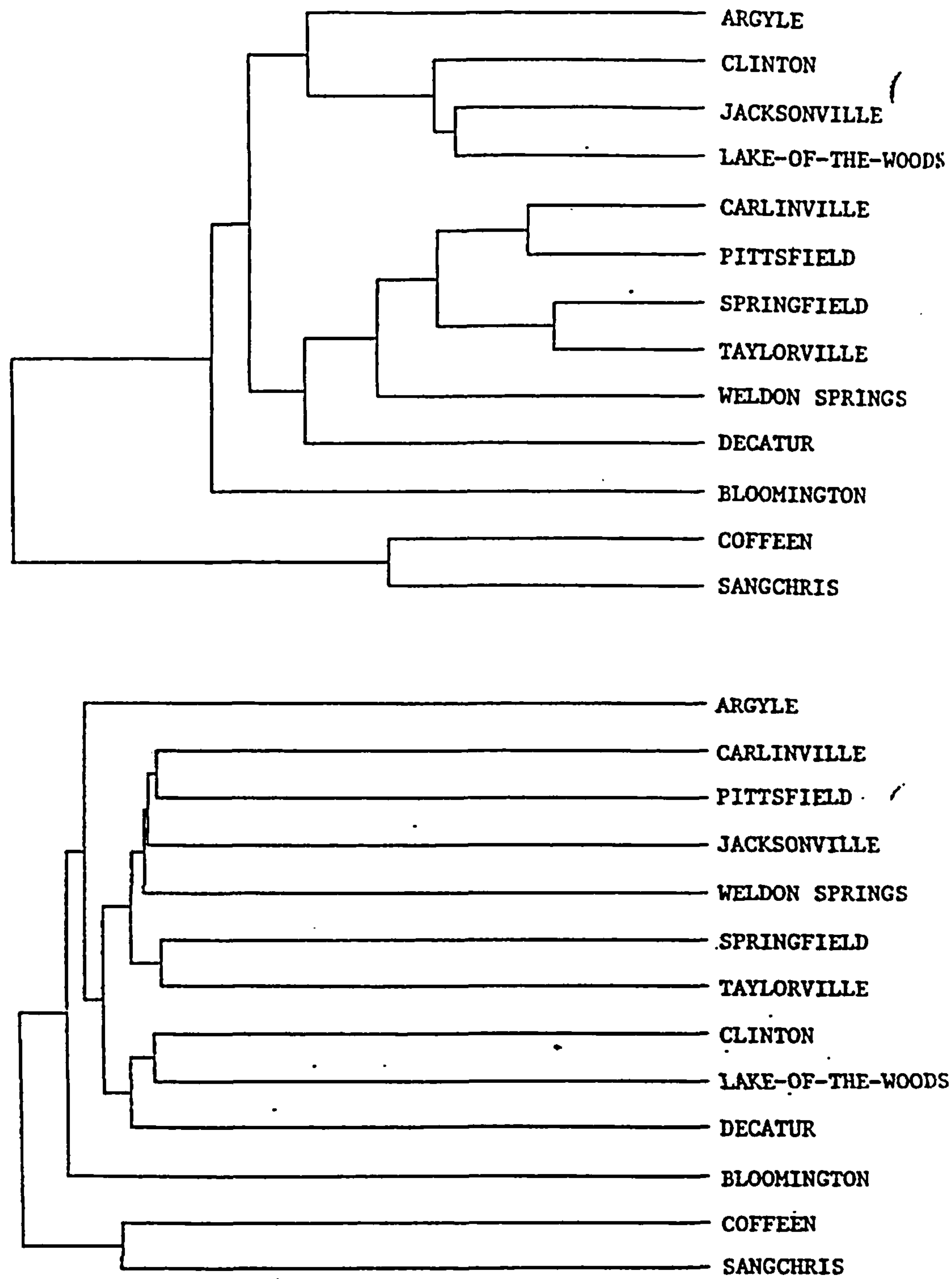


Figure 190. Dendograms illustrating results of average linkage method of cluster analyses of Pinkham-Pearson similarity matrix performed on water quality data for 14 Illinois lakes.

concentrations less than 5.0 mg/l (Table 9). These three samples were collected during 1983 (Table 15).

The General Use standard for DO was not met for 12, 3, and less than 1% of the samples collected during 1987, 1988, and 1991 respectively (Table 15). All DO determinations were within the General Use standards during 1989 and 1990. The slightly greater frequency of epilimnion DO concentrations that did not meet the General Use standard during the operational period was probably related to increased water temperatures.

The volumes of water which had concentrations of DO less than 5.0 mg/l were calculated from depth profile data determined during the operational years (1987 through 1991) (Table 16). Determinations were made for the warmest months of the year; i.e. May through September. During each year the largest percent volume less than 5.0 mg/l occurred during either August (1987 through 1990) or September (1991). The greatest volume of water which had DO concentrations less than 5.0 mg/l during the operational period occurred in September, 1991. This volume (23,518,291 m3) represented 41% of the total volume of Clinton Lake.

Most Illinois lakes have depleted DO in bottom waters during summer, even without thermal stratification (Sefton et al. 1980). Drew and Tilton (1970) reported that it is not uncommon for reservoirs to have as much as 50% of their total volume that is not capable of supporting aerobic aquatic communities.

pH

The General Use water quality standard requires pH to be maintained between 6.5 and 9.0. This standard was not met for one sample during the preoperational period (Tables 9 and 15). This occurred at Site 2 in June, 1983, when the pH was 6.4. All samples monitored for pH during the operational period satisfied the General Use water quality standard for pH (Table 15).

Nitrate

The General Use water quality standard for nitrates is 10 mg/l. Six epilimnion samples (1%) had nitrate concentrations which exceeded the standard (Table 9). All six samples were collected during the preoperational period (Table 15). Exceedances were probably due to run-off from agricultural fields in the Salt Creek and North Fork basins.

Total Phosphorus

The General Use water quality standard for total phosphorus was exceeded in 73% of the epilimnion samples collected during 1978 through 1991. Annual exceedances ranged from 44 through 93% of the samples. There was no apparent pattern in the distribution of exceedances among years (Table 15). Exceedances of the phosphorus standard in surface waters occurred in 62% of the lakes and reservoirs in Illinois which were surveyed by Sefton et al. (1980). High concentrations of phosphorus in surface waters of Illinois lakes and reservoirs is attributed to run-off

Table 15. Percentages of annual observations from epilimnion samples collected from Clinton Lake where data were not within General Use water quality standards set by the Illinois Pollution Control Board.

	Preoperational Years (b)									Operational Years (c)				
Parameter	78	79	80	81	82	83	84	85	86	87	88	89	90	91
Dissolved Oxygen	0	0	0	0	0	6.2	0	0	0	12.5	2.9	0	0	<1
pH	0	0	0	0	0	2.1	0	0	0	0	0	0	0	0
Total Dissolved Solids	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chloride	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sulfate	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ammonia	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nitrate	0	0	0	4.2	2.1	4.2	0	0	2.4	0	0	0	0	0
Total Phosphorus	44	53	52	69	71	73	71	75	93	77	86	87	92	83
Copper	0	0	0	0	0	0	0	0	0	0	0	–	–	–
Lead	0	0	0	0	0	0	0	0	0	0	0	–	–	–
Mercury	8.6	8.3	20.4	10.4	6.5	2.1	2.1	0	0	0	0	0	0	0
Zinc	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fecal Coliforms	11.1	0	0	6.2	6.2	2.1	2	4.2	0	–	–	–	–	–

(a) 35 Ill. Adm. Code Subtitle C, Chapter I.
(b) Preoperational Years refers to data which were collected prior to the operation of the Clinton Power Station
(c) Operational Years refers to data which were collected during years when Clinton Power Station was operational.
(d) Dash (–) indicates datum was not determined.

Table 16. Volumes of water (cubic meters) in Clinton Lake and the corresponding percentages of the total volume of Clinton Lake that had dissolved oxygen concentrations less than 5.0 mg/l during 1987 through 1991.

YEAR/MONTH	LAKE WATER VOLUME (CUBIC METERS)	PERCENT VOLUME LESS THAN 5 MG/L
1987		
MAY	10,482,495	7.63
JUNE	28,656,947	20.85
JULY	19,926,094	14.50
AUGUST	55,778,033	40.59
SEPTEMBER	29,249,436	21.29
1988		
JUNE	20,883,149	15.20
JULY	31,277,120	22.76
AUGUST	39,942,382	29.07
SEPTEMBER	18,409,507	13.40
1989		
JUNE	10,753,075	7.83
JULY	26,184,524	19.06
AUGUST	42,469,472	30.91
SEPTEMBER	9,951,356	7.24
1990		
MAY	3,576,008	2.60
JUNE	19,563,651	14.24
JULY	16,814,416	12.24
AUGUST	34,873,170	25.38
SEPTEMBER	1,603,441	1.17
1991		
MAY	14,972,130	10.90
JUNE	21,001,735	15.28
JULY	14,521,163	10.57
AUGUST	21,820,159	15.88
SEPTEMBER	56,848,662	41.37

from agricultural lands (Sefton et al. 1980). Excessive concentrations of nutrients is one of the factors which cause lakes in the Sangamon and Illinois river basins to fail attainment of goals for use support (IEPA 1988).

Mercury

The General Use water quality standard for mercury is 0.5 ug/l. This standard was exceeded in 33 epilimnion samples (1.4%) collected from Clinton Lake during 1978 through 1991 (Table 9). All of the epilimnion mercury exceedances occurred from 1978 through 1984 during the preoperational period. There is no apparent reason for the greater concentrations of mercury during 1978 through 1984. Exceedances may have been due to sampling or analytical errors. These sources of error are supported by the distribution of results. Exceedances were not consistent among strata or over preceding and succeeding sampling events.

Concentrations of mercury in fish flesh and lake bottom sediments are generally within respective guidelines or classifications (Table 17) and do not suggest mercury contamination in Clinton Lake. One fish flesh sample for tiger muskellunge collected in 1981 contained mercury above the FDA guideline (0.5 mg/kg) (Table 17). Sediment samples were collected by the IEPA from three sites in Clinton Lake during August, 1988 and analyzed for mercury. Concentrations of mercury in these samples ranged from 0.04 to 0.06 mg/kg (IEPA 1988).

Mercury has been detected above the LOD only once during the period since CPS became operational. This sample was collected from the hypolimnion at Site 16 during October, 1989.

Fecal Coliforms

The General Use water quality standard for fecal coliforms is 200/100 ml. This standard was exceeded for 14 samples (4%) collected from 1978 through 1986 (Table 15). Ratios of fecal coliform:fecal streptococcus suggest the fecal contamination is not from human sources. Samples were not analyzed for fecal coliforms during the period when CPS was operational (1987 through 1991).

9.3 Trophic State Index

Carlson's Trophic State Index (TSI) (Carlson 1977) was used to determine spatial and temporal trophic relationships within Clinton Lake, and also to compare the trophic status of Clinton Lake with 12 other lakes in Illinois. Secchi disc and chlorophyll a determinations for Clinton Lake were obtained from the Biological Programs Section (BPS) of IP's Environmental Affairs Department. The BPS is responsible for the Biological EMP for Clinton Lake. Data from other lakes in Illinois were obtained from STORET database developed by the IEPA lake program staff (Greg Good, IEPA Division of Water Pollution Control, Springfield, IL).

Table 17. Concentrations of mercury (mg/kg) in fish flesh from samples of eight fish species collected from Clinton Lake, Clinton, Illinois.

Species Analyzed	1981(a)	1981(b)	1982(b)
Channel Catfish	ND(c)	0.07	0.07
Largemouth Bass	0.19	0.09	0.12
White Crappie	0.03	0.04	0.03
Carp	ND	0.09	0.10
Bigmouth Buffalo	ND	0.06	ND
Walleye	0.26	0.05	0.07
Tiger Musky	0.74	0.09	0.12
Hybrid Striped Bass	ND	0.07	ND

(a) From Illinois Power – Field Biology Section samples – analyzed by Analytical Biochemistry Laboratories, Columbia, Missouri.
(b) From IDOC samples analyzed by Illinois Department of Agriculture.
(c) ND Indicates No Data.

The mean TSI value for Clinton Lake, 65.91, characterizes Clinton Lake as eutrophic (Table 18). Most Illinois lakes are eutrophic (58%) to hypereutrophic (35%); only a few lakes are considered mesotrophic (and oligotrophic (<1%) (IEPA 1988). The mean TSI for 69 Illinois la sampled in 1979 was 65.2; TSI values ranged from 43.6 to 90.3 (Sefton et al. 1980).

Mean Clinton Lake TSI values were 66.12 for Secchi transparency. 68.17 for total phosphorus, and 63.35 for chlorophyll a (Table 19). These TSI values were somewhat greater than the mean TSI values for the 69 Illinois lakes sampled in 1979 (Sefton et al. 1980). Mean values for these 69 lakes were 65.3 for secchi disc, 63.2 for total phosphorus, and 63.7 for chlorophyll a.

The slightly lower TSI value for chlorophyll a in Clinton Lake may be indicative of limited algal production due to light attenuation from suspended inorganic material.

Plots of TSI values by site indicate index values were typically greatest at Site 16 (Figure 191). Site 16 is the nearest to the influence of Salt Creek and is the shallowest Clinton Lake sampling site. Greater TSI values at Site 16 may be reflective of lower Secchi transparency due to wind-induced suspension of silt/clay sediments and greater nutrient concentrations from run-off from agricultural lands in the Salt Creek drainage basin.

There is a tendency for TSI values to decrease as waters are carried downlake. On the Salt Creek arm of Clinton Lake, the TSI values consistently decrease from Site 16, to sites 2, 13, and 8. Site 8 is in the deepest part of Clinton Lake, near the dam, and is furth from tributary inflow. The same downlake decreasing pattern is evide on the North Fork arm of the lake where Site 4 consistently has greater TSI values than Site 8.

Mean annual values for chlorophyll a, Secchi transparency and total phosphorus TSIs were plotted to determine relationships in trophic states among years (Figure 192). Typically, the trophic status increases during the initial few years after a reservoir has been formed (Drew and Tilten 1980). This is apparent from the distribution of TSI values for Clinton Lake from 1978 through 1981 (Figure 192). After the initial years, the trophic status tends to stabilize. It appears that the trophic level for Clinton Lake was in the process of stabilization by 1983 since there is no consistent chronological pattern in the distribution of TSI values from 1983 through 1991 (Figure 192).

Distributions of TSIs for total phosphorus and Secchi transparency are more similar to each other than they are to TSIs for chlorophyll a (Figure 193). Secchi transparency in Clinton Lake is probably more reflective of suspension of clay and silt sediments (as represented by total suspended solids) than of algal concentrations, as represented by chlorophyll a (Figure 194). The similarity in the distributions of TSIs for Secchi transparency and phosphorus may be due to the low solubility of phosphorus and the propensity of phosphorus to adsorb to particles.

Table 18. Lake trophic classification using the Trophic State Index for Secchi transparency (m). total phosphorus (mg/l), and chlorophyll a (ug/l).

Trophic State	TSI	Secchi Disc (m)	Total Phosphorus (mg/l)	Chlorophyll a (ug/l)
Oligotrophic	<40	>3.67	<0.012	<2.5
Mesotrophic	>40<50	>2.00<3.67	>0.012<0.025	>2.5<7.5
Eutrophic	>50<70	>0.455<2.00	>0.025<0.100	>7.5<55
Hypereutrophic	>70	<0.455	>0.100	>55

(a) Carlson, R.E. 1977. A Trophic State Index for Lakes. Limnol. Oceanogr. 23:361-369.

Table 19. Summary of Trophic State Index values for Secchi transparency, total phosphorus, and chlorophyll a data from Clinton Lake, Clinton, Illinois.

Parameter	Mean Value	Mean TSI	Trophic Status
Secchi Disc	0.65 m	66.12	Eutrophic
Phosphorus	0.085 mg/l	68.17	Eutrophic
Chlorophyll	29.8 ug/l(b)	33.35	Eutrophic
Mean	-	55.86	Eutrophic

(a) Carlson, R.E. 1977. A Trophic State Index for Lakes. Limnol. Oceanogr. 23:361-369.
(b) Average of Chlorophyll concentrations during 1983 through 1991.

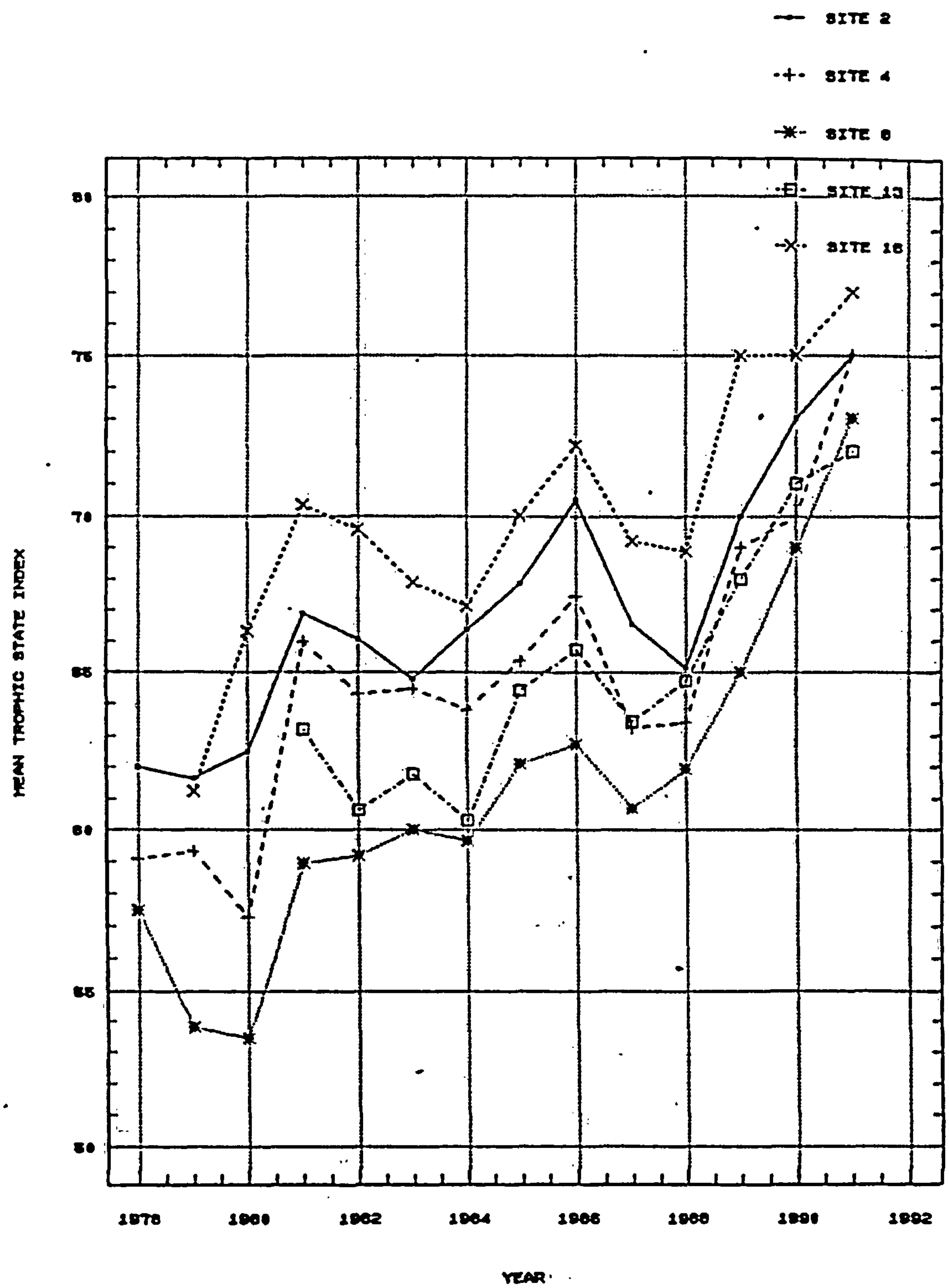


Figure 191. Mean annual Trophic State Index values for Clinton Lake sampling sites during 1978 through 1991.

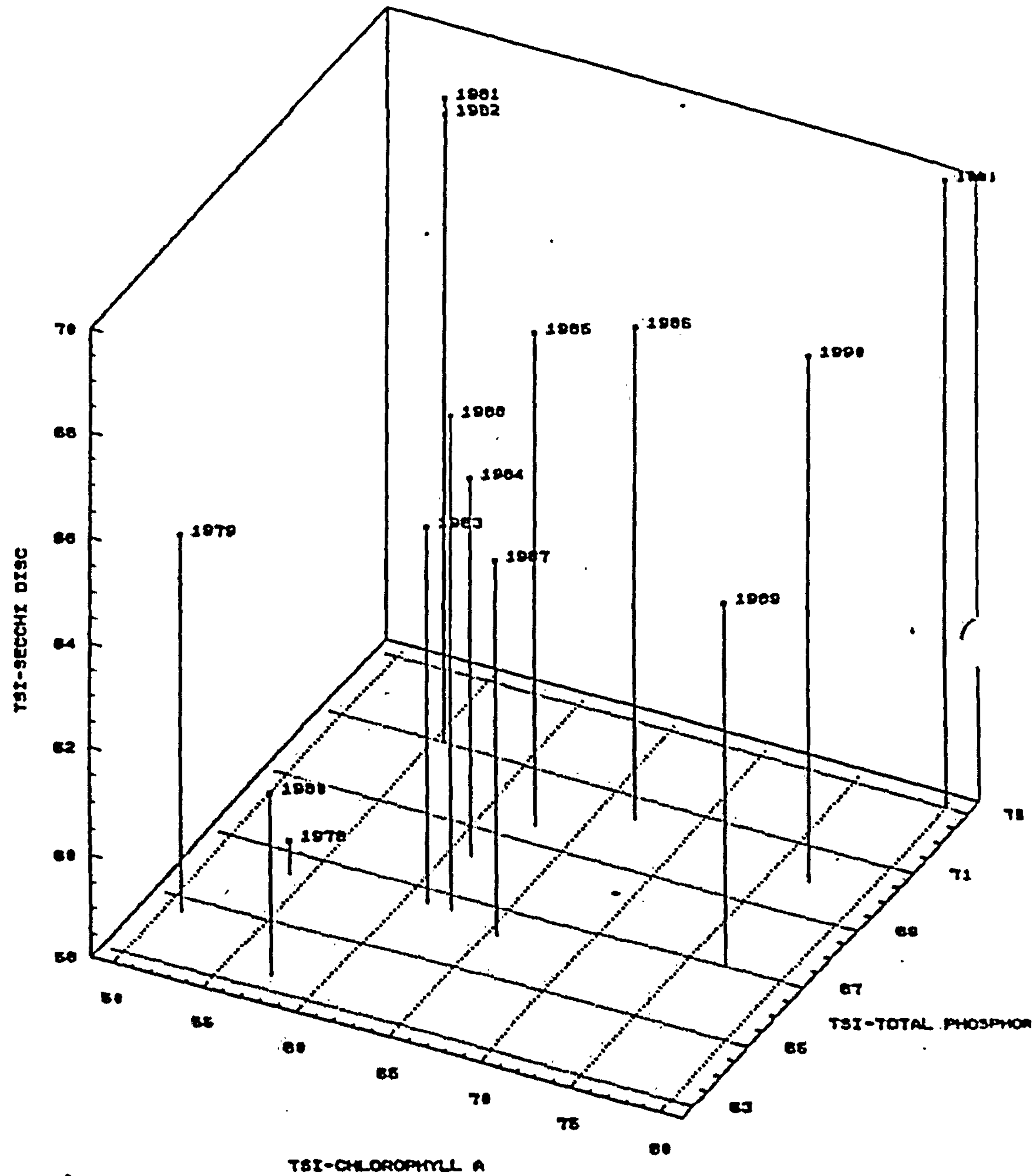


Figure 192. Plots of mean annual Trophic State Index values for Secchi transparency (y axis), total phosphorus (x axis) and chlorophyll a (z axis) for Clinton Lake during 1978 through 1991.

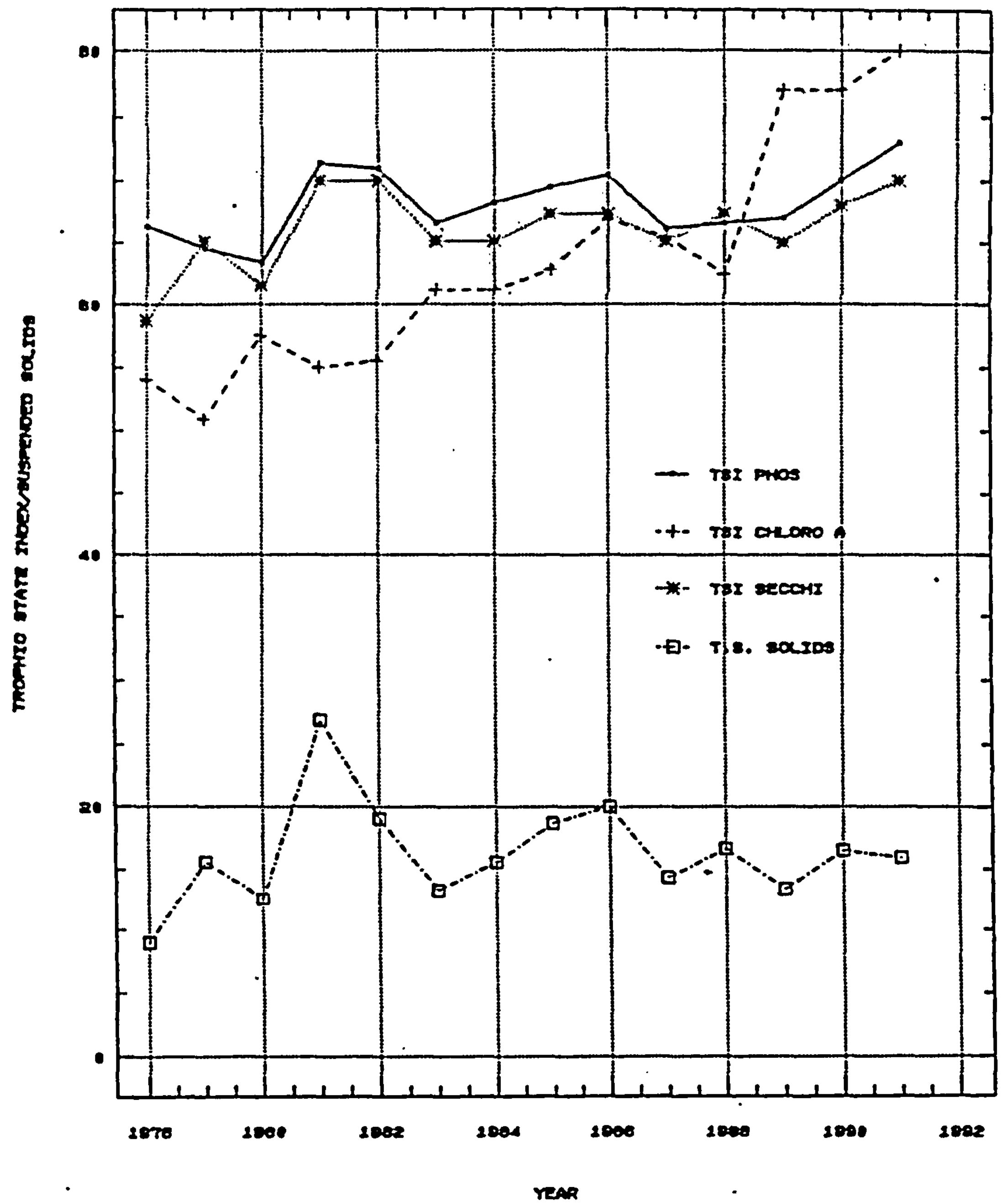


Figure 193. Plots of mean annual Trophic State Index values for total phosphorus, chlorophyll a, Secchi transparency, and mean annual concentrations of total suspended solids (mg/l) for Clinton Lake during 1978 through 1991.

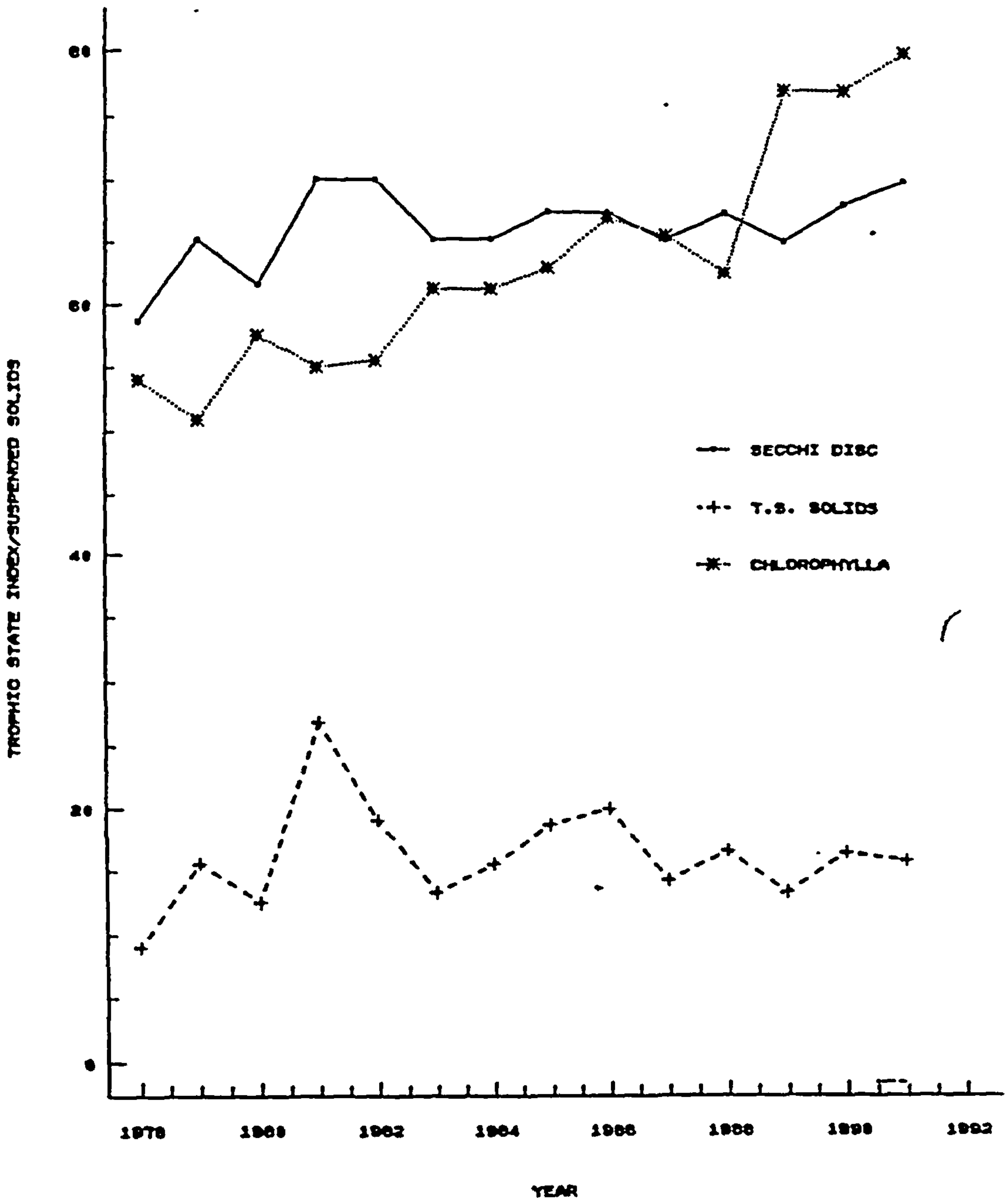


Figure 194. Plots of mean annual Trophic State Index values for Secc[h]i transparency and chlorophyll a and mean annu[al] concentrations of total suspended solids (mg/l) for Clinto[n] Lake during 1978 through 1991.

The trophic states of Clinton Lake were compared to those from 12 other Illinois lakes (Figures 195 and 196). These lakes are listed in a order based on their average TSI values in Table 20. Clinton Lake was ranked sixth based on average TSI among the 13 Illinois lakes. Plots of TSI values are illustrated for each lake in Figure 196. Coordinates for each lake represent the combined trophic state for each lake and spaces among coordinates are indicative of trophic state differences among lakes.

Variability among Secchi disc TSIs limits their contribution to the interpretation of trophic states among lakes. Plots of TSIs for chlorophyll a and total phosphorus provide a better comparison of trophic states among lakes (Figure 197). Coordinates of TSI values placed Clinton Lake near the middle of the range of values for the twelve other Illinois lakes.

Regressions of Clinton lake TSI values for Secchi disc, chlorophyll a and total phosphorus are compared in Figure 198. The best regression occurred for total phosphorus and Secchi disc TSIs (r = 0.782). This was because of the relationship of total phosphorus and Secchi transparency to suspended solids, not to chlorophyll a. This also occurred for 69 other Illinois lakes (Sefton et al. 1980). The correlation between total phosphorus and chlorophyll a (r = 0.4159) indicated the potential for algal growth is inhibited, probably by light attenuation from inorganic suspended materials. The greater than expected Secchi TSIs relative to the corresponding chlorophyll a TSIs indicated something other than algae (represented by chlorophyll a) was attenuating light penetration.

9.4 Trends of Parameters

Spearman rank correlation coefficient values were calculated to determine relationships for all of the chemical/physical constituents monitored in Clinton Lake. The coefficients represent pairwise relationships between each constituent over all values in the matrix. The Spearman rank correlation coefficient uses the ranks of the data rather than the actual data values. Each variable is ranked separately. Then, the differences between the ranks of paired observations are calculated to measure the disagreement between pairs. The squared disagreements over all pairs are summed, and a relative measure of disagreement calculated. The coefficient is scaled to fall between -1 (perfect disagreement) and +1 (perfect agreement). This method is equivalent to ranking each variable separately and calculating the usual correlation coefficient on the ranks.

The constituents with the best Spearman correlation coefficient were turbidity and total suspended solids (r = .8088); other constituents with relatively high coefficients included specific conductivity and hardness (r = .7766), sulfate and magnesium (r = .7483), and dissolved oxygen and dissolved oxygen percent saturation (r = .7430). Table 21 presents the parameters with Spearman correlation coefficients greater than 0.5000.

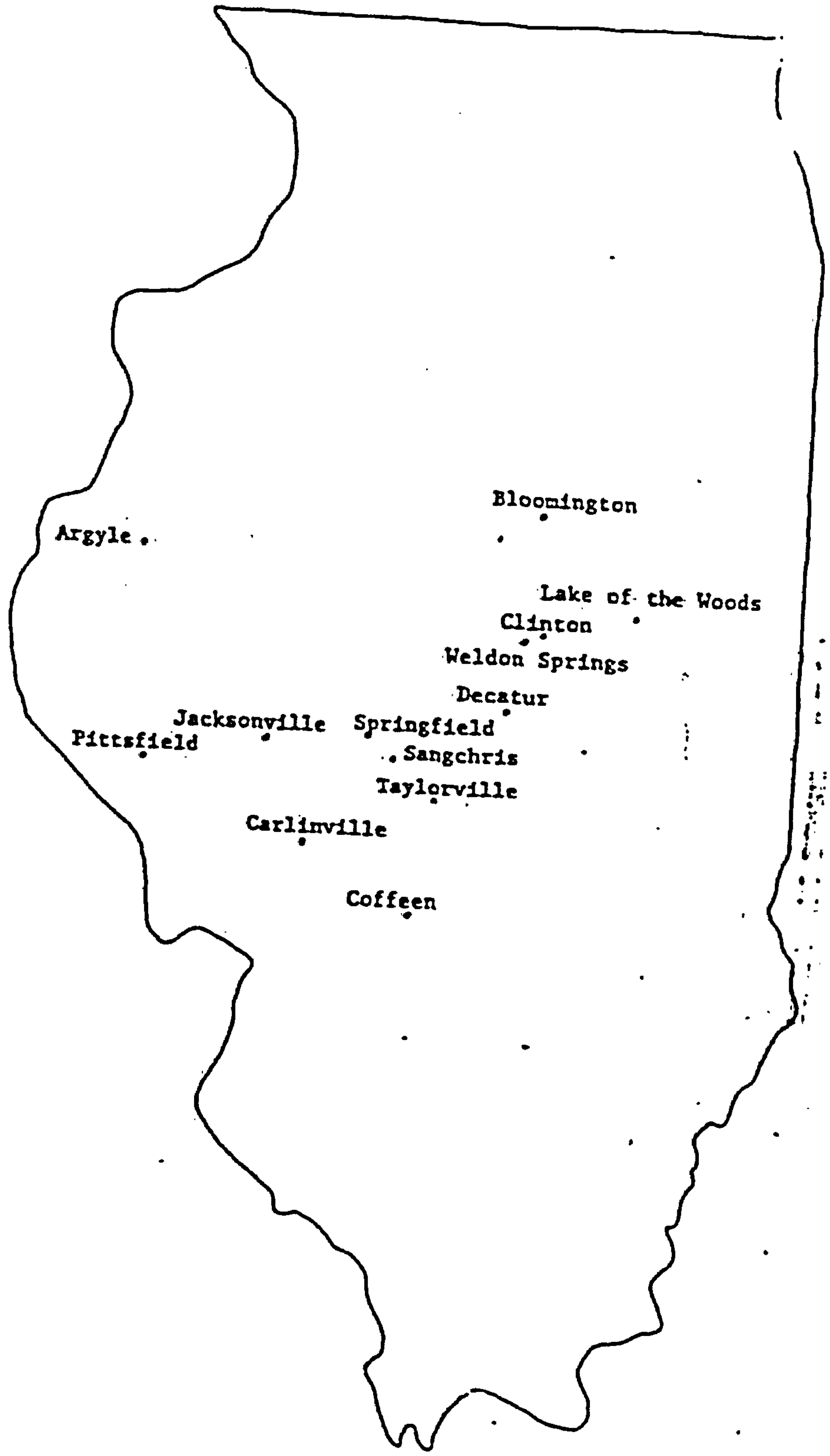


Figure 195. Map of Illinois depicting locations of 13 Illinois lak

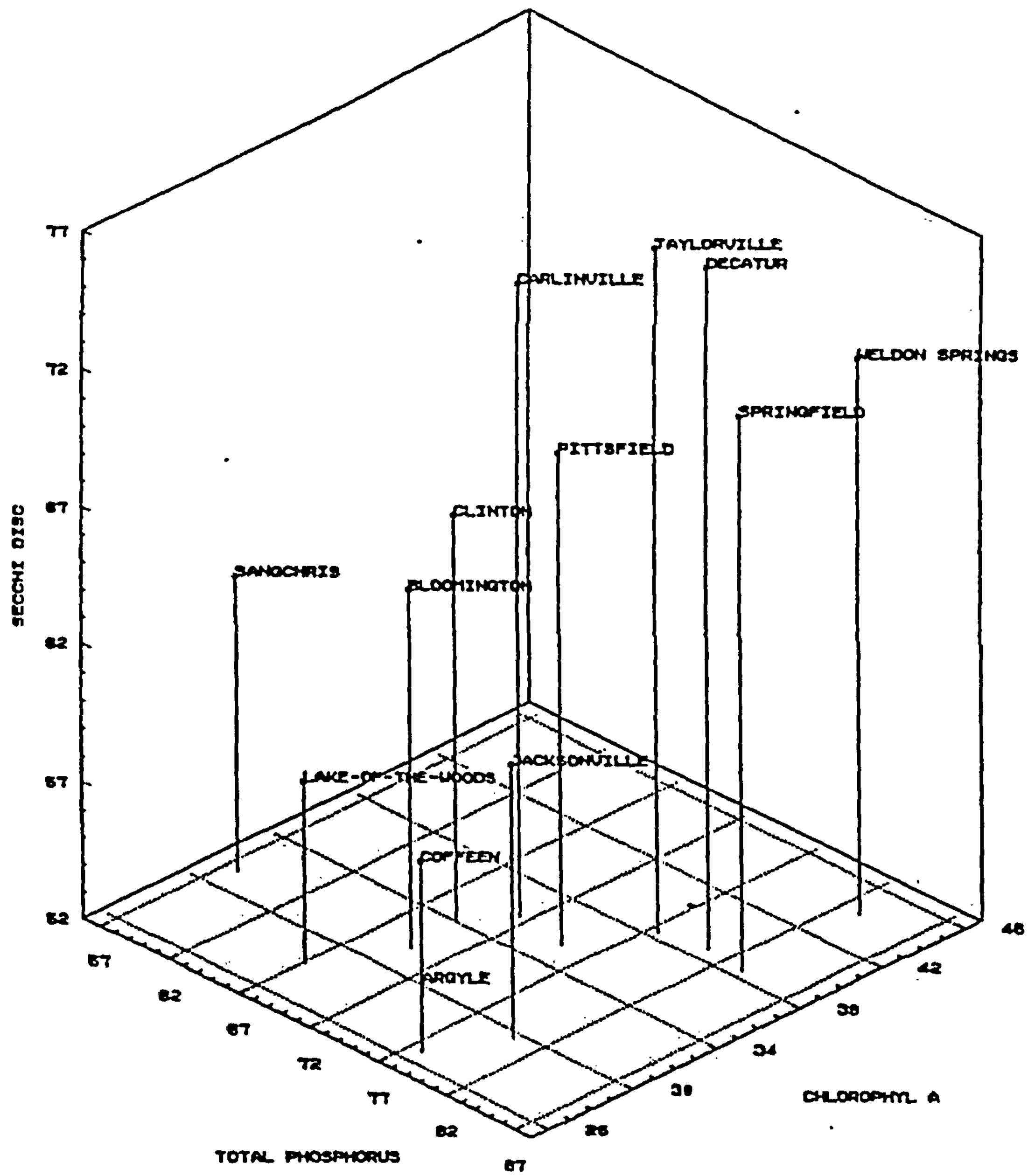


Figure 196. Plots of mean Trophic State Index values for Secchi transparency (y axis), total phosphorus (x axis), and chlorophyll a (z axis) for 13 Illinois lakes.

Table 20. Mean Trophic State Index values for total phosphorus, chlorophyll a, and Secchi transparency data from Clinton Lake and thirty-one other Illinois lakes.

Number	Lake	Trophic State Index			
		Secchi	Total Phosphorus	Chlorophyll a	Mean TSI
1	Sangchris	62.71	57.86	31.25	50.6
2	Lake-of-the-Woods	58.71	67.15	28.21	51.4
3	Argyle	52.54	73.96	29.38	52.0
4	Bloomington	65.06	69.81	31.57	52.5
5	Coffeen	58.96	77.85	26.72	54.5
6	Clinton	66.83	69.50	33.30	56.5
7	Jacksonville	62.04	80.18	29.61	57.3
8	Pittsfield	70.02	75.09	35.41	60.2
9	Carlinville	74.99	71.39	35.84	60.7
11	Taylorville	76.91	77.50	38.33	64.2
10	Springfield	72.27	83.47	38.44	64.7
12	Decatur	76.79	80.61	38.74	65.4
13	Weldon Springs	72.24	83.41	44.12	66.6

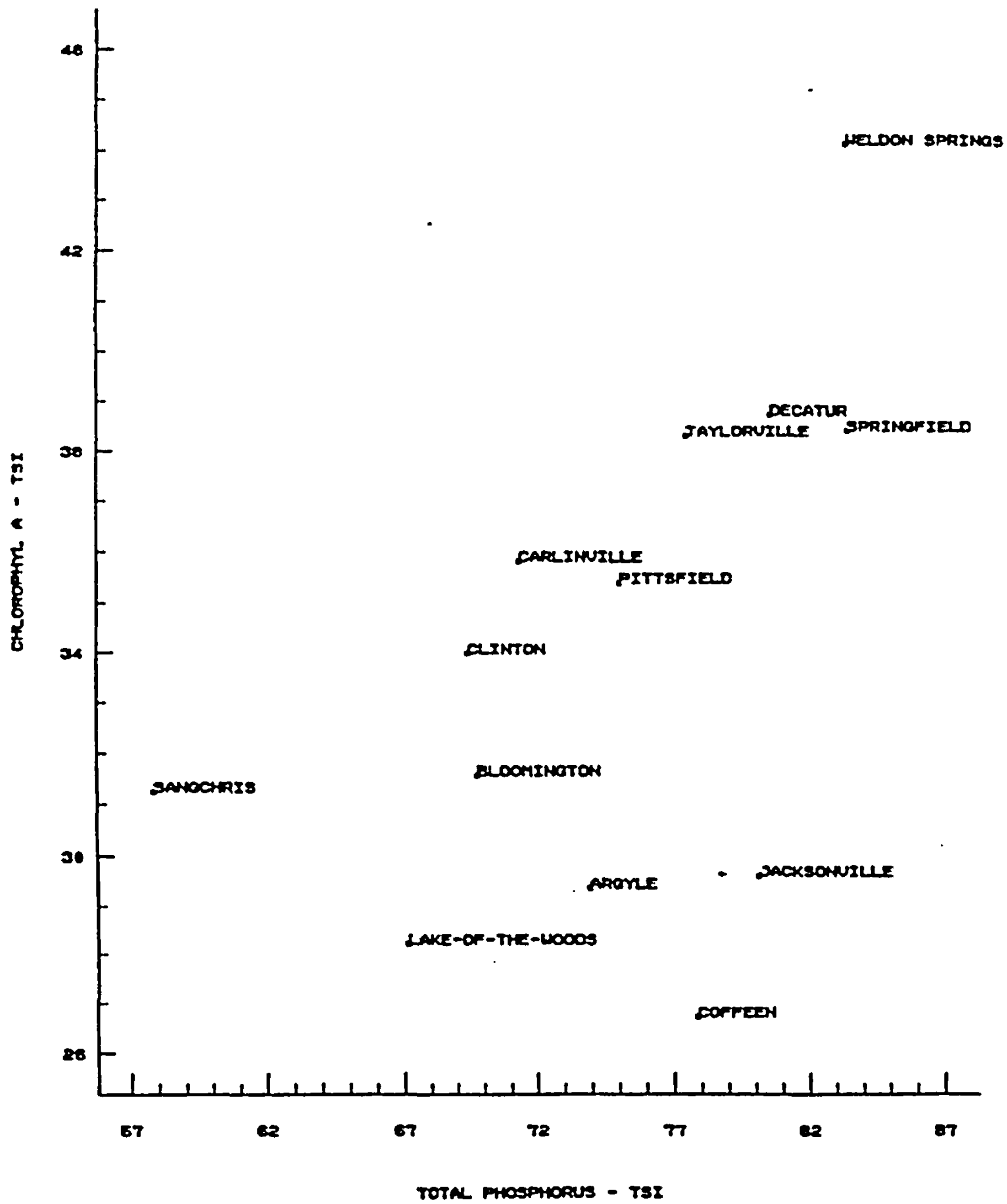


Figure 197. Plots of mean Trophic State Index values for chlorophyll a total phosphorus for 13 Illinois Lakes.

