Water-Quality and Lake-Stage Data for Wisconsin Lakes, Water Year 2001

U.S. GEOLOGICAL SURVEY
Open-File Report 02–135

Prepared in cooperation with the
State of Wisconsin and local agencies

USGS
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WATER-QUALITY AND LAKE-STAGE DATA FOR WISCONSIN LAKES, WATER YEAR 2001

By Wisconsin District Lake-Studies Team

U.S. GEOLOGICAL SURVEY
Open-File Report 02-135

A report by the Wisconsin District Lake-Studies Team–
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Prepared in cooperation with
THE STATE OF WISCONSIN AND OTHER AGENCIES

Middleton, Wisconsin
2002

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CONVERSION FACTORS, VERTICAL DATUM, AND ABBREVIATED WATER-QUALITY UNITS

Multiply	By	To Obtain
mile (mi)	1.609	kilometer
pound (lb)	453.6	gram
acre	0.4048	hectare
foot (ft)	0.3048	meter
gallon (gal)	3.785	liter
square mile (mi^2)	2.590	square kilometer

Temperature, in degrees Celsius (°C) can be converted to degrees Fahrenheit (°F) by use of the following equation:

$$°F = 1.8(°C) + 32.$$

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

Abbreviated water-quality units: Chemical concentrations and water temperature are given in metric units. Chemical concentration is given in milligrams per liter (mg/L) or micrograms per liter (µg/L). Milligrams per liter is a unit expressing the concentration of chemical constituents in solution as weight (milligrams) of solute per unit volume (liter) of water. One thousand micrograms per liter is equivalent to one milligram per liter. For water with dissolved-solids concentrations less than 7,000 mg/L, the numerical values for concentrations expressed as mg/L and µg/L are the same as for concentrations in parts per million and parts per billion, respectively.

Specific conductance of water is expressed in microsiemens per centimeter at 25 degrees Celsius (µS/cm). This unit is equivalent to micromhos per centimeter at 25 degrees Celsius (µmho/cm), formerly used by the U.S. Geological Survey.

WATER-QUALITY AND LAKE-STAGE DATA FOR WISCONSIN LAKES, WATER YEAR 2001

By **Wisconsin District Lake-Studies Team**

INTRODUCTION

The U.S. Geological Survey (USGS), in cooperation with local and other agencies, collects data at selected lakes throughout Wisconsin. These data, accumulated over many years, provide a data base for developing an improved understanding of the water quality of lakes. To make these data available to interested parties outside the USGS, the data are published annually in this report series. The locations of water-quality and lake-stage stations in Wisconsin for water year 2001 are shown in figure 1. A water year is the 12-month period from October 1 through September 30. It is designated by the calendar year in which it ends. Thus, the period October 1, 2000 through September 30, 2001 is called "water year 2001."

The purpose of this report is to provide information about the chemical and physical characteristics of Wisconsin lakes. Data that have been collected at specific lakes, and information to aid in the interpretation of those data, are included in this report. Data collected include measurements of in-lake water quality and lake stage. Time series of Secchi depths, surface total phosphorus and chlorophyll *a* concentrations collected during non-frozen periods are included for all lakes. Graphs of vertical profiles of temperature, dissolved oxygen, pH, and specific conductance are included for sites where these parameters were measured. Descriptive information for each lake includes: location of the lake, area of the lake's watershed, period for which data are available, revisions to previously published records, and pertinent remarks. Additional data, such as streamflow and water quality in tributary and outlet streams of some of the lakes, are published in another volume: "Water Resources Data-Wisconsin, 2001."

Water-resources data, including stage and discharge data at most streamflow-gaging stations, are available throught the World Wide Web on the Internet. The Wisconsin District's home page is at http://wi.water.usgs.gov/. Information on the Wisconsin District's Lakes Program is found at wi.water.usgs.gov/lake/index.html.

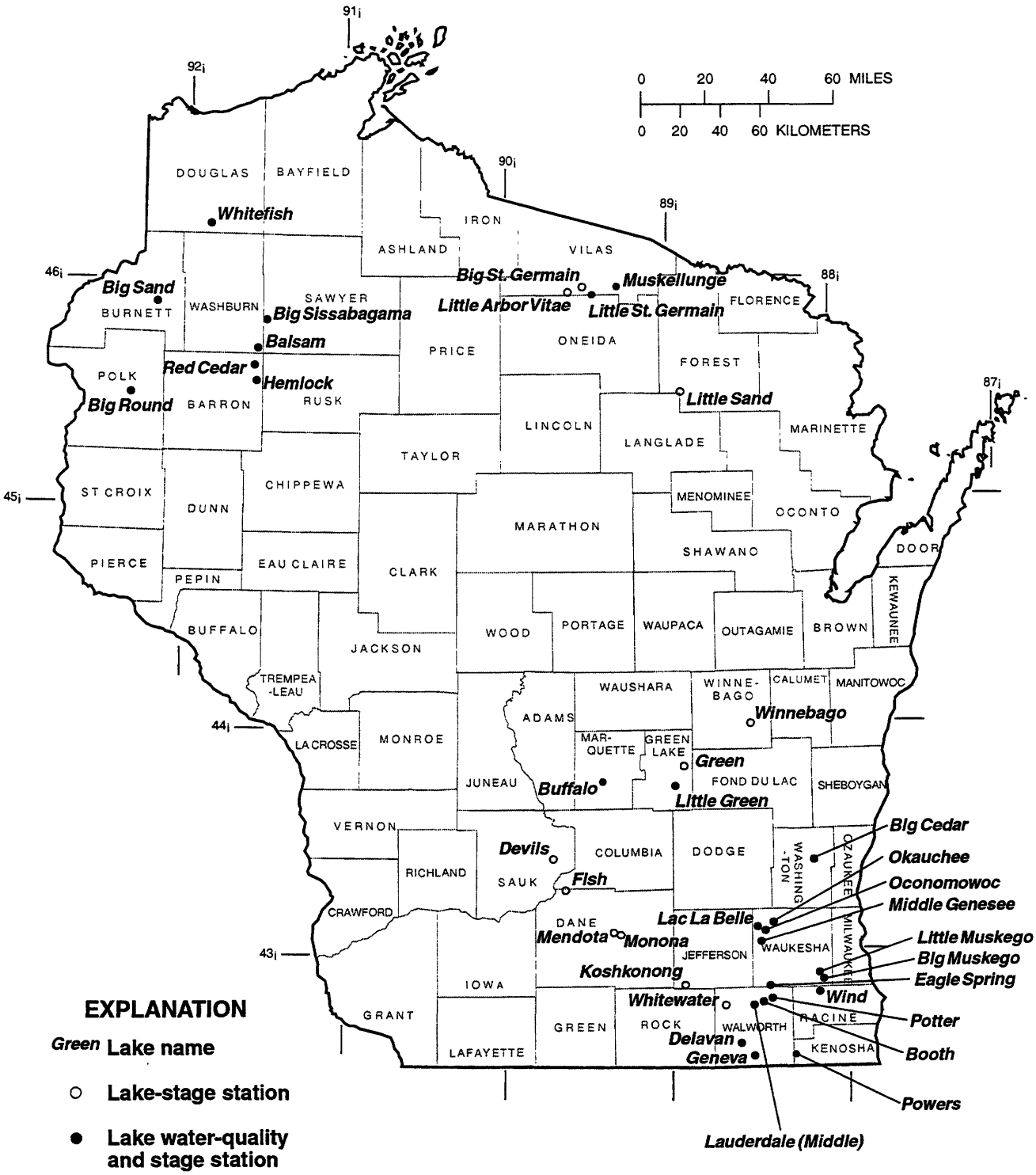

Figure 1. Location of lake water-quality and lake-stage stations in Wisconsin.

The USGS has done cooperative lake monitoring with local and other agencies since 1983. Cooperators in 2001 included:

Big Cedar Lake Protection and Rehabilitation District
Big Muskego Lake District
Booth Lake Management District
Buffalo Lake District
City of Muskego
Dane County Department of Public Works
Eagle Spring Lake Management District
Geneva Lake Environmental Agency
Green Lake Sanitary District
Lac La Belle Management District
Lauderdale Lakes Lake District
Little Green Lake Protection and Rehabilitation District
Little Muskego Lake Protection and Rehabilitation District
Little St. Germain Lake Protection and Rehabilitation District (Muskellunge Lake Association)
Middle Genesee Lake District
Okauchee Lake Management District
Potters Lake Protection and Rehabilitation District
Powers Lake District
Rock County Public Works Department
St. Croix Tribe
Town of Cedar Lake (Red Cedar Lake Association)
Town of Delavan (Delavan Lake)
Town of Sand Lake (Big Sissabagama Lake Association)
Town of Wascott (Whitefish Lake Association)
U.S. Army Corps of Engineers
Village of Oconomowoc Lake
Whitewater Lake Management District
Wind Lake Management District
Wisconsin Department of Natural Resources

Lake data-collection sites are identified by a unique identification number. Lake water-quality sites are identified by a 15-digit number that is a concatenation of the site's latitude, longitude, and a two-digit sequence number. The sequence number is used to distinguish between sites located at the same latitude-longitude designation. The site identification number is permanently assigned to the site; actual latitude and longitude of the site are subject to update and are stored separately. For some lakes, which have historical records of lake stage, an eight-to-ten digit number is assigned according to downstream order. Gaps are left in the numerical series to allow for new stations; hence, the numbers are not consecutive. The first two digits of the complete eight-to-ten digit number, such as 04087000 or 054310157, designate the major river basin. For example, "04" designates the St. Lawrence River Basin and "05" designates the Upper Mississippi River Basin.

The water-quality lake stations that were discontinued prior to water year 2001 are listed in table 1. Discontinued lake-stage stations are not included in this table.

This report is the culmination of a concerted effort by a number of people who collected, compiled, analyzed, verified, and organized the data, and who typed, edited, and assembled the report. The authors had primary responsibility for assuring that the information contained herein is accurate, complete, and adheres to USGS policy and established guidelines. Technicians in charge of the field offices are: T.J. Popowski (Rice Lake), J.J. Hanig (Merrill), and J. Habale (Middleton). The data were collected and processed by S.M. Berg, G.L. Goddard, J.J. Hanig, D.E. Housner, E.A. Mergener, D.L. Olson, R.L. Rewey, E.D. Roerish, and J.G. Schuler. P.A. Stark assembled, edited, and formatted the report. Additional assistance in preparation of the report was provided by M.M. Greenwood.

METHODS OF DATA COLLECTION

Depth profiles of water temperature, dissolved oxygen, pH, and specific conductance were collected using multi-parameter meters. Prior to measurements, the meters were calibrated using standards for pH and conductance, and dissolved oxygen was calibrated using the air calibration method. Generally, field measurements in profiles were made at 0.5-m intervals if the maximum depth of the lake was 5 m or less and at 1.0-m intervals if the maximum depth was greater than 5 m.

Table 1. Discontinued lake stations

Station name	Site identification number	Period of record
Alma Lake near St. Germain	455426089254700	Oct. 1984–Sept. 1990, May 1992–Sept.1996
Balsam Lake, off Cedar Island, at Balsam Lake	452755092264600	Feb. 1991–Aug. 1994
off Little Narrows, near Balsam Lake	452858092265300	May 1991–Aug. 1994
off Rock Island, near Balsam Lake	452754092234300	May 1991–Aug. 1994
Bass Lake near Shawano	445215088300300	Feb. 1990–Aug. 1992
Bear Lake at Deep Hole near Haugen	453754091490900	Mar. 1992–Aug. 1993
Beaver Dam Lake, South end, at Beaver Dam	432814088515000	June–Oct. 1991
North end, near Beaver Dam	433122088545700	June–Oct. 1991
Benedict Lake near Powers Lake	423201088180800	May 1998–Aug. 2000
Big Blacksmith Lake near Keshena	445401088334500	Feb. 1990–Aug. 1992
Big Hills (Hills) Lake near Wild Rose	440912089092000	June 1983–Aug. 1984, Feb.–Aug. 1987, Feb.–Aug. 1990, Feb.–Aug. 1993, Feb.–Aug. 1996, Feb.–Aug. 1999
Big Muskego Lake, at North Site, near Muskego	425301088061300	Feb.–Aug. 1988
Research Base, near Muskego	425235088075300	May–June 1994
Big St. Germain Lake near St. Germain	455557089311000	Feb. 1992–Aug. 1996
Denoon Lake at Wind Lake	425044088100300	Feb. 1991–Aug. 1996
Druid Lake near Hartford	431643088243300	Feb. 1991–Sept. 1996
Eagle Lake near Kansasville	05544500	1936–64, 1975–77, 1979, Feb. 1993–Sept. 1996
Eagle Lake, at Deep Hole, near Kansasville	424207088072400	Feb. 1993–Aug. 1996
Elizabeth Lake near Twin Lakes	423051088155300	Feb. 1995–Sept. 1997
Forest Lake near Dundee	433632088100200	Mar. 1994–Aug. 1996
Fowler Lake, Center, at Oconomowoc	430653088294601	Jan.–Dec. 1984, Oct. 1986–Sept. 1996
Fox Lake Deep Hole at Fox Lake	433458088560600	June 1991–Mar. 1993
Geneva Lake		
Geneva Bay, at Lake Geneva	423455088263800	Apr. 1997–Feb. 1999
Williams Bay, at Williams Bay	423420088320500	Apr. 1997–Feb. 1999
Center, near Lake Geneva	423402088301400	Apr. 1997–Mar. 1999
East End, near Lake Geneva	423421088272300	Apr. 1997–May 2000
Hooker Lake at Salem	423335088060300	Feb. 1992–Aug. 1993
Kirby Lake near Cumberland	453554092042101	Nov. 1995–Oct. 1996
(Site 1) near Cumberland	453608092035801	Nov. 1995–Nov. 1996
(Site 2) near Cumberland	453601092035301	Nov. 1995–Nov. 1996
(Site 3) near Cumberland	453612092034901	Nov. 1995–Nov. 1996
(Site 4) near Cumberland	453603092035701	Nov. 1995–Nov. 1996
(Site 5) near Cumberland	453608092041201	Nov. 1995–Nov. 1996
(Site 6) near Cumberland	453555092040901	Nov. 1995–Nov. 1996
Lac La Belle, NW, at Oconomowoc	430809088313900	Feb. 1984–Aug. 1985
SE at Oconomowoc	430707088301400	Feb. 1984–Aug. 1985

Table 1. Discontinued lake stations

Station name	Site identification number	Period of record
Lake Blass at Lake Delton	433545089482400	Mar. 1989–Aug. 1990
Lake Keesus, East Bay, near Merton	430957088183400	Apr. 1991–Aug. 1995
North Bay, near Merton	431006088191000	Apr. 1991–Aug. 1995
Lake Morris at Mount Morris	440654089120500	Jun. 1983–Sept. 1989
Lake Nebagamon, Northeast Bay, at Lake Nebagamon	463050091412300	May 1992–Aug. 1995
Southeast Bay, at Lake Nebagamon	462928091413500	Mar. 1992–Sept. 1995
West Bay, at Lake Nebagamon	463034091425300	May 1992–Aug. 1995
Lake Noquebay near Crivitz	451511087550900	Feb. 1987–Aug. 1988, Apr. 1991–Aug. 1994
East End, near Crivitz	451540087525700	Apr. 1991–Aug. 1994
Lamotte Lake near Shawano	445305088361200	Feb. 1990–Aug. 1992
Lauderdale Lakes		
at Lauderdale	424554088332700	Oct. 1993–Oct. 1994
Green near Lauderdale	424652088341500	Nov. 1993–Nov. 1994
Green, Auxiliary, Number 1, near Lauderdale	424640088341900	June 1999–Sept. 2000
Mill at Lauderdale	424555088335700	Nov. 1993–Nov. 1994
Legend Lake (site 1) near Shawano	445342088312700	Feb. 1990–Feb. 1992
Little Cedar Lake		
North Site, near West Bend	432255088134700	Feb. 1997–Aug. 1999
South Site, near West Bend	432249088134500	Feb. 1997–Aug. 1999
Little Rock Lake near Woodruff	455946089415702	Oct. 1983–Sept. 1996
Long (Kee Nong Go-Mong) Lake at Wind Lake	424937088103400	Feb. 1988–Aug. 1989, Feb. 1991–Aug. 1996
Loon Lake near Shawano	445009088303700	Feb. 1991–Aug. 1993
Lost Lake near Beaver Dam	432640088580500	June–Oct. 1991
McKenzie Lakes		
McKenzie (Big McKenzie)		
Deep Hole, near Spooner	455507092013500	Feb. 1987–Aug. 1998
Northern Site, near Spooner	455540092022000	June 1997–Aug. 1998
South Site, near Spooner	455437092022300	June 1997–Aug. 1998
Lower McKenzie, near Webb Lake	455902092011900	June 1997–Aug. 1998
Middle McKenzie, near Spooner	455635092021800	June 1997–Aug. 1998
Mary (Marie) Lake at Twin Lakes	423128088151200	Feb. 1995–Aug. 1997
Max Lake near Woodruff	460128089423501	Mar. 1988–Dec. 1996
Mead Lake, East Bay near Willard	444720090445000	Apr. 1991–Aug. 1995
West Bay near Willard	444733090460100	Feb. 1991–Sept. 1995
Montello Lake at Montello	434748089195800	Feb. 1995–Aug. 1998
Moon Lake near St. Germain	455504089260500	Feb. 1992–Aug. 1996
Morgan Lake near Fence	454622088324801	Oct. 1987–Sept. 1998.
Moshawquit Lake near Shawano	445352088295800	Feb. 1990–Aug. 1992
Muskego (Big Muskego)		Jan. 1991–Sept. 2000
Auxiliary Number 1, near Muskego	425329088054000	June 1996–Aug. 2000

Table 1. Discontinued lake stations

Station name	Site identification number	Period of record
Namekagon Lakes		
Garden, near Cable	461224091033200	Mar. 1998–Aug. 1999
Jackson, near Cable	461457091065900	Mar. 1998–Aug. 1999
Namekagon		
Deep Hole, near Cable	461308091065100	Mar. 1998–Aug. 1999
East Basin, near Cable	461228091044300	Mar. 1998–Aug. 1999
Northeast Basin, near Cable	461410091050700	Mar. 1998–Aug. 1999
Park Lake (site 1) at Pardeeville	433239089175800	Feb. 1986–Aug. 1987, May–Nov. 1993
(site 2) at Pardeeville	433226089175500	May–Nov. 1993
(site 3) at Pardeeville	433245089173000	May–Nov. 1993
(site 4) at Pardeeville	433257089165100	May–Nov. 1993
Pike Lake near Hartford	431835088200600	Dec. 1998–Nov. 2000
Pretty Lake, at Deep Hole, near Dousman	425722088295000	Feb. 1993–Aug. 1997
Rice Lake at Deep Hole near Whitewater	424629088415700	Apr.–Nov. 1991
Round Lake near Shawano	445328088335000	Feb. 1990–Aug. 1992
Sand Lake (Deep Hole) near Keshena	445321088323101	June–Aug. 1992
Shell Lake at Shell Lake	05334000	Aug. 1936–Sept. 1999
Silver Lake near Oconomowoc	430436088293300	Apr. 1992–Aug. 1996
Silver Lake near West Bend	432322088125000	Feb. 1996–Aug. 1997
Sinissippi Lake, off Anthony Is., at Hustisford	432113088361100	Feb. 1991–Aug. 1993
off Butternut Is., near Hustisford	432240088363900	Apr. 1991–Aug. 1993
off Sam Point, near Hustisford	432300088374200	Apr. 1991–Aug. 1993
Spirit Lake near Keshena	445400088320100	Apr.–Aug. 1992
Stewart Lake at Mt. Horeb	430117089442701	May 1992–Sept. 1993
Tichigan Lake near Waterford	424854088123300	Mar. 1994–Aug. 1996
Tombeau Lake near Powers Lake	423153088184800	May 1998–Aug. 2000
Upper Nemahbin Lake, Center, near Delafield	430400088254900	June 1993–Aug. 1995
South Site, near Delafield	430339088254800	June 1993–Aug. 1995
Outlet near Delafield	430334088255400	June 1993–Aug. 1995
Vandercook Lake near Woodruff	455909089405602	Nov. 1980–Aug. 1998
Watosah-skice Lake near Keshena	445330088361400	Feb. 1990–Aug. 1992
Waubeesee Lake at Wind Lake	424857088101500	Feb. 1988–Aug. 1989, Feb. 1991–Aug. 1996
Wazee Lake near Black River Falls	441721090431700	Nov. 1999–Aug. 2000
Whitewater Lake, off Heart Prairie, near Whitewater	424533088420100	Apr.–Nov. 1991
near Whitewater	424608088414800	Apr.–Oct. 1991
North Bay, near Whitewater	424625088405500	Apr.–Nov. 1991
South Bay, near Whitewater	424501088422300	Apr.–Nov. 1991
Wind Lake, Northeast Basin, at Wind Lake	424938088080800	Feb. 1997–Aug. 1998
Wolf Lake near Mt. Calvary	435152088123100	Nov. 1983–Sept. 1986, Nov. 1992–Sept. 1997

In most lakes, water samples were collected at two depths - near the surface and near the bottom. Chemical analyses of water samples were performed using standard analytical methods by either the USGS National Water Quality Laboratory (Wershaw and others, 1987; Fishman and Friedman, 1989; Fishman, 1993) or the Wisconsin State Laboratory of Hygiene (Wisconsin State Laboratory of Hygiene, 1993). Analyses for dissolved constituents were performed on samples that were filtered in the field through a 0.45-µm (micrometer) pore-size filter. Total or total recoverable constituents were determined by analyzing unfiltered water samples. Preservation and shipment of samples followed standard protocols established by the laboratories. Water-quality data were archived in the Water Quality Data Base (QWDATA) of the National Water Information System (NWIS). Additional descriptive information about water-quality data is available in the data report: "Water Resources Data – Wisconsin, 2001". NWIS parameter codes and minimum laboratory reporting levels for chemical constituents are given in table 2.

Records of lake stage are considered complete when one or more manual or automatic measurements were obtained per day. Partial records of lake stage result when measurements were less frequent than daily. A complete description of manual or automatic measurements of lake stage is described by Rantz and others (1982).

EXPLANATION OF PHYSICAL AND CHEMICAL CHARACTERISTICS OF LAKES

Following are brief, generalized explanations of some of the common measurements of water quality and some of the physical processes occurring in lakes that influence these measures of water quality. More detailed explanations of water-quality data and lake processes are given by Wetzel (1983), Hem (1985), and Shaw and others (1993).

Water Temperature and Thermal Stratification

Water temperature in lakes is important because of its role in stratification and because of the temperature dependence of many chemical reactions and life processes of aquatic organisms. The extent of thermal stratification in lakes depends on the interaction between the lake's shape, water clarity, solar heating, and wind-driven mixing. Complete mixing of the lake is usually inhibited by thermal stratification in summer and by ice cover in winter. Thermal stratification affects water quality and the distribution of organisms in the lake. Summer thermal stratification can occur in any lake, but in Wisconsin it commonly occurs in lakes deeper than about 6 m (Shaw and others, 1993).

Table 2. Parameter identification numbers and laboratory reporting levels (LRL) for chemical parameters commonly measured in lakes, and analyzed at the National Water Quality Laboratory (NWQL) or the Wisconsin State Laboratory of Hygiene (WSLH)

				(NWQL)				(WSLH)	
				Standard Analysis		Low-Level Analysis			
Parameter Name	Units	CAS Number (1)	Parameter Code (2)	LRL	Lab Code	LRL	Lab Code	LRL	Test Code
Calcium, diss. (Ca)	mg/L	7440-70-2	00915	0.020	659	0.002	1895	0.02	I230IUD
Magnesium, diss. (Mg)	mg/L	7439-95-4	00925	0.004	663	0.001	1897	0.02	I390IUD
Sodium, diss. (Na)	mg/L	7440-23-5	00930	0.09	675	0.025	1898	0.09	I80IUD
Potassium, diss. (K)	mg/L	7440-09-7	00935	0.24	54	0.01	833	0.3	I540IUD
Sulfate, diss. (SO_4)	mg/L	14808-79-8	00945	0.31	1572	0.01	1263	1.0	I600DLD
Chloride, diss. (Cl)	mg/L	16887-00-6	00940	0.29	1571	0.01	1259	0.1	I240ELD
Fluoride, diss. (F)	mg/L	16984-48-8	00950	0.100	31	0.01	1260	0.03	I330FLD
Iron, diss. (Fe)	µg/L	7439-89-6	01046	10	645	3	1896	10	I370IUD
Manganese, diss. (Mn)	µg/L	7439-96-5	01056	2.2	648	1	1793	0.4	I400IUD
Silica, diss. (SiO_2)	mg/L	7631-86-9	00955	0.1	56	0.02	1899	0.008	I560LLD
Nitrogen, NO_2+NO_3, diss.	mg/L		00631	0.05	1975	0.005	1979	0.01	I460MLD
Nitrogen, ammonia, diss.	mg/L	7664-41-7	00608	0.02	1976	0.002	1980	0.013	I440NLD
Nitrogen, organic, total (3)	mg/L								
Nitrogen, amm.+org., total (4)	mg/L	17778-88-0	00625	0.100	1985			0.2	I470BLT
Nitrogen, total (5)	mg/L								
Phosphorus, total	mg/L	7723-14-0	00665	0.05	1984	0.001	837	0.005	I520PLT
Phosphorus, ortho, diss.	mg/L	14265-44-2	00671	0.01	1262	0.001	1978	0.002	I530CLD
Chlorophyll *a*, phytoplankton	µg/L	479-61-8	70953	0.1	586				
Chlorophyll *a*, phytoplankton	µg/L	479-61-8	32210					1	I250UNF

Footnotes:

1: CAS (Chemical Abstracting Services) number = unique identification for each constituent
2: Parameter Code - unique number for storage of data in database
3: Calculated as difference between total ammonia + organic nitrogen and ammonia nitrogen
4: Also known as Total Kjeldahl Nitrogen (TKN)
5: Calculated as sum of TKN + Nitrogen as (NO_2+NO_3)

The density of water increases with decreasing temperature down to a temperature of 4°C, then decreases with decreasing temperature between 4°C and the freezing point of water (0°C). For a brief period in the spring after the ice is out, water temperature is usually uniform through the entire water column and wind action causes the lake to mix completely. This process is known as "spring turnover." As the lake absorbs the sun's energy, the surface water becomes warmer and its density decreases, making it more resistant to complete mixing. The difference in density caused by different water temperatures can prevent warm and cold water from mixing. In most lakes, therefore, a density "barrier" forms between the warmer surface water (epilimnion) and the underlying colder water (hypolimnion). This barrier is often marked by a sharp temperature gradient known as the "thermocline (metalimnion)." During the stratified summer period, these three distinct layers of lake water are often present. As the temperature difference between surface and deep water increases, this "stratified" condition stabilizes and can persist until surface temperatures decrease in the fall, which decreases the stability of the stratification. The mixing of the lake water in the fall is known as "fall turnover."

Thermal stratification may also occur under ice cover in the winter. In the winter, the coldest water (near 0°C) under the ice at the surface of the lake is less dense than water deeper in the lake with warmer temperatures.

Specific Conductance

Specific conductance is a measure of the ability of water to conduct an electrical current and is an indicator of the concentration of dissolved solids in the water. Because conductance is temperature related, reported values are normalized at 25°C and are termed specific conductance. As the concentration of dissolved minerals increases, specific conductance increases. During winter and summer thermal stratification, concentrations of dissolved constituents near the lake bottom increase due to the decomposition of materials settling from the epilimnion, or release of dissolved materials (such as iron, manganese, and phosphorus) from the bottom sediments during anoxic periods. Therefore, differences in specific conductance with depth indicate differences in concentrations of dissolved solids.

Water Clarity

Water clarity, or transparency, is commonly measured using a Secchi disc. The range of depths within which photosynthetic activity occurs depends largely on depth of light penetration, which is influenced by water clarity. A Secchi disc, most commonly an 20-cm.-diameter disc with alternating black-and-white quadrants, is lowered to a depth at which it is no longer visible. This depth is referred to as the Secchi depth. Clarity can be reduced by algae, zooplankton, water color, and suspended sediment. Algae are often the most dominant influence on clarity in lakes and, therefore, Secchi depth is usually correlated with the algal abundance. Secchi depths are generally the least during summer when algal populations are largest.

pH

The pH is a measure of the acidity of the water. It is defined as the negative logarithm of hydrogen-ion concentration and varies over a 14-unit log scale, with a pH of 7 being neutral. Values less than 7 indicate acidic conditions; the lower the value, the stronger the acidity. Values greater than 7 indicate alkaline conditions. The pH of water is influenced in part by photosynthesis and respiration of planktonic algae and aquatic plants. It is important because it affects the solubility of many chemical constituents, and because aquatic organisms have limited pH tolerances. Planktonic algae and aquatic plants produce oxygen and consume carbon dioxide as they photosynthesize during daytime; they consume oxygen and produce carbon dioxide when they respire at night. Carbon dioxide combines with the water molecule to form carbonic acid; therefore respiration causes a decrease in pH at night and photosynthesis during the day causes an increase in pH. The result is a daily cycle in pH. Because phytoplankton are usually concentrated in the near-surface water, changes in pH in the epilimnion are more extreme than in the hypolimnion, where less photosynthesis usually occurs.

Lakes having good fish populations and productivity generally have a pH between 6.7 and 8.2. Values of pH greater than 8.5 have been shown to cause the release of phosphorus from lake sediments (James and Barko, 1991).

Dissolved Oxygen

Dissolved oxygen is one of the most critical factors affecting a lake ecosystem because it is essential to most aquatic organisms, and it is involved in many chemical reactions. Very low dissolved oxygen concentrations can control some types of chemical reactions. The solubility of oxygen in water is inversely related to temperature–that is, oxygen solubility decreases as water temperature increases. This relation is important because at warmer temperatures the metabolic rate of organisms increases but less oxygen is available for respiration. The primary sources of dissolved oxygen are from the air and from photosynthesis. The minimum dissolved oxygen concentration specified in national water-quality criteria for early life stages of warmwater aquatic life is 5.0 mg/L (U.S. Environmental Protection Agency, 1986).

In early summer, if thermal stratification develops, the metalimnion restricts the surface supply of dissolved oxygen to the hypolimnion. The hypolimnion can become isolated from the atmosphere. Thus, as summer progresses, the dissolved oxygen concentration can decrease in response to decomposition of dead algae that settle from the epilimnion and in response to the biological and chemical oxygen demand of the sediments. The oxygen demand from these processes may completely deplete the oxygen (anoxia) in the water near the lake bottom. The oxygen depletion then progresses upward but usually is confined to the hypolimnion.

Anoxia in the hypolimnion is common in stratified eutrophic (nutrient-rich) lakes in Wisconsin. Complete anoxia, however, is often not detected because of meter constraints. During anoxic conditions, many aquatic organisms cannot survive, but many other species (primarily bacteria) actually function only in such conditions. Therefore, a shift from oxic to anoxic conditions produces a rapid and dramatic change in the biological community and chemical environment. Anoxia also can cause release of phosphorus from the bottom sediments. This phosphorus then mixes throughout the water column during spring and fall turnover.

Phosphorus

Phosphorus is one of the essential nutrients for plant growth. High phosphorus concentrations can cause dense algal populations (blooms) and can therefore be a major cause of eutrophication in lakes. When phosphorus concentrations exceed 0.025 mg/L at the time of spring overturn in lakes and reservoirs, these water bodies may occasionally experience excess or nuisance growth of algae or other aquatic plants (U.S. Environmental Protection Agency, 1986). In many regions of the country, including the upper Midwest, other nutrients, particularly nitrogen, tend to be in abundant supply. Phosphorus is often the nutrient in shortest supply, therefore limiting or controlling plant growth. About 90 percent of the lakes in Wisconsin are limited by phosphorus (Shaw and others, 1993). In water, dissolved orthophosphate is that part of total phosphorus that is most readily available for use by algae.

Internal phosphorus recycling occurs in many lakes. Phosphorus used by algae, aquatic plants, fish, and zooplankton is stored within these organisms. As these organisms die and decompose, this phosphorus is returned to the lake water and sediments. Anoxia in the hypolimnion makes phosphorus more soluble, adding further to the release of phosphorus from the falling particles and the lake sediments. During spring and fall turnover the phosphorus, which was released from the bottom sediments into the hypolimnion during anoxia, is mixed throughout the lake. The phosphorus is then available for algal growth. These phenomena are part of the internal-recycling processes of lakes.

Nitrogen

Nitrogen, like phosphorus, is an essential nutrient for plant and algal growth. Usually in Wisconsin lakes, nitrogen is in abundant supply from the atmosphere and other sources. If phosphorus is abundant relative to algal needs, nitrogen can become the limiting nutrient. In that case, algal blooms are more likely to be triggered by increases in nitrogen than by increases in phosphorus. Some bluegreen algal species can fix nitrogen from the atmosphere (Wetzel, 1983). Therefore, in situations where other types of algae are excluded because of a shortage of nitrogen, the nitrogen-fixing bluegreen algae have a competitive advantage and may be present in abundance.

Lakes with a nitrogen to phosphorus ratio larger than 15 to 1 near the surface may generally be considered phosphorus limited; a ratio from 10 to 1 to 15 to 1 indicates a transition situation; and a ratio smaller than 10 to 1 generally indicates nitrogen limitation. Total nitrogen is the sum of ammonia, organic nitrogen, and nitrate-plus-nitrite nitrogen. The near-surface concentration is commonly used to compute the total nitrogen to phosphorus ratio because most algal species grow near the lake surface.

Chlorophyll *a*

Chlorophyll *a* is a photosynthetic pigment found in algae (Wetzel, 1983) and other green plants. Its concentration, therefore, is commonly used as a measure of the density of the algal population in a lake. Chlorophyll *a* concentrations are generally highest during summer when algal populations are highest. Moderate populations of desirable algae are important in the food chain; however, excessive populations or algal blooms are undesirable. Algal blooms can cause taste and odor problems, and limit light penetration needed to support growth of submerged aquatic plants. Certain species of bluegreen algae can produce toxins (Rapavich and others, 1987).

CLASSIFICATION OF LAKES

Two methods are commonly used to classify and evaluate Wisconsin lakes according to their water quality or trophic state: Lillie and Mason's (1983) water-quality index and a modification of Carlson's (1977) Trophic State Index (TSI) by Lillie and others (1993). Three water-quality measures are used in these classification systems: near-surface concentrations of total phosphorus and chlorophyll *a*, and water clarity as indicated by the Secchi depth.

Lillie and Mason's (1983) water-quality indices for Wisconsin lakes were developed based on random summer measurements of total phosphorus and chlorophyll *a* concentrations, and Secchi depth to classify the lakes' water quality as shown below:

Water-quality index	Total phosphorus range (mg/L)	Chlorophyll *a* range (µg/L)	Water clarity range (Secchi depth, in meters)
"Excellent"	<0.001	<1.0	>6.0
"Very good"	.001–.009	1.0– 4.9	3.0–6.0
"Good"	.010–.029	5.0– 9.9	2.0–2.9
"Fair"	.030–.049	10.0–14.9	1.5–1.9
"Poor"	.050–.149	15.0–30.0	1.0–1.4
"Very poor"	>.150	>30.0	<1.0

The TSI approach to lake classification assigns numerical ranges to the three trophic conditions generally used to describe the wide range of lake water-quality conditions. Oligotrophic lakes are typically clear, algal populations and phosphorus concentrations are low, and the deepest water is likely to contain oxygen throughout the year. Mesotrophic lakes typically have a moderate supply of nutrients, experience moderate algal blooms, and have occasional oxygen depletions at depth. Eutrophic lakes are nutrient rich with relatively severe water-quality problems, such as frequent seasonal algal blooms, oxygen depletion in lower parts of the lakes, and poor clarity. When eutrophic conditions are very severe, the lake is considered hyper-eutrophic.

The WDNR modified the lakes classification scheme developed by Carlson (1977) to apply specifically to Wisconsin lakes. The WDNR system (Lillie and others, 1993) uses surface total phosphorus and chlorophyll *a* concentrations, and Secchi depth for ice-free periods to calculate values for TSI's. The WDNR has adopted the following TSI ranges to classify Wisconsin lakes: indices of less than 40 define oligotrophic conditions, 40 to 50 define mesotrophic conditions, greater than 50 to define eutrophic conditions, and greater than 70 define hypereutrophic conditions (Wisconsin Department of Natural Resources, 1992). These ranges are used to make relative comparisons in Wisconsin lake trophic-state evaluations by the WDNR and others.

The TSI for a lake can be calculated using the following equations (Lillie and others, 1993):

$TSI_{Secchi} = 60.0 - 33.2 \times (\log_{10} \text{Secchi depth})$
$TSI_{chlorophyll\ a} = 34.82 + (17.41 \times (\log_{10} \text{chlorophyll } a \text{ concentration}))$
$TSI_{total\ phosphorus} = 28.24 + (17.81 \times (\log_{10} \text{total phosphorus concentration} \times 1{,}000))$

where: Secchi depth is in meters,
chlorophyll *a* is in micrograms per liter, and
total phosphorus is in milligrams per liter.

The three trophic conditions are defined with the following boundaries for total phosphorus, Secchi disc, and chlorophyll *a*:

Trophic Level	Trophic State Index	Total phosphorus (mg/L)	Secchi depth (m)	Chlorophyll *a* (µg/L)
Eutrophic				
	50	0.017	2.0	7.4
Mesotrophic				
	40	0.005	4.0	2.0
Oligotrophic				

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LAKE DATA

453907091345800 BALSAM LAKE NEAR BIRCHWOOD, WI

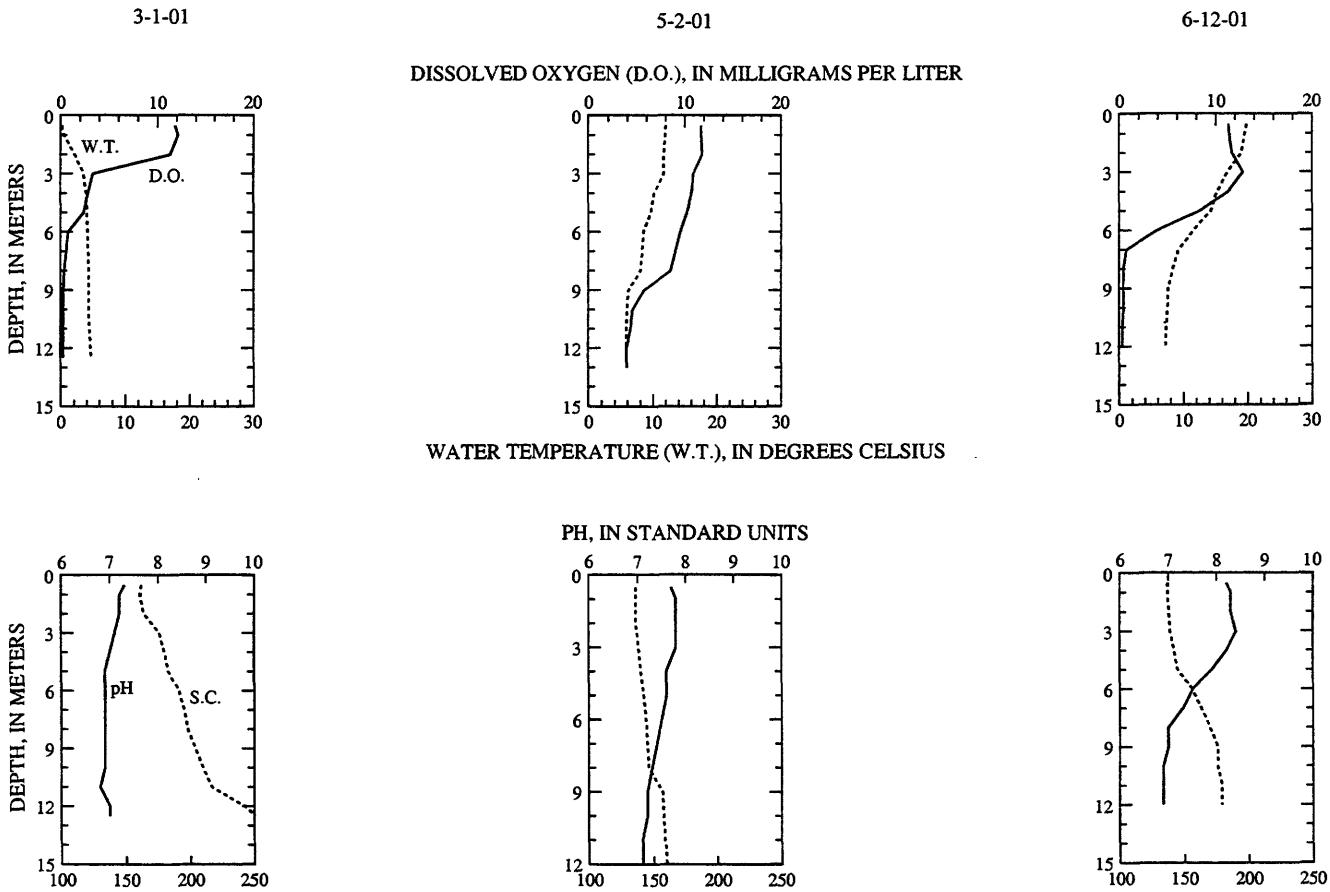
LOCATION.--Lat 45°39'07", long 91°34'58", in NE 1/4 NE 1/4 sec.34, T.37 N., R.10 W., Washburn County, Hydrologic Unit 07050007, 1.2 mi southwest of Birchwood.

PERIOD OF RECORD.--March 1993 to August 1994, March 1996 to August 1997, and March to September 2001.

REMARKS.--Lake sampled near southern end at a depth of about 14 m. Lake ice-covered during March sampling. Water-quality analyses by Wisconsin State Laboratory of Hygiene.