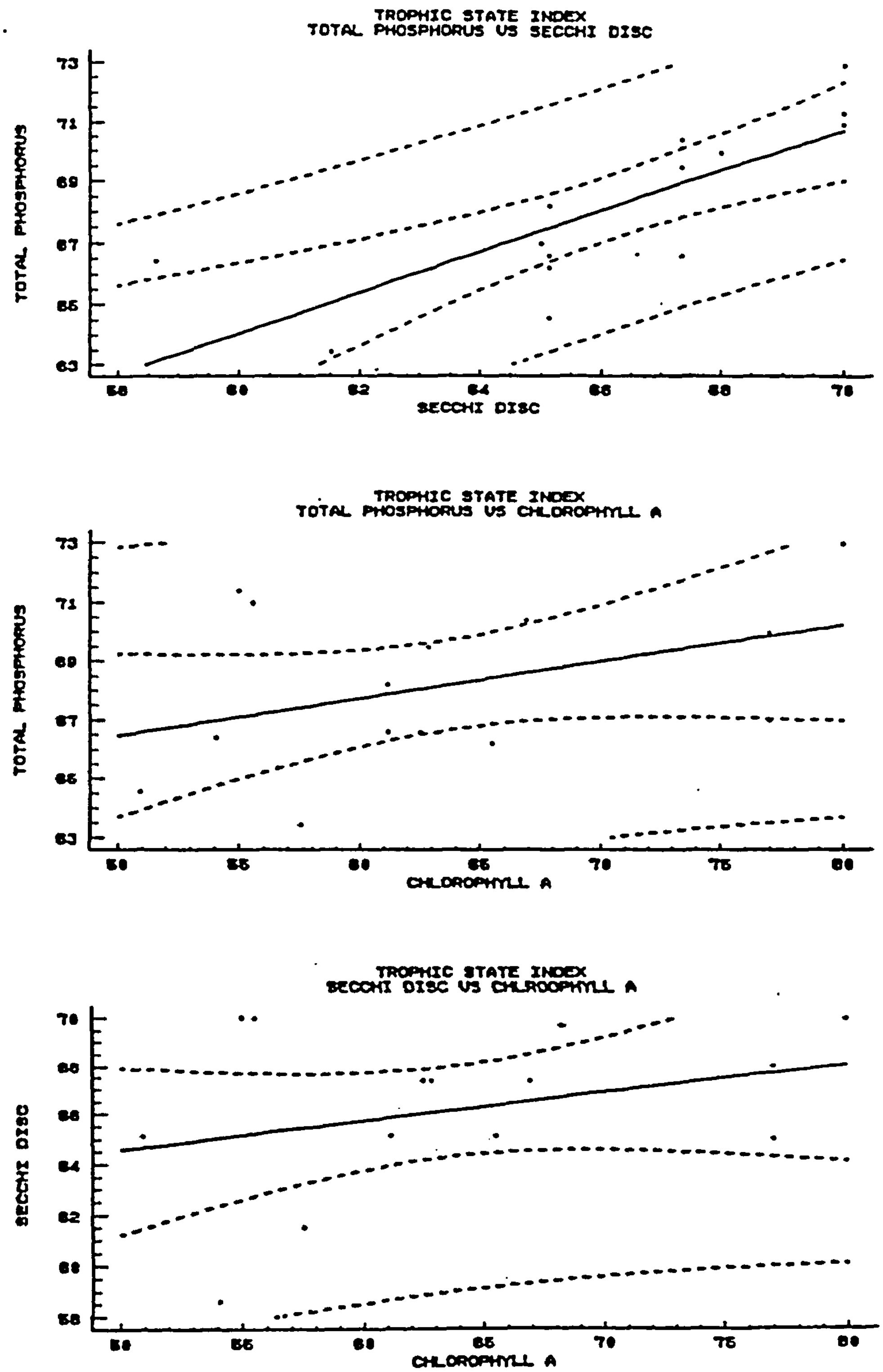


Figure 198. Regressions of Trophic State Index values for to phosphorus and Secchi transparency (top graph), to phosphorus and chlorophyll a (middle graph), and Secc transparency and chlorophyll a (bottom graph) for C nt Lake.

Table 21. Spearman correlation coefficients and regression correlation coefficients for water quality constituents in Clinton Lake with Spearman correlation coefficients greater than 0.5000.

X Axis	Y Axis	Spearman Correlation Coefficient	Regression Correlation Coefficient
Temperature	Dissolved Oxygen	-.6979	-.6458
Dissolved Oxygen	DO % Saturation	.7430	.8547
Total Phosphorus	Orthophosphate	.5353	.6438
Total Phosphorus	Turbidity	.6992	.5585
Total Phosphorus	Total Suspended Solids	.6586	.4766
Nitrate	Silica	.5570	.6154
Orthophosphate	Silica	.6303	.6375
Magnesium	Sulfate	.7483	.7241
Magnesium	Chloride	.7172	.7040
Hardness	Total Dissolved Solids	.7284	.7764
Hardness	Specific Conductivity	.7766	.7770
Hardness	Alkalinity	.7293	.7765
Hardness	Calcium	.6780	.7956
Total Dissolved Solids	Specific Conductivity	.7241	.7558
Total Dissolved Solids	Alkalinity	.5810	.6876
Total Dissolved Solids	Calcium	.7063	.8039
Specific Conductivity	Alkalinity	.6882	.7221
Specific Conductivity	Calcium	.5106	.6752
Alkalinity	Calcium	.6759	.7086
Sulfate	Chloride	.5877	.6252
Turbidity	Total Suspended Solids	.8088	.8455
Fecal Coliform	Fecal Streptococcus	.5742	.4816
Orthophosphate	Fecal Coliform	.5163	.4862
Orthophosphate	Fecal Streptococcus	.5102	.4104

The Spearman correlation coefficient for turbidity and total suspended solids was greater than that reported for 63 other Illinois lakes (r = .762) (Sefton et al. 1980). Both correlations indicate there is a strong positive trend between these two parameters.

Alkalinity, hardness, total dissolved solids, specific conductance, and calcium each had several correlations with coefficients greater than 0.5000. Alkalinity was also highly correlated with hardness (r = .7293), specific conductance (r = .6882), and total dissolved solids (r = .5810). The high correlations of alkalinity to TDS, hardness, and specific conductance are also associated with calcium.. Carbonate alkalinity commonly results from the association of carbon dioxide and water which forms a weak acid (carbonic acid). This acid reacts with alkaline earth metals (mostly calcium carbonate) to form a bicarbonate and metal ions (mostly Ca++).

The hardness of water is governed by the content of calcium and magnesium salts. The specific conductance of bicarbonate-type lakes is directly related to concentrations of salinity ions (Cole 1975), which are primarily calcium in Clinton Lake. The major cations in surface waters of the world, listed in order of abundance, are calcium, magnesium, sodium, and potassium (Wetzel 1975). Clinton Lake data and data from surveys of 69 other Illinois lakes (Sefton et al. 1980) indicate that most of the conductivity and total dissolved solids are associated with carbonate alkalinity.

Hardness and specific conductance had a Spearman correlation coefficient of 0.7766. A relationship between these constituents is expected since both are affected by the concentration of ions in water. Hardness in water is governed by the content of calcium and magnes[illegible] salts. Specific conductance is a measure of the flow of electr[illegible] through water and is related to concentrations of salinity ions which are primarily calcium and magnesium (Cole 1975).

High correlations were found for total phosphorus with TSS (r = .6586), turbidity (r = .6992), and orthophosphate (r = .5353). The high correlations with TSS and turbidity may be due to phosphorus adsorption onto suspended silt/clay particles in Clinton Lake. The IEPA attributed high correlations of total phosphorus with TSS, turbidity and Secchi transparency with the relationship of total phosphorus to soil particles (Sefton et al. 1980). Total suspended solids give opaqueness to the water and reduce light penetration. Total suspended solids are made up of inorganic solids (colloidal clay particles), to which phosphorus can adsorb, and organic solids, mainly algae, which utilize phosphorus.

High correlation coefficients were noted for silica with orthophosphate (r = .6303) and nitrate (r = .5570). Silica is an essential nutrient for some taxa of phytoplankton. Diatoms utilize silica in the formation of their frustules and chrysophytes utilize silica to construct silicified scales. Nitrates and orthophosphates are also essential in the metabolism of phytoplankton. Correlations between these constituents may result from metabolic effects of the phytoplankton community in Clinton Lake.

Trend analyses indicate long-term trends for the constituents monitored. The results of the analyses are presented as a formula for a first degree line that represents the best fit for the data. Trend analyses (1978-1986) indicated that nine constituents had trends for decreasing values and 19 had trends for increasing values (Table 22). Fecal streptococcus had the greatest trend for increasing values (+0.587089) and fecal coliforms had the greatest trend for decreasing values (-0.095624). Analyses for these bacteria were not performed during the operational period.

Trend analyses during the operational period (i.e. 1987 through 1991) are also presented in Table 22. Changes in the Y axis intercept in the formula and in the amount of change through time indicate influences of the Clinton Power Station. For the operational period the Y axis intercept for temperature is 10° Celcius greater compared to the results for the preoperational period; however, during the operational period the trend is for temperature to decrease slightly. Lines representing trends for the nutrient parameters (total organic nitrogen, ammonia, total phosphorus, and orthophosphate) are nearly flat representing very little change during preoperational and operational periods. There were increasing trends for hardness, total dissolved solids, and specific conductance during preoperational and operational periods. These trends will probably continue due to the low changeover rate of Clinton Lake and the concentrating effect from increased temperatures and consequential greater evaporative rates due to CPS.

Trend analysis comparisons among operational modes, however, are not associated with any degree of statistical confidence. Analyses of variance (Tukey's procedure) was determined at the 95% confidence interval to determine if there are significant differences in the distributions of data for each constituent between preoperational and operational data (Table 23). Significant differences between preoperational and operational periods were determined for six constituents. Temperature and chloride values had increasing trends and dissolved oxygen, nitrate, mercury and silica had decreasing trends. The extent of CPS influence on these six constituents will be discussed in detail in the next section.

9.5 *Limnological Influence of Clinton Power Station*

There were significant differences between preoperational and operational periods in the distributions of data for six water quality parameters (Figure 199). Discussions of each of these constituents are presented below.

Temperature

Temperature profile data indicate that Clinton Lake does not develop the classical clinograde pattern of thermal stratification. Thermal profile data during the operational period (1987 through 1991) illustrate that vertical temperature gradients occur, but they are of short duration, and do not correspond to the classical clinograde pattern of thermal stratification (Figures 200 through 204). Thermal stratification is not

Table 22. Results of trend analyses for water quality constituents monitored in Clinton Lake during 1978 through 1991 and during the period of Clinton Power Station operation (1987 through 1991).

CONSTITUENT	1978-1991	1987-1991
Temperature (C)	11.052+0.0163067*T	21.9335-1.54829E-4*T
Diss. Oxygen (mg/l)	9.38337-1.86247E-3*T	10.3629-5.69946E-3*T
DO Percent Saturation	80.1785+0.0286822*T	107.339-0.0441743*T
BOD (mg/l)	2.40081+2.33794E-4*T (a)	
TON (mg/l)	0.962927-3.42047E-4*T	0.761619+7.14635E-[illegible]*T
Ammonia Nitrogen (mg/l)	0.245947-2.95974E-4*T	0.0498274+1.96818E-4*
Nitrate Nitrogen (mg/l)	0.352239-3.46615E-4*T	1.65533+2.62677E-3*T
Total Phosphorus (mg/l)	0.0748082+3.54461E-5*T	0.0698909+5.1553E-6*T
Orthophosphate (mg/l)	0.0323633-2.13136E-5*T	9.76524E-3+3.22621E-[illegible]
Copper (ug/l)	2.95489+3.47436E-3*T (a)	
Lead (ug/l)	1.63803-1.0103E-3*T (a)	
Magnesium (mg/l)	34.6003-0.0372617*T (b)	32.5619-6.7304E-3*T
Mercury (ug/l)	0.352239-3.46615E-4*T	0.0626536+1.70762E-4*
Zinc (ug/l)	7.07833+1.32452E-3*T (a)	
Hardness (mg/l)	241.868-0.0203227*T (c)	224.473+0.0479309*T
TDS (mg/l)	265.23+0.0202254*T	273.57+0.0159974*T
Sp. Conductance (umhos/cm)	492.358-7.98979E-3*T	486.086+0.0214893*T
pH	8.02151-1.44319E-5*T	8.30134-5.91061E-4*T
Alkalinity (mg/l)	177.158-0.0308884*T	167.822+3.65774E-[illegible]*T
Calcium (mg/l)	44.8208+8.09734E-3*T (b)	43.1538+0.02789[illegible]
TOC (mg/l)	4.747-3.15024E-3*T (a)	
Sulfate (mg/l)	36.1922+9.26841E-3*T (c)	39.3537-3.55693E-4*T
Chloride (mg/l)	16.8018+0.0252919*T (c)	27.1515+1.76781E-3*T
Fecal Coliform (no./100 ml)	51.7317-0.0956242*T (a)	
Fecal Streptococcus (no./100 ml)	118.633+0.587089*T (a)	
Turbidity (NTU)	17.0672-0.0100156*T	7.44005+6.08378E-3*T
TSS (mg/l)	15.6832+2.97911E-3*T	11.6996+9.95984E-3*T
Silica (mg/l)	3.25197-1.57447E-3*T	0.799838+3.52456E-3*

a. Trend analysis determined for period of monitoring (1978 through 1986)
b. Trend analysis determined for period of monitoring (1987 through 1991)
c. Trend analysis determined for period of monitoring (1981 through 1991)

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Table 23. Descriptive statistics of water quality constituents monitored in Clinton Lake during the periods prior to (preoperational) and during (operational) Clinton Power Station operation.

Water Quality Constituent	Preoperational Period			Operational Period			ANOVA Sig. Level
	No.	Mean	Median	No.	Mean	Median	
Temperature (C)	402	13.3	13.5	189	21.1	23.5	.0000* (a)
Dissolved Oxygen (mg/l)	402	10.2	10.0	189	8.9	9.0	.0000*
D.O. % Saturation	394	94	92	95	97.1	97.2	.2406
BOD (mg/l)	388	2.8	2.5	–(b)	–	–	1.000
Tot. Org. Nitrogen (mg/l)	393	0.9	0.86	100	0.82	0.79	.0239
Ammonia (mg/l)	393	0.12	0.10	100	0.1	0.05	.0395
Nitrate (mg/l)	398	4.3	4	190	2.6	1.6	.0000*
Total Phosphorus (mg/l)	398	0.08	0.07	189	0.09	0.07	.8790
Orthophosphate (mg/l)	393	0.03	0.01	100	0.02	0.005	.0538
Copper (ug/l)	387	3.6	3.4	–	–	–	1.0000
Lead (ug/l)	385	1.4	0.92	–	–	–	1.0000
Magnesium (mg/l)	–	–	–	100	32.3	33	1.0000
Mercury (ug/l)	390	0.28	0.25	100	0.11	0.1	.0000*
Zinc (ug/l)	388	7.3	5.1	–	–	–	1.0000
Hardness (mg/l)	277	237	234	100	237	230	.9277
TDS (mg/l)	391	270	270	100	280	280	.0476
Conductance (uhmos/cm)	402	485	485	190	495	488	.0579
pH	402	8.1	8.1	189	8.1	8.1	.0183
Alkalinity (mg/l)	390	167	166	100	170	166	.4108
Calcium (mg/l)	5	53	48	100	45	43	.1489
Tot. Org. Carbon (mg/l)	388	4.1	3.8	–	–	–	1.0000
Sulfate (mg/l)	277	38	38	100	40	40	.0583
Chloride (mg/l)	277	20.2	20.8	100	27.6	26	.0000*
Fecal Coliforms	390	33	2.5	–	–	–	1.0000
Fecal Streptoccus	388	233	7	–	–	–	1.0000
Turbidity (NTU)	393	15.6	8.5	100	9.3	7.6	.0107
TSS (mg/l)	391	17.1	12.0	100	14.7	13.0	.2835
Silica (mg/l)	393	2.8	1.6	100	1.86	1.2	.0000*

(a) Significance level in distribution of data between preoperational and operational periods indicated by *
(b) Dash (–) indicates samples were not analyzed for respective parameters.

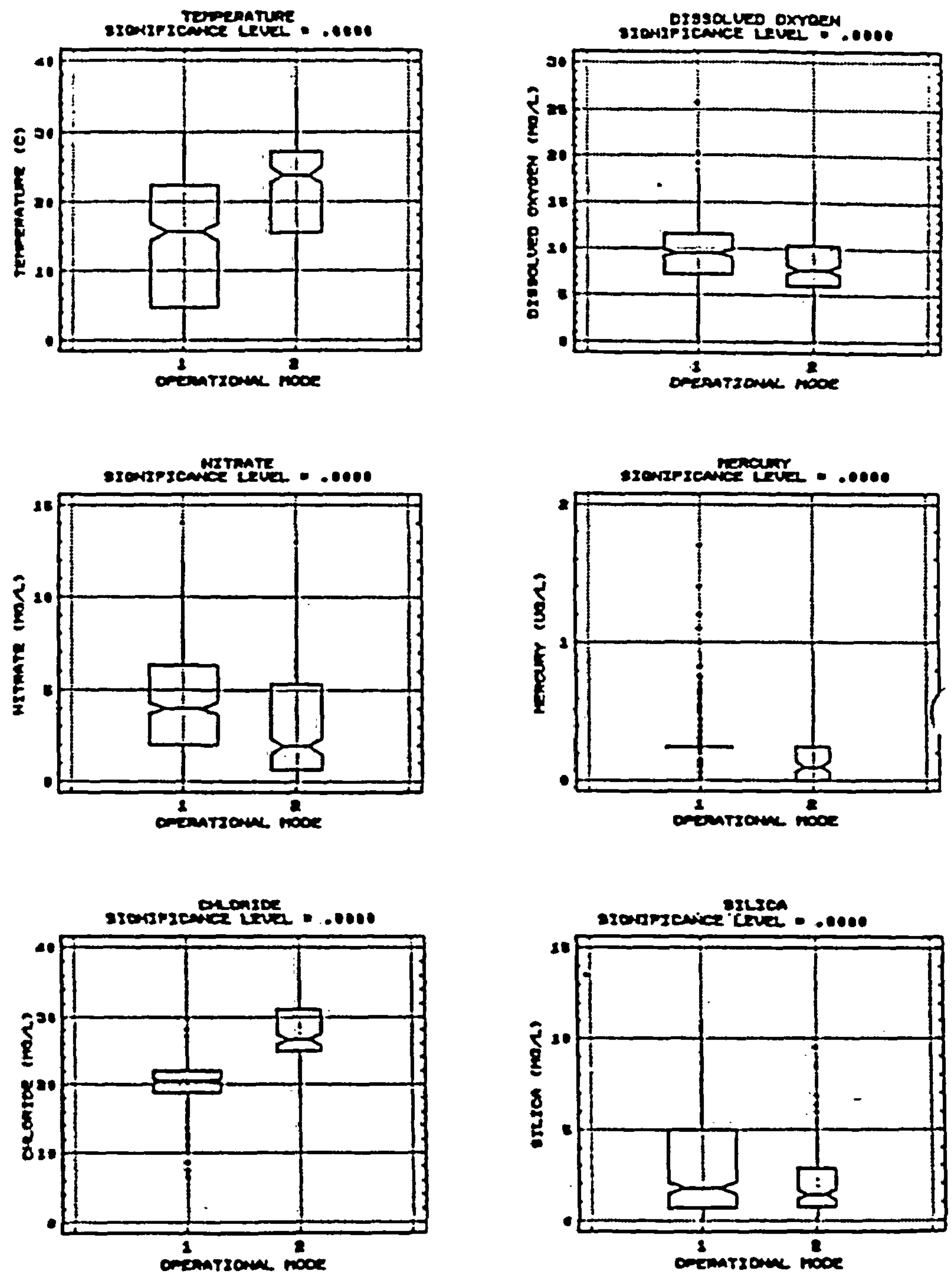

Figure 199. Plots of temperature, dissolved oxygen, nitrate, sulfat chloride, and silica values for Clinton Lake during t period prior to (Preoperational Mode 1) and during Clint Power Station operation (Operational Mode 2).

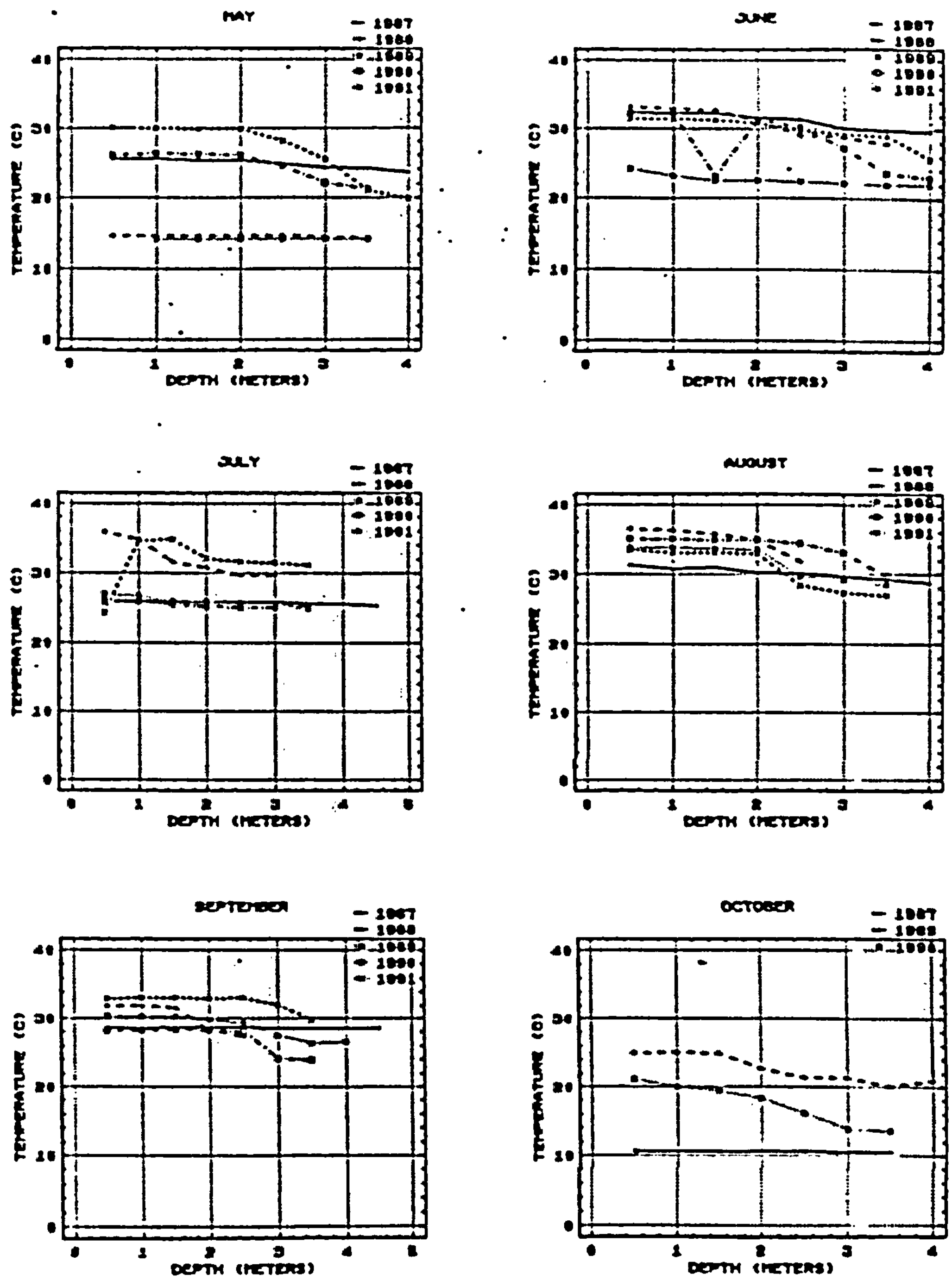

Figure 200. Depth profiles of temperatures (C) at monitoring Site 2 in Clinton Lake from May through October during 1987 through 1991.

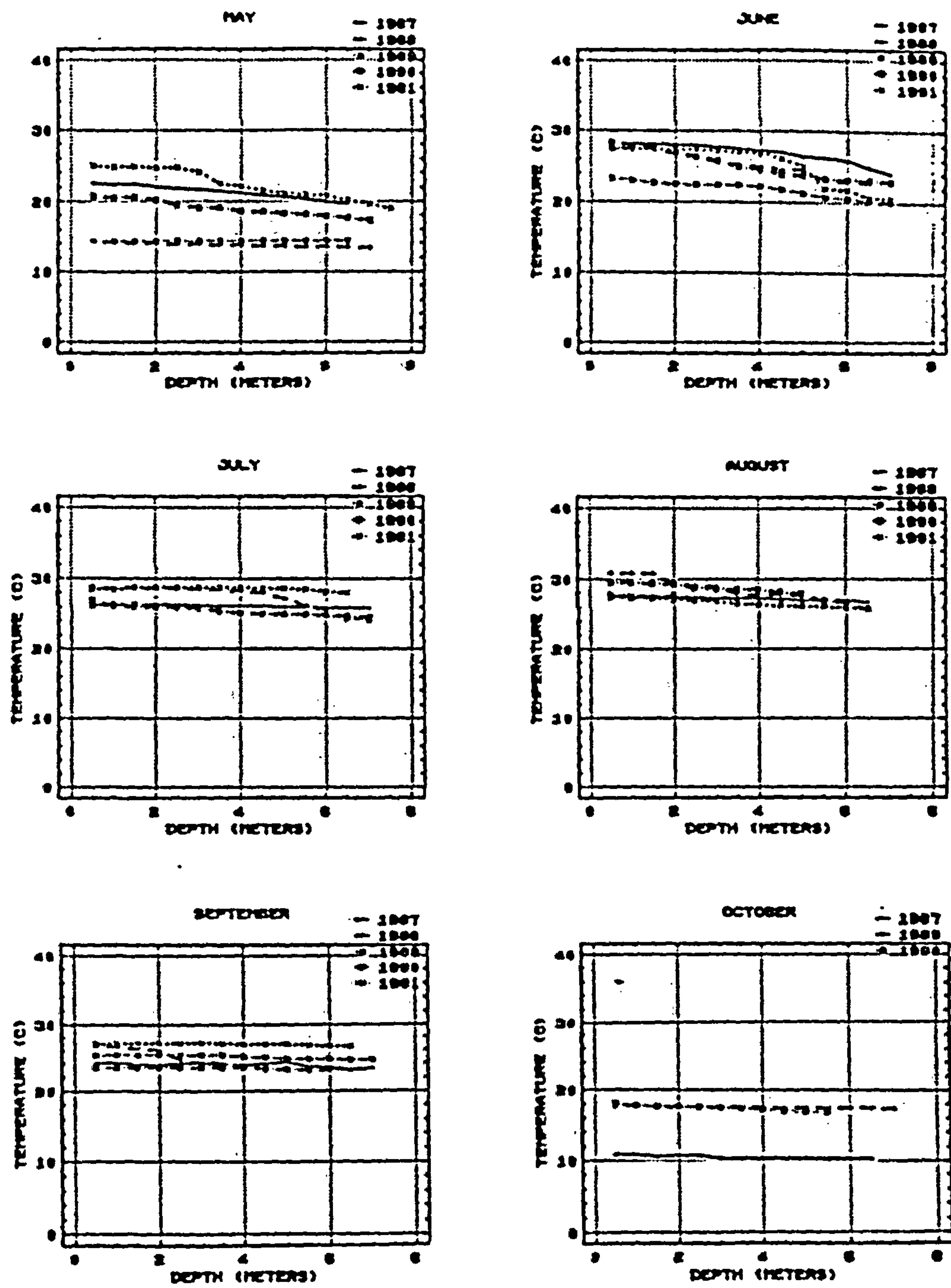

Figure 201. Depth profiles of temperatures (C) at monitoring Site 13 in Clinton Lake from May through October during 1987 through 1991.

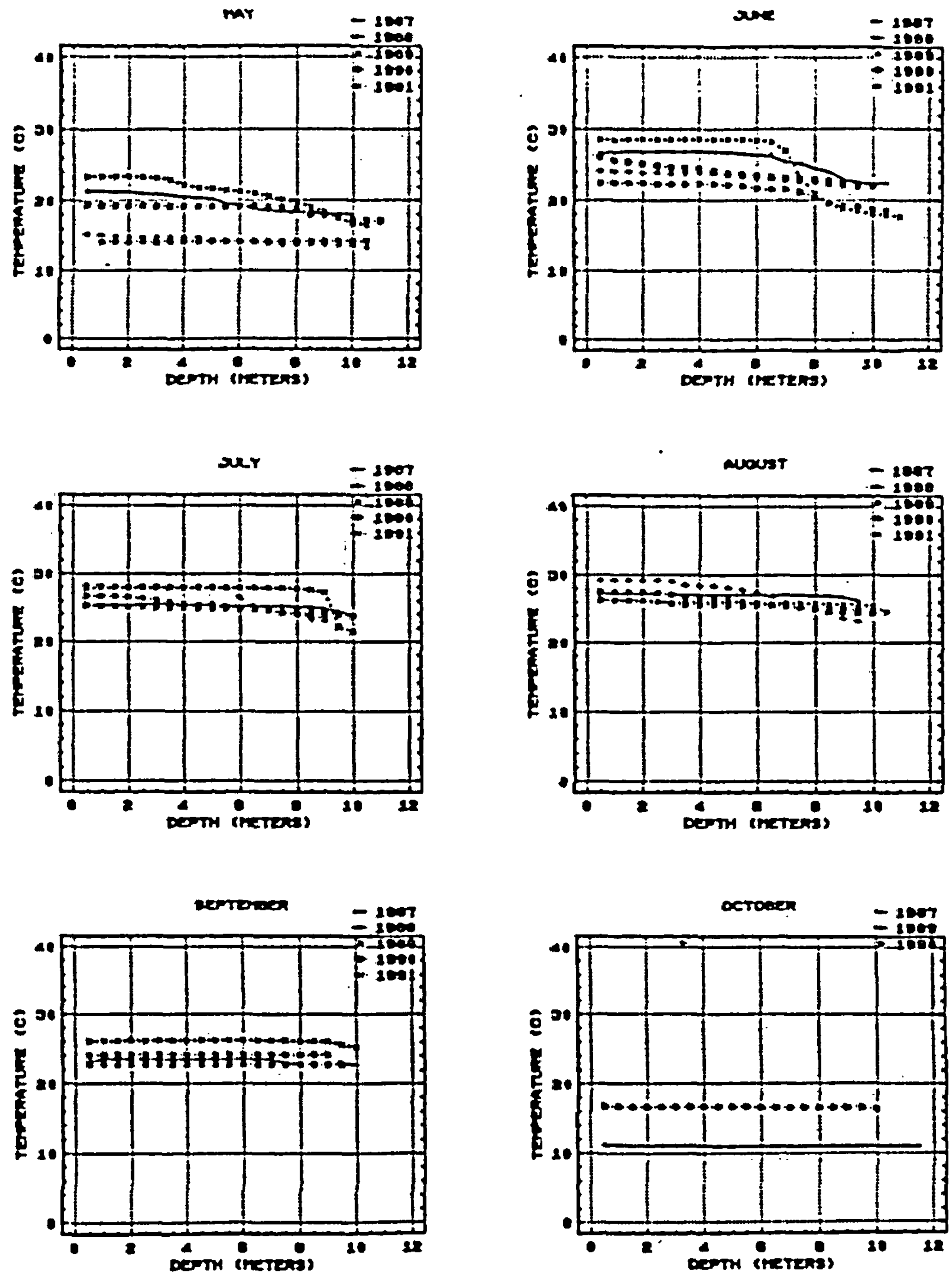

Figure 202. Depth profiles of temperatures (C) at monitoring Site 8 in Clinton Lake from May through October during 1987 through 1991.

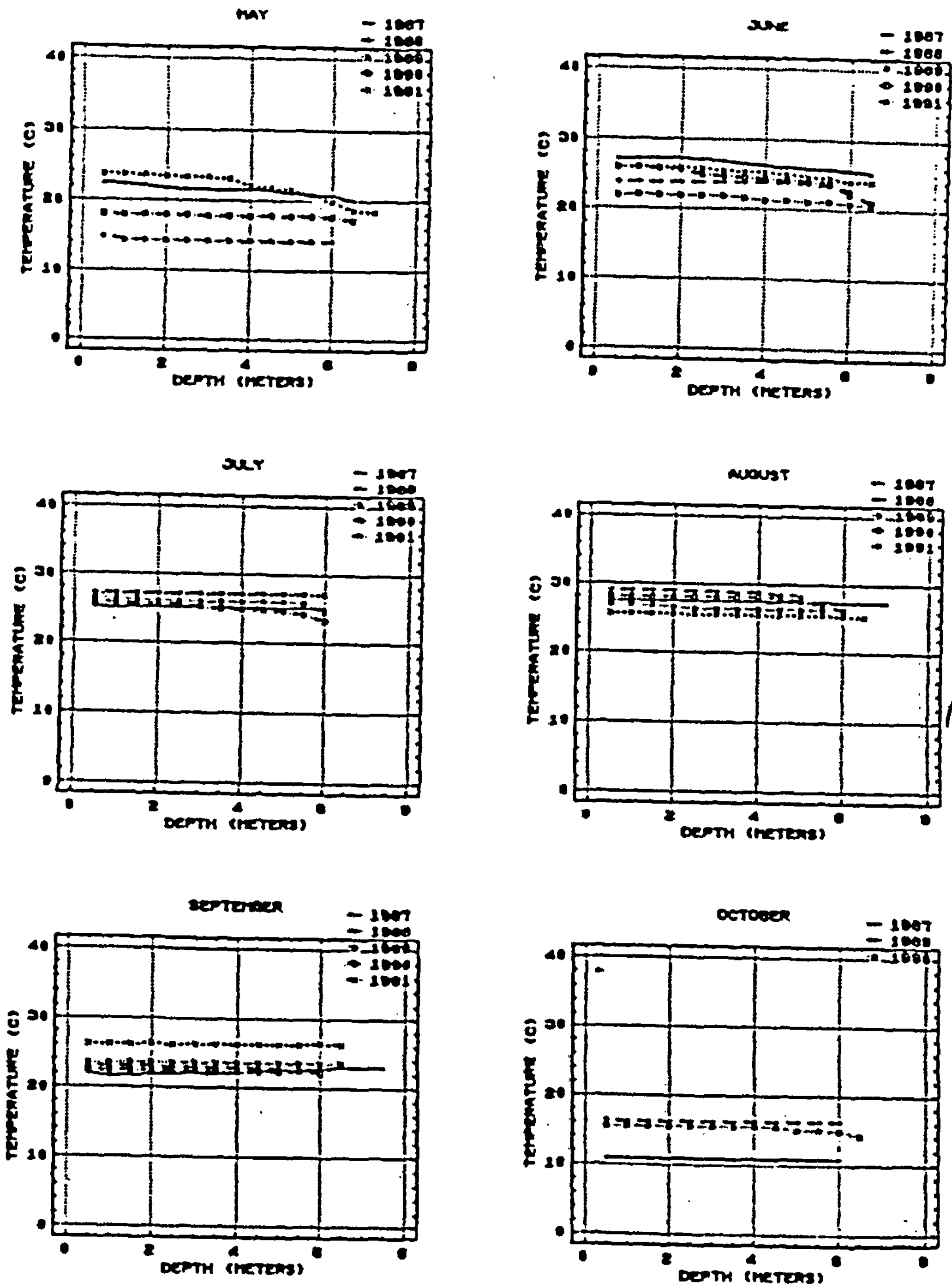

Figure 203. Depth profiles of temperatures (C) at monitoring Site 4 in Clinton Lake from May through October during 1987 through 1991.

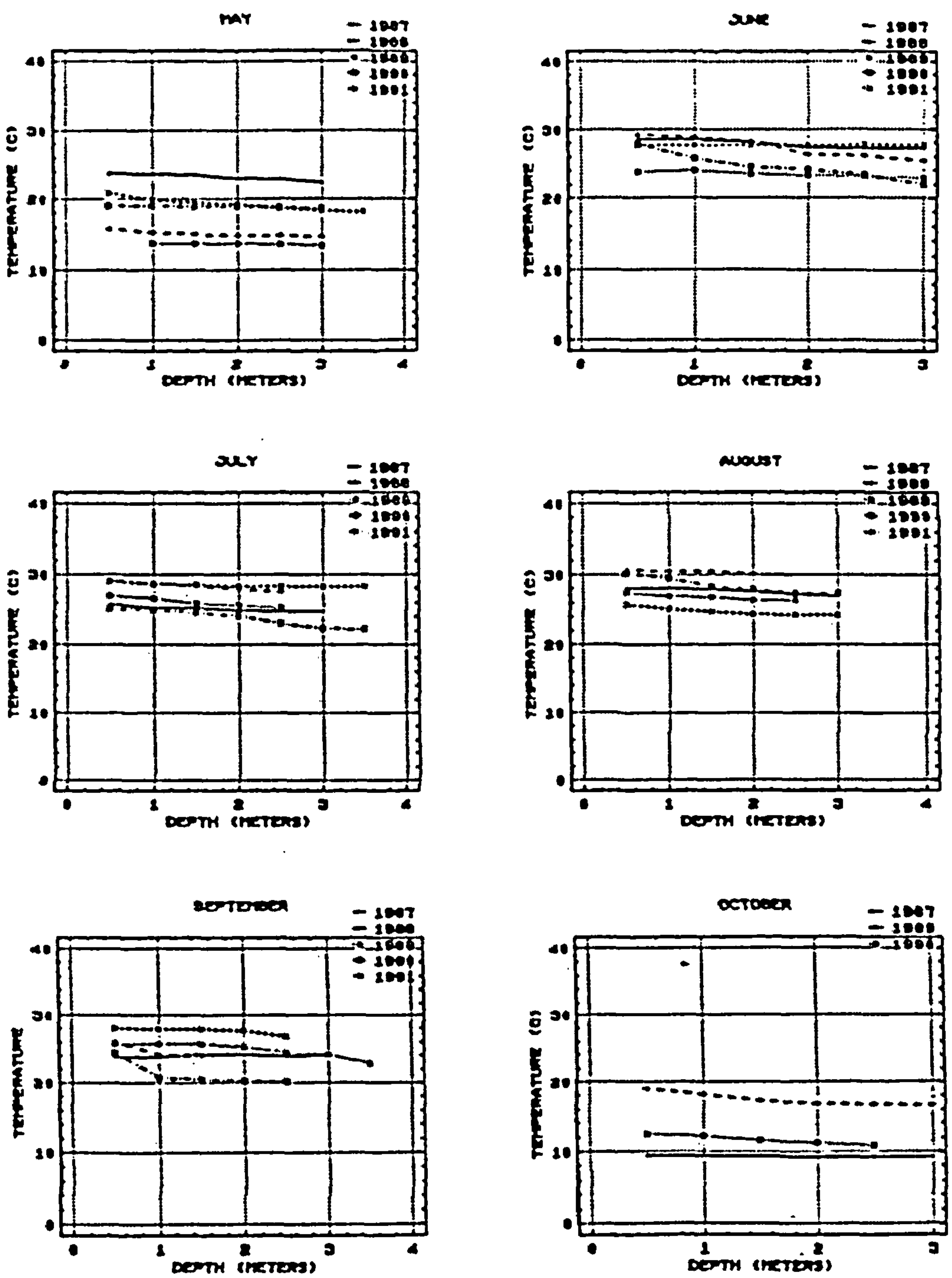

Figure 204. Depth profiles of temperatures (C) at monitoring Site 16 in Clinton Lake from May through October during 1987 through 1991.

stable, and distinct layers are not developed even at Site 8, the deepest monitoring site in Clinton Lake (Figure 202). Thermal profiles at Site 2 during June through September, 1988, were most similar to the typical pattern of thermal stratification. Site 2 is nearest to the thermal discharge of CPS. Thermal profiles at the other sites do not illustrate typical, sustained thermal stratification. Thus, any tendency for CPS operations to induce thermal stratification appears to be dependant on Site 2.

The unstable pattern of lake-wide stratification is probably due to disruptive forces of mixing due to CPS operations. Stable thermal stratification also failed to develop in Lake Sangchris, another cooling lake in central Illinois (Brigham 1981).

Regressions of temperature during operational years for Site 2 and the remaining sites illustrate little differences among sites throughout the lake (Figure 205). Actual measurements of temperature ranges during operational conditions indicate the greatest monthly temperature range among sites was 10.2° C (Table 24).

More extensive temperature data are available for Clinton Lake. Temperature data presented in this report represent instantaneous data. Water temperatures in Plunkett (1991) represent continuous temperature monitoring in Clinton Lake. These data were also used to verify and adjust a hydrothermal model for temperatures in Clinton Lake (Edinger 1989). These references contain more extensive databases and discussions of water temperatures in Clinton Lake. It should be emphasized that meteorological conditions during the summer of 1988 represented the second driest on record (110 years) when temperatures were considerably higher than normal.

Dissolved Oxygen

The solubility of oxygen in water is inversely related to temperature and, like temperature, influences the distribution of other chemical constituents, (e.g., ammonia, phosphorus, heavy metals and hydrogen sulfide). In eutrophic lakes, the dissolved oxygen depth profile is characteristically clinograde during thermal stratification. The typical clinograde curve results from respiration and decomposition in the hypolimnion without oxygen replenishment from atmospheric diffusion or photosynthesis. Chemical and biological decomposition in sediments may deplete dissolved oxygen in overlying waters by as much as 50-90% (Sefton et al. 1980). It has been demonstrated that bottom waters in reservoirs may become anaerobic within one year after construction (Kothanderamon and Evans 1975) even without the influence of power plant operations.