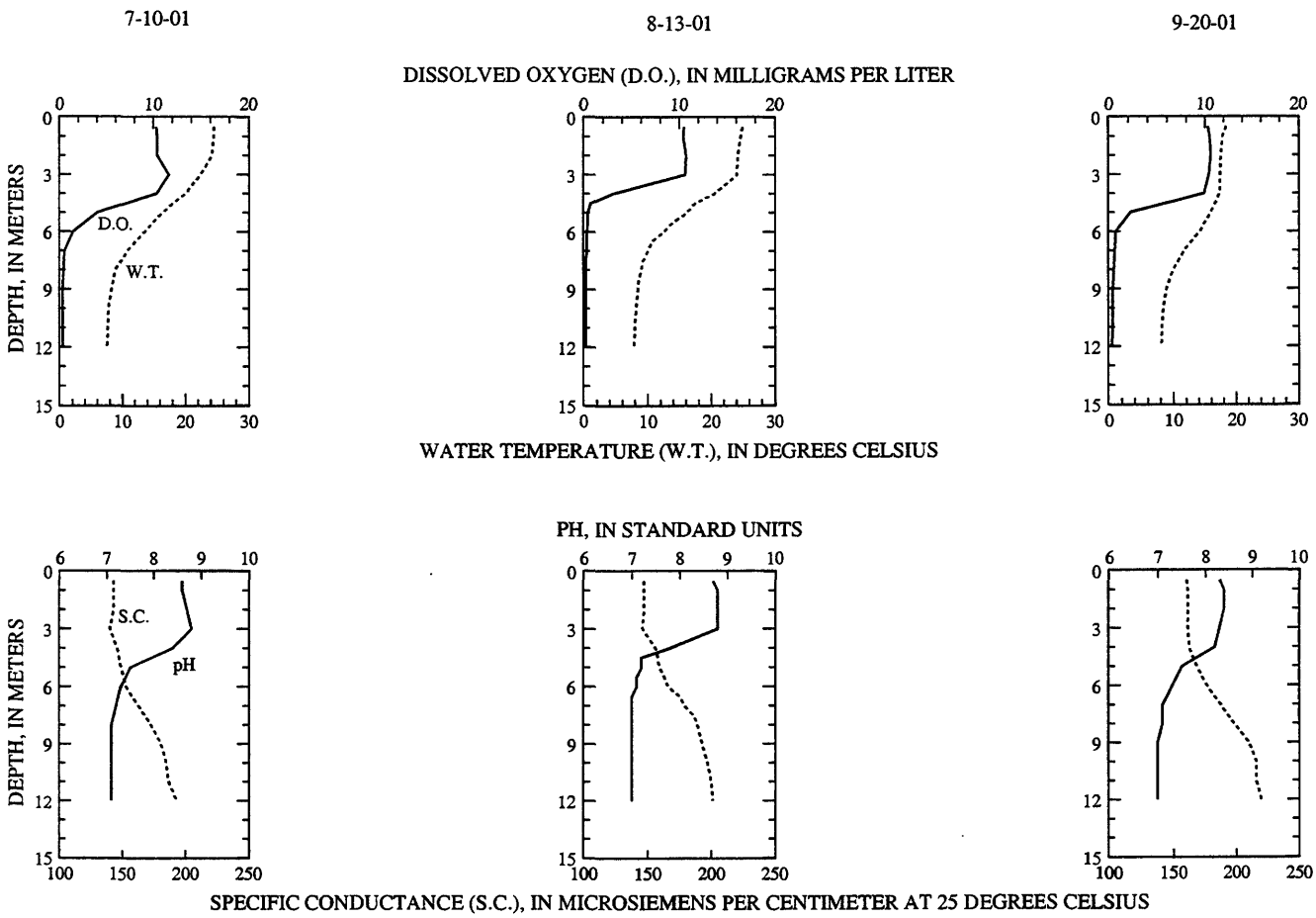
WATER-QUALITY DATA, MARCH 1 TO JUNE 12, 2001
(Milligrams per liter unless otherwise indicated)

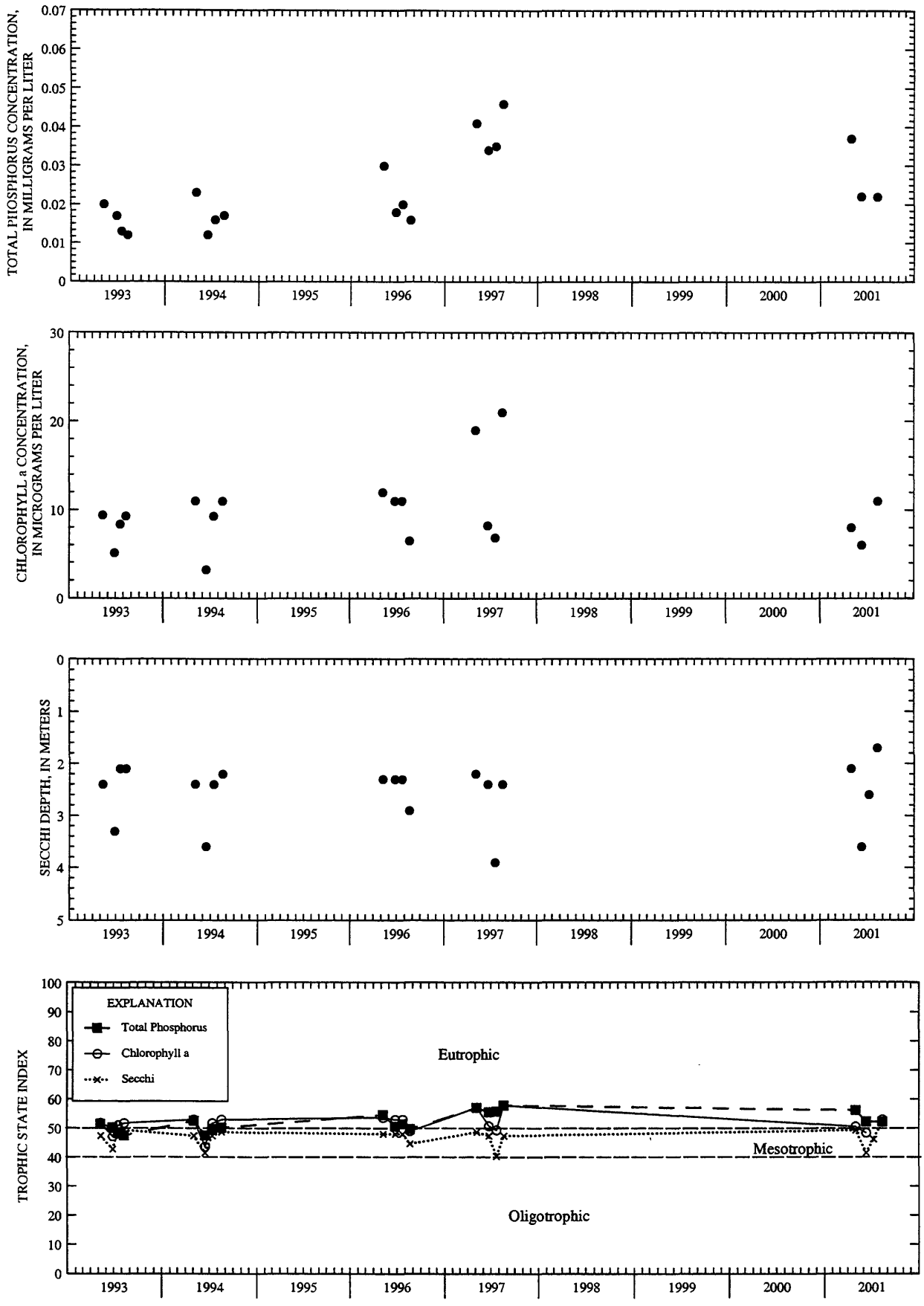
	Mar-1		May-2	Jun-12	
Lake stage (ft)	---		10.94	10.66	
Secchi-depth (m)	---		2.1	3.6	
Chlorophyll a, phytoplankton (µg/L)	---		8	6	
Depth of sample (m)	0.5	12.0	0.5	0.5	12.0
Water temperature (°C)	0.1	4.6	12.0	19.8	7.2
Specific conductance (µS/cm)	162	243	136	137	179
pH (units)	7.3	7.0	7.7	8.2	6.9
Dissolved oxygen (mg/L)	11.8	0.2	11.7	11.3	0.3
Phosphorus, total (as P)	0.040	0.596	0.037	0.022	0.101
Phosphorus, ortho, dissolved (as P)	---	---	0.005	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	0.217	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	0.024	---	---
Nitrogen, amm. + org., total (as N)	---	---	0.57	---	---
Nitrogen, total (as N)	---	---	0.787	---	---
Color (Pt-Co. scale)	---	---	20	---	---
Turbidity (NTU)	---	---	2.1	---	---
Hardness, (as $CaCO_3$)	---	---	68.8	---	---
Calcium, dissolved (Ca)	---	---	18	---	---
Magnesium, dissolved (Mg)	---	---	5.8	---	---
Sodium, dissolved (Na)	---	---	2.8	---	---
Potassium, dissolved (K)	---	---	0.7	---	---
Alkalinity, (as $CaCO_3$)	---	---	64	---	---
Sulfate, dissolved (SO_4)	---	---	<4.5	---	---
Chloride, dissolved (Cl)	---	---	2.7	---	---
Silica, dissolved (SiO_2)	---	---	14.2	---	---
Solids, dissolved, at 180°C	---	---	96	---	---
Iron, dissolved (Fe) µg/L	---	---	30	---	---
Manganese, dissolved (Mn) µg/L	---	---	2.5	---	---



WATER-QUALITY DATA, JULY 10 TO SEPTEMBER 20, 2001
(Milligrams per liter unless otherwise indicated)

	Jul-10		Aug-13			Sep-20		
Lake stage (ft)	10.72		10.67			10.74		
Secchi-depth (m)	2.6		1.7			2.6		
Chlorophyll a, phytoplankton (µg/L)	---		11			17		
Depth of sample (m)	0.5	12.0	0.5	4.5	12.0	0.5	7.0	12.0
Water temperature (°C)	24.6	7.6	25.0	17.4	7.9	18.4	11.6	8.1
Specific conductance (µS/cm)	143	193	147	158	201	160	187	220
pH (units)	8.6	7.1	8.7	7.2	7.0	8.3	7.1	7.0
Dissolved oxygen (mg/L)	10.3	0.3	10.5	0.4	0.2	10.3	0.6	0.3
Phosphorus, total (as P)	---	0.287	0.022	0.032	0.407	0.025	0.040	0.512





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Balsam Lake, near Birchwood, Wisconsin.

432409088151600 BIG CEDAR LAKE, NORTH SITE, NEAR WEST BEND, WI

LOCATION.--Lat 43°24'09", long 88°15'16", in NE 1/4 sw 1/4 sec.20, T.11 N., R.19 E., Washington County, Hydrologic Unit 04040003, near West Bend.

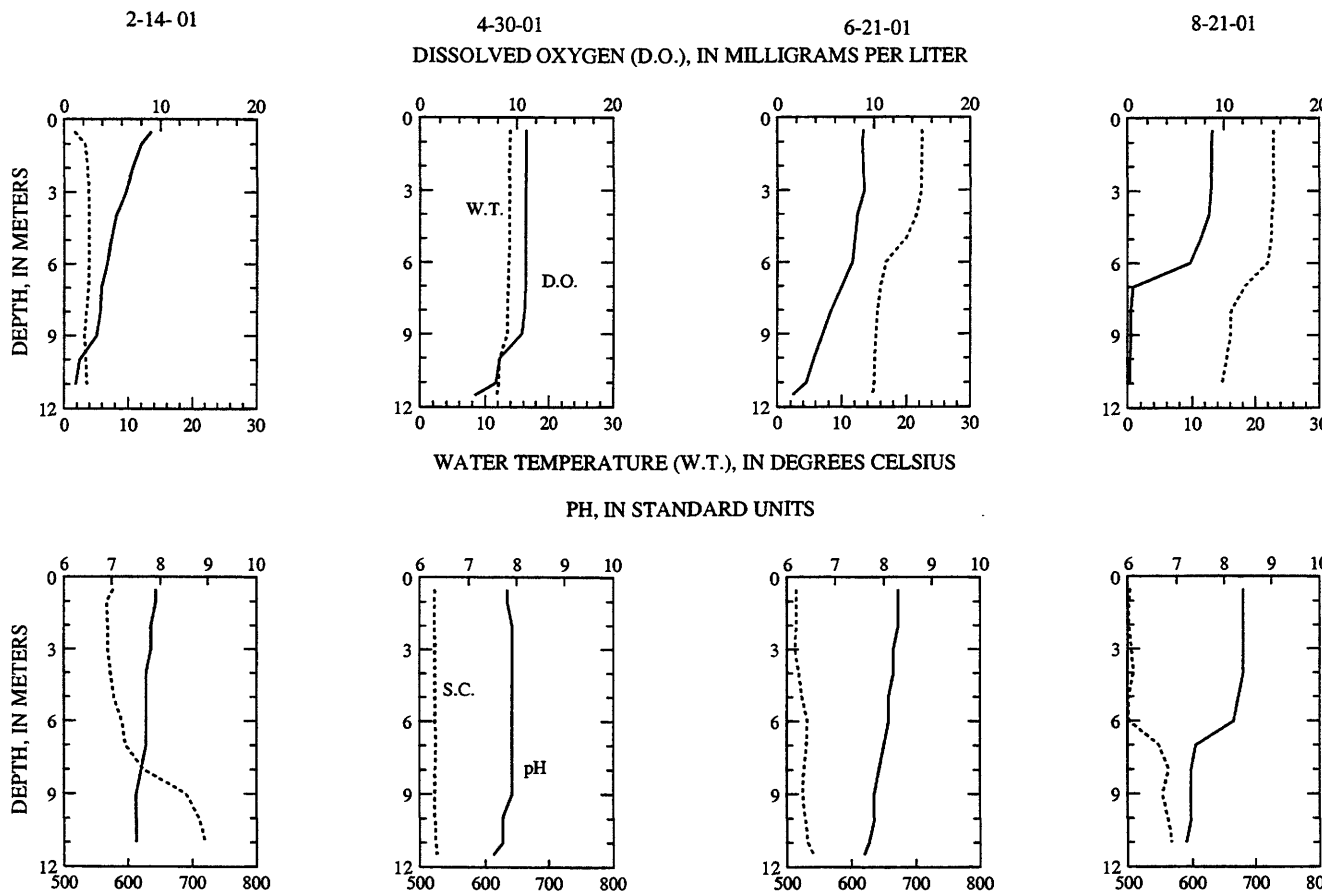
PERIOD OF RECORD.--February 2000 to to current year.

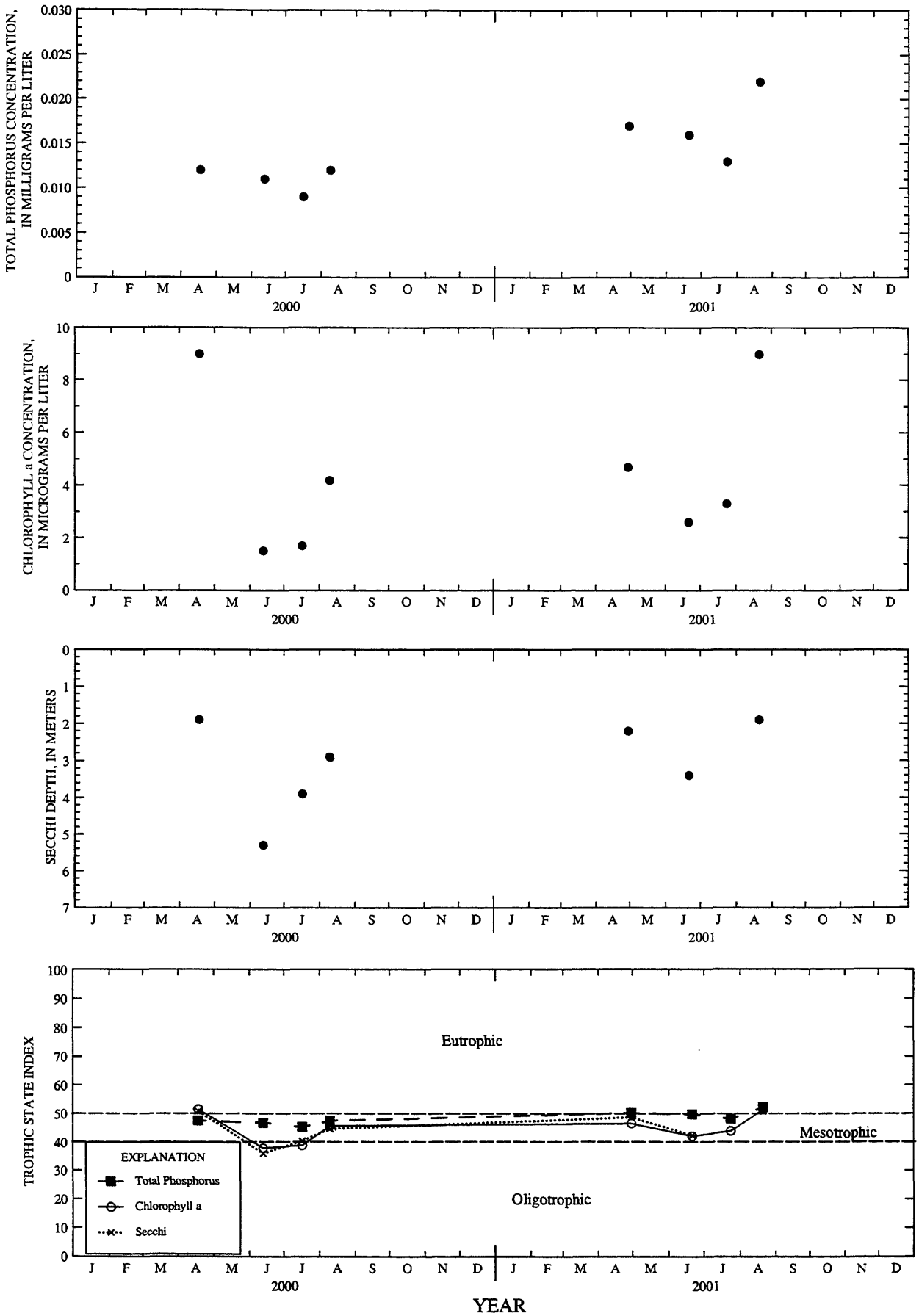
REMARKS.--Lake sampled on north side at a depth of 12 m. Lake ice-covered during February sampling. Water-quality analyses by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, FEBRUARY 14 TO AUGUST 21, 2001

(Milligrams per liter unless otherwise indicated)

	Feb-14		Apr-30		Jun-21		Aug-21			
Secchi-depth (m)	---		2.2		3.4		1.9			
Chlorophyll a, phytoplankton (µg/L)	---		4.7		2.6		9			
Depth of sample (m)	0.5	11.0	0.5	11.5	0.5	11.5	0.5	7.0	9.0	11.0
Water temperature (°C)	1.6	3.6	13.9	11.8	22.5	14.8	22.9	18.2	16.0	14.7
Specific conductance (µS/cm)	577	721	523	526	514	541	503	547	553	567
pH (units)	7.9	7.5	7.8	7.5	8.3	7.6	8.4	7.4	7.3	7.2
Dissolved oxygen (mg/L)	9.0	1.2	11.0	5.6	8.9	1.6	8.8	0.5	0.3	0.2
Phosphorus, total (as P)	0.012	0.021	0.017	0.015	0.016	0.017	0.022	0.021	0.027	0.041
Phosphorus, ortho, dissolved (as P)	---	---	---	---	---	---	0.005	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	---	---	---	---	0.01	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	---	---	---	---	<0.013	---	---	---





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Big Cedar Lake, North Site, near West Bend, Wisconsin.

432224088154900 BIG CEDAR LAKE, SOUTH SITE, NEAR WEST BEND, WI

LOCATION.--Lat 43°22'24", long 88°15'49", in NE 1/4 SE 1/4 sec.31, T.11 N., R.19 E., Washington County, Hydrologic Unit 04040003, near West Bend.

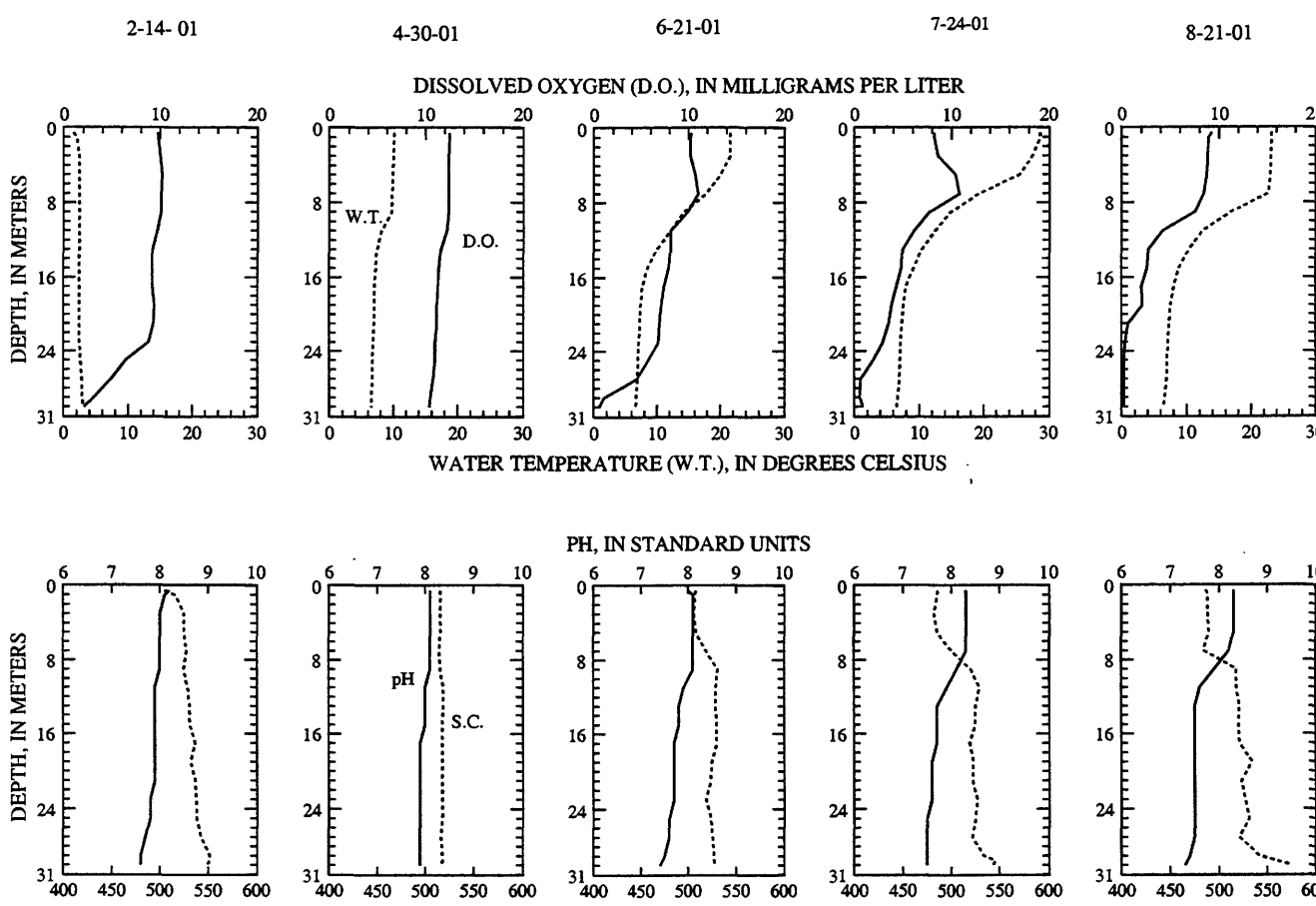
PERIOD OF RECORD.--February 2000 to current year.

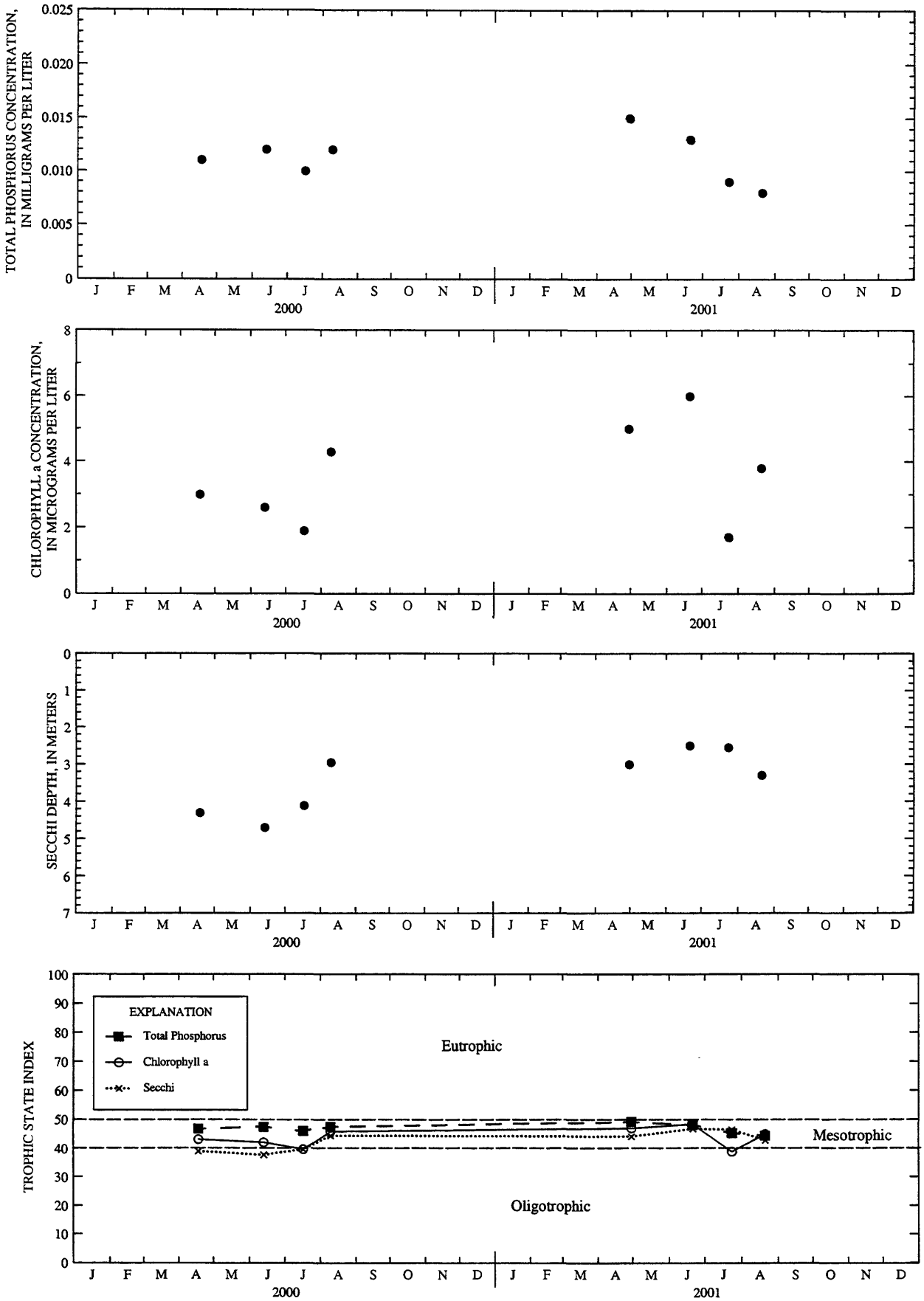
REMARKS.--Lake sampled on south side at deep hole. Lake ice-covered during February sampling. Water-quality analyses by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, FEBRUARY 14 TO AUGUST 21, 2001

(Milligrams per liter unless otherwise indicated)

	Feb-14		Apr-30		Jun-21		Jul-24		Aug-21			
Secchi-depth (m)	---		3.0		2.5		2.6		3.3			
Chlorophyll a, phytoplankton (µg/L)	---		5		6		1.7		3.8			
Depth of sample (m)	0.5	30.0	0.5	30.0	0.5	30.0	0.5	29.5	0.5	19.0	23.0	30.0
Water temperature (°C)	1.5	3.0	10.1	6.5	21.5	6.6	28.7	6.6	23.2	7.5	7.1	6.4
Specific conductance (µS/cm)	505	550	516	518	508	528	486	546	486	534	527	576
pH (units)	8.2	7.6	8.1	7.9	8.0	7.4	8.3	7.5	8.3	7.5	7.5	7.3
Dissolved oxygen (mg/L)	9.8	2.1	12.5	10.4	10.3	0.5	8.2	0.7	9.2	2.1	0.3	0.2
Phosphorus, total (as P)	0.010	0.010	0.015	0.014	0.013	0.052	0.009	0.034	0.008	0.014	0.013	0.158
Phosphorus, ortho, dissolved (as P)	---	---	0.003	---	---	---	---	---	0.004	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	0.273	---	---	---	---	---	<0.010	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	<0.013	---	---	---	---	---	0.015	---	---	---
Nitrogen, amm. + org., total (as N)	---	---	0.56	---	---	---	---	---	---	---	---	---
Nitrogen, total (as N)	---	---	0.833	---	---	---	---	---	---	---	---	---
Color (Pt-Co. scale)	---	---	10	---	---	---	---	---	---	---	---	---
Turbidity (NTU)	---	---	1.7	---	---	---	---	---	---	---	---	---
Hardness, (as $CaCO_3$)	---	---	227	---	---	---	---	---	---	---	---	---
Calcium, dissolved (Ca)	---	---	38	---	---	---	---	---	---	---	---	---
Magnesium, dissolved (Mg)	---	---	32	---	---	---	---	---	---	---	---	---
Sodium, dissolved (Na)	---	---	19	---	---	---	---	---	---	---	---	---
Potassium, dissolved (K)	---	---	0.9	---	---	---	---	---	---	---	---	---
Alkalinity, (as $CaCO_3$)	---	---	190	---	---	---	---	---	---	---	---	---
Sulfate, dissolved (SO_4)	---	---	20.9	---	---	---	---	---	---	---	---	---
Chloride, dissolved (Cl)	---	---	41	---	---	---	---	---	---	---	---	---
Silica, dissolved (SiO_2)	---	---	0.1	---	---	---	---	---	---	---	---	---
Solids, dissolved, at 180°C	---	---	312	---	---	---	---	---	---	---	---	---
Iron, dissolved (Fe) µg/L	---	---	<10	---	---	---	---	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	<0.4	---	---	---	---	---	---	---	---	---





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Big Cedar Lake, South Site, near West Bend, Wisconsin.

453142092180100 BIG ROUND LAKE NEAR MILLTOWN, WI

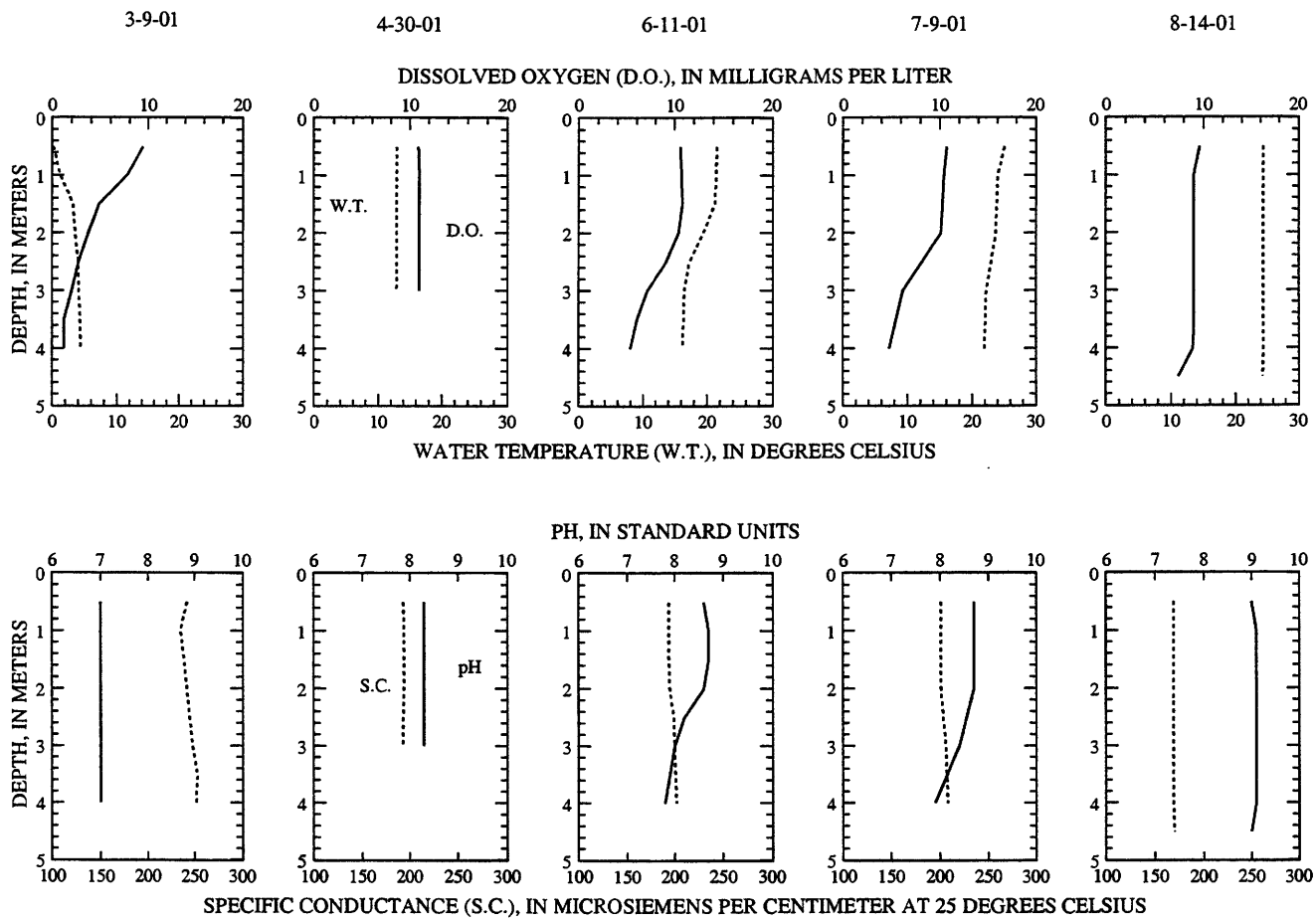
LOCATION.--Lat 45°31'42", long 92°18'01", in NE 1/4 SW 1/4 SW 1/4 sec.12, T.35 N., R.16 W., Polk County, Hydrologic Unit 07030005, near Millton.

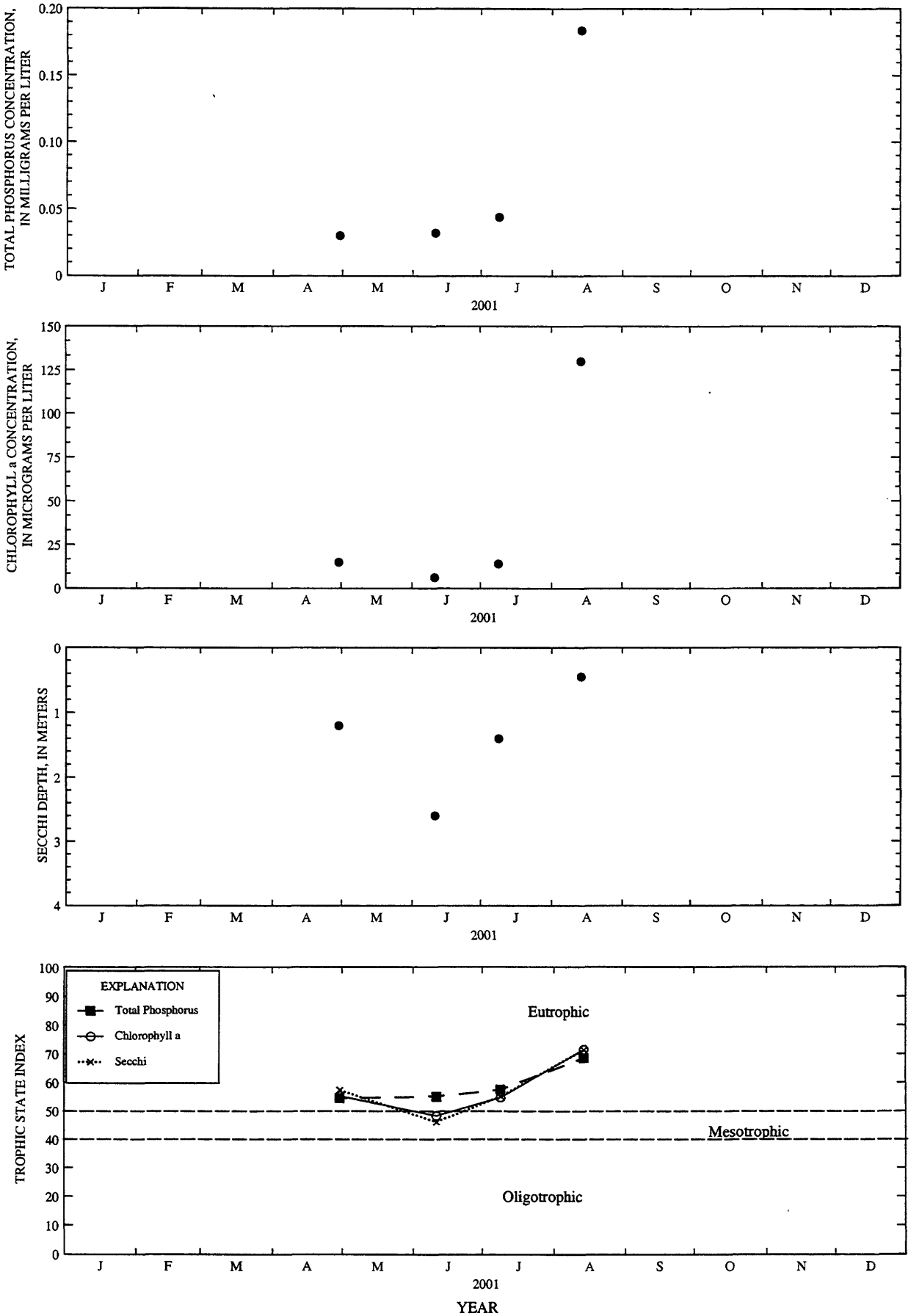
PERIOD OF RECORD.--February to September 2001.

REMARKS.--Lake sampled near center of lake at a depth of 4.0 m. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, MARCH 09 TO AUGUST 14, 2001
(Milligrams per liter unless otherwise indicated)

	Mar-9		Apr-30		Jun-11		Jul-9		Aug-14	
Lake stage (ft)	---		4.89		4.31		4.04		4.05	
Secchi-depth (m)	---		1.2		2.6		1.4		0.4	
Chlorophyll a, phytoplankton (µg/L)	---		15		6		14		130	
Depth of sample (m)	0.5	4.0	0.5	3.0	0.5	4.0	0.5	4.0	0.5	4.5
Water temperature (°C)	0.1	4.3	12.9	12.9	21.5	16.2	25.1	21.9	24.4	24.4
Specific conductance (µS/cm)	242	253	193	193	194	202	201	208	169	169
pH (units)	7.0	7.0	8.3	8.3	8.6	7.8	8.7	7.9	9.0	9.1
Dissolved oxygen (mg/L)	9.4	1.2	10.9	11.0	10.6	5.3	10.7	4.8	9.6	8.9
Phosphorus, total (as P)	0.027	0.053	0.030	0.033	0.032	0.038	0.044	0.053	0.184	0.191
Phosphorus, ortho, dissolved (as P)	---	---	0.003	---	---	---	---	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	<0.010	---	---	---	---	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	<0.013	---	---	---	---	---	---	---
Nitrogen, amm. + org., total (as N)	---	---	0.58	---	---	---	---	---	---	---
Nitrogen, total (as N)	---	---	---	---	---	---	---	---	---	---
Color (Pt-Co. scale)	---	---	20	---	---	---	---	---	---	---
Turbidity (NTU)	---	---	0.3	---	---	---	---	---	---	---
Hardness, (as $CaCO_3$)	---	---	99.1	---	---	---	---	---	---	---
Calcium, dissolved (Ca)	---	---	26	---	---	---	---	---	---	---
Magnesium, dissolved (Mg)	---	---	8.3	---	---	---	---	---	---	---
Sodium, dissolved (Na)	---	---	3	---	---	---	---	---	---	---
Potassium, dissolved (K)	---	---	0.7	---	---	---	---	---	---	---
Alkalinity, (as $CaCO_3$)	---	---	92	---	---	---	---	---	---	---
Sulfate, dissolved (SO_4)	---	---	<4.5	---	---	---	---	---	---	---
Chloride, dissolved (Cl)	---	---	3.1	---	---	---	---	---	---	---
Silica, dissolved (SiO_2)	---	---	18.5	---	---	---	---	---	---	---
Solids, dissolved, at 180°C	---	---	126	---	---	---	---	---	---	---
Iron, dissolved (Fe) µg/L	---	---	<10	---	---	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	42	---	---	---	---	---	---	---





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Big Round Lake, near Milltown, Wisconsin.

05390750 BIG ST. GERMAIN LAKE NEAR LAKE TOMAHAWK, WI

LOCATION.--Lat 45°55'00", long 89°31'55" in NE 1/4 SE 1/4 sec.30, T.40 N., R.8 E., Vilas County, Hydrologic Unit 07070001, at dam outlet, 7.7 mi northeast of Lake Tomahawk.

DRAINAGE AREA.--73.1 mi^2.

PERIOD OF RECORD.--October 1991 to current year. Lake stages for previous years were recorded by Wisconsin Valley Improvement Company.

GAGE.--Nonrecording gage. Datum of gage is 1,580 ft, above sea level.

COOPERATION.--Lake stages provided by Wisconsin Valley Improvement Company.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 10.98 ft, May 9, 1999; minimum observed, 8.16 ft, Jan. 26, 1996, and Mar. 11, 2001.

EXTREMES FOR CURRENT YEAR.--Maximum gage height observed, 10.78 ft, June 19, 20; minimum observed, 8.16 ft, Mar. 11.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10.56	---	9.78	---	---	8.18	8.48	10.68	10.56	10.48	10.60	10.50
2	10.54	---	---	8.66	8.34	8.18	8.56	10.70	10.54	10.48	10.76	10.48
3	10.54	10.10	9.74	---	---	---	8.66	10.76	10.54	10.46	10.76	10.48
4	10.54	---	---	---	8.34	8.22	8.74	10.72	10.52	10.46	10.76	10.48
5	10.54	10.08	9.70	8.62	---	---	8.82	10.68	10.52	10.46	10.76	10.46
6	10.52	---	---	---	8.34	8.20	8.92	10.66	10.52	10.46	10.76	10.46
7	10.52	10.04	---	8.58	---	---	9.00	10.64	10.52	10.46	10.68	10.54
8	10.52	---	9.62	---	---	---	9.12	10.62	10.50	10.44	10.64	10.66
9	---	---	---	8.52	8.40	8.20	9.18	10.60	10.50	10.46	10.60	10.68
10	10.52	10.00	9.58	---	---	---	9.30	10.64	10.50	10.46	10.56	10.64
11	---	---	---	---	8.42	8.16	9.42	10.66	10.54	10.46	10.54	10.62
12	---	9.96	9.50	8.42	---	---	9.56	10.64	10.58	10.48	10.50	10.60
13	10.52	---	---	---	8.42	8.30	9.68	10.64	10.66	10.48	10.52	10.58
14	---	9.94	---	8.46	---	---	9.74	10.64	10.66	10.48	10.52	10.60
15	10.52	---	9.28	---	---	---	9.84	10.62	10.64	10.46	10.54	10.60
16	---	---	---	8.46	8.42	8.40	9.92	10.60	10.64	10.50	10.54	10.58
17	10.52	9.90	9.10	---	---	---	10.02	10.58	10.62	10.48	10.52	10.58
18	---	---	---	---	---	8.44	10.08	10.54	10.64	10.48	10.54	10.58
19	---	9.90	9.08	8.45	---	---	10.16	10.50	10.78	10.46	10.58	10.60
20	10.48	---	---	---	8.40	8.46	10.22	10.48	10.78	10.58	10.58	10.60
21	---	9.88	---	8.45	---	---	10.28	10.48	10.76	10.66	10.58	10.60
22	10.44	---	8.98	---	---	8.46	10.40	10.48	10.72	10.66	10.56	10.60
23	---	---	---	8.42	8.38	8.46	10.50	10.50	10.68	10.64	10.56	10.66
24	10.38	9.86	8.88	---	---	8.46	10.60	10.52	10.62	10.64	10.56	10.62
25	---	---	---	---	8.38	8.46	10.62	10.54	10.60	10.64	10.56	10.62
26	---	9.84	8.76	8.40	---	8.46	10.68	10.54	10.58	10.62	10.56	10.58
27	---	---	---	---	8.28	8.46	10.68	10.56	10.56	10.62	10.56	10.56
28	---	9.82	---	8.38	---	8.46	10.68	10.56	10.52	10.62	10.54	10.54
29	10.18	---	8.77	---	---	8.46	10.70	10.56	10.50	10.61	10.54	10.54
30	---	---	---	8.36	---	8.47	10.68	10.56	10.50	10.62	10.52	10.54
31	10.16	---	8.68	8.36	---	8.47	---	10.56	---	10.62	10.50	---
MEAN	---	---	---	---	---	---	9.77	10.60	10.59	10.53	10.59	10.57
MAX	---	---	---	---	---	---	10.70	10.76	10.78	10.66	10.76	10.68
MIN	---	---	---	---	---	---	8.48	10.48	10.50	10.44	10.50	10.46

454910092134000 BIG SAND LAKE AT DEEP HOLE NEAR HERTEL, WI

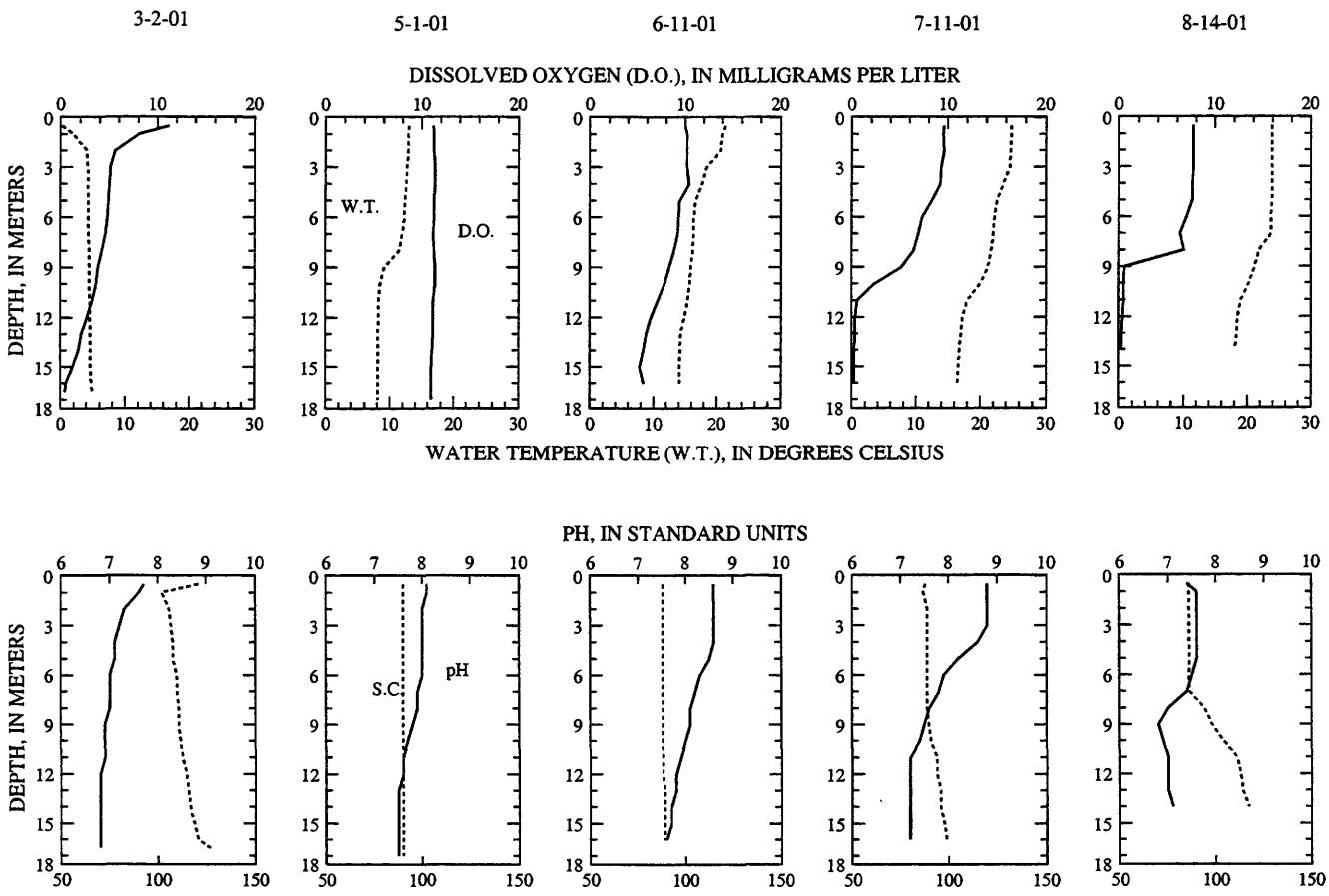
LOCATION.--Lat 45°49'10", long 92°13'40", in NE 1/4 SE 1/4 SW 1/4 sec.33, T.39 N., R.16 W., Burnett County, Hydrologic Unit 07030001, near Hertel.

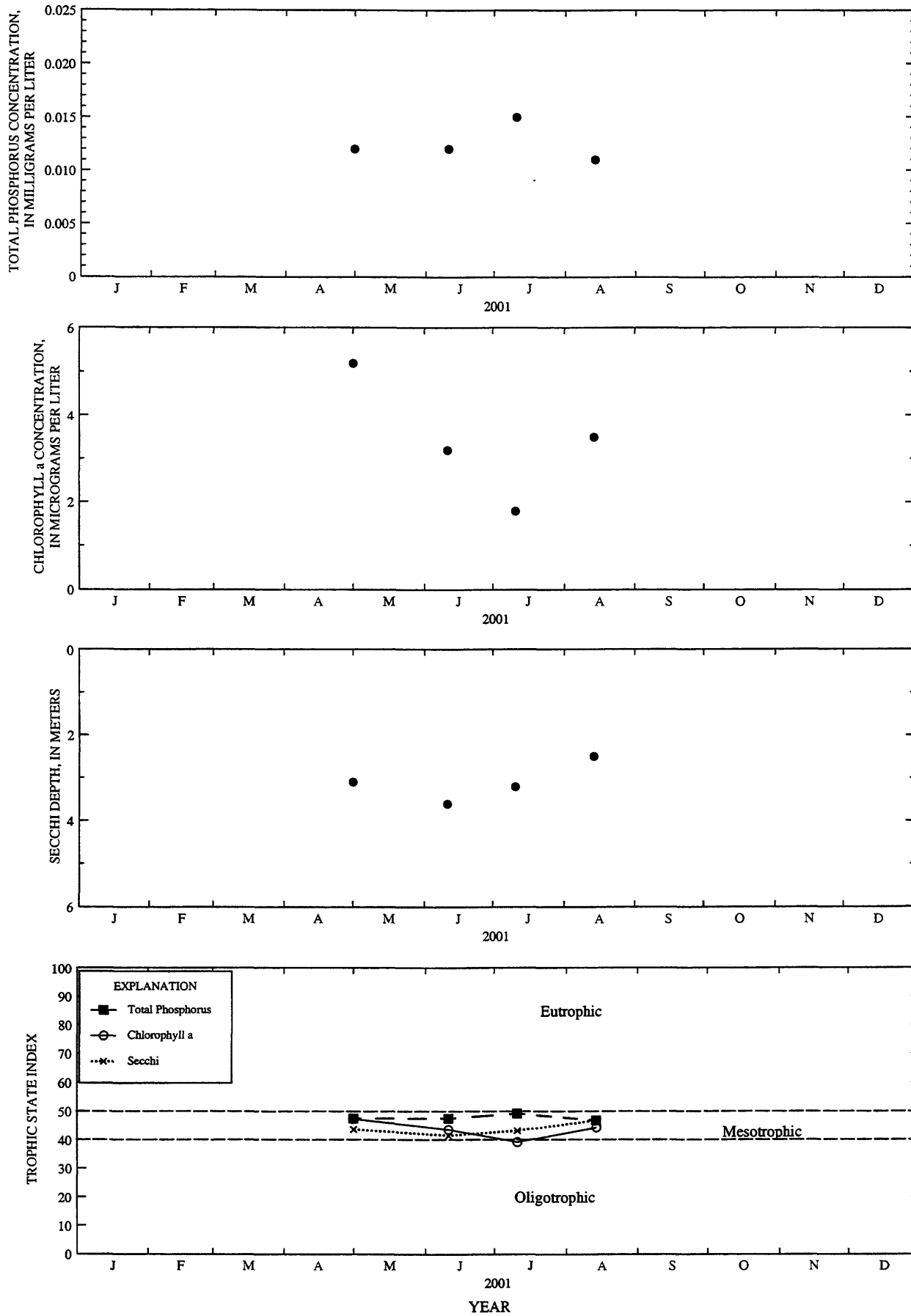
PERIOD OF RECORD.--February to September 2001.

REMARKS.--Lake sampled on west side of lake at a depth of 16.0 m. Water-quality analyses by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, MARCH 02 TO AUGUST 14, 2001
(Milligrams per liter unless otherwise indicated)

	Mar-2		May-1		Jun-11		Jul-11		Aug-14		
Lake stage (ft)	---		4.92		4.70		4.30		3.70		
Secchi-depth (m)	---		3.1		3.6		3.2		2.50		
Chlorophyll a, phytoplankton (µg/L)	---		5.2		3.2		1.8		3.5		
Depth of sample (m)	0.5	16.0	0.5	16.5	0.5	16.0	0.5	16.0	0.5	10.0	14.0
Water temperature (°C)	0.2	4.7	13.0	8.1	21.4	14.1	24.8	16.5	23.9	20.2	18.1
Specific conductance (µS/cm)	121	121	90	90	88	89	88	99	86	104	117
pH (units)	7.7	6.8	8.1	7.5	8.6	7.6	8.8	7.2	7.4	6.9	7.1
Dissolved oxygen (mg/L)	11.2	0.5	11.2	11.0	10.0	5.6	9.6	0.2	7.7	0.4	0.2
Phosphorus, total (as P)	0.013	0.018	0.012	0.016	0.012	0.011	0.015	0.024	0.011	0.017	0.033
Phosphorus, ortho, dissolved (as P)	---	---	0.002	---	---	---	---	---	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	<0.010	---	---	---	---	---	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	0.019	---	---	---	---	---	---	---	---
Nitrogen, amm. + org., total (as N)	---	---	0.54	---	---	---	---	---	---	---	---
Nitrogen, total (as N)	---	---	---	---	---	---	---	---	---	---	---
Color (Pt-Co. scale)	---	---	15	---	---	---	---	---	---	---	---
Turbidity (NTU)	---	---	4.6	---	---	---	---	---	---	---	---
Hardness, (as $CaCO_3$)	---	---	44	---	---	---	---	---	---	---	---
Calcium, dissolved (Ca)	---	---	12	---	---	---	---	---	---	---	---
Magnesium, dissolved (Mg)	---	---	3.4	---	---	---	---	---	---	---	---
Sodium, dissolved (Na)	---	---	2.1	---	---	---	---	---	---	---	---
Potassium, dissolved (K)	---	---	0.6	---	---	---	---	---	---	---	---
Alkalinity, (as $CaCO_3$)	---	---	41	---	---	---	---	---	---	---	---
Sulfate, dissolved (SO_4)	---	---	<4.5	---	---	---	---	---	---	---	---
Chloride, dissolved (Cl)	---	---	2	---	---	---	---	---	---	---	---
Silica, dissolved (SiO_2)	---	---	0.9	---	---	---	---	---	---	---	---
Solids, dissolved, at 180°C	---	---	56	---	---	---	---	---	---	---	---
Iron, dissolved (Fe) µg/L	---	---	120	---	---	---	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	1.3	---	---	---	---	---	---	---	---





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Big Sand Lake, Deep Hole, near Hertel, Wisconsin.

454921092124300 BIG SAND LAKE, EAST SITE, NEAR HERTEL, WI

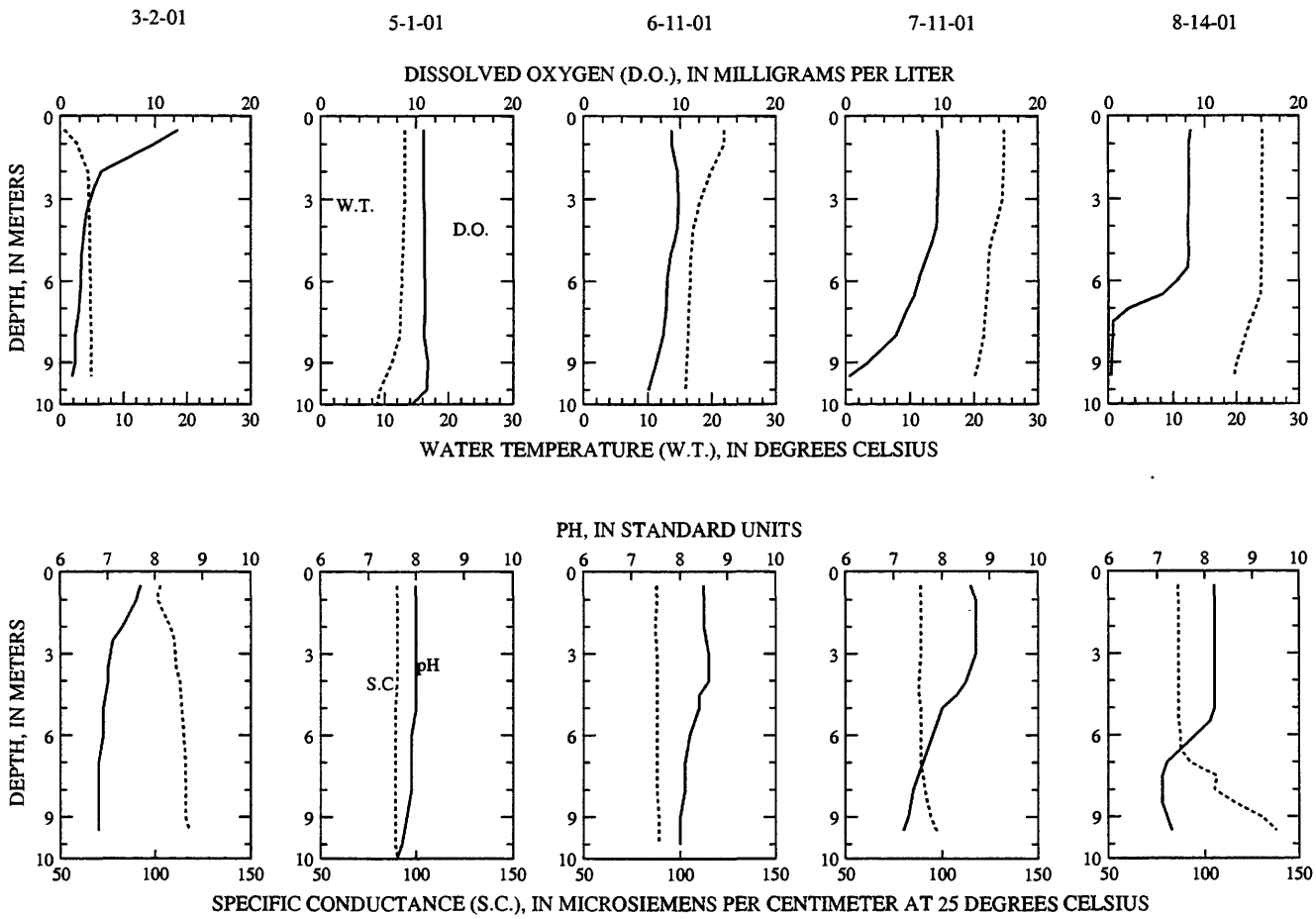
LOCATION.--Lat 45°49'21", long 92°12'43", in NE 1/4 NW 1/4 SW 1/4 sec.34, T.39 N., R.15 W., Burnett County, Hydrologic Unit 07030001, near Hertel.

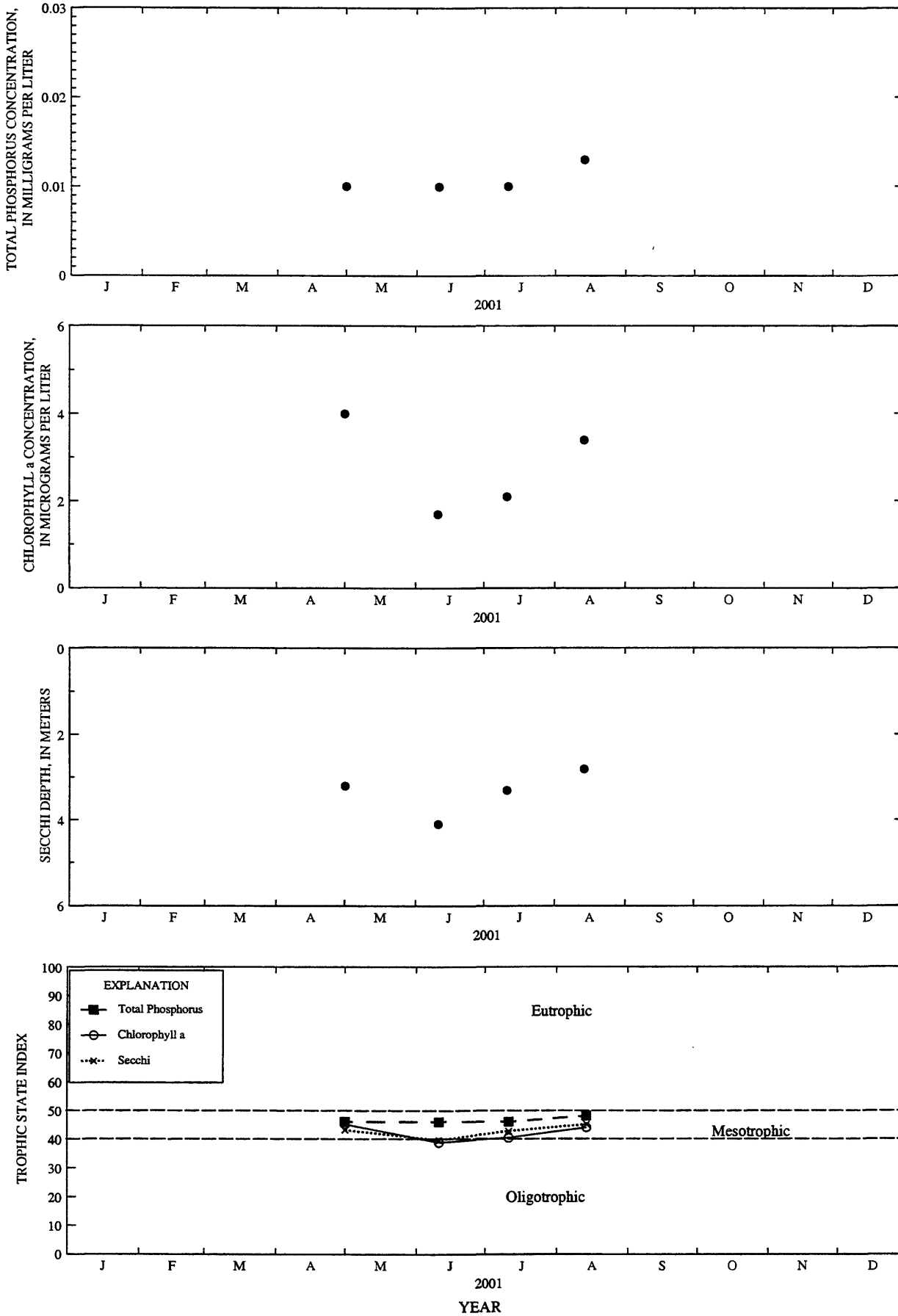
PERIOD OF RECORD.--February to September 2001.

REMARKS.--Lake sampled on east side of lake at a depth of 9.0 m. Water-quality analyses by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, MARCH 02 TO AUGUST 14, 2001
(Milligrams per liter unless otherwise indicated)

	Mar-2	May-1	Jun-11	Jul-11	Aug-14	
Lake stage (ft)	---	4.92	4.70	4.30	3.70	
Secchi-depth (m)	---	3.2	4.1	3.3	2.8	
Chlorophyll a, phytoplankton (µg/L)	---	4	1.7	2.1	3.4	
Depth of sample (m)	0.5	0.5	0.5	0.5	0.5	9.5
Water temperature (°C)	0.6	13.2	21.9	24.8	24.2	19.6
Specific conductance (µS/cm)	103	90	88	89	86	138
pH (units)	7.7	8.0	8.5	8.6	8.2	7.3
Dissolved oxygen (mg/L)	12.4	10.8	9.1	9.5	8.5	0.2
Phosphorus, total (as P)	0.016	0.010	0.010	0.010	0.013	0.021





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Big Sand Lake, East Site, near Hertel, Wisconsin.

454724091303600 BIG SISSABAGAMA LAKE NEAR STONE LAKE, WI

LOCATION.--Lat 45°47'24", long 91°30'36", in NW 1/4 SE 1/4 sec.6, T.38 N., R.9 W., Sawyer County, Hydrologic Unit 07050001, near Stone Lake.

DRAINAGE AREA.--9.47 mi^2.

LAKE-STAGE RECORDS

PERIOD OF RECORD.--April 1986 to September 1996, and October 1997 to current year, during open-water periods.

GAGE.--Water surface measured from reference point near lake outlet. Measurements were made by Richard Roehrich and James Eary.

EXTREMES FOR PERIOD OF RECORD: Maximum gage height observed, 6.39 ft, July 9, 2000; minimum observed, 4.78 ft, Sept. 15, 16, 1988.

EXTREMES FOR CURRENT YEAR.--Maximum gage height observed, 6.36 ft, Apr. 25; minimum observed, less than 5.38 ft, Oct. 8-12.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.55	5.53	---	---	---	---	---	6.20	5.86	5.84	5.85	5.57
2	5.54	5.74	---	---	---	---	---	6.15	5.84	5.81	5.84	5.55
3	5.51	5.80	---	---	---	---	---	6.11	5.80	5.79	5.84	5.54
4	5.48	5.80	---	---	---	---	---	6.08	5.80	5.76	5.82	5.54
5	5.46	5.80	---	---	---	---	---	6.06	5.78	5.74	5.82	5.53
6	5.43	5.84	---	---	---	---	---	6.05	5.76	5.73	5.81	5.53
7	5.40	5.90	---	---	---	---	---	6.04	5.80	5.71	5.80	5.60
8	5.38	5.89	---	---	---	---	---	6.02	5.76	5.70	5.73	5.63
9	5.38	5.88	---	---	---	---	---	6.00	5.78	5.70	5.75	5.64
10	5.38	5.85	---	---	---	---	---	6.08	5.83	5.69	5.70	5.62
11	5.38	5.84	---	---	---	---	---	6.05	---	5.68	5.69	5.62
12	5.38	5.86	---	---	---	---	---	6.04	---	5.67	5.68	5.61
13	5.39	5.89	---	---	---	---	---	6.03	5.98	---	5.66	5.60
14	5.40	5.90	---	---	---	---	---	6.15	6.00	---	5.65	5.55
15	5.41	5.90	---	---	---	---	---	6.12	5.98	5.63	5.66	5.55
16	5.41	5.90	---	---	---	---	---	6.10	5.99	5.62	5.67	5.55
17	5.41	5.89	---	---	---	---	---	6.06	5.97	5.63	5.66	5.55
18	5.41	5.88	---	---	---	---	---	---	6.05	5.68	5.67	5.55
19	5.41	5.87	---	---	---	---	---	6.00	6.10	5.66	5.66	5.55
20	5.42	5.87	---	---	---	---	---	5.96	6.10	---	5.65	5.55
21	5.42	5.87	---	---	---	---	---	5.98	6.08	---	5.65	5.55
22	5.42	5.86	---	---	---	---	---	6.00	6.05	5.75	5.64	5.56
23	5.43	5.86	---	---	---	---	---	5.98	---	5.75	5.63	5.56
24	5.44	5.85	---	---	---	---	---	5.95	6.00	5.73	5.61	5.55
25	5.45	5.84	---	---	---	---	6.36	6.00	5.98	5.70	5.60	5.52
26	5.46	5.84	---	---	---	---	6.31	5.98	5.95	5.69	5.60	5.55
27	5.48	5.84	---	---	---	---	6.25	5.96	5.93	5.67	5.60	5.50
28	5.46	5.84	---	---	---	---	6.23	5.95	5.91	5.70	5.59	5.46
29	5.48	5.84	---	---	---	---	6.22	5.94	5.89	5.69	5.59	5.45
30	5.50	5.84	---	---	---	---	6.21	5.90	5.85	5.69	5.60	5.42
31	5.51	---	---	---	---	---	---	5.88	---	5.69	5.59	---
MEAN	5.44	5.84	---	---	---	---	---	---	---	---	5.69	5.55
MAX	5.55	5.90	---	---	---	---	---	---	---	---	5.85	5.64
MIN	5.38	5.53	---	---	---	---	---	---	---	---	5.59	5.42

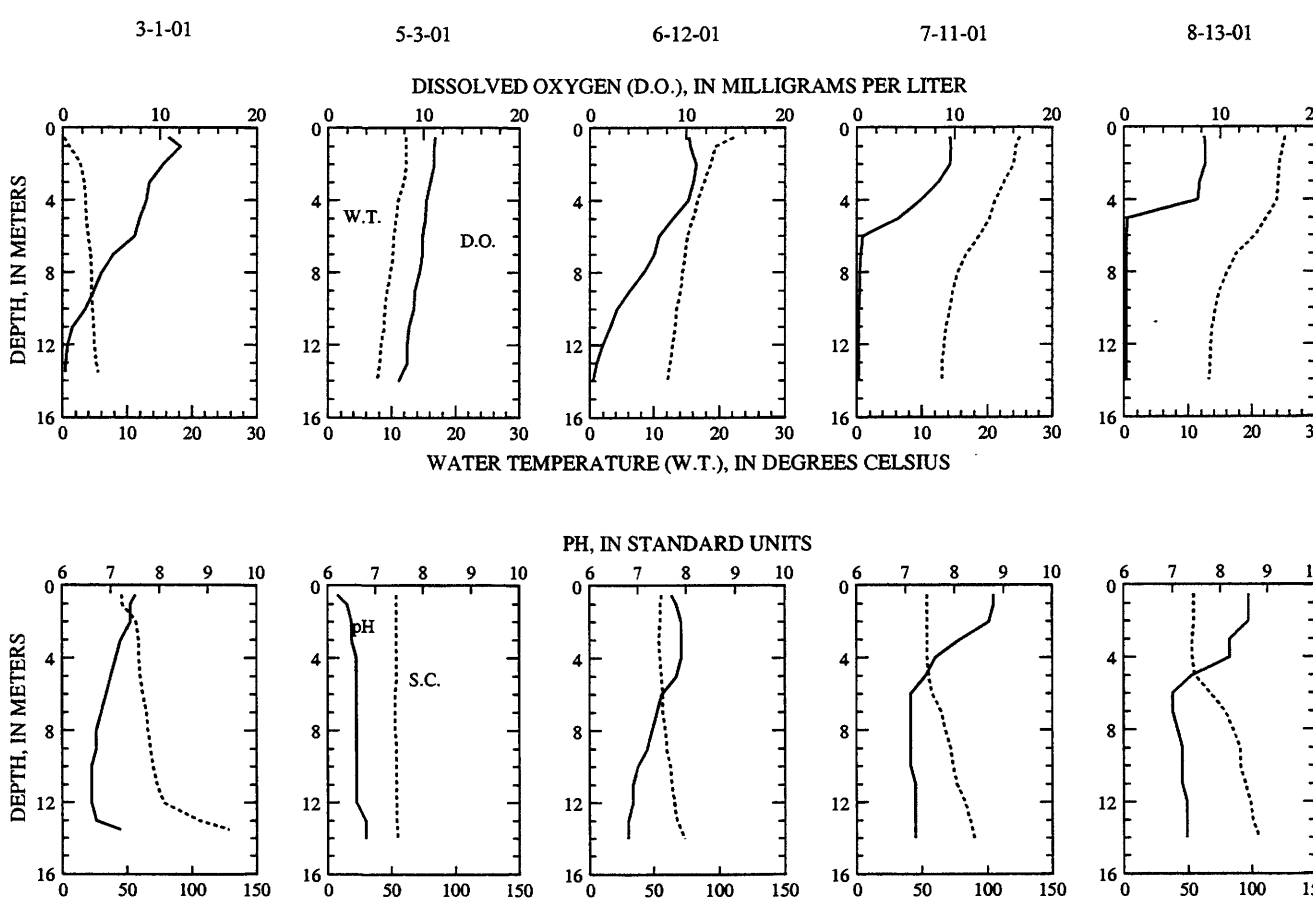
WATER-QUALITY RECORDS

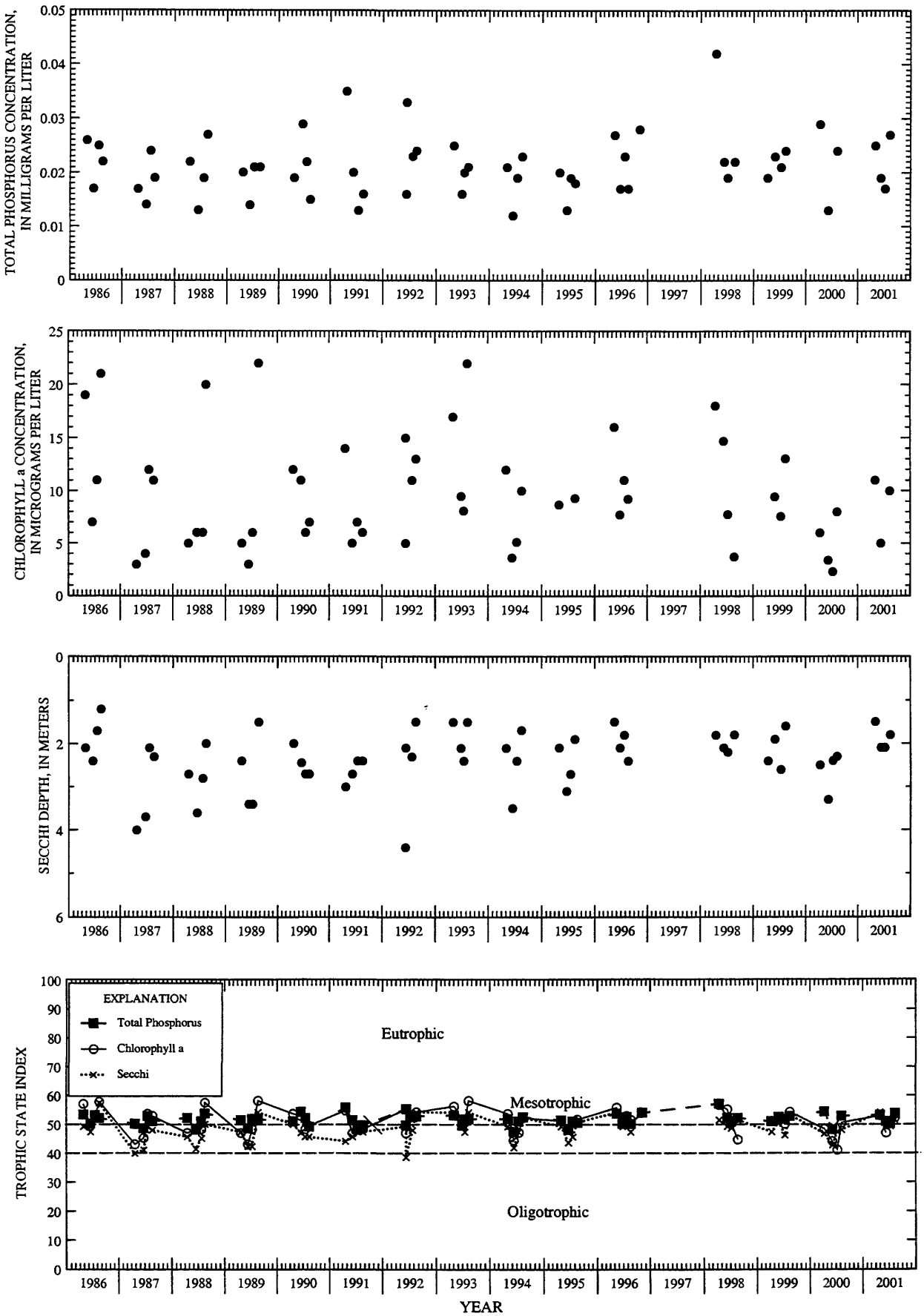
PERIOD OF RECORD.--1986 to 1996, and March 1998 to current year.

REMARKS.--Lake sampled near center at the deep hole. Lake ice-covered during March sampling. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, MARCH 01 TO AUGUST 13, 2001
(Milligrams per liter unless otherwise indicated)

	Mar-1		May-3	Jun-12		Jul-11		Aug-13		
Lake stage (ft)	---		6.11	5.88		5.68		5.66		
Secchi-depth (m)	---		1.5	2.4		2.3		1.8		
Chlorophyll a, phytoplankton (µg/L)	---		11	5		---		10		
Depth of sample (m)	0.5	13.0	0.5	0.5	14.0	0.5	14.0	0.5	6.0	14.0
Water temperature (°C)	0.1	5.2	12.3	22.1	12.5	20.3	13.1	25.3	20.5	13.2
Specific conductance (µS/cm)	46	106	54	56	68	55	90	54	67	106
pH (units)	7.5	6.7	6.2	7.7	6.8	8.0	7.2	8.6	7.0	7.3
Dissolved oxygen (mg/L)	10.9	0.3	11.2	10.3	0.7	10.5	0.2	8.3	0.2	0.2
Phosphorus, total (as P)	0.011	0.155	0.025	0.019	0.096	---	0.099	0.027	0.032	0.255
Phosphorus, ortho, dissolved (as P)	---	---	0.003	---	---	---	---	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	0.059	---	---	---	---	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	0.015	---	---	---	---	---	---	---
Nitrogen, amm. + org., total (as N)	---	---	0.61	---	---	---	---	---	---	---
Nitrogen, total (as N)	---	---	0.669	---	---	---	---	---	---	---
Color (Pt-Co. scale)	---	---	40	---	---	---	---	---	---	---
Turbidity (NTU)	---	---	3.9	---	---	---	---	---	---	---
Hardness, (as $CaCO_3$)	---	---	27.9	---	---	---	---	---	---	---
Calcium, dissolved (Ca)	---	---	6.9	---	---	---	---	---	---	---
Magnesium, dissolved (Mg)	---	---	2.6	---	---	---	---	---	---	---
Sodium, dissolved (Na)	---	---	1.6	---	---	---	---	---	---	---
Potassium, dissolved (K)	---	---	0.8	---	---	---	---	---	---	---
Alkalinity, (as $CaCO_3$)	---	---	25	---	---	---	---	---	---	---
Sulfate, dissolved (SO_4)	---	---	<4.5	---	---	---	---	---	---	---
Chloride, dissolved (Cl)	---	---	1.1	---	---	---	---	---	---	---
Silica, dissolved (SiO_2)	---	---	5.5	---	---	---	---	---	---	---
Solids, dissolved, at 180°C	---	---	48	---	---	---	---	---	---	---
Iron, dissolved (Fe) µg/L	---	---	130	---	---	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	0.9	---	---	---	---	---	---	---





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Big Sissabagma Lake, near Stone Lake, Wisconsin.

454800091312900 BIG SISSABAGAMA LAKE, NORTH SITE, NEAR STONE LAKE, WI

LOCATION.--Lat 42°48'00", long 91°31'29", in NE 1/4 SE 1/4 sec.6, T.38 N., R.9 W., Sawyer County, Hydrologic Unit 07050001, near Stone Lake.

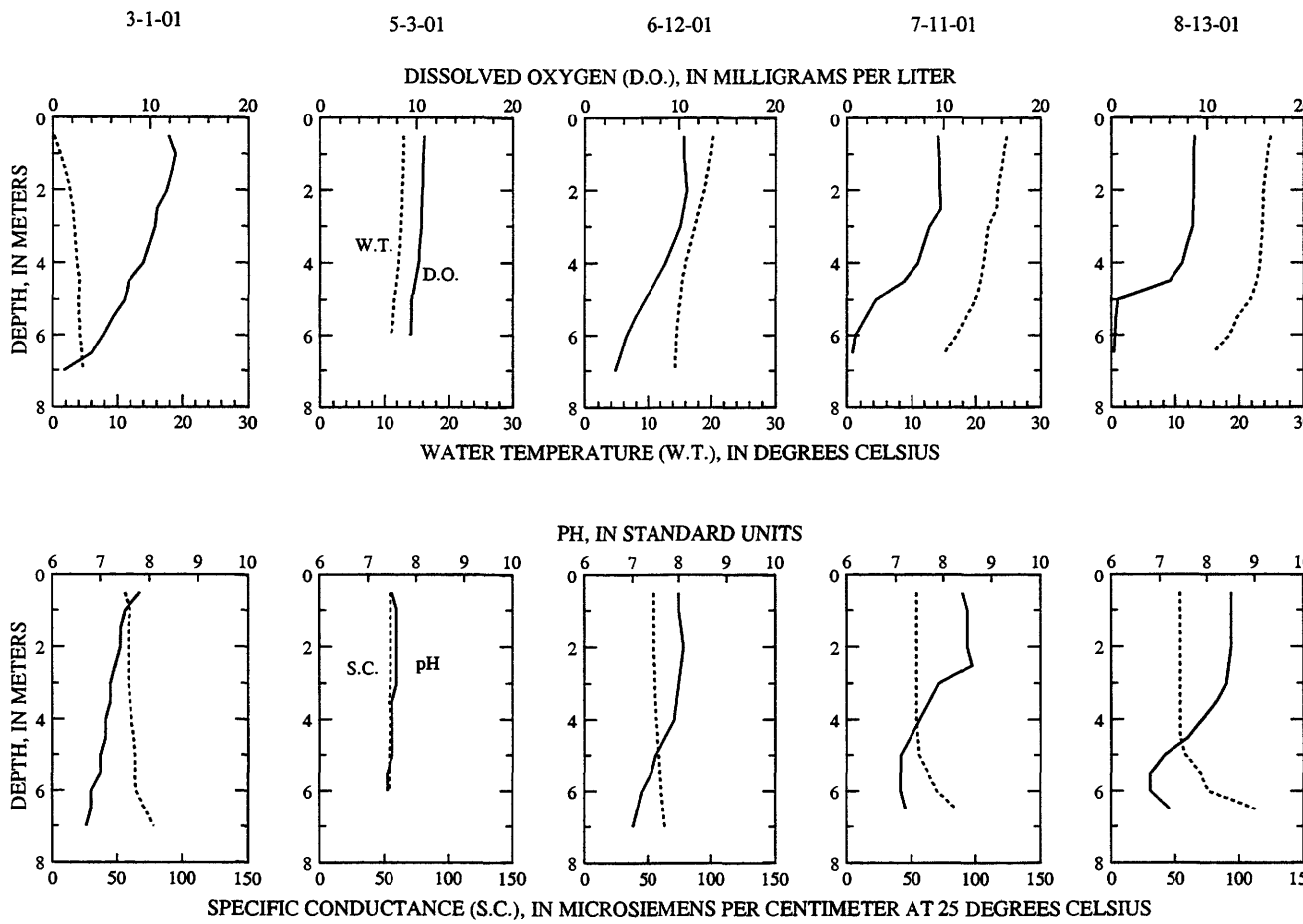
DRAINAGE AREA.--9.47 mi^2.

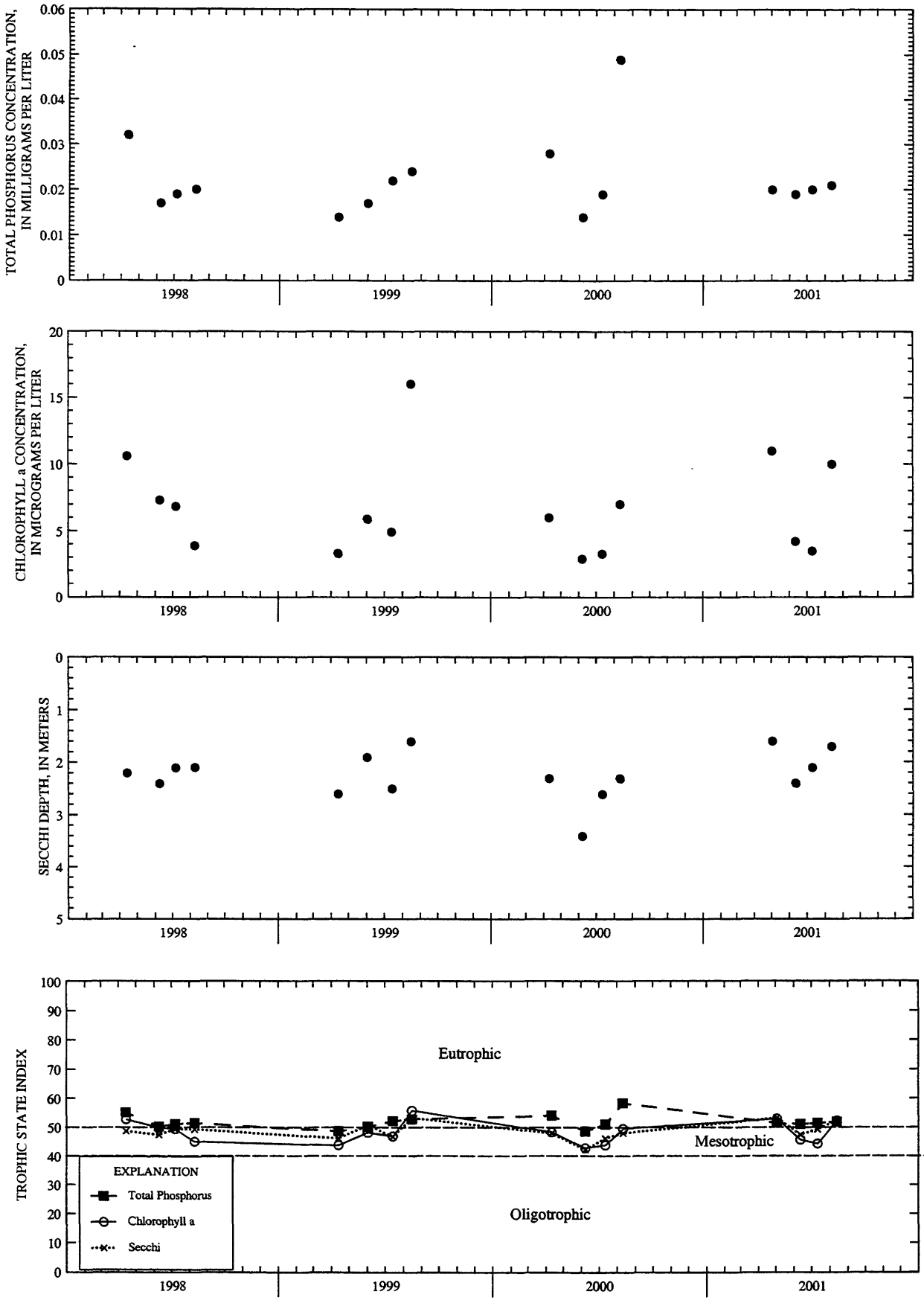
PERIOD OF RECORD.--March 1998 to current year.

REMARKS.--Lake sampled near the deepest part of the North Bay. Lake ice-covered during March sampling. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, MARCH 01 TO AUGUST 13, 2001
(Milligrams per liter unless otherwise indicated)

	Mar-1	May-3	Jun-12	Jul-11	Aug-13	
Lake stage (ft)	---	6.11	5.88	5.68	5.66	
Secchi-depth (m)	---	1.6	2.3	2.1	1.7	
Chlorophyll a, phytoplankton (µg/L)	---	11	4.2	3.5	10	
Depth of sample (m)	0.5	0.5	0.5	0.5	0.5	6.5
Water temperature (°C)	0.1	13.0	20.3	24.8	25.0	15.9
Specific conductance (µS/cm)	56	55	55	54	54	113
pH (units)	7.8	7.5	8.0	8.4	8.5	7.2
Dissolved oxygen (mg/L)	11.9	10.8	10.5	9.4	8.7	0.2
Phosphorus, total (as P)	0.012	0.020	0.019	0.020	0.021	0.041





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Big Sissabagma Lake, North Site, near Stone Lake, Wisconsin.

424800088254800 BOOTH LAKE NEAR EAST TROY, WI

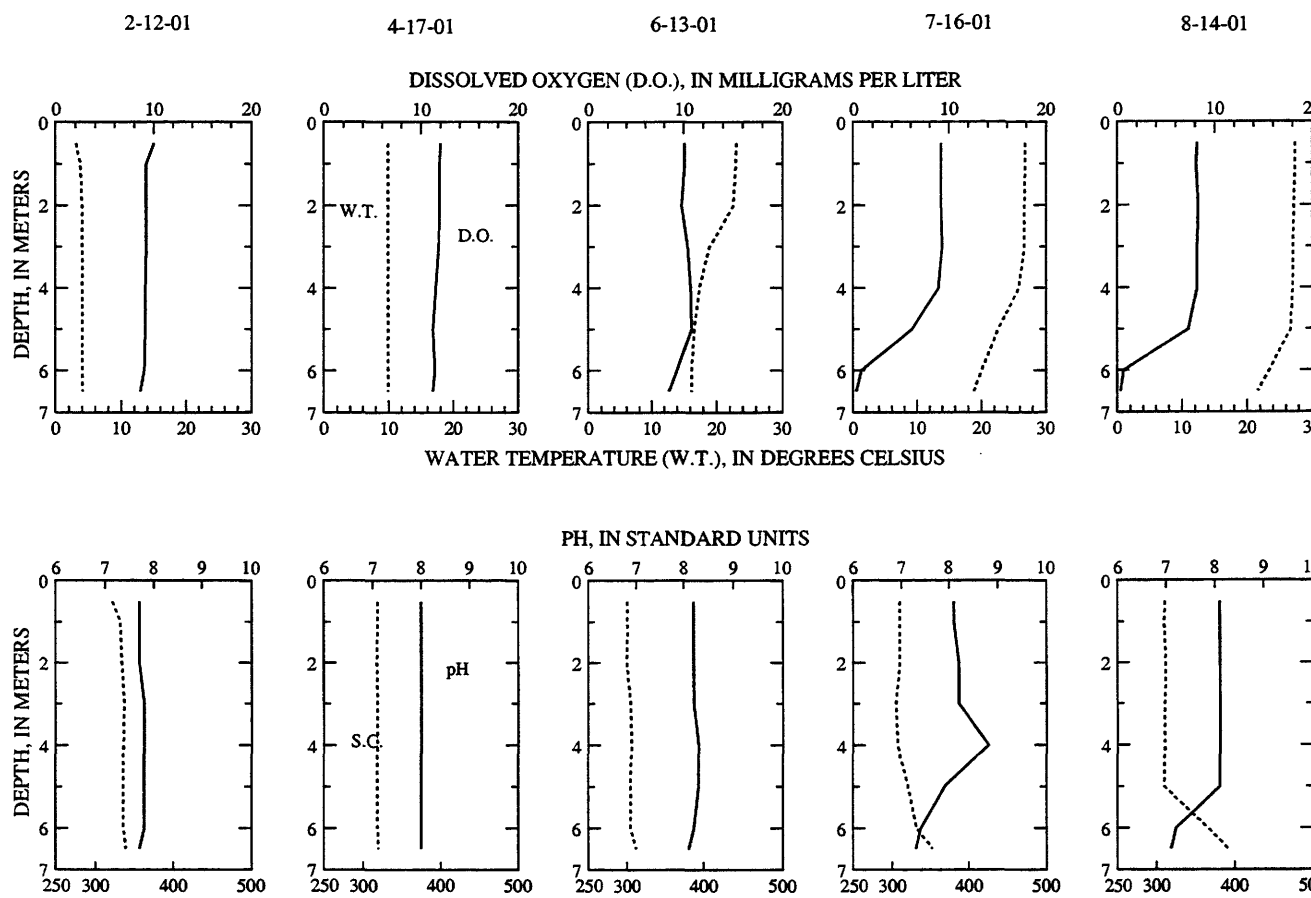
LOCATION.--Lat 42°48'00", long 88°25'48", in SW 1/4 SE 1/4 sec.13, T.4 N., R.17 E., Walworth County, Hydrologic Unit 07120006, 1.6 mi northwest of East Troy.