Anoxia occurred near lake bottom during preoperational (Illinois Power Company 1986 and 1989) and operational periods (Figures 206 through 210). During the preoperational period, anoxia occurred at Site 8 during July of 1985 and June of 1986. During the operational period, anoxia occurred at sites 2, 13 and 8. The most extensive anoxic period in bottom waters occurred at Site 8 in 1991 when anoxic conditions

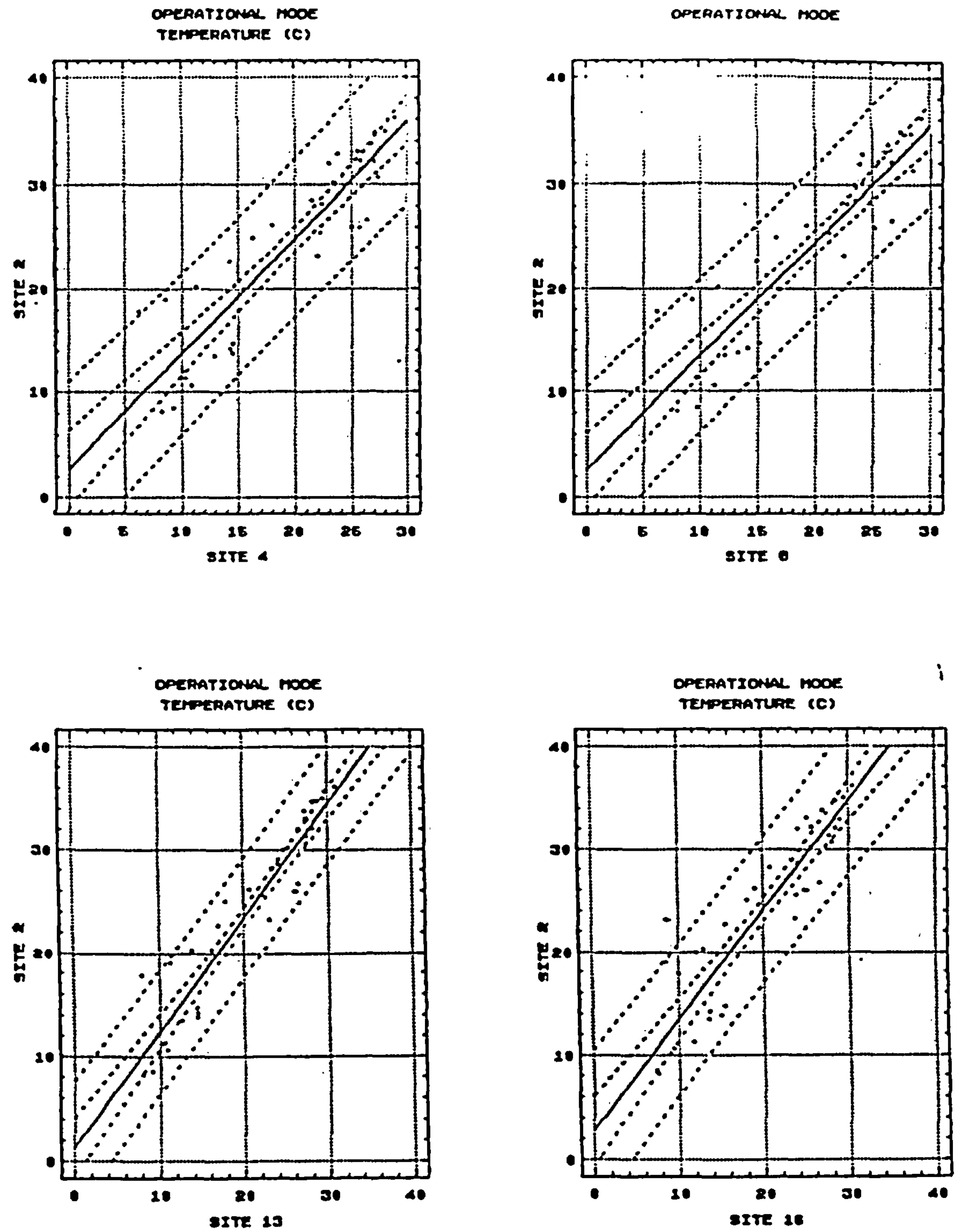

Figure 205. Regressions of epilimnion temperatures (C) taken during the period when Clinton Power Station was operational at Site 2 with each of the remaining monitoring sites in Clinton Lake.

Table 24. Summary of epilimnion water temperatures (C) from Clinton Lake for May through October during 1985 through 1991.

Month	1985			1986			1987			1988			1989			1990			1991		
	Min	Max	Range	Min	Max	Range	Min	Max	Range	Min	Max	Range	Min	Max	Range	Min	Max	Range	Min	Max	Range
May	16.9	18.2	1.3	16.2	18.0	1.8	21.3	25.5	4.2	14.3	15.4	1.1	13.7	14.4	0.7	18.0	26.2	8.2	19.8	30.0	10.2
June	20.6	22.3	1.7	22.2	23.8	1.6	26.7	32.1	5.4	23.8	32.9	9.1	22.0	23.6	1.6	25.6	32.2	6.6	25.9	31.4	5.5
July	25.2	26.6	1.4	26.4	27.5	1.1	25.0	26.3	1.3	27.2	34.8	7.6	26.4	26.7	0.3	24.9	26.1	1.2	27.1	34.7	7.6
August	25.3	26.0	0.7	24.6	25.2	0.6	27.2	30.7	3.5	29.0	36.2	7.2	26.4	33.8	7.4	27.5	35.0	7.5	25.2	33.1	7.9
September	19.6	21.0	1.4	21.5	23.0	1.5	21.6	28.6	7.0	23.0	32.0	9.0	23.4	30.2	6.8	20.8	28.2	7.4	26.1	33.1	7.0
October	15.4	16.1	0.7	ND	ND	ND	9.4	11.2	1.8	ND	ND	ND	16.3	25.0	8.7	12.2	20.0	7.8	ND	ND	ND

ND Temperature data were not determined during October 1991.

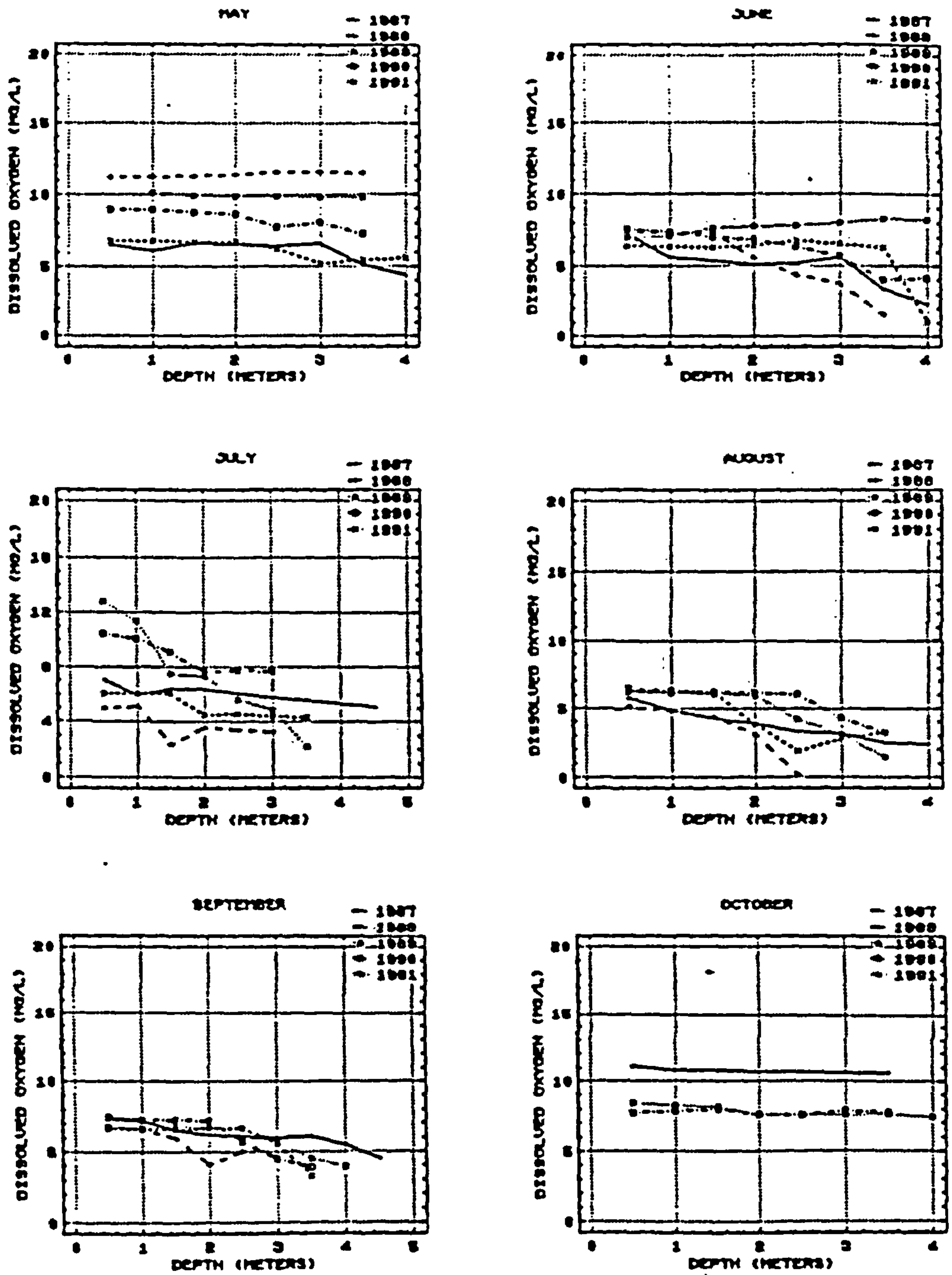

Figure 206. Depth profiles of dissolved oxygen concentrations (mg/l) at monitoring Site 2 in Clinton Lake from May through October during 1987 through 1991.

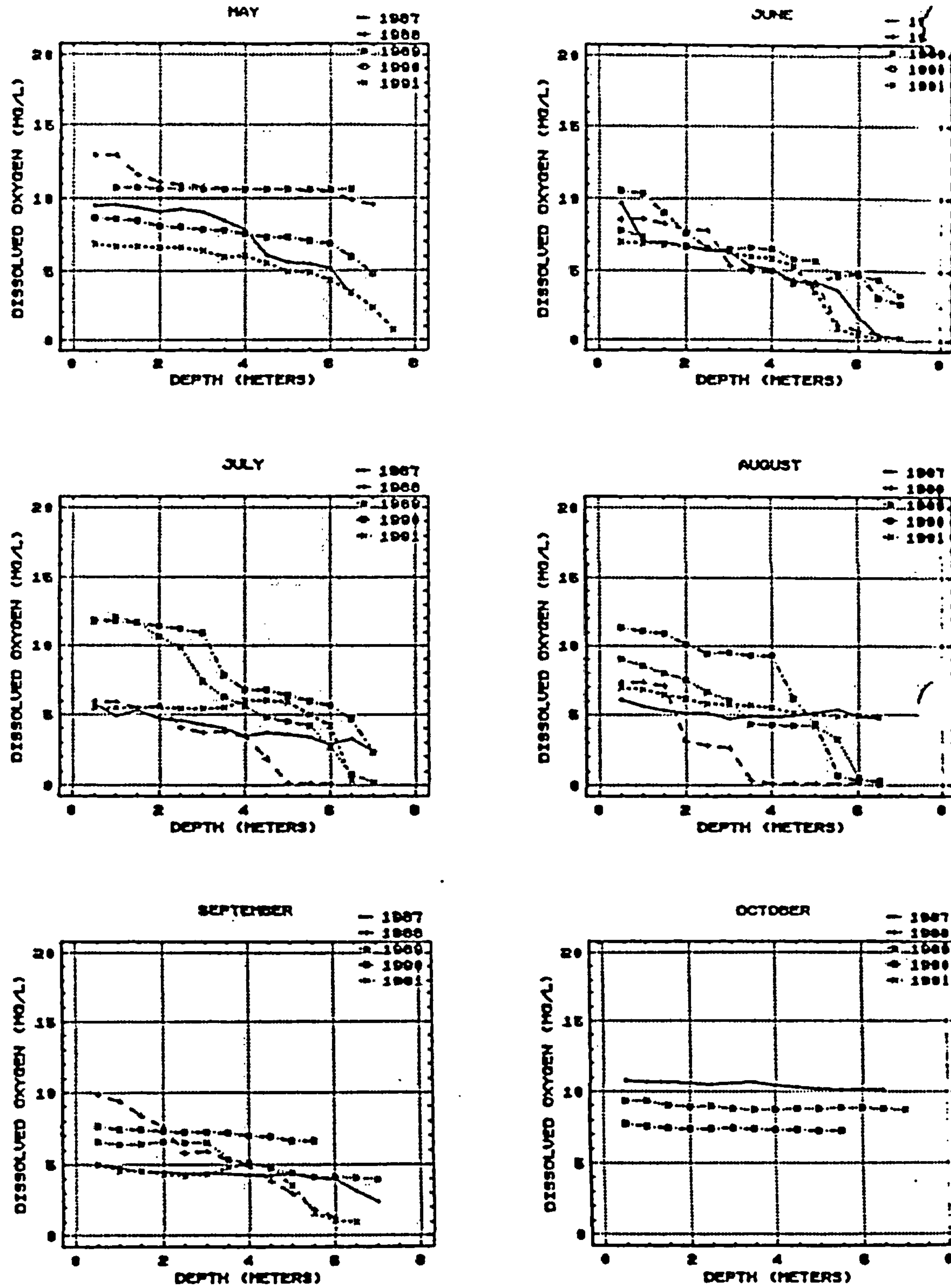

Figure 207. Depth profiles of dissolved oxygen concentrations (mg/l) at monitoring Site 13 in Clinton Lake from May throu October during 1987 through 1991.

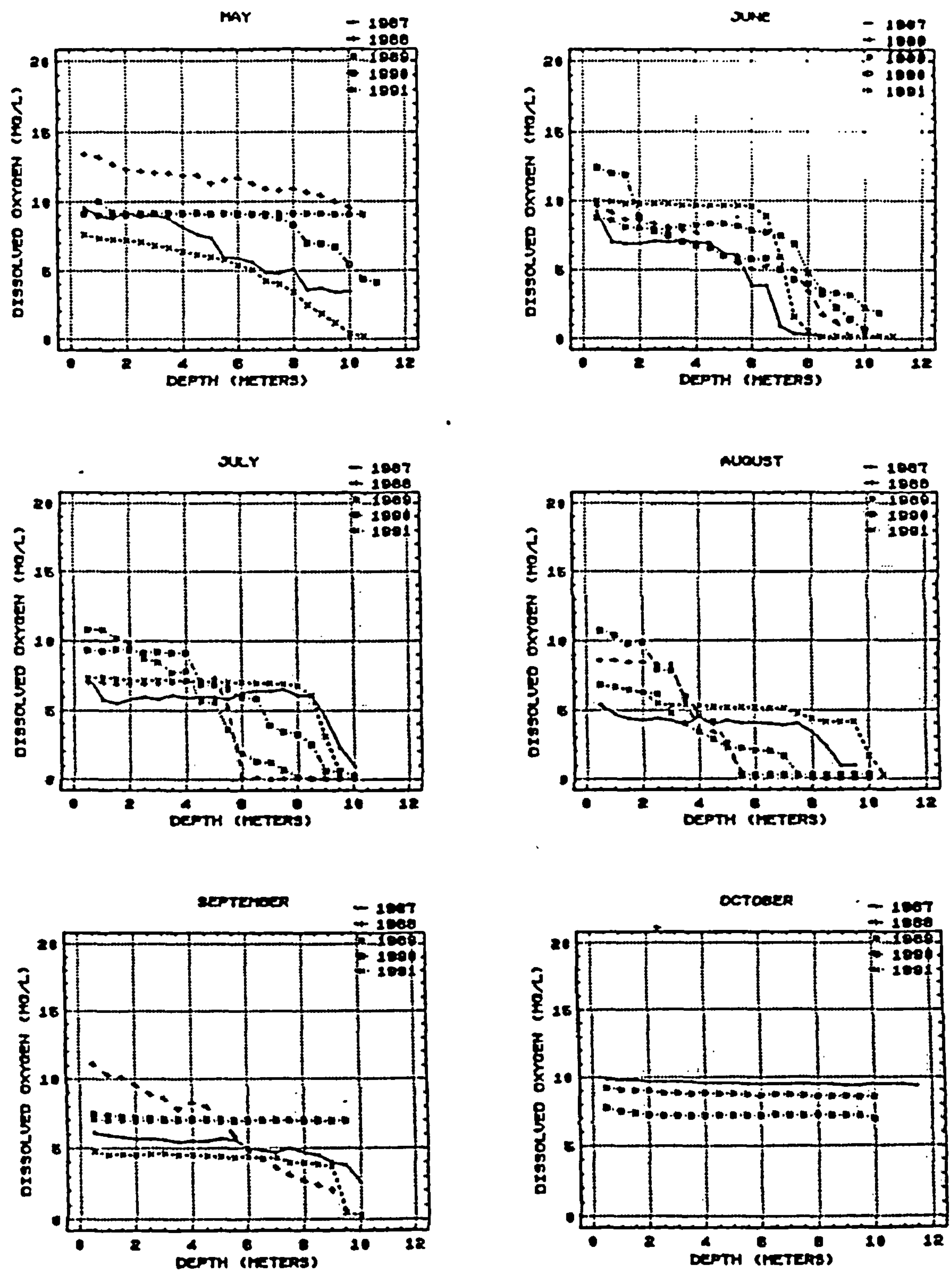

Figure 208. Depth profiles of dissolved oxygen concentrations (mg/l) at monitoring Site 8 in Clinton Lake from May through October during 1987 through 1991.

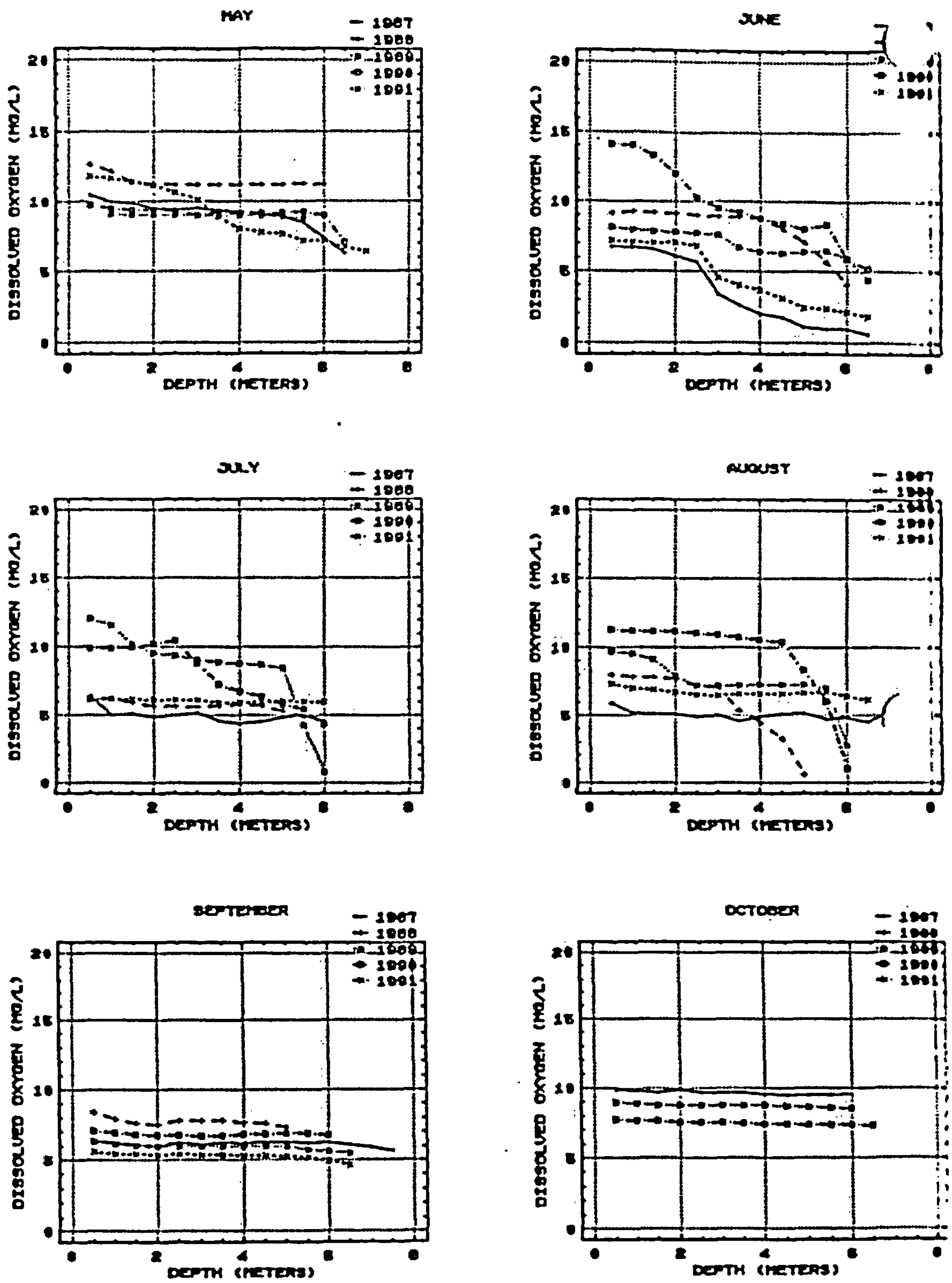

Figure 209. Depth profiles of dissolved oxygen concentrations (mg/l) at monitoring Site 4 in Clinton Lake from May through October during 1987 through 1991.

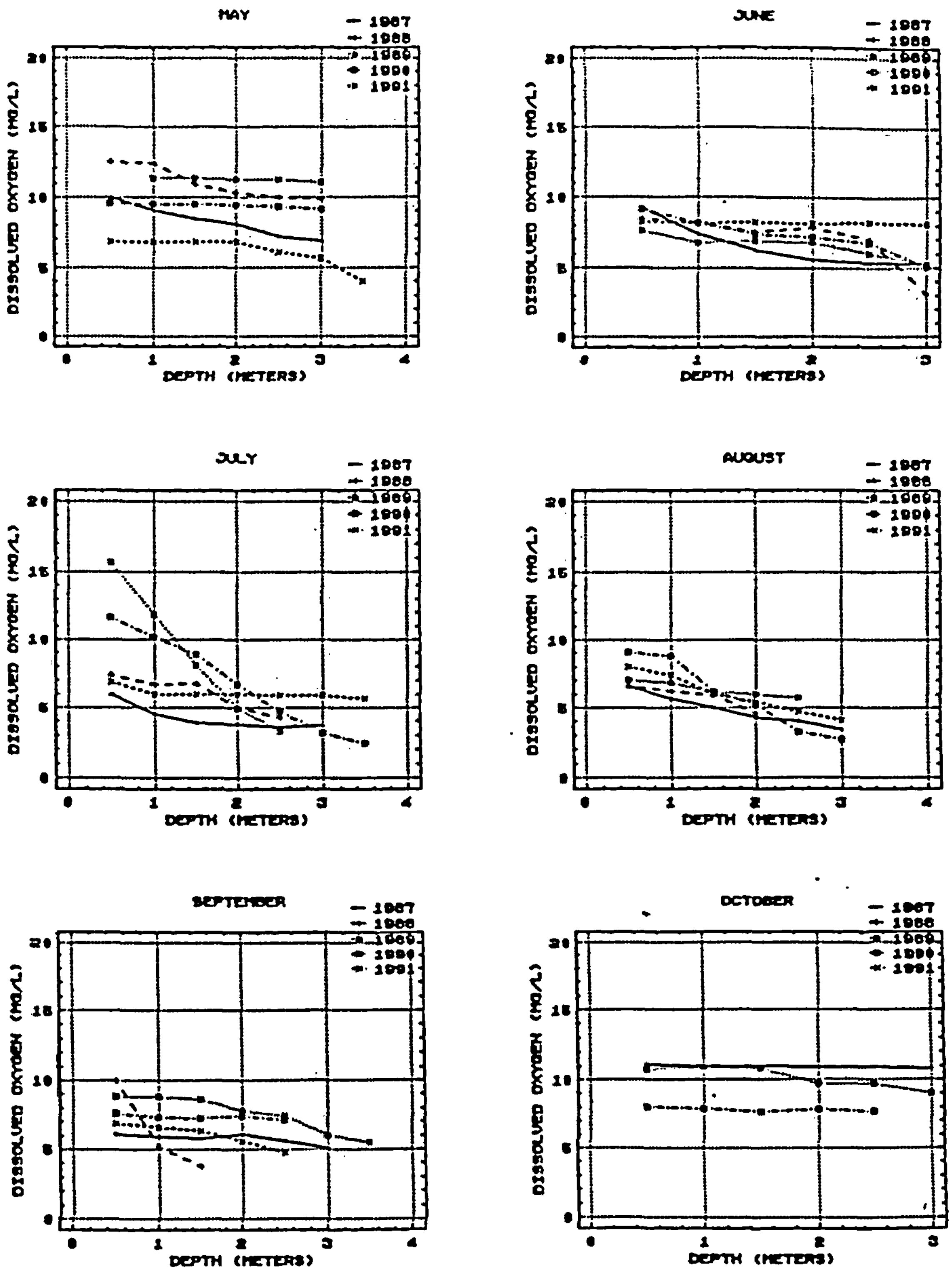

Figure 210. Depth profiles of dissolved oxygen concentrations (mg/l) at monitoring Site 16 in Clinton Lake from May through October during 1987 through 1991.

prevailed from June through September. During this period the DO depth profile was clinograde, which is characteristic of eutrophic lakes.

Results of analyses of variance (Tukey's) indicate distribution of dissolved oxygen concentrations was significantly different between preoperational and operational periods for Site 2 only (Figure 27). Thus, differences in DO profile data which could be attributable to CPS operations are limited to Site 2.

Nitrate

Concentrations of nitrates were significantly lower during the operational period (Figure 63). Distribution of nitrate data among years indicate that the lowest annual distributions of nitrate occurred during the initial three years after CPS became operational (1987 through 1989). Nitrate levels recovered during 1990 and 1991 and were not significantly different from years during the preoperational period. Lower concentrations occurred at all sites, months, and depth strata (Figures 64 through 66) during the operational period.

Decreased nitrate concentrations during 1987 through 1989 were probably due to two concomitant circumstances. Significantly greater concentrations of phytoplankton occurred during these years compared to the preoperational period (Willmore 1991). Nitrates and phosphates are essential nutrients for phytoplankton. Decreased concentrations in nitrates may be attributed to an increase in nitrate usage by significantly greater concentrations of phytoplankton. Nitrate assimilation by photosynthesis can greatly exceed sources of income and generation, and in some instances nitrate concentrations have been reduced to below detectable concentrations (Wetzel 1975).

Decreased precipitation in the lake's drainage basin may have also contributed to significant decreases in nitrate concentrations during the operational period. An inordinately low amount of precipitation, the second lowest recorded in 110 years, occurred during 1988. Major sources of nitrate to fresh waters are the atmosphere, in the form of precipitation, and runoff from surface land drainage and groundwater sources (Wetzel 1975). Thus, the decrease in nitrates during CPS operations may have resulted from greater densities of phytoplankton and supplies which were not replenished through precipitation and runoff.

Silica

There was a significant decrease in silica concentrations between preoperational and operational periods (Figure 199). Average concentrations of silica were 2.98 and 2.1 mg/l for preoperational and operational periods, respectively. The differences between periods may be an artifact of changes in sample collection schedules between periods, and concomitant shifts in diatom population densities. Diatoms assimilate large quantities of silica in cellular metabolism. Usage of silica by diatoms may greatly modify flux rates of silica in lakes (Wetzel 1975).

During the preoperational period, silica samples were collected monthly from March through November Since CPS began operation, silica samples have been collected quarterly. Samples were collected in April, June, July, September, October and November during the operational period. Silica concentrations generally increase in spring and early summer (Figure 211), following a decrease in diatom populations. However, during the operational period, samples were not collected for silica analysis in February, March or May. The majority of the operational data was collected during late summer and fall months when lower silica concentrations were historically observed (Figure 211).

Preoperational and operational distributions of silica were compared for months when operational samples were collected. Results of analysis of variance (Tukey's) indicate distribution of silica concentrations was significantly different only for April (Figure 211).

Silica concentrations were especially low during April of 1987. This corresponded to greater densities of diatoms in March and April, 1987 (Willmore 1991). The increased densities of diatoms in spring, 1987 probably accounted for the low silica levels and the significant difference in the distribution of silica concentrations between preoperational and operational periods (Figure 212).

Chloride

Comparisons in the distribution of chloride concentrations indicate a significant increase between preoperational and operational data (Figure 157). The CPS sewage treatment plant and the condenser cooling system are known sources of chloride contribution to Clinton Lake, but they may not be totally responsible for the sharp increase in chlorides in Clinton Lake during 1988 and 1989. The chlorine gas injection system used to treat condenser cooling water was not operated from 1985 to 1988. The chlorine gas system was replaced with a sodium hypochlorite treatment system which became operable in May, 1988. Thus, increased chloride values detected during 1987 and in the spring (April) of 1988 were not due to treatments for the condenser cooling water system. The total sodium hypochlorite dosage for 1988 was 25,138 gallons (10.6% solution). This dosage could account for an increase of 0.11 mg/l of chlorides in Clinton Lake. Thus, the sodium hypochlorite dosage in 1988 could account for only 1% of the increase in chloride between 1987 and 1988.

It would seem likely that chloride concentrations would be greater at the discharge (Site 2) if elevated chloride concentrations were due to CPS operations, since Site 2 receives effluent from the CPS sanitary wastewater treatment plant and the condenser cooling water. Analyses of intersite distributions of chloride data indicate no significant differences among sampling sites (Figure 158).

Low amounts of precipitation and high temperatures during the operational period resulted in lower than normal lake levels, which may have concentrated the chloride in the lake. No other causes for the increase in operational chloride levels are known at this time.

Mercury

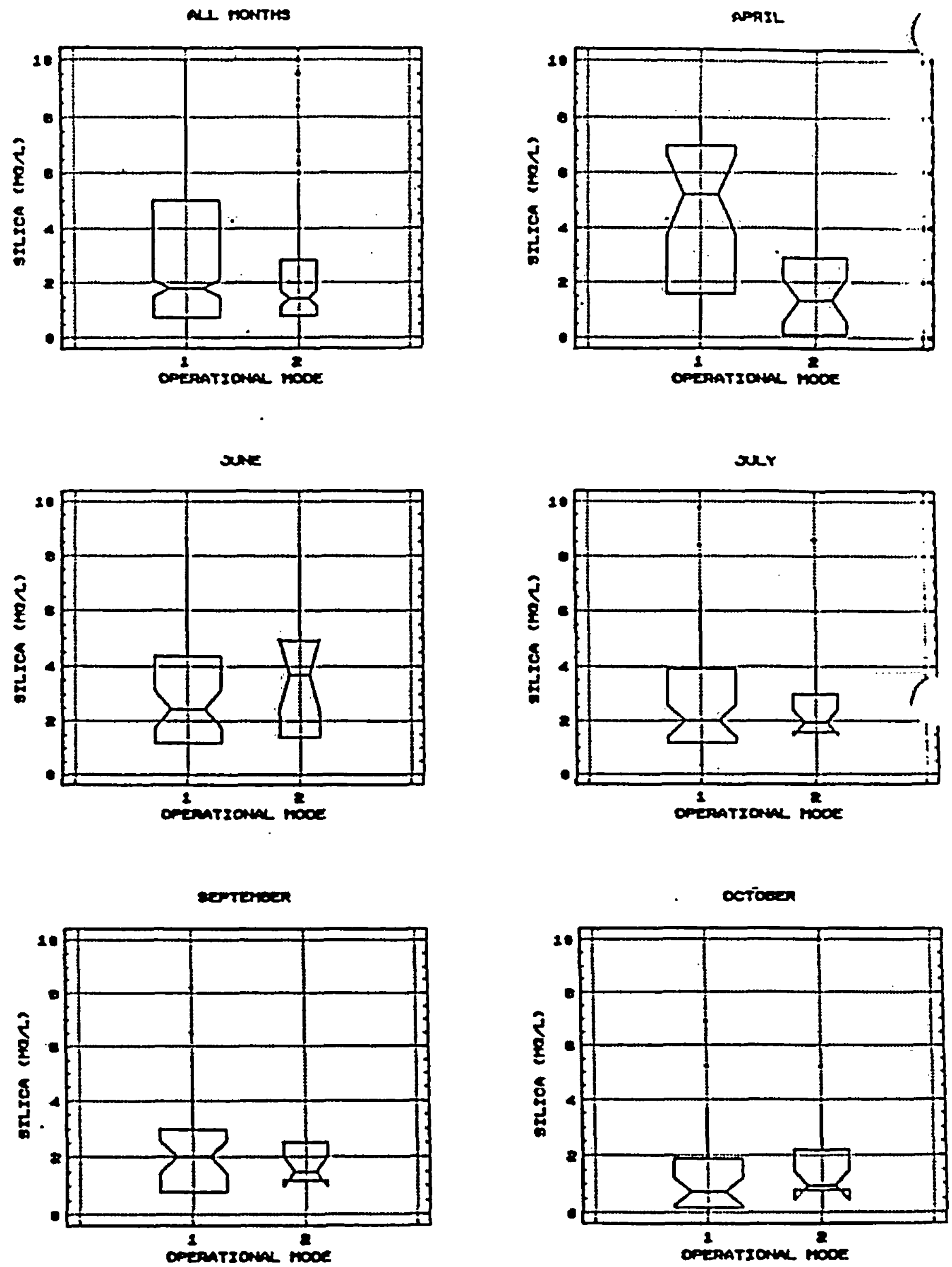

Figure 211. Plots of silica concentrations (mg/l) in Clinton Lake from May through October during the period prior to (Operational Mode 1) and during (Operational Mode 2) Clinton Power Station operation.

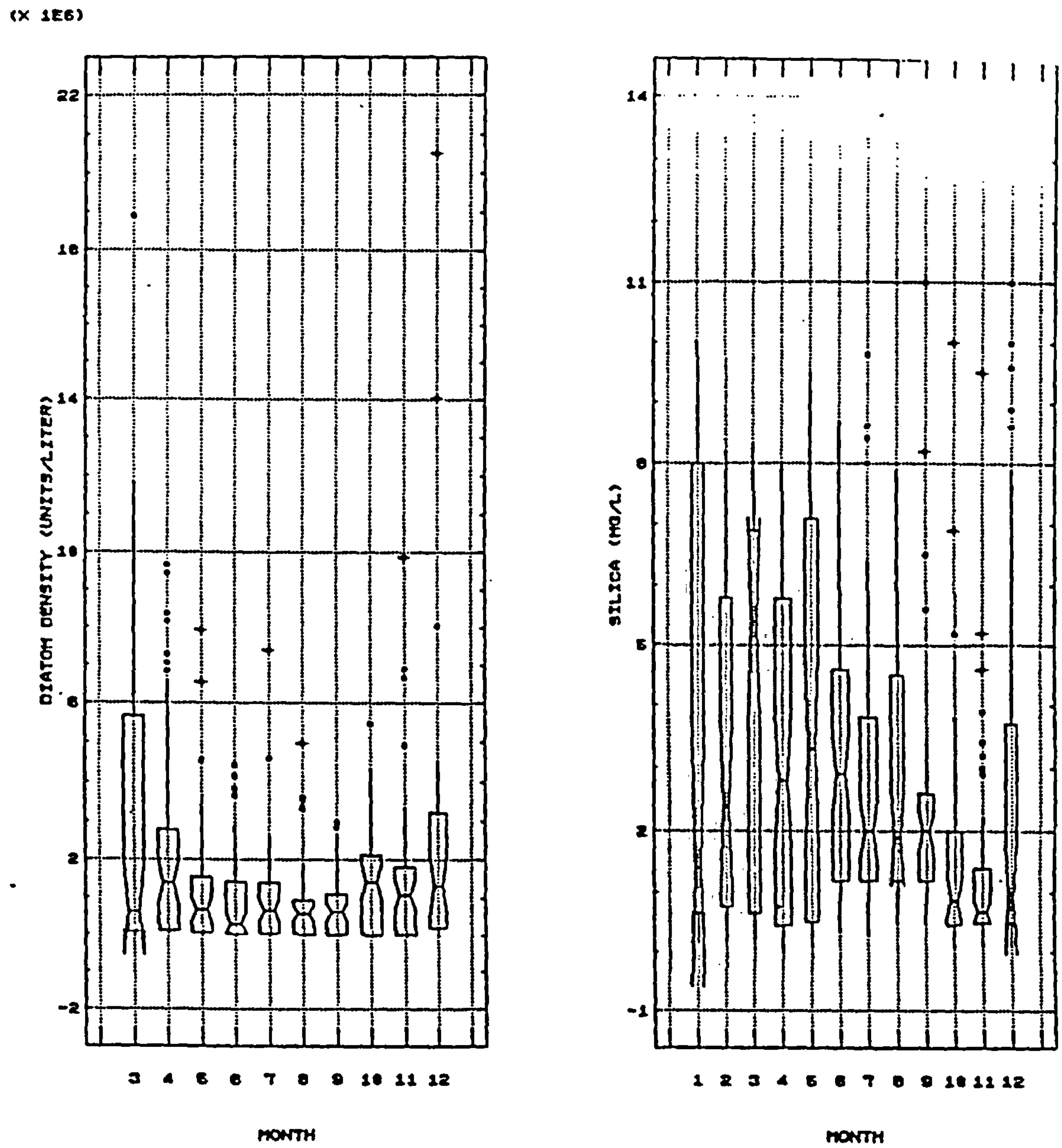

Figure 212. Plots of diatom densities (units/liter) and silica concentrations (mg/l) in Clinton Lake during 1987 through 1991.

All of the epilimnion mercury exceedances occurred from 1978 through 1984 during the preoperational period. There is no apparent reason for the greater concentrations of mercury during 1978 through 1984. Exceedances were not consistent among strata or over preceding and succeeding sampling events. Concentrations of mercury in fish flesh and sediment samples do not suggest mercury contamination in Clinton Lake (see Section 9.3). Since CPS became operational mercury has been detected above the LOD only once; this sample was collected from the hypolimnion at Site 16 during October, 1989.

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CLINTON POWER STATION

ENVIRONMENTAL MONITORING PROGRAM

WATER QUALITY REPORT

January 1978 through December 1991

Appendix A

Prepared by

Illinois Power Company

1992

TITLE	
APPENDIX	
A	Clinton Lake Water Quality Data 1987 through 1991
B	Clinton Lake Profile Data 1987 through 1991

Appendix A. Clinton Lake Water Quality Data 1987 through 1991

Tables A-1 through A-5 list the water quality data collected from Clinton Lake for the Environmental Monitoring Program during 1987 through 1991. Water quality data for 1978 through 1984 were included in the Clinton Lake Water Quality Report, 1978-1984, Volumes 2, 3 and 4. Water quality data for 1985 through 1988 are included in the Clinton Lake Water Quality Report, 1978-1988. Clinton Lake water quality data are organized by sampling date, site, gradient and parameter code.

Gradients and codes are explained below.

(1) GRAD = Gradient

1 = Epilimnion

2 = Metalimnion

3 = Hypolimnion

(2) PARAMETER CODE

105 = Specific conductance, umhos/cm

110 = pH 115 = Water temperature, C

120 = Dissolved oxygen, mg/l

121 = Dissolved oxygen saturation, %

130 = Turbidity, NTU

205 = Alkalinity, mg/l

215 = Biochemical oxygen demand, mg/l

230 = Hardness, mg/l

240 = Total dissolved solids, mg/l

245 = Total organic carbon, mg/l

(2) PARAMETER CODE (Cont.)

250 = Total organic nitrogen, mg/l

260 = Total suspended solids, mg/l

325 = Calcium, mg/l

335 = Copper, ug/l

345 = Lead, ug/l

350 = Magnesium, mg/l

360 = Mercury, ug/l

395 = Zinc, ug/l

415 = Chloride, mg/l

430 = Ammonia, mg/l

435 = Nitrate, mg/l

440 = Orthophosphate, mg/l

445 = Total phosphorus, mg/l

450 = Sulfate, mg/l

455 = Silica, mg/l

710 = Fecal coliform, no./100 ml

720 = Fecal streptococcus, no./100 ml

(3) DATA

The negative sign represents "less than", and indicates that the concentration was below the limit of detection. For statistical analysis, these values were divided by -2 to give a positive value halfway between the level of detection and zero.