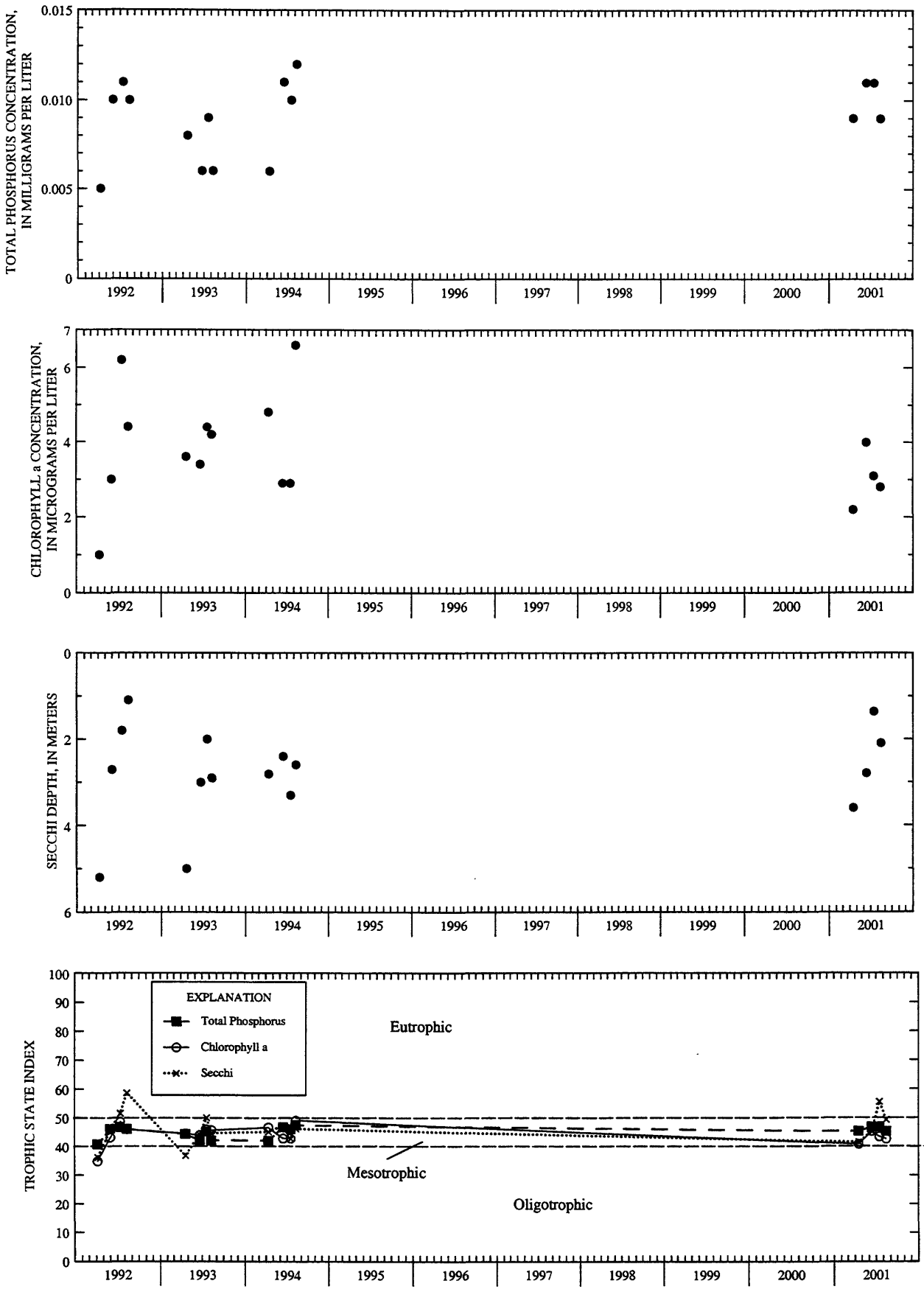
PERIOD OF RECORD.--February 1992 to August 1994, February to August 2001.

REMARKS.--Lake sampled near center of lake at the deep hole. Lake ice-covered during February sampling. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, FEBRUARY 12 TO AUGUST 14, 2001
(Milligrams per liter unless otherwise indicated)

	Feb-12		Apr-17		Jun-13		Jul-16		Aug-14	
Lake stage (ft)	---		11.25		11.02		11.16		11.03	
Secchi-depth (m)	---		3.6		2.8		1.4		2.10	
Chlorophyll a, phytoplankton (µg/L)	---		2.2		4		3.1		2.8	
Depth of sample (m)	0.5	6.5	0.5	6.5	0.5	6.5	0.5	6.5	0.5	6.5
Water temperature (°C)	3.1	4.1	9.9	9.9	23.0	16.2	26.8	18.8	27.4	21.6
Specific conductance (µS/cm)	322	339	319	320	301	312	310	353	331	391
pH (units)	7.7	7.7	8.0	8.0	8.2	8.1	8.1	7.3	8.1	7.1
Dissolved oxygen (mg/L)	10.0	8.6	12.0	11.2	10.1	8.5	9.2	0.3	8.2	0.3
Phosphorus, total (as P)	<0.005	<0.005	0.009	0.010	0.011	0.014	0.011	0.023	0.009	0.024
Phosphorus, ortho, dissolved (as P)	---	---	<0.002	---	---	---	---	---	0.004	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	0.092	---	---	---	---	---	0.019	---
Nitrogen, ammonia, dissolved (as N)	---	---	0.141	---	---	---	---	---	0.045	---
Nitrogen, amm. + org., total (as N)	---	---	0.57	---	---	---	---	---	---	---
Nitrogen, total (as N)	---	---	0.662	---	---	---	---	---	---	---
Color (Pt-Co. scale)	---	---	5	---	---	---	---	---	---	---
Turbidity (NTU)	---	---	4.7	---	---	---	---	---	---	---
Hardness, (as $CaCO_3$)	---	---	142	---	---	---	---	---	---	---
Calcium, dissolved (Ca)	---	---	29	---	---	---	---	---	---	---
Magnesium, dissolved (Mg)	---	---	17	---	---	---	---	---	---	---
Sodium, dissolved (Na)	---	---	6.7	---	---	---	---	---	---	---
Potassium, dissolved (K)	---	---	1	---	---	---	---	---	---	---
Alkalinity, (as $CaCO_3$)	---	---	126	---	---	---	---	---	---	---
Sulfate, dissolved (SO_4)	---	---	13.3	---	---	---	---	---	---	---
Chloride, dissolved (Cl)	---	---	12.9	---	---	---	---	---	---	---
Silica, dissolved (SiO_2)	---	---	0.1	---	---	---	---	---	---	---
Solids, dissolved, at 180°C	---	---	172	---	---	---	---	---	---	---
Iron, dissolved (Fe) µg/L	---	---	<10	---	---	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	<0.4	---	---	---	---	---	---	---





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Booth Lake, near East Troy, Wisconsin.

434558089260600 BUFFALO LAKE, CENTER SITE, AT PACKWAUKEE, WI

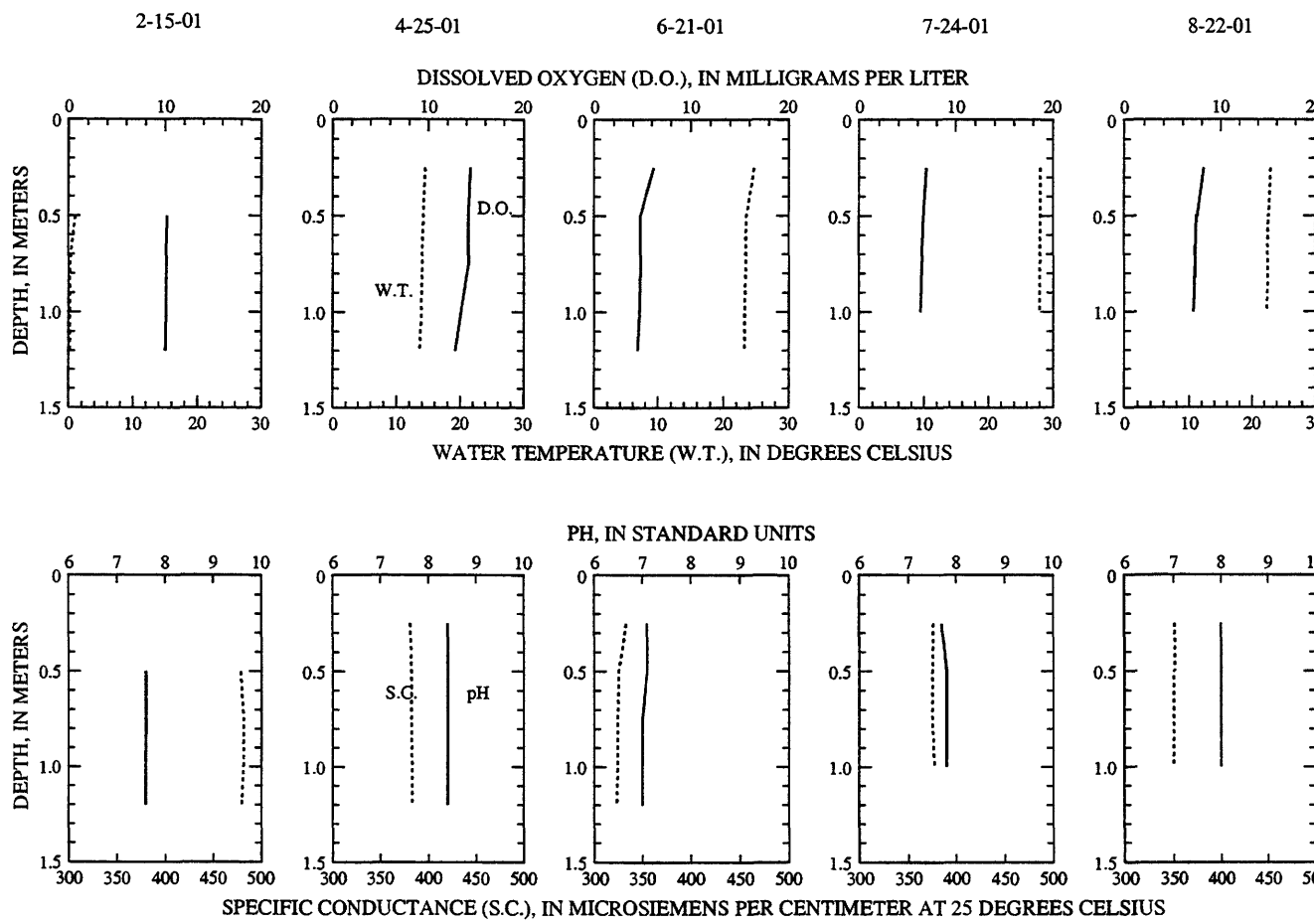
LOCATION.--Lat 43°45'58", long 89°26'06", in NW 1/4 SE 1/4 sec.21, T.15 N., R.9 E., Marquette County, Hydrologic Unit 04030201, 1.1 mi northeast of Packwaukee.

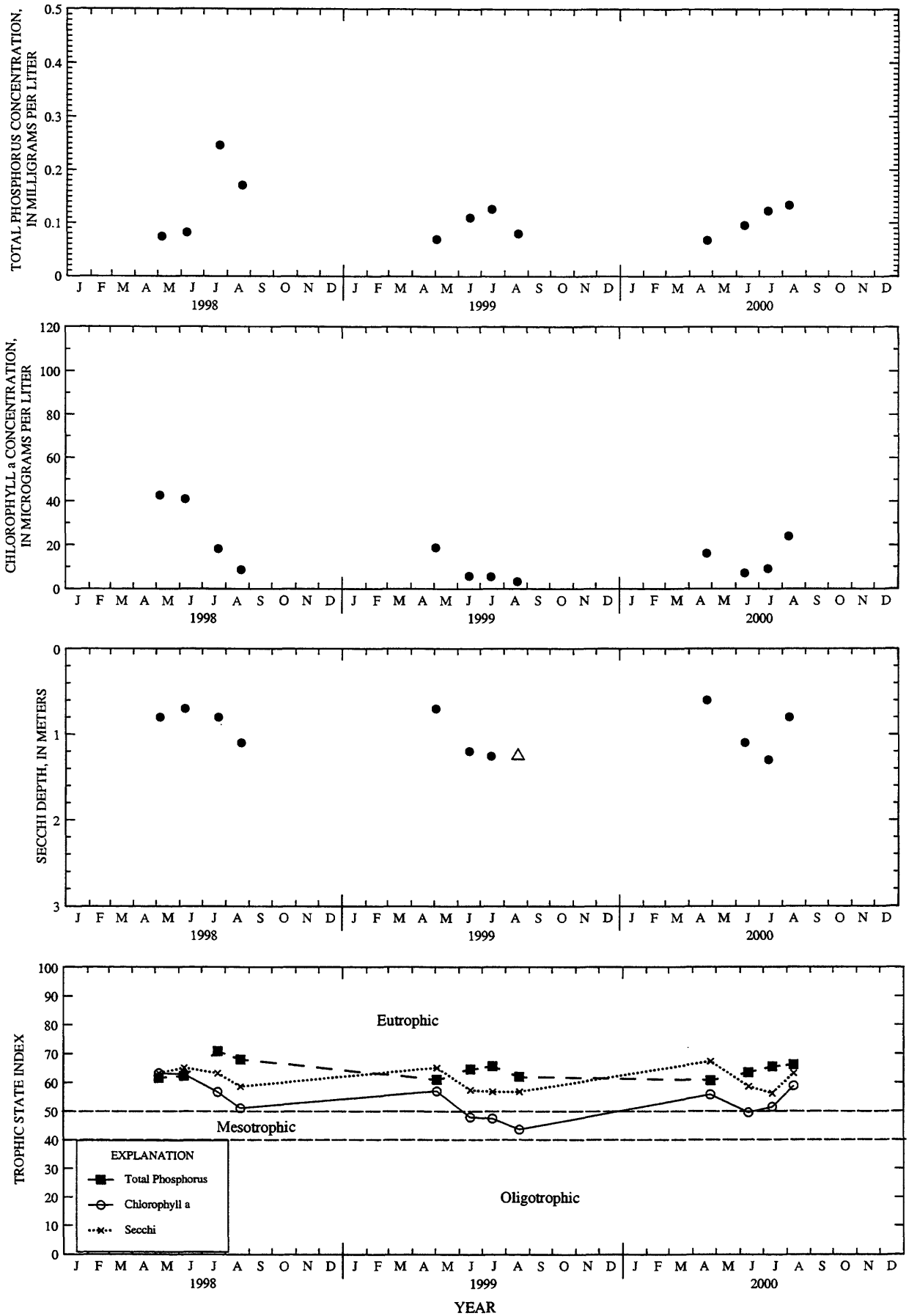
PERIOD OF RECORD.--May 1998 to current year. Data collected 1991-94 by Wisconsin Department of Natural Resources are available.

REMARKS.--Site sampled near center of lake. Lake ice-covered during February sampling. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, FEBRUARY 15 TO AUGUST 22, 2001
(Milligrams per liter unless otherwise indicated)

	Feb-15	Apr-25	Jun-21	Jul-24	Aug-22
Lake stage (ft)	1.80	1.68	2.29	1.37	1.36
Secchi-depth (m)	---	0.5	1.0	0.7	1.0
Chlorophyll a, phytoplankton (µg/L)	---	81	8.5	14	16.3
Depth of sample (m)	0.5	0.5	0.25	0.5	0.5
Water temperature (°C)	1.0	14.2	24.7	28.1	23.0
Specific conductance (µS/cm)	479	382	333	375	351
pH (units)	7.6	8.4	7.1	7.8	8.0
Dissolved oxygen (mg/L)	10.2	14.2	6.2	6.6	8.2
Phosphorus, total (as P)	0.034	<0.005	0.138	0.276	0.091
Phosphorus, ortho, dissolved (as P)	---	0.004	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	0.841	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	<0.013	---	---	---
Nitrogen, amm. + org., total (as N)	---	1.7	---	---	---
Nitrogen, total (as N)	---	2.53	---	---	---
Color (Pt-Co. scale)	---	50	---	---	---
Turbidity (NTU)	---	12	---	---	---
Hardness, (as $CaCO_3$)	---	196	---	---	---
Calcium, dissolved (Ca)	---	42	---	---	---
Magnesium, dissolved (Mg)	---	22	---	---	---
Sodium, dissolved (Na)	---	5.4	---	---	---
Potassium, dissolved (K)	---	1.5	---	---	---
Alkalinity, (as $CaCO_3$)	---	167	---	---	---
Sulfate, dissolved (SO_4)	---	14.3	---	---	---
Chloride, dissolved (Cl)	---	10.9	---	---	---
Silica, dissolved (SiO_2)	---	3.9	---	---	---
Solids, dissolved, at 180°C	---	230	---	---	---
Iron, dissolved (Fe) µg/L	---	100	---	---	---
Manganese, dissolved (Mn) µg/L	---	1.6	---	---	---





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Buffalo Lake, Center Site, near Packwaukee, Wisconsin.

(Triangles indicate maximum depth at sampling site. Actual Secchi depth on these days was greater than plotted values)

434720089201600 BUFFALO LAKE, EAST END, AT MONTELLO, WI

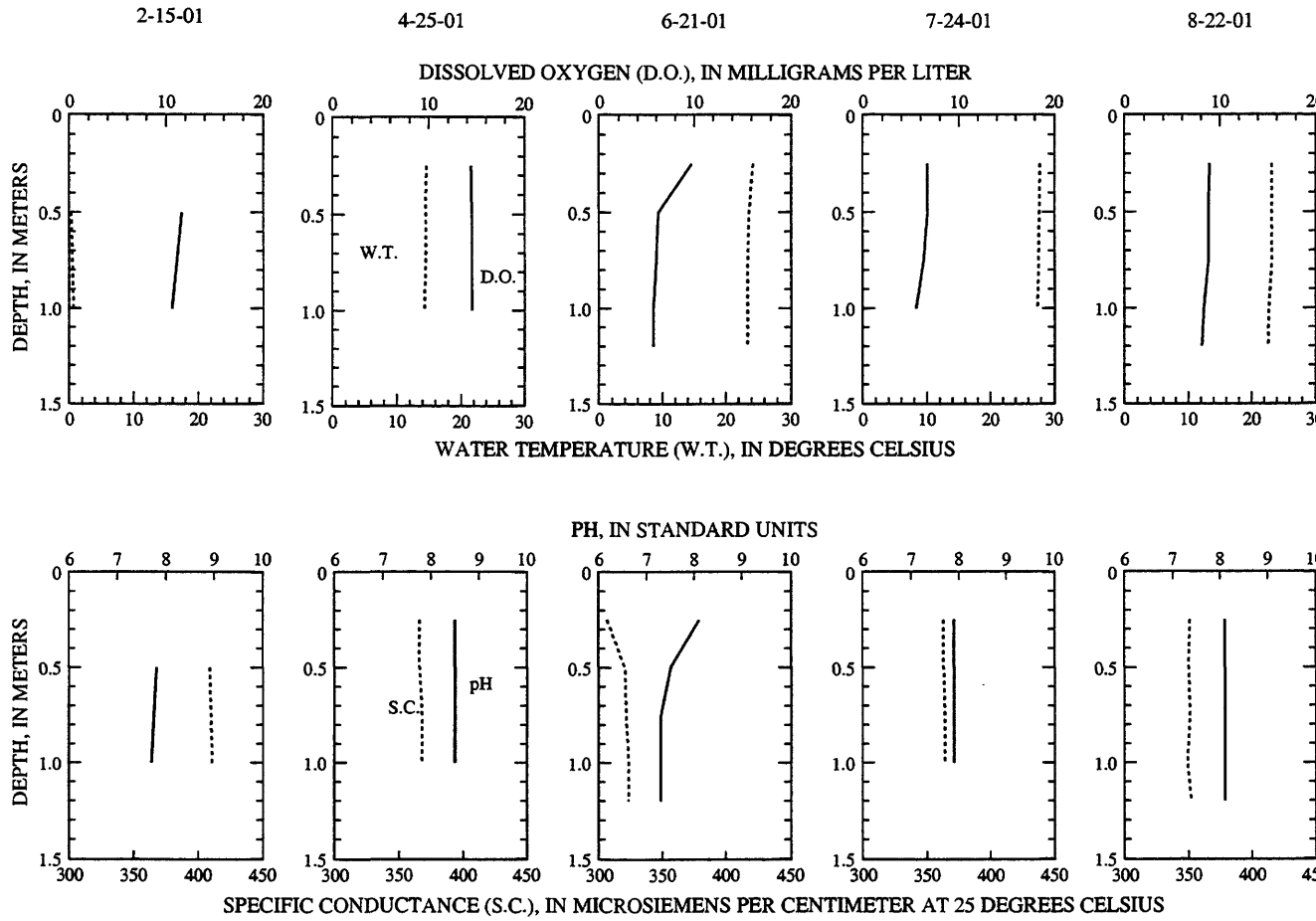
LOCATION.--Lat 43°47'20", long 89°20'16", in SE 1/4 SW 1/4 sec.8, T.15 N., R.10 E., Marquette County, Hydrologic Unit 04030201, at Montello.

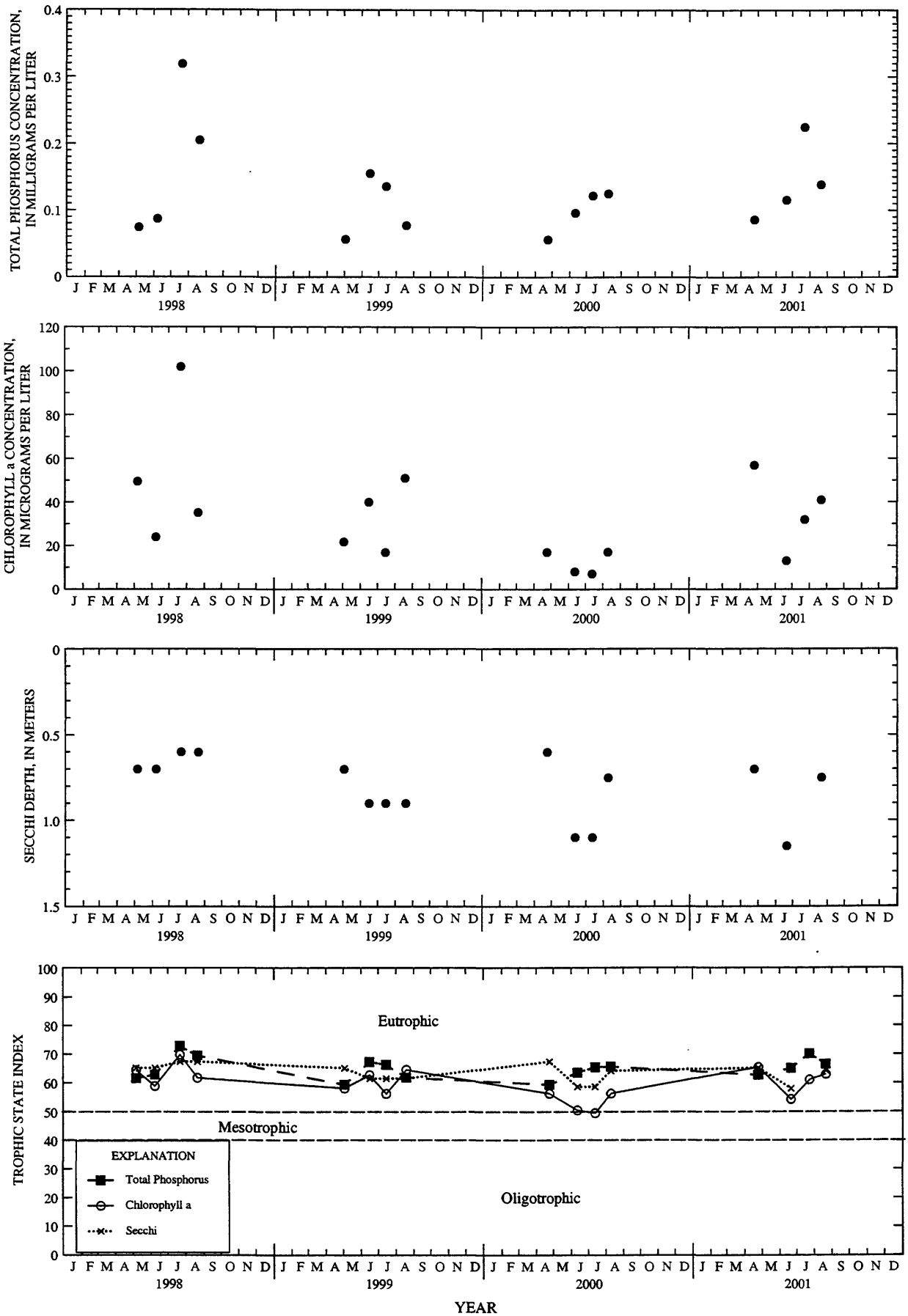
PERIOD OF RECORD.--May 1998 to current year. Data collected 1991-94 by Wisconsin Department of Natural Resources are available.

REMARKS.--Site sampled at east end of lake. Lake ice-covered during February sampling. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, FEBRUARY 15 TO AUGUST 22, 2001
(Milligrams per liter unless otherwise indicated)

	Feb-15	Apr-25	Jun-21	Jul-24	Aug-22
Lake stage (ft)	1.80	1.68	2.29	1.37	1.36
Secchi-depth (m)	---	0.7	1.2	---	0.8
Chlorophyll a, phytoplankton (µg/L)	---	57	13	32	41
Depth of sample (m)	0.5	0.5	0.25	0.5	0.25
Water temperature (°C)	0.3	14.5	24.2	27.7	23.2
Specific conductance (µS/cm)	409	366	306	363	351
pH (units)	7.8	8.5	8.1	7.9	8.1
Dissolved oxygen (mg/L)	11.6	14.4	9.7	6.7	8.9
Phosphorus, total (as P)	0.012	0.086	0.116	0.225	0.139





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Buffalo Lake, East Site, at Montello, Wisconsin.

434414089282400 BUFFALO LAKE, WEST END, NEAR ENDEAVOR, WI

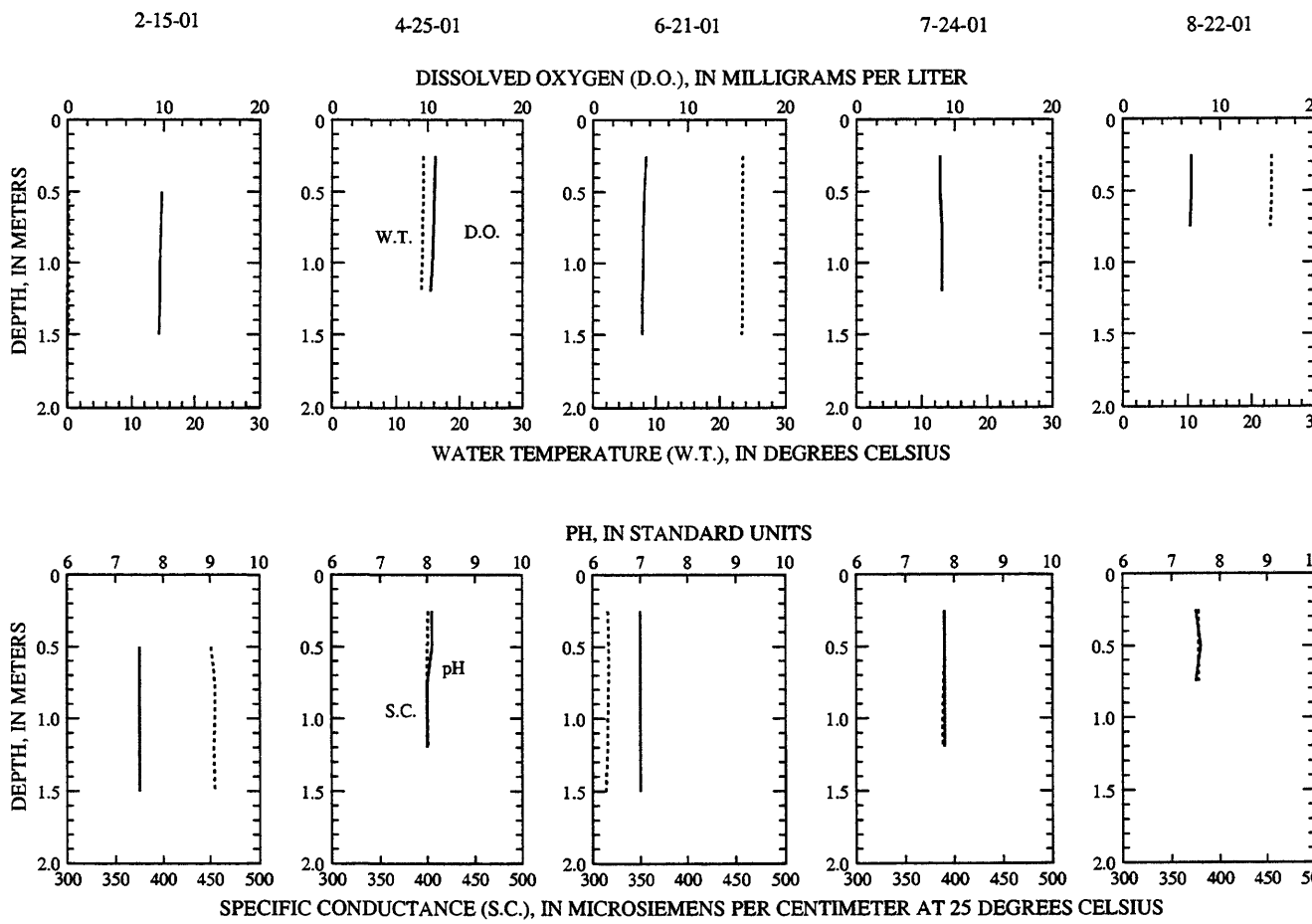
LOCATION.--Lat 43°44'14", long 89°28'24", in NW 1/4 SE 1/4 sec.31, T.15 N., R.9 E., Marquette County, Hydrologic Unit 04030201, 1.5 mi north of Endeavor.

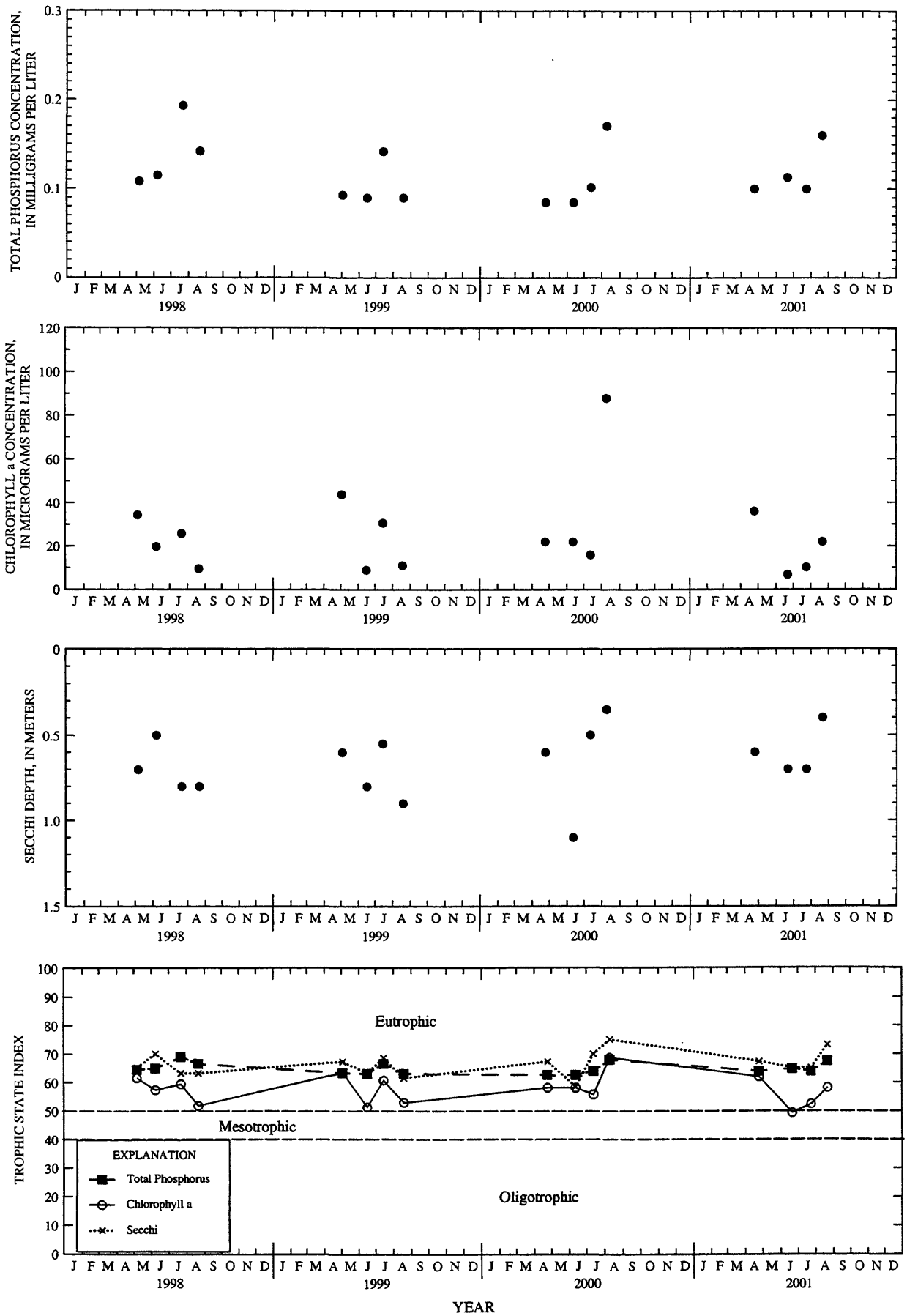
PERIOD OF RECORD.--May 1998 to current year. Data collected 1991-94 by Wisconsin Department of Natural Resources are available.

REMARKS.--Site sampled near west end of lake. Lake ice-covered during February sampling. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, FEBRUARY 15 TO AUGUST 22, 2001
(Milligrams per liter unless otherwise indicated)

	Feb-15	Apr-25	Jun-21	Jul-24	Aug-22
Lake stage (ft)	1.80	1.68	2.29	1.37	1.36
Secchi-depth (m)	---	0.6	0.7	0.7	0.4
Chlorophyll a, phytoplankton (µg/L)	---	36	6.8	10.2	22
Depth of sample (m)	0.5	0.5	0.25	0.5	0.5
Water temperature (°C)	0.1	14.3	23.5	28.2	23.2
Specific conductance (µS/cm)	451	400	315	390	378
pH (units)	7.5	8.1	7.0	7.8	7.6
Dissolved oxygen (mg/L)	9.8	10.8	5.6	8.5	7.0
Phosphorus, total (as P)	0.052	0.100	0.113	0.100	0.160





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Buffalo Lake, West Site, near Endeavor, Wisconsin.

423706088363400 DELAVAN LAKE NEAR DELAVAN, WI

LOCATION.--Lat 42°36'27", long 88°36'19", in SW 1/4 NE 1/4 sec.28, T.2 N., R.16 E., Walworth County, Hydrologic Unit 07090001, at Delavan Lake Sanitary District Lift Station No. 2 at Delavan Lake Yacht Club, 1.0 mi southeast of outlet, and 2.7 mi southeast of Delavan.

DRAINAGE AREA.--41.4 mi^2, of which 2.3 mi^2 is non-contributing. Area of Delavan Lake, 2,072 acres.

PERIOD OF RECORD.--October 1983 to current year. October 1983 to September 1985 data published in Water Resources Investigation series report "Water Quality and Hydrology of Delavan Lake in Southeastern Wisconsin" by S. J. Field and M. D. Duerk (1988).

GAGE.--Water-stage recorder. Datum of gage is 922.92 ft above sea level. Prior to Sept. 5, 1989, staff gage at bridge on North Shore Drive at same datum.

REMARKS.--Lake was ice covered from Dec. 13 to Apr. 7. Lake levels controlled by Delavan Lake Sanitary District. Gage-height telemeter at station.

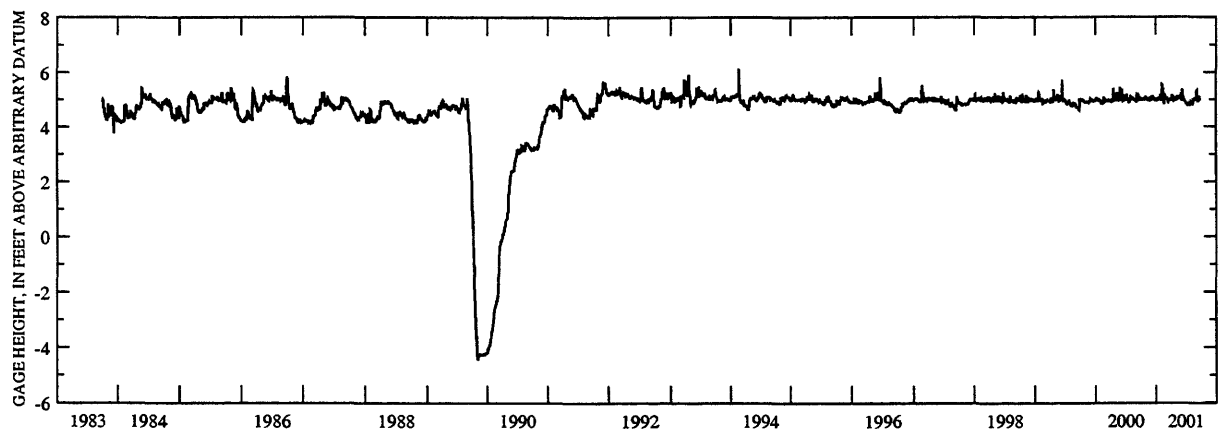
EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 6.19 ft, Feb. 21, 1994; minimum daily, -4.44 ft, Nov. 6, 1989 (lake drawn down for lake rehabilitation program).

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 5.57 ft, Feb. 11, 12; minimum, 4.74 ft, July 15-17.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.99	5.00	5.06	5.00	5.07	5.12	4.98	4.96	5.07	4.92	4.80	4.99
2	4.99	5.02	5.05	4.99	5.04	5.06	4.98	4.96	5.13	4.89	4.88	4.98
3	5.00	5.02	5.04	4.98	5.01	5.03	4.98	4.97	5.10	4.88	4.91	4.98
4	5.03	5.01	5.02	4.97	4.99	5.07	4.98	5.00	5.07	4.87	4.91	5.01
5	5.02	5.00	5.00	4.96	4.99	5.09	4.98	4.99	5.15	4.86	4.90	5.01
6	5.02	5.00	4.99	4.95	4.99	5.09	5.01	4.98	5.25	4.85	4.89	5.02
7	5.00	5.08	5.00	4.94	4.99	5.07	5.02	4.99	5.19	4.84	4.88	5.17
8	4.99	5.07	5.01	4.95	5.02	5.06	5.03	4.98	5.09	4.84	4.88	5.31
9	4.99	5.07	5.02	4.95	5.25	5.04	5.06	4.98	5.01	4.85	4.87	5.33
10	4.99	5.06	5.03	4.95	5.49	5.05	5.07	5.00	4.95	4.84	4.88	5.35
11	4.99	5.04	5.06	4.96	5.56	5.07	5.10	5.09	4.94	4.82	4.86	5.28
12	4.99	5.02	5.09	4.97	5.55	5.08	5.18	5.11	5.24	4.80	4.84	5.18
13	4.98	5.00	5.09	4.97	5.51	5.05	5.18	5.10	5.39	4.79	4.82	5.09
14	4.98	5.00	5.10	4.99	5.47	5.00	5.14	5.09	5.26	4.78	4.81	4.99
15	4.99	4.99	5.10	5.01	5.41	4.99	5.10	5.07	5.14	4.77	4.79	4.95
16	5.00	5.00	5.10	5.02	5.35	5.01	5.05	5.06	5.12	4.75	4.88	4.94
17	5.00	5.01	5.08	5.02	5.28	4.97	5.01	5.03	5.06	4.77	4.89	4.93
18	5.00	5.01	5.07	5.03	5.20	4.92	4.98	5.02	5.02	4.79	4.90	4.93
19	5.00	5.00	5.08	5.03	5.12	4.89	4.97	5.00	4.98	4.79	4.96	5.01
20	5.00	5.00	5.07	5.03	5.04	4.90	5.01	5.00	4.99	4.79	4.95	5.02
21	5.00	5.00	5.07	5.03	4.97	4.92	5.06	5.01	4.99	4.79	4.95	5.06
22	5.00	4.99	5.05	5.02	4.90	4.94	5.09	5.02	4.99	4.81	4.99	5.06
23	5.01	4.99	5.04	5.02	4.85	4.96	5.08	5.02	4.98	4.85	5.01	5.11
24	5.03	4.99	5.03	5.02	4.84	4.97	5.07	5.03	4.97	4.87	5.01	5.13
25	5.04	4.99	5.01	5.01	4.99	4.97	5.04	5.09	4.96	4.86	5.02	5.09
26	5.04	5.02	4.99	5.01	5.17	4.97	5.00	5.12	4.96	4.84	5.04	5.04
27	5.05	5.03	4.98	5.01	5.20	4.96	4.98	5.11	4.95	4.82	5.04	5.02
28	5.04	5.03	4.98	5.00	5.17	4.96	4.97	5.10	4.95	4.81	5.03	5.00
29	5.03	5.05	e4.99	5.03	---	4.96	4.96	5.09	4.94	4.81	5.02	5.00
30	5.02	5.06	e5.01	5.09	---	4.96	4.96	5.06	4.93	4.80	5.01	5.00
31	5.01	---	5.01	5.09	---	4.96	---	5.05	---	4.80	5.00	---
MEAN	5.01	5.02	5.04	5.00	5.16	5.00	5.03	5.03	5.06	4.82	4.92	5.07
MAX	5.05	5.08	5.10	5.09	5.56	5.12	5.18	5.12	5.39	4.92	5.04	5.35
MIN	4.98	4.99	4.98	4.94	4.84	4.89	4.96	4.96	4.93	4.75	4.79	4.93

e Estimated



423556088365001 DELAVAN LAKE AT CENTER NEAR DELAVAN LAKE, WI

LOCATION.--Lat 42°35'56", long 88°36'50", in SE 1/4 SW 1/4 sec.28, T.2 N., R.16 E., Walworth County, Hydrologic Unit 07090001, 2.6 mi southeast of Delavan.

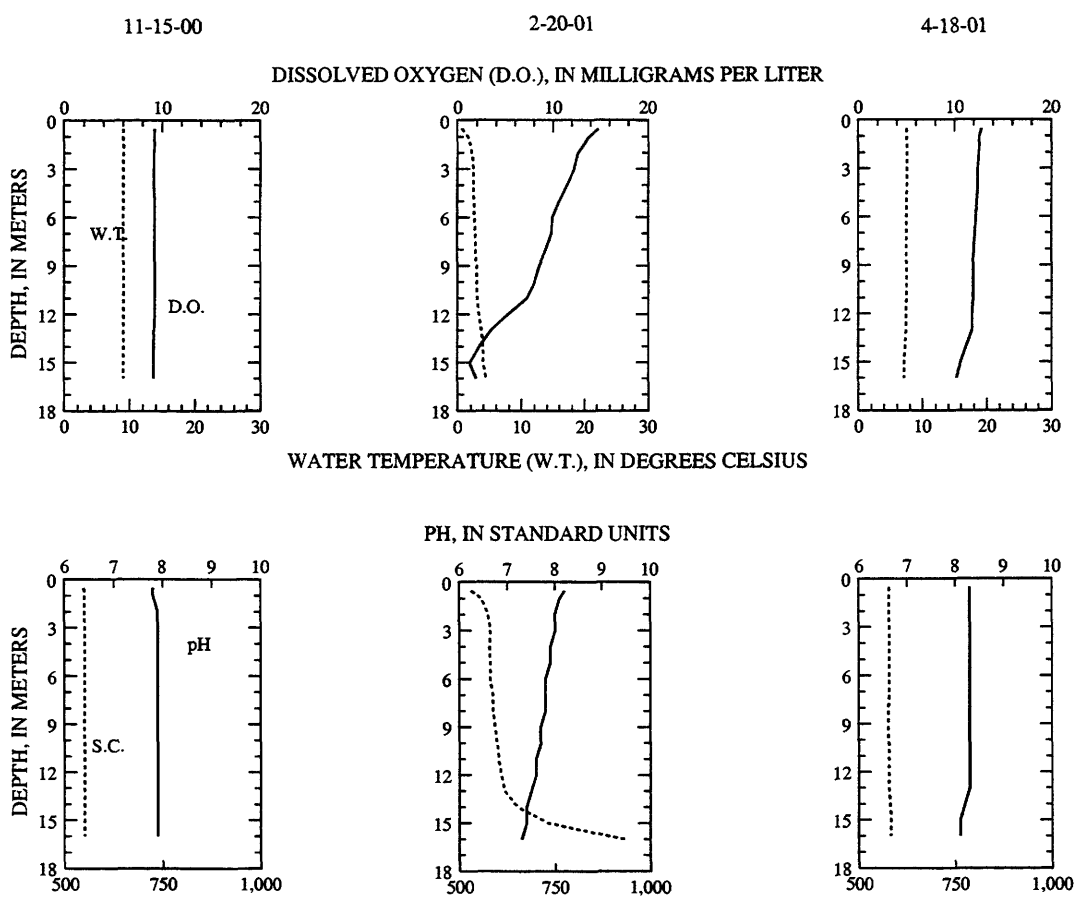
DRAINAGE AREA.--41.4 mi^2, of which 2.3 mi^2 is non-contributing. Area of Delavan Lake, 2,072 acres.

PERIOD OF RECORD.--October 1983 to current year.

REMARKS.--Lake ice-covered during February measurements. Water-quality analyses done by the U.S. Geological Survey National Water Quality Laboratory. Samples for determination of chlorophyll-a concentration are collected from the top 1.5 ft of the lake.

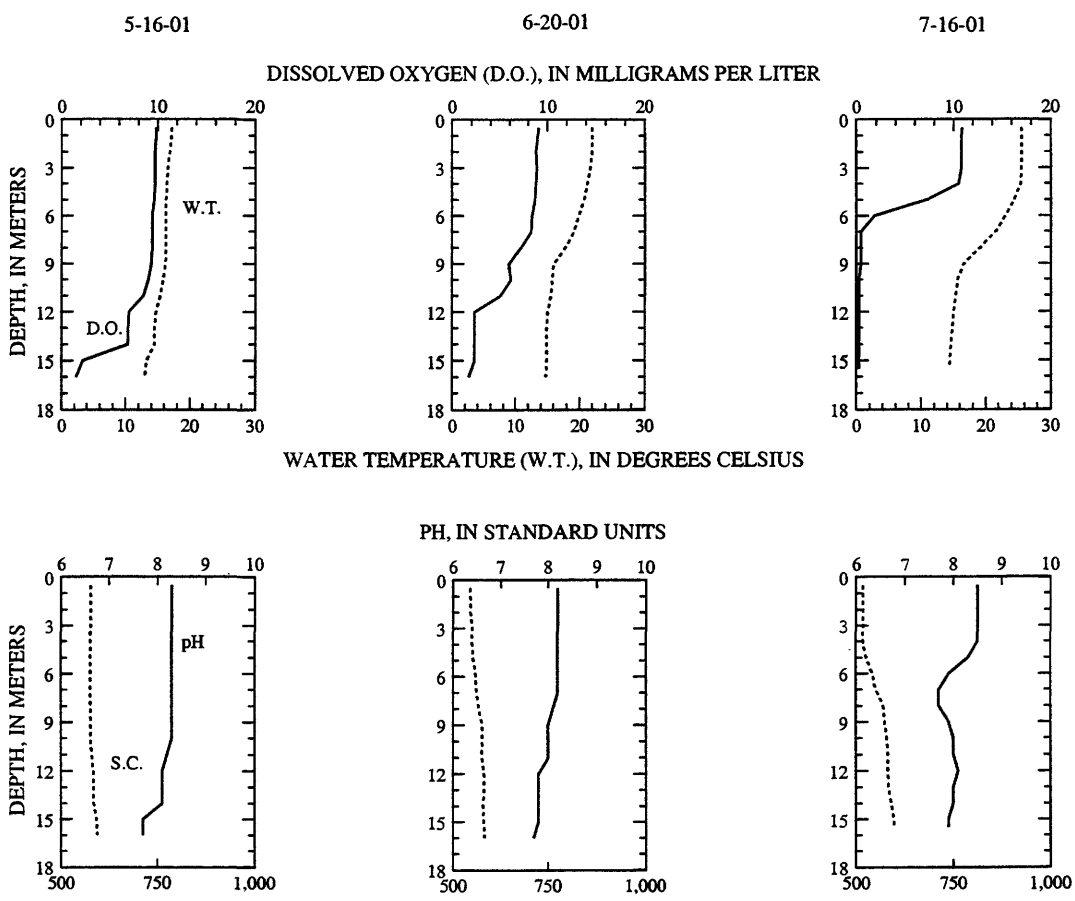
WATER-QUALITY DATA, NOVEMBER 15, 2000 TO APRIL 18, 2001
(Milligrams per liter unless otherwise indicated)

	Nov-15		Feb-20			Apr-18	
Lake stage (ft)	4.99		5.04			4.98	
Secchi-depth (m)	4.6		1.4			1.7	
Chlorophyll a, phytoplankton (µg/L)	2.1		6.7			2.4	
Depth of sample (m)	0.5	16.0	0.5	13.0	16.0	0.5	16.0
Water temperature (°C)	9.0	9.0	0.6	3.7	4.4	7.6	7.1
Specific conductance (µS/cm)	549	550	531	617	935	578	583
pH (units)	7.8	7.9	8.2	7.5	7.3	8.3	8.1
Dissolved oxygen (mg/L)	9.2	9.1	14.8	3.4	1.9	12.8	10.2
Phosphorus, total (as P)	0.117	0.116	0.089	0.142	0.197	0.087	0.083
Phosphorus, ortho, dissolved (as P)	0.093	0.093	0.061	0.115	0.144	0.018	0.038
Nitrogen, NO2 + NO3, diss. (as N)	0.157	---	0.318	---	---	0.395	0.408
Nitrogen, ammonia, dissolved (as N)	0.141	---	0.071	---	---	0.019	0.056
Nitrogen, amm. + org., total (as N)	0.64	---	0.57	---	---	0.77	0.53
Nitrogen, total (as N)	0.8	---	0.88	---	---	1.2	0.94
Color (Pt-Co. scale)	---	---	---	---	---	10	2
Turbidity (NTU)	---	---	---	---	---	1.6	3.6
Hardness, (as $CaCO_3$)	---	---	---	---	---	240	240
Calcium, dissolved (Ca)	---	---	---	---	---	44.2	44
Magnesium, dissolved (Mg)	---	---	---	---	---	30.8	30.5
Sodium, dissolved (Na)	---	---	---	---	---	22.9	22.5
Potassium, dissolved (K)	---	---	---	---	---	2.96	2.98
Alkalinity, (as $CaCO_3$)	---	---	---	---	---	193	191
Sulfate, dissolved (SO_4)	---	---	---	---	---	26.2	26.6
Chloride, dissolved (Cl)	---	---	---	---	---	54.3	53.9
Silica, dissolved (SiO_2)	---	---	---	---	---	2.7	3.3
Solids, dissolved, at 180°C	---	---	---	---	---	318	319
Iron, dissolved (Fe) µg/L	---	---	---	---	---	<10	<10
Manganese, dissolved (Mn) µg/L	---	---	---	---	---	<3.2	<3.2



WATER-QUALITY DATA, MAY 16 TO JULY 16, 2001
(Milligrams per liter unless otherwise indicated)

	May-16				Jun-20				Jul-16			
Lake stage (ft)	5.06				4.99				4.75			
Secchi-depth (m)	7.30				3.80				2.90			
Chlorophyll a, phytoplankton (µg/L)	0.4				2.8				4.9			
Depth of sample (m)	0.5	9.0	14.0	16.0	0.5	4.0	12.0	16.0	0.5	4.0	11.0	15.5
Water temperature (°C)	17.2	16.2	14.5	13.0	22.0	21.2	15.1	14.8	25.6	25.4	15.3	14.4
Specific conductance (µS/cm)	577	578	586	595	544	550	581	582	517	517	581	597
pH (units)	8.3	8.3	8.1	7.7	8.2	8.2	7.8	7.7	8.5	8.5	8.0	7.9
Dissolved oxygen (mg/L)	9.8	9.3	6.9	1.5	9.1	8.8	2.9	1.7	10.9	10.5	0.2	0.2
Phosphorus, total (as P)	0.052	0.054	0.081	0.189	0.055	0.047	0.162	0.184	0.027	0.030	0.237	0.652
Phosphorus, ortho, dissolved (as P)	0.014	0.029	0.052	0.013	<0.007	0.012	0.103	0.147	0.01	<0.007	0.198	0.55
Nitrogen, NO2 + NO3, diss. (as N)	0.228	---	---	---	0.331	---	---	---	0.014	---	---	---
Nitrogen, ammonia, dissolved (as N)	0.029	---	---	---	0.021	---	---	---	0.026	---	---	---
Nitrogen, amm. + org., total (as N)	0.61	---	---	---	1.4	---	---	---	0.56	---	---	---
Nitrogen, total (as N)	0.84	---	---	---	1.7	---	---	---	0.57	---	---	---

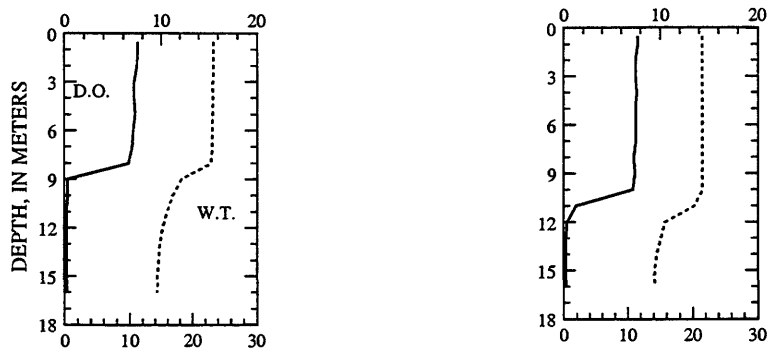


WATER-QUALITY DATA, AUGUST 20 TO SEPTEMBER 13, 2001
(Milligrams per liter unless otherwise indicated)

	Aug-20								Sep-13			
Lake stage (ft)				4.95						5.09		
Secchi-depth (m)				2.90						1.70		
Chlorophyll a, phytoplankton (µg/L)				6.8						0.2		
Depth of sample (m)	0.5	4.0	8.0	10.0	12.0	14.0	15.0	16.0	0.5	10.0	14.0	16.0
Water temperature (°C)	23.3	23.2	22.9	16.8	15.2	14.6	14.4	14.3	21.5	21.5	14.5	14.1
Specific conductance (µS/cm)	519	519	522	592	598	612	615	623	519	520	619	632
pH (units)	8.2	8.2	8.1	7.7	7.7	7.6	7.6	7.5	8.2	8.2	7.4	7.3
Dissolved oxygen (mg/L)	7.5	7.1	6.5	0.3	0.2	0.2	0.2	0.2	7.7	7.2	0.2	0.2
Phosphorus, total (as P)	0.031	0.033	0.027	0.211	0.400	0.626	0.690	0.753	0.055	0.049	0.665	0.9
Phosphorus, ortho, dissolved (as P)	<0.007	---	<0.007	---	---	0.533	---	0.728	0.008	0.014	0.604	0.789
Nitrogen, NO2 + NO3, diss. (as N)	0.015	---	---	---	---	---	---	---	0.008	---	---	---
Nitrogen, ammonia, dissolved (as N)	0.067	---	---	---	---	---	---	---	0.007	---	---	---
Nitrogen, amm. + org., total (as N)	0.67	---	---	---	---	---	---	---	0.66	---	---	---
Nitrogen, total (as N)	0.68	---	---	---	---	---	---	---	0.67	---	---	---

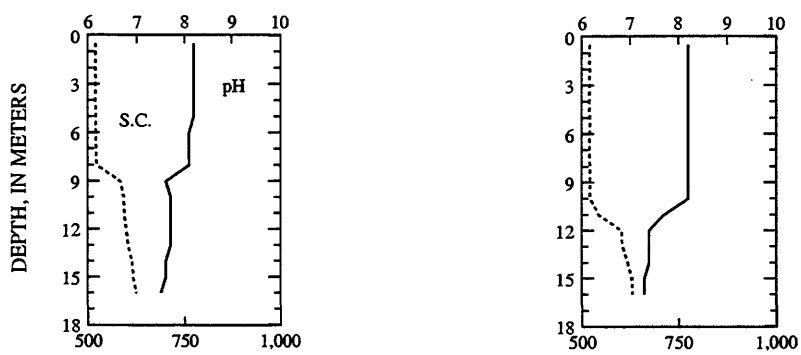
8-20-01 9-13-01

DISSOLVED OXYGEN (D.O.), IN MILLIGRAMS PER LITER

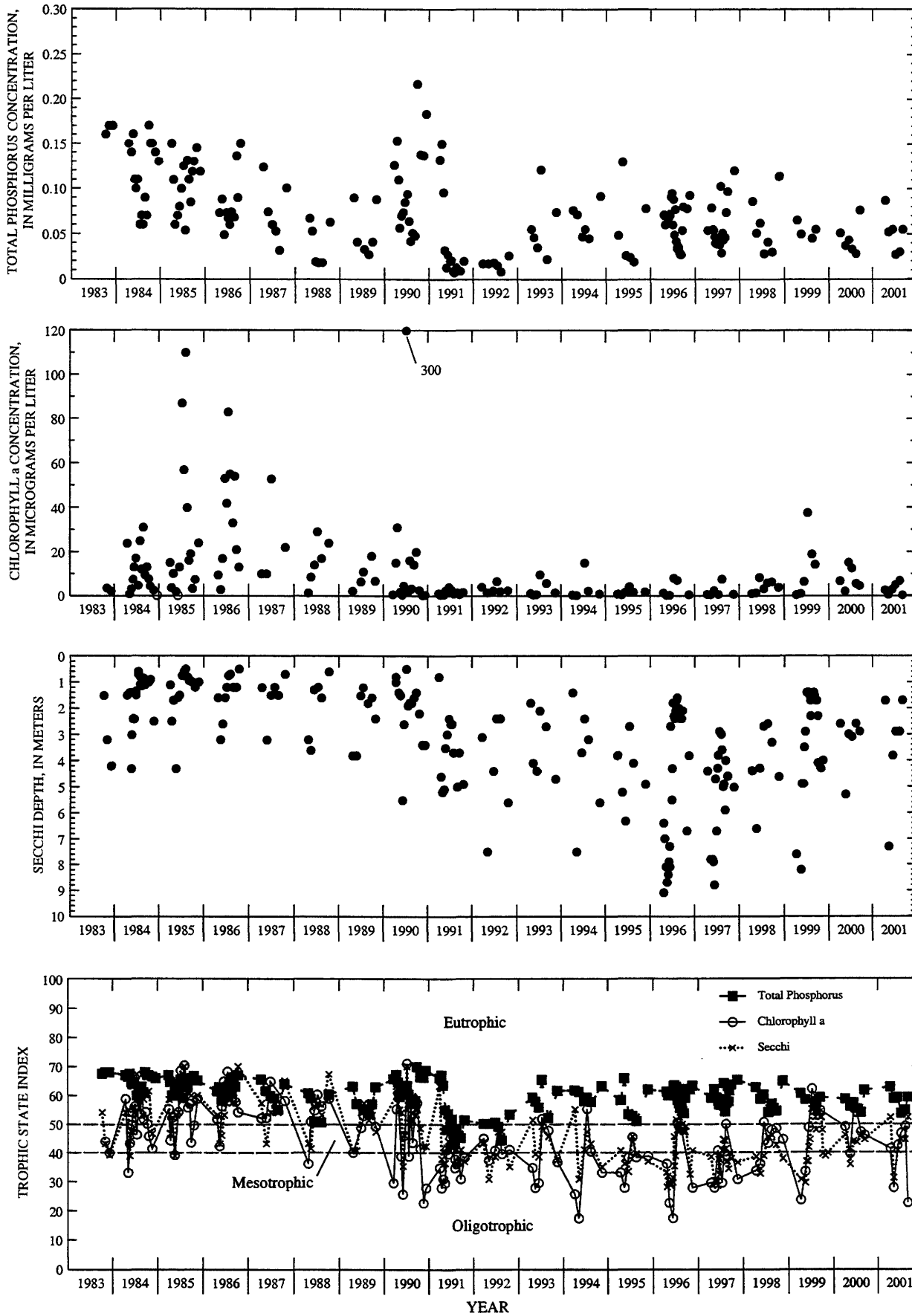


WATER TEMPERATURE (W.T.), IN DEGREES CELSIUS

PH, IN STANDARD UNITS



SPECIFIC CONDUCTANCE (S.C.), IN MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS



Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Delavan Lake at Center near Delavan, Wisconsin.

ADDITIONAL WATER-QUALITY DATA, OCTOBER 11, 2000 TO SEPTEMBER 27, 2001
(Milligrams per liter unless otherwise indicated)

	Oct. 11	May 9	May 31	June 7	June 26	July 9
Lake stage (ft)	4.99	4.98	5.05	5.19	4.96	4.85
Secchi-depth (meters)	9.1	9.0	4.1	4.7	2.4	2.9
Depth of sample (meters)	0.5	0.5	0.5	0.5	0.5	0.5
Water temperature (°C)	14.0	14.5	16.1	11.5	24.0	24.0
Phosphorus, total (as P)	0.129	0.052	0.066	0.075	0.051	0.035

	July 19	July 24	Aug. 1	Aug. 8	Aug. 29	Sept. 27
Lake stage (ft)	4.79	4.87	4.80	4.88	5.02	5.02
Secchi-depth (meters)	2.7	2.9	2.9	2.9	2.1	2.3
Depth of sample (meters)	0.5	0.5	0.5	0.5	0.5	0.5
Water temperature (°C)	25.2	26.0	25.0	27.0	22.5	15.8
Phosphorus, total (as P)	0.026	0.210	0.022	0.022	0.028	0.113

423659088354401 DELAVAN LAKE, AT NORTH END, NEAR LAKE LAWN, WI

LOCATION.--Lat 42°36'59", long 88°35'44", in NW 1/4 SW 1/4, sec.22, T.2 N., R.16 E., Walworth County, Hydrologic Unit 07090001, 2.6 mi southeast of Delavan.

DRAINAGE AREA.--41.4 mi^2, of which 2.3 mi^2 is non-contributing.

PERIOD OF RECORD.--October 1983 to current year.

WATER-QUALITY DATA, MAY 16 TO AUGUST 20, 2001

	May 16	June 20	July 16	Aug. 20
Secchi-depth (meters)	8.1	4.5	2.3	2.3

423526088380101 DELAVAN LAKE, AT SW END, NEAR DELAVAN LAKE, WI

LOCATION.--Lat 42°35'26", long 88°38'01", in SE 1/4 NW 1/4, sec.32, T.2 N., R.16 E., Walworth County, Hydrologic Unit 07090001, 2.6 mi southeast of Delavan.

DRAINAGE AREA.--41.4 mi^2, of which 2.3 mi^2 is non-contributing.

PERIOD OF RECORD.--October 1983 to current year.

WATER-QUALITY DATA, MAY 16 TO AUGUST 20, 2001

	May 16	June 20	July 16	Aug. 20
Secchi-depth (meters)	7.5	4.1	3.0	2.4

05404500 DEVILS LAKE NEAR BARABOO, WI

LOCATION.--Lat 43°25'18", long 89°43'38", in SW 1/4 SE 1/4 sec.13, T.11 N., R.6 E., Sauk County, Hydrologic Unit 07070004, in Devils Lake State Park, 3.5 mi south of Baraboo.

DRAINAGE AREA.--4.79 mi^2. Area of Devils Lake, 361 acres.

PERIOD OF RECORD.--June 1922 to August 1930, June to August 1932, June 1934 to September 1981, October 1984 to June 1991 (fragmentary), July 1991 to current year. Unpublished daily stage records from October 1981 to September 1984 in District files.

REVISED RECORDS.--WDR WI-78-1: Drainage area.

GAGE.--Water-stage recorder installed July 17, 1991. Datum of gage is 955.00 ft, above sea level.

REMARKS.--Lake has no surface outlet.

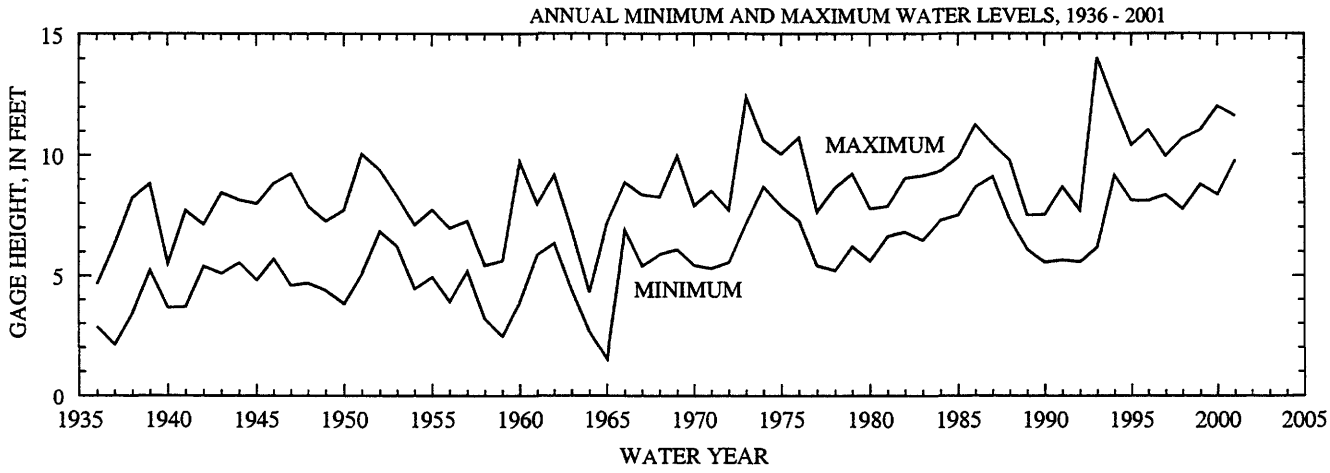
EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 14.13 ft, July 18, 1993; minimum observed, 1.49 ft, Feb. 8, 1965.

EXTREMES FOR CURRENT YEAR.--Maximum recorded gage height, 11.64 ft, June 22; minimum recorded, 9.73 ft, Jan. 27.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10.61	10.15	9.88	9.87	9.85	9.89	10.11	11.03	11.17	11.47	10.90	10.97
2	10.59	10.15	9.87	9.86	9.84	9.88	10.13	11.04	11.20	11.43	11.39	10.95
3	10.58	10.13	9.86	9.85	9.84	9.88	10.15	11.12	11.18	11.40	11.46	10.92
4	10.57	10.11	9.84	9.85	9.83	9.87	10.16	11.22	11.16	11.37	11.44	10.90
5	10.55	10.09	9.82	9.85	9.82	9.87	10.19	11.25	11.20	11.34	11.42	10.88
6	10.53	10.09	9.81	9.85	9.82	9.86	10.24	11.28	11.21	11.31	11.40	10.87
7	10.50	10.13	9.81	9.84	9.82	9.85	10.34	11.31	11.21	11.28	11.38	10.91
8	10.47	10.11	9.80	9.83	9.84	9.84	10.38	11.33	11.21	11.27	11.36	11.01
9	10.44	10.10	9.79	9.83	9.93	9.83	10.53	11.33	11.20	11.25	11.33	11.02
10	10.42	10.08	9.79	9.82	9.97	9.83	10.60	11.34	11.20	11.22	11.29	11.03
11	10.40	10.07	9.81	9.82	9.97	9.84	10.73	11.38	11.20	11.19	11.26	11.01
12	10.39	10.06	9.82	9.82	9.96	9.86	10.89	11.38	11.37	11.16	11.23	10.98
13	10.37	10.05	9.82	9.82	9.95	9.86	10.94	11.37	11.40	11.13	11.19	10.96
14	10.36	10.03	9.82	9.84	9.96	9.87	10.97	11.36	11.42	11.11	11.16	10.94
15	10.34	10.02	9.81	9.84	9.96	9.86	10.99	11.35	11.47	11.08	11.15	10.91
16	10.33	10.02	9.83	9.83	9.96	9.85	11.00	11.35	11.46	11.05	11.13	10.89
17	10.32	10.02	9.82	9.84	9.96	9.84	11.00	11.33	11.45	11.05	11.11	10.91
18	10.31	10.01	9.83	9.83	9.95	9.84	11.00	11.32	11.50	11.10	11.08	10.91
19	10.30	9.99	9.85	9.83	9.92	9.84	11.00	11.30	11.48	11.10	11.05	10.96
20	10.29	9.97	9.86	9.82	9.90	9.84	11.04	11.28	11.46	11.08	11.03	10.96
21	10.27	9.96	9.87	9.81	9.90	9.86	11.07	11.28	11.49	11.06	11.00	10.95
22	10.25	9.94	9.87	9.80	9.90	9.89	11.08	11.26	11.63	11.05	11.06	10.94
23	10.27	9.93	9.87	9.80	9.89	9.92	11.08	11.26	11.63	11.05	11.06	11.02
24	10.27	9.92	9.86	9.79	9.89	9.96	11.08	11.26	11.62	11.03	11.05	11.03
25	10.27	9.90	9.86	9.79	9.91	9.97	11.08	11.26	11.60	11.00	11.07	11.00
26	10.26	9.89	9.85	9.78	9.92	9.97	11.07	11.25	11.58	10.97	11.10	10.97
27	10.24	9.88	9.85	9.77	9.91	9.98	11.07	11.23	11.56	10.94	11.10	10.96
28	10.23	9.88	9.85	9.77	9.91	9.99	11.06	11.21	11.55	10.92	11.08	10.94
29	10.21	9.89	9.88	9.78	---	10.02	11.04	11.19	11.53	10.91	11.06	10.92
30	10.19	9.88	9.88	9.85	---	10.03	11.03	11.17	11.50	10.89	11.03	10.91
31	10.16	---	9.87	9.85	---	10.07	---	11.15	---	10.88	11.00	---
MEAN	10.36	10.02	9.84	9.82	9.90	9.90	10.77	11.26	11.39	11.13	11.17	10.95
MAX	10.61	10.15	9.88	9.87	9.97	10.07	11.08	11.38	11.63	11.47	11.46	11.03
MIN	10.16	9.88	9.79	9.77	9.82	9.83	10.11	11.03	11.16	10.88	10.90	10.87



425103088261500 EAGLE SPRING LAKE AT EAGLEVILLE, WI

LOCATION.--Lat 42°51'03", long 88°26'15", in SE 1/4 NW 1/4 sec.36, T.5 N., R.17 E., Waukesha County, Hydrologic Unit 07120006, at Eagleville.

DRAINAGE AREA.--33.2 mi^2.

PERIOD OF RECORD.--April 1991 to current year.

REMARKS.--Lake sampled near southeast end at a lake depth of about 3 m. Lake ice-covered during February sampling. Water-quality analyses done by Wisconsin State Laboratory of Hygiene. Lake-stage readings from 1991 to 1993 (except 2/4/93 and 4/19/93) were previously reported 1 ft too high.

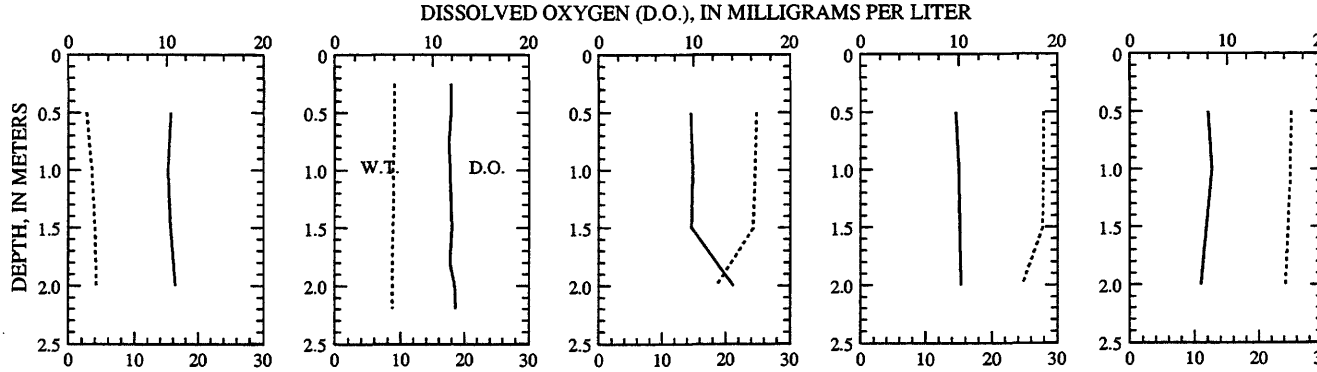
WATER-QUALITY DATA, FEBRUARY 12 TO AUGUST 14, 2001

(Milligrams per liter unless otherwise indicated)

	Feb-12		Apr-17		Jun-13		Jul-16		Aug-14
Lake stage (ft)	9.40		9.54		9.62		9.55		9.48
Secchi-depth (m)	---		1.4		2.0		1.0		0.95
Chlorophyll a, phytoplankton (µg/L)	---		7		3.2		6		5
Depth of sample (m)	0.5	2.0	0.5	2.0	0.5	2.0	0.5	2.0	0.5
Water temperature (°C)	2.7	4.2	9.0	8.7	24.8	18.5	27.9	24.6	25.1
Specific conductance (µS/cm)	619	701	434	435	471	644	533	595	557
pH (units)	7.4	7.4	8.1	8.1	7.8	7.4	7.9	7.6	7.7
Dissolved oxygen (mg/L)	10.4	10.9	11.9	12.3	9.7	14.1	9.7	10.2	8.0
Phosphorus, total (as P)	0.010	0.010	0.011	0.011	0.014	0.035	0.023	0.025	0.025
Phosphorus, ortho, dissolved (as P)	---	---	0.002	---	---	---	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	0.715	---	---	---	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	0.022	---	---	---	---	---	---
Nitrogen, amm. + org., total (as N)	---	---	0.33	---	---	---	---	---	---
Nitrogen, total (as N)	---	---	1.04	---	---	---	---	---	---
Color (Pt-Co. scale)	---	---	15	---	---	---	---	---	---
Turbidity (NTU)	---	---	6.5	---	---	---	---	---	---
Hardness, (as $CaCO_3$)	---	---	212	---	---	---	---	---	---
Calcium, dissolved (Ca)	---	---	47	---	---	---	---	---	---
Magnesium, dissolved (Mg)	---	---	23	---	---	---	---	---	---
Sodium, dissolved (Na)	---	---	5.6	---	---	---	---	---	---
Potassium, dissolved (K)	---	---	0.6	---	---	---	---	---	---
Alkalinity, (as $CaCO_3$)	---	---	192	---	---	---	---	---	---
Sulfate, dissolved (SO_4)	---	---	12.4	---	---	---	---	---	---
Chloride, dissolved (Cl)	---	---	13.5	---	---	---	---	---	---
Silica, dissolved (SiO_2)	---	---	6.3	---	---	---	---	---	---
Solids, dissolved, at 180°C	---	---	246	---	---	---	---	---	---
Iron, dissolved (Fe) µg/L	---	---	10	---	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	<0.4	---	---	---	---	---	---

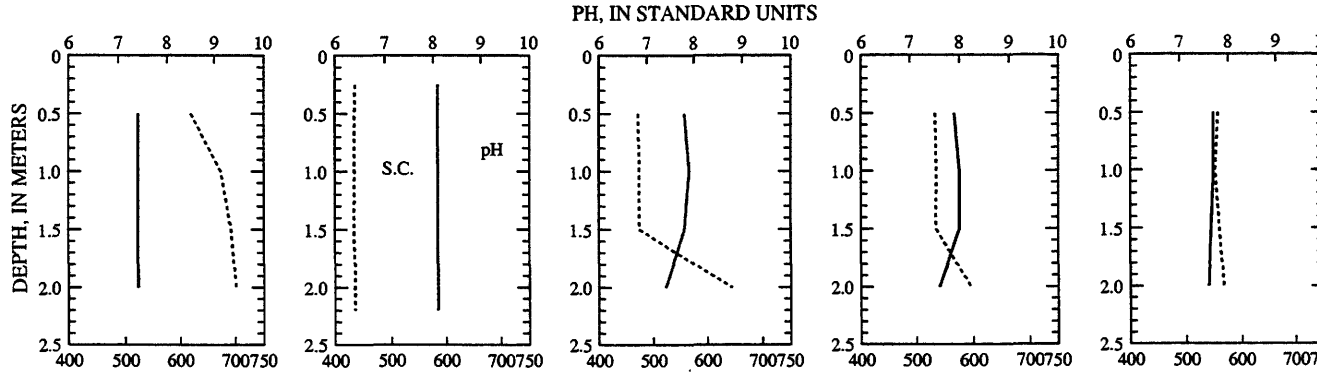
2-12-01 4-17-01 6-13-01 7-16-01 8-14-01

DISSOLVED OXYGEN (D.O.), IN MILLIGRAMS PER LITER

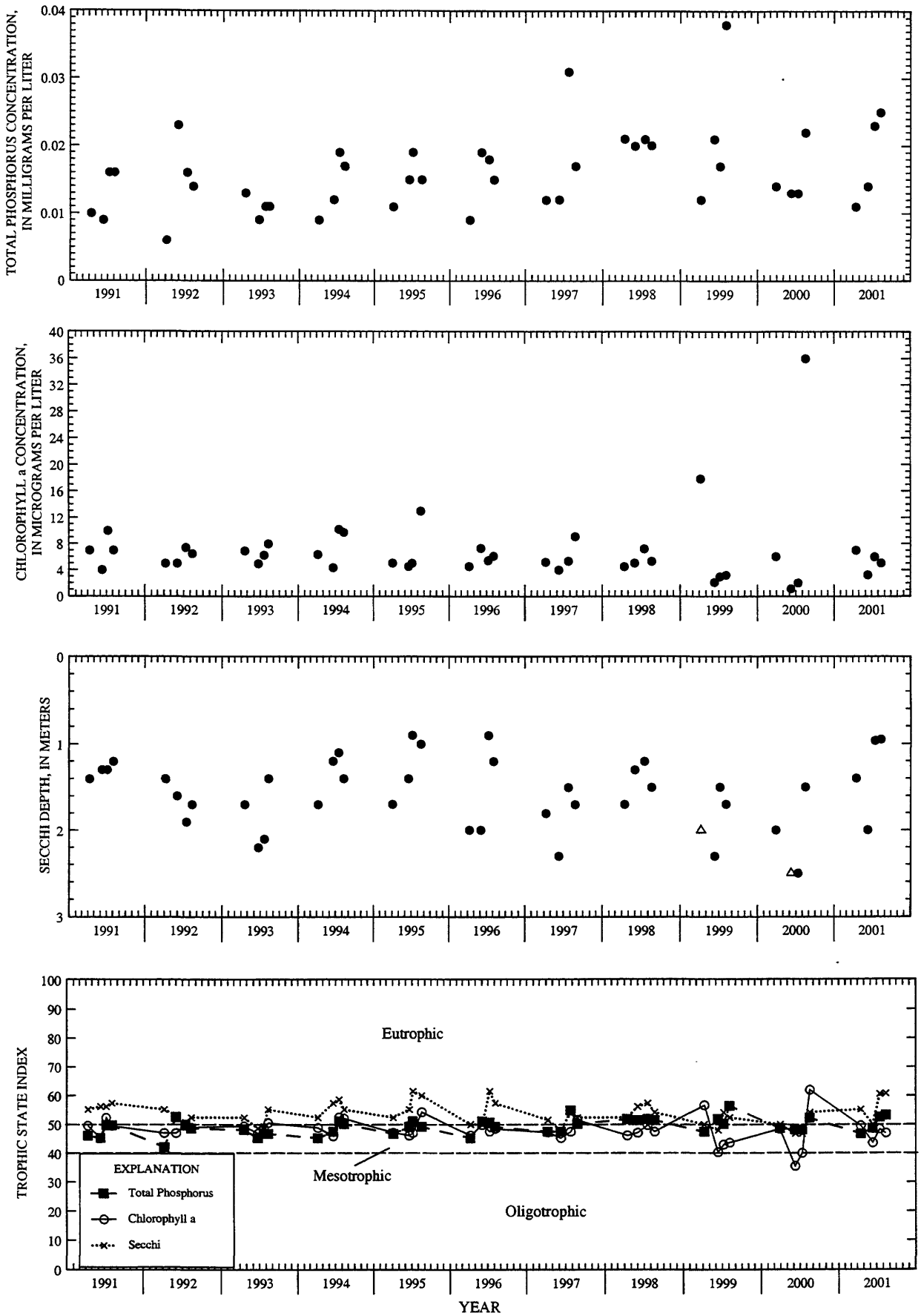


WATER TEMPERATURE (W.T.), IN DEGREES CELSIUS

PH, IN STANDARD UNITS



SPECIFIC CONDUCTANCE (S.C.), IN MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS



Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Eagle Spring Lake at Eagleville, Wisconsin.

(Triangles indicate maximum depth at sampling site. Actual secchi depth on these days was greater than plotted triangles.)

05406050 FISH LAKE NEAR SAUK CITY, WI

LOCATION.--Lat 43°17'27", long 89°39'09" in NE 1/4 SW 1/4 sec.3, T.9 N., R.7 E., Dane County, Hydrologic Unit 07070005, on north side of lake, 0.4 mi southwest of Crystal Lake, and 3.1 mi east of Sauk City.

DRAINAGE AREA.--2.23 mi^2. Area of Fish Lake, 252 acres.

PERIOD OF RECORD.--November 1966 to September 1981, April 1985 to May 1987, May 1988, April 1989 to October 1990 (fragmentary); continuous record from October 1990 to November 1996; nonrecording gage November 1996 to current year.

REVISED RECORDS.--WDR WI-92-1: Drainage area. WDR WI-87-1: All published values for the 1987 water year are invalid. Two valid values for water years 1987 and 1988 are available: May 7, 1987, water surface 10.52 ft, and May 16, 1988, water surface 10.83 ft.

GAGE.--Nonrecording gage. Datum of gage is 848.07 ft above sea level. Prior to Oct. 23, 1990, nonrecording gage. Local observer, Richard Lillie, reads staff gage when lake is ice-free.

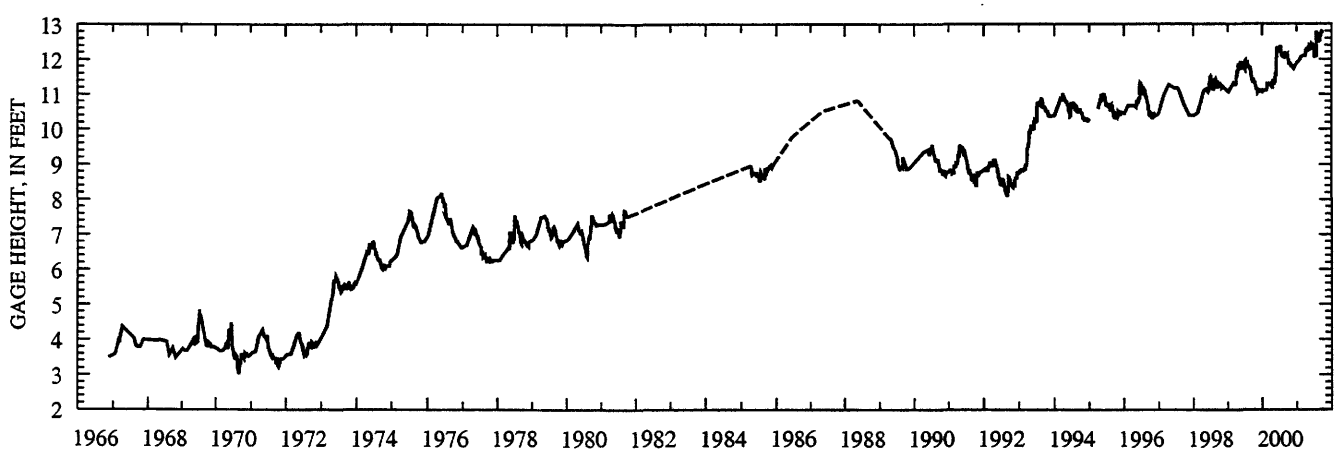
REMARKS.--Lake has no surface outlet.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 12.83 ft, Sept. 23, 2001; minimum observed, 3.02 ft, Aug. 29, 1970.

EXTREMES FOR CURRENT YEAR.--Maximum gage height observed, 12.83 ft, Sept. 23; minimum observed, 11.73 ft, Nov. 30.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12.01	---	---	---	---	---	12.09	12.24	12.31	12.30	12.06	12.58
2	---	11.81	---	---	---	---	---	12.24	---	12.28	12.75	---
3	---	---	---	---	---	---	---	12.27	12.30	12.26	12.76	12.57
4	---	11.78	---	---	---	---	---	12.29	---	12.24	12.75	---
5	---	11.77	---	---	---	---	---	12.29	12.33	12.20	12.74	12.54
6	---	---	---	---	---	---	---	12.28	12.32	12.18	12.73	12.54
7	---	---	---	---	11.98	---	---	12.30	---	12.16	12.72	12.59
8	---	---	---	---	---	---	---	12.28	12.33	12.16	12.71	12.71
9	---	---	---	---	---	---	---	12.27	---	12.15	12.69	12.75
10	---	11.79	---	---	---	---	---	12.27	12.31	---	12.66	12.73
11	---	---	---	---	---	---	---	12.38	12.30	12.11	12.63	12.71
12	11.90	---	---	---	---	---	12.27	---	12.44	12.08	12.61	---
13	11.88	---	---	---	---	12.11	12.29	12.36	12.42	---	12.58	12.68
14	---	---	---	---	---	---	---	---	12.44	12.05	---	12.66
15	11.88	---	---	---	---	---	12.27	---	12.45	---	---	---
16	11.88	11.80	---	---	---	---	---	12.34	---	---	12.58	---
17	---	---	---	---	12.08	---	12.26	---	12.42	12.12	---	12.68
18	11.88	---	---	---	---	---	---	12.30	12.45	12.13	12.54	12.67
19	11.88	11.78	---	---	---	---	12.24	---	12.41	---	12.52	12.75
20	---	---	---	---	---	---	12.29	---	12.40	12.15	12.50	12.74
21	11.86	---	---	---	---	---	---	12.34	12.46	12.14	12.50	12.75
22	---	---	---	---	---	---	12.30	---	12.44	---	12.52	---
23	11.88	---	---	---	---	---	---	---	12.42	12.22	---	12.83
24	---	11.74	---	---	---	---	---	12.31	12.41	12.20	12.48	12.81
25	---	---	---	---	---	---	---	---	12.38	12.18	12.66	---
26	---	---	---	---	---	---	12.28	12.30	12.39	---	12.68	12.78
27	11.87	---	---	---	---	---	---	12.30	12.38	---	12.67	12.76
28	---	---	11.88	---	---	---	12.26	12.29	12.36	12.11	12.65	---
29	11.85	---	---	---	---	---	12.25	---	12.34	12.10	12.64	---
30	---	11.73	---	---	---	---	---	12.27	12.32	12.08	12.63	12.74
31	---	---	---	---	---	---	---	---	---	---	12.61	---



423525088260400 GENEVA LAKE AT LAKE GENEVA, WI

LOCATION.--Lat 42°35'25", long 88°26'04" in SE 1/4 NW 1/4 sec.36, T.2 N., R.17 E., Walworth County, Hydrologic Unit 07120006, at Geneva Lake dam at Center Street at Lake Geneva.

DRAINAGE AREA.--28.7 mi^2. Area of Geneva Lake, 5,262 acres.

PERIOD OF RECORD.--October 1997 to current year.

GAGE.--Water-stage recorder. Datum of gage is 862.08 ft above sea level.

REMARKS.--Recording rain gage and gage-height telemeter at station.