CLINTON POWER STATION
ENVIRONMENTAL MONITORING PROGRAM
LAKE WATER QUALITY DATA FOR 1987

MONTH	DAY	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
** SITE 2					
4	15	2	1	105	538.000
4	15	2	1	110	8.000
4	15	2	1	115	11.300
4	15	2	1	120	10.700
4	15	2	1	121	99.100
4	15	2	1	130	9.600
4	15	2	1	205	193.000
4	15	2	1	230	224.000
4	15	2	1	240	290.000
4	15	2	1	250	0.900
4	15	2	1	260	15.000
4	15	2	1	325	59.000
4	15	2	1	350	30.000
4	15	2	1	360	-0.500
4	15	2	1	415	22.700
4	15	2	1	430	-0.100
4	15	2	1	435	3.400
4	15	2	1	440	-0.010
4	15	2	1	445	0.050
4	15	2	1	450	39.000
4	15	2	1	455	0.045
** SITE 4					
4	15	4	1	105	539.000
4	15	4	1	110	8.000
4	15	4	1	115	10.300
4	15	4	1	120	9.800
4	15	4	1	121	89.100
4	15	4	1	130	7.300
4	15	4	1	205	196.000
4	15	4	1	230	224.000
4	15	4	1	240	290.000
4	15	4	1	250	0.840
4	15	4	1	260	12.000
4	15	4	1	325	60.000
4	15	4	1	350	32.000
4	15	4	1	360	-0.500
4	15	4	1	415	22.400
4	15	4	1	430	-0.100
4	15	4	1	435	3.500
4	15	4	1	440	-0.010
4	15	4	1	445	0.050
4	15	4	1	450	40.000
4	15	4	1	455	-0.020
** SITE 8					
4	15	8	1	105	534.000
4	15	8	1	110	8.000
4	15	8	1	115	9.700
4	15	8	1	120	11.100
4	15	8	1	121	99.100
4	15	8	1	130	4.500
4	15	8	1	205	196.000
4	15	8	1	230	224.000
4	15	8	1	240	300.000
4	15	8	1	250	0.710
4	15	8	1	260	9.400
4	15	8	1	325	59.000
4	15	8	1	350	32.000
4	15	8	1	360	-0.500
4	15	8	1	415	22.700
4	15	8	1	430	0.100
4	15	8	1	435	3.700

MONTH	DAY	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
4	15	8	1	440	-0.010
4	15	8	1	445	0.068
4	15	8	1	450	40.000
4	15	8	1	455	-0.020
** SITE 13					
4	15	13	1	105	536.000
4	15	13	1	110	7.800
4	15	13	1	115	10.400
4	15	13	1	120	10.100
4	15	13	1	121	91.800
4	15	13	1	130	6.100
4	15	13	1	205	195.000
4	15	13	1	230	224.000
4	15	13	1	240	310.000
4	15	13	1	250	0.870
4	15	13	1	260	11.000
4	15	13	1	325	60.000
4	15	13	1	350	32.000
4	15	13	1	360	-0.500
4	15	13	1	415	22.700
4	15	13	1	430	-0.100
4	15	13	1	435	3.600
4	15	13	1	440	-0.010
4	15	13	1	445	0.050
4	15	13	1	450	43.000
4	15	13	1	455	-0.020
** SITE 16					
4	15	16	1	105	575.000
4	15	16	1	110	8.000
4	15	16	1	115	11.800
4	15	16	1	120	10.400
4	15	16	1	121	97.200
4	15	16	1	130	12.000
4	15	16	1	205	201.000
4	15	16	1	230	241.000
4	15	16	1	240	340.000
4	15	16	1	250	1.000
4	15	16	1	260	15.000
4	15	16	1	325	65.000
4	15	16	1	350	34.000
4	15	16	1	360	-0.500
4	15	16	1	415	24.900
4	15	16	1	430	-0.100
4	15	16	1	435	3.700
4	15	16	1	440	-0.010
4	15	16	1	445	0.071
4	15	16	1	450	47.000
4	15	16	1	455	0.220
** SITE 2					
5	19	2	1	105	497.000
5	19	2	1	110	7.900
5	19	2	1	115	25.500
5	19	2	1	120	6.100
5	19	2	1	435	2.600
5	19	2	1	445	0.079
** SITE 4					
5	19	4	1	105	491.000
5	19	4	1	110	8.200
5	19	4	1	115	22.300
5	19	4	1	120	10.100

CLINTON POWER STATION
ENVIRONMENTAL MONITORING PROGRAM
LAKE WATER QUALITY DATA FOR 1987

MONTH	DAY	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
5	19	4	1	435	2.400
5	19	4	1	445	0.068
** SITE 8					
5	19	8	1	105	485.000
5	19	8	1	110	8.200
5	19	8	1	115	21.300
5	19	8	1	120	9.000
5	19	8	1	435	2.400
5	19	8	1	445	0.063
** SITE 13					
5	19	13	1	105	479.000
5	19	13	1	110	8.300
5	19	13	1	115	22.400
5	19	13	1	120	9.600
5	19	13	1	435	2.700
5	19	13	1	445	0.060
** SITE 16					
5	19	16	1	105	475.000
5	19	16	1	110	8.400
5	19	16	1	115	23.800
5	19	16	1	120	9.100
5	19	16	1	435	3.200
5	19	16	1	445	0.120
** SITE 2					
6	23	2	1	105	476.000
6	23	2	2	105	471.000
6	23	2	3	105	470.000
6	23	2	1	110	7.700
6	23	2	2	110	7.900
6	23	2	3	110	7.800
6	23	2	1	115	32.100
6	23	2	2	115	31.300
6	23	2	3	115	29.900
6	23	2	1	120	5.800
6	23	2	2	120	5.400
6	23	2	3	120	2.800
6	23	2	1	435	1.200
6	23	2	2	435	1.200
6	23	2	3	435	0.820
6	23	2	1	445	0.093
6	23	2	2	445	0.076
6	23	2	3	445	0.150
** SITE 4					
6	23	4	1	105	454.000
6	23	4	1	110	8.000
6	23	4	1	115	27.100
6	23	4	1	120	6.700
6	23	4	1	435	1.300
6	23	4	1	445	0.050
** SITE 8					
6	23	8	1	105	468.000
6	23	8	2	105	490.000
6	23	8	3	105	500.000
6	23	8	1	110	8.000
6	23	8	2	110	7.200
6	23	8	3	110	7.200
6	23	8	1	115	26.700
6	23	8	2	115	24.000

MONTH	DAY	SITE	GRAD(1)	PARAMETER CODE(2)	[illegible]
6	23	8	3	115	22.300
6	23	8	1	120	7.000
6	23	8	2	120	-1.000
6	23	8	3	120	-1.000
6	23	8	1	435	1.300
6	23	8	2	435	0.830
6	23	8	3	435	0.490
6	23	8	1	445	0.011
6	23	8	2	445	0.044
6	23	8	3	445	0.170
** SITE 13					
6	23	13	1	105	472.000
6	23	13	2	105	482.000
6	23	13	1	110	8.000
6	23	13	2	110	7.600
6	23	13	1	115	28.200
6	23	13	2	115	26.000
6	23	13	1	120	7.000
6	23	13	2	120	1.700
6	23	13	1	435	1.000
6	23	13	2	435	0.850
6	23	13	1	445	0.060
6	23	13	2	445	0.098
** SITE 16					
6	23	16	1	105	484.000
6	23	16	2	105	489.000
6	23	16	1	110	8.000
6	23	16	2	110	8.000
6	23	16	1	115	[illegible]
6	23	16	2	115	[illegible]
6	23	16	1	120	[illegible]
6	23	16	2	120	5.600
6	23	16	1	435	0.670
6	23	16	1	445	0.120
** SITE 2					
7	16	2	1	105	471.000
7	16	2	1	110	8.000
7	16	2	1	115	26.000
7	16	2	1	120	6.000
7	16	2	1	121	75.000
7	16	2	1	130	17.000
7	16	2	1	205	164.000
7	16	2	1	230	204.000
7	16	2	1	240	250.000
7	16	2	1	250	0.720
7	16	2	1	260	34.000
7	16	2	1	325	46.000
7	16	2	1	350	30.000
7	16	2	1	360	-0.500
7	16	2	1	415	25.900
7	16	2	1	430	-0.100
7	16	2	1	435	0.900
7	16	2	1	440	-0.010
7	16	2	1	445	0.090
7	16	2	1	450	38.000
7	16	2	1	455	1.100
** SITE 4					
7	16	4	1	105	475.000
7	16	4	1	110	8.000
7	16	4	1	115	25.000

CLINTON POWER STATION
ENVIRONMENTAL MONITORING PROGRAM
LAKE WATER QUALITY DATA FOR 1987

MONTH	DAY	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
7	16	4	1	120	5.000
7	16	4	1	121	61.000
7	16	4	1	130	7.600
7	16	4	1	205	155.000
7	16	4	1	230	207.000
7	16	4	1	240	250.000
7	16	4	1	250	0.660
7	16	4	1	260	11.000
7	16	4	1	325	44.000
7	16	4	1	350	29.000
7	16	4	1	360	-0.500
7	16	4	1	415	25.800
7	16	4	1	430	-0.100
7	16	4	1	435	0.660
7	16	4	1	440	-0.010
7	16	4	1	445	0.060
7	16	4	1	450	40.000
7	16	4	1	455	0.860

** SITE 8

MONTH	DAY	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
7	16	8	1	105	472.000
7	16	8	2	105	483.000
7	16	8	1	110	8.100
7	16	8	2	110	7.700
7	16	8	1	115	25.200
7	16	8	2	115	24.600
7	16	8	1	120	6.300
7	16	8	2	120	3.300
7	16	8	1	121	71.100
7	16	8	2	121	28.000
7	16	8	1	130	3.300
7	16	8	2	130	16.000
7	16	8	1	205	159.000
7	16	8	2	205	185.000
7	16	8	1	230	222.000
7	16	8	2	230	234.000
7	16	8	1	240	260.000
7	16	8	2	240	260.000
7	16	8	1	250	0.680
7	16	8	2	250	0.590
7	16	8	1	260	5.700
7	16	8	2	260	22.000
7	16	8	1	325	44.000
7	16	8	2	325	46.000
7	16	8	1	350	30.000
7	16	8	2	350	30.000
7	16	8	1	360	-0.500
7	16	8	2	360	-0.500
7	16	8	1	415	25.900
7	16	8	2	415	25.400
7	16	8	1	430	-0.100
7	16	8	2	430	1.200
7	16	8	1	435	0.700
7	16	8	2	435	0.180
7	16	8	1	440	-0.010
7	16	8	2	440	0.020
7	16	8	1	445	0.038
7	16	8	2	445	0.100
7	16	8	1	450	39.000
7	16	8	2	450	34.000
7	16	8	1	455	0.730
7	16	8	2	455	3.400

** SITE 13

MONTH	DAY	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
7	16	13	1	105	476.000
7	16	13	1	110	7.900
7	16	13	1	115	26.300
7	16	13	1	120	4.900
7	16	13	1	121	61.200
7	16	13	1	130	5.900
7	16	13	1	205	165.000
7	16	13	1	230	228.000
7	16	13	1	240	260.000
7	16	13	1	250	0.980
7	16	13	1	260	9.000
7	16	13	1	325	45.000
7	16	13	1	350	30.000
7	16	13	1	360	-0.500
7	16	13	1	415	26.000
7	16	13	1	430	-0.100
7	16	13	1	435	0.580
7	16	13	1	440	-0.010
7	16	13	1	445	0.059
7	16	13	1	450	38.000
7	16	13	1	455	0.990

** SITE 16

MONTH	DAY	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
7	16	16	1	105	493.000
7	16	16	1	110	7.700
7	16	16	1	115	25.200
7	16	16	1	120	4.500
7	16	16	1	121	54.900
7	16	16	1	130	22.000
7	16	16	1	205	170.000
7	16	16	1	230	228.000
7	16	16	1	240	290.000
7	16	16	1	250	0.790
7	16	16	1	260	36.000
7	16	16	1	325	50.000
7	16	16	1	350	32.000
7	16	16	1	360	-0.500
7	16	16	1	415	28.200
7	16	16	1	430	-0.100
7	16	16	1	435	0.330
7	16	16	1	440	0.078
7	16	16	1	445	0.170
7	16	16	1	450	39.000
7	16	16	1	455	2.200

** SITE 2

MONTH	DAY	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
8	19	2	1	105	443.000
8	19	2	1	110	8.200
8	19	2	1	115	30.700
8	19	2	1	120	4.900
8	19	2	1	435	-0.050
8	19	2	1	445	0.095

** SITE 4

MONTH	DAY	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
8	19	4	1	105	439.000
8	19	4	1	110	8.200
8	19	4	1	115	27.400
8	19	4	1	120	5.200
8	19	4	1	435	-0.050
8	19	4	1	445	0.086

** SITE 8

MONTH	DAY	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
8	19	8	1	105	449.000

CLINTON POWER STATION
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MONTH	DAY	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
8	19	8	1	110	8.000
8	19	8	1	115	27.200
8	19	8	1	120	4.700
8	19	8	1	435	-0.050
8	19	8	1	445	0.051
** SITE 13					
8	19	13	1	105	443.000
8	19	13	1	110	8.100
8	19	13	1	115	27.500
8	19	13	1	120	5.500
8	19	13	1	435	-0.050
8	19	13	1	445	0.070
** SITE 16					
8	19	16	1	105	449.000
8	19	16	1	110	8.200
8	19	16	1	115	28.000
8	19	16	1	120	5.700
8	19	16	1	435	-0.050
8	19	16	1	445	0.160
** SITE 2					
9	17	2	1	105	459.000
9	17	2	1	110	8.000
9	17	2	1	115	28.600
9	17	2	1	120	7.200
9	17	2	1	435	0.050
9	17	2	1	445	0.084
** SITE 4					
9	17	4	1	105	452.000
9	17	4	1	110	8.100
9	17	4	1	115	21.600
9	17	4	1	120	6.200
9	17	4	1	435	-0.050
9	17	4	1	445	0.055
** SITE 8					
9	17	8	1	105	452.000
9	17	8	1	110	8.100
9	17	8	1	115	23.500
9	17	8	1	120	5.800
9	17	8	1	435	-0.050
9	17	8	1	445	0.048
** SITE 13					
9	17	13	1	105	458.000
9	17	13	1	110	7.800
9	17	13	1	115	24.200
9	17	13	1	120	4.800
** SITE 16					
9	17	16	1	105	461.000
9	17	16	1	110	8.100
9	17	16	1	115	24.000
9	17	16	1	120	7.000
9	17	16	1	435	-0.050
9	17	16	1	445	0.150
** SITE 2					
10	28	2	1	105	490.000
10	28	2	1	110	8.400
10	28	2	1	115	10.600
10	28	2	1	120	10.[illegible]
10	28	2	1	121	[illegible]
10	28	2	1	130	10.[illegible]
10	28	2	1	205	167.[illegible]
10	28	2	1	230	220.[illegible]
10	28	2	1	240	280.[illegible]
10	28	2	1	250	0.[illegible]
10	28	2	1	260	18.[illegible]
10	28	2	1	325	42.[illegible]
10	28	2	1	350	35.[illegible]
10	28	2	1	360	-0.[illegible]
10	28	2	1	415	25.[illegible]
10	28	2	1	430	-0.1[illegible]
10	28	2	1	435	0.17[illegible]
10	28	2	1	440	-0.011
10	28	2	1	445	0.0[illegible]
10	28	2	1	450	35.000
10	28	2	1	455	0.27[illegible]
** SITE 4					
10	28	4	1	105	500.000
10	28	4	1	110	8.200
10	28	4	1	115	10.800
10	28	4	1	120	9.700
10	28	4	1	121	89.900
10	28	4	1	130	10.000
10	28	4	1	205	166.000
10	28	4	1	230	218.000
10	28	4	1	240	250.000
10	28	4	1	250	0.640
10	28	4	1	260	16.000
10	28	4	1	325	[illegible]
10	28	4	1	350	[illegible]
10	28	4	1	360	[illegible]
10	28	4	1	415	25.000
10	28	4	1	430	-0.100
10	28	4	1	435	0.120
10	28	4	1	440	-0.017
10	28	4	1	445	0.047
10	28	4	1	450	36.000
10	28	4	1	455	0.390
** SITE 8					
10	28	8	1	105	494.000
10	28	8	1	110	8.300
10	28	8	1	115	11.200
10	28	8	1	120	9.800
10	28	8	1	121	90.700
10	28	8	1	130	5.100
10	28	8	1	205	188.000
10	28	8	1	230	214.000
10	28	8	1	240	280.000
10	28	8	1	250	0.630
10	28	8	1	260	9.700
10	28	8	1	325	42.000
10	28	8	1	350	35.000
10	28	8	1	360	-0.500
10	28	8	1	415	25.200
10	28	8	1	430	-0.100
10	28	8	1	435	0.070
10	28	8	1	440	-0.010
10	28	8	1	445	0.049
10	28	8	1	450	35.000
10	28	8	1	455	0.320

MONTH	DAY	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
** SITE 13					
10	28	13	1	105	488.000
10	28	13	1	110	8.400
10	28	13	1	115	10.800
10	28	13	1	120	10.700
10	28	13	1	121	98.200
10	28	13	1	130	5.200
10	28	13	1	205	167.000
10	28	13	1	230	224.000
10	28	13	1	240	270.000
10	28	13	1	250	0.660
10	28	13	1	260	11.000
10	28	13	1	325	42.000
10	28	13	1	350	35.000
10	28	13	1	360	-0.500
10	28	13	1	415	25.400
10	28	13	1	430	-0.100
10	28	13	1	435	0.064
10	28	13	1	440	-0.010
10	28	13	1	445	0.049
10	28	13	1	450	37.000
10	28	13	1	455	0.200
** SITE 16					
10	28	16	1	105	500.000
10	28	16	1	110	8.500
10	28	16	1	115	9.400
10	28	16	1	120	11.000
10	28	16	1	121	97.300
10	28	16	1	130	7.700
10	28	16	1	205	172.000
10	28	16	1	230	232.000
10	28	16	1	240	270.000
10	28	16	1	250	0.660
10	28	16	1	260	14.000
10	28	16	1	325	44.000
10	28	16	1	350	36.000
10	28	16	1	360	-0.500
10	28	16	1	415	26.000
10	28	16	1	430	-0.100
10	28	16	1	435	-0.050
10	28	16	1	440	0.015
10	28	16	1	445	0.065
10	28	16	1	450	39.000
10	28	16	1	455	1.200
** SITE 2					
11	4	2	1	105	486.000
11	4	2	1	110	8.100
11	4	2	1	115	13.500
11	4	2	1	120	10.800
11	4	2	1	121	105.000
11	4	2	1	130	9.500
11	4	2	1	205	167.000
11	4	2	1	230	215.000
11	4	2	1	240	230.000
11	4	2	1	250	0.720
11	4	2	1	260	13.000
11	4	2	1	325	39.000
11	4	2	1	350	35.000
11	4	2	1	360	-0.500
11	4	2	1	415	24.900
11	4	2	1	430	-0.100

MONTH	DAY	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
11	4	2	1	435	0.085
11	4	2	1	440	-0.010
11	4	2	1	445	0.058
11	4	2	1	450	38.000
11	4	2	1	455	0.290
** SITE 4					
11	4	4	1	105	485.000
11	4	4	1	110	8.000
11	4	4	1	115	12.900
11	4	4	1	120	10.500
11	4	4	1	121	101.000
11	4	4	1	130	8.100
11	4	4	1	205	172.000
11	4	4	1	230	220.000
11	4	4	1	240	270.000
11	4	4	1	250	0.750
11	4	4	1	260	10.000
11	4	4	1	325	41.000
11	4	4	1	350	35.000
11	4	4	1	360	-0.500
11	4	4	1	415	25.100
11	4	4	1	430	0.150
11	4	4	1	435	0.090
11	4	4	1	440	-0.010
11	4	4	1	445	0.070
11	4	4	1	450	35.000
11	4	4	1	455	0.310
** SITE 8					
11	4	8	1	105	487.000
11	4	8	1	110	8.000
11	4	8	1	115	12.100
11	4	8	1	120	9.000
11	4	8	1	121	93.800
11	4	8	1	130	5.300
11	4	8	1	205	170.000
11	4	8	1	230	218.000
11	4	8	1	240	260.000
11	4	8	1	250	0.630
11	4	8	1	260	5.000
11	4	8	1	325	40.000
11	4	8	1	350	35.000
11	4	8	1	360	-0.500
11	4	8	1	415	25.000
11	4	8	1	430	-0.100
11	4	8	1	435	0.082
11	4	8	1	440	-0.010
11	4	8	1	445	0.046
11	4	8	1	450	38.000
11	4	8	1	455	0.400
** SITE 13					
11	4	13	1	105	485.000
11	4	13	1	110	8.200
11	4	13	1	115	12.600
11	4	13	1	120	11.400
11	4	13	1	121	108.000
11	4	13	1	130	7.500
11	4	13	1	205	169.000
11	4	13	1	230	222.000
11	4	13	1	240	250.000
11	4	13	1	250	0.790
11	4	13	1	260	8.500

MONTH	DAY	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
11	4	13	1	325	40.000
11	4	13	1	350	35.000
11	4	13	1	360	-0.500
11	4	13	1	415	24.800
11	4	13	1	430	-0.100
11	4	13	1	435	0.058
11	4	13	1	440	-0.010
11	4	13	1	445	0.051
11	4	13	1	450	34.000
11	4	13	1	455	-0.200
** SITE 16					
11	4	16	1	105	499.000
11	4	16	1	110	8.100
11	4	16	1	115	13.600
11	4	16	1	120	10.300
11	4	16	1	121	100.000
11	4	16	1	130	11.000
11	4	16	1	205	176.000
11	4	16	1	230	232.000
11	4	16	1	240	260.000
11	4	16	1	250	0.840
11	4	16	1	260	15.000
11	4	16	1	325	42.000
11	4	16	1	350	36.000
11	4	16	1	360	-0.500
11	4	16	1	415	25.800
11	4	16	1	430	-0.100
11	4	16	1	435	-0.050
11	4	16	1	440	0.016
11	4	16	1	445	0.085
11	4	16	1	450	41.000
11	4	16	1	455	0.330

CLINTON POWER STATION
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LAKE WATER QUALITY DATA FOR 1988

MONTH	DAY	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
** SITE 2					
4	12	2	1	105	486.000
4	12	2	1	110	8.100
4	12	2	1	115	13.500
4	12	2	1	120	10.800
4	12	2	1	121	98.100
4	12	2	1	130	14.000
4	12	2	1	205	198.000
4	12	2	1	230	280.000
4	12	2	1	240	340.000
4	12	2	1	250	0.500
4	12	2	1	260	28.400
4	12	2	1	325	59.000
4	12	2	1	350	32.000
4	12	2	1	360	-0.200
4	12	2	1	415	27.900
4	12	2	1	430	-0.100
4	12	2	1	435	1.000
4	12	2	1	440	-0.010
4	12	2	1	445	0.062
4	12	2	1	450	45.000
4	12	2	1	455	1.070
** SITE 4					
4	12	4	1	105	485.000
4	12	4	1	110	8.000
4	12	4	1	115	12.900
4	12	4	1	120	10.500
4	12	4	1	121	94.300
4	12	4	1	130	11.000
4	12	4	1	205	205.000
4	12	4	1	230	284.000
4	12	4	1	240	340.000
4	12	4	1	250	0.550
4	12	4	1	260	20.000
4	12	4	1	325	57.000
4	12	4	1	350	32.000
4	12	4	1	360	-0.200
4	12	4	1	415	28.500
4	12	4	1	430	-0.100
4	12	4	1	435	0.960
4	12	4	1	440	-0.010
4	12	4	1	445	0.074
4	12	4	1	450	41.000
4	12	4	1	455	2.220
** SITE 8					
4	12	8	1	105	488.000
4	12	8	1	110	8.000
4	12	8	1	115	12.100
4	12	8	1	120	9.900
4	12	8	1	121	100.000
4	12	8	1	130	8.600
4	12	8	1	205	184.000
4	12	8	1	230	256.000
4	12	8	1	240	310.000
4	12	8	1	250	0.900
4	12	8	1	260	13.300
4	12	8	1	325	46.000
4	12	8	1	350	31.000
4	12	8	1	360	-0.200
4	12	8	1	415	27.100
4	12	8	1	430	-0.100
4	12	8	1	435	0.680
4	12	8	1	440	-0.010
4	12	8	1	445	0.050
4	12	8	1	450	40.000
4	12	8	1	455	0.300
** SITE 13					
4	12	13	1	105	485.000
4	12	13	1	110	8.200
4	12	13	1	115	12.600
4	12	13	1	120	11.400
4	12	13	1	121	99.600
4	12	13	1	130	10.000
4	12	13	1	205	186.000
4	12	13	1	230	263.000
4	12	13	1	240	310.000
4	12	13	1	250	0.840
4	12	13	1	260	16.100
4	12	13	1	325	50.000
4	12	13	1	350	30.000
4	12	13	1	360	-0.200
4	12	13	1	415	27.300
4	12	13	1	430	-0.100
4	12	13	1	435	0.800
4	12	13	1	440	-0.010
4	12	13	1	445	0.038
4	12	13	1	450	42.000
4	12	13	1	455	0.510
** SITE 16					
4	12	16	1	105	499.000
4	12	16	1	110	8.100
4	12	16	1	115	13.600
4	12	16	1	120	10.300
4	12	16	1	121	94.300
4	12	16	1	130	20.000
4	12	16	1	205	222.000
4	12	16	1	230	324.000
4	12	16	1	240	380.000
4	12	16	1	250	0.860
4	12	16	1	260	36.300
4	12	16	1	325	70.000
4	12	16	1	350	34.000
4	12	16	1	360	-0.200
4	12	16	1	415	36.200
4	12	16	1	430	-0.100
4	12	16	1	435	8.200
4	12	16	1	440	0.021
4	12	16	1	445	0.110
4	12	16	1	450	47.000
4	12	16	1	455	3.710
** SITE 2					
5	11	2	1	105	551.000
5	11	2	1	110	8.100
5	11	2	1	115	14.700
5	11	2	1	120	11.200
5	11	2	1	435	4.200
5	11	2	1	445	0.028
** SITE 4					
5	11	4	1	105	536.000
5	11	4	1	110	7.900
5	11	4	1	115	14.500
5	11	4	1	120	12.200

CLINTON POWER STATION
ENVIRONMENTAL MONITORING PROGRAM
LAKE WATER QUALITY DATA FOR 1988

MONTH	DAY	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
5	11	4	1	435	4.100
5	11	4	1	445	0.041
** SITE 8					
5	11	8	1	105	522.000
5	11	8	1	110	8.200
5	11	8	1	115	15.100
5	11	8	1	120	13.200
5	11	8	1	435	3.700
5	11	8	1	445	0.061
** SITE 13					
5	11	13	1	105	546.000
5	11	13	1	110	8.200
5	11	13	1	115	14.300
5	11	13	1	120	12.900
5	11	13	1	435	5.800
5	11	13	1	445	0.062
** SITE 16					
5	11	16	1	105	601.000
5	11	16	1	110	8.200
5	11	16	1	115	15.400
5	11	16	1	120	12.400
5	11	16	1	435	6.800
5	11	16	1	445	0.100
** SITE 2					
6	16	2	1	105	507.000
6	16	2	1	110	8.400
6	16	2	1	115	32.900
6	16	2	1	120	7.300
6	16	2	1	435	2.100
6	16	2	2	435	2.600
6	16	2	1	445	0.072
6	16	2	2	445	0.110
** SITE 4					
6	16	4	1	105	513.000
6	16	4	1	110	8.400
6	16	4	1	115	23.800
6	16	4	1	120	9.300
6	16	4	1	435	2.600
6	16	4	1	445	0.080
** SITE 8					
6	16	8	1	105	513.000
6	16	8	1	110	8.400
6	16	8	1	115	24.100
6	16	8	1	120	9.100
6	16	8	1	435	2.300
6	16	8	1	445	0.069
** SITE 13					
6	16	13	1	105	511.000
6	16	13	1	110	8.500
6	16	13	1	115	27.600
6	16	13	1	120	8.600
6	16	13	1	435	2.000
6	16	13	2	435	4.800
6	16	13	3	435	2.100
6	16	13	1	445	0.079
6	16	13	2	445	0.074
6	16	13	3	445	0.082

MONTH	DAY	SITE	GRAD(1)	PARAMETER CODE(2)	[illegible]
** SITE 16					
6	16	16	1	105	506.00
6	16	16	1	110	8.50
6	16	16	1	115	29.00
6	16	16	1	120	8.20
6	16	16	1	435	1.90
6	16	16	2	435	3.30
6	16	16	1	445	0.10
6	16	16	2	445	0.12
** SITE 2					
7	21	2	1	105	484.000
7	21	2	2	105	487.000
7	21	2	1	110	8.000
7	21	2	2	110	8.000
7	21	2	1	115	34.800
7	21	2	2	115	30.700
7	21	2	1	120	5.100
7	21	2	2	120	3.600
7	21	2	1	121	72.800
7	21	2	2	121	48.600
7	21	2	1	130	10.000
7	21	2	2	130	12.000
7	21	2	1	205	146.000
7	21	2	2	205	148.000
7	21	2	1	230	191.000
7	21	2	2	230	214.000
7	21	2	1	240	270.000
7	21	2	2	240	280.000
7	21	2	1	250	0.720
7	21	2	2	250	[illegible]
7	21	2	1	260	[illegible]
7	21	2	2	260	[illegible]
7	21	2	1	325	32.000
7	21	2	2	325	30.000
7	21	2	1	350	34.000
7	21	2	2	350	34.000
7	21	2	1	360	-0.200
7	21	2	2	360	-0.200
7	21	2	1	415	30.500
7	21	2	2	415	30.300
7	21	2	1	430	0.270
7	21	2	2	430	0.370
7	21	2	1	435	0.420
7	21	2	2	435	0.480
7	21	2	1	440	0.077
7	21	2	2	440	0.064
7	21	2	1	445	0.085
7	21	2	2	445	0.110
7	21	2	1	450	46.000
7	21	2	2	450	39.000
7	21	2	1	455	2.100
7	21	2	2	455	2.300
** SITE 4					
7	21	4	1	105	485.000
7	21	4	1	110	8.100
7	21	4	1	115	27.200
7	21	4	1	120	6.200
7	21	4	1	121	78.500
7	21	4	1	130	6.600
7	21	4	1	205	146.000
7	21	4	1	230	210.000

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MONTH	DAY	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
7	21	4	1	240	290.000
7	21	4	1	250	0.720
7	21	4	1	260	10.000
7	21	4	1	325	30.000
7	21	4	1	350	34.000
7	21	4	1	360	-0.200
7	21	4	1	415	30.000
7	21	4	1	430	-0.100
7	21	4	1	435	0.870
7	21	4	1	440	0.040
7	21	4	1	445	0.058
7	21	4	1	450	45.000
7	21	4	1	455	1.700
** SITE 8					
7	21	8	1	105	481.000
7	21	8	2	105	517.000
7	21	8	3	105	536.000
7	21	8	1	110	8.200
7	21	8	2	110	7.300
7	21	8	3	110	7.200
7	21	8	1	115	28.300
7	21	8	2	115	25.200
7	21	8	3	115	23.800
7	21	8	1	120	7.000
7	21	8	2	120	0.100
7	21	8	3	120	0.050
7	21	8	1	121	90.900
7	21	8	2	121	1.220
7	21	8	3	121	0.600
7	21	8	1	130	4.600
7	21	8	2	130	10.000
7	21	8	3	130	16.000
7	21	8	1	205	146.000
7	21	8	2	205	156.000
7	21	8	3	205	174.000
7	21	8	1	230	220.000
7	21	8	2	230	234.000
7	21	8	3	230	238.000
7	21	8	1	240	260.000
7	21	8	2	240	270.000
7	21	8	3	240	250.000
7	21	8	1	250	0.690
7	21	8	2	250	0.520
7	21	8	3	250	0.430
7	21	8	1	260	9.400
7	21	8	2	260	18.000
7	21	8	3	260	16.000
7	21	8	1	325	32.000
7	21	8	2	325	38.000
7	21	8	3	325	39.000
7	21	8	1	350	34.000
7	21	8	2	350	34.000
7	21	8	3	350	34.000
7	21	8	1	360	-0.200
7	21	8	2	360	-0.200
7	21	8	3	360	-0.200
7	21	8	1	415	30.100
7	21	8	2	415	29.500
7	21	8	3	415	28.900
7	21	8	1	430	0.120
7	21	8	2	430	0.510
7	21	8	3	430	1.100
7	21	8	1	435	0.480
7	21	8	2	435	0.560
7	21	8	3	435	0.260
7	21	8	1	440	0.055
7	21	8	2	440	0.072
7	21	8	3	440	0.090
7	21	8	1	445	0.056
7	21	8	2	445	0.081
7	21	8	3	445	0.120
7	21	8	1	450	42.000
7	21	8	2	450	40.000
7	21	8	3	450	39.000
7	21	8	1	455	1.600
7	21	8	2	455	2.500
7	21	8	3	455	3.800
** SITE 13					
7	21	13	1	105	490.000
7	21	13	2	105	500.000
7	21	13	1	110	8.000
7	21	13	2	110	7.400
7	21	13	1	115	28.700
7	21	13	2	115	27.200
7	21	13	1	120	5.800
7	21	13	2	120	0.120
7	21	13	1	121	77.000
7	21	13	2	121	1.530
7	21	13	1	130	5.600
7	21	13	2	130	7.400
7	21	13	1	205	146.000
7	21	13	2	205	146.000
7	21	13	1	230	216.000
7	21	13	2	230	226.000
7	21	13	1	240	270.000
7	21	13	2	240	300.000
7	21	13	1	250	0.730
7	21	13	2	250	0.520
7	21	13	1	260	8.800
7	21	13	2	260	12.000
7	21	13	1	325	30.000
7	21	13	2	325	32.000
7	21	13	1	350	34.000
7	21	13	2	350	34.000
7	21	13	1	360	-0.200
7	21	13	2	360	-0.200
7	21	13	1	415	29.800
7	21	13	2	415	30.000
7	21	13	1	430	0.140
7	21	13	2	430	0.260
7	21	13	1	435	0.560
7	21	13	2	435	0.590
7	21	13	1	440	0.068
7	21	13	2	440	0.078
7	21	13	1	445	0.074
7	21	13	2	445	0.068
7	21	13	1	450	47.000
7	21	13	2	450	45.000
7	21	13	1	455	1.900
7	21	13	2	455	2.000
** SITE 16					
7	21	16	1	105	485.000
7	21	16	1	110	8.200
7	21	16	1	115	28.500
7	21	16	1	120	6.700

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MONTH	DAY	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
7	21	16	1	121	88.200
7	21	16	1	130	14.000
7	21	16	1	205	144.000
7	21	16	1	230	223.000
7	21	16	1	240	310.000
7	21	16	1	250	0.870
7	21	16	1	260	24.000
7	21	16	1	325	31.000
7	21	16	1	350	33.000
7	21	16	1	360	-0.200
7	21	16	1	415	31.200
7	21	16	1	430	0.150
7	21	16	1	435	0.250
7	21	16	1	440	0.069
7	21	16	1	445	0.150
7	21	16	1	450	46.000
7	21	16	1	455	1.700
** SITE 2					
8	10	2	1	105	448.000
8	10	2	2	105	449.000
8	10	2	1	110	8.200
8	10	2	2	110	7.900
8	10	2	1	115	36.200
8	10	2	2	115	34.900
8	10	2	1	120	4.800
8	10	2	2	120	3.100
8	10	2	1	435	0.390
8	10	2	2	435	-0.050
8	10	2	1	445	0.086
8	10	2	2	445	0.120
** SITE 4					
8	10	4	1	105	443.000
8	10	4	1	110	8.200
8	10	4	1	115	29.000
8	10	4	1	120	7.900
8	10	4	1	435	-0.050
8	10	4	1	445	0.066
** SITE 8					
8	10	8	1	105	445.000
8	10	8	2	105	494.000
8	10	8	1	110	8.300
8	10	8	2	110	6.800
8	10	8	1	115	29.300
8	10	8	2	115	25.500
8	10	8	1	120	-8.600
8	10	8	2	120	-0.100
8	10	8	1	435	1.700
8	10	8	2	435	-0.050
8	10	8	1	445	-0.010
8	10	8	2	445	0.160
** SITE 13					
8	10	13	1	105	451.000
8	10	13	2	105	452.000
8	10	13	3	105	472.000
8	10	13	1	110	8.200
8	10	13	2	110	7.700
8	10	13	3	110	7.000
8	10	13	1	115	30.900
8	10	13	2	115	29.400
8	10	13	3	115	27.800

MONTH	DAY	SITE	GRAD(1)	PARAMETER CODE(2)	DAT
8	10	13	1	120	7.300
8	10	13	2	120	-3.100
8	10	13	3	120	-0.100
8	10	13	1	435	-0.050
8	10	13	2	435	1.100
8	10	13	3	435	-0.050
8	10	13	1	445	0.073
8	10	13	2	445	0.070
8	10	13	3	445	0.092
** SITE 16					
8	10	16	1	105	457.000
8	10	16	1	110	8.100
8	10	16	1	115	30.500
8	10	16	1	120	6.200
8	10	16	1	435	-0.050
8	10	16	1	445	0.130
** SITE 2					
9	14	2	1	105	503.000
9	14	2	2	105	512.000
9	14	2	1	110	8.300
9	14	2	2	110	8.200
9	14	2	1	115	32.000
9	14	2	2	115	28.300
9	14	2	1	120	6.600
9	14	2	2	120	4.000
9	14	2	1	121	91.000
9	14	2	2	121	52.600
9	14	2	1	130	8.800
9	14	2	2	130	9.400
9	14	2	1	205	158[illegible]
9	14	2	2	205	158[illegible]
9	14	2	1	230	224[illegible]
9	14	2	2	230	227.000
9	14	2	1	240	280.000
9	14	2	2	240	280.000
9	14	2	1	250	0.900
9	14	2	2	250	0.870
9	14	2	1	260	22.000
9	14	2	2	260	22.000
9	14	2	1	325	34.000
9	14	2	2	325	34.000
9	14	2	1	350	36.000
9	14	2	2	350	36.000
9	14	2	1	360	-0.400
9	14	2	2	360	-0.400
9	14	2	1	415	32.800
9	14	2	2	415	33.200
9	14	2	1	430	0.180
9	14	2	2	430	0.160
9	14	2	1	435	-0.050
9	14	2	2	435	-0.050
9	14	2	1	440	-0.010
9	14	2	2	440	-0.010
9	14	2	1	445	0.100
9	14	2	2	445	0.090
9	14	2	1	450	44.000
9	14	2	2	450	42.000
9	14	2	1	455	1.400
9	14	2	2	455	1.400
** SITE 4					
9	14	4	1	105	515.000

MONTH	DAY	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
9	14	16	1	445	0.170
9	14	16	1	450	46.000
9	14	16	1	455	1.200
** SITE 2					
11	8	2	1	105	542.000
11	8	2	1	110	7.900
11	8	2	1	115	19.000
11	8	2	1	120	8.900
11	8	2	1	121	97.800
11	8	2	1	130	6.800
11	8	2	1	205	166.000
11	8	2	1	230	218.000
11	8	2	1	240	280.000
11	8	2	1	250	0.750
11	8	2	1	260	7.200
11	8	2	1	325	34.000
11	8	2	1	350	37.000
11	8	2	1	360	-0.200
11	8	2	1	415	34.300
11	8	2	1	430	-0.020
11	8	2	1	435	0.190
11	8	2	1	440	0.026
11	8	2	1	445	0.061
11	8	2	1	450	47.000
11	8	2	1	455	0.680
** SITE 4					
11	8	4	1	105	546.000
11	8	4	1	110	7.900
11	8	4	1	115	8.500
11	8	4	1	120	10.600
11	8	4	1	121	91.400
11	8	4	1	130	6.300
11	8	4	1	205	168.000
11	8	4	1	230	237.000
11	8	4	1	240	270.000
11	8	4	1	250	1.000
11	8	4	1	260	10.000
11	8	4	1	325	36.000
11	8	4	1	350	37.000
11	8	4	1	360	-0.200
11	8	4	1	415	34.100
11	8	4	1	430	-0.020
11	8	4	1	435	0.220
11	8	4	1	440	0.014
11	8	4	1	445	0.059
11	8	4	1	450	49.000
11	8	4	1	455	0.520
** SITE 8					
11	8	8	1	105	549.000
11	8	8	1	110	8.000
11	8	8	1	115	9.300
11	8	8	1	120	10.900
11	8	8	1	121	96.500
11	8	8	1	130	5.600
11	8	8	1	205	168.000
11	8	8	1	230	244.000
11	8	8	1	240	280.000
11	8	8	1	250	1.100
11	8	8	1	260	8.300
11	8	8	1	325	34.000
11	8	8	1	350	37.000

MONTH	DAY	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
11	8	8	1	360	-0.200
11	8	8	1	415	34.000
11	8	8	1	430	-0.020
11	8	8	1	435	0.730
11	8	8	1	440	-0.010
11	8	8	1	445	0.064
11	8	8	1	450	47.000
11	8	8	1	455	0.310
** SITE 13					
11	8	13	1	105	548.000
11	8	13	1	110	8.000
11	8	13	1	115	11.200
11	8	13	1	120	9.800
11	8	13	1	121	90.700
11	8	13	1	130	8.000
11	8	13	1	205	170.000
11	8	13	1	230	220.000
11	8	13	1	240	280.000
11	8	13	1	250	0.970
11	8	13	1	260	11.000
11	8	13	1	325	34.000
11	8	13	1	350	37.000
11	8	13	1	360	-0.200
11	8	13	1	415	34.600
11	8	13	1	430	-0.020
11	8	13	1	435	0.200
11	8	13	1	440	0.018
11	8	13	1	445	0.072
11	8	13	1	450	48.000
11	8	13	1	455	0.500
** SITE 16					
11	8	16	1	105	552.000
11	8	16	1	110	8.000
11	8	16	1	115	8.600
11	8	16	1	120	11.100
11	8	16	1	121	96.500
11	8	16	1	130	14.000
11	8	16	1	205	170.000
11	8	16	1	230	239.000
11	8	16	1	240	280.000
11	8	16	1	250	1.300
11	8	16	1	260	14.000
11	8	16	1	325	34.000
11	8	16	1	350	37.000
11	8	16	1	360	-0.200
11	8	16	1	415	34.600
11	8	16	1	430	-0.020
11	8	16	1	435	0.110
11	8	16	1	440	0.024
11	8	16	1	445	0.094
11	8	16	1	450	50.000
11	8	16	1	455	0.540

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MONTH	DAY	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
9	14	4	1	110	8.400
9	14	4	1	115	23.000
9	14	4	1	120	7.900
9	14	4	1	121	92.900
9	14	4	1	130	5.300
9	14	4	1	205	156.000
9	14	4	1	230	224.000
9	14	4	1	240	250.000
9	14	4	1	250	1.100
9	14	4	1	260	12.000
9	14	4	1	325	33.000
9	14	4	1	350	35.000
9	14	4	1	360	-0.400
9	14	4	1	415	33.200
9	14	4	1	430	-0.100
9	14	4	1	435	-0.050
9	14	4	1	440	-0.010
9	14	4	1	445	0.074
9	14	4	1	450	44.000
9	14	4	1	455	1.300
** SITE 8					
9	14	8	1	105	513.000
9	14	8	1	110	8.600
9	14	8	1	115	23.900
9	14	8	1	120	10.300
9	14	8	1	121	124.000
9	14	8	1	130	4.400
9	14	8	1	205	158.000
9	14	8	1	230	225.000
9	14	8	1	240	270.000
9	14	8	1	250	1.100
9	14	8	1	260	13.000
9	14	8	1	325	34.000
9	14	8	1	350	36.000
9	14	8	1	360	-0.200
9	14	8	1	415	33.600
9	14	8	1	430	-0.100
9	14	8	1	435	-0.050
9	14	8	1	440	-0.010
9	14	8	1	445	0.083
9	14	8	1	450	43.000
9	14	8	1	455	0.950
** SITE 13					
9	14	13	1	105	513.000
9	14	13	2	105	517.000
9	14	13	3	105	525.000
9	14	13	1	110	8.500
9	14	13	2	110	8.400
9	14	13	3	110	7.900
9	14	13	1	115	26.600
9	14	13	2	115	26.100
9	14	13	3	115	23.300
9	14	13	1	120	9.400
9	14	13	2	120	7.600
9	14	13	3	120	3.900
9	14	13	1	121	119.000
9	14	13	2	121	95.000
9	14	13	3	121	46.400
9	14	13	1	130	5.600
9	14	13	2	130	5.600
9	14	13	3	130	5.400
9	14	13	1	205	156.000
9	14	13	2	205	158.000
9	14	13	3	205	157.000
9	14	13	1	230	226.000
9	14	13	2	230	228.000
9	14	13	3	230	225.000
9	14	13	1	240	250.000
9	14	13	2	240	240.000
9	14	13	3	240	240.000
9	14	13	1	250	1.700
9	14	13	2	250	0.920
9	14	13	3	250	0.710
9	14	13	1	260	15.000
9	14	13	2	260	15.000
9	14	13	3	260	13.000
9	14	13	1	325	34.000
9	14	13	2	325	35.000
9	14	13	3	325	35.000
9	14	13	1	350	36.000
9	14	13	2	350	36.000
9	14	13	3	350	36.000
9	14	13	1	360	-0.400
9	14	13	2	360	-0.400
9	14	13	3	360	-0.400
9	14	13	1	415	33.800
9	14	13	2	415	33.200
9	14	13	3	415	32.700
9	14	13	1	430	-0.100
9	14	13	2	430	0.110
9	14	13	3	430	0.200
9	14	13	1	435	-0.050
9	14	13	2	435	[illegible]
9	14	13	3	435	[illegible]
9	14	13	1	440	[illegible]
9	14	13	2	440	-0.010
9	14	13	3	440	-0.010
9	14	13	1	445	0.079
9	14	13	2	445	0.069
9	14	13	3	445	0.065
9	14	13	1	450	44.000
9	14	13	2	450	40.000
9	14	13	3	450	43.000
9	14	13	1	455	1.200
9	14	13	2	455	1.100
9	14	13	3.	455	1.500
** SITE 16					
9	14	16	1	105	521.000
9	14	16	1	110	8.300
9	14	16	1	115	24.100
9	14	16	1	120	5.200
9	14	16	1	121	62.600
9	14	16	1	130	18.000
9	14	16	1	205	160.000
9	14	16	1	230	230.000
9	14	16	1	240	250.000
9	14	16	1	250	1.000
9	14	16	1	260	42.000
9	14	16	1	325	35.000
9	14	16	1	350	36.000
9	14	16	1	360	-0.400
9	14	16	1	415	33.400
9	14	16	1	430	0.100
9	14	16	1	435	-0.050
9	14	16	1	440	0.016

CLINTON POWER STATION
ENVIRONMENTAL MONITORING PROGRAM
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MONTH	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
SITE 2				
4	2	1	105	553.000
4	2	1	110	8.700
4	2	1	115	8.200
4	2	1	120	12.500
4	2	1	121	103.000
4	2	1	130	9.600
4	2	1	205	180.000
4	2	1	230	268.000
4	2	1	240	320.000
4	2	1	250	0.940
4	2	1	260	17.000
4	2	1	325	47.000
4	2	1	350	36.000
4	2	1	360	-0.500
4	2	1	415	35.200
4	2	1	430	-0.100
4	2	1	435	1.900
4	2	1	440	-0.010
4	2	1	445	0.078
4	2	1	450	55.000
4	2	1	455	-0.200
SITE 4				
4	4	1	105	567.000
4	4	1	110	8.600
4	4	1	115	8.200
4	4	1	120	12.400
4	4	1	121	107.000
4	4	1	130	7.800
4	4	1	205	184.000
4	4	1	230	268.000
4	4	1	240	320.000
4	4	1	250	0.920
4	4	1	260	14.000
4	4	1	325	49.000
4	4	1	350	36.000
4	4	1	360	-0.500
4	4	1	415	37.200
4	4	1	430	-0.100
4	4	1	435	2.300
4	4	1	440	-0.010
4	4	1	445	0.072
4	4	1	450	54.000
4	4	1	455	0.400
SITE 8				
4	8	1	105	516.000
4	8	1	110	8.500
4	8	1	115	7.900
4	8	1	120	12.000
4	8	1	121	102.000
4	8	1	130	6.600
4	8	1	205	172.000
4	8	1	230	246.000
4	8	1	240	280.000
4	8	1	250	0.700
4	8	1	260	8.800
4	8	1	325	37.000
4	8	1	350	37.000
4	8	1	360	-0.500
4	8	1	415	33.200
4	8	1	430	-0.100
4	8	1	435	0.440
4	8	1	440	-0.010
4	8	1	445	0.052
4	8	1	450	48.000
4	8	1	455	-0.200

MONTH	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
SITE 13				
4	13	1	[illegible]	[illegible]
4	13	1	110	[illegible]
4	13	1	115	[illegible]
4	13	1	120	[illegible]
4	13	1	121	103.000
4	13	1	130	7.200
4	13	1	205	171.000
4	13	1	230	246.000
4	13	1	240	280.000
4	13	1	250	0.700
4	13	1	260	12.000
4	13	1	325	38.000
4	13	1	350	36.000
4	13	1	360	-0.500
4	13	1	415	34.000
4	13	1	430	-0.100
4	13	1	435	0.530
4	13	1	440	-0.010
4	13	1	445	0.057
4	13	1	450	50.000
4	13	1	455	-0.200
SITE 16				
4	16	1	105	598.000
4	16	1	110	8.800
4	16	1	115	7.700
4	16	1	120	14.100
4	16	1	121	119.000
4	16	1	130	11.900
4	16	1	205	174.000
4	16	1	230	293.000
4	16	1	240	340.000
4	16	1	250	1.200
4	16	1	260	26.000
4	16	1	325	57.000
4	16	1	350	35.000
4	16	1	360	-0.500
4	16	1	415	36.600
4	16	1	430	-0.100
4	16	1	435	7.300
4	16	1	440	-0.010
4	16	1	445	0.086
4	16	1	450	60.000
4	16	1	455	-0.200
SITE 2				
5	2	1	105	547.000
5	2	1	110	8.400
5	2	1	115	14.200
5	2	1	120	10.100
5	2	1	435	3.100
5	2	1	445	0.073
SITE 4				
5	4	1	105	541.000
5	4	1	110	8.400
5	4	1	115	14.300
5	4	1	120	9.100
5	4	1	435	2.100
5	4	1	445	0.054
SITE 8				
5	8	1	105	537.000
5	8	1	110	8.400
5	8	1	115	14.100
5	8	1	120	10.000
5	8	1	435	1.600
5	8	1	445	0.045

CLINTON POWER STATION
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MONTH	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
SITE 13				
5	13	1	105	541.000
5	13	1	110	8.600
5	13	1	115	14.400
5	13	1	120	10.700
5	13	1	435	2.500
5	13	1	445	0.067
SITE 16				
5	16	1	105	573.000
5	16	1	110	8.500
5	16	1	115	13.700
5	16	1	120	11.300
5	16	1	435	8.700
5	16	1	445	0.100
SITE 2				
6	2	1	105	500.000
6	2	1	110	7.800
6	2	1	115	23.200
6	2	1	120	7.100
6	2	1	121	83.800
6	2	1	130	28.000
6	2	1	205	146.000
6	2	1	230	232.000
6	2	1	240	280.000
6	2	1	250	0.790
6	2	1	260	23.000
6	2	1	325	51.000
6	2	1	350	26.000
6	2	1	360	-0.200
6	2	1	415	23.400
6	2	1	430	0.340
6	2	1	435	8.000
6	2	1	440	0.084
6	2	1	445	0.130
6	2	1	450	32.000
6	2	1	455	6.400
SITE 4				
6	4	1	105	532.000
6	4	1	110	7.900
6	4	1	115	22.000
6	4	1	120	8.000
6	4	1	121	93.200
6	4	1	130	11.000
6	4	1	205	162.000
6	4	1	230	250.000
6	4	1	240	290.000
6	4	1	250	0.870
6	4	1	260	14.000
6	4	1	325	47.000
6	4	1	350	33.000
6	4	1	360	-0.200
6	4	1	415	29.900
6	4	1	430	0.300
6	4	1	435	2.400
6	4	1	440	0.056
6	4	1	445	0.082
6	4	1	450	42.000
6	4	1	455	2.800
SITE 8				
6	8	1	105	536.000
6	8	1	110	7.900
6	8	1	115	22.500
6	8	1	120	8.700
6	8	1	121	100.000

MONTH	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
6	8	1	130	7.400
6	8	2	130	11.000
6	8	3	130	11.000
6	8	1	205	164.000
6	8	2	205	174.000
6	8	3	205	174.000
6	8	1	230	252.000
6	8	2	230	254.000
6	8	3	230	257.000
6	8	1	240	300.000
6	8	2	240	300.000
6	8	3	240	280.000
6	8	1	250	0.850
6	8	2	250	0.690
6	8	3	250	0.690
6	8	1	260	3.600
6	8	2	260	17.000
6	8	3	260	14.000
6	8	1	325	47.000
6	8	2	325	46.000
6	8	3	325	46.000
6	8	1	350	33.000
6	8	2	350	35.000
6	8	3	350	36.000
6	8	1	360	-0.200
6	8	2	360	-0.200
6	8	3	360	-0.200
6	8	1	415	31.600
6	8	2	415	32.900
6	8	3	415	33.500
6	8	1	430	0.160
6	8	2	430	0.170
6	8	3	430	-0.100
6	8	1	435	3.600
6	8	2	435	4.800
6	8	3	435	2.600
6	8	1	440	0.019
6	8	2	440	0.035
6	8	3	440	0.032
6	8	1	445	0.050
6	8	2	445	0.065
6	8	3	445	0.056
6	8	1	450	44.000
6	8	2	450	45.000
6	8	3	450	48.000
6	8	1	455	0.990
6	8	2	455	1.200
6	8	3	455	1.200
SITE 13				
4	13	1	105	500.000
6	13	1	110	8.000
6	13	1	115	23.000
6	13	1	120	7.400
6	13	1	121	86.700
6	13	1	130	14.000
6	13	2	130	11.000
6	13	3	130	12.000
6	13	1	205	150.000
6	13	2	205	165.000
6	13	3	205	172.000
6	13	1	230	228.000
6	13	2	230	249.000
6	13	3	230	256.000
6	13	1	240	270.000
6	13	2	240	280.000
6	13	3	240	290.000
6	13	1	250	0.570
6	13	2	250	0.610

CLINTON POWER STATION
ENVIRONMENTAL MONITORING PROGRAM
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MONTH	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
6	13	3	250	0.740
6	13	1	260	12.000
6	13	2	260	8.300
6	13	3	260	8.600
6	13	1	325	48.000
6	13	2	325	48.000
6	13	3	325	44.000
6	13	1	350	28.000
6	13	2	350	33.000
6	13	3	350	35.000
6	13	1	360	-0.200
6	13	2	360	-0.200
6	13	3	360	-0.200
6	13	1	415	27.100
6	13	2	415	30.800
6	13	3	415	33.300
6	13	1	430	-0.100
6	13	2	430	-0.100
6	13	3	430	0.240
6	13	1	435	4.800
6	13	2	435	3.600
6	13	3	435	2.600
6	13	1	440	0.062
6	13	2	440	0.032
6	13	3	440	0.027
6	13	1	445	0.087
6	13	2	445	0.081
6	13	3	445	0.056
6	13	1	450	46.000
6	13	2	450	44.000
6	13	3	450	46.000
6	13	1	455	2.800
6	13	2	455	1.400
6	13	3	455	1.100
SITE 16				
6	16	1	105	538.000
6	16	1	110	7.700
6	16	1	115	23.600
6	16	1	120	6.800
6	16	1	121	81.100
6	16	1	130	23.000
6	16	1	205	155.000
6	16	1	230	257.000
6	16	1	240	300.000
6	16	1	250	0.900
6	16	1	260	20.000
6	16	1	325	58.000
6	16	1	350	26.000
6	16	1	360	-0.200
6	16	1	415	23.400
6	16	1	430	0.220
6	16	1	435	12.000
6	16	1	440	0.069
6	16	1	445	0.130
6	16	1	450	34.000
6	16	1	455	8.400
SITE 2				
7	2	1	105	488.000
7	2	1	110	8.000
7	2	1	115	26.700
7	2	1	120	11.400
7	2	1	435	2.000
7	2	1	445	0.098
SITE 4				
7	4	1	105	478.000
7	4	1	110	8.200
7	4	1	115	26.400
7	4	1	120	11.600
7	4	1	435	2.200
7	4	1	445	0.146
SITE 8				
7	8	1	105	494.000
7	8	1	110	8.100
7	8	1	115	26.700
7	8	1	120	10.800
7	8	1	435	0.840
7	8	2	435	0.870
7	8	1	445	0.045
7	8	2	445	0.068
SITE 13				
7	13	1	105	489.000
7	13	1	110	8.100
7	13	1	115	26.500
7	13	1	120	12.100
7	13	1	435	2.100
7	13	1	445	0.036
SITE 16				
7	16	1	105	485.000
7	16	1	110	8.100
7	16	1	115	26.600
7	16	1	120	11.900
7	16	1	435	0.960
7	16	2	435	0.930
7	16	1	445	0.043
7	16	2	445	0.090
SITE 2				
8	2	1	105	468.000
8	2	2	105	477.000
8	2	1	110	8.300
8	2	2	110	8.100
8	2	1	115	33.800
8	2	2	115	29.600
8	2	1	120	6.200
8	2	2	120	4.200
8	2	1	435	0.960
8	2	2	435	0.880
8	2	1	445	0.085
8	2	2	445	0.113
SITE 4				
8	4	1	105	463.000
8	4	1	110	8.400
8	4	1	115	26.900
8	4	1	120	9.600
8	4	1	435	0.970
8	4	1	445	0.081
SITE 8				
8	8	1	105	470.000
8	8	1	110	8.000
8	8	1	115	26.400
8	8	1	120	6.600
8	8	1	435	1.400
8	8	1	445	0.059
SITE 13				
8	13	1	105	470.000
8	13	1	110	8.100
8	13	1	115	27.300
8	13	1	120	8.500
8	13	1	435	0.780

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MONTH	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
8	13	1	445	0.072
SITE 16				
8	16	1	105	455.000
8	16	1	110	8.300
8	16	1	115	27.000
8	16	1	120	6.800
8	16	1	435	1.700
8	16	1	445	0.112
SITE 2				
9	2	1	105	466.000
9	2	2	105	462.000
9	2	1	110	8.300
9	2	2	110	8.500
9	2	1	115	30.200
9	2	2	115	27.600
9	2	1	120	6.700
9	2	2	120	5.700
9	2	1	435	1.200
9	2	2	435	0.800
9	2	1	445	0.052
9	2	2	445	0.070
SITE 4				
9	4	1	105	461.000
9	4	1	110	8.200
9	4	1	115	23.400
9	4	1	120	6.100
9	4	1	435	0.960
9	4	1	445	0.059
SITE 8				
9	8	1	105	467.000
9	8	1	110	8.600
9	8	1	115	24.100
9	8	1	120	7.000
9	8	1	435	0.940
9	8	1	445	0.060
SITE 13				
9	13	1	105	468.000
9	13	1	110	8.400
9	13	1	115	25.400
9	13	1	120	6.400
9	13	1	435	0.700
9	13	1	445	0.080
SITE 16				
9	16	1	105	456.000
9	16	1	110	8.800
9	16	1	115	25.700
9	16	1	120	8.900
9	16	1	435	0.780
9	16	1	445	0.098
9	16	2	445	0.097
SITE 2				
10	2	1	105	490.000
10	2	2	105	492.000
10	2	1	110	8.400
10	2	2	110	8.400
10	2	1	115	25.000
10	2	2	115	21.300
10	2	1	120	8.200
10	2	2	120	7.500
10	2	1	121	100.000
10	2	2	121	92.800
10	2	1	130	9.000
10	2	2	130	9.000
10	2	1	205	160.000
10	2	2	205	160.000
10	2	1	230	230.000
10	2	2	230	233.000
10	2	1	240	240.000
10	2	2	240	240.000
10	2	1	250	0.370
10	2	2	250	0.490
10	2	1	260	13.000
10	2	2	260	13.000
10	2	1	325	40.000
10	2	2	325	38.000
10	2	1	350	34.000
10	2	2	350	34.000
10	2	1	360	-0.400
10	2	2	360	-0.400
10	2	1	415	29.300
10	2	2	415	30.300
10	2	1	430	-0.100
10	2	2	430	-0.100
10	2	1	435	1.100
10	2	2	435	0.720
10	2	1	440	-0.010
10	2	2	440	-0.010
10	2	1	445	0.061
10	2	2	445	0.072
10	2	1	450	40.000
10	2	2	450	37.000
10	2	1	455	0.950
10	2	2	455	0.820
SITE 4				
10	4	1	105	478.000
10	4	1	110	8.500
10	4	1	115	16.300
10	4	1	120	9.000
10	4	1	121	91.300
10	4	1	130	8.400
10	4	1	205	160.000
10	4	1	230	227.000
10	4	1	240	240.000
10	4	1	250	0.310
10	4	1	260	14.000
10	4	1	325	37.000
10	4	1	350	33.000
10	4	1	360	-0.400
10	4	1	415	31.400
10	4	1	430	-0.100
10	4	1	435	0.450
10	4	1	440	-0.010
10	4	1	445	0.078
10	4	1	450	40.000
10	4	1	455	0.880
SITE 8				
10	8	1	105	485.000
10	8	1	110	8.300
10	8	1	115	16.600
10	8	1	120	9.100
10	8	1	121	95.000
10	8	1	130	5.100
10	8	1	205	160.000
10	8	1	230	230.000
10	8	1	240	230.000
10	8	1	250	0.690
10	8	1	260	8.000
10	8	1	325	39.000
10	8	1	350	34.000

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MONTH	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
10	8	1	360	-0.400
10	8	1	415	30.400
10	8	1	430	-0.100
10	8	1	435	0.710
10	8	1	440	-0.010
10	8	1	445	0.070
10	8	1	450	42.000
10	8	1	455	0.860
SITE 13				
10	13	1	105	491.000
10	13	1	110	8.600
10	13	1	115	17.800
10	13	1	120	9.400
10	13	1	121	100.000
10	13	1	130	5.300
10	13	1	205	160.000
10	13	1	230	226.000
10	13	1	240	240.000
10	13	1	250	0.800
10	13	1	260	9.000
10	13	1	325	41.000
10	13	1	350	34.000
10	13	1	360	-0.400
10	13	1	415	31.100
10	13	1	430	-0.100
10	13	1	435	1.400
10	13	1	440	-0.010
10	13	1	445	0.104
10	13	1	450	42.000
10	13	1	455	0.790
SITE 16				
10	16	1	105	483.000
10	16	2	105	484.000
10	16	3	105	487.000
10	16	1	110	8.700
10	16	2	110	8.800
10	16	3	110	8.900
10	16	1	115	18.100
10	16	2	115	17.300
10	16	3	115	16.800
10	16	1	120	10.900
10	16	2	120	10.800
10	16	3	120	9.700
10	16	1	121	120.000
10	16	1	130	12.000
10	16	2	130	12.000
10	16	3	130	10.000
10	16	1	205	160.000
10	16	2	205	160.000
10	16	3	205	160.000
10	16	1	230	236.000
10	16	2	230	238.000
10	16	3	230	236.000
10	16	1	240	250.000
10	16	2	240	250.000
10	16	3	240	260.000
10	16	1	250	0.840
10	16	2	250	0.830
10	16	3	250	0.670
10	16	1	260	22.000
10	16	2	260	23.000
10	16	3	260	22.000
10	16	1	325	38.000
10	16	2	325	39.000
10	16	3	325	38.000
10	16	1	350	34.000
10	16	2	350	34.000

MONTH	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
10	16	3	350	34.000
10	16	1	360	-0.400
10	16	2	360	-0.600
10	16	3	360	3.700
10	16	1	415	31.800
10	16	2	415	31.300
10	16	3	415	31.400
10	16	1	430	0.140
10	16	2	430	-0.100
10	16	3	430	-0.100
10	16	1	435	0.630
10	16	2	435	0.630
10	16	3	435	0.720
10	16	1	440	0.011
10	16	2	440	-0.010
10	16	3	440	-0.010
10	16	1	445	0.121
10	16	2	445	0.134
10	16	3	445	0.111
10	16	1	450	40.000
10	16	2	450	41.000
10	16	3	450	42.000
10	16	1	455	1.000
10	16	2	455	0.880
10	16	3	455	1.200
SITE 2				
11	2	1	105	504.000
11	2	2	105	505.000
11	2	1	110	8.300
11	2	2	110	8.300
11	2	1	115	20.300
11	2	2	115	17.400
11	2	3	115	16.400
11	2	1	120	8.100
11	2	2	120	8.400
11	2	1	130	7.400
11	2	2	130	10.000
11	2	1	205	162.000
11	2	2	205	162.000
11	2	1	230	240.000
11	2	2	230	238.000
11	2	1	240	270.000
11	2	2	240	270.000
11	2	1	250	0.710
11	2	2	250	0.700
11	2	1	260	11.000
11	2	2	260	13.000
11	2	1	325	39.000
11	2	2	325	40.000
11	2	1	350	34.000
11	2	2	350	33.000
11	2	1	360	-0.100
11	2	2	360	-0.100
11	2	1	415	30.800
11	2	2	415	30.600
11	2	1	430	0.130
11	2	2	430	0.110
11	2	1	435	0.610
11	2	2	435	0.640
11	2	1	440	0.020
11	2	2	440	0.018
11	2	1	445	0.073
11	2	2	445	0.063
11	2	1	450	40.000
11	2	2	450	41.000
11	2	1	455	0.940
11	2	2	455	0.810

CLINTON POWER STATION
ENVIRONMENTAL MONITORING PROGRAM
LAKE WATER QUALITY DATA FOR 1989

MONTH	SITE	QUAD(1)	PARAMETER CODE(2)	DATA(3)
SITE 4				
11	4	1	105	496.000
11	4	1	110	8.400
11	4	1	115	11.200
11	4	1	120	10.100
11	4	1	130	8.400
11	4	1	205	160.000
11	4	1	230	235.000
11	4	1	240	260.000
11	4	1	250	0.660
11	4	1	260	8.000
11	4	1	325	38.000
11	4	1	350	33.000
11	4	1	360	-0.300
11	4	1	415	31.000
11	4	1	430	-0.110
11	4	1	435	0.630
11	4	1	440	-0.011
11	4	1	445	0.064
11	4	1	450	40.000
11	4	1	455	0.830
SITE 8				
11	8	1	105	502.000
11	8	1	110	8.400
11	8	1	115	11.600
11	8	1	120	10.100
11	8	1	130	6.600
11	8	1	205	160.000
11	8	1	230	237.000
11	8	1	240	260.000
11	8	1	250	0.700
11	8	1	260	5.000
11	8	1	325	38.000
11	8	1	350	33.000
11	8	1	360	-0.100
11	8	1	415	31.000
11	8	1	430	-0.100
11	8	1	435	0.700
11	8	1	440	-0.011
11	8	1	445	0.054
11	8	1	450	40.000
11	8	1	455	0.660
SITE 13				
11	13	1	105	501.000
11	13	1	110	8.500
11	13	1	115	13.800
11	13	1	120	9.900
11	13	1	130	6.300
11	13	1	205	164.000
11	13	1	230	234.000
11	13	1	240	270.000
11	13	1	250	0.750
11	13	1	260	2.000
11	13	1	325	36.000
11	13	1	350	34.000
11	13	1	360	-0.100
11	13	1	415	31.100
11	13	1	430	-0.100
11	13	1	435	0.670
11	13	1	440	0.010
11	13	1	445	0.062
11	13	1	450	39.000
11	13	1	455	0.550
SITE 16				
11	16	1	105	499.000
11	16	1	110	8.800

MONTH	SITE	QUAD(1)	PARAMETER CODE(2)	DATA(3)
11	16	1	115	13.000
11	16	1	120	10.800
11	16	1	130	16.000
11	16	1	205	164.000
11	16	1	230	250.000
11	16	1	240	280.000
11	16	1	250	1.000
11	16	1	260	15.000
11	16	1	325	38.000
11	16	1	350	34.000
11	16	1	360	-0.100
11	16	1	415	31.600
11	16	1	430	-0.100
11	16	1	435	0.330
11	16	1	440	0.010
11	16	1	445	0.088
11	16	1	450	43.000
11	16	1	455	0.580

CLINTON POWER STATION
ENVIRONMENTAL MONITORING PROGRAM
LAKE WATER QUALITY DATA FOR 1990

MONTH	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
SITE 2				
4	2	1	105	558.000
4	2	1	110	8.800
4	2	1	115	13.800
4	2	1	120	11.400
4	2	1	121	111.000
4	2	1	130	16.000
4	2	1	205	180.000
4	2	1	230	270.000
4	2	1	240	320.000
4	2	1	250	0.980
4	2	1	260	22.000
4	2	1	325	56.000
4	2	1	350	31.000
4	2	1	360	-0.001
4	2	1	415	29.000
4	2	1	430	-0.100
4	2	1	435	5.400
4	2	1	440	-0.010
4	2	1	445	0.160
4	2	1	450	41.900
4	2	1	455	2.800
SITE 4				
4	4	1	105	514.000
4	4	1	110	8.800
4	4	1	115	14.500
4	4	1	120	16.200
4	4	1	121	160.000
4	4	1	130	9.300
4	4	1	205	168.000
4	4	1	230	250.000
4	4	1	240	310.000
4	4	1	250	1.000
4	4	1	260	23.000
4	4	1	325	52.000
4	4	1	350	29.000
4	4	1	360	-0.001
4	4	1	415	28.000
4	4	1	430	-0.100
4	4	1	435	5.100
4	4	1	440	-0.010
4	4	1	445	0.160
4	4	1	450	37.000
4	4	1	455	2.800
SITE 8				
4	8	1	105	543.000
4	8	2	105	547.000
4	8	3	105	558.000
4	8	1	110	9.000
4	8	2	110	8.900
4	8	3	110	8.600
4	8	1	115	13.300
4	8	2	115	12.000
4	8	3	115	10.000
4	8	1	120	14.200
4	8	2	120	12.900
4	8	3	120	11.000
4	8	1	121	137.000
4	8	1	130	7.100
4	8	2	130	7.100
4	8	3	130	7.200
4	8	1	205	196.000
4	8	2	205	180.000
4	8	3	205	180.000
4	8	1	230	266.000
4	8	2	230	266.000
4	8	3	230	266.000
4	8	1	240	300.000
4	8	2	240	310.000
4	8	3	240	290.000
4	8	1	250	0.830
4	8	2	250	0.820
4	8	3	250	0.810
4	8	1	260	14.000
4	8	2	260	12.000
4	8	3	260	11.000
4	8	1	325	57.000
4	8	2	325	55.000
4	8	3	325	54.000
4	8	1	350	31.000
4	8	2	350	30.000
4	8	3	350	28.000
4	8	1	360	-0.001
4	8	2	360	-0.001
4	8	3	360	-0.001
4	8	1	415	28.000
4	8	2	415	28.000
4	8	3	415	27.000
4	8	1	430	-0.100
4	8	2	430	0.130
4	8	3	430	0.140
4	8	1	435	5.800
4	8	2	435	6.100
4	8	3	435	6.000
4	8	1	440	-0.010
4	8	2	440	-0.010
4	8	3	440	0.020
4	8	1	445	0.100
4	8	2	445	0.160
4	8	3	445	0.090
4	8	1	450	38.500
4	8	2	450	36.600
4	8	3	450	36.300
4	8	1	455	3.600
4	8	2	455	3.800
4	8	3	455	4.000
SITE 13				
4	13	1	105	350.000
4	13	1	110	9.000
4	13	1	115	14.400
4	13	1	120	14.100
4	13	1	121	139.000
4	13	1	130	11.000
4	13	1	205	186.000
4	13	1	230	266.000
4	13	1	240	300.000
4	13	1	250	1.300
4	13	1	260	23.000
4	13	1	325	64.000
4	13	1	350	30.000
4	13	1	360	-0.001
4	13	1	415	28.000
4	13	1	430	-0.100
4	13	1	435	5.600
4	13	1	440	-0.010
4	13	1	445	0.120
4	13	1	450	38.300
4	13	1	455	2.900
SITE 16				
4	16	1	105	667.000
4	16	1	110	8.500
4	16	1	115	15.000
4	16	1	120	12.400
4	16	1	121	124.000

CLINTON POWER STATION
ENVIRONMENTAL MONITORING PROGRAM
LAKE WATER QUALITY DATA FOR 1990

MONTH	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
4	16	1	130	21.000
4	16	1	205	216.000
4	16	1	230	333.000
4	16	1	240	370.000
4	16	1	250	1.200
4	16	1	260	39.000
4	16	1	325	78.000
4	16	1	350	36.000
4	16	1	360	-0.001
4	16	1	415	32.000
4	16	1	430	0.160
4	16	1	435	7.600
4	16	1	440	-0.010
4	16	1	445	0.140
4	16	1	450	44.300
4	16	1	455	2.600
SITE 2				
5	2	1	105	571.000
5	2	2	105	582.000
5	2	1	110	8.300
5	2	2	110	8.200
5	2	1	115	26.200
5	2	2	115	24.600
5	2	1	120	8.900
5	2	2	120	7.700
5	2	1	435	6.400
5	2	2	435	6.900
5	2	1	445	0.300
5	2	2	445	0.090
SITE 4				
5	4	1	105	545.000
5	4	1	110	8.100
5	4	1	115	18.000
5	4	1	120	9.500
5	4	1	435	6.400
5	4	1	445	0.020
SITE 8				
5	8	1	105	560.000
5	8	2	105	565.000
5	8	3	105	564.000
5	8	1	110	8.100
5	8	2	110	7.900
5	8	3	110	8.100
5	8	1	115	19.300
5	8	2	115	18.800
5	8	3	115	17.200
5	8	1	120	9.100
5	8	2	120	8.300
5	8	3	120	5.400
5	8	1	435	7.000
5	8	2	435	5.800
5	8	3	435	5.900
5	8	1	445	0.090
5	8	2	445	0.050
5	8	3	445	0.080
SITE 13				
5	13	1	105	566.000
5	13	2	105	566.000
5	13	3	105	562.000
5	13	1	110	8.100
5	13	2	110	8.100
5	13	3	110	8.000
5	13	1	115	20.700
5	13	2	115	19.600
5	13	3	115	18.400

MONTH	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
5	13	1	120	8.600
5	13	2	120	8.100
5	13	3	120	7.300
5	13	1	435	6.100
5	13	2	435	6.600
5	13	3	435	6.800
5	13	1	445	0.080
5	13	2	445	0.060
5	13	3	445	0.060
SITE 16				
5	16	1	105	705.000
5	16	1	110	8.100
5	16	1	115	19.000
5	16	1	120	9.500
5	16	1	435	13.000
5	16	1	445	0.080
SITE 2				
6	2	1	105	541.000
6	2	2	105	539.000
6	2	1	110	8.300
6	2	2	110	8.000
6	2	1	115	32.200
6	2	2	115	27.000
6	2	1	120	7.400
6	2	2	120	5.700
6	2	1	435	6.800
6	2	1	445	0.070
6	2	2	445	0.100
SITE 4				
6	4	1	105	510.000
6	4	2	105	533.000
6	4	3	105	541.000
6	4	1	110	8.100
6	4	2	110	8.000
6	4	3	110	8.000
6	4	1	115	25.800
6	4	2	115	24.900
6	4	3	115	24.000
6	4	1	120	14.100
6	4	2	120	10.300
6	4	3	120	8.000
6	4	1	435	5.800
6	4	2	435	5.600
6	4	3	435	6.500
6	4	1	445	0.070
6	4	2	445	0.060
6	4	3	445	0.050
SITE 8				
6	8	1	105	530.000
6	8	1	110	8.200
6	8	1	115	25.600
6	8	1	120	12.000
6	8	1	435	5.800
6	8	1	445	0.040
SITE 13				
6	13	1	105	538.000
6	13	2	105	551.000
6	13	3	105	561.000
6	13	1	110	8.400
6	13	2	110	8.000
6	13	3	110	7.800
6	13	1	115	28.000
6	13	2	115	25.800
6	13	3	115	23.300

CLINTON POWER STATION
ENVIRONMENTAL MONITORING PROGRAM
LAKE WATER QUALITY DATA FOR 1990

MONTH	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
6	13	1	120	10.400
6	13	2	120	6.400
6	13	3	120	4.800
6	13	1	435	6.800
6	13	2	435	6.600
6	13	3	435	6.000
6	13	1	445	0.070
6	13	2	445	0.070
6	13	3	445	0.040

SITE 16

MONTH	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
6	16	1	105	530.000
6	16	2	105	551.000
6	16	1	110	8.200
6	16	2	110	7.900
6	16	1	115	25.700
6	16	2	115	24.200
6	16	1	120	8.200
6	16	2	120	7.200
6	16	1	435	9.200
6	16	2	435	10.000
6	16	1	445	0.130
6	16	2	445	0.140

SITE 2

MONTH	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
7	2	1	105	542.000
7	2	1	110	8.400
7	2	1	115	26.000
7	2	1	120	10.400
7	2	1	121	130.000
7	2	1	130	9.400
7	2	1	205	160.000
7	2	1	230	262.000
7	2	1	240	290.000
7	2	1	250	1.010
7	2	1	260	14.000
7	2	1	325	49.000
7	2	1	350	30.000
7	2	1	360	-0.001
7	2	1	415	24.000
7	2	1	430	-0.400
7	2	1	435	5.500
7	2	1	440	0.018
7	2	1	445	0.077
7	2	1	450	32.000
7	2	1	455	3.000

SITE 4

MONTH	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
7	4	1	105	508.000
7	4	2	105	535.000
7	4	1	110	8.200
7	4	2	110	7.800
7	4	1	115	25.700
7	4	2	115	24.300
7	4	1	120	9.900
7	4	2	120	5.400
7	4	1	121	124.000
7	4	1	130	4.000
7	4	2	130	11.000
7	4	1	205	160.000
7	4	2	205	176.000
7	4	1	230	246.000
7	4	2	230	260.000
7	4	1	240	260.000
7	4	2	240	290.000
7	4	1	250	0.940
7	4	2	250	0.900
7	4	1	260	6.000
7	4	2	260	20.000

MONTH	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
7	4	1	325	45.000
7	4	2	325	49.000
7	4	1	350	30.000
7	4	2	350	29.000
7	4	1	360	-0.001
7	4	2	360	-0.001
7	4	1	415	25.000
7	4	2	415	24.000
7	4	1	430	-0.400
7	4	2	430	-0.400
7	4	1	435	5.100
7	4	2	435	5.200
7	4	1	440	0.015
7	4	2	440	-0.010
7	4	1	445	0.062
7	4	2	445	0.079
7	4	1	450	34.000
7	4	2	450	31.000
7	4	1	455	1.600
7	4	2	455	4.100

SITE 8

MONTH	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
7	8	1	105	503.000
7	8	1	110	8.200
7	8	1	115	25.300
7	8	1	120	9.300
7	8	1	121	115.000
7	8	1	130	2.800
7	8	1	205	160.000
7	8	1	230	245.000
7	8	1	240	270.000
7	8	1	250	0.900
7	8	1	260	10.000
7	8	1	325	45.000
7	8	1	350	30.000
7	8	1	360	-0.001
7	8	1	415	25.000
7	8	1	430	-0.400
7	8	1	435	5.100
7	8	1	440	-0.010
7	8	1	445	0.045
7	8	1	450	34.000
7	8	1	455	1.500

SITE 13

MONTH	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
7	13	1	105	518.000
7	13	1	110	8.200
7	13	1	115	26.100
7	13	1	120	11.800
7	13	1	121	148.000
7	13	1	130	5.400
7	13	1	205	164.000
7	13	1	230	250.000
7	13	1	240	290.000
7	13	1	250	1.300
7	13	1	260	10.000
7	13	1	325	45.000
7	13	1	350	31.000
7	13	1	360	-0.001
7	13	1	415	25.000
7	13	1	430	-0.400
7	13	1	435	5.300
7	13	1	440	-0.010
7	13	1	445	0.140
7	13	1	450	32.000
7	13	1	455	1.800

SITE 16

MONTH	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
7	16	1	105	563.000

CLINTON POWER STATION
ENVIRONMENTAL MONITORING PROGRAM
LAKE WATER QUALITY DATA FOR 1990

MONTH	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
7	16	2	105	487.000
7	16	1	110	8.300
7	16	2	110	7.600
7	16	1	115	24.900
7	16	2	115	23.100
7	16	1	120	10.200
7	16	2	120	4.700
7	16	1	121	124.000
7	16	1	130	10.000
7	16	2	130	26.000
7	16	1	205	172.000
7	16	2	205	160.000
7	16	1	230	276.000
7	16	2	230	234.000
7	16	1	240	300.000
7	16	2	240	260.000
7	16	1	250	1.300
7	16	2	250	0.960
7	16	1	260	18.000
7	16	2	260	24.000
7	16	1	325	53.000
7	16	2	325	48.000
7	16	1	350	31.000
7	16	2	350	23.000
7	16	1	360	-0.001
7	16	2	360	-0.001
7	16	1	415	24.000
7	16	2	415	18.000
7	16	1	430	-0.400
7	16	2	430	-0.400
7	16	1	435	6.200
7	16	2	435	5.600
7	16	1	440	0.023
7	16	2	440	0.098
7	16	1	445	0.120
7	16	2	445	0.190
7	16	1	450	32.000
7	16	2	450	26.000
7	16	1	455	6.000
7	16	2	455	8.600
SITE 2				
8	2	1	105	453.000
8	2	2	105	459.000
8	2	1	110	8.200
8	2	2	110	7.700
8	2	1	115	35.000
8	2	2	115	33.100
8	2	1	120	6.400
8	2	2	120	4.300
8	2	1	435	3.200
8	2	2	435	3.000
8	2	1	445	0.079
8	2	2	445	0.095
SITE 4				
8	4	1	105	445.000
8	4	2	105	464.000
8	4	1	110	8.400
8	4	2	110	8.000
8	4	1	115	28.100
8	4	2	115	27.200
8	4	1	120	11.200
8	4	2	120	6.100
8	4	1	435	3.400
8	4	2	435	2.700
8	4	1	445	0.073
8	4	2	445	0.110

MONTH	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
SITE 8				
8	8	1	105	451.000
8	8	1	110	8.400
8	8	1	115	27.500
8	8	1	120	10.400
8	8	1	435	3.000
8	8	1	445	0.062
SITE 13				
8	13	1	105	446.000
8	13	2	105	479.000
8	13	1	110	8.400
8	13	2	110	7.500
8	13	1	115	29.500
8	13	2	115	26.900
8	13	1	120	11.100
8	13	2	120	-1.000
8	13	1	435	3.000
8	13	2	435	3.400
8	13	1	445	0.072
8	13	2	445	0.073
SITE 16				
8	16	1	105	443.000
8	16	2	105	455.000
8	16	3	105	470.000
8	16	1	110	8.200
8	16	2	110	7.900
8	16	3	110	7.400
8	16	1	115	29.500
8	16	2	115	28.200
8	16	3	115	27.300
8	16	1	120	8.800
8	16	2	120	6.100
8	16	3	120	2.700
8	16	1	435	2.400
8	16	2	435	3.500
8	16	3	435	1.700
8	16	1	445	0.210
8	16	2	445	0.140
SITE 2				
9	2	1	105	470.000
9	2	1	105	470.000
9	2	2	105	475.000
9	2	1	110	8.400
9	2	2	110	8.200
9	2	1	115	28.200
9	2	2	115	24.200
9	2	1	120	7.200
9	2	2	120	4.500
9	2	1	435	1.800
9	2	2	435	1.700
9	2	1	445	0.086
9	2	2	445	0.087
SITE 4				
9	4	1	105	468.000
9	4	1	110	8.000
9	4	1	115	22.400
9	4	1	120	6.900
9	4	1	435	2.000
9	4	1	445	0.080
SITE 8				
9	8	1	105	470.000
9	8	1	110	8.000
9	8	1	115	22.800
9	8	1	120	7.400

CLINTON POWER STATION
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MONTH	SITE	GRAB(1)	PARAMETER CODE(2)	DATA(3)
9	8	1	435	1.700
9	8	1	445	0.077
SITE 13				
9	13	1	105	468.000
9	13	1	110	8.300
9	13	1	115	23.400
9	13	1	120	7.500
9	13	1	435	1.800
9	13	1	445	0.080
SITE 16				
9	16	1	105	461.000
9	16	1	110	8.800
9	16	1	115	20.800
9	16	1	120	7.300
9	16	1	435	1.400
9	16	1	445	0.120
SITE 2				
10	2	1	105	475.000
10	2	2	105	473.000
10	2	1	110	7.600
10	2	2	110	7.800
10	2	1	115	20.000
10	2	2	115	16.100
10	2	1	120	7.900
10	2	2	120	7.600
10	2	1	121	88.000
10	2	1	130	14.000
10	2	2	130	17.000
10	2	1	205	156.000
10	2	2	205	162.000
10	2	1	230	228.000
10	2	2	230	236.000
10	2	1	240	290.000
10	2	2	240	290.000
10	2	1	250	0.650
10	2	2	250	0.720
10	2	1	260	18.000
10	2	2	260	18.000
10	2	1	325	41.000
10	2	2	325	48.000
10	2	1	350	28.000
10	2	2	350	27.000
10	2	1	360	-0.001
10	2	2	360	-0.001
10	2	1	415	26.000
10	2	2	415	26.000
10	2	1	430	0.210
10	2	2	430	0.250
10	2	1	435	2.100
10	2	2	435	3.300
10	2	1	440	0.058
10	2	2	440	0.080
10	2	1	445	0.120
10	2	2	445	0.140
10	2	1	450	37.000
10	2	2	450	38.000
10	2	1	455	3.800
10	2	2	455	5.200
SITE 4				
10	4	1	105	457.000
10	4	1	110	7.700
10	4	1	115	15.500
10	4	1	120	7.700
10	4	1	121	79.000
10	4	1	130	9.300

MONTH	SITE	GRAB(1)	PARAMETER CODE(2)	DATA(3)
10	4	1	[illegible]	[illegible]
10	4	1	230	[illegible]
10	4	1	240	[illegible]
10	4	1	250	[illegible]
10	4	1	260	[illegible]
10	4	1	325	37.000
10	4	1	330	[illegible]
10	4	1	360	-0.001
10	4	1	415	24.000
10	4	1	430	0.170
10	4	1	435	1.400
10	4	1	440	0.028
10	4	1	445	0.068
10	4	1	450	36.000
10	4	1	455	2.600
SITE 8				
10	8	1	105	456.000
10	8	1	110	7.800
10	8	1	115	16.800
10	8	1	120	7.500
10	8	1	121	79.000
10	8	1	130	5.100
10	8	1	205	148.000
10	8	1	230	228.000
10	8	1	240	260.000
10	8	1	250	0.580
10	8	1	260	6.000
10	8	1	325	36.000
10	8	1	350	30.000
10	8	1	360	-0.001
10	8	1	415	26.000
10	8	1	430	0.170
10	8	1	435	1.300
10	8	1	440	0.022
10	8	1	445	0.075
10	8	1	450	35.000
10	8	1	455	2.200
SITE 13				
10	13	1	105	461.000
10	13	1	110	7.600
10	13	1	115	17.800
10	13	1	120	7.600
10	13	1	121	82.000
10	13	1	130	8.000
10	13	1	205	144.000
10	13	1	230	218.000
10	13	1	240	250.000
10	13	1	250	0.600
10	13	1	260	13.000
10	13	1	325	35.000
10	13	1	350	29.000
10	13	1	360	-0.001
10	13	1	415	27.000
10	13	1	430	0.110
10	13	1	435	1.300
10	13	1	440	0.033
10	13	1	445	0.084
10	13	1	450	34.000
10	13	1	455	2.200
SITE 16				
10	16	1	105	504.000
10	16	1	110	7.400
10	16	1	115	12.200
10	16	1	120	8.000
10	16	1	121	76.000
10	16	1	130	34.000

CLINTON POWER STATION
ENVIRONMENTAL MONITORING PROGRAM
LAKE WATER QUALITY DATA FOR 1990

MONTH	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
10	16	1	205	168.000
10	16	1	230	238.000
10	16	1	240	320.000
10	16	1	250	1.300
10	16	1	260	42.000
10	16	1	325	54.000
10	16	1	350	23.000
10	16	1	360	-0.001
10	16	1	415	26.000
10	16	1	430	0.270
10	16	1	435	5.800
10	16	1	440	0.160
10	16	1	445	0.250
10	16	1	450	29.000
10	16	1	455	10.000
SITE 2				
11	2	1	105	583.000
11	2	1	110	8.100
11	2	1	115	8.500
11	2	1	120	12.600
11	2	1	121	109.000
11	2	1	130	5.400
11	2	1	205	218.000
11	2	1	230	291.000
11	2	1	240	370.000
11	2	1	250	0.740
11	2	1	260	10.000
11	2	1	325	63.000
11	2	1	350	40.000
11	2	1	360	-0.001
11	2	1	415	27.000
11	2	1	430	0.130
11	2	1	435	5.500
11	2	1	440	-0.010
11	2	1	450	44.000
11	2	1	455	3.900
SITE 4				
11	4	1	105	534.000
11	4	1	110	7.800
11	4	1	115	9.200
11	4	1	120	12.000
11	4	1	121	106.000
11	4	1	130	5.900
11	4	1	205	196.000
11	4	1	230	258.000
11	4	1	240	327.000
11	4	1	250	0.650
11	4	1	260	11.000
11	4	1	325	56.000
11	4	1	350	37.000
11	4	1	360	-0.001
11	4	1	415	26.000
11	4	1	430	0.130
11	4	1	435	3.600
11	4	1	440	-0.010
11	4	1	445	0.100
11	4	1	450	42.000
11	4	1	455	2.900
SITE 8				
11	8	1	105	477.000
11	8	1	110	7.800
11	8	1	115	9.700
11	8	1	120	11.000
11	8	1	121	98.000
11	8	1	130	3.900
11	8	1	205	166.000
11	8	1	230	240.000
11	8	1	240	279.000
11	8	1	250	0.320
11	8	1	260	10.000
11	8	1	325	44.000
11	8	1	350	34.000
11	8	1	360	-0.001
11	8	1	415	26.000
11	8	1	430	-0.100
11	8	1	435	2.800
11	8	1	440	-0.010
11	8	1	445	0.061
11	8	1	450	39.000
11	8	1	455	1.700
SITE 13				
11	13	1	105	499.000
11	13	1	110	8.000
11	13	1	115	9.100
11	13	1	120	11.600
11	13	1	121	102.000
11	13	1	130	4.500
11	13	1	205	178.000
11	13	1	230	238.000
11	13	1	240	301.000
11	13	1	250	0.740
11	13	1	260	12.000
11	13	1	325	48.000
11	13	1	350	35.000
11	13	1	360	-0.001
11	13	1	415	26.000
11	13	1	430	-0.100
11	13	1	435	2.900
11	13	1	440	-0.010
11	13	1	445	0.069
11	13	1	450	60.000
11	13	1	455	1.700
SITE 16				
11	16	1	105	720.000
11	16	1	110	8.000
11	16	1	115	7.300
11	16	1	120	12.900
11	16	1	121	108.000
11	16	1	130	3.400
11	16	1	205	274.000
11	16	1	230	372.000
11	16	1	240	430.000
11	16	1	250	0.820
11	16	1	260	14.000
11	16	1	325	84.000
11	16	1	350	46.000
11	16	1	360	-0.001
11	16	1	415	29.000
11	16	1	430	-0.100
11	16	1	435	8.900
11	16	1	440	0.016
11	16	1	445	0.066
11	16	1	450	53.000
11	16	1	455	9.500

CLINTON POWER STATION
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MONTH	SITE	QUAD(1)	PARAMETER CODE(2)	DATA(3)
SITE 2				
4	2	1	105	529.0000
4	2	2	105	563.0000
4	2	1	110	7.9000
4	2	2	110	8.0000
4	2	1	115	22.7000
4	2	2	115	19.1000
4	2	1	120	8.7000
4	2	2	120	8.7000
4	2	1	121	101.8000
4	2	1	130	4.7000
4	2	2	130	4.9000
4	2	1	205	179.0000
4	2	2	205	182.0000
4	2	1	230	244.0000
4	2	2	230	246.0000
4	2	1	240	320.0000
4	2	2	240	300.0000
4	2	1	250	0.8400
4	2	2	250	0.8400
4	2	1	260	18.0000
4	2	2	260	21.0000
4	2	1	325	58.0000
4	2	2	325	59.0000
4	2	1	350	32.0000
4	2	2	350	31.0000
4	2	1	360	-0.0010
4	2	2	360	-0.0010
4	2	1	415	25.3000
4	2	2	415	23.4000
4	2	1	430	-0.1000
4	2	2	430	-0.1000
4	2	1	435	6.1000
4	2	2	435	6.2000
4	2	1	440	0.0180
4	2	2	440	0.0190
4	2	1	445	0.0680
4	2	2	445	0.0790
4	2	1	450	35.0000
4	2	2	450	35.0000
4	2	1	455	1.4420
4	2	2	455	1.6040
SITE 4				
4	4	1	105	512.0000
4	4	1	110	7.9000
4	4	1	115	14.2000
4	4	1	120	11.2000
4	4	1	121	110.2000
4	4	1	130	6.1000
4	4	1	205	178.0000
4	4	1	230	248.0000
4	4	1	240	300.0000
4	4	1	250	0.4700
4	4	1	260	16.0000
4	4	1	325	57.0000
4	4	1	350	30.0000
4	4	1	360	-0.0010
4	4	1	415	25.6000
4	4	1	430	-0.1000
4	4	1	435	5.9000
4	4	1	440	-0.0100
4	4	1	445	0.0880
4	4	1	450	36.0000
4	4	1	455	1.2130
SITE 8				
4	8	1	105	514.0000
4	8	1	110	7.9000
4	8	1	115	14.9000
4	8	1	120	10.6000
4	8	1	121	105.9000
4	8	1	130	4.9000
4	8	1	205	176.0000
4	8	1	230	240.0000
4	8	1	240	290.0000
4	8	1	250	0.8600
4	8	1	260	18.0000
4	8	1	325	55.0000
4	8	1	350	30.0000
4	8	1	360	-0.0010
4	8	1	415	25.3000
4	8	1	430	-0.1000
4	8	1	435	5.9000
4	8	1	440	-0.0100
4	8	1	445	0.0480
4	8	1	450	34.0000
4	8	1	455	0.4260
SITE 13				
4	13	1	105	530.0000
4	13	1	110	7.9000
4	13	1	115	17.0000
4	13	1	120	9.8000
4	13	1	121	103.2000
4	13	1	130	5.5000
4	13	1	205	180.0000
4	13	1	230	246.0000