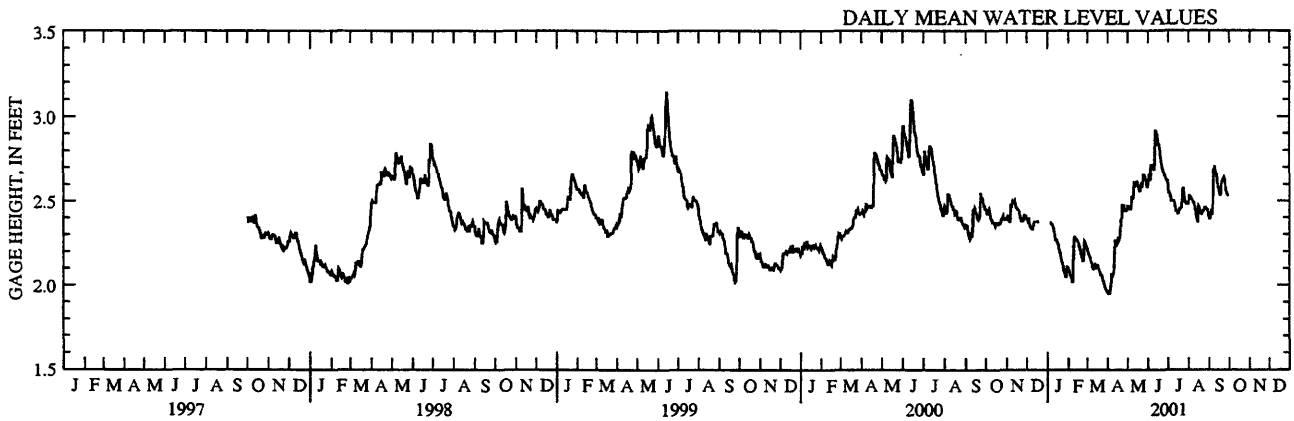
EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 3.29 ft, June 13, 2000; minimum gage height, 1.66 ft, Apr. 9, 2001.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 3.05 ft, June 12; minimum gage height, 1.66 ft, Apr. 9.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.45	2.39	2.40	---	2.10	2.22	1.97	2.47	2.61	2.58	2.49	2.40
2	2.44	2.41	2.39	---	2.09	2.20	1.95	2.47	2.66	2.55	2.53	2.39
3	2.42	2.41	2.38	---	2.07	2.19	1.95	2.46	2.64	2.55	2.53	2.41
4	2.45	2.39	2.39	---	2.06	2.18	1.95	2.46	2.62	2.54	2.52	2.43
5	2.44	2.38	2.36	2.37	2.05	2.17	1.97	2.45	2.67	2.51	2.52	2.42
6	2.45	2.37	2.35	2.37	2.04	2.16	2.00	2.45	2.71	2.50	2.51	2.42
7	2.42	2.48	2.34	2.36	2.02	2.14	2.07	2.50	2.71	2.50	2.50	2.51
8	2.40	2.46	2.34	2.36	2.02	2.13	2.05	2.53	2.71	2.50	2.49	2.68
9	2.39	2.49	2.33	2.35	2.23	2.11	2.06	2.51	2.70	2.50	2.49	2.69
10	2.38	2.50	2.33	2.34	2.29	2.10	2.08	2.53	2.71	2.50	2.47	2.71
11	2.37	2.49	2.35	2.32	2.28	2.11	2.13	2.61	2.68	2.48	2.45	2.67
12	2.37	2.49	2.38	2.30	2.28	2.11	2.27	2.61	2.90	2.46	2.44	2.66
13	2.37	2.50	2.37	2.27	2.27	2.12	2.23	2.61	2.92	2.44	2.40	2.62
14	2.36	2.48	---	2.27	2.27	2.11	2.24	2.60	2.90	2.44	2.39	2.59
15	2.35	2.46	---	2.27	2.26	2.12	2.26	2.61	2.89	2.43	2.37	2.57
16	2.36	2.46	2.38	2.25	2.25	2.12	2.27	2.60	2.87	2.42	2.47	2.56
17	2.36	2.45	2.38	2.24	2.24	2.12	2.26	2.59	2.83	2.44	2.46	2.54
18	2.37	2.45	2.37	2.22	2.22	2.10	2.27	2.57	2.83	2.45	2.44	2.53
19	2.37	2.44	---	2.20	2.21	2.09	2.28	2.56	2.80	2.45	2.43	2.60
20	2.37	2.43	---	2.19	2.19	2.08	2.33	2.56	2.76	2.46	2.42	2.61
21	2.36	2.41	---	2.17	2.17	2.07	2.39	2.59	2.73	2.46	2.42	2.63
22	2.36	2.39	---	2.15	2.16	2.06	2.40	2.61	2.71	2.50	2.44	2.63
23	2.37	2.38	---	2.13	2.14	2.06	2.48	2.58	2.69	2.57	2.44	2.64
24	2.39	2.38	---	2.12	2.16	2.04	2.44	2.61	2.68	2.58	2.44	2.63
25	2.39	2.38	---	2.10	2.26	2.03	2.45	2.66	2.66	2.55	2.46	2.60
26	2.40	2.40	---	2.08	2.25	2.02	2.46	2.65	2.65	2.52	2.46	2.57
27	2.41	2.41	---	2.07	2.24	2.00	2.44	2.64	2.64	2.49	2.46	2.55
28	2.39	2.40	---	2.05	2.23	1.99	2.44	2.63	2.63	2.49	2.45	2.54
29	2.39	2.41	---	2.05	---	1.98	2.44	2.62	2.62	2.48	2.45	2.53
30	2.39	2.41	---	2.11	---	1.97	2.45	2.59	2.62	2.48	2.44	2.53
31	2.39	---	---	2.11	---	1.96	---	2.58	---	2.48	2.42	---
MEAN	2.39	2.43	---	---	2.18	2.09	2.23	2.56	2.72	2.49	2.46	2.56
MAX	2.45	2.50	---	---	2.29	2.22	2.48	2.66	2.92	2.58	2.53	2.71
MIN	2.35	2.37	---	---	2.02	1.96	1.95	2.45	2.61	2.42	2.37	2.39



423329088323300 GENEVA LAKE AT WEST END NEAR WILLIAMS BAY, WI

LOCATION.--Lat 42°33'29", long 88°32'33", in NE 1/4 SE 1/4, sec.12, T.1 N., R.16 E., Walworth County, Hydrologic Unit 07120006, 1.3 mi south of Williams Bay.

DRAINAGE AREA.--28.7 mi^2.

PERIOD OF RECORD.--April 1997 to current year.

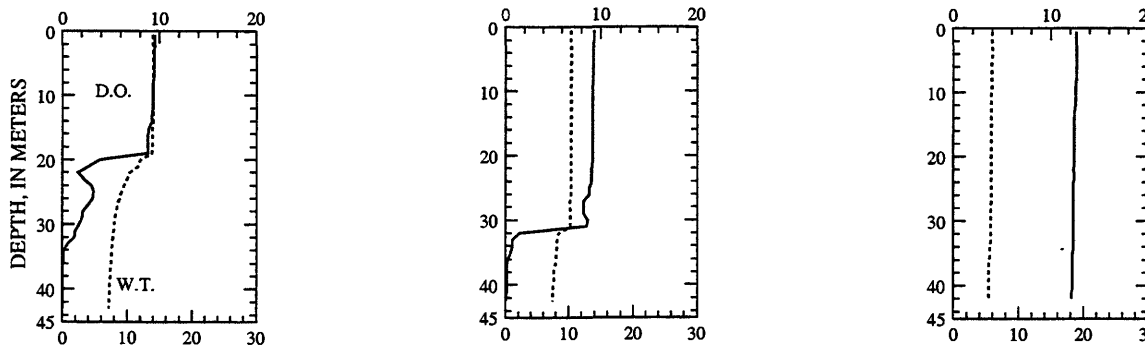
REMARKS.--Lake sampled at deep hole at a depth of about 43 m. Water-quality analyses done by Wisconsin State Laboratory of Hygiene. Samples for determination of chlorophyll-a concentration are collected from the top 1.5 ft of the lake.

WATER-QUALITY DATA, OCTOBER 16, 2000 TO APRIL 18, 2001
(Milligrams per liter unless otherwise indicated)

	Oct-16						Nov-15				Apr-18	
Lake stage (ft)			2.36						2.46			2.27
Secchi-depth (m)			5.8						6.4			5.9
Chlorophyll a, phytoplankton (µg/L)			1.9						<1.0			<1.0
Depth of sample (m)	0.5	19.0	25.0	34.0	39.0	43.0	0.5	31.0	38.0	42.5	0.5	41.0
Water temperature (°C)	14.0	13.8	9.1	7.6	7.3	7.2	10.4	10.3	7.7	7.5	6.0	5.4
Specific conductance (µS/cm)	494	497	516	518	521	522	499	502	518	520	513	514
pH (units)	8.0	8.1	7.6	7.4	7.4	7.4	8.1	8.1	7.4	7.4	8.2	8.2
Dissolved oxygen (mg/L)	9.5	8.8	3.2	0.1	0.0	0.0	9.3	8.5	0.1	0.0	12.6	12.1
Phosphorus, total (as P)	0.010	0.012	0.008	0.030	0.038	0.061	0.010	0.008	0.022	0.061	0.010	0.010
Phosphorus, ortho, dissolved (as P)	<0.002	---	---	---	---	---	0.003	---	---	---	<0.002	<0.002
Nitrogen, NO2 + NO3, diss. (as N)	0.01	---	---	---	---	---	0.058	---	---	---	0.11	0.123
Nitrogen, ammonia, dissolved (as N)	0.007	---	---	---	---	---	0.025	---	---	---	0.02	0.045
Nitrogen, amm. + org., total (as N)	0.42	---	---	---	---	---	0.42	---	---	---	0.35	0.37
Nitrogen, total (as N)	0.426	---	---	---	---	---	0.478	---	---	---	0.46	0.493
Color (Pt-Co. scale)	---	---	---	---	---	---	---	---	---	---	5	5
Turbidity (NTU)	---	---	---	---	---	---	---	---	---	---	1.5	1.1
Hardness, (as $CaCO_3$)	---	---	---	---	---	---	---	---	---	---	227	223
Calcium, dissolved (Ca)	---	---	---	---	---	---	---	---	---	---	35	35
Magnesium, dissolved (Mg)	---	---	---	---	---	---	---	---	---	---	34	33
Sodium, dissolved (Na)	---	---	---	---	---	---	---	---	---	---	17	17
Potassium, dissolved (K)	---	---	---	---	---	---	---	---	---	---	1.7	1.8
Alkalinity, (as $CaCO_3$)	---	---	---	---	---	---	---	---	---	---	180	180
Sulfate, dissolved (SO_4)	---	---	---	---	---	---	---	---	---	---	30.1	30
Chloride, dissolved (Cl)	---	---	---	---	---	---	---	---	---	---	35	34.8
Silica, dissolved (SiO_2)	---	---	---	---	---	---	---	---	---	---	2.1	2.2
Solids, dissolved, at 180°C	---	---	---	---	---	---	---	---	---	---	280	280
Iron, dissolved (Fe) µg/L	---	---	---	---	---	---	---	---	---	---	<10	<10
Manganese, dissolved (Mn) µg/L	---	---	---	---	---	---	---	---	---	---	<0.4	<0.4

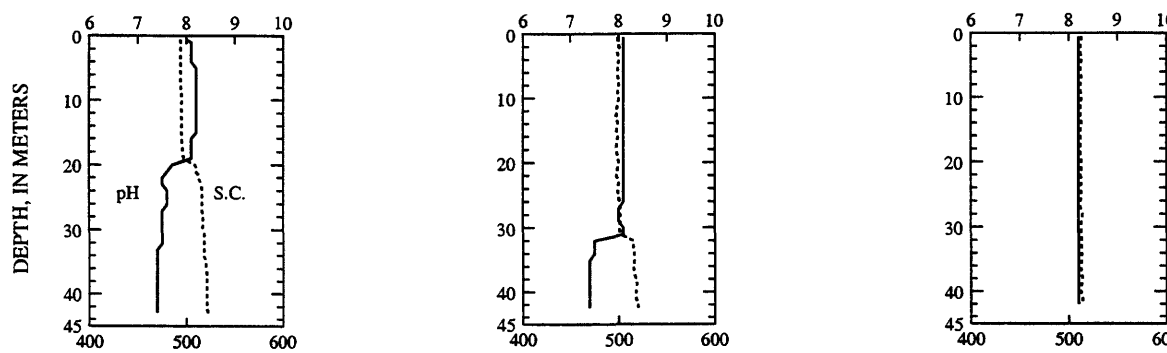
10-16-00 11-15-00 4-18-01

DISSOLVED OXYGEN (D.O.), IN MILLIGRAMS PER LITER



WATER TEMPERATURE (W.T.), IN DEGREES CELSIUS

PH, IN STANDARD UNITS



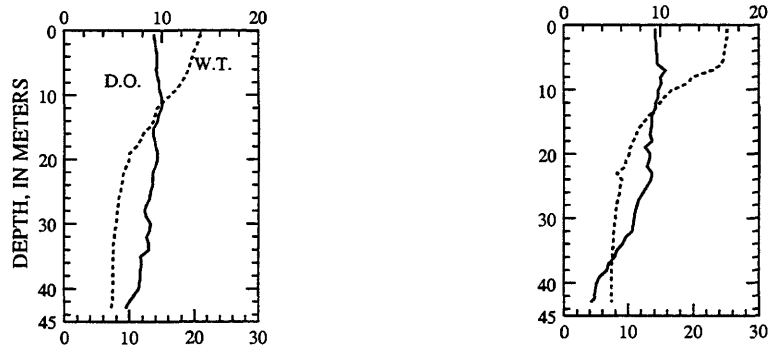
SPECIFIC CONDUCTANCE (S.C.), IN MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS

WATER-QUALITY DATA, JUNE 20 TO JULY 16, 2001
(Milligrams per liter unless otherwise indicated)

	Jun-20						Jul-16				
Lake stage (ft)			2.76						2.42		
Secchi-depth (m)			9.4						4.3		
Chlorophyll a, phytoplankton (µg/L)			<1.0						<1.0		
Depth of sample (m)	0.5	7.0	20.0	33.0	38.0	42.0	0.5	25.0	33.0	38.0	42.0
Water temperature (°C)	20.9	18.6	9.9	7.6	7.5	7.3	25.2	8.8	7.7	7.5	7.4
Specific conductance (µS/cm)	494	500	511	514	514	516	488	507	509	511	512
pH (units)	8.3	8.3	8.4	8.1	7.9	7.7	8.4	8.6	8.2	7.9	7.7
Dissolved oxygen (mg/L)	9.2	9.5	9.5	8.6	7.8	6.4	9.5	8.6	6.4	4.5	3.1
Phosphorus, total (as P)	0.009	0.015	0.012	0.013	0.012	0.026	0.005	<0.005	<0.005	0.007	0.017
Phosphorus, ortho, dissolved (as P)	0.004	---	---	---	---	---	0.003	---	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	0.053	---	---	---	---	---	0.012	---	---	---	---
Nitrogen, ammonia, dissolved (as N)	0.027	---	---	---	---	---	0.026	---	---	---	---
Nitrogen, amm. + org., total (as N)	0.36	---	---	---	---	---	0.51	---	---	---	---
Nitrogen, total (as N)	0.413	---	---	---	---	---	0.525	---	---	---	---

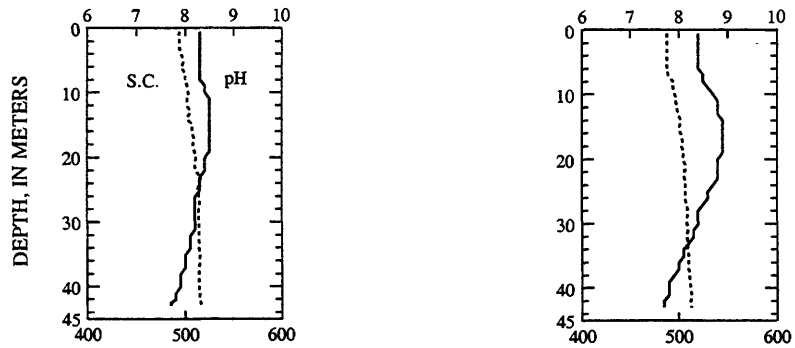
06-20-01 07-16-01

DISSOLVED OXYGEN (D.O.), IN MILLIGRAMS PER LITER



WATER TEMPERATURE (W.T.), IN DEGREES CELSIUS

PH, IN STANDARD UNITS



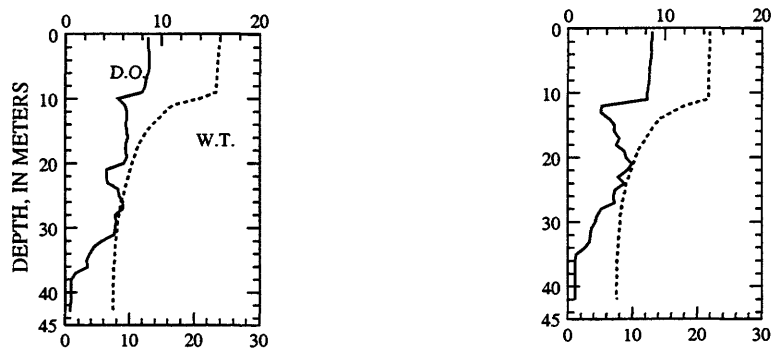
SPECIFIC CONDUCTANCE (S.C.), IN MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS

WATER-QUALITY DATA, AUGUST 20 TO SEPTEMBER 11, 2001
(Milligrams per liter unless otherwise indicated)

	Aug-20						Sep-11					
Lake stage (ft)			2.42						2.67			
Secchi-depth (m)			3.2						5.20			
Chlorophyll a, phytoplankton (µg/L)			2.3						4			
Depth of sample (m)	0.5	9.0	21.0	33.0	38.0	42.0	0.5	11.0	29.0	32.0	37.0	41.0
Water temperature (°C)	23.9	23.4	10.1	7.8	7.5	7.4	21.9	21.8	8.1	7.9	7.6	7.5
Specific conductance (µS/cm)	492	493	517	521	523	527	491	493	520	526	527	527
pH (units)	8.4	8.3	8.4	7.9	7.7	7.6	8.3	8.1	7.7	7.6	7.5	7.5
Dissolved oxygen (mg/L)	8.6	8.0	4.3	2.9	0.8	0.5	8.7	8.2	3.0	2.3	0.7	0.7
Phosphorus, total (as P)	0.008	0.008	0.009	0.011	0.021	0.051	0.008	0.011	0.008	0.011	0.016	0.025
Phosphorus, ortho, dissolved (as P)	0.003	---	---	---	---	---	0.003	0.003	0.004	0.005	0.009	0.015
Nitrogen, NO2 + NO3, diss. (as N)	<0.010	---	---	---	---	---	<0.010	<0.010	0.27	0.285	0.17	0.096
Nitrogen, ammonia, dissolved (as N)	0.033	---	---	---	---	---	<0.013	0.016	0.034	0.048	0.125	0.182
Nitrogen, amm. + org., total (as N)	0.48	---	---	---	---	---	0.53	0.53	0.46	0.52	0.59	0.65
Nitrogen, total (as N)	---	---	---	---	---	---	---	---	0.73	0.805	0.76	0.746

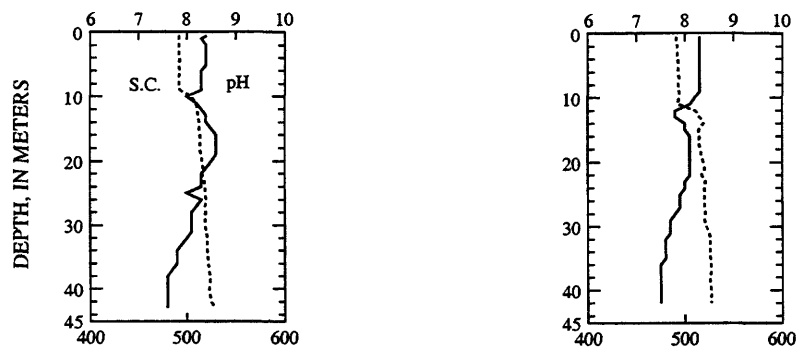
08-20-01 09-11-01

DISSOLVED OXYGEN (D.O.), IN MILLIGRAMS PER LITER

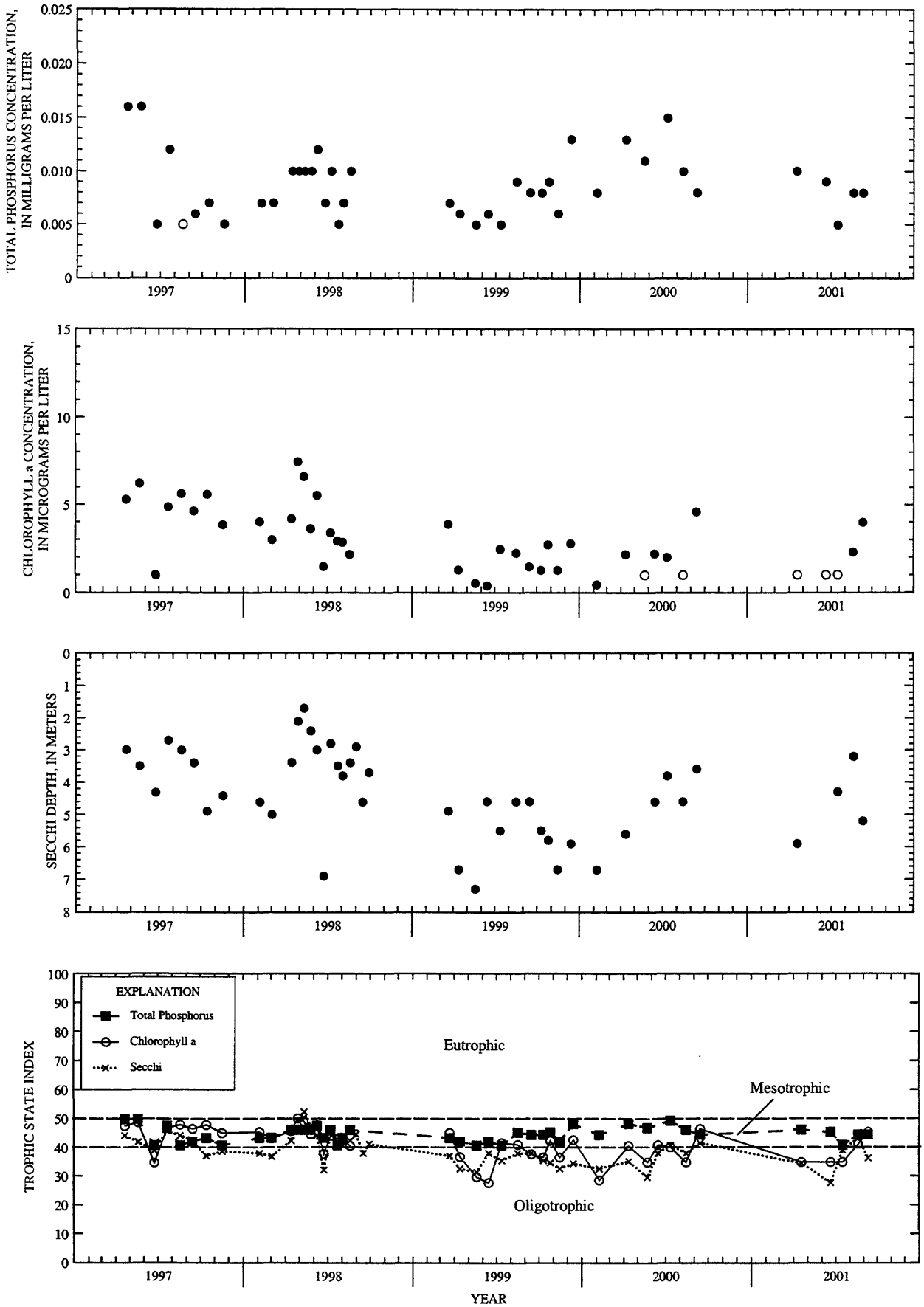


WATER TEMPERATURE (W.T.), IN DEGREES CELSIUS

PH, IN STANDARD UNITS



SPECIFIC CONDUCTANCE (S.C.), IN MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS



Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Lake Geneva, West End, near Williams Bay, Wisconsin.

(Actual concentrations for these particular analyses are less than the plotted circles. Circles on the first three plots indicate laboratory detection limit for selected analyses.)

434928088553601 GREEN LAKE AT COUNTY TRUNK HIGHWAY A NEAR GREEN LAKE, WI

LOCATION.--Lat 43°49'28", long 88°55'36" in NE 1/4 SE 1/4 SE 1/4 sec.27, T.16 N., R.13 E., Green Lake County, Hydrologic Unit 04030201, on left bank at downstream side of County Trunk Highway A, 2.3 mi southeast of Green Lake.

DRAINAGE AREA.--103 mi^2.

PERIOD OF RECORD.--October 1993 to current year.

GAGE.--Water-stage recorder. Datum of gage is 790.00 ft above sea level.

REMARKS.--Lake level regulated by dam at outlet at Green Lake. Gage-height telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum recorded gage height, 7.05 ft, Apr. 12, 2001; minimum recorded, 5.41 ft, Jan. 17, 1995.

EXTREMES FOR CURRENT YEAR.--Maximum recorded gage height, 7.05 ft, Apr. 12; minimum recorded, 6.04 ft, Dec. 9.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.41	6.19	6.12	6.20	6.29	6.36	6.63	6.44	6.56	6.53	6.32	6.37
2	6.40	6.18	6.12	6.20	6.29	6.36	6.63	6.44	6.60	6.48	6.42	6.36
3	6.38	6.17	6.12	6.20	6.29	6.36	6.65	6.49	6.60	6.46	6.43	6.35
4	6.38	6.14	6.13	6.20	6.30	6.36	6.65	6.59	6.59	6.46	6.43	6.33
5	6.37	6.13	6.11	6.20	6.30	6.36	6.66	6.61	6.61	6.42	6.43	6.32
6	6.36	6.10	6.09	e6.20	6.29	6.35	6.71	6.62	6.63	6.40	6.43	6.32
7	6.34	6.16	6.08	e6.20	6.29	6.35	6.82	6.65	6.64	6.37	6.42	6.42
8	6.31	6.16	6.09	6.20	6.30	6.35	6.85	6.67	6.64	6.36	6.42	6.54
9	6.30	6.15	6.07	6.20	6.36	6.35	6.85	6.65	6.64	6.36	6.41	6.55
10	6.28	6.16	6.08	6.20	6.38	6.35	6.85	6.66	6.65	6.36	6.35	6.58
11	6.27	6.15	6.09	6.20	6.38	6.35	6.89	6.73	6.65	6.33	6.33	6.56
12	6.26	6.14	6.10	6.20	6.37	6.36	6.96	6.73	6.79	6.32	6.32	6.55
13	6.26	6.17	6.09	6.20	6.37	6.37	6.90	6.72	6.81	6.31	6.30	6.51
14	6.26	6.18	6.09	6.22	6.37	6.37	6.87	6.75	6.82	6.30	6.29	6.48
15	6.25	6.15	6.10	6.24	6.38	6.38	6.84	6.80	6.88	6.29	6.28	6.47
16	6.25	6.15	6.15	6.24	6.37	6.38	6.81	6.80	6.88	6.28	6.30	6.46
17	6.25	6.17	6.15	6.24	6.37	6.38	6.75	6.79	6.85	6.28	6.29	6.46
18	6.24	6.17	6.15	6.24	6.36	6.39	6.72	6.76	6.90	6.30	6.27	6.46
19	6.24	6.15	6.17	6.23	6.36	6.40	6.68	6.73	6.90	6.31	6.26	6.46
20	6.24	6.16	6.17	6.23	6.36	6.42	6.67	6.70	6.84	6.31	6.26	6.48
21	6.23	6.14	6.19	6.23	6.35	6.44	6.68	6.71	6.82	6.31	6.25	6.47
22	6.22	6.11	6.18	6.23	6.35	6.46	6.63	6.73	6.82	6.32	6.34	6.46
23	6.22	6.10	6.17	6.23	6.34	6.48	6.64	6.70	6.79	6.36	6.39	6.46
24	6.23	6.09	6.18	6.23	6.34	6.50	6.59	6.68	6.75	6.37	6.38	6.46
25	6.23	6.09	6.17	6.22	6.37	6.51	6.56	6.67	6.72	6.34	6.42	6.44
26	6.24	6.09	6.17	6.23	6.37	6.53	6.53	6.66	6.69	6.32	6.44	6.43
27	6.25	6.10	6.17	6.23	6.37	6.54	6.49	6.64	6.66	6.30	6.45	6.41
28	6.23	6.09	6.17	6.23	6.37	6.55	6.47	6.62	6.63	6.29	6.44	6.40
29	6.22	6.11	6.20	6.23	---	6.57	6.45	6.59	6.60	6.29	6.43	6.38
30	6.21	6.12	6.20	6.29	---	6.59	6.45	6.57	6.58	6.29	6.42	6.38
31	6.21	---	6.20	6.30	---	6.60	---	6.54	---	6.29	6.39	---
MEAN	6.28	6.14	6.14	6.22	6.34	6.42	6.70	6.66	6.72	6.35	6.36	6.44
MAX	6.41	6.19	6.20	6.30	6.38	6.60	6.96	6.80	6.90	6.53	6.45	6.58
MIN	6.21	6.09	6.07	6.20	6.29	6.35	6.45	6.44	6.56	6.28	6.25	6.32

e Estimated

453421091333700 HEMLOCK LAKE NEAR MIKANA, WI

LOCATION.--Lat 45°34'21", long 91°33'37", in SE 1/4 SE 1/4 sec.26, T.36 N., R.10 W., Barron County, Hydrologic Unit 07050007, 2.5 mi southeast of Mikana.

PERIOD OF RECORD.--March 1993 to August 1994, March 1996 to August 1997, and March to September 2001.

REMARKS.--Lake sampled at deep hole near center of lake. Lake ice-covered during March sampling. Water-quality analyses by Wisconsin State Laboratory of Hygiene.

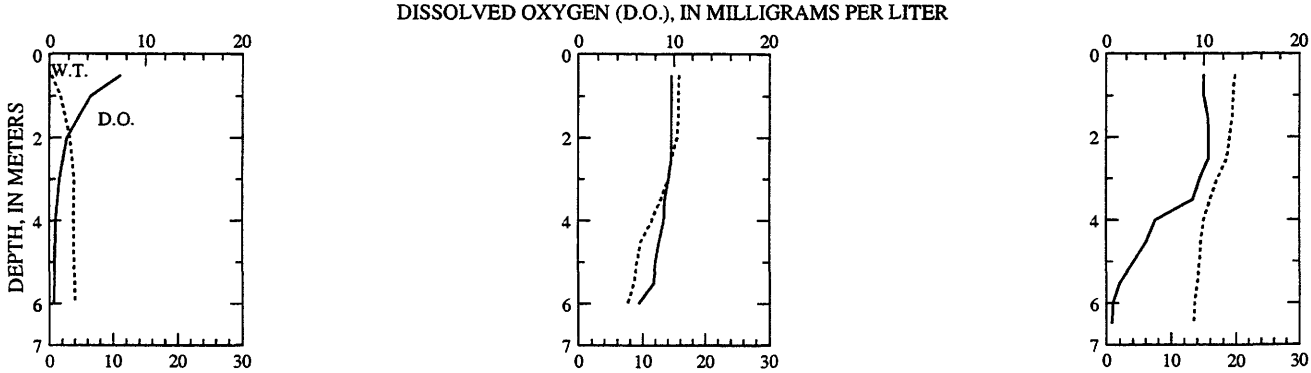
WATER-QUALITY DATA, MARCH 01 TO JUNE 12, 2001

(Milligrams per liter unless otherwise indicated

	Mar-1		May-2		Jun-12	
Lake stage (ft)	---		10.94		10.66	
Secchi-depth (m)	---		1.7		1.8	
Chlorophyll a, phytoplankton (µg/L)	---		4.3		7	
Depth of sample (m)	0.5	6.0	0.5	6.0	0.5	6.0
Water temperature (°C)	0.2	4.0	15.8	7.6	19.8	13.6
Specific conductance (µS/cm)	120	132	56	58	78	85
pH (units)	6.6	6.6	8.1	7.3	7.8	6.9
Dissolved oxygen (mg/L)	7.4	0.4	9.7	6.2	10.0	0.6
Phosphorus, total (as P)	0.060	0.049	0.041	0.042	0.033	0.098
Phosphorus, ortho, dissolved (as P)	---	---	0.01	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	0.105	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	0.071	---	---	---
Nitrogen, amm. + org., total (as N)	---	---	0.49	---	---	---
Nitrogen, total (as N)	---	---	0.595	---	---	---
Color (Pt-Co. scale)	---	---	60	---	---	---
Turbidity (NTU)	---	---	4.2	---	---	---
Hardness, (as $CaCO_3$)	---	---	27.5	---	---	---
Calcium, dissolved (Ca)	---	---	6.9	---	---	---
Magnesium, dissolved (Mg)	---	---	2.5	---	---	---
Sodium, dissolved (Na)	---	---	1.5	---	---	---
Potassium, dissolved (K)	---	---	0.6	---	---	---
Alkalinity, (as $CaCO_3$)	---	---	24	---	---	---
Sulfate, dissolved (SO_4)	---	---	<4.5	---	---	---
Chloride, dissolved (Cl)	---	---	1.2	---	---	---
Silica, dissolved (SiO_2)	---	---	11.7	---	---	---
Solids, dissolved, at 180°C	---	---	54	---	---	---
Iron, dissolved (Fe) µg/L	---	---	430	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	220	---	---	---

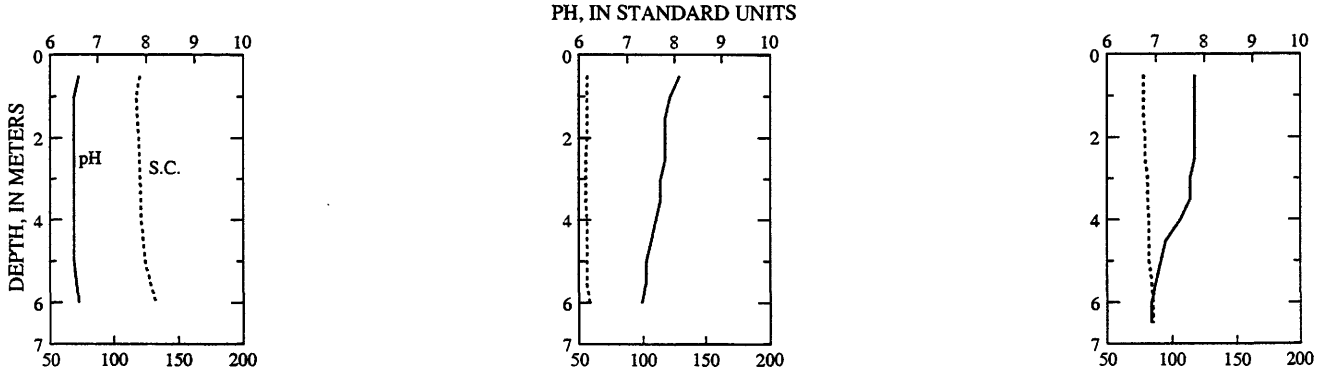
3-1-01 5-2-01 6-12-01

DISSOLVED OXYGEN (D.O.), IN MILLIGRAMS PER LITER



WATER TEMPERATURE (W.T.), IN DEGREES CELSIUS

PH, IN STANDARD UNITS



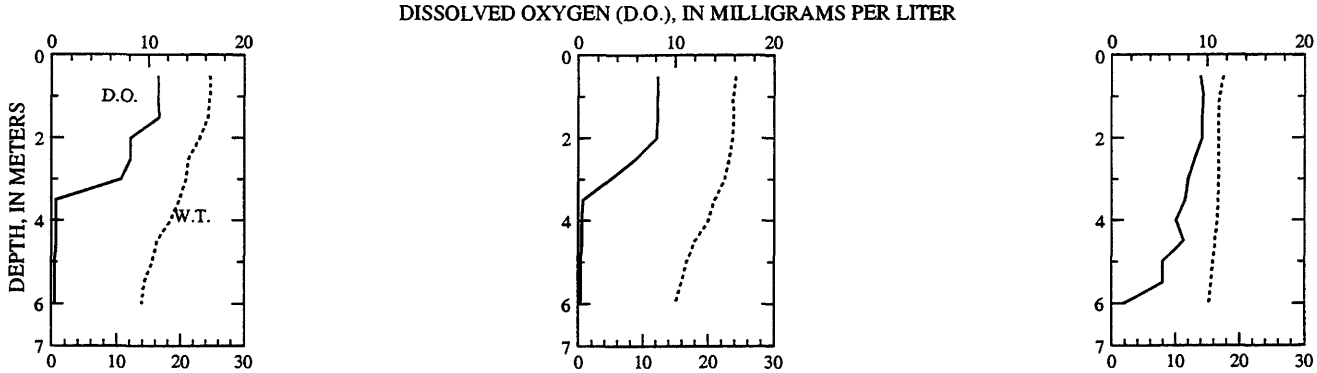
SPECIFIC CONDUCTANCE (S.C.), IN MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS

WATER-QUALITY DATA, JULY 10 TO SEPTEMBER 20, 2001
(Milligrams per liter unless otherwise indicated)

	Jul-10		Aug-13			Sep-20		
Lake stage (ft)	10.72		10.67			10.74		
Secchi-depth (m)	1.6		1.7			1.6		
Chlorophyll a, phytoplankton (µg/L)	---		5.3			27		
Depth of sample (m)	0.5	6.0	0.5	3.5	6.0	0.5	4.5	6.0
Water temperature (°C)	24.7	13.9	24.2	20.9	15.0	17.5	16.2	15.3
Specific conductance (µS/cm)	84	124	82	88	169	96	98	107
pH (units)	9.0	7.1	7.5	6.7	7.0	7.7	7.2	6.9
Dissolved oxygen (mg/L)	11.0	0.3	8.2	0.4	0.2	9.3	7.5	1.2
Phosphorus, total (as P)	---	0.374	0.034	0.044	0.696	0.037	0.036	0.043

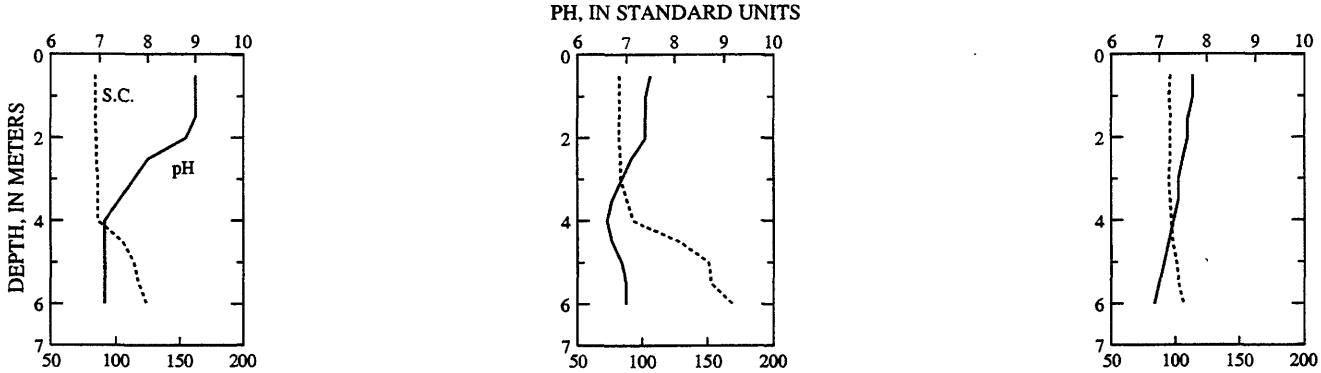
7-10-01 8-13-01 9-20-01

DISSOLVED OXYGEN (D.O.), IN MILLIGRAMS PER LITER

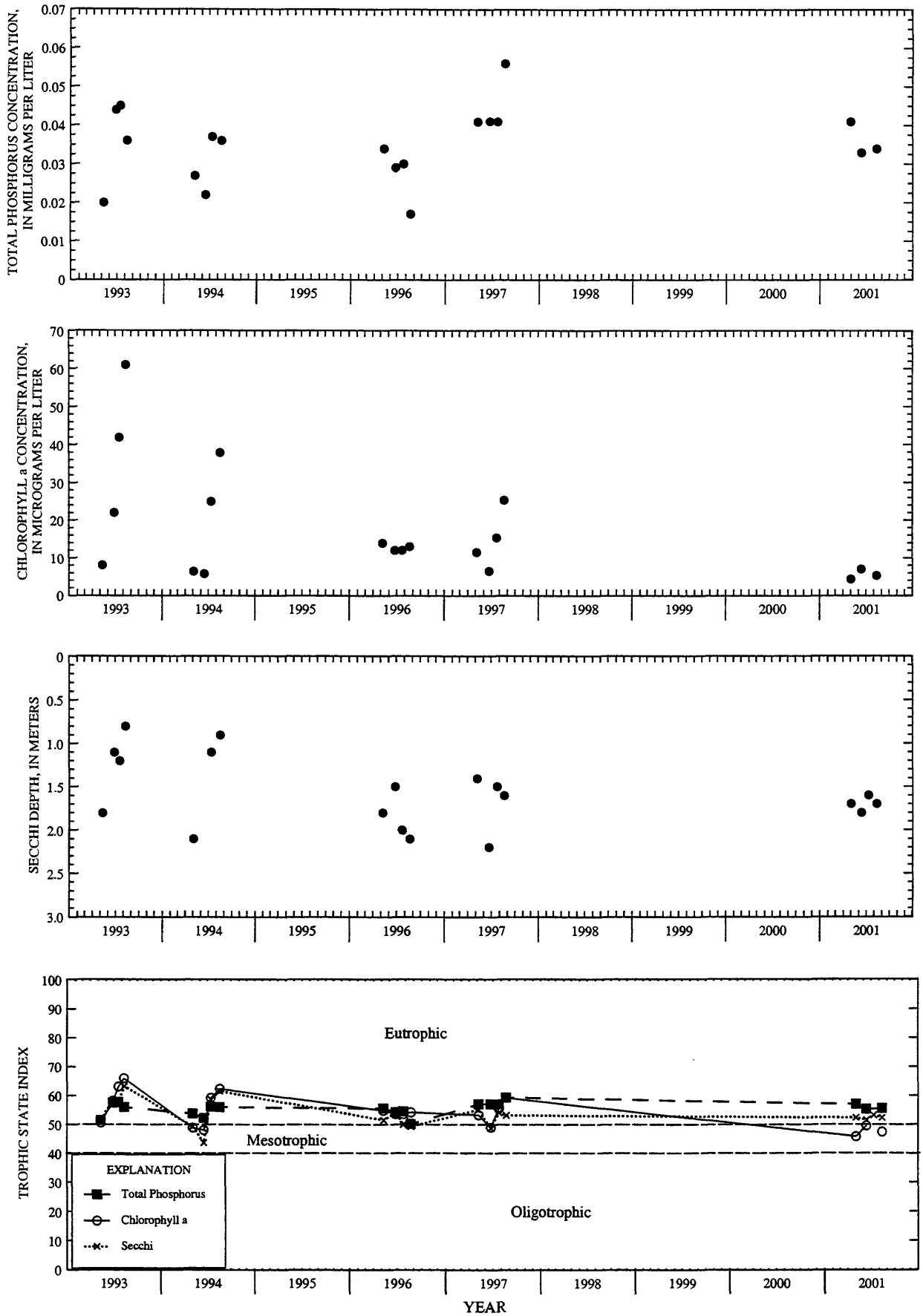


WATER TEMPERATURE (W.T.), IN DEGREES CELSIUS

PH, IN STANDARD UNITS



SPECIFIC CONDUCTANCE (S.C.), IN MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS



Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Hemlock Lake, near Mikana, Wisconsin.

05427235 LAKE KOSHKONONG NEAR NEWVILLE, WI

LOCATION.--Lat 42°51'27", long 88°56'27", in NW 1/4 NE 1/4 sec.34, T.5 N., R.13 E., Jefferson County, Hydrologic Unit 07090001, 80 ft east of Pottawatomi Trail Bridge at Bingham Point Estates, and 4.5 mi northeast of Newville.

DRAINAGE AREA.--2,560 mi^2, at lake outlet. Area of Lake Koshkonong, 16.3 mi^2.

PERIOD OF RECORD.--July 1987 to current year.

GAGE.--Water-stage recorder. Datum of gage is 770.00 ft above sea level.

REMARKS.--Lake level regulated by dam at Indianford. Gage-height telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum recorded gage height, 12.23 ft, Apr. 25, 1993; minimum recorded, 5.10 ft, Dec. 28, 29, 1999.

EXTREMES FOR CURRENT YEAR.--Maximum recorded gage height, 8.98 ft, Apr. 16, 17; minimum recorded, 5.51 ft, Nov. 1.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.51	5.59	5.67	5.86	5.79	6.75	8.20	8.09	7.22	8.21	6.23	6.27
2	6.48	5.62	5.70	5.85	5.83	6.76	8.17	8.01	7.22	8.09	6.51	6.29
3	6.42	5.66	5.71	5.85	5.86	6.77	8.14	7.97	7.16	7.98	6.54	6.30
4	6.34	5.67	5.70	5.82	5.88	6.80	8.11	8.04	7.11	7.89	6.48	6.30
5	6.25	5.68	5.68	5.79	5.90	6.86	8.08	8.00	7.10	7.76	6.41	6.24
6	6.27	5.67	5.63	5.76	5.89	6.92	8.08	7.97	7.11	7.61	6.36	6.20
7	6.25	5.78	5.60	5.74	5.88	6.96	8.05	7.95	7.11	7.48	6.30	6.29
8	6.22	5.81	5.57	5.72	5.87	7.00	8.07	7.92	7.12	7.35	6.23	6.49
9	6.21	5.86	5.56	5.70	6.01	7.03	8.21	7.86	7.12	7.21	6.19	6.64
10	6.21	5.87	5.57	5.69	6.10	7.06	8.28	7.82	7.10	7.07	6.15	6.84
11	6.20	5.84	5.60	5.67	6.20	7.10	8.35	7.89	7.08	6.89	6.09	6.91
12	6.21	5.82	5.63	5.65	6.29	7.16	8.52	7.85	7.21	6.72	6.05	6.94
13	6.24	5.84	5.63	5.64	6.40	7.25	8.70	7.79	7.37	6.55	6.02	6.92
14	6.26	5.85	5.62	5.65	6.51	7.34	8.82	7.73	7.59	6.41	6.03	6.89
15	6.26	5.79	5.62	5.65	6.60	7.45	8.88	7.69	7.81	6.28	6.05	6.85
16	6.26	5.80	5.65	5.65	6.67	7.56	8.93	7.65	7.97	6.17	6.15	6.80
17	6.21	5.86	5.69	5.65	6.72	7.66	8.92	7.59	8.06	6.19	6.17	6.76
18	6.17	5.87	5.73	5.67	6.75	7.76	8.83	7.52	8.13	6.22	6.19	6.73
19	6.11	5.88	5.77	5.68	6.76	7.86	8.75	7.45	8.21	6.22	6.22	6.80
20	6.06	5.90	5.79	5.70	6.74	8.01	8.73	7.36	8.28	6.22	6.21	6.77
21	6.03	5.84	5.81	5.71	6.72	8.09	8.70	7.35	8.34	6.22	6.22	6.81
22	6.01	5.77	5.82	5.71	6.68	8.16	8.68	7.32	8.41	6.20	6.28	6.83
23	6.01	5.72	5.83	5.71	6.63	8.24	8.63	7.30	8.44	6.19	6.27	6.95
24	6.02	5.67	5.84	5.70	6.59	8.31	8.63	7.29	8.47	6.16	6.23	7.06
25	5.95	5.62	5.84	5.68	6.61	8.37	8.56	7.30	8.47	6.13	6.23	7.12
26	5.88	5.60	5.84	5.67	6.63	8.39	8.50	7.31	8.47	6.10	6.27	7.18
27	5.84	5.58	5.84	5.65	6.67	8.39	8.45	7.32	8.44	6.07	6.28	7.22
28	5.79	5.59	5.85	5.63	6.72	8.37	8.36	7.32	8.40	6.10	6.30	7.25
29	5.73	5.62	5.87	5.63	---	8.32	8.25	7.30	8.34	6.16	6.28	7.26
30	5.68	5.64	5.88	5.70	---	8.27	8.16	7.27	8.27	6.19	6.26	7.24
31	5.65	---	5.87	5.74	---	8.22	---	7.22	---	6.21	6.27	---
MEAN	6.12	5.74	5.72	5.71	6.35	7.59	8.46	7.63	7.77	6.72	6.24	6.77
MAX	6.51	5.90	5.88	5.86	6.76	8.39	8.93	8.09	8.47	8.21	6.54	7.26
MIN	5.65	5.58	5.56	5.63	5.79	6.75	8.05	7.22	7.08	6.07	6.02	6.20

430733088305900 LAC LA BELLE AT OCONOMOWOC, WI

LOCATION.--Lat 43°07'33", long 88°30'59", in NW 1/4 SW 1/4 sec.29, T.8 N., R.17 E., Waukesha County, Hydrologic Unit 07090001, at Oconomowoc.

DRAINAGE AREA.--99.6 mi^2.

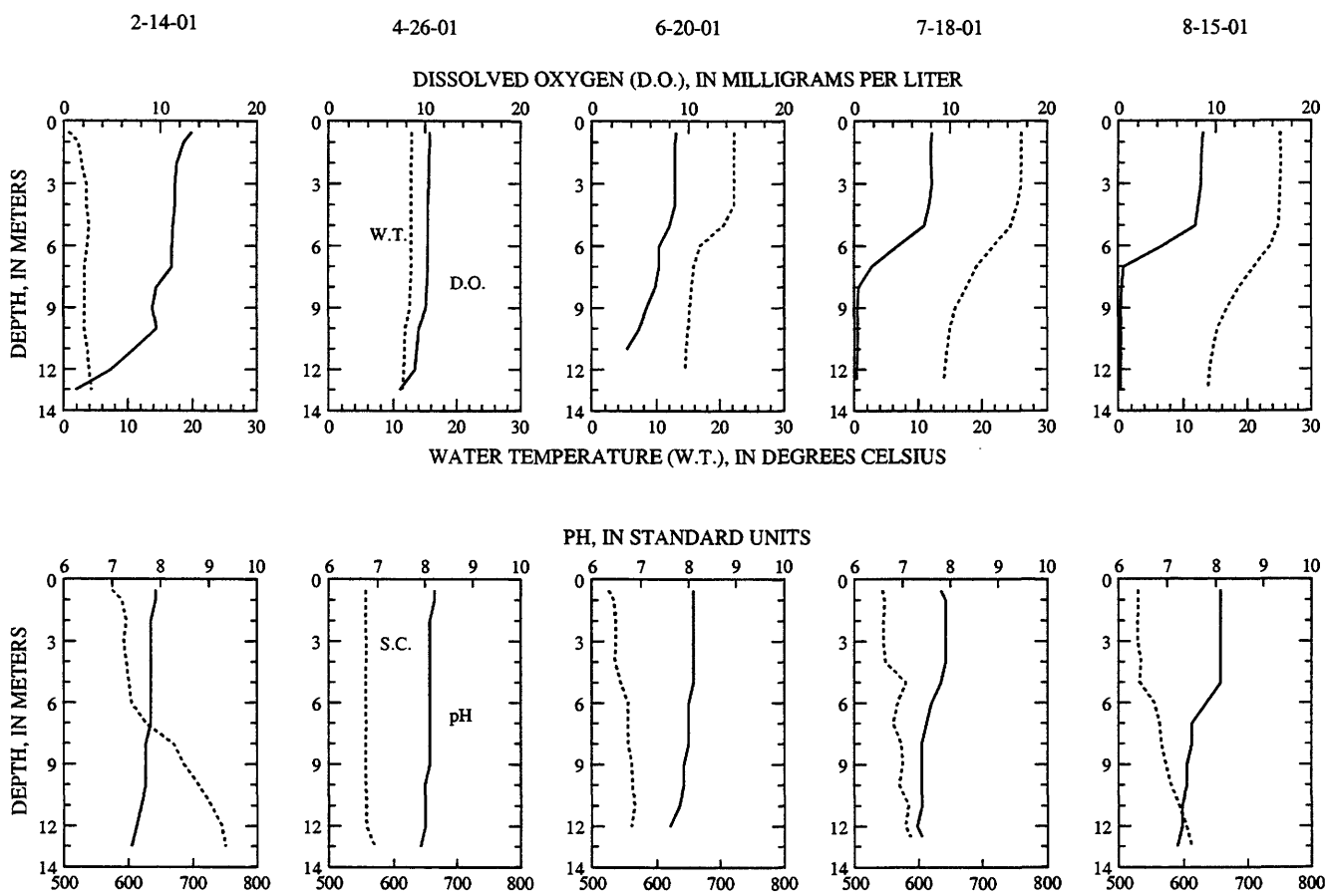
PERIOD OF RECORD.--February 1984 to August 1985, April to August 1991, and February to September, 2001.

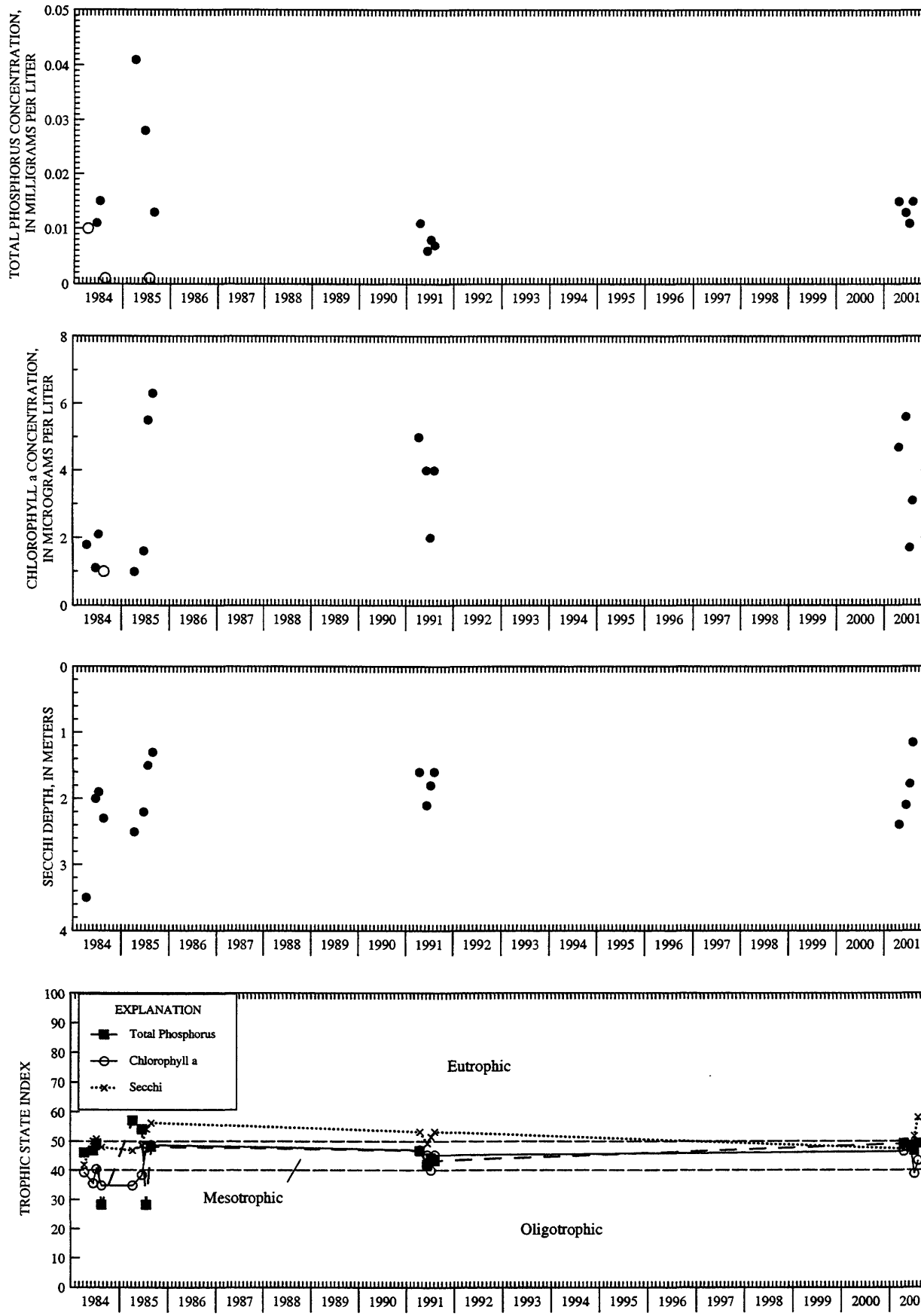
REMARKS.--Lake sampled near center of lake at a depth of 13 m. Water-quality analyses by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, FEBRUARY 14 TO AUGUST 15, 2001

(Milligrams per liter unless otherwise indicated)

	Feb-14		Apr-26		Jun-20		Jul-18		Aug-15	
Secchi-depth (m)	---		2.4		2.1		1.8		1.15	
Chlorophyll a, phytoplankton (µg/L)	---		4.7		5.6		1.7		3.1	
Depth of sample (m)	0.5	13.0	0.5	13.0	0.5	12.0	0.5	12.5	0.5	13.0
Water temperature (°C)	0.7	4.3	12.9	11.4	22.2	14.5	26.1	14.0	25.2	13.8
Specific conductance (µS/cm)	575	751	556	570	525	560	543	587	530	612
pH (units)	7.9	7.4	8.2	7.9	8.1	7.6	7.8	7.4	8.1	7.2
Dissolved oxygen (mg/L)	13.2	1.2	10.5	7.3	8.7	---	8.1	0.2	8.7	0.2
Phosphorus, total (as P)	0.017	0.042	0.015	0.017	0.013	0.023	0.011	0.028	0.015	0.032
Phosphorus, ortho, dissolved (as P)	---	---	<0.002	---	---	---	0.004	---	0.003	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	0.755	---	---	---	0.281	---	0.208	---
Nitrogen, ammonia, dissolved (as N)	---	---	0.024	---	---	---	0.043	---	0.035	---
Nitrogen, amm. + org., total (as N)	---	---	0.63	---	---	---	---	---	---	---
Nitrogen, total (as N)	---	---	1.39	---	---	---	---	---	---	---
Color (Pt-Co. scale)	---	---	15	---	---	---	---	---	---	---
Turbidity (NTU)	---	---	3.1	---	---	---	---	---	---	---
Hardness, (as $CaCO_3$)	---	---	243	---	---	---	---	---	---	---
Calcium, dissolved (Ca)	---	---	48	---	---	---	---	---	---	---
Magnesium, dissolved (Mg)	---	---	30	---	---	---	---	---	---	---
Sodium, dissolved (Na)	---	---	18	---	---	---	---	---	---	---
Potassium, dissolved (K)	---	---	1.4	---	---	---	---	---	---	---
Alkalinity, (as $CaCO_3$)	---	---	206	---	---	---	---	---	---	---
Sulfate, dissolved (SO_4)	---	---	24.9	---	---	---	---	---	---	---
Chloride, dissolved (Cl)	---	---	40.8	---	---	---	---	---	---	---
Silica, dissolved (SiO_2)	---	---	5.2	---	---	---	---	---	---	---
Solids, dissolved, at 180°C	---	---	332	---	---	---	---	---	---	---
Iron, dissolved (Fe) µg/L	---	---	<10	---	---	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	<0.4	---	---	---	---	---	---	---





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Lac La Belle, at Oconomowoc, Wisconsin.

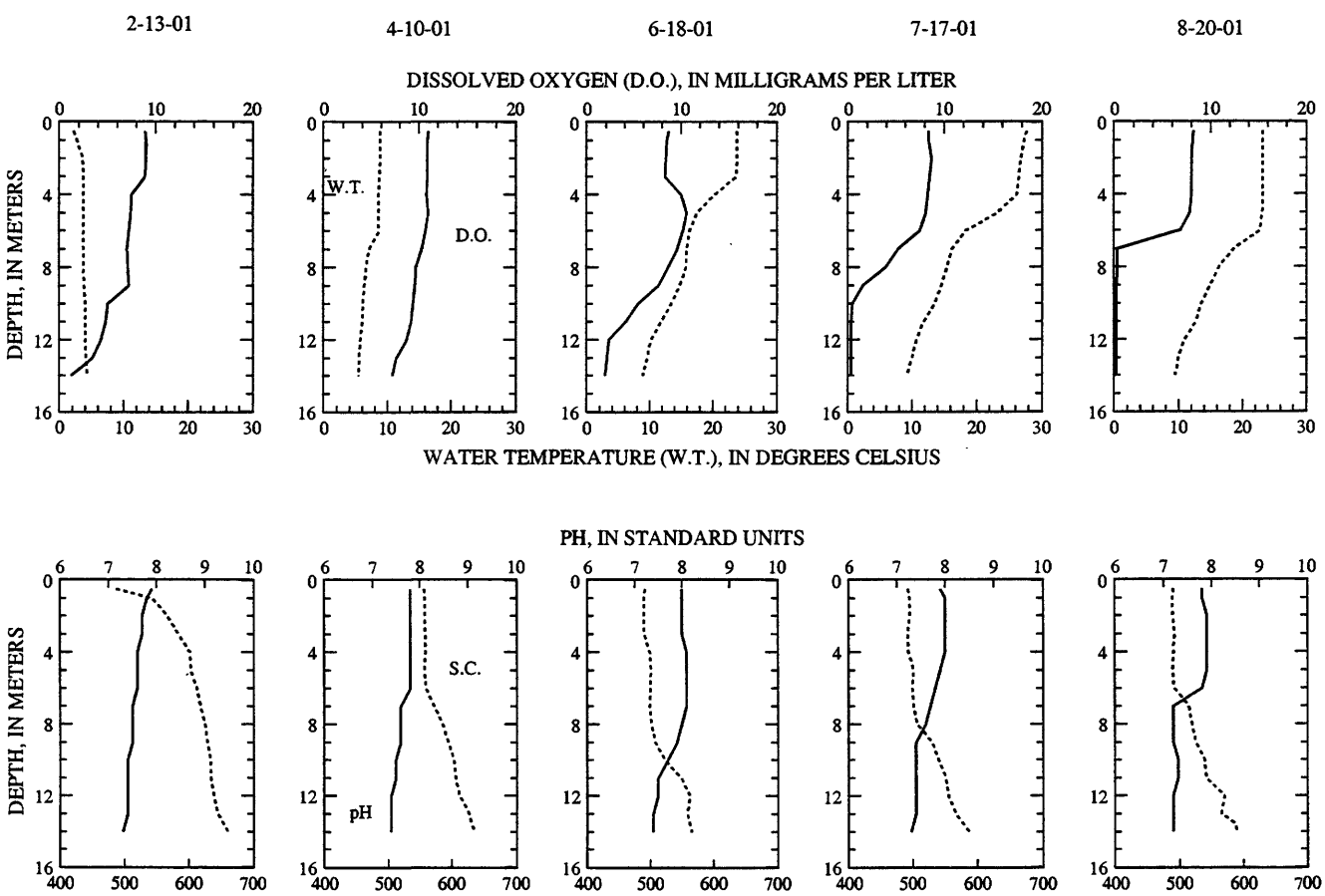
Circles on the first three plots indicate laboratory detection limit for selected analysis.
Actual concentrations for these particular analyses are less than the plotted circles.

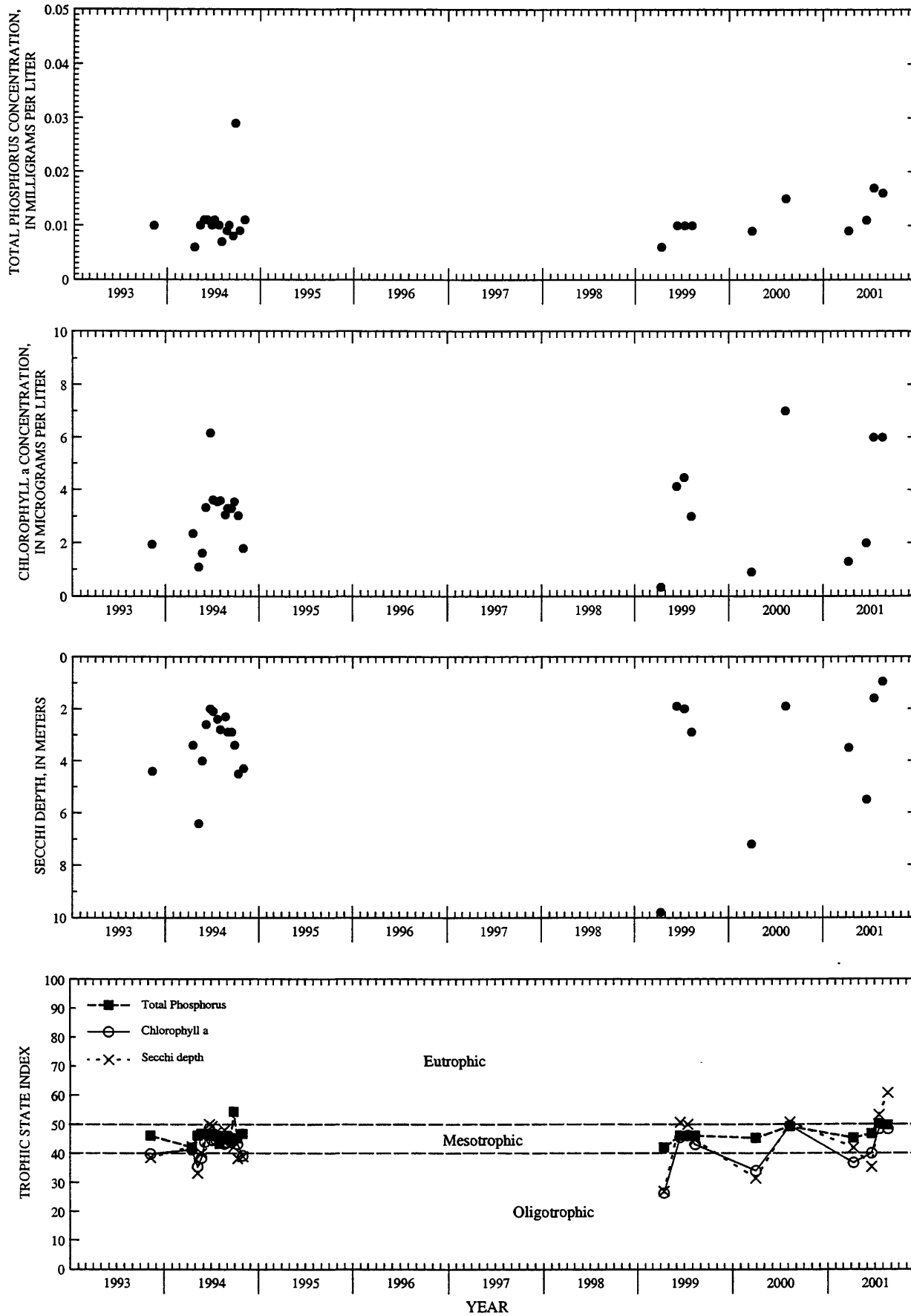
424621088335500 MIDDLE LAKE AT LAUDERDALE, WI

LOCATION.--Lat 42°46'21", long 88°33'55", in SE 1/4 SE 1/4 sec.26, T.4 N., R.16 E., Walworth County, Hydrologic Unit 07120006, at Lauderdale.
PERIOD OF RECORD.--November 1993 to November 1994, February 1999 to August 2000, and February to August 2001.
REMARKS.--Lake sampled near east end of lake at a depth of about 52 ft. Lake ice-covered during February sampling. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, FEBRUARY 13 TO AUGUST 20, 2001
(Milligrams per liter unless otherwise indicated)

	Feb-13		Apr-10		Jun-18		Jul-17		Aug-20		
Secchi-depth (m)	---		3.5		5.5		1.6		0.95		
Chlorophyll a, phytoplankton (µg/L)	---		1.3		2		6		6		
Depth of sample (m)	0.5	14.0	0.5	14.0	0.5	14.0	0.5	14.0	0.5	7.0	13.5
Water temperature (°C)	2.2	4.3	8.8	5.4	23.8	8.9	27.7	9.2	23.2	18.6	9.7
Specific conductance (µS/cm)	487	660	557	635	491	566	492	587	490	514	585
pH (units)	7.9	7.3	7.8	7.4	8.0	7.4	7.9	7.3	7.8	7.2	7.2
Dissolved oxygen (mg/L)	8.9	1.2	11.0	7.2	8.7	1.9	8.4	0.3	8.2	0.3	0.2
Phosphorus, total (as P)	0.006	0.025	0.009	0.012	0.011	0.018	0.017	0.041	0.016	0.019	0.036
Phosphorus, ortho, dissolved (as P)	---	---	<0.002	---	---	---	---	---	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	1.61	---	---	---	---	---	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	0.25	---	---	---	---	---	---	---	---
Nitrogen, amm. + org., total (as N)	---	---	0.67	---	---	---	---	---	---	---	---
Nitrogen, total (as N)	---	---	2.28	---	---	---	---	---	---	---	---
Color (Pt-Co. scale)	---	---	5	---	---	---	---	---	---	---	---
Turbidity (NTU)	---	---	1.7	---	---	---	---	---	---	---	---
Hardness, (as $CaCO_3$)	---	---	264	---	---	---	---	---	---	---	---
Calcium, dissolved (Ca)	---	---	53	---	---	---	---	---	---	---	---
Magnesium, dissolved (Mg)	---	---	32	---	---	---	---	---	---	---	---
Sodium, dissolved (Na)	---	---	7.5	---	---	---	---	---	---	---	---
Potassium, dissolved (K)	---	---	1	---	---	---	---	---	---	---	---
Alkalinity, (as $CaCO_3$)	---	---	214	---	---	---	---	---	---	---	---
Sulfate, dissolved (SO_4)	---	---	30.7	---	---	---	---	---	---	---	---
Chloride, dissolved (Cl)	---	---	21.2	---	---	---	---	---	---	---	---
Silica, dissolved (SiO_2)	---	---	8.0	---	---	---	---	---	---	---	---
Solids, dissolved, at 180°C	---	---	304	---	---	---	---	---	---	---	---
Iron, dissolved (Fe) µg/L	---	---	<10	---	---	---	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	,0.7	---	---	---	---	---	---	---	---





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Lauderdale Lake (Middle) near Lauderdale, Wisconsin.

455446089370300 LITTLE ARBOR VITAE LAKE NEAR WOODRUFF, WI

LOCATION.--Lat 45°54'46" long 89°37'03", in SW 1/4 SE 1/4 sec.28, T.40 N., R.7 E., Vilas County, Hydrologic Unit 07070001, 4 mi northeast of Woodruff.

PERIOD OF RECORD.--February 1991 to current year.

GAGE.--Staff gage read by Glyn A. Roberts.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 8.76 ft, July 13, 2000; minimum observed, 7.63 ft, Aug. 23, 2001.

EXTREMES FOR CURRENT YEAR.--Maximum gage height observed, 7.90 ft, July 31; minimum observed, 7.63 ft, Aug. 23.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	7.77	7.75	---	7.77	---	---	---
2	---	7.72	---	---	---	---	---	---	---	---	---	---
3	7.76	---	---	---	---	---	---	---	---	7.72	---	---
4	---	---	---	7.76	---	7.78	---	---	---	---	---	7.68
5	---	---	7.78	---	7.77	---	---	7.82	---	---	7.84	---
6	7.74	---	---	7.76	---	---	---	---	---	---	---	---
7	---	---	---	---	---	---	7.78	---	7.76	7.70	---	---
8	---	---	---	---	---	---	---	---	---	---	---	---
9	---	---	---	---	---	---	---	7.82	---	---	---	---
10	---	---	7.78	---	---	7.76	---	---	---	---	---	7.88
11	7.75	7.74	---	---	7.76	7.76	---	---	---	---	7.75	---
12	---	---	---	---	---	---	---	---	7.76	7.74	---	---
13	7.75	---	---	7.76	---	---	7.80	7.82	---	---	7.80	---
14	7.76	---	---	---	---	---	---	---	---	---	---	7.76
15	7.76	---	---	---	7.76	---	---	---	---	---	---	---
16	---	7.78	---	---	---	---	---	---	---	7.80	---	---
17	---	---	7.78	---	---	7.76	---	---	7.76	---	---	---
18	---	---	---	---	7.78	---	---	---	---	---	7.70	---
19	---	---	---	7.76	7.78	---	---	---	---	---	---	---
20	---	---	---	---	---	---	7.84	7.78	---	7.80	---	7.78
21	---	---	---	---	---	---	---	---	---	---	---	---
22	7.75	7.76	---	---	---	7.76	---	---	---	---	---	---
23	---	---	7.78	---	---	---	---	---	7.80	---	7.63	---
24	---	---	---	---	---	---	---	---	---	---	---	7.80
25	---	---	---	7.77	---	---	---	---	---	7.82	---	---
26	---	---	---	---	7.80	---	7.86	7.78	---	---	---	---
27	---	---	---	---	---	7.78	---	---	---	---	---	---
28	7.75	7.76	---	7.77	---	---	---	---	---	---	---	---
29	---	---	7.76	---	---	---	---	---	7.74	---	7.65	7.75
30	---	---	---	---	---	---	7.82	---	---	---	---	---
31	---	---	---	7.78	---	7.76	---	---	---	7.90	---	---

434412088590700 LITTLE GREEN LAKE, AT CENTER, NEAR MARKESAN, WI

LOCATION--Lat 43°44'12", long 88°59'07", in SW 1/4 SW 1/4 sec.29, T.15 N., R.13 E., Green Lake County, Hydrologic Unit 04030201, 2 mi north of Markesan.

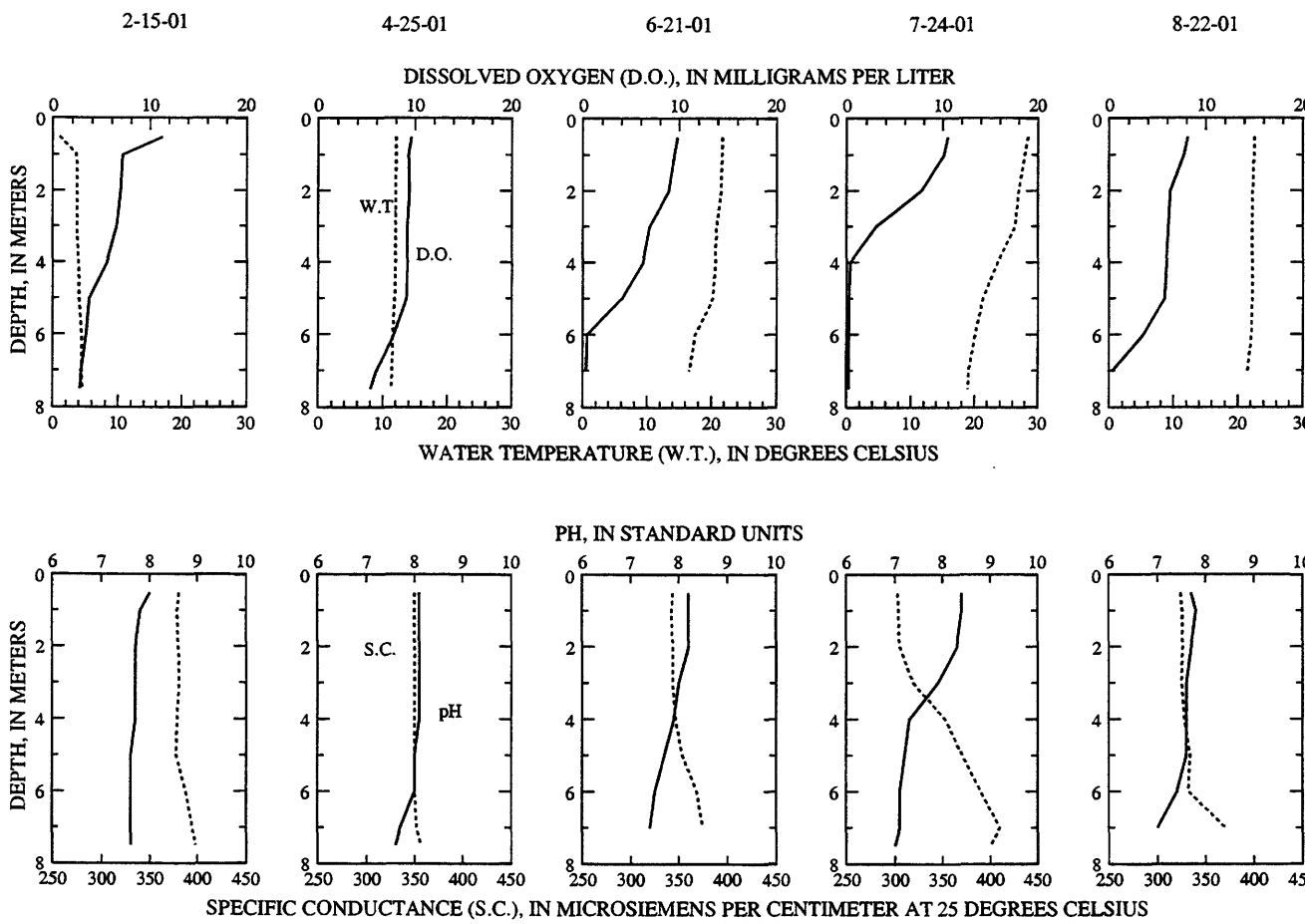
PERIOD OF RECORD.--February 1991 to current year.

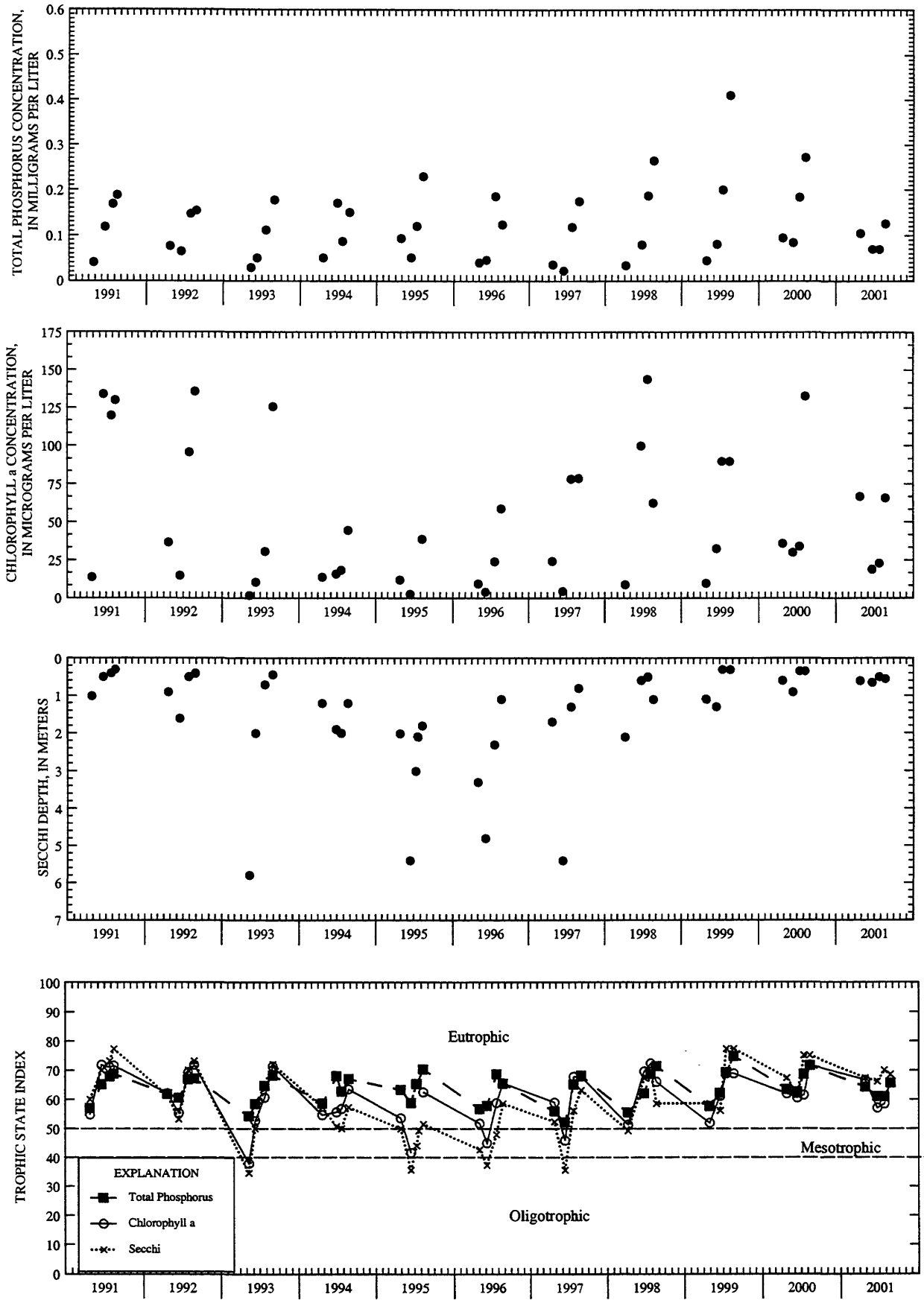
REMARKS.--Lake sampled near center at the deep hole. Lake ice-covered during February sampling. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, FEBRUARY 15 TO AUGUST 22, 2001

(Milligrams per liter unless otherwise indicated)

	Feb-15		Apr-25		Jun-21		Jul-24				Aug-22		
Lake stage (ft)	---		96.84		97.63		97.01				96.01		
Secchi-depth (m)	---		0.6		0.7		0.5				0.6		
Chlorophyll a, phytoplankton (µg/	---		67		19		23				66		
Depth of sample (m)	0.5	7.5	0.5	7.5	0.5	7.0	0.5	3.0	6.0	7.5	0.5	6.0	7.0
Water temperature (°C)	1.0	4.5	12.0	11.3	21.7	16.6	28.5	26.4	20.1	19.0	22.6	22.1	21.5
Specific conductance (µS/cm)	391	398	350	356	344	375	303	319	390	400	324	332	371
pH (units)	8.0	7.6	8.1	7.6	8.2	7.4	8.4	7.9	7.1	7.0	7.7	7.4	7.0
Dissolved oxygen (mg/L)	11.3	2.8	9.6	5.4	9.8	0.3	10.5	3.0	0.2	0.2	8.1	3.5	0.3
Phosphorus, total (as P)	0.057	0.071	0.105	0.127	0.070	0.207	0.069	0.077	0.649	0.395	0.126	0.111	0.393
Phosphorus, ortho, dissolved (as	---	---	0.003	---	---	---	---	---	---	---	0.006	---	---
Nitrogen, NO2 + NO3, diss. (as N	---	---	0.017	---	---	---	---	---	---	---	0.012	---	---
Nitrogen, ammonia, dissolved (as	---	---	0.013	---	---	---	---	---	---	---	0.023	---	---
Nitrogen, amm. + org., total (as	---	---	1.7	---	---	---	---	---	---	---	---	---	---
Nitrogen, total (as N)	---	---	1.73	---	---	---	---	---	---	---	---	---	---
Color (Pt-Co. scale)	---	---	15	---	---	---	---	---	---	---	---	---	---
Turbidity (NTU)	---	---	14.0	---	---	---	---	---	---	---	---	---	---
Hardness, (as $CaCO_3$)	---	---	164	---	---	---	---	---	---	---	---	---	---
Calcium, dissolved (Ca)	---	---	31	---	---	---	---	---	---	---	---	---	---
Magnesium, dissolved (Mg)	---	---	21	---	---	---	---	---	---	---	---	---	---
Sodium, dissolved (Na)	---	---	8.1	---	---	---	---	---	---	---	---	---	---
Potassium, dissolved (K)	---	---	3.4	---	---	---	---	---	---	---	---	---	---
Alkalinity, (as $CaCO_3$)	---	---	147	---	---	---	---	---	---	---	---	---	---
Sulfate, dissolved (SO_4)	---	---	5.6	---	---	---	---	---	---	---	---	---	---
Chloride, dissolved (Cl)	---	---	17.3	---	---	---	---	---	---	---	---	---	---
Silica, dissolved (SiO_2)	---	---	0.0	---	---	---	---	---	---	---	---	---	---
Solids, dissolved, at 180°C	---	---	206	---	---	---	---	---	---	---	---	---	---
Iron, dissolved (Fe) µg/L	---	---	10	---	---	---	---	---	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	<0.4	---	---	---	---	---	---	---	---	---	---





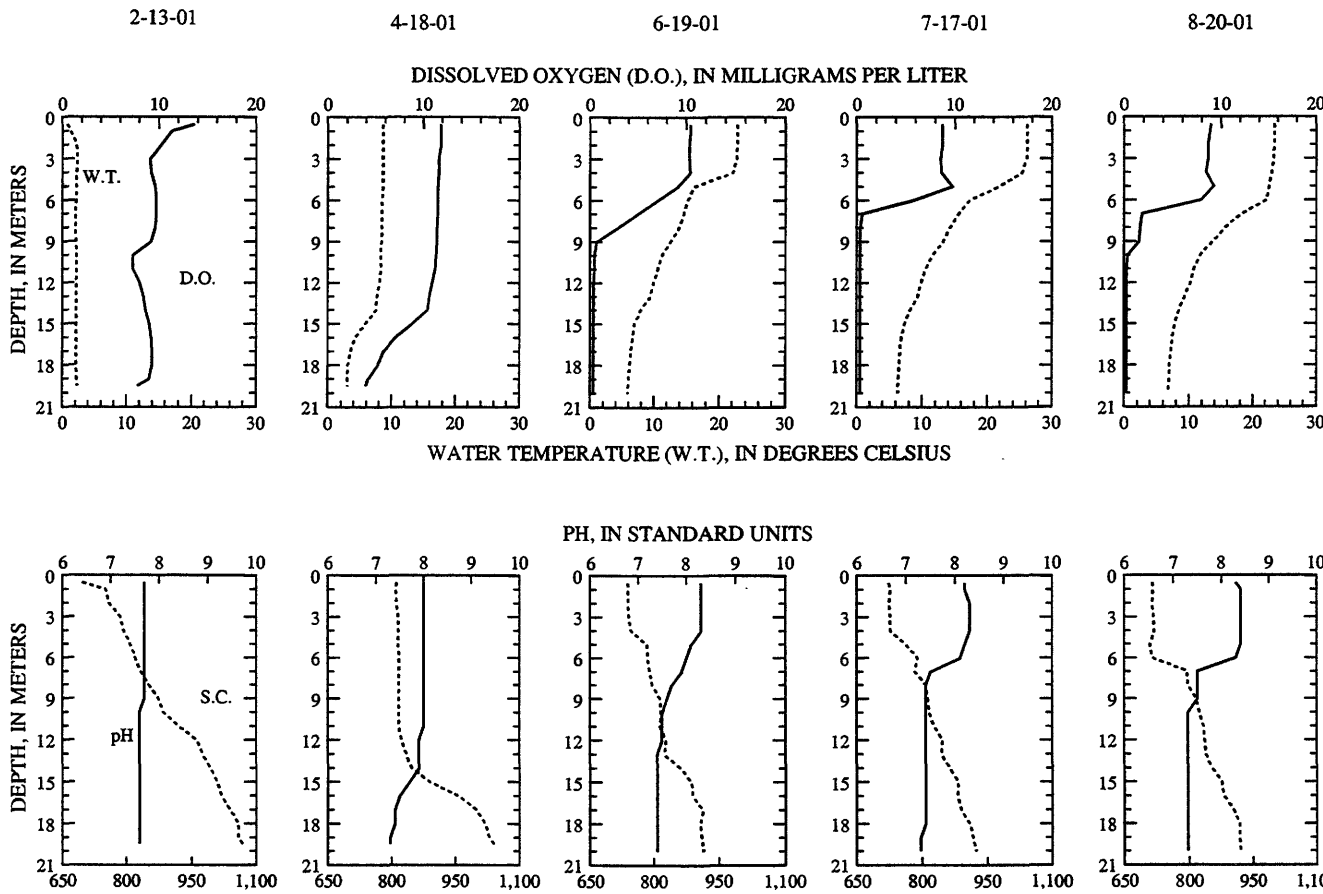
Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Little Green Lake, near Markensan, Wisconsin.