CLINTON POWER STATION
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MONTH	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
4	13	1	240	310.0000
4	13	1	250	0.7800
4	13	1	260	16.0000
4	13	1	325	56.0000
4	13	1	350	31.0000
4	13	1	360	-0.0010
4	13	1	415	24.6000
4	13	1	430	-0.1000
4	13	1	435	5.6000
4	13	1	440	0.0180
4	13	1	445	0.0980
4	13	1	450	34.0000
4	13	1	455	1.7410

SITE 16

MONTH	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
4	16	1	105	410.0000
4	16	1	110	7.9000
4	16	1	115	15.5000
4	16	1	120	11.1000
4	16	1	121	112.7000
4	16	2	121	112.0000
4	16	3	121	103.0000
4	16	1	130	5.0000
4	16	2	130	7.0000
4	16	3	130	5.4000
4	16	1	205	209.0000
4	16	2	205	217.0000
4	16	3	205	224.0000
4	16	1	230	288.0000
4	16	2	230	300.0000
4	16	3	230	322.0000
4	16	1	240	370.0000
4	16	2	240	380.0000
4	16	3	240	390.0000
4	16	1	250	0.8400
4	16	2	250	0.6400
4	16	3	250	0.8200
4	16	1	260	26.0000
4	16	2	260	28.0000
4	16	3	260	32.0000
4	16	1	325	70.0000
4	16	2	325	73.0000
4	16	3	325	77.0000
4	16	1	350	33.0000
4	16	2	350	35.0000
4	16	3	350	36.0000
4	16	1	360	-0.0010
4	16	2	360	-0.0010
4	16	3	360	-0.0010

MONTH	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
4	16	1	415	25.5000
4	16	2	415	28.7000
4	16	3	415	32.0000
4	16	1	430	-0.1000
4	16	2	430	-0.1000
4	16	3	430	-0.1000
4	16	1	435	8.4000
4	16	2	435	9.0000
4	16	3	435	9.8000
4	16	1	440	-0.0100
4	16	2	440	-0.0100
4	16	3	440	-0.0100
4	16	1	445	0.0970
4	16	2	445	0.1200
4	16	3	445	0.1100
4	16	1	450	41.0000
4	16	2	450	42.0000
4	16	3	430	43.0000
4	16	1	455	6.3040
4	16	2	455	5.5840
4	16	3	455	5.1040

SITE 2

MONTH	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
5	2	1	105	439.0000
5	2	2	105	436.0000
5	2	1	110	7.6000
5	2	2	110	7.4000
5	2	1	115	30.0000
5	2	2	115	25.4000
5	2	1	120	4.8000
5	2	2	120	5.2000
5	2	1	435	6.1000
5	2	2	435	6.0000
5	2	1	445	0.1600
5	2	2	445	0.1700

SITE 4

MONTH	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
5	4	1	105	480.0000
5	4	2	105	480.0000
5	4	3	105	504.0000
5	4	1	110	8.1000
5	4	2	110	7.8000
5	4	3	110	7.3000
5	4	1	115	23.6000
5	4	2	115	22.1000
5	4	3	115	18.6000
5	4	1	120	11.7000
5	4	2	120	8.1000
5	4	3	120	6.7000

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MONTH	SITE	QUAD(1)	PARAMETER CODE(2)	DATA(3)
5	6	1	435	5.3000
5	6	2	435	5.1000
5	6	3	435	6.0000
5	6	1	445	0.0900
5	6	2	445	0.1000
5	6	3	445	0.1500
SITE 8				
5	8	1	105	496.0000
5	8	2	105	505.0000
5	8	3	105	510.0000
5	8	1	110	7.6000
5	8	2	110	7.6000
5	8	3	110	7.1000
5	8	1	115	23.4000
5	8	2	115	22.2000
5	8	3	115	18.4000
5	8	1	120	7.3000
5	8	2	120	6.4000
5	8	3	120	1.9000
5	8	1	435	5.8000
5	8	2	435	5.5000
5	8	3	435	5.5000
5	8	1	445	0.0930
5	8	2	445	0.0920
5	8	3	445	-0.0100
SITE 13				
5	13	1	105	464.0000
5	13	2	105	495.0000
5	13	3	105	496.0000
5	13	1	110	7.4000
5	13	2	110	7.5000
5	13	3	110	7.2000
5	13	1	115	24.9000
5	13	2	115	22.4000
5	13	3	115	20.8000
5	13	1	120	6.7000
5	13	2	120	6.8000
5	13	3	120	4.3000
5	13	1	435	5.9000
5	13	2	435	5.9000
5	13	3	435	4.7000
5	13	1	445	0.1400
5	13	2	445	0.1400
5	13	3	445	0.1100
SITE 16				
5	16	1	105	443.0000

MONTH	SITE	QUAD(1)	PARAMETER CODE(2)	DATA(3)
5	16	2	105	454.0000
5	16	1	110	7.2000
5	16	2	110	7.0000
5	16	1	115	19.8000
5	16	2	115	18.3000
5	16	1	120	6.8000
5	16	2	120	5.7000
5	16	1	435	7.4000
5	16	2	435	7.8000
5	16	1	445	0.2100
5	16	2	445	0.2500
SITE 2				
6	2	1	105	501.0000
6	2	2	105	518.0000
6	2	3	105	507.0000
6	2	1	110	7.8000
6	2	2	110	7.9000
6	2	3	110	6.9000
6	2	1	115	31.4000
6	2	2	115	29.7000
6	2	3	115	25.6000
6	2	1	120	6.3000
6	2	2	120	6.8000
6	2	3	120	1.1000
6	2	1	121	86.4000
6	2	1	130	14.0000
6	2	2	130	13.0000
6	2	3	130	14.0000
6	2	1	205	170.0000
6	2	2	205	175.0000
6	2	3	205	180.0000
6	2	1	230	224.0000
6	2	2	230	248.0000
6	2	3	230	248.0000
6	2	1	240	280.0000
6	2	2	240	280.0000
6	2	3	240	390.0000
6	2	1	250	0.4600
6	2	2	250	0.7400
6	2	3	250	0.7500
6	2	1	260	15.0000
6	2	2	260	11.0000
6	2	3	260	23.0000
6	2	1	325	53.0000
6	2	2	325	49.0000
6	2	3	325	55.0000
6	2	1	350	27.0000
6	2	2	350	28.0000

CLINTON POWER STATION
ENVIRONMENTAL MONITORING PROGRAM
LAKE WATER QUALITY DATA FOR 1991

MONTH	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
6	2	1	360	-0.0005
6	2	2	360	-0.0005
6	2	3	360	-0.0005
6	2	1	415	21.2000
6	2	2	415	20.8000
6	2	3	415	21.4000
6	2	1	430	-0.1000
6	2	2	430	-0.1000
6	2	3	430	-0.1000
6	2	1	435	7.4000
6	2	2	435	6.2000
6	2	1	440	0.0400
6	2	2	440	0.0380
6	2	3	440	0.0340
6	2	1	445	0.0780
6	2	2	445	0.7800
6	2	1	450	30.0000
6	2	2	450	31.0000
6	2	1	455	4.3500
6	2	2	455	4.9100
6	2	3	455	5.3300
SITE 4				
6	4	1	105	481.0000
6	4	1	110	7.7000
6	4	1	115	25.9000
6	4	1	120	7.1000
6	4	1	121	88.0000
6	4	1	130	11.8000
6	4	1	205	142.0000
6	4	1	230	222.0000
6	4	1	240	250.8000
6	4	1	250	0.8700
6	4	1	260	12.0000
6	4	1	325	48.0000
6	4	1	350	27.0000
6	4	3	350	26.0000
6	4	1	360	-0.0005
6	4	1	415	20.6000
6	4	1	430	-0.1000
6	4	1	435	5.9000
6	4	1	440	0.0160
6	4	1	445	0.7300
6	4	3	445	0.0670
6	4	1	450	32.0000
6	4	1	455	3.4200
SITE 8				
6	8	1	105	478.0000

MONTH	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
6	8	2	105	487.0000
6	8	3	105	510.0000
6	8	1	110	8.0000
6	8	2	110	7.4000
6	8	3	110	7.1000
6	8	1	115	28.5000
6	8	2	115	23.2000
6	8	3	115	18.1000
6	8	1	120	10.0000
6	8	2	120	1.4000
6	8	3	120	-1.0000
6	8	1	121	130.2000
6	8	1	130	6.4000
6	8	2	130	10.0000
6	8	3	130	15.0000
6	8	1	205	162.0000
6	8	2	205	152.0000
6	8	3	205	156.0000
6	8	1	230	224.0000
6	8	2	230	220.0000
6	8	3	230	226.0000
6	8	1	240	260.0000
6	8	2	240	260.0000
6	8	3	240	270.0000
6	8	1	250	0.9500
6	8	2	250	0.8400
6	8	3	250	0.6200
6	8	1	260	12.0000
6	8	2	260	14.0000
6	8	3	260	15.0000
6	8	1	325	47.0000
6	8	2	325	49.0000
6	8	3	325	52.0000
6	8	1	350	26.0000
6	8	2	350	26.0000
6	8	3	350	27.0000
6	8	1	360	-0.0005
6	8	2	360	-0.0005
6	8	3	360	-0.0005
6	8	1	415	21.1000
6	8	2	415	21.3000
6	8	3	415	20.8000
6	8	1	430	-0.1000
6	8	2	430	-0.1000
6	8	3	430	-0.1000
6	8	1	435	5.9000
6	8	2	435	6.4000
6	8	3	435	5.8000
6	8	1	440	-0.0100

CLINTON POWER STATION
ENVIRONMENTAL MONITORING PROGRAM
LAKE WATER QUALITY DATA FOR [illegible]

MONTH	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
6	8	2	440	-0.0100
6	8	3	440	0.0420
6	8	1	445	0.4500
6	8	2	445	0.5100
6	8	3	445	0.0770
6	8	1	450	29.0000
6	8	2	450	31.0000
6	8	3	450	30.0000
6	8	1	455	3.6800
6	8	2	455	3.6900
6	8	3	455	3.7500
SITE 13				
6	13	1	105	502.0000
6	13	2	105	489.0000
6	13	1	110	7.8000
6	13	2	110	7.3000
6	13	1	115	27.5000
6	13	2	115	22.8000
6	13	1	120	6.9000
6	13	2	120	-1.0000
6	13	1	121	88.6000
6	13	1	130	6.6000
6	13	2	130	11.0000
6	13	1	205	148.0000
6	13	2	205	146.0000
6	13	1	230	250.0000
6	13	2	230	234.0000
6	13	1	240	280.0000
6	13	2	240	270.0000
6	13	1	250	0.8200
6	13	2	250	0.5500
6	13	1	260	7.0000
6	13	2	260	9.0000
6	13	1	325	49.0000
6	13	2	325	53.0000
6	13	1	350	26.0000
6	13	2	350	27.0000
6	13	1	360	-0.0005
6	13	2	360	-0.0005
6	13	1	415	21.3000
6	13	2	415	21.0000
6	13	1	430	0.1000
6	13	2	430	-0.1000
6	13	1	435	5.5000
6	13	2	435	6.3000
6	13	3	435	4.9000
6	13	1	440	0.0330
6	13	2	440	0.0470

MONTH	SITE	GRAD(1)	PARAMETER [illegible](2)	DATA(3)
6	13	1	445	[illegible]
6	13	2	445	[illegible]
6	13	1	450	32.0000
6	13	2	450	30.0000
6	13	3	450	30.0000
6	13	1	455	4.5500
6	13	2	455	4.6000
SITE 16				
6	16	1	105	554.0000
6	16	1	110	7.8000
6	16	1	115	27.7000
6	16	1	120	8.2000
6	16	1	121	105.0000
6	16	1	130	28.0000
6	16	1	205	184.0000
6	16	1	230	260.0000
6	16	1	240	270.0000
6	16	1	250	1.0000
6	16	1	260	28.0000
6	16	1	325	57.0000
6	16	1	350	31.0000
6	16	1	360	-0.0005
6	16	1	415	22.4000
6	16	1	430	0.1400
6	16	1	435	6.1000
6	16	1	440	0.0100
6	16	1	445	0.1200
6	16	1	450	36.0000
6	16	1	455	6.8400
SITE 2				
7	2	1	105	444.0000
7	2	2	105	446.0000
7	2	1	110	7.6000
7	2	2	110	7.4000
7	2	1	115	34.7000
7	2	2	115	31.6000
7	2	1	120	6.1000
7	2	2	120	4.6000
7	2	1	435	3.7000
7	2	2	435	3.4000
7	2	1	445	0.0560
7	2	2	445	0.0450
SITE 4				
7	4	1	105	461.0000
7	4	1	110	7.7000
7	4	1	115	27.1000

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ENVIRONMENTAL MONITORING PROGRAM
LAKE WATER QUALITY DATA FOR 1991

MONTH	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
7	4	1	120	6.2000
7	4	1	435	3.7000
7	4	1	445	0.0350
SITE 8				
7	8	1	105	463.0000
7	8	2	105	491.0000
7	8	1	110	7.8000
7	8	2	110	7.1000
7	8	1	115	27.9000
7	8	2	115	22.0000
7	8	1	120	7.4000
7	8	2	120	-1.0000
7	8	1	435	3.3000
7	8	2	435	3.5000
7	8	1	445	0.0280
7	8	2	445	0.0230
SITE 13				
7	13	1	105	470.0000
7	13	1	110	7.8000
7	13	1	115	28.4000
7	13	1	120	5.3000
7	13	1	435	3.6000
7	13	1	445	0.0310
SITE 14				
7	14	1	105	463.0000
7	14	1	110	7.9000
7	14	1	115	28.6000
7	14	1	120	6.0000
7	14	1	435	3.0000
7	14	1	445	0.0450
SITE 2				
8	2	1	105	428.0000
8	2	2	105	435.0000
8	2	1	110	7.8000
8	2	2	110	7.7000
8	2	1	115	33.1000
8	2	2	115	28.4000
8	2	1	120	6.2000
8	2	2	120	1.9000
8	2	1	435	1.6000
8	2	2	435	2.0000
8	2	1	445	0.0750
8	2	2	445	0.0830
SITE 4				
8	4	1	105	417.0000
8	4	1	110	7.8000
8	4	1	115	25.6000
8	4	1	120	7.3000
8	4	1	435	1.7000
8	4	1	445	0.0680
SITE 8				
8	8	1	105	427.0000
8	8	1	110	7.7000
8	8	1	115	26.2000
8	8	1	120	6.7000
8	8	1	435	1.6000
8	8	1	445	0.0640
SITE 13				
8	13	1	105	435.0000
8	13	1	110	7.6000
8	13	1	115	27.5000
8	13	1	120	6.8000
8	13	1	435	1.5000
8	13	1	445	0.0660
SITE 14				
8	14	1	105	417.0000
8	14	1	110	8.3000
8	14	1	115	25.2000
8	14	1	120	7.4000
8	14	1	435	1.2000
8	14	1	445	0.1040
SITE 2				
9	2	1	105	396.0000
9	2	2	105	396.0000
9	2	1	110	7.8000
9	2	2	110	7.8000
9	2	1	115	33.1000
9	2	2	115	32.0000
9	2	1	120	6.6000
9	2	2	120	5.6000
9	2	1	121	91.8000
9	2	1	130	10.0000
9	2	2	130	12.0000
9	2	1	205	156.0000
9	2	2	205	190.0000
9	2	1	230	186.0000
9	2	2	230	186.0000
9	2	1	240	230.0000

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ENVIRONMENTAL MONITORING PROGRAM
LAKE WATER QUALITY DATA FOR 1991

MONTH	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
9	2	2	240	220.0000
9	2	1	250	0.7300
9	2	2	250	0.6000
9	2	1	260	16.0000
9	2	2	260	28.0000
9	2	1	325	29.0000
9	2	2	325	28.0000
9	2	1	350	27.0000
9	2	2	350	27.0000
9	2	1	360	-0.0050
9	2	2	360	-0.0050
9	2	1	415	23.1000
9	2	2	415	23.0000
9	2	1	430	0.2600
9	2	2	430	0.2800
9	2	1	435	0.7100
9	2	2	435	0.6200
9	2	1	440	0.0180
9	2	2	440	0.0350
9	2	1	445	0.0900
9	2	2	445	0.1220
9	2	1	450	31.0000
9	2	2	450	31.0000
9	2	1	455	2.4000
9	2	2	455	2.9000
SITE 4				
9	4	1	105	392.0000
9	4	1	110	7.8000
9	4	1	115	26.1000
9	4	1	120	5.4000
9	4	1	121	48.1000
9	4	1	130	10.8000
9	4	1	205	128.0000
9	4	1	230	186.0000
9	4	1	240	210.0000
9	4	1	250	0.8400
9	4	1	260	16.0000
9	4	1	325	28.0000
9	4	1	350	27.0000
9	4	1	360	-0.0050
9	4	1	415	22.9000
9	4	1	430	0.1000
9	4	1	435	0.4200
9	4	1	440	-0.0100
9	4	1	445	0.0850
9	4	1	450	31.0000
9	4	1	455	2.4000

MONTH	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
SITE 8				
9	8	2	105	403.0000
9	8	2	110	7.5000
9	8	2	115	26.1000
9	8	2	120	4.5000
9	8	1	121	56.4000
9	8	1	130	4.7000
9	8	1	205	258.0000
9	8	1	230	186.0000
9	8	1	240	210.0000
9	8	1	250	0.5300
9	8	1	260	6.0000
9	8	1	325	30.0000
9	8	1	350	27.0000
9	8	1	360	-0.0050
9	8	1	415	23.1000
9	8	1	430	-0.1000
9	8	1	435	0.7900
9	8	1	440	-0.0100
9	8	1	445	0.0620
9	8	1	450	30.0000
9	8	1	455	2.3000
SITE 13				
9	13	1	105	406.0000
9	13	1	110	7.4000
9	13	1	115	27.2000
9	13	1	120	4.4000
9	13	1	121	58.0000
9	13	1	130	6.7000
9	13	1	205	90.0000
9	13	1	230	190.0000
9	13	1	240	210.0000
9	13	1	250	0.7700
9	13	1	260	9.0000
9	13	1	325	30.0000
9	13	1	350	27.0000
9	13	1	360	-0.0050
9	13	1	415	22.8000
9	13	1	430	-0.1000
9	13	1	435	0.7800
9	13	1	440	0.0150
9	13	1	445	0.0770
9	13	1	450	31.0000
9	13	1	455	2.4000
SITE 16				
9	16	1	105	398.0000
9	16	2	105	399.0000

CLINTON POWER STATION
ENVIRONMENTAL MONITORING PROGRAM
LAKE WATER QUALITY DATA FOR 1991

MONTH	SITE	QUAD(1)	PARAMETER CODE(2)	DATA(3)
9	16	1	110	8.2000
9	16	2	110	8.1000
9	16	1	115	28.0000
9	16	2	115	27.7000
9	16	1	120	6.4000
9	16	2	120	5.6000
9	16	1	121	85.5000
9	16	1	130	15.0000
9	16	2	130	17.0000
9	16	1	205	122.0000
9	16	2	205	130.0000
9	16	1	230	184.0000
9	16	2	230	186.0000
9	16	1	240	190.0000
9	16	2	240	200.0000
9	16	1	250	1.2000
9	16	2	250	0.7800
9	16	1	260	22.0000
9	16	2	260	29.0000
9	16	1	325	27.0000
9	16	2	325	29.0000
9	16	1	350	27.0000
9	16	2	350	27.0000
9	16	1	360	-0.0050
9	16	2	360	-0.0050
9	16	1	415	23.9000
9	16	2	415	23.4000
9	16	1	430	0.2260
9	16	2	430	0.3200
9	16	1	435	0.0680
9	16	2	435	0.3800
9	16	1	440	0.0320
9	16	2	440	0.0350
9	16	1	445	0.1210
9	16	2	445	0.1310
9	16	1	450	31.0000
9	16	2	430	32.0000
9	16	1	455	2.3000
9	16	2	455	2.6000
SITE 2				
11	2	1	105	429.0000
11	2	1	110	8.2000
11	2	1	115	17.8000
11	2	1	120	9.0000
11	2	1	121	96.2000
11	2	1	130	6.8000
11	2	1	205	177.0000
11	2	1	230	204.0000
11	2	1	240	220.0000
11	2	1	250	0.3500
11	2	1	260	11.0000
11	2	1	325	36.0000
11	2	1	350	29.0000
11	2	1	360	-0.0005
11	2	1	415	25.1000
11	2	1	430	0.1600
11	2	1	435	0.5600
11	2	1	440	0.0360
11	2	1	445	0.0420
11	2	1	450	29.7000
11	2	1	455	1.0000
SITE 4				
11	4	1	105	419.0000
11	4	1	110	8.0000
11	4	1	115	6.2000
11	4	1	120	10.6000
11	4	1	121	86.8000
11	4	1	130	4.0000
11	4	1	205	148.0000
11	4	1	230	202.0000
11	4	1	240	240.0000
11	4	1	250	0.4200
11	4	1	260	2.0000
11	4	1	325	36.0000
11	4	1	350	29.0000
11	4	1	360	-0.0005
11	4	1	415	24.6000
11	4	1	430	0.2500
11	4	1	435	0.5600
11	4	1	440	0.0270
11	4	1	445	0.0570
11	4	1	450	28.7000
11	4	1	455	0.9700
SITE 8				
11	8	1	105	412.0000
11	8	1	110	8.0000
11	8	1	115	6.1000
11	8	1	120	10.8000
11	8	1	121	88.4000
11	8	1	130	3.4000
11	8	1	205	147.0000
11	8	1	230	205.0000
11	8	1	240	220.0000
11	8	1	250	0.4700
11	8	1	260	2.0000

CLINTON POWER STATION
ENVIRONMENTAL MONITORING PROGRAM
LAKE WATER QUALITY DATA FOR 1991

MONTH	SITE	GRAD(1)	PARAMETER CODE(2)	DATA(3)
11	8	1	325	35.0000
11	8	1	350	29.0000
11	8	1	360	-0.0005
11	8	1	415	24.8000
11	8	1	430	0.2000
11	8	1	435	0.5700
11	8	1	440	0.0300
11	8	1	445	0.0480
11	8	1	450	29.0000
11	8	1	455	0.7900
SITE 13				
11	13	1	105	417.0000
11	13	1	110	8.1000
11	13	1	115	8.0000
11	13	1	120	10.6000
11	13	1	121	93.2000
11	13	1	130	4.5000
11	13	1	205	142.0000
11	13	1	230	210.0000
11	13	1	240	230.0000
11	13	1	250	0.5200
11	13	1	260	7.0000
11	13	1	325	37.0000
11	13	1	350	29.0000
11	13	1	360	-0.0005
11	13	1	415	24.8000
11	13	1	430	0.1300
11	13	1	435	0.5500
11	13	1	440	0.0240
11	13	1	445	0.0530
11	13	1	450	29.1000
11	13	1	455	0.7900
SITE 16				
11	16	1	105	436.0000
11	16	2	105	439.0000
11	16	1	110	8.3000
11	16	2	110	8.3000
11	16	1	115	10.0000
11	16	2	115	8.0000
11	16	1	120	11.0000
11	16	2	120	11.5000
11	16	1	121	99.3000
11	16	1	130	7.9000
11	16	2	130	7.0000
11	16	1	205	156.0000
11	16	2	205	132.0000
11	16	1	230	208.0000
11	16	2	230	218.0000
11	16	1	240	240.0000
11	16	2	240	230.0000
11	16	1	250	0.5800
11	16	2	250	0.7100
11	16	1	260	16.0000
11	16	2	260	9.0000
11	16	1	325	39.0000
11	16	2	325	40.0000
11	16	1	350	29.0000
11	16	2	350	30.0000
11	16	1	360	-0.0005
11	16	2	360	-0.0005
11	16	1	415	26.0000
11	16	2	415	26.1000
11	16	1	430	0.1700
11	16	2	430	0.1600
11	16	1	435	0.5400
11	16	2	435	0.6000
11	16	1	440	0.0250
11	16	2	440	0.0200
11	16	1	445	0.0920
11	16	2	445	0.0540
11	16	1	450	30.4000
11	16	2	450	33.0000
11	16	1	455	1.0000
11	16	2	455	1.2000

Appendix B. Clinton Lake Profile Data 1987 through 1991

Tables B-1 through B-5 list the water quality profile data collected from Clinton Lake for the Environmental Monitoring Program during 1987 through 1991. Profile data for 1978 through 1984 were included in the Clinton Lake Water Quality Report 1978-1984, Volumes 2, 3 and 4. Profile data for 1985 and 1986 were included in the 1989 Clinton Lake Water Quality Report. Clinton Lake profile data are organized by sampling data, site and depth. Parameter names are abbreviated as follows:

TEMP = Water temperature, C

DO = Dissolved oxygen, mg/l

COND = Specific conductance, umhos/cm

pH = pH

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MONTH	SITE	DEPTH	TEMP	DO	COND	pH
** SITE 2						
4	2	0.5	11.30	10.7	538	8.0
4	2	1.0	11.30	10.6	538	8.0
4	2	1.5	11.30	10.2	538	8.0
4	2	2.0	11.30	10.3	538	8.0
4	2	2.5	11.30	10.0	538	8.0
4	2	3.0	11.30	9.9	539	8.0
4	2	3.5	11.20	9.8	538	8.0
4	2	4.0	11.10	9.7	538	8.0
** SITE 4						
4	4	0.5	10.30	9.8	539	8.0
4	4	1.0	10.20	9.8	538	8.0
4	4	1.5	10.20	10.0	539	8.0
4	4	2.0	10.20	10.1	538	8.0
4	4	2.5	10.10	10.1	538	8.0
4	4	3.0	10.10	10.0	538	8.0
4	4	3.5	10.10	10.0	538	8.0
4	4	4.0	10.10	10.0	538	8.0
4	4	4.5	10.10	10.0	538	8.0
4	4	5.0	10.10	9.3	538	8.0
4	4	5.5	10.10	9.5	538	8.0
4	4	6.0	10.00	9.3	538	7.9
4	4	6.5	9.90	9.3	538	7.9
4	4	7.0	9.90	9.4	538	7.9
4	4	7.5	9.90	9.4	538	7.9
4	4	8.0	9.90	9.4	538	7.9
4	4	8.5	9.90	9.4	538	7.9
** SITE 8						
4	8	0.5	9.70	11.1	534	8.0
4	8	1.0	9.80	10.0	533	8.0
4	8	1.5	9.80	10.4	533	8.0
4	8	2.0	9.80	10.5	533	8.0
4	8	2.5	9.70	10.5	534	8.0
4	8	3.0	9.70	10.4	535	8.0
4	8	3.5	9.60	10.5	535	8.0
4	8	4.0	9.60	10.4	534	8.0
4	8	4.5	9.60	10.5	535	8.0
4	8	5.0	9.60	10.0	534	8.0
4	8	5.5	9.50	10.4	535	8.0
4	8	6.0	9.50	10.2	535	8.0
4	8	6.5	9.50	10.2	535	8.0
4	8	7.0	9.50	10.2	535	8.0
4	8	7.5	9.50	10.4	534	8.0
4	8	8.0	9.40	9.9	535	8.0
4	8	8.5	9.40	10.0	535	8.0
4	8	9.0	9.40	9.6	535	8.0
4	8	9.5	9.30	9.4	535	8.0
4	8	10.0	9.30	10.1	536	8.0
4	8	10.5	9.30	10.0	536	8.0
** SITE 13						
4	13	0.5	10.40	10.1	536	7.8
4	13	1.0	10.40	10.0	536	7.8
4	13	1.5	10.40	10.2	536	7.8
4	13	2.0	10.40	10.0	536	7.8
4	13	2.5	10.40	9.9	536	7.8
4	13	3.0	10.30	9.8	536	7.8
4	13	3.5	10.30	10.2	537	7.8
4	13	4.0	10.30	10.0	538	7.9
4	13	4.5	10.30	9.9	538	7.9
4	13	5.0	10.20	10.1	539	8.0
4	13	5.5	10.20	9.8	539	8.0
4	13	6.0	10.20	9.5	539	8.0
4	13	6.5	10.20	9.2	539	8.0
4	13	7.0	10.10	9.2	539	8.0
4	13	7.5	10.10	9.0	539	8.0
4	13	8.0	10.00	9.2	538	8.0
4	13	8.5	10.00	9.3	539	8.0
** SITE 16						
4	16	0.5	11.80	10.4	575	8.0
4	16	1.0	11.80	10.3	575	8.0
4	16	1.5	11.80	9.9	576	8.0
4	16	2.0	11.80	10.0	576	8.0
4	16	2.5	11.80	9.7	576	8.0
4	16	3.0	11.80	9.6	576	8.0
4	16	3.5	11.70	8.8	578	7.9
4	16	4.0	11.40	8.8	579	7.9
** SITE 2						
5	2	0.5	25.50	6.5	497	7.9
5	2	1.0	25.50	6.1	497	7.9
5	2	1.5	25.30	6.6	497	7.9
5	2	2.0	25.20	6.5	495	7.9
5	2	2.5	24.80	6.4	493	8.0
5	2	3.0	24.30	6.6	490	8.0
5	2	3.5	24.10	5.1	492	8.0
5	2	4.0	23.50	4.4	494	7.9
** SITE 4						
5	4	0.5	22.30	10.5	491	8.2
5	4	1.0	22.30	10.0	490	8.2
5	4	1.5	22.00	9.9	489	8.2
5	4	2.0	21.70	9.4	485	8.1
5	4	2.5	21.60	9.4	485	8.1
5	4	3.0	21.60	9.5	486	8.1
5	4	3.5	21.50	9.3	487	8.1
5	4	4.0	21.50	9.1	486	8.0
5	4	4.5	21.40	9.1	490	8.0
5	4	5.0	21.00	8.9	488	7.9
5	4	5.5	20.80	8.5	495	7.8
5	4	6.0	20.70	7.4	496	7.9
5	4	6.5	20.00	6.3	513	7.8
** SITE 8						
5	8	0.5	21.30	9.6	485	8.2
5	8	1.0	21.30	9.0	485	8.2
5	8	1.5	21.20	8.8	484	8.2
5	8	2.0	21.20	9.3	484	8.2
5	8	2.5	21.00	8.9	486	8.2
5	8	3.0	20.90	9.1	488	8.2
5	8	3.5	20.70	8.8	489	8.1
5	8	4.0	20.50	8.2	491	8.1
5	8	4.5	20.40	7.6	494	8.1
5	8	5.0	20.30	7.4	494	8.0
5	8	5.5	19.50	5.9	500	7.9
5	8	6.0	19.40	5.9	507	7.8
5	8	6.5	18.80	5.6	510	7.8
5	8	7.0	18.50	4.9	511	7.7
5	8	7.5	18.40	4.8	511	7.7
5	8	8.0	18.30	5.1	513	7.7
5	8	8.5	18.30	3.6	514	7.6
5	8	9.0	18.20	3.7	515	7.6
5	8	9.5	18.00	3.4	514	7.5
5	8	10.0	18.10	3.5	513	7.5
** SITE 13						
5	13	0.5	22.60	9.5	478	8.3

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MONTH	SITE	DEPTH	TEMP	DO	COND	pH
5	13	1.0	22.40	9.6	479	8.3
5	13	1.5	22.40	9.4	480	8.3
5	13	2.0	22.10	9.1	481	8.3
5	13	2.5	21.90	9.3	484	8.2
5	13	3.0	21.70	9.1	486	8.2
5	13	3.5	21.50	8.5	489	8.2
5	13	4.0	21.20	7.9	491	8.1
5	13	4.5	20.90	6.1	494	8.0
5	13	5.0	20.60	5.6	499	8.0
5	13	5.5	20.40	5.5	504	8.0
5	13	6.0	20.00	5.2	507	7.9
5	13	6.5	19.70	3.3	516	7.7
** SITE 16						
5	16	0.5	23.80	10.0	475	8.4
5	16	1.0	23.70	9.1	475	8.4
5	16	1.5	23.50	8.5	476	8.4
5	16	2.0	23.10	8.1	476	8.3
5	16	2.5	22.90	7.2	480	8.2
5	16	3.0	22.50	6.9	480	8.2
** SITE 2						
6	2	0.5	32.40	7.2	475	7.7
6	2	1.0	32.30	5.6	475	7.7
6	2	1.5	32.30	5.4	475	7.7
6	2	2.0	31.60	5.1	473	7.8
6	2	2.5	31.40	5.2	472	7.9
6	2	3.0	30.00	5.5	470	7.9
6	2	3.5	29.80	3.4	470	7.8
6	2	4.0	29.60	2.3	477	7.5
** SITE 4						
6	4	0.5	27.10	6.8	454	8.0
6	4	1.0	27.10	6.7	454	8.0
6	4	1.5	27.20	6.6	454	8.0
6	4	2.0	27.20	6.1	455	8.0
6	4	2.5	27.10	5.7	456	8.0
6	4	3.0	26.80	3.4	461	7.6
6	4	3.5	26.50	2.6	467	7.5
6	4	4.0	26.20	2.0	472	7.4
6	4	4.5	26.00	1.8	474	7.3
6	4	5.0	25.80	1.1	476	7.2
6	4	5.5	25.70	1.0	477	7.2
6	4	6.0	25.60	1.0	478	7.2
6	4	6.5	25.30	0.6	480	7.2
** SITE 8						
6	8	0.5	26.60	9.2	468	8.0
6	8	1.0	26.70	7.0	468	8.0
6	8	1.5	26.80	6.9	468	8.0
6	8	2.0	26.80	6.9	468	8.0
6	8	2.5	26.80	7.1	468	8.0
6	8	3.0	26.80	7.0	468	8.0
6	8	3.5	26.80	7.1	469	8.0
6	8	4.0	26.80	7.0	469	8.0
6	8	4.5	26.80	6.9	469	8.0
6	8	5.0	26.70	6.2	469	8.0
6	8	5.5	26.60	6.1	469	7.9
6	8	6.0	26.30	3.9	472	7.9
6	8	6.5	26.20	3.9	476	7.5
6	8	7.0	25.40	0.9	482	7.5
6	8	7.5	25.30	0.4	484	7.2
6	8	8.0	24.50	0.3	490	7.2
6	8	8.5	24.00	0.2	490	7.2
6	8	9.0	23.10	0.2	494	7.2

MONTH	SITE	DEPTH	TEMP	DO	COND	pH
6	8	9.5	[illegible]	[illegible]	[illegible]	[illegible]
6	8	10.0	[illegible]	[illegible]	[illegible]	[illegible]
6	8	10.5	[illegible]	[illegible]	[illegible]	[illegible]
** SITE 13						
6	13	0.5	28.20	7.7	472	8.0
6	13	1.0	28.20	7.0	472	8.0
6	13	1.5	28.20	7.0	472	8.0
6	13	2.0	28.10	6.7	473	8.0
6	13	2.5	28.10	6.4	473	8.0
6	13	3.0	27.80	6.3	474	8.0
6	13	3.5	27.70	5.3	475	7.9
6	13	4.0	27.30	5.1	477	7.9
6	13	4.5	27.10	4.2	478	7.8
6	13	5.0	26.50	4.2	480	7.7
6	13	5.5	26.40	3.6	481	7.6
6	13	6.0	26.00	1.7	482	7.6
6	13	6.5	25.00	0.4	497	7.2
6	13	7.0	24.10	0.2	499	7.2
** SITE 16						
6	16	0.5	28.50	9.3	483	8.0
6	16	1.0	28.50	7.4	484	8.0
6	16	1.5	28.20	6.3	487	8.0
6	16	2.0	27.30	5.6	489	8.0
6	16	2.5	27.20	5.4	491	7.9
6	16	3.0	27.20	5.3	492	7.8
** SITE 2						
7	2	0.5	26.00	7.1	471	8.0
7	2	1.0	26.00	6.0	471	8.0
7	2	1.5	25.90	6.4	471	8.0
7	2	2.0	25.90	6.4	471	8.0
7	2	2.5	25.90	6.1	472	8.0
7	2	3.0	25.80	5.8	472	8.0
7	2	3.5	25.60	5.6	474	8.0
7	2	4.0	25.60	5.4	474	8.0
7	2	4.5	25.40	5.1	474	7.9
** SITE 4						
7	4	0.5	25.10	6.4	474	8.0
7	4	1.0	25.00	5.0	475	8.0
7	4	1.5	25.10	5.1	473	8.0
7	4	2.0	25.10	4.8	472	8.0
7	4	2.5	25.10	5.0	472	8.0
7	4	3.0	25.10	5.2	472	8.0
7	4	3.5	25.10	4.6	472	8.0
7	4	4.0	25.10	4.4	472	8.0
7	4	4.5	25.10	4.5	472	7.9
7	4	5.0	25.10	4.8	472	7.9
7	4	5.5	25.10	5.0	472	7.9
7	4	6.0	25.10	4.5	472	7.9
** SITE 8						
7	8	0.5	25.40	7.4	470	8.0
7	8	1.0	25.40	5.8	471	8.0
7	8	1.5	25.40	5.5	471	8.0
7	8	2.0	25.40	5.8	470	8.0
7	8	2.5	25.50	6.0	471	8.0
7	8	3.0	25.50	5.8	470	8.0
7	8	3.5	25.50	6.1	470	8.0
7	8	4.0	25.40	5.9	470	8.0
7	8	4.5	25.40	6.0	470	8.1
7	8	5.0	25.40	6.0	470	8.1
7	8	5.5	25.20	5.8	470	8.1

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MONTH	SITE	DEPTH	TEMP	DO	COND	pH
7	8	6.0	25.20	6.3	470	8.1
7	8	6.5	25.20	6.4	469	8.1
7	8	7.0	25.20	6.4	469	8.1
7	8	7.5	25.20	6.5	469	8.1
7	8	8.0	25.10	6.1	470	8.1
7	8	8.5	25.10	6.1	470	8.0
7	8	9.0	24.90	4.6	475	7.8
7	8	9.5	24.50	2.3	482	7.6
7	8	10.0	23.80	1.0	490	7.3
** SITE 13						
7	13	0.5	26.30	5.8	477	7.9
7	13	1.0	26.30	4.9	476	7.9
7	13	1.5	26.30	5.3	476	7.9
7	13	2.0	26.30	4.7	476	7.9
7	13	2.5	26.30	4.6	476	7.9
7	13	3.0	26.20	4.3	477	7.9
7	13	3.5	26.10	4.0	477	7.9
7	13	4.0	26.10	3.5	477	7.8
7	13	4.5	26.10	3.7	477	7.8
7	13	5.0	26.00	3.6	477	7.8
7	13	5.5	26.00	3.4	477	7.8
7	13	6.0	25.90	2.9	479	7.8
7	13	6.5	25.90	3.3	478	7.8
7	13	7.0	25.80	2.4	480	7.7
** SITE 16						
7	16	0.5	25.70	6.0	493	7.7
7	16	1.0	25.20	4.5	493	7.7
7	16	1.5	25.20	3.9	493	7.7
7	16	2.0	24.90	3.8	495	7.6
7	16	2.5	24.80	3.6	495	7.6
7	16	3.0	24.80	3.7	495	7.6
** SITE 2						
8	2	0.5	31.30	5.8	443	8.2
8	2	1.0	30.70	4.9	443	8.2
8	2	1.5	31.00	4.3	442	8.2
8	2	2.0	30.20	3.9	441	8.1
8	2	2.5	30.10	3.3	443	8.0
8	2	3.0	29.60	3.2	445	8.0
8	2	3.5	29.30	2.5	447	7.9
8	2	4.0	28.80	2.4	446	7.9
** SITE 4						
8	4	0.5	27.40	5.9	437	8.2
8	4	1.0	27.40	5.2	439	8.2
8	4	1.5	27.40	5.1	439	8.2
8	4	2.0	27.40	5.1	439	8.2
8	4	2.5	27.40	4.9	439	8.2
8	4	3.0	27.40	5.0	439	8.2
8	4	3.5	27.40	4.6	439	8.2
8	4	4.0	27.40	4.9	438	8.2
8	4	4.5	27.40	5.1	438	8.3
8	4	5.0	27.40	5.2	438	8.2
8	4	5.5	27.40	4.7	438	8.2
8	4	6.0	27.30	4.8	439	8.2
8	4	6.5	27.30	4.5	439	8.2
8	4	7.0	27.30	5.2	438	8.2
** SITE 8						
8	8	0.5	27.20	5.4	449	8.0
8	8	1.0	27.20	4.7	449	8.0
8	8	1.5	27.20	4.4	449	8.0
8	8	2.0	27.20	4.3	449	8.0

MONTH	SITE	DEPTH	TEMP	DO	COND	pH
8	8	2.5	27.20	4.4	449	8.0
8	8	3.0	27.20	4.3	449	8.0
8	8	3.5	27.10	3.9	449	8.0
8	8	4.0	27.10	4.5	449	8.0
8	8	4.5	27.10	3.9	449	8.0
8	8	5.0	27.10	4.3	449	8.0
8	8	5.5	27.10	4.0	449	8.0
8	8	6.0	27.10	4.1	449	8.0
8	8	6.5	27.00	4.0	449	8.0
8	8	7.0	27.10	3.9	449	8.0
8	8	7.5	27.10	4.0	449	8.0
8	8	8.0	27.00	3.4	450	7.9
8	8	8.5	26.90	2.4	454	7.8
8	8	9.0	26.70	1.0	459	7.5
8	8	9.5	26.20	1.0	460	7.5
** SITE 13						
8	13	0.5	27.50	6.1	443	8.1
8	13	1.0	27.50	5.5	443	8.1
8	13	1.5	27.50	5.3	443	8.1
8	13	2.0	27.40	5.1	443	8.1
8	13	2.5	27.30	5.1	444	8.1
8	13	3.0	27.30	4.7	444	8.1
8	13	3.5	27.20	4.9	444	8.1
8	13	4.0	27.20	4.8	444	8.1
8	13	4.5	27.20	4.9	444	8.0
8	13	5.0	27.00	5.0	445	8.0
8	13	5.5	26.90	5.4	445	8.0
8	13	6.0	27.10	4.9	445	8.0
8	13	6.5	26.70	4.7	445	8.0
** SITE 16						
8	16	0.5	28.10	6.6	448	8.2
8	16	1.0	28.00	5.7	449	8.2
8	16	1.5	27.90	5.0	449	8.2
8	16	2.0	27.60	4.3	450	8.1
8	16	2.5	27.20	4.0	450	8.1
8	16	3.0	27.00	3.4	452	7.9
** SITE 2						
9	2	0.5	28.70	7.4	457	8.0
9	2	1.0	28.60	7.2	459	8.0
9	2	1.5	28.70	6.5	459	8.0
9	2	2.0	28.70	6.2	459	8.0
9	2	2.5	28.70	6.1	459	8.0
9	2	3.0	28.60	6.0	459	8.0
9	2	3.5	28.60	6.1	459	8.0
9	2	4.0	28.60	5.5	459	8.0
9	2	4.5	28.60	4.5	461	8.0
** SITE 4						
9	4	0.5	21.90	6.4	453	8.1
9	4	1.0	21.60	6.2	452	8.1
9	4	1.5	21.70	6.1	452	8.1
9	4	2.0	21.80	6.0	452	8.1
9	4	2.5	22.00	6.3	452	8.1
9	4	3.0	22.10	6.1	452	8.1
9	4	3.5	21.90	6.3	452	8.1
9	4	4.0	22.20	6.2	452	8.1
9	4	4.5	22.40	6.3	452	8.1
9	4	5.0	22.70	6.3	453	8.1
9	4	5.5	22.60	6.2	453	8.1
9	4	6.0	22.80	6.3	452	8.1
9	4	6.5	23.00	6.1	452	8.1
9	4	7.0	23.10	5.9	454	8.1

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MONTH	SITE	DEPTH	TEMP	DO	COND	pH
9	4	7.5	23.10	5.7	452	8.1
** SITE 8						
9	8	0.5	23.20	6.1	452	8.1
9	8	1.0	23.50	5.9	452	8.1
9	8	1.5	23.50	5.8	452	8.1
9	8	2.0	23.50	5.7	452	8.1
9	8	2.5	23.50	5.7	454	8.1
9	8	3.0	23.50	5.6	454	8.1
9	8	3.5	23.50	5.4	454	8.1
9	8	4.0	23.50	5.5	454	8.1
9	8	4.5	23.50	5.5	454	8.1
9	8	5.0	23.50	5.7	454	8.1
9	8	5.5	23.50	5.6	454	8.1
9	8	6.0	23.50	5.0	454	8.1
9	8	6.5	23.50	4.8	455	8.0
9	8	7.0	23.50	4.7	455	8.0
9	8	7.5	23.00	5.0	456	7.9
9	8	8.0	22.80	4.7	455	8.0
9	8	8.5	22.80	4.5	455	8.0
9	8	9.0	22.70	4.0	455	8.0
9	8	9.5	22.90	3.8	455	7.9
9	8	10.0	22.80	2.6	460	7.9
** SITE 13						
9	13	0.5	24.10	5.0	458	7.8
9	13	1.0	24.20	4.8	458	7.8
9	13	1.5	23.90	4.5	459	7.8
9	13	2.0	23.80	4.5	459	7.8
9	13	2.5	24.00	4.4	459	7.8
9	13	3.0	24.10	4.4	459	7.8
9	13	3.5	23.90	4.4	459	7.8
9	13	4.0	23.80	4.3	459	7.8
9	13	4.5	24.00	4.3	459	7.8
9	13	5.0	24.10	4.4	459	7.8
9	13	5.5	23.60	4.1	459	7.8
9	13	6.0	23.40	4.0	459	7.8
9	13	6.5	23.10	3.2	461	7.8
9	13	7.0	23.30	2.4	461	7.8
** SITE 16						
9	16	0.5	23.80	6.0	461	8.1
9	16	1.0	23.80	5.9	461	8.1
9	16	1.5	24.20	5.8	462	8.1
9	16	2.0	24.20	6.1	462	8.1
9	16	2.5	23.90	5.6	462	8.1
9	16	3.0	24.00	5.1	462	8.1
** SITE 2						
10	2	0.5	10.60	11.1	490	8.4
10	2	1.0	10.60	10.8	491	8.4
10	2	1.5	10.60	10.8	491	8.4
10	2	2.0	10.60	10.7	491	8.4
10	2	2.5	10.60	10.7	491	8.4
10	2	3.0	10.50	10.6	491	8.4
10	2	3.5	10.50	10.6	491	8.4
** SITE 4						
10	4	0.5	10.80	9.8	500	8.2
10	4	1.0	10.80	9.8	500	8.2
10	4	1.5	10.80	9.7	501	8.2
10	4	2.0	10.80	9.9	501	8.2
10	4	2.5	10.80	9.7	501	8.2
10	4	3.0	10.80	9.7	502	8.2
10	4	3.5	10.80	9.7	502	8.1

MONTH	SITE	DEPTH	TEMP	DO	COND	pH
10	4	4.0	10.80	9.6	502	8.1
10	4	4.5	10.80	9.5	502	8.1
10	4	5.0	10.80	9.5	502	8.1
10	4	5.5	10.70	9.4	502	8.1
10	4	6.0	10.70	9.5	502	8.1
** SITE 8						
10	8	0.5	11.20	9.9	494	8.3
10	8	1.0	11.20	9.8	494	8.3
10	8	1.5	11.10	9.8	496	8.3
10	8	2.0	11.10	9.7	496	8.3
10	8	2.5	11.10	9.7	496	8.3
10	8	3.0	11.10	9.7	496	8.3
10	8	3.5	11.10	9.7	498	8.3
10	8	4.0	11.10	9.6	497	8.3
10	8	4.5	11.00	9.6	499	8.3
10	8	5.0	11.00	9.6	499	8.3
10	8	5.5	11.00	9.5	500	8.3
10	8	6.0	11.00	9.5	498	8.3
10	8	6.5	11.00	9.5	498	8.3
10	8	7.0	11.00	9.5	498	8.3
10	8	7.5	11.00	9.5	498	8.3
10	8	8.0	11.00	9.5	498	8.3
10	8	8.5	11.00	9.5	498	8.3
10	8	9.0	11.00	9.4	499	8.3
10	8	9.5	11.00	9.4	498	8.3
10	8	10.0	11.00	9.5	498	8.3
10	8	10.5	11.00	9.5	499	8.3
10	8	11.0	11.00	9.5	499	8.3
10	8	11.5	11.00	9.4	499	8.3
** SITE 13						
10	13	0.5	10.80	10.8	488	8.4
10	13	1.0	10.80	10.7	488	8.4
10	13	1.5	10.60	10.7	489	8.4
10	13	2.0	10.70	10.6	489	8.4
10	13	2.5	10.70	10.5	490	8.4
10	13	3.0	10.40	10.6	490	8.4
10	13	3.5	10.40	10.7	490	8.4
10	13	4.0	10.40	10.4	490	8.4
10	13	4.5	10.40	10.3	492	8.4
10	13	5.0	10.40	10.2	492	8.4
10	13	5.5	10.40	10.1	493	8.4
10	13	6.0	10.40	10.1	493	8.4
10	13	6.5	10.40	10.1	492	8.4
** SITE 16						
10	16	0.5	9.40	11.1	499	8.5
10	16	1.0	9.40	11.0	500	8.5
10	16	1.5	9.40	11.0	500	8.5
10	16	2.0	9.30	10.9	500	8.5
10	16	2.5	9.30	10.9	500	8.5
10	16	3.0	9.30	10.8	500	8.5
** SITE 2						
11	2	0.5	13.70	11.1	487	8.1
11	2	1.0	13.50	10.8	486	8.1
11	2	1.5	13.20	10.9	486	8.1
11	2	2.0	13.20	10.9	488	8.1
11	2	2.5	13.20	10.8	487	8.1
11	2	3.0	13.20	10.9	487	8.1
11	2	3.5	13.10	10.9	488	8.1
11	2	4.0	13.10	10.8	488	8.1

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MONTH	SITE	DEPTH	TEMP	DO	COND	pH
** SITE 4						
11	4	0.5	13.00	10.6	478	8.0
11	4	1.0	12.90	10.5	485	8.0
11	4	1.5	12.70	10.3	484	8.0
11	4	2.0	12.60	10.6	483	8.0
11	4	2.5	12.60	10.2	484	8.0
11	4	3.0	12.60	10.2	486	8.0
11	4	3.5	12.60	10.1	486	8.0
11	4	4.0	12.60	10.0	485	8.0
11	4	4.5	12.50	10.0	486	8.0
11	4	5.0	12.50	10.0	488	8.0
11	4	5.5	12.50	10.0	488	8.0
11	4	6.0	12.50	9.9	488	8.0
** SITE 8						
11	8	0.5	12.10	10.0	487	8.0
11	8	1.0	12.10	9.9	487	8.0
11	8	1.5	12.10	9.8	487	8.0
11	8	2.0	12.00	9.7	487	8.0
11	8	2.5	12.00	9.8	487	8.0
11	8	3.0	11.90	9.8	487	8.0
11	8	3.5	11.90	9.6	487	8.0
11	8	4.0	11.90	9.6	488	8.0
11	8	4.5	11.80	9.5	488	8.0
11	8	5.0	11.80	9.6	489	8.0
11	8	5.5	11.80	9.6	490	8.0
11	8	6.0	11.80	9.4	490	8.0
11	8	6.5	11.80	9.3	491	8.0
11	8	7.0	11.80	9.5	491	8.0
11	8	7.5	11.80	9.5	492	8.0
11	8	8.0	11.80	9.5	492	8.0
11	8	8.5	11.70	9.0	492	8.0
11	8	9.0	11.40	8.3	494	7.9
11	8	9.5	11.30	8.2	496	7.9
11	8	10.0	11.30	8.0	496	7.9
11	8	10.5	11.30	7.8	497	7.9
** SITE 13						
11	13	0.5	12.60	11.5	486	8.2
11	13	1.0	12.60	11.4	485	8.2
11	13	1.5	12.60	11.2	487	8.2
11	13	2.0	12.60	11.1	487	8.2
11	13	2.5	12.50	10.9	487	8.1
11	13	3.0	12.40	10.6	489	8.1
11	13	3.5	12.30	10.5	489	8.1
11	13	4.0	12.30	10.5	488	8.1
11	13	4.5	12.30	10.5	490	8.2
11	13	5.0	12.30	10.5	489	8.2
11	13	5.5	12.10	10.5	489	8.1
11	13	6.0	11.80	10.1	488	8.1
11	13	6.5	11.40	8.5	490	8.0
** SITE 16						
11	16	0.5	13.80	10.6	500	8.1
11	16	1.0	13.60	10.3	499	8.1
11	16	1.5	13.50	10.0	499	8.1
11	16	2.0	13.20	9.6	499	8.1
11	16	2.5	13.10	9.5	499	8.1

[illegible] ENVIRONMENTAL MONITORING [illegible]

LAKE WATER QUALITY PROFILE [illegible]

MONTH	SITE	DEPTH	TEMP	DO	COND	pH
** SITE 2						
1	2	1.0	19.00	8.9	542	7.9
4	2	0.5	12.20	10.4	584	8.0
4	2	1.0	12.20	10.4	584	8.0
4	2	1.5	12.20	10.4	585	8.0
4	2	2.0	12.20	10.4	584	8.0
4	2	2.5	12.20	10.3	584	8.0
4	2	3.0	12.20	10.3	586	8.0
4	2	3.5	12.20	10.3	586	8.0
4	2	4.0	12.20	10.2	586	8.0
4	2	4.5	12.10	10.2	586	8.0
** SITE 4						
4	4	0.5	12.20	10.1	585	7.9
4	4	1.0	12.20	10.0	585	7.9
4	4	1.5	12.20	10.0	585	7.9
4	4	2.0	12.10	10.0	586	7.9
4	4	2.5	12.10	9.9	586	7.9
4	4	3.0	12.10	9.9	586	7.9
4	4	3.5	12.10	9.8	586	7.9
4	4	4.0	12.00	9.8	587	7.9
4	4	4.5	12.00	9.7	587	7.9
4	4	5.0	12.00	9.7	587	7.8
4	4	5.5	12.00	9.7	587	7.8
4	4	6.0	12.00	9.6	588	7.8
4	4	6.5	12.00	9.6	588	7.8
** SITE 8						
4	8	0.5	12.10	10.9	533	8.0
4	8	1.0	12.10	10.6	535	8.0
4	8	1.5	12.10	10.6	534	8.0
4	8	2.0	12.00	10.6	534	8.0
4	8	2.5	12.00	10.5	535	8.0
4	8	3.0	12.00	10.5	535	8.0
4	8	3.5	12.00	10.5	535	8.0
4	8	4.0	11.90	10.5	535	8.0
4	8	4.5	11.90	10.4	535	8.0
4	8	5.0	11.90	10.4	536	8.0
4	8	5.5	11.90	10.5	536	8.0
4	8	6.0	11.90	10.8	537	8.0
4	8	6.5	11.80	10.5	537	8.0
4	8	7.0	11.90	10.5	536	8.0
4	8	7.5	11.80	10.4	537	8.0
4	8	8.0	11.80	10.3	538	8.0
4	8	8.5	11.80	10.4	539	8.0
4	8	9.0	11.80	10.3	539	8.0
4	8	9.5	11.80	10.3	540	8.0
4	8	10.0	11.80	10.3	540	8.0
4	8	10.5	11.80	10.2	540	8.0
4	8	11.0	11.80	10.3	541	8.0
** SITE 13						
4	13	0.5	11.90	10.8	551	8.0
4	13	1.0	11.90	10.6	551	8.0
4	13	1.5	11.90	10.4	552	8.0
4	13	2.0	11.80	10.3	552	8.0
4	13	2.5	11.80	10.4	552	8.0
4	13	3.0	11.80	10.3	552	8.0
4	13	3.5	11.80	10.3	552	8.0
4	13	4.0	11.80	10.3	553	8.0
4	13	4.5	11.80	10.3	553	8.0
4	13	5.0	11.80	10.3	552	8.0
4	13	5.5	11.80	10.2	553	8.0
4	13	6.0	11.80	10.2	554	8.0
4	13	6.5	11.70	10.2	555	8.0

MONTH	SITE	DEPTH	TEMP	DO	COND	pH
[illegible]						
4	13	7.0	11.70	10.1	555	8.0
** SITE 16						
4	16	0.5	12.30	10.1	660	7.9
4	16	1.0	12.20	10.0	655	7.9
4	16	1.5	12.20	9.9	660	7.9
4	16	2.0	12.30	9.9	660	7.9
4	16	2.5	12.20	9.9	661	7.9
4	16	3.0	12.20	9.9	661	7.9
** SITE 2						
5	2	0.5	14.70	11.2	550	8.1
5	2	1.0	14.70	11.2	551	8.1
5	2	1.5	14.70	11.3	552	8.0
5	2	2.0	14.60	11.4	554	7.9
5	2	2.5	14.60	11.6	555	7.8
5	2	3.0	14.50	11.6	558	7.8
5	2	3.5	14.30	11.5	554	7.8
** SITE 4						
5	4	0.5	14.90	12.7	536	8.1
5	4	1.0	14.50	12.2	536	7.9
5	4	1.5	14.40	11.4	539	7.8
5	4	2.0	14.30	11.2	539	7.7
5	4	2.5	14.30	11.2	541	7.7
5	4	3.0	14.30	11.2	541	7.7
5	4	3.5	14.30	11.2	541	7.7
5	4	4.0	14.20	11.2	541	7.7
5	4	4.5	14.20	11.2	544	7.7
5	4	5.0	14.20	11.2	543	7.7
5	4	5.5	14.20	11.3	544	7.7
5	4	6.0	14.20	11.2	542	7.7
** SITE 8						
5	8	0.5	15.20	13.4	521	8.2
5	8	1.0	15.10	13.2	522	8.2
5	8	1.5	14.90	12.7	523	8.1
5	8	2.0	14.80	12.3	524	8.0
5	8	2.5	14.80	12.2	525	7.9
5	8	3.0	14.80	12.1	525	7.8
5	8	3.5	14.80	12.0	525	7.8
5	8	4.0	14.80	11.9	525	7.8
5	8	4.5	14.80	11.9	525	7.8
5	8	5.0	14.40	11.3	531	7.8
5	8	5.5	14.30	11.5	533	7.8
5	8	6.0	14.20	11.7	534	7.8
5	8	6.5	14.00	11.3	538	7.8
5	8	7.0	13.90	10.9	538	7.7
5	8	7.5	13.70	10.8	539	7.8
5	8	8.0	13.70	10.9	539	7.7
5	8	8.5	13.70	10.7	540	7.7
5	8	9.0	13.70	10.4	540	7.7
5	8	9.5	13.60	10.0	542	7.7
5	8	10.0	13.50	9.6	542	7.7
5	8	10.5	13.30	9.0	544	7.6
** SITE 13						
5	13	0.5	14.40	12.9	546	8.2
5	13	1.0	14.30	12.9	546	8.2
5	13	1.5	14.00	11.6	548	8.1
5	13	2.0	14.00	11.1	549	7.9
5	13	2.5	13.90	10.9	548	7.9
5	13	3.0	13.90	10.8	548	7.[illegible]
5	13	3.5	13.80	10.7	547	7.[illegible]
5	13	4.0	13.80	10.6	547	7.[illegible]

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MONTH	SITE	DEPTH	TEMP	DO	COND	pH
5	13	4.5	13.70	10.6	546	7.8
5	13	5.0	13.70	10.6	546	7.8
5	13	5.5	13.60	10.5	546	7.8
5	13	6.0	13.60	10.5	545	7.7
5	13	6.5	13.50	9.9	546	7.7
5	13	7.0	13.40	9.6	546	7.6
** SITE 16						
5	16	0.5	15.70	12.5	605	8.2
5	16	1.0	15.30	12.3	603	8.1
5	16	1.5	15.00	10.9	604	8.0
5	16	2.0	14.80	10.3	610	7.8
5	16	2.5	14.70	10.0	609	7.7
5	16	3.0	14.60	9.9	606	7.7
** SITE 2						
6	2	0.5	33.20	7.4	507	8.4
6	2	1.0	32.90	7.3	507	8.4
6	2	1.5	32.80	7.3	507	8.4
6	2	2.0	31.10	5.6	507	8.3
6	2	2.5	29.00	4.4	515	8.1
6	2	3.0	28.70	3.8	519	8.0
6	2	3.5	27.80	1.6	515	7.7
** SITE 4						
6	4	0.5	23.80	9.2	513	8.4
6	4	1.0	23.80	9.3	513	8.4
6	4	1.5	23.80	9.2	513	8.4
6	4	2.0	23.80	9.2	513	8.3
6	4	2.5	23.80	9.1	513	8.3
6	4	3.0	23.80	9.0	513	8.2
6	4	3.5	23.80	8.9	513	8.2
6	4	4.0	23.80	8.9	513	8.2
6	4	4.5	23.70	8.1	513	8.1
6	4	5.0	23.70	7.2	517	8.1
6	4	5.5	23.30	5.7	517	7.9
6	4	6.0	22.90	4.1	519	7.7
** SITE 8						
6	8	0.5	24.20	9.6	512	8.4
6	8	1.0	24.10	9.1	513	8.4
6	8	1.5	24.00	8.7	515	8.3
6	8	2.0	24.00	8.6	515	8.3
6	8	2.5	23.90	8.3	516	8.2
6	8	3.0	23.80	8.1	516	8.1
6	8	3.5	23.80	7.9	517	8.1
6	8	4.0	23.80	7.8	517	8.1
6	8	4.5	23.80	6.9	518	8.0
6	8	5.0	23.50	6.0	518	7.9
6	8	5.5	23.30	5.5	520	7.8
6	8	6.0	23.10	5.1	520	7.8
6	8	6.5	23.00	5.3	520	7.8
6	8	7.0	22.90	6.0	520	7.8
6	8	7.5	22.80	5.0	521	7.8
6	8	8.0	22.50	3.5	510	7.6
6	8	8.5	22.20	1.8	524	7.5
6	8	9.0	22.00	1.2	523	7.5
6	8	9.5	21.80	0.1	528	7.4
** SITE 13						
6	13	0.5	27.60	8.5	511	8.6
6	13	1.0	27.60	8.6	511	8.5
6	13	1.5	27.50	8.3	511	8.5
6	13	2.0	26.60	7.8	512	8.4
6	13	2.5	26.30	7.8	512	8.3
6	13	3.0	25.70	5.4	517	8.0
6	13	3.5	25.20	4.9	515	7.9
6	13	4.0	25.10	4.9	517	7.9
6	13	4.5	24.70	4.4	516	7.8
6	13	5.0	24.60	4.2	518	7.8
6	13	5.5	23.20	1.2	523	7.5
6	13	6.0	23.10	0.7	525	7.4
6	13	6.5	22.80	0.5	526	7.4
** SITE 16						
6	16	0.5	29.20	8.5	506	8.6
6	16	1.0	29.00	8.2	506	8.5
6	16	1.5	28.30	7.6	509	8.5
6	16	2.0	26.30	7.9	509	8.4
6	16	2.5	26.20	7.0	510	8.4
6	16	3.0	25.30	3.1	520	7.9
** SITE 2						
7	2	0.5	35.90	5.0	481	8.0
7	2	1.0	34.80	5.1	484	8.0
7	2	1.5	31.60	2.3	485	8.0
7	2	2.0	30.70	3.6	487	8.0
7	2	2.5	29.70	3.4	487	7.9
7	2	3.0	29.70	3.3	486	7.9
** SITE 4						
7	4	0.5	27.20	6.2	485	8.1
7	4	1.0	27.20	6.2	485	8.1
7	4	1.5	27.20	5.9	485	8.0
7	4	2.0	27.20	5.7	485	7.9
7	4	2.5	27.20	5.7	485	7.9
7	4	3.0	27.20	5.6	485	7.9
7	4	3.5	27.20	5.7	486	7.9
7	4	4.0	27.20	5.8	486	7.9
7	4	4.5	27.20	5.7	487	7.9
7	4	5.0	27.20	5.3	487	7.9
7	4	5.5	27.20	4.9	490	7.9
** SITE 8						
7	8	0.5	28.30	7.0	481	8.2
7	8	1.0	28.30	7.0	481	8.2
7	8	1.5	28.20	6.9	482	8.3
7	8	2.0	28.20	6.9	481	8.2
7	8	2.5	28.20	6.9	481	8.2
7	8	3.0	28.20	6.9	480	8.1
7	8	3.5	28.20	7.0	479	8.1
7	8	4.0	28.20	7.1	478	8.1
7	8	4.5	28.20	7.2	478	8.2
7	8	5.0	28.20	7.3	477	8.2
7	8	5.5	28.00	5.2	479	8.1
7	8	6.0	26.50	0.1	503	7.4
7	8	6.5	25.20	0.1	517	7.3
7	8	7.0	24.70	0.1	523	7.3
7	8	7.5	24.10	0.1	532	7.2
7	8	8.0	23.80	0.1	536	7.2
7	8	8.5	23.30	0.1	542	7.2
7	8	9.0	23.10	0.1	545	7.2
** SITE 13						
7	13	0.5	28.70	6.0	490	8.0
7	13	1.0	28.70	5.8	490	8.0
7	13	1.5	28.70	5.5	491	8.0
7	13	2.0	28.70	5.6	491	7.9
7	13	2.5	28.60	4.0	491	7.9
7	13	3.0	28.50	3.7	493	7.8

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MONTH	SITE	DEPTH	TEMP	DO	COND	pH
7	13	3.5	28.30	3.8	493	7.8
7	13	4.0	28.20	3.4	493	7.7
7	13	4.5	28.00	1.9	495	7.6
7	13	5.0	27.20	0.1	500	7.4
7	13	5.5	26.20	0.1	516	7.3
7	13	6.0	25.40	0.1	522	7.2
** SITE 16						
7	16	0.5	29.20	7.4	484	8.3
7	16	1.0	28.50	6.7	485	8.2
7	16	1.5	28.40	6.8	487	8.3
7	16	2.0	27.90	5.0	492	8.1
7	16	2.5	27.60	4.3	496	7.9
** SITE 2						
8	2	0.5	36.50	5.2	448	8.2
8	2	1.0	36.20	4.8	447	8.2
8	2	1.5	36.70	4.4	448	8.0
8	2	2.0	34.90	3.1	449	7.9
8	2	2.5	31.80	0.1	452	7.4
** SITE 4						
8	4	0.5	29.00	8.0	443	8.4
8	4	1.0	29.00	7.9	443	8.2
8	4	1.5	29.00	7.8	443	8.2
8	4	2.0	29.00	7.7	443	8.1
8	4	2.5	28.90	7.2	444	8.0
8	4	3.0	28.90	7.1	445	8.0
8	4	3.5	28.80	5.4	446	7.9
8	4	4.0	28.80	4.5	448	7.9
8	4	4.5	28.60	3.3	452	7.6
8	4	5.0	28.30	0.6	459	7.2
** SITE 8						
8	8	0.5	29.30	8.6	445	8.4
8	8	1.0	29.30	8.6	445	8.3
8	8	1.5	29.30	8.5	445	8.2
8	8	2.0	29.30	8.5	446	8.2
8	8	2.5	29.30	8.3	446	8.1
8	8	3.0	29.20	8.3	447	8.1
8	8	3.5	28.60	5.6	447	7.9
8	8	4.0	28.40	3.6	455	7.7
8	8	4.5	28.40	3.4	455	7.6
8	8	5.0	28.20	2.4	456	7.5
8	8	5.5	27.80	0.1	461	7.2
8	8	6.0	27.40	0.1	469	7.1
8	8	6.5	26.80	0.1	470	7.0
8	8	7.0	25.90	0.1	490	6.8
8	8	7.5	25.50	0.1	494	6.8
8	8	8.0	24.90	0.1	506	6.7
8	8	8.5	24.50	0.1	511	6.7
8	8	9.0	23.60	0.1	530	6.6
8	8	9.5	23.20	0.1	535	6.5
** SITE 13						
8	13	0.5	30.90	7.3	451	8.4
8	13	1.0	30.90	7.3	451	8.2
8	13	1.5	30.90	7.1	453	8.2
8	13	2.0	29.40	3.1	452	7.7
8	13	2.5	29.20	2.8	461	7.7
8	13	3.0	29.00	2.6	462	7.6
8	13	3.5	27.90	0.4	470	7.1
8	13	4.0	27.80	0.1	471	7.0
8	13	4.5	27.80	0.1	472	7.0
8	13	5.0	27.70	0.1	473	6.9
8	13	5.5	27.10	0.1	485	6.8
8	13	6.0	26.80	0.1	486	6.7
** SITE 16						
8	16	0.5	30.60	6.6	456	8.2
8	16	1.0	30.50	6.2	457	8.1
8	16	1.5	30.50	5.9	457	8.0
8	16	2.0	30.10	4.6	461	7.8
** SITE 2						
9	2	0.5	32.00	6.7	502	8.4
9	2	1.0	32.00	6.5	502	8.3
9	2	1.5	31.60	5.9	505	8.3
9	2	2.0	28.30	4.0	512	8.2
9	2	2.5	27.20	4.9	513	8.2
** SITE 4						
9	4	0.5	23.10	8.4	515	8.4
9	4	1.0	23.00	7.9	515	8.4
9	4	1.5	23.00	7.6	516	8.3
9	4	2.0	23.00	7.5	517	8.2
9	4	2.5	22.90	7.8	517	8.3
9	4	3.0	22.90	7.8	518	8.3
9	4	3.5	22.90	7.8	518	8.2
9	4	4.0	22.90	7.7	518	8.2
9	4	4.5	22.90	7.6	519	8.2
9	4	5.0	22.90	7.3	518	8.2
** SITE 8						
9	8	0.5	24.10	11.1	511	8.6
9	8	1.0	23.90	10.3	513	8.6
9	8	1.5	23.90	10.1	514	8.5
9	8	2.0	23.60	9.6	514	8.5
9	8	2.5	23.40	8.9	517	8.4
9	8	3.0	23.40	8.6	517	8.4
9	8	3.5	23.40	7.8	518	8.3
9	8	4.0	23.40	8.3	518	8.3
9	8	4.5	23.30	8.0	518	8.3
9	8	5.0	23.20	7.1	520	8.2
9	8	5.5	23.20	5.9	522	8.1
9	8	6.0	23.00	4.8	525	8.0
9	8	6.5	23.00	4.2	527	7.9
9	8	7.0	22.90	3.6	528	7.8
9	8	7.5	22.80	3.1	528	7.7
9	8	8.0	22.80	2.7	530	7.7
9	8	8.5	22.70	2.4	532	7.7
9	8	9.0	22.70	2.0	533	7.6
** SITE 13						
9	13	0.5	26.80	9.9	513	8.6
9	13	1.0	26.60	9.4	513	8.5
9	13	1.5	26.30	8.4	515	8.4
9	13	2.0	26.10	7.6	517	8.4
9	13	2.5	24.50	5.8	522	8.2
9	13	3.0	24.20	5.9	521	8.1
9	13	3.5	24.10	5.3	522	8.0
9	13	4.0	23.60	4.9	524	8.0
9	13	4.5	23.30	3.9	525	7.9
9	13	5.0	23.20	3.0	528	7.8
9	13	5.5	23.00	1.9	529	7.6
9	13	6.0	22.90	1.3	532	7.6
** SITE 16						
9	16	0.5	26.10	10.0	509	8.6
9	16	1.0	24.10	5.2	521	8.3

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MONTH	SITE	DEPTH	TEMP	DO	COND	pH
9	16	1.5	24.00	3.8	524	8.1
** SITE 1						
11	1	1.0	8.50	10.6	546	7.9
11	1	1.5	8.60	10.6	546	7.9
11	1	2.0	8.50	10.6	549	7.9
11	1	2.5	8.50	10.5	550	7.9
11	1	3.0	8.50	10.5	552	7.9
11	1	3.5	8.40	10.5	553	7.9
11	1	4.0	8.30	10.5	554	7.9
11	1	4.5	8.30	10.5	557	7.9
11	1	5.0	8.30	10.6	557	7.9
11	1	5.5	8.30	10.6	558	8.0
** SITE 2						
11	2	1.5	18.90	8.8	545	7.9
11	2	2.0	18.70	8.5	545	7.9
11	2	2.5	18.50	8.5	549	7.9
** SITE 8						
11	8	1.0	9.30	10.9	549	8.0
11	8	1.5	9.30	10.6	549	8.0
11	8	2.0	9.30	10.6	550	8.0
11	8	2.5	9.20	10.5	551	8.0
11	8	3.0	9.20	10.5	551	8.0
11	8	3.5	9.20	10.5	553	8.0
11	8	4.0	9.20	10.5	554	8.0
11	8	4.5	9.20	10.5	556	8.0
11	8	5.0	9.20	10.5	555	8.0
11	8	5.5	9.20	10.4	556	8.0
11	8	6.0	9.20	10.4	558	8.0
11	8	6.5	9.20	10.4	558	8.0
11	8	7.0	9.20	10.4	558	8.0
11	8	7.5	9.20	10.4	559	8.0
11	8	8.0	9.20	10.4	559	8.0
11	8	8.5	9.20	10.4	560	8.0
11	8	9.0	9.20	10.4	560	8.0
** SITE 13						
11	13	1.0	11.20	9.8	548	8.0
11	13	1.5	11.20	9.8	548	8.0
11	13	2.0	11.20	9.7	549	8.0
11	13	2.5	11.20	9.7	551	8.0
11	13	3.0	11.20	9.6	551	8.0
11	13	3.5	11.20	9.6	552	8.0
11	13	4.0	11.20	9.6	553	8.0
11	13	4.5	11.00	9.5	554	8.0
11	13	5.0	10.80	9.7	555	8.0
11	13	5.5	10.50	9.8	555	8.0
11	13	6.0	10.50	9.7	557	8.0
** SITE 16						
11	16	1.0	8.60	11.1	552	8.0
11	16	1.5	8.40	11.0	552	8.1
11	16	2.0	8.00	11.1	553	8.1

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MONTH	SITE	DEPTH	TEMP	DO	COND	PH
SITE 2						
4	2	1.0	8.20	12.50	353	8.70
4	2	1.5	8.20	12.40	351	8.80
4	2	2.0	8.20	12.30	353	8.80
4	2	2.5	8.20	12.30	355	8.80
4	2	3.0	8.20	12.20	557	8.80
4	2	3.5	8.20	12.20	559	8.80
SITE 4						
4	4	1.0	8.20	12.40	567	8.60
4	4	1.5	8.20	12.40	569	8.70
4	4	2.0	8.20	12.40	571	8.70
4	4	2.5	8.10	12.40	573	8.70
4	4	3.0	8.10	12.40	573	8.70
4	4	3.5	8.20	12.40	575	8.70
4	4	4.0	8.20	12.40	576	8.70
4	4	4.5	8.20	12.30	577	8.70
4	4	5.0	8.20	12.30	576	8.70
4	4	5.5	8.20	12.30	579	8.70
4	4	6.0	8.20	12.30	578	8.70
SITE 8						
4	8	1.0	7.90	12.00	516	8.50
4	8	1.5	7.90	11.80	517	8.50
4	8	2.0	7.90	11.70	517	8.50
4	8	2.5	7.90	11.60	519	8.50
4	8	3.0	7.90	11.60	521	8.50
4	8	3.5	7.90	11.40	522	8.50
4	8	4.0	7.90	11.60	523	8.50
4	8	4.5	7.80	11.50	523	8.50
4	8	5.0	7.80	11.50	523	8.50
4	8	5.5	7.80	11.60	524	8.50
4	8	6.0	7.80	11.60	525	8.50
4	8	6.5	7.80	11.60	528	8.50
4	8	7.0	7.80	11.60	528	8.50
4	8	7.5	7.80	11.60	529	8.50
4	8	8.0	7.80	11.60	530	8.50
4	8	8.5	7.80	11.60	531	8.50
4	8	9.0	7.80	11.60	532	8.50
4	8	9.5	7.70	11.50	532	8.50
4	8	10.0	7.80	11.30	531	8.50
4	8	10.5	7.80	11.30	532	8.50
SITE 13						
4	13	1.0	7.95	12.10	516	8.60
4	13	1.5	8.00	12.05	518	8.60
4	13	2.0	8.00	12.00	520	8.60
4	13	2.5	7.95	12.00	520	8.60
4	13	3.0	7.95	12.00	521	8.60
4	13	3.5	7.95	11.95	522	8.60
4	13	4.0	7.90	12.00	523	8.60
4	13	4.5	7.90	11.95	523	8.60
4	13	5.0	7.90	11.95	523	8.60
4	13	5.5	7.90	11.95	525	8.60
4	13	6.0	7.90	11.95	525	8.60
4	13	6.5	7.85	11.90	525	8.60
SITE 16						
4	16	1.0	7.70	14.10	598	8.80
4	16	1.5	7.70	14.00	600	8.80
4	16	2.0	7.70	14.00	601	8.80
4	16	2.5	7.70	13.90	603	8.80
SITE 2						
5	2	1.0	14.19	10.11	547	8.45
5	2	1.5	14.18	9.92	547	8.47
5	2	2.0	14.17	9.89	548	8.48
5	2	2.5	14.19	9.88	547	8.47
5	2	3.0	14.19	9.84	549	8.47
5	2	3.5	14.19	9.84	550	8.46
SITE 4						
5	4	1.0	14.31	9.10	541	8.44
5	4	1.5	14.32	9.06	541	8.44
5	4	2.0	14.32	9.06	542	8.44
5	4	2.5	14.33	9.06	543	8.45
5	4	3.0	14.33	8.97	544	8.45
5	4	3.5	14.33	8.99	547	8.44
5	4	4.0	14.35	8.97	547	8.45
5	4	4.5	14.34	8.94	548	8.45
5	4	5.0	14.32	8.90	550	8.42
5	4	5.5	14.31	8.82	553	8.46
SITE 8						
5	8	1.0	14.10	10.83	537	8.43
5	8	1.5	14.10	9.28	537	8.43
5	8	2.0	14.09	9.24	537	8.42
5	8	2.5	14.11	9.24	537	8.43
5	8	3.0	14.09	9.21	539	8.42
5	8	3.5	14.10	9.21	539	8.43
5	8	4.0	14.10	9.16	540	8.42
5	8	4.5	14.14	9.13	544	8.41
5	8	5.0	14.13	9.08	546	8.42
5	8	5.5	14.12	9.12	545	8.42
5	8	6.0	14.12	9.19	546	8.42
5	8	6.5	14.12	9.16	547	8.42
5	8	7.0	14.12	9.16	548	8.41
5	8	7.5	14.13	9.15	547	8.42
5	8	8.0	14.13	9.12	548	8.43
5	8	8.5	14.13	9.16	548	8.42
5	8	9.0	14.14	9.12	549	8.43
5	8	9.5	14.14	9.08	551	8.42
5	8	10.0	14.15	9.08	550	8.41
5	8	10.5	14.10	9.07	551	8.46

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SITE 4

MONTH	SITE	DEPTH	TEMP	DO	COND	PH
7	4	0.5	26.30	12.10	478	8.10
7	4	1.0	26.40	11.60	478	8.15
7	4	1.5	26.20	10.20	484	8.11
7	4	2.0	26.10	9.60	485	8.05
7	4	2.5	26.10	9.40	487	8.03
7	4	3.0	26.00	9.10	488	8.02
7	4	3.5	26.00	8.90	489	8.00
7	4	4.0	26.00	8.80	489	7.99
7	4	4.5	26.00	8.70	492	7.99
7	4	5.0	26.00	8.50	492	7.97
7	4	5.5	25.80	4.30	499	7.88
7	4	6.0	24.50	0.80	505	7.34

SITE 8

MONTH	SITE	DEPTH	TEMP	DO	COND	PH
7	8	0.5	26.70	10.80	495	8.10
7	8	1.0	26.70	10.80	494	8.12
7	8	1.5	26.70	10.20	496	8.07
7	8	2.0	26.60	9.80	496	8.05
7	8	2.5	26.40	8.70	500	7.95
7	8	3.0	26.10	8.50	499	7.94
7	8	3.5	25.80	7.70	501	7.89
7	8	4.0	25.60	7.80	502	6.74
7	8	4.5	25.50	5.70	506	7.69
7	8	5.0	25.50	5.60	507	7.68
7	8	5.5	25.20	3.60	510	7.54
7	8	6.0	24.90	1.90	510	7.39
7	8	6.5	24.80	1.30	515	7.29
7	8	7.0	24.60	1.20	515	7.24
7	8	7.5	24.30	0.70	520	7.20
7	8	8.0	24.20	0.20	521	7.15
7	8	8.5	23.70	0.04	529	7.10
7	8	9.0	23.40	0.04	533	7.07
7	8	9.5	22.20	0.04	537	6.99
7	8	10.0	21.50	0.04	545	6.91

SITE 13

MONTH	SITE	DEPTH	TEMP	DO	COND	PH
7	13	0.5	27.00	11.70	490	8.08
7	13	1.0	26.50	12.10	489	8.13
7	13	1.5	26.30	11.70	490	8.10
7	13	2.0	26.20	10.70	490	8.06
7	13	2.5	26.10	9.90	494	8.01
7	13	3.0	25.70	7.40	497	7.85
7	13	3.5	25.40	6.30	502	7.77
7	13	4.0	25.20	5.40	502	7.65
7	13	4.5	25.00	4.80	504	7.54
7	13	5.0	24.90	4.50	505	7.49
7	13	5.5	24.90	4.20	506	7.46
7	13	6.0	24.80	2.70	509	7.41
7	13	6.5	24.40	0.80	517	7.29
7	13	7.0	24.20	0.20	521	7.19

SITE 16

MONTH	SITE	DEPTH	TEMP	DO	COND	PH
7	16	0.5	27.00	15.70	476	8.37
7	16	1.0	26.40	11.90	485	8.14
7	16	1.5	25.90	8.09	497	7.86
7	16	2.0	25.40	4.94	507	7.58
7	16	2.5	25.20	3.30	512	7.46

SITE 2

MONTH	SITE	DEPTH	TEMP	DO	COND	PH
8	2	0.5	33.80	6.25	468	8.29
8	2	1.0	33.80	6.09	468	8.29
8	2	1.5	33.70	6.07	469	8.30
8	2	2.0	33.60	6.00	469	8.31
8	2	2.5	29.60	4.19	477	8.07
8	2	3.0	29.10	3.10	477	7.97
8	2	3.5	28.50	1.45	481	7.74

SITE 4

MONTH	SITE	DEPTH	TEMP	DO	COND	PH
8	4	0.5	27.00	9.68	463	8.34
8	4	1.0	26.90	9.55	463	8.35
8	4	1.5	26.80	9.15	464	8.33
8	4	2.0	26.60	7.91	466	8.28
8	4	2.5	26.40	7.21	468	8.19
8	4	3.0	26.30	7.18	467	8.15
8	4	3.5	26.30	7.20	468	8.16
8	4	4.0	26.30	7.25	468	8.14
8	4	4.5	26.30	7.29	468	8.15
8	4	5.0	26.30	7.29	469	8.16
8	4	5.5	26.30	7.04	460	8.15
8	4	6.0	25.70	2.74	478	7.82

SITE 8

MONTH	SITE	DEPTH	TEMP	DO	COND	PH
8	8	0.5	26.40	6.83	469	8.01
8	8	1.0	26.40	6.65	470	8.01
8	8	1.5	26.30	6.46	472	7.96
8	8	2.0	26.30	6.31	472	7.98
8	8	2.5	26.10	6.19	475	7.88
8	8	3.0	25.70	4.75	477	7.65
8	8	3.5	25.40	4.00	477	7.62
8	8	4.0	25.40	3.40	477	7.56
8	8	4.5	25.40	2.89	479	7.54
8	8	5.0	25.50	2.26	481	7.47
8	8	5.5	25.50	2.18	483	7.44
8	8	6.0	25.50	2.05	483	7.41
8	8	6.5	25.50	2.01	485	7.40
8	8	7.0	25.40	1.67	485	7.37
8	8	7.5	25.30	0.26	490	7.34
8	8	8.0	25.10	0.06	492	7.28
8	8	8.5	25.10	0.04	495	7.25
8	8	9.0	25.10	0.04	496	7.23
8	8	9.5	25.00	0.04	498	7.22
8	8	10.0	24.80	0.04	501	7.22

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MONTH	SITE	DEPTH	TEMP	DO	COND	PH
SITE 4						
10	4	0.5	16.29	8.90	479	8.48
10	4	1.0	16.28	8.85	476	8.50
10	4	1.5	16.27	8.81	482	8.50
10	4	2.0	16.27	8.78	484	8.50
10	4	2.5	16.25	8.80	488	8.53
10	4	3.0	16.25	8.76	488	8.53
10	4	3.5	16.24	8.76	488	8.52
10	4	4.0	16.24	8.76	488	8.51
10	4	4.5	16.24	8.72	488	8.51
10	4	5.0	16.24	8.69	492	8.51
10	4	5.5	16.22	8.60	492	8.50
10	4	6.0	16.23	8.52	492	8.49
SITE 8						
10	8	0.5	16.62	9.23	485	8.50
10	8	1.0	16.62	9.10	485	8.51
10	8	1.5	16.61	9.04	485	8.52
10	8	2.0	16.58	9.05	484	8.50
10	8	2.5	16.57	8.86	486	8.50
10	8	3.0	16.56	8.83	486	8.51
10	8	3.5	16.56	8.80	488	8.51
10	8	4.0	16.54	8.83	488	8.51
10	8	4.5	16.56	8.80	490	8.51
10	8	5.0	16.54	8.77	489	8.50
10	8	5.5	16.55	8.73	492	8.49
10	8	6.0	16.51	8.68	492	8.48
10	8	6.5	16.52	8.71	494	8.47
10	8	7.0	16.52	8.74	495	8.48
10	8	7.5	16.53	8.67	497	8.48
10	8	8.0	16.51	8.61	498	8.47
10	8	8.5	16.50	8.62	499	8.48
10	8	9.0	16.50	8.58	501	8.48
10	8	9.5	16.49	8.55	502	8.47
10	8	10.0	16.49	8.52	507	8.48
SITE 13						
10	13	0.5	17.70	9.36	490	8.57
10	13	1.0	17.76	9.35	491	8.59
10	13	1.5	17.66	9.00	491	8.59
10	13	2.0	17.61	8.89	491	8.60
10	13	2.5	17.60	8.95	491	8.59
10	13	3.0	17.54	8.78	491	8.57
10	13	3.5	17.55	8.73	493	8.56
10	13	4.0	17.51	8.73	494	8.56
10	13	4.5	17.50	8.78	494	8.54
10	13	5.0	17.48	8.78	494	8.55
10	13	5.5	17.47	8.82	494	8.56
10	13	6.0	17.44	8.83	495	8.55
10	13	6.5	17.44	8.81	497	8.54
10	13	7.0	17.36	8.74	498	8.54

MONTH	SITE	DEPTH	TEMP	DO	COND	PH
SITE 16						
10	16	0.5	18.97	10.74	480	8.64
10	16	1.0	18.13	10.90	483	8.70
10	16	1.5	17.28	10.82	484	8.81
10	16	2.0	16.84	9.70	486	8.85
10	16	2.5	16.77	9.70	487	8.86
10	16	3.0	16.59	9.00	489	8.85
SITE 2						
11	2	0.5	20.71	8.47	504	8.24
11	2	1.0	20.26	8.06	504	8.31
11	2	1.5	19.62	8.46	504	8.29

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SITE 2						
4	2	0.5	13.88	11.75	559	8.82
4	2	1.0	13.83	11.38	558	8.79
4	2	1.5	13.82	11.29	560	8.77
4	2	2.0	13.82	11.32	560	8.79
4	2	2.5	13.80	11.25	565	8.77
4	2	3.0	13.71	11.22	570	8.75
4	2	3.5	13.44	11.09	570	8.75
4	2	4.0	13.44	10.80	573	8.70
SITE 4						
4	4	0.5	14.56	16.29	514	8.85
4	4	1.0	14.49	16.22	514	8.85
4	4	1.5	14.44	16.11	514	8.87
4	4	2.0	14.43	16.11	515	8.88
4	4	2.5	14.41	16.00	515	8.88
4	4	3.0	14.39	15.98	517	8.89
4	4	3.5	14.38	15.94	517	8.89
4	4	4.0	14.35	15.96	518	8.89
4	4	4.5	14.34	14.71	529	8.90
4	4	5.0	14.10	14.23	538	8.88
4	4	5.5	13.80	11.78	597	8.68
4	4	6.0	13.20	10.26	594	8.52
SITE 8						
4	8	0.5	13.40	14.49	543	8.98
4	8	1.0	13.34	14.19	543	8.97
4	8	1.5	13.33	14.00	544	8.96
4	8	2.0	13.31	13.91	543	8.94
4	8	2.5	13.28	13.77	546	8.94
4	8	3.0	13.25	12.97	546	8.92
4	8	4.0	12.82	12.89	547	8.86
4	8	4.5	11.85	13.00	546	8.85
4	8	5.0	11.36	12.46	547	8.82
4	8	5.5	11.17	12.34	549	8.79
4	8	6.0	10.60	11.61	553	8.72
4	8	6.5	10.30	11.15	556	8.71
4	8	7.0	10.02	11.07	555	8.66
4	8	7.5	9.97	11.05	558	8.65
4	8	8.0	9.94	11.01	558	8.63
4	8	8.5	9.48	10.74	560	8.60
4	8	9.0	9.51	10.11	561	8.54
4	8	9.5	9.46	9.93	563	8.52
4	8	10.0	9.41	9.86	563	8.49
SITE 13						
4	13	0.5	14.43	14.23	550	9.01
4	13	1.0	14.37	14.06	550	8.96
4	13	1.5	14.28	13.78	550	8.93
4	13	2.0	14.23	13.88	550	8.91
4	13	2.5	14.20	13.68	552	8.91
4	13	3.0	14.15	13.63	552	8.90
4	13	3.5	13.85	13.87	557	8.88
4	13	4.0	13.72	12.58	558	8.85
4	13	4.5	13.71	12.28	561	8.83
4	13	5.0	12.75	11.30	563	8.75
4	13	5.5	12.74	11.06	570	8.73
4	13	6.0	12.44	11.01	570	8.72
4	13	6.5	11.79	10.26	576	8.65
4	13	7.0	11.50	9.76	577	8.56
SITE 16						
4	16	0.5	15.00	12.60	661	8.57
4	16	1.0	14.98	12.39	667	8.51
4	16	1.5	15.00	12.27	662	8.49
4	16	2.0	14.60	11.80	671	8.46
4	16	2.5	14.21	11.33	677	8.42
4	16	3.0	13.50	9.18	702	8.33
SITE 2						
5	2	0.5	26.04	8.98	570	8.22
5	2	1.0	26.20	8.94	571	8.30
5	2	1.5	26.13	8.80	571	8.29
5	2	2.0	25.97	8.68	572	8.29
5	2	2.5	24.57	7.76	582	8.23
5	2	3.0	22.04	8.07	598	8.19
5	2	3.5	21.20	7.25	617	8.15
SITE 4						
5	4	0.5	18.08	9.79	544	8.15
5	4	1.0	17.99	9.52	545	8.15
5	4	1.5	17.95	9.40	545	8.15
5	4	2.0	17.94	9.37	546	8.14
5	4	2.5	17.92	9.35	547	8.15
5	4	3.0	17.84	9.06	558	8.10
5	4	3.5	17.84	9.16	559	8.09
5	4	4.0	17.81	9.13	560	8.08
5	4	4.5	17.81	9.15	565	8.01
5	4	5.0	17.78	9.15	566	8.07
5	4	5.5	17.76	9.26	571	8.06
5	4	6.0	17.68	8.96	581	8.01
5	4	6.5	17.25	7.09	628	7.82
SITE 8						
5	8	0.5	19.35	9.15	559	8.11
5	8	1.0	19.33	9.06	560	8.13
5	8	1.5	19.30	9.04	559	8.14
5	8	2.0	19.27	9.02	559	8.15
5	8	2.5	19.24	9.08	559	8.16
5	8	3.0	19.20	9.13	559	8.17
5	8	3.5	19.18	9.17	559	8.17
5	8	4.0	19.14	9.22	559	8.19
5	8	4.5	19.12	9.20	559	8.18
5	8	5.0	19.11	9.17	559	8.17

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5	8	5.5	19.11	9.12	562	8.17
5	8	6.0	19.10	9.11	562	8.16
5	8	6.5	19.10	9.08	563	8.16
5	8	7.0	19.08	9.03	562	8.15
5	8	7.5	19.06	8.82	564	8.13
5	8	8.0	18.82	8.31	565	8.12
5	8	8.5	18.02	7.00	566	8.06
5	8	9.0	17.95	6.96	565	8.02
5	8	9.5	17.81	6.70	566	8.00
5	8	10.0	17.24	5.43	564	7.94
5	8	10.5	17.05	4.41	567	7.85
5	8	11.0	17.05	4.18	568	7.81
SITE 13						
5	13	0.5	20.72	8.64	567	8.07
5	13	1.0	20.66	8.60	566	8.09
5	13	1.5	20.62	8.46	566	8.10
5	13	2.0	20.25	8.10	566	8.11
5	13	2.5	19.35	8.08	563	8.11
5	13	3.0	19.21	7.89	562	8.11
5	13	3.5	19.16	7.79	563	8.09
5	13	4.0	18.67	7.55	562	8.08
5	13	4.5	18.50	7.35	561	8.06
5	13	5.0	18.35	7.30	562	8.05
5	13	5.5	18.13	7.06	562	8.04
5	13	6.0	17.88	6.90	562	8.03
5	13	6.5	17.67	5.98	562	8.00
5	13	7.0	17.36	4.83	565	7.92
SITE 16						
5	16	0.5	19.06	9.57	705	8.07
5	16	1.0	19.05	9.54	705	8.08
5	16	1.5	18.95	9.49	706	8.08
5	16	2.0	18.92	9.44	705	8.07
5	16	2.5	18.85	9.36	706	8.06
5	16	3.0	18.69	9.15	709	8.05
SITE 2						
6	2	0.0	25.75	9.30	534	8.26
6	2	0.5	32.27	7.55	540	8.24
6	2	1.0	32.19	7.41	541	8.26
6	2	1.5	23.06	7.03	542	8.24
6	2	2.0	31.36	6.86	540	8.24
6	2	2.5	30.19	6.57	544	8.18
6	2	3.0	27.02	5.67	539	7.97
6	2	3.5	23.49	4.00	545	7.76
6	2	4.0	22.96	4.14	545	7.40
SITE 4						
6	4	0.5	25.92	14.15	510	8.06
6	4	1.0	25.80	14.06	510	8.09
6	4	1.5	25.72	13.33	515	8.06
6	4	2.0	25.61	12.09	516	8.02
6	4	2.5	24.94	10.32	533	8.01
6	4	3.0	24.58	9.54	537	8.01
6	4	3.5	24.52	9.20	538	8.02
6	4	4.0	24.31	8.80	539	8.01
6	4	4.5	24.22	8.43	540	7.99
6	4	5.0	23.97	8.04	541	7.96
6	4	5.5	23.84	8.35	551	7.92
6	4	6.0	22.29	5.91	561	7.72
6	4	6.5	21.06	5.18	638	7.54
SITE 8						
6	8	0.5	26.08	12.42	531	8.30
6	8	1.0	25.58	11.99	530	8.23
6	8	1.5	25.43	11.87	527	8.20
6	8	2.0	25.09	8.83	539	8.15
6	8	2.5	24.83	7.80	549	8.11
6	8	3.0	24.64	7.45	549	8.06
6	8	3.5	24.56	7.01	551	8.03
6	8	4.0	24.36	6.77	551	7.98
6	8	4.5	24.14	6.57	553	7.98
6	8	5.0	23.74	6.02	552	7.92
6	8	5.5	23.49	5.79	556	7.89
6	8	6.0	23.45	5.78	554	7.89
6	8	6.5	23.28	5.87	555	7.88
6	8	7.0	23.05	5.08	557	7.83
6	8	7.5	22.93	4.31	558	7.76
6	8	8.0	22.92	4.05	559	7.71
6	8	8.5	22.77	3.32	561	7.66
6	8	9.0	22.52	2.26	561	7.57
6	8	9.5	22.33	1.43	565	7.50
6	8	10.0	22.04	0.66	568	7.48
SITE 13						
6	13	0.5	28.35	10.54	539	8.40
6	13	1.0	27.95	10.39	538	8.41
6	13	1.5	27.83	9.05	540	8.31
6	13	2.0	27.16	7.41	541	8.20
6	13	2.5	26.36	6.60	549	8.07
6	13	3.0	25.83	6.40	551	8.04
6	13	3.5	25.03	5.23	558	7.90
6	13	4.0	24.60	5.02	558	7.87
6	13	4.5	24.07	4.12	562	7.79
6	13	5.0	23.86	4.04	562	7.73
6	13	5.5	23.44	4.75	563	7.78
6	13	6.0	23.26	4.81	561	7.81
6	13	6.5	23.18	3.07	566	7.69
6	13	7.0	23.09	2.65	566	7.63
SITE 16						
6	16	0.5	27.80	9.16	530	8.31
6	16	1.0	25.70	8.15	530	8.16

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6	16	1.5	24.47	7.40	535	8.02
6	16	2.0	24.17	7.23	551	7.88
6	16	2.5	23.32	6.80	596	7.77
6	16	3.0	22.00	5.08	634	7.54
SITE 2						
7	2	0.5	26.02	10.42	541	8.46
7	2	1.0	25.88	10.08	543	8.32
7	2	1.5	25.54	9.06	554	8.22
7	2	2.0	25.30	7.40	553	8.08
7	2	2.5	25.19	7.74	546	8.04
7	2	3.0	25.17	7.46	544	8.04
SITE 4						
7	4	0.5	25.66	9.87	506	8.21
7	4	1.0	25.69	9.89	508	8.22
7	4	1.5	25.66	9.92	507	8.21
7	4	2.0	25.63	10.20	506	8.22
7	4	2.5	25.62	10.43	504	8.23
7	4	3.0	25.28	8.82	518	8.13
7	4	3.5	25.02	7.27	522	8.02
7	4	4.0	24.85	6.77	524	7.94
7	4	4.5	24.76	6.33	519	7.91
7	4	5.0	24.66	5.80	523	7.83
7	4	5.5	24.33	5.45	535	7.79
7	4	6.0	23.26	4.36	533	7.42
SITE 8						
7	8	0.5	25.34	9.35	502	8.15
7	8	1.0	25.28	9.30	503	8.15
7	8	1.5	25.23	9.37	505	8.16
7	8	2.0	25.17	9.39	506	8.19
7	8	2.5	25.13	9.18	508	8.19
7	8	3.0	25.06	9.22	508	8.19
7	8	3.5	25.03	9.18	508	8.19
7	8	4.0	24.99	9.12	510	8.18
7	8	4.5	24.91	6.92	517	7.98
7	8	5.0	24.88	6.82	518	7.95
7	8	5.5	24.86	6.55	519	7.92
7	8	6.0	24.81	5.97	521	7.87
7	8	6.5	24.79	5.85	524	7.85
7	8	7.0	24.66	3.92	525	7.65
7	8	7.5	24.39	3.40	531	7.60
7	8	8.0	24.37	3.26	532	7.56
7	8	8.5	24.23	2.53	534	7.53
7	8	9.0	24.12	0.42	539	7.47
7	8	9.5	23.89	0.42	543	7.43
7	8	10.0	23.74	0.26	548	7.41
SITE 13						
7	13	0.5	26.17	11.82	518	8.21
7	13	1.0	26.12	11.75	518	8.28
7	13	1.5	25.98	11.43	517	8.26
7	13	2.0	25.86	11.41	516	8.27
7	13	2.5	25.80	11.23	516	8.26
7	13	3.0	25.70	10.90	515	8.25
7	13	3.5	25.32	7.80	531	8.14
7	13	4.0	25.07	6.77	540	7.98
7	13	4.5	25.03	6.79	539	7.95
7	13	5.0	24.98	6.62	540	7.92
7	13	5.5	24.95	5.95	544	7.86
7	13	6.0	24.85	5.70	542	7.84
7	13	6.5	24.73	4.71	542	7.73
7	13	7.0	24.53	2.32	547	7.40
SITE 16						
7	16	0.5	25.09	11.66	536	8.33
7	16	1.0	24.94	10.20	563	8.26
7	16	1.5	24.62	8.89	563	8.05
7	16	2.0	24.16	6.71	545	7.93
7	16	2.5	23.06	4.72	487	7.55
7	16	3.0	22.30	3.18	472	7.40
7	16	3.5	22.22	2.42	467	7.31
SITE 2						
8	2	0.5	34.97	6.47	453	8.18
8	2	1.0	34.97	6.37	453	8.20
8	2	1.5	34.92	6.25	452	8.22
8	2	2.0	34.85	6.17	453	8.21
8	2	2.5	34.39	6.07	453	8.20
8	2	3.0	33.06	6.34	459	7.96
8	2	3.5	29.72	3.25	463	7.73
SITE 4						
8	4	0.5	28.03	11.30	444	8.41
8	4	1.0	28.09	11.22	445	8.45
8	4	1.5	28.08	11.14	444	8.45
8	4	2.0	28.08	11.14	444	8.46
8	4	2.5	28.08	11.03	443	8.45
8	4	3.0	28.05	10.94	445	8.45
8	4	3.5	28.03	10.72	445	8.44
8	4	4.0	28.03	10.56	445	8.43
8	4	4.5	28.03	10.36	445	8.42
8	4	5.0	27.51	8.34	453	8.23
8	4	5.5	27.23	6.06	464	8.05
8	4	6.0	26.21	1.05	484	7.48
SITE 8						
8	8	0.5	27.50	10.72	451	8.41
8	8	1.0	27.46	10.39	451	8.42
8	8	1.5	27.41	9.82	454	8.40
8	8	2.0	27.40	9.86	455	8.38
8	8	2.5	27.30	7.93	462	8.28
8	8	3.0	27.12	7.88	462	8.26

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MONTH	SITE	DEPTH	TEMP	DO	COND	PH
8	8	3.5	26.79	5.95	467	8.05
8	8	4.0	26.65	4.79	468	7.93
8	8	4.5	26.53	4.15	471	7.83
8	8	5.0	26.35	2.56	473	7.67
8	8	5.5	26.08	0.37	477	7.47
8	8	6.0	25.83	0.34	480	7.38
8	8	6.5	25.63	0.34	483	7.36
8	8	7.0	25.47	0.33	484	7.35
8	8	7.5	25.31	0.33	490	7.34
8	8	8.0	24.97	0.32	497	7.33
8	8	8.5	24.64	0.33	504	7.32
8	8	9.0	24.55	0.33	508	7.31
8	8	9.5	24.37	0.33	513	7.30
8	8	10.0	24.38	0.33	513	7.29
SITE 13						
8	13	0.5	29.50	11.34	445	8.45
8	13	1.0	29.50	11.10	444	8.45
8	13	1.5	29.43	10.89	445	8.47
8	13	2.0	29.27	10.13	446	8.43
8	13	2.5	28.75	9.47	453	8.39
8	13	3.0	28.44	9.52	453	8.40
8	13	3.5	28.52	9.28	454	8.40
8	13	4.0	28.53	9.30	455	8.40
8	13	4.5	28.18	6.14	466	8.07
8	13	5.0	27.90	4.33	473	7.80
8	13	5.5	26.90	0.70	479	7.50
8	13	6.0	26.63	0.31	483	7.41
8	13	6.5	25.80	0.32	492	7.37
SITE 16						
8	16	0.5	30.18	9.08	442	8.30
8	16	1.0	29.54	8.77	443	8.17
8	16	1.5	28.25	6.14	455	7.88
8	16	2.0	27.94	5.19	459	7.66
8	16	2.5	27.38	3.24	470	7.45
8	16	3.0	27.31	2.66	470	7.38
SITE 2						
9	2	0.5	28.15	7.44	467	8.41
9	2	1.0	28.22	7.23	470	8.33
9	2	1.5	28.25	7.26	470	8.27
9	2	2.0	28.22	7.21	470	8.25
9	2	2.5	28.06	5.75	470	8.22
9	2	3.0	24.16	4.52	475	8.24
9	2	3.5	23.93	3.88	471	8.10
SITE 4						
9	4	0.5	22.40	7.10	468	7.98
9	4	1.0	22.39	6.94	468	8.00
9	4	1.5	22.39	6.82	468	8.01
9	4	2.0	22.42	6.79	468	7.99
9	4	2.5	22.44	6.75	468	8.00
9	4	3.0	22.44	6.71	468	8.00
9	4	3.5	22.41	6.72	468	7.99
9	4	4.0	22.36	6.81	468	7.99
9	4	4.5	22.33	6.82	468	8.00
9	4	5.0	22.29	6.87	469	8.00
9	4	5.5	22.35	6.90	468	8.01
9	4	6.0	22.15	6.79	468	8.00
SITE 8						
9	8	0.5	22.76	7.42	471	8.05
9	8	1.0	22.76	7.36	470	8.05
9	8	1.5	22.77	7.24	470	8.08
9	8	2.0	22.77	7.19	470	8.10
9	8	2.5	22.76	7.13	470	8.10
9	8	3.0	22.75	7.09	470	8.10
9	8	3.5	22.75	7.09	470	8.10
9	8	4.0	22.76	7.05	470	8.09
9	8	4.5	22.76	7.05	470	8.08
9	8	5.0	22.76	7.05	470	8.08
9	8	5.5	22.76	7.01	470	8.07
9	8	6.0	22.77	7.03	470	8.07
9	8	6.5	22.76	7.03	470	8.07
9	8	7.0	22.76	7.02	471	8.07
9	8	7.5	22.77	7.03	471	8.07
9	8	8.0	22.77	6.99	471	8.07
9	8	8.5	22.76	6.99	471	8.08
9	8	9.0	22.77	6.97	474	8.08
9	8	9.5	22.78	6.95	475	8.08
SITE 13						
9	13	0.5	23.38	7.67	467	8.26
9	13	1.0	23.40	7.46	468	8.26
9	13	1.5	23.40	7.42	469	8.28
9	13	2.0	23.41	7.35	468	8.30
9	13	2.5	23.42	7.26	469	8.30
9	13	3.0	23.42	7.28	468	8.30
9	13	3.5	23.40	7.19	468	8.28
9	13	4.0	23.36	7.02	468	8.27
9	13	4.5	23.30	6.94	469	8.27
9	13	5.0	23.14	6.48	468	8.26
9	13	5.5	23.09	6.46	469	8.25
SITE 16						
9	16	0.5	24.38	7.62	464	9.04
9	16	1.0	20.77	7.30	461	8.82
9	16	1.5	20.46	7.27	461	8.59
9	16	2.0	20.28	7.47	460	8.57
9	16	2.5	20.11	7.14	460	8.54
SITE 2						
10	2	0.5	21.10	7.76	479	7.39

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MONTH	SITE	DEPTH	TEMP	DO	COND	PH
10	2	1.0	20.00	7.89	475	7.72
10	2	1.5	19.40	7.99	471	7.82
10	2	2.0	18.30	7.63	477	7.82
10	2	2.5	16.10	7.57	473	7.75
10	2	3.0	13.80	7.86	508	7.80
10	2	3.5	13.50	7.77	509	7.56
SITE 4						
10	4	0.5	15.50	7.76	456	7.72
10	4	1.0	15.50	7.70	457	7.76
10	4	1.5	15.50	7.68	457	7.76
10	4	2.0	15.50	7.58	458	7.77
10	4	2.5	15.50	7.55	458	7.78
10	4	3.0	15.50	7.54	458	7.78
10	4	3.5	15.50	7.51	460	7.78
10	4	4.0	15.50	7.46	460	7.78
10	4	4.5	15.45	7.42	461	7.78
10	4	5.0	15.05	7.38	472	7.79
10	4	5.5	14.95	7.38	477	7.79
10	4	6.0	14.90	7.38	479	7.77
10	4	6.5	14.10	7.34	484	7.79
SITE 8						
10	8	0.5	16.80	7.73	457	7.78
10	8	1.0	16.80	7.48	456	7.75
10	8	1.5	16.70	7.36	457	7.76
10	8	2.0	16.70	7.27	457	7.76
10	8	2.5	16.70	7.21	457	7.75
10	8	3.0	16.70	7.19	457	7.75
10	8	3.5	16.70	7.17	457	7.76
10	8	4.0	16.70	7.17	458	7.76
10	8	4.5	16.70	7.18	458	7.71
10	8	5.0	16.70	7.20	458	7.77
10	8	5.5	16.70	7.18	459	7.77
10	8	6.0	16.60	7.22	460	7.79
10	8	6.5	16.60	7.25	460	7.79
10	8	7.0	16.60	7.20	461	7.79
10	8	7.5	16.60	7.20	461	7.79
10	8	8.0	16.60	7.25	462	7.78
10	8	8.5	16.60	7.20	463	7.70
10	8	9.0	16.60	7.18	464	7.78
10	8	9.5	16.60	7.18	464	7.79
10	8	10.0	16.40	4.98	465	7.80
SITE 13						
10	13	0.5	18.00	7.76	460	7.61
10	13	1.0	17.80	7.55	461	7.65
10	13	1.5	17.70	7.43	460	7.68
10	13	2.0	17.70	7.37	460	7.70
10	13	2.5	17.60	7.40	461	7.73
10	13	3.0	17.50	7.45	461	7.75
10	13	3.5	17.30	7.39	460	7.75
10	13	4.0	17.20	7.35	460	7.76
10	13	4.5	16.90	7.31	461	7.78
10	13	5.0	16.80	7.24	460	7.76
10	13	5.5	16.80	7.23	459	7.75
SITE 16						
10	16	0.5	12.40	8.08	506	7.51
10	16	1.0	12.20	7.95	504	7.43
10	16	1.5	11.60	7.67	501	7.43
10	16	2.0	11.22	7.85	490	7.38
10	16	2.5	10.80	7.70	426	7.28
SITE 2						
11	2	0.5	12.88	10.31	509	7.98
11	2	0.5	8.62	12.70	584	8.12
11	2	1.0	12.88	10.28	508	7.96
11	2	1.0	8.52	12.62	583	8.11
11	2	1.5	12.86	10.19	514	7.96
11	2	1.5	8.46	12.54	586	8.10
11	2	2.0	12.86	10.16	514	7.95
11	2	2.0	8.36	12.47	586	8.10
11	2	2.5	12.85	10.19	513	7.94
11	2	2.5	8.08	12.26	595	8.12
11	2	3.0	12.85	10.16	514	7.95
11	2	3.0	8.08	12.26	596	8.09
11	2	3.5	12.84	10.14	519	7.94
11	2	3.5	8.08	12.00	607	8.05
11	2	4.0	8.10	12.00	610	8.04
SITE 4						
11	4	0.5	9.25	12.08	531	7.80
11	4	1.0	9.18	11.96	534	7.81
11	4	1.5	9.22	11.62	534	7.81
11	4	2.0	9.19	11.59	534	7.82
11	4	2.5	9.15	11.38	536	7.83
11	4	3.0	9.14	11.38	536	7.84
11	4	3.5	9.14	11.30	537	7.84
11	4	4.0	9.11	11.04	539	7.83
11	4	4.5	9.13	9.87	572	7.77
11	4	5.0	9.14	9.71	581	7.71
11	4	5.5	9.05	9.70	607	7.70
11	4	6.0	8.80	10.44	645	7.72
SITE 8						
11	8	0.5	9.73	11.17	477	7.76
11	8	1.0	9.72	10.95	477	7.77
11	8	1.5	9.71	10.72	477	7.76
11	8	2.0	9.69	10.57	478	7.77
11	8	2.5	9.69	10.54	478	7.77
11	8	3.0	9.69	10.54	478	7.77
11	8	3.5	9.69	10.53	478	7.78
11	8	4.0	9.69	10.54	479	7.78

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MONTH	SITE	DEPTH	TEMP	DO	COND	PH
11	8	4.5	9.68	10.50	482	7.79
11	8	5.0	9.68	10.50	482	7.79
11	8	5.5	9.68	10.47	484	7.80
11	8	6.0	9.66	10.47	486	7.81
11	8	6.5	9.66	10.44	487	7.81
11	8	7.0	9.66	10.40	487	7.80
11	8	7.5	9.67	10.40	490	7.81
11	8	8.0	9.66	10.40	490	7.81
11	8	8.5	9.66	10.41	492	7.80
11	8	9.0	9.66	10.40	493	7.81
11	8	9.5	9.66	10.40	493	7.82
11	8	10.0	9.65	10.41	494	7.82
11	8	10.5	9.64	10.42	502	7.83
11	8	11.0	9.64	10.37	503	7.84
SITE 13						
11	13	0.5	9.09	11.86	499	7.99
11	13	1.0	9.10	11.65	499	7.98
11	13	1.5	9.10	11.58	499	7.97
11	13	2.0	9.09	11.51	499	7.97
11	13	2.5	9.04	11.46	501	7.98
11	13	3.0	9.04	11.44	501	7.98
11	13	3.5	9.03	11.44	502	7.98
11	13	4.0	9.01	11.40	503	7.99
11	13	4.5	9.03	11.36	504	7.98
11	13	5.0	8.99	11.34	504	7.99
11	13	5.5	.8.96	11.30	507	8.00
11	13	6.0	8.94	11.27	509	7.98
11	13	6.5	8.93	11.20	510	7.98
11	13	7.0	8.93	11.16	511	7.98
SITE 14						
11	14	0.5	12.38	10.96	697	7.99
11	14	0.5	7.35	12.90	722	7.98
11	14	1.0	12.29	10.90	697	8.04
11	14	1.0	7.32	12.88	719	7.97
11	14	1.5	12.28	10.92	698	8.04
11	14	1.5	7.31	12.86	722	7.98
11	14	2.0	12.19	10.90	700	8.05
11	14	2.0	7.29	12.86	722	7.98
11	14	2.5	12.15	10.82	706	8.04
11	14	2.5	7.28	12.82	724	7.98
11	14	3.0	12.14	10.79	706	8.03
11	14	3.0	7.27	12.83	726	7.99
11	14	3.5	7.23	12.77	726	7.99

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MONTH	SITE	DEPTH	TEMP	DO	COND	PH
SITE 2						
4	2	0.5	22.65	8.77	528	7.87
4	2	1.0	22.74	8.68	529	7.88
4	2	1.5	22.71	8.69	529	7.89
4	2	2.0	22.70	8.63	529	7.90
4	2	2.5	22.65	8.59	529	7.92
4	2	3.0	22.48	8.51	529	7.93
4	2	3.5	19.07	8.73	563	8.01
4	2	4.0	18.26	9.13	568	7.96
SITE 4						
4	4	0.5	14.26	11.39	511	7.93
4	4	1.0	14.24	11.20	512	7.89
4	4	1.5	14.23	11.18	512	7.90
4	4	2.0	14.21	11.14	512	7.91
4	4	2.5	14.22	11.08	513	7.91
4	4	3.0	14.18	11.04	514	7.91
4	4	3.5	14.18	11.05	514	7.92
4	4	4.0	14.17	11.00	514	7.92
4	4	4.5	14.16	10.99	516	7.93
4	4	5.0	14.14	10.97	517	7.94
4	4	5.5	14.12	10.98	517	7.92
4	4	6.0	14.09	10.99	519	7.91
4	4	6.5	14.04	10.97	522	7.93
4	4	7.0	13.28	9.43	582	7.76
SITE 8						
4	8	0.5	14.89	10.76	515	7.87
4	8	1.0	14.88	10.61	514	7.89
4	8	1.5	14.88	10.61	514	7.91
4	8	2.0	14.89	10.56	514	7.91
4	8	2.5	14.87	10.40	515	7.92
4	8	3.0	14.88	10.52	515	7.93
4	8	3.5	14.87	10.37	515	7.92
4	8	4.0	14.86	10.34	514	7.92
4	8	4.5	14.86	10.34	516	7.92
4	8	5.0	14.86	10.34	516	7.92
4	8	5.5	14.85	10.25	517	7.92
4	8	6.0	14.85	10.22	516	7.92
4	8	6.5	14.84	10.17	517	7.90
4	8	7.0	14.78	9.99	518	7.89
4	8	7.5	14.74	9.81	518	7.88
4	8	8.0	14.73	9.67	518	7.87
4	8	8.5	14.70	9.56	520	7.86
4	8	9.0	14.61	9.29	522	7.84
4	8	9.5	14.53	8.93	522	7.81
4	8	10.0	14.45	8.30	525	7.74
4	8	10.5	14.44	8.17	528	7.73
4	8	11.0	14.44	8.10	530	7.73
SITE 13						
4	13	0.5	17.03	9.91	529	7.86
4	13	1.0	17.03	9.80	530	7.88
4	13	1.5	17.00	9.77	530	7.89
4	13	2.0	17.04	9.77	529	7.91
4	13	2.5	17.01	9.68	530	7.92
4	13	3.0	17.00	9.63	529	7.92
4	13	3.5	16.93	9.52	530	7.93
4	13	4.0	16.63	9.47	528	8.02
4	13	4.5	16.33	9.51	529	8.02
4	13	5.0	16.18	9.53	529	7.99
4	13	5.5	16.00	9.65	529	7.99
4	13	6.0	15.93	9.82	527	8.00
4	13	6.5	15.71	9.93	527	7.99
4	13	7.0	15.69	9.84	528	7.94
SITE 16						
4	16	0.5	15.94	11.44	587	8.13
4	16	1.0	15.51	11.10	610	7.94
4	16	1.5	14.31	11.36	638	8.05
4	16	2.0	13.21	11.23	640	8.00
4	16	2.5	13.15	11.18	640	8.00
4	16	3.0	13.12	11.00	642	7.92
SITE 2						
5	2	0.5	30.11	6.79	463	7.58
5	2	1.0	29.95	6.75	459	7.60
5	2	1.5	29.89	6.73	459	7.61
5	2	2.0	29.87	6.73	459	7.60
5	2	2.5	28.17	6.24	458	7.60
5	2	3.0	25.63	5.17	434	7.45
5	2	3.5	20.93	5.45	421	7.25
5	2	4.0	19.85	5.57	414	7.14
SITE 4						
5	4	0.5	23.65	11.86	480	8.10
5	4	1.0	23.63	11.73	480	8.10
5	4	1.5	23.52	11.44	481	8.10
5	4	2.0	23.43	11.14	481	8.08
5	4	2.5	23.36	10.70	482	8.06
5	4	3.0	23.27	10.15	483	8.03
5	4	3.5	23.01	8.93	487	7.94
5	4	4.0	22.14	8.06	480	7.76
5	4	4.5	21.89	7.81	472	7.72
5	4	5.0	21.44	7.66	473	7.67
5	4	5.5	20.91	7.22	468	7.55
5	4	6.0	19.87	7.21	487	7.43
5	4	6.5	18.64	6.70	504	7.26
5	4	7.0	18.42	6.41	507	7.14
SITE 8						
5	8	0.5	23.46	7.40	495	7.58
5	8	1.0	23.45	7.33	496	7.58
5	8	1.5	23.40	7.28	495	7.58

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MONTH	SITE	DEPTH	TEMP	DO	COND	PH
5	8	2.0	23.37	7.20	494	7.58
5	8	2.5	23.29	7.06	493	7.56
5	8	3.0	23.14	6.86	491	7.56
5	8	3.5	22.98	6.67	494	7.53
5	8	4.0	22.25	6.40	505	7.57
5	8	4.5	21.87	6.15	508	7.58
5	8	5.0	21.66	5.96	509	7.56
5	8	5.5	21.48	5.81	509	7.52
5	8	6.0	21.20	5.44	511	7.50
5	8	6.5	20.97	5.05	510	7.46
5	8	7.0	20.58	4.30	509	7.41
5	8	7.5	20.15	4.01	508	7.36
5	8	8.0	19.78	3.45	507	7.33
5	8	8.5	19.03	2.45	508	7.27
5	8	9.0	18.39	1.86	510	7.14
5	8	9.5	17.50	1.16	511	7.16
5	8	10.0	16.49	0.40	510	7.18
5	8	10.5	16.50	0.20	515	7.12
SITE 13						
5	13	0.5	25.05	6.88	465	7.50
5	13	1.0	24.89	6.74	464	7.45
5	13	1.5	24.83	6.70	462	7.44
5	13	2.0	24.76	6.67	461	7.43
5	13	2.5	24.75	6.65	459	7.43
5	13	3.0	24.17	6.40	459	7.42
5	13	3.5	22.44	6.01	495	7.47
5	13	4.0	22.05	6.05	505	7.49
5	13	4.5	21.52	5.56	503	7.48
5	13	5.0	21.10	4.94	487	7.57
5	13	5.5	20.99	4.86	488	7.33
5	13	6.0	20.77	4.32	496	7.23
5	13	6.5	20.22	3.48	493	7.18
5	13	7.0	19.48	2.34	496	7.12
5	13	7.5	19.06	0.74	515	7.09
SITE 14						
5	14	0.5	20.90	6.81	431	7.25
5	14	1.0	19.83	6.85	443	7.17
5	14	1.5	19.42	6.84	436	7.14
5	14	2.0	19.28	6.83	434	7.12
5	14	2.5	18.71	6.09	422	7.12
5	14	3.0	18.28	5.46	434	7.05
5	14	3.5	18.14	4.05	430	6.96
SITE 2						
6	2	0.5	31.48	6.39	501	7.79
6	2	1.0	31.43	6.32	501	7.80
6	2	1.5	31.32	6.30	502	7.82
6	2	2.0	30.83	6.42	508	7.85
6	2	2.5	29.73	4.76	518	7.86
6	2	3.0	29.19	6.53	519	6.53
6	2	3.5	30.01	[illegible]	[illegible]	[illegible]
6	2	4.0	25.64	[illegible]	[illegible]	[illegible]
SITE 4						
6	4	0.5	25.84	7.21	[illegible]	[illegible]
6	4	1.0	25.86	7.07	[illegible]	[illegible]
6	4	1.5	25.87	7.00	[illegible]	[illegible]
6	4	2.0	25.86	7.09	483	[illegible]
6	4	2.5	25.79	6.84	483	[illegible]
6	4	3.0	25.33	6.56	487	[illegible]
6	4	3.5	25.21	4.00	487	7.41
6	4	4.0	25.20	3.71	493	7.36
6	4	4.5	24.97	3.13	502	7.28
6	4	5.0	24.70	2.44	509	7.26
6	4	5.5	24.54	2.40	500	7.23
6	4	6.0	24.02	2.11	489	7.21
6	4	6.5	23.99	1.82	494	7.17
SITE 8						
6	8	0.5	28.49	9.98	480	8.02
6	8	1.0	28.47	9.96	478	7.99
6	8	1.5	28.49	9.79	479	8.00
6	8	2.0	28.49	9.77	478	8.01
6	8	2.5	28.50	9.75	478	8.02
6	8	3.0	28.50	9.78	479	8.02
6	8	3.5	28.50	9.65	479	8.02
6	8	4.0	28.50	9.66	479	8.01
6	8	4.5	28.49	9.62	478	8.00
6	8	5.0	28.49	9.66	479	8.01
6	8	5.5	28.49	9.66	476	8.01
6	8	6.0	28.39	9.40	474	7.98
6	8	6.5	28.15	8.92	477	7.97
6	8	7.0	27.00	6.00	478	7.76
6	8	7.5	23.25	1.57	487	7.41
6	8	8.0	21.04	0.54	491	7.25
6	8	8.5	19.66	0.19	496	7.16
6	8	9.0	18.79	0.20	502	7.14
6	8	9.5	18.49	0.18	509	7.11
6	8	10.0	18.06	0.18	510	7.07
6	8	10.5	17.92	0.19	515	7.05
6	8	11.0	17.72	0.16	521	7.02
SITE 13						
6	13	0.5	27.52	6.99	502	7.81
6	13	1.0	27.50	6.91	502	7.80
6	13	1.5	27.50	6.87	502	7.79
6	13	2.0	27.42	6.62	501	7.77
6	13	2.5	27.41	6.50	502	7.76
6	13	3.0	27.18	6.27	502	7.72
6	13	3.5	27.08	5.96	503	7.68
6	13	4.0	26.96	5.84	502	7.65
6	13	4.5	26.22	5.30	503	7.57

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MONTH	SITE	DEPTH	TEMP	DO	COND	PH
6	13	5.0	25.15	3.47	494	7.46
6	13	5.5	22.01	0.84	489	7.28
6	13	6.0	21.81	0.36	494	7.29
6	13	6.5	20.49	0.18	500	7.12
6	13	7.0	20.39	0.18	501	7.10
SITE 14						
6	14	0.5	27.49	8.23	553	7.79
6	14	1.0	27.48	8.15	554	7.79
6	14	1.5	27.48	8.25	553	7.80
6	14	2.0	27.48	8.19	553	7.80
6	14	2.5	27.48	8.25	554	7.80
6	14	3.0	27.49	8.13	555	7.72
SITE 2						
7	2	0.5	34.34	6.13	441	7.69
7	2	1.0	34.48	6.10	444	7.58
7	2	1.5	34.71	6.04	444	7.52
7	2	2.0	32.02	4.49	471	7.40
7	2	2.5	31.44	4.57	444	7.39
7	2	3.0	31.47	4.39	444	7.34
7	2	3.5	31.09	4.34	444	7.34
SITE 4						
7	4	0.5	27.01	6.19	440	7.77
7	4	1.0	27.07	6.19	441	7.77
7	4	1.5	27.08	6.15	441	7.78
7	4	2.0	27.09	6.13	441	7.78
7	4	2.5	27.08	6.13	442	7.78
7	4	3.0	27.09	6.08	444	7.77
7	4	3.5	27.08	5.94	445	7.75
7	4	4.0	27.08	5.92	444	7.75
7	4	4.5	27.07	5.94	443	7.75
7	4	5.0	27.03	6.02	444	7.75
7	4	5.5	27.03	5.96	445	7.75
7	4	6.0	27.07	5.96	447	7.75
SITE 8						
7	8	0.5	27.86	7.25	442	7.84
7	8	1.0	27.90	7.36	443	7.84
7	8	1.5	27.93	7.28	442	7.81
7	8	2.0	27.94	7.15	443	7.81
7	8	2.5	27.94	7.16	443	7.80
7	8	3.0	27.94	7.14	443	7.80
7	8	3.5	27.94	7.13	442	7.79
7	8	4.0	27.93	7.14	443	7.76
7	8	4.5	27.94	7.07	443	7.74
7	8	5.0	27.92	7.07	443	7.62
7	8	5.5	27.93	7.04	443	7.62
7	8	6.0	27.92	7.00	444	7.63
7	8	6.5	27.94	6.98	444	7.67
7	8	7.0	27.97	6.97	444	7.67
7	8	7.5	27.94	6.88	445	7.46
7	8	8.0	27.82	6.76	446	7.42
7	8	8.5	27.67	6.08	447	7.40
7	8	9.0	27.38	3.12	477	7.30
7	8	9.5	22.03	0.41	491	7.14
SITE 13						
7	13	0.5	28.49	5.52	468	7.84
7	13	1.0	28.44	5.49	470	7.79
7	13	1.5	28.78	5.44	471	7.76
7	13	2.0	28.78	5.55	471	7.74
7	13	2.5	28.77	5.46	471	7.72
7	13	3.0	28.80	5.44	472	7.65
7	13	3.5	28.78	5.52	472	7.65
7	13	4.0	28.78	6.04	471	7.58
7	13	4.5	28.71	6.04	469	7.34
7	13	5.0	28.48	5.92	468	7.47
7	13	5.5	28.48	5.03	470	7.47
7	13	6.0	28.20	4.22	473	7.41
7	13	6.5	28.06	0.39	492	7.01
SITE 14						
7	14	0.5	28.99	6.89	455	8.14
7	14	1.0	28.61	5.97	463	7.89
7	14	1.5	28.58	6.00	463	7.79
7	14	2.0	28.32	5.99	465	7.77
7	14	2.5	28.28	5.94	466	7.77
7	14	3.0	28.26	5.89	468	7.77
7	14	3.5	28.24	5.69	470	7.76
SITE 2						
8	2	0.5	33.42	6.30	427	7.73
8	2	1.0	33.08	6.26	428	7.76
8	2	1.5	33.03	6.19	428	7.77
8	2	2.0	32.90	3.85	427	7.70
8	2	2.5	28.43	1.89	435	7.48
8	2	3.0	27.33	2.81	428	7.73
8	2	3.5	26.98	3.23	427	7.77
SITE 4						
8	4	0.5	25.44	7.32	417	7.83
8	4	1.0	25.40	7.04	417	7.83
8	4	1.5	25.38	6.92	417	7.82
8	4	2.0	25.36	6.71	418	7.80
8	4	2.5	25.32	6.55	417	7.79
8	4	3.0	25.31	6.48	417	7.79
8	4	3.5	25.47	6.58	417	7.80
8	4	4.0	25.47	6.60	418	7.80
8	4	4.5	25.47	6.62	418	7.81
8	4	5.0	25.47	6.63	418	7.81
8	4	5.5	25.45	6.69	418	7.81
8	4	6.0	25.37	6.39	422	7.79

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MONTH	SITE	DEPTH	TEMP	DO	COND	PH
9	13	5.0	26.92	3.55	407	7.48
9	13	5.5	26.73	1.60	409	7.40
9	13	6.0	26.63	1.08	412	7.30
9	13	6.5	26.61	0.98	412	7.29
SITE 16						
9	16	0.5	28.10	6.88	397	8.21
9	16	1.0	27.96	6.59	398	8.17
9	16	1.5	27.89	6.37	397	8.16
9	16	2.0	27.74	5.64	399	8.12
9	16	2.5	26.79	4.75	397	8.11
SITE 2						
11	2	0.5	17.79	9.19	429	8.21
11	2	1.0	17.78	8.99	429	8.18
11	2	1.5	17.88	9.00	429	8.18
11	2	2.0	17.70	8.98	429	8.18
11	2	2.5	17.85	8.95	428	8.18
11	2	3.0	17.67	8.96	429	8.19
11	2	3.5	17.14	8.86	428	8.18
SITE 4						
11	4	0.5	6.22	10.53	418	7.98
11	4	1.0	6.22	10.54	419	7.95
11	4	1.5	6.21	10.46	420	7.96
11	4	2.0	6.21	10.44	419	7.95
11	4	2.5	6.19	10.46	419	7.95
11	4	3.0	6.19	10.47	419	7.96
11	4	3.5	6.16	10.42	419	7.96
11	4	4.0	6.15	10.43	420	7.95
11	4	4.5	6.15	10.43	420	7.97
11	4	5.0	6.16	10.37	420	7.98
11	4	5.5	6.12	10.32	420	7.98
11	4	6.0	6.12	10.33	420	7.98
SITE 8						
11	8	0.5	6.08	11.19	412	8.05
11	8	1.0	6.09	10.78	412	8.03
11	8	1.5	6.07	10.73	412	8.03
11	8	2.0	6.08	10.62	412	8.03
11	8	2.5	6.08	10.58	412	8.03
11	8	3.0	6.08	10.58	412	8.03
11	8	3.5	6.07	10.55	412	8.03
11	8	4.0	6.06	10.58	412	8.03
11	8	4.5	6.07	10.52	412	8.03
11	8	5.0	6.06	10.49	412	8.03
11	8	5.5	6.06	10.49	412	8.03
11	8	6.0	6.06	10.47	412	8.02
11	8	6.5	6.06	10.48	412	8.03
11	8	7.0	6.06	10.44	412	8.03
11	8	7.5	6.06	10.46	412	8.03
11	8	8.0	6.06	10.41	412	8.03

MONTH	SITE	DEPTH	TEMP	DO	COND	PH
11	8	8.5	6.06	10.44	412	8.04
11	8	9.0	6.06	10.41	412	8.04
11	8	9.5	6.06	10.38	412	8.04
11	8	10.0	6.06	10.41	412	8.04
SITE 13						
11	13	0.5	8.01	10.58	418	8.14
11	13	1.0	8.02	10.61	417	8.12
11	13	1.5	8.05	10.63	418	8.12
11	13	2.0	8.04	10.63	417	8.12
11	13	2.5	8.03	10.67	417	8.12
11	13	3.0	7.88	10.80	417	8.12
11	13	3.5	7.49	10.75	417	8.11
11	13	4.0	7.17	10.93	416	8.09
11	13	4.5	6.98	10.83	416	8.08
11	13	5.0	6.89	10.93	415	8.08
11	13	5.5	6.86	10.94	416	8.08
11	13	6.0	6.82	10.96	416	8.08
11	13	6.5	6.82	10.33	416	8.08
SITE 16						
11	16	0.5	10.86	11.00	431	8.25
11	16	1.0	10.02	11.02	436	8.26
11	16	1.5	7.25	11.18	437	8.25
11	16	2.0	7.98	11.47	439	8.27
11	16	2.5	6.39	10.91	438	8.27
11	16	3.0	6.13	11.49	445	8.27
11	16	3.5	5.23	11.78	444	8.27
11	16	4.0	4.62	11.72	445	8.27

FOR MORE INFORMATION, CALL OR WRITE

Illinois Power Company
Water Pollution Control Section (A-17)
500 South 27th Street
Decatur, Illinois 62525
(217) 424-7322

ILLINOIS POWER