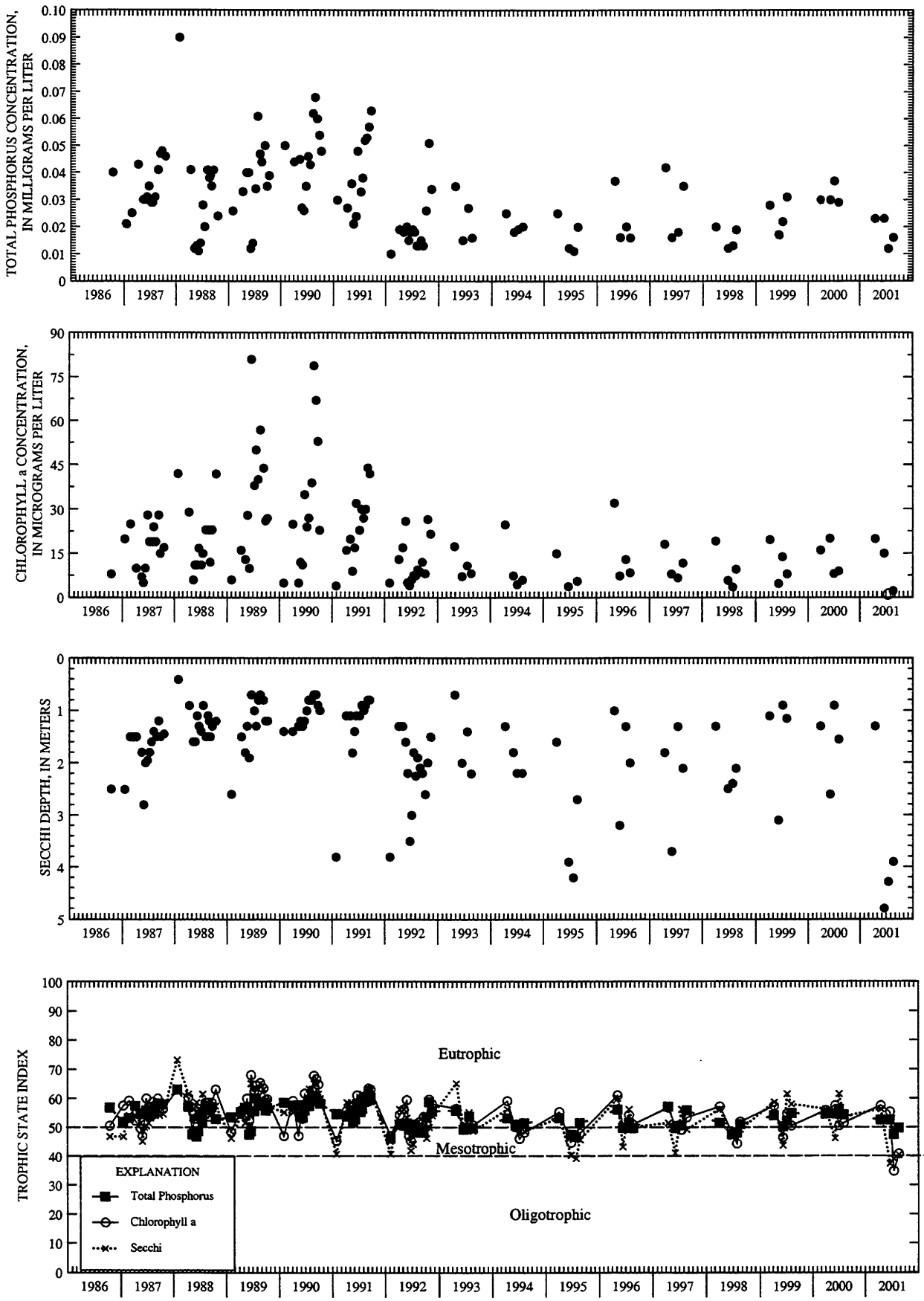
425425088083500 LITTLE MUSKEGO LAKE AT MUSKEGO, WI

LOCATION.--Lat 42°54'25", long 88°08'35", in SE 1/4 NW 1/4 sec.9, T.5 N., R.20 E., Waukesha County, Hydrologic Unit 07120006, at Muskego.
DRAINAGE AREA.--11.6 mi^2.
PERIOD OF RECORD.--October 1986 to current year.
LAKE-STAGE GAGE.--Datum of gage is 693.40 ft above sea level.
REMARKS.--Lake sampled at the deep hole about 1,000 ft north-northwest of dam at outlet. Lake ice-covered during February sampling. An aeration system was operated from April to November for the years 1987-91. Water-quality analyses done by Wisconsin State Laboratory of Hygiene. Prior to October 1987, published under station number 425450088083500.

WATER-QUALITY DATA, FEBRUARY 13 TO AUGUST 20, 2001
(Milligrams per liter unless otherwise indicated)

	Feb-13		Apr-18		Jun-19		Jul-17		Aug-20				
Lake stage (ft)	97.65		98.46		98.87		98.66				93.97		
Secchi-depth (m)	---		1.3		4.8		4.3				3.9		
Chlorophyll a, phytoplankton (µg/L)	---		20		15		<1				2.2		
Depth of sample (m)	0.5	19.0	0.5	19.0	0.5	20.0	0.5	20.0	0.5	6.0	8.0	19.0	20.0
Water temperature (°C)	0.7	2.3	8.6	3.0	22.8	5.9	26.2	6.3	23.4	22.2	15.6	6.9	6.8
Specific conductance (µS/cm)	696	1040	811	1040	738	915	724	924	715	714	796	918	920
pH (units)	7.7	7.6	8.0	7.3	8.3	7.4	8.2	7.3	8.3	8.3	7.5	7.3	7.3
Dissolved oxygen (mg/L)	13.6	7.8	11.8	3.9	10.4	0.3	8.7	0.3	8.9	7.9	1.6	0.2	0.2
Phosphorus, total (as P)	0.135	0.075	0.023	0.082	0.023	0.174	0.012	0.244	0.016	0.017	0.018	0.254	0.282
Phosphorus, ortho, dissolved (as P)	---	---	<0.002	---	---	---	---	---	---	---	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	0.403	---	---	---	---	---	---	---	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	0.032	---	---	---	---	---	---	---	---	---	---
Nitrogen, amm. + org., total (as N)	---	---	0.66	---	---	---	---	---	---	---	---	---	---
Nitrogen, total (as N)	---	---	1.06	---	---	---	---	---	---	---	---	---	---
Color (Pt-Co. scale)	---	---	20	---	---	---	---	---	---	---	---	---	---
Turbidity (NTU)	---	---	4.7	---	---	---	---	---	---	---	---	---	---
Hardness, (as $CaCO_3$)	---	---	261	---	---	---	---	---	---	---	---	---	---
Calcium, dissolved (Ca)	---	---	55	---	---	---	---	---	---	---	---	---	---
Magnesium, dissolved (Mg)	---	---	30	---	---	---	---	---	---	---	---	---	---
Sodium, dissolved (Na)	---	---	61	---	---	---	---	---	---	---	---	---	---
Potassium, dissolved (K)	---	---	2.4	---	---	---	---	---	---	---	---	---	---
Alkalinity, (as $CaCO_3$)	---	---	193	---	---	---	---	---	---	---	---	---	---
Sulfate, dissolved (SO_4)	---	---	36.9	---	---	---	---	---	---	---	---	---	---
Chloride, dissolved (Cl)	---	---	120	---	---	---	---	---	---	---	---	---	---
Silica, dissolved (SiO_2)	---	---	3.4	---	---	---	---	---	---	---	---	---	---
Solids, dissolved, at 180°C	---	---	458	---	---	---	---	---	---	---	---	---	---
Iron, dissolved (Fe) µg/L	---	---	<10	---	---	---	---	---	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	<0.4	---	---	---	---	---	---	---	---	---	---





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Little Muskego Lake, at Muskego, Wisconsin.

(Circles on the first three plots indicate laboratory detection limit for selected analyses. Actual concentrations for thse particular analyses are less than the plotted circles.)

05390700 LITTLE ST. GERMAIN LAKE NEAR EAGLE RIVER, WI

LOCATION--Lat 45°53'55", long 89°27'10", in SW 1/4 SE 1/4 sec.35, T.40 N., R.8 E., Vilas County, Hydrologic Unit 07070001, 9.6 mi west of Eagle River.

DRAINAGE AREA.--19.0 mi^2.

PERIOD OF RECORD.--October 1990 to current year.

GAGE.--Staff gage mounted on the dam wall at lake outlet. Datum of gage is 1,600 ft, above sea level.

REMARKS.--Lake level regulated by dam at outlet.

COOPERATION.--Gage readings furnished by Wisconsin Valley Improvement Company.

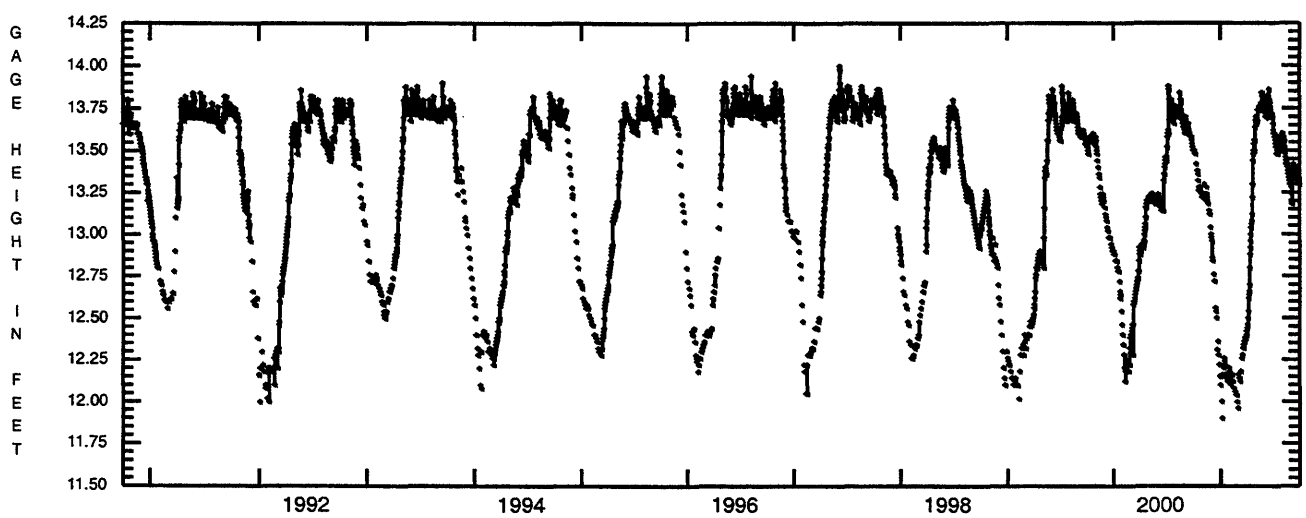
EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 14.00 ft, June 6, 1997; minimum observed, 12.00 ft, Jan. 3 and Feb. 3, 1992.

EXTREMES FOR CURRENT YEAR.--Maximum gage height observed, 13.86, June 19; minimum observed, 11.90 ft, Jan. 7.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAILY MEAN VALUE

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13.50	---	13.00	---	---	11.96	12.42	13.64	13.78	13.70	13.52	13.30
2	13.50	---	12.98	12.10	12.18	11.96	12.40	13.68	13.78	13.66	13.60	13.28
3	13.50	13.24	12.96	---	---	---	12.44	13.68	13.76	13.62	13.60	13.28
4	13.50	13.24	12.86	---	12.14	12.16	12.46	13.70	13.72	13.60	13.58	13.24
5	13.48	13.24	12.84	12.00	---	---	12.46	13.68	13.70	13.60	13.58	13.18
6	13.48	---	---	---	12.10	12.14	12.50	13.66	13.70	13.60	13.58	13.18
7	13.48	13.30	---	11.90	---	---	12.54	13.68	13.70	13.58	13.58	13.36
8	13.48	---	12.76	---	---	---	12.62	13.68	13.70	13.58	13.58	13.40
9	---	---	---	12.16	12.16	12.14	12.64	13.68	13.70	13.58	13.56	13.42
10	13.42	13.24	12.72	---	---	---	12.66	13.74	13.70	13.56	13.56	13.42
11	---	---	---	---	12.16	12.12	12.70	13.74	13.76	13.54	13.52	13.38
12	---	13.20	12.72	12.20	---	---	12.80	13.74	13.82	13.52	13.48	13.38
13	13.38	---	---	---	12.12	12.18	12.88	13.74	13.78	13.52	13.48	13.36
14	---	13.28	---	12.26	---	---	12.92	13.76	13.74	13.48	13.46	13.36
15	13.36	---	12.56	---	---	---	12.96	13.76	13.74	13.48	13.42	13.36
16	---	13.24	---	12.24	12.08	12.26	13.00	13.76	13.70	13.50	13.44	13.36
17	13.32	13.22	12.54	12.22	---	---	13.04	13.76	13.70	13.48	13.44	13.34
18	---	13.22	---	---	---	12.28	13.04	13.76	13.72	13.48	13.42	13.34
19	13.26	13.20	12.50	12.16	---	---	13.06	13.76	13.86	13.48	13.42	13.34
20	13.28	---	---	---	12.06	12.32	13.08	13.74	13.80	13.54	13.40	13.34
21	---	13.18	---	12.14	---	---	13.12	13.76	13.78	13.58	13.38	13.32
22	13.26	---	12.31	---	---	12.34	13.22	13.78	13.76	13.56	13.36	13.32
23	---	---	---	12.14	12.04	12.34	13.30	13.78	13.74	13.56	13.36	13.40
24	13.28	13.14	12.36	---	---	12.36	13.44	13.84	13.72	13.56	13.36	13.40
25	---	13.12	---	---	12.04	12.36	13.48	13.82	13.72	13.54	13.34	13.38
26	---	13.12	12.28	12.12	---	12.38	13.50	13.84	13.70	13.52	13.34	13.38
27	---	---	---	---	12.00	12.38	13.54	13.84	13.70	13.52	13.32	13.36
28	---	13.04	---	12.12	---	12.38	13.56	13.82	13.72	13.50	13.30	13.34
29	13.24	---	12.22	---	---	12.38	13.50	13.82	13.70	13.51	13.30	13.32
30	---	---	---	12.16	---	12.38	13.56	13.80	13.70	13.52	13.30	13.30
31	13.22	---	12.15	12.20	---	12.40	---	13.78	---	13.52	13.30	---
MEAN	---	---	---	---	---	---	12.96	13.75	13.74	13.55	13.45	13.34
MAX	---	---	---	---	---	---	13.56	13.84	13.86	13.70	13.60	13.42
MIN	---	---	---	---	---	---	12.40	13.64	13.70	13.48	13.30	13.18



455532089253900 LITTLE ST. GERMAIN LAKE, UPPER EAST BAY, AT ST. GERMAIN, WI

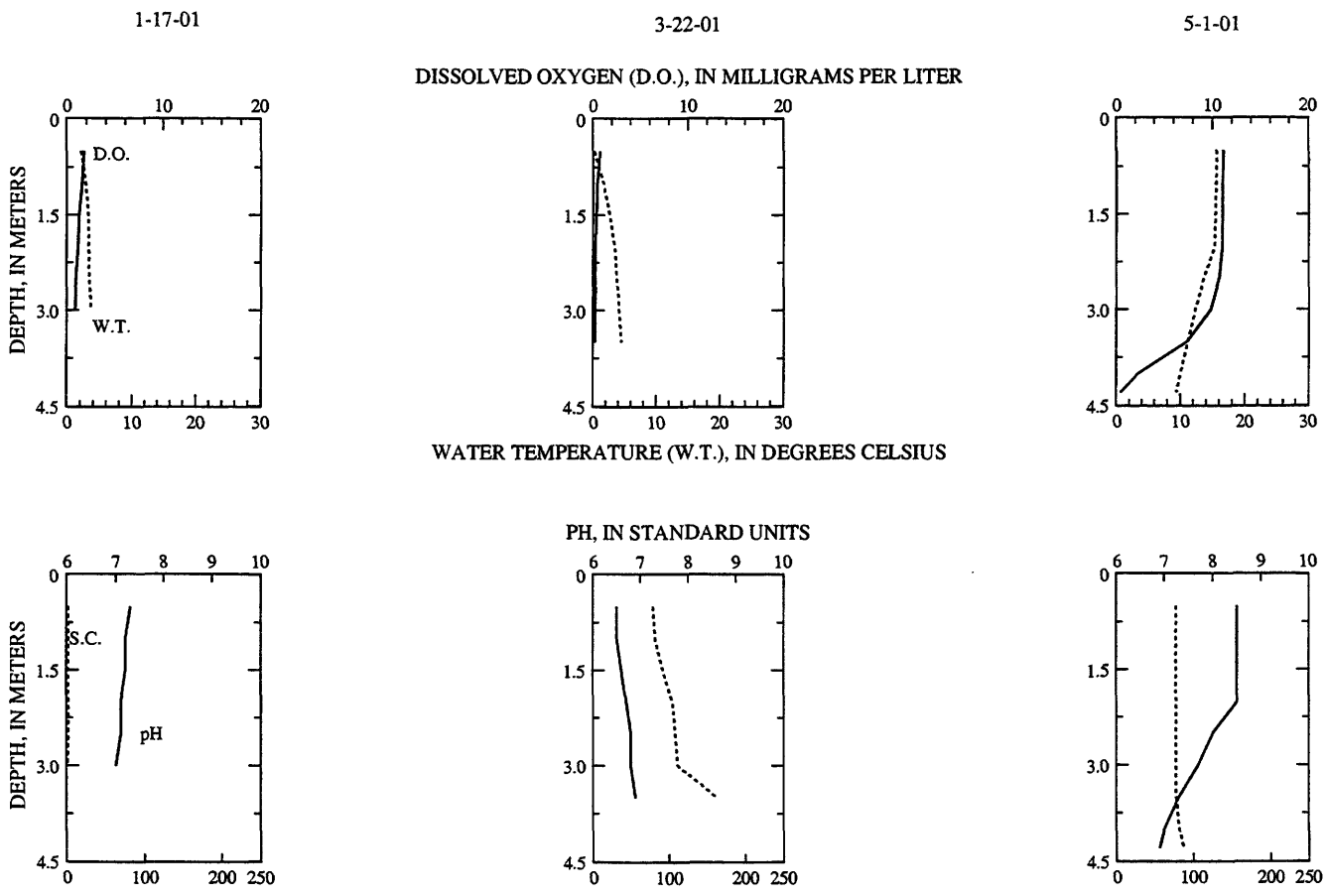
LOCATION.--Lat 45°55'32", long 89°25'39", in NE 1/4 NW 1/4 sec.25, T.40 N., R.8 E., Vilas County, Hydrologic Unit 07070001, near St. Germain.

PERIOD OF RECORD.--December 1996, January-March 1997, March 1999, and March 2000 to current year.

REMARKS.--Water-quality analyses by Wisconsin State Laboratory of Hygiene.

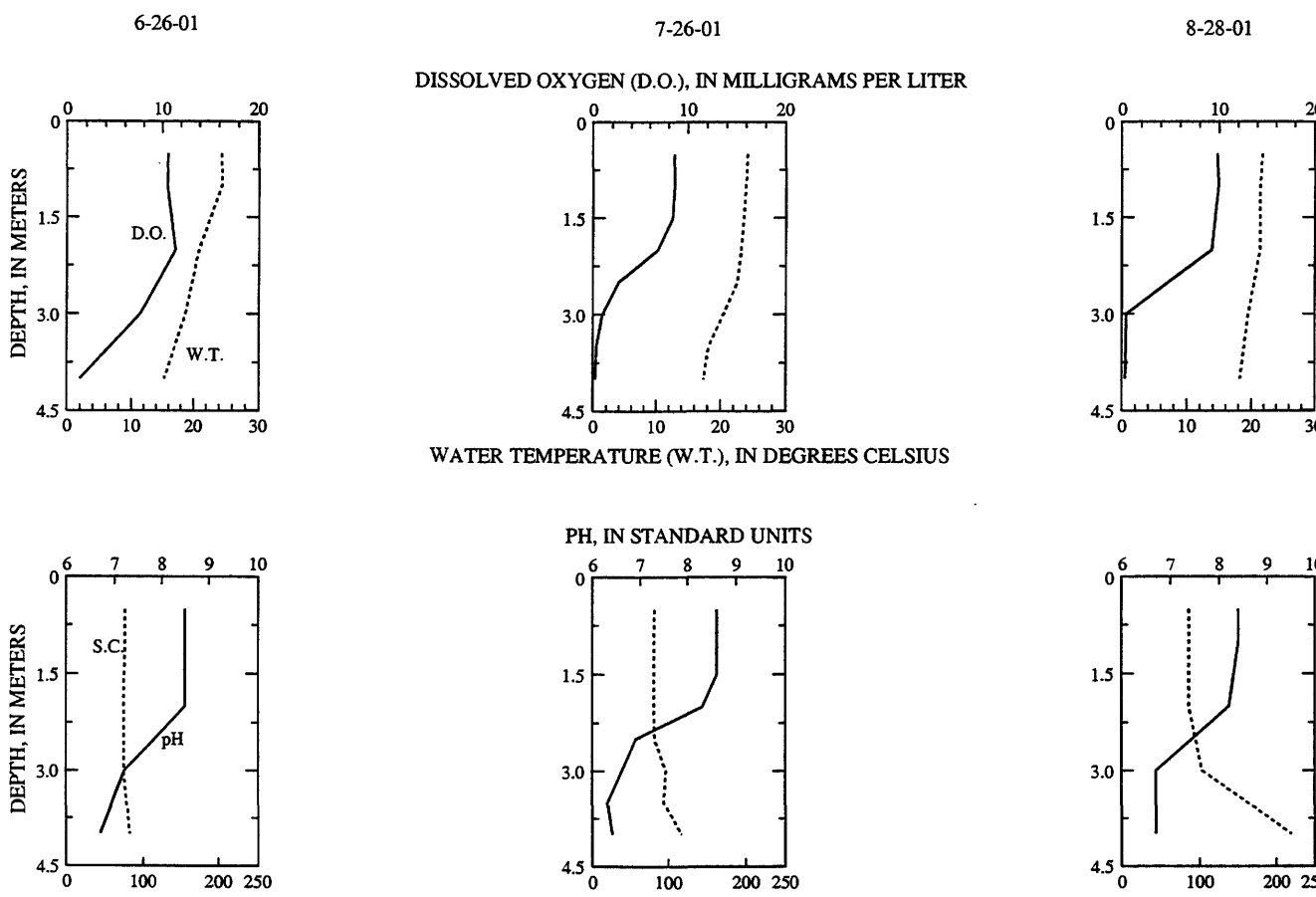
WATER-QUALITY DATA, JANUARY 17 TO MAY 01, 2001
(Milligrams per liter unless otherwise indicated)

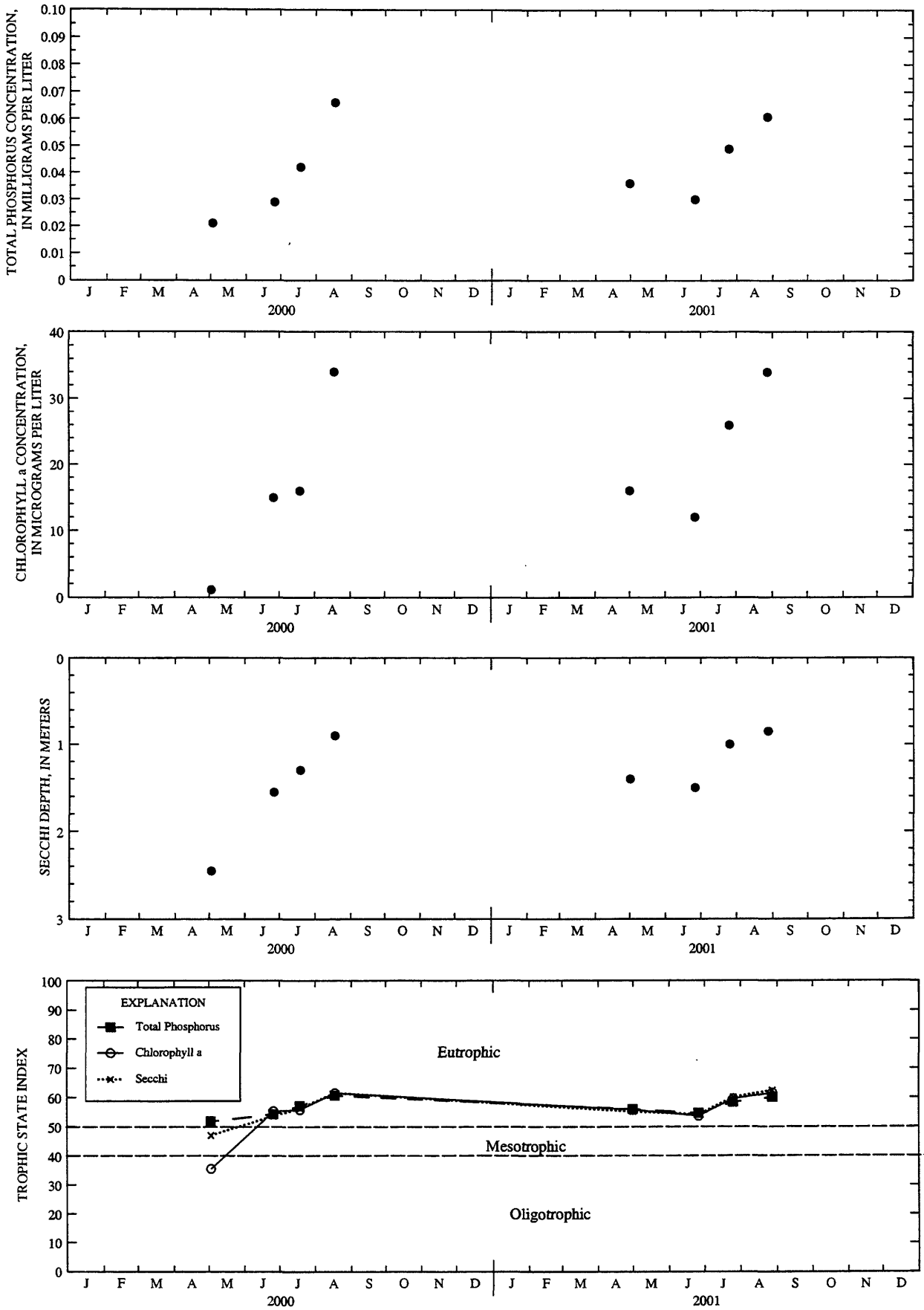
	Jan-17		Mar-22		May-1
Lake stage (ft)	12.22		12.34		13.64
Secchi-depth (m)	---		---		1.4
Chlorophyll a, phytoplankton (µg/L)	---		---		16
Depth of sample (m)	0.5	3.0	0.5	3.0	0.5
Water temperature (°C)	2.1	3.6	0.1	4.1	15.6
Specific conductance (µS/cm)	90	94	79	111	78
pH (units)	7.3	7.0	6.5	6.8	8.5
Dissolved oxygen (mg/L)	1.7	0.8	0.7	0.2	11.1
Phosphorus, total (as P)	0.053	0.058	0.078	0.219	0.036



WATER-QUALITY DATA, JUNE 26 TO AUGUST 28, 2001
(Milligrams per liter unless otherwise indicated)

	Jun-26		Jul-26		Aug-28	
Lake stage (ft)	13.70		13.52		13.30	
Secchi-depth (m)	1.5		1.0		0.9	
Chlorophyll a, phytoplankton (µg/L)	12		26		34	
Depth of sample (m)	0.5	4.0	0.5	4.0	0.5	3.0
Water temperature (°C)	24.4	15.3	24.2	17.4	21.8	19.5
Specific conductance (µS/cm)	76	82	82	117	86	103
pH (units)	8.5	6.7	8.6	6.4	8.4	6.7
Dissolved oxygen (mg/L)	10.6	1.3	8.6	0.2	9.8	0.4
Phosphorus, total (as P)	0.030	0.061	0.049	0.154	0.061	0.076
Phosphorus, ortho, dissolved (as P)	---	---	0.004	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	0.015	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	0.018	---	---	---
Nitrogen, amm. + org., total (as N)	---	---	0.93	---	---	---
Nitrogen, total (as N)	---	---	0.945	---	---	---





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Little St. Germain Lake, Upper East Bay, at St. Germain, Wisconsin.

455545089262500 LITTLE ST. GERMAIN LAKE, NORTHEAST BAY, NEAR ST. GERMAIN, WI

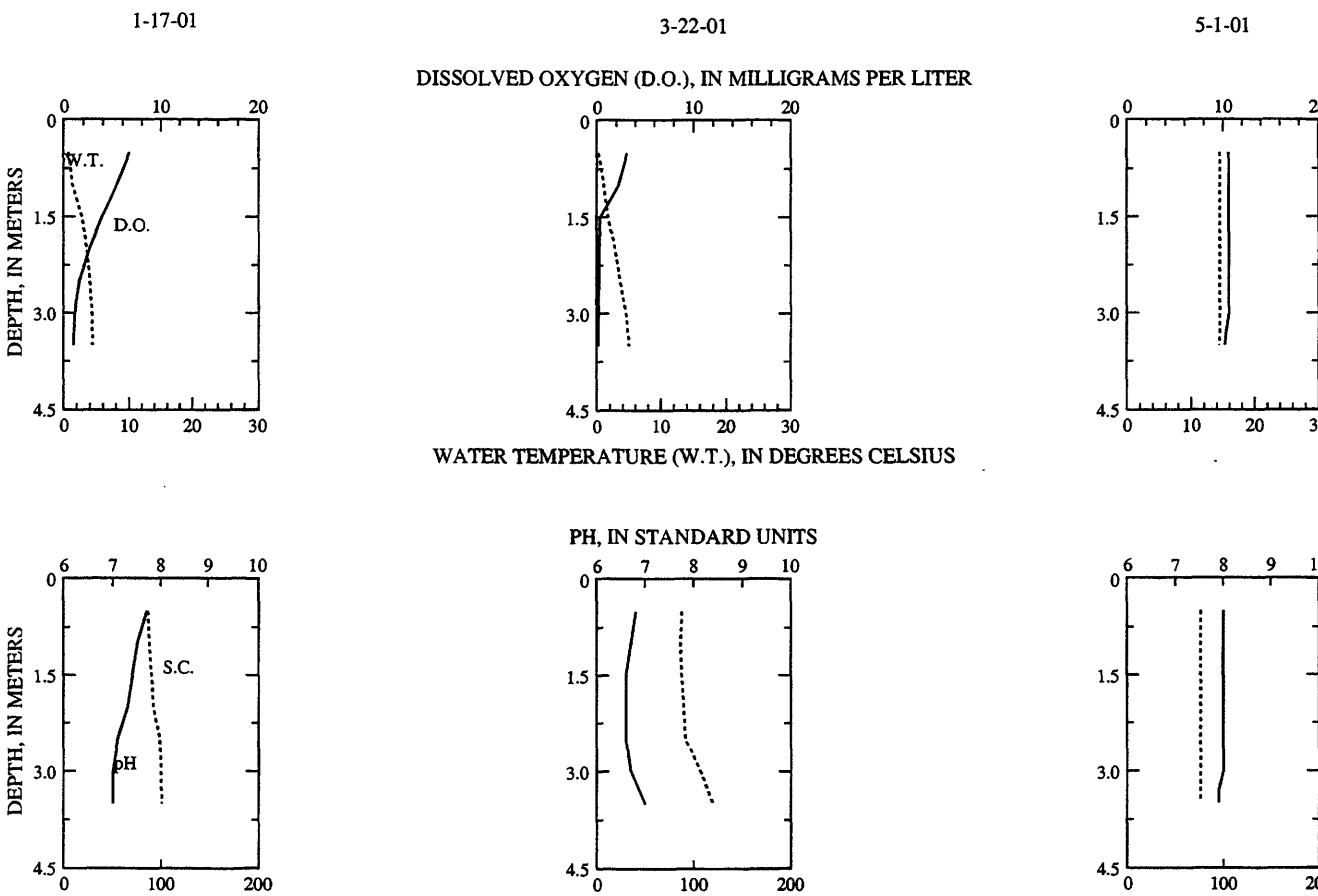
LOCATION.--Lat 45°55'45", long 89°26'25", in SW 1/4 SE 1/4 sec.24, T.40 N., R.8 E., Vilas County, Hydrologic Unit 07070001, near St. Germain.

PERIOD OF RECORD.--April 1991 to August 1994, August 1996 to August 1997, March 1999 to current year.

REMARKS.--Lake sampled in northeast bay at a lake depth of about 4 m. Lake ice-covered during January and March sampling. Water-quality analyses by Wisconsin State Laboratory of Hygiene.

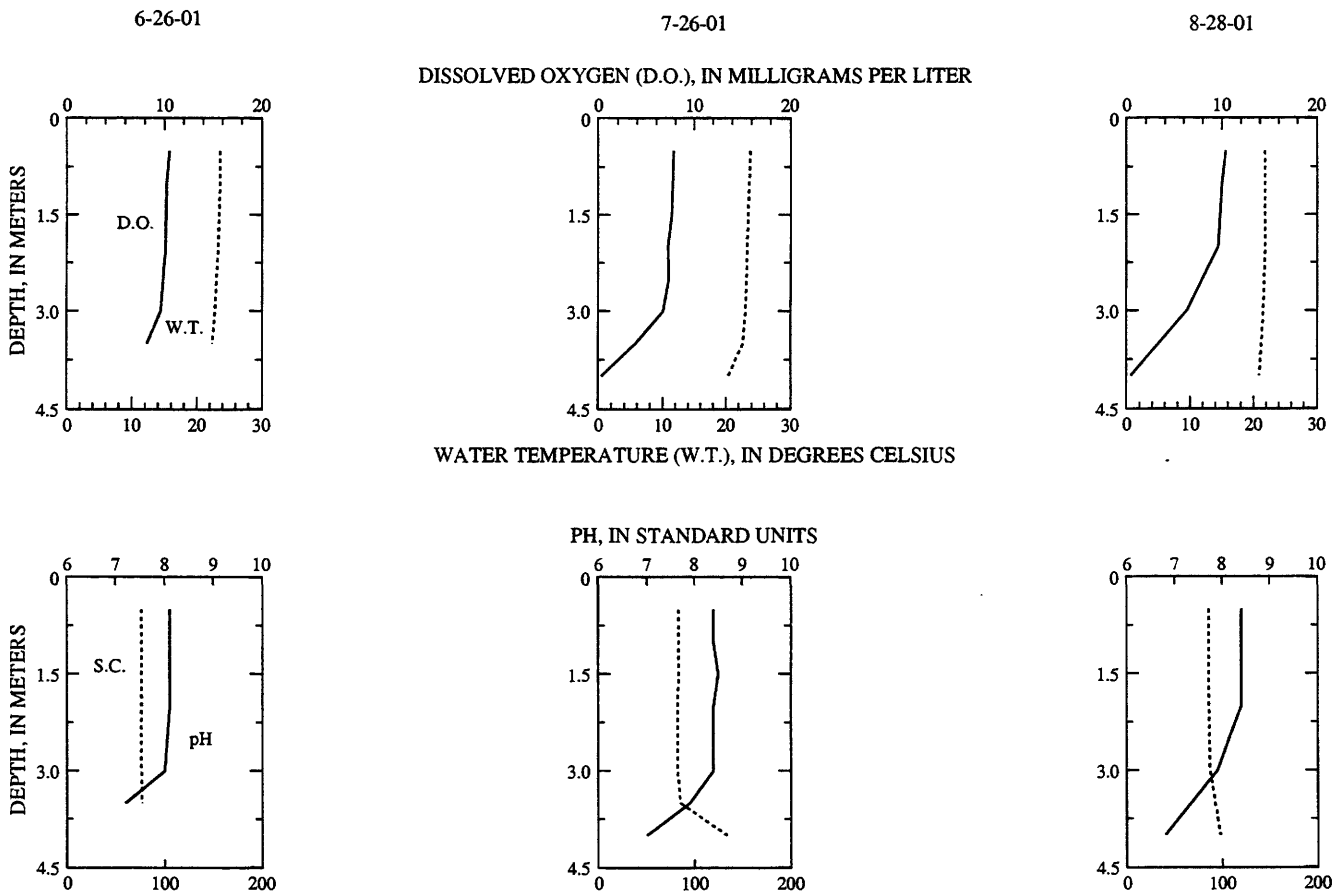
WATER-QUALITY DATA, JANUARY 17 TO MAY 01, 2001
(Milligrams per liter unless otherwise indicated)

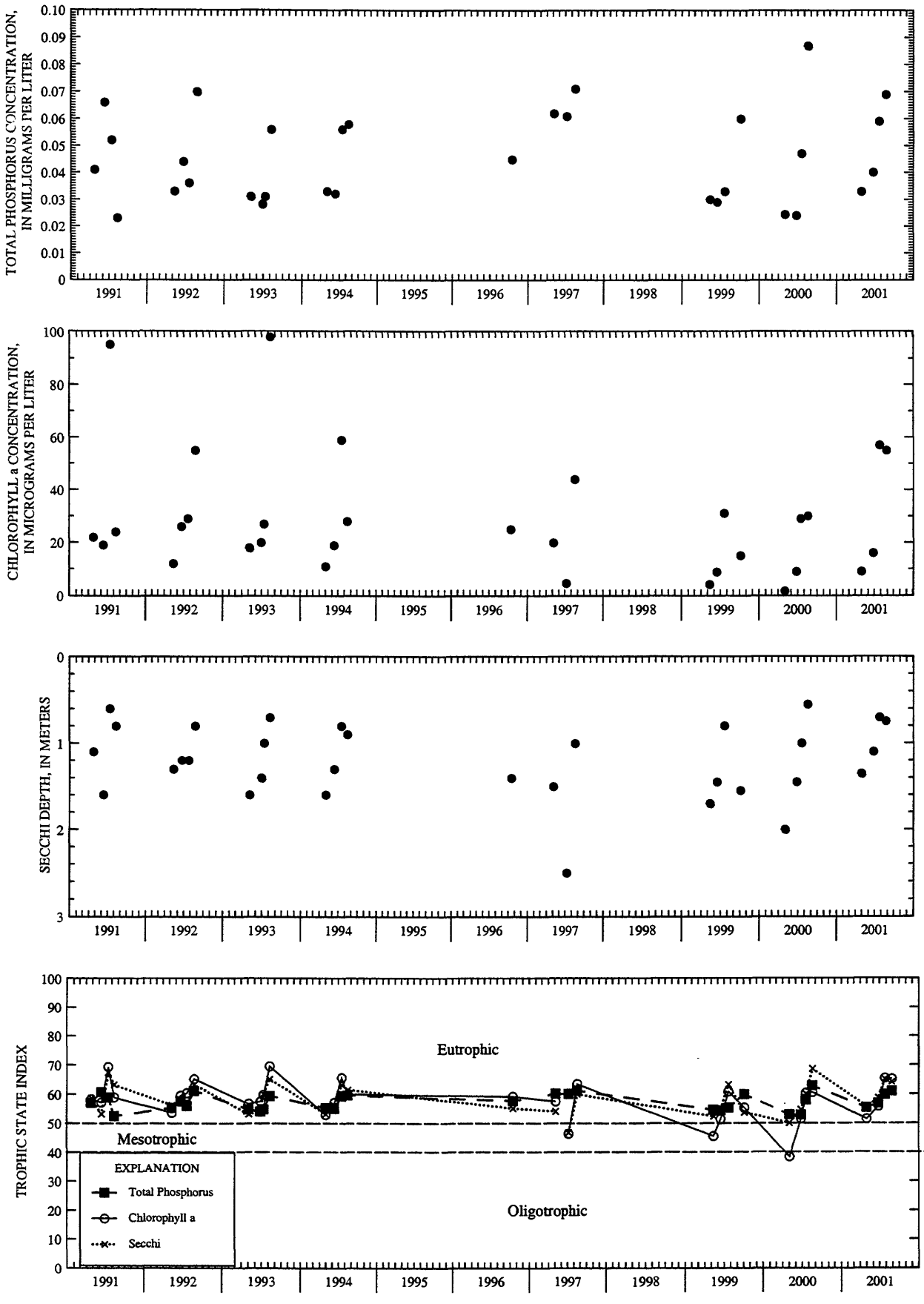
	Jan-17		Mar-22		May-1
Lake stage (ft)	12.22		12.34		13.64
Secchi-depth (m)	---		---		1.4
Chlorophyll a, phytoplankton (µg/L)	---		---		9
Depth of sample (m)	0.5	3.5	0.5	2.5	0.5
Water temperature (°C)	0.7	4.4	0.2	3.6	14.5
Specific conductance (µS/cm)	86	101	88	92	76
pH (units)	7.7	7.0	6.8	6.6	8.0
Dissolved oxygen (mg/L)	6.7	1.0	3.1	0.2	10.6
Phosphorus, total (as P)	0.029	0.036	0.038	0.037	0.033
Phosphorus, ortho, dissolved (as P)	---	---	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	---	---	---
Nitrogen, amm. + org., total (as N)	---	---	---	---	---
Nitrogen, total (as N)	---	---	---	---	---



WATER-QUALITY DATA, JUNE 26 TO AUGUST 28, 2001
(Milligrams per liter unless otherwise indicated)

	Jun-26		Jul-26		Aug-28	
Lake stage (ft)	13.70		13.52		13.30	
Secchi-depth (m)	1.1		0.7		0.8	
Chlorophyll a, phytoplankton (µg/L)	16		57		55	
Depth of sample (m)	0.5	3.5	0.5	4.0	0.5	4.0
Water temperature (°C)	23.6	22.4	23.8	20.3	21.9	20.9
Specific conductance (µS/cm)	76	77	83	134	86	98
pH (units)	8.1	7.2	8.4	7.0	8.4	6.8
Dissolved oxygen (mg/L)	10.5	8.2	7.8	0.3	10.4	0.4
Phosphorus, total (as P)	0.040	0.040	0.059	---	0.069	0.095
Phosphorus, ortho, dissolved (as P)	---	---	0.004	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	0.014	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	0.036	---	---	---
Nitrogen, amm. + org., total (as N)	---	---	1.2	---	---	---
Nitrogen, total (as N)	---	---	1.2	---	---	---





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Little St. Germain Lake, Northeast Bay, at St. Germain, Wisconsin.

455437089270800 LITTLE ST. GERMAIN LAKE, SOUTH BAY, NEAR ST. GERMAIN, WI

LOCATION.--Lat 45°54'37", long 89°27'08", in NW 1/4 NE 1/4 sec.35, T.40 N., R.8 E., Vilas County, Hydrologic Unit 07070001, 1.7 mi east of St. Germain.

PERIOD OF RECORD.--April 1991 to August 1994, August 1996 to August 1997, March 1999 to current year.

REMARKS.--Lake sampled in south bay at a lake depth of about 7 m. Lake ice-covered during January and March sampling. Water-quality analyses by Wisconsin State Laboratory of Hygiene.

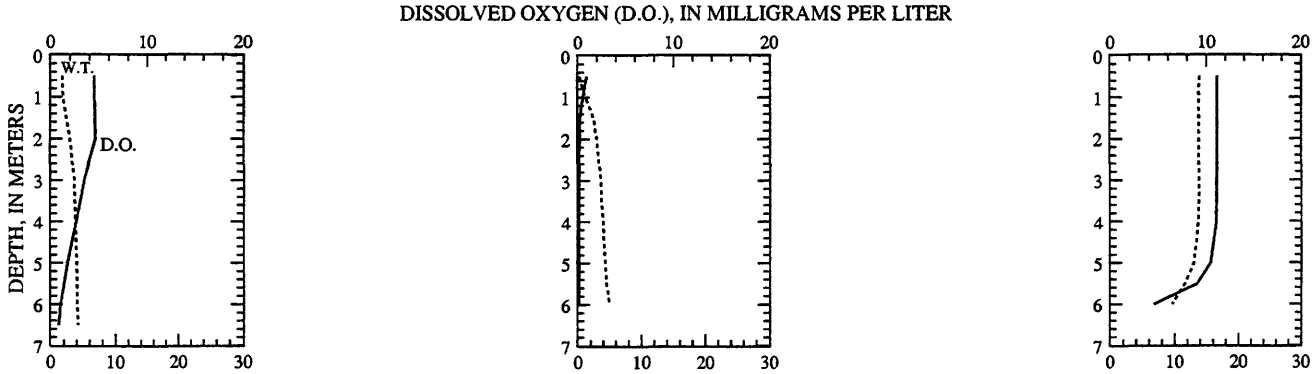
WATER-QUALITY DATA, JANUARY 17 TO MAY 01, 2001

(Milligrams per liter unless otherwise indicated

	Jan-17		Mar-22		May-1
Lake stage (ft)	12.22		12.34		13.64
Secchi-depth (m)	---		---		1.3
Chlorophyll a, phytoplankton (µg/L)	---		---		13
Depth of sample (m)	0.5	6.5	0.5	6.0	0.5
Water temperature (°C)	1.8	4.2	0.2	5.0	13.9
Specific conductance (µS/cm)	75	98	98	146	83
pH (units)	7.4	6.6	7.0	7.1	8.2
Dissolved oxygen (mg/L)	4.5	0.8	0.9	0.1	11.1
Phosphorus, total (as P)	0.030	0.029	0.039	0.209	0.052
Phosphorus, ortho, dissolved (as P)	---	---	---	---	0.007
Nitrogen, NO2 + NO3, diss. (as N)	---	---	---	---	<0.010
Nitrogen, ammonia, dissolved (as N)	---	---	---	---	0.014
Nitrogen, amm. + org., total (as N)	---	---	---	---	0.68
Nitrogen, total (as N)	---	---	---	---	0.68
Color (Pt-Co. scale)	---	---	---	---	40
Turbidity (NTU)	---	---	---	---	4.6
Hardness, (as $CaCO_3$)	---	---	---	---	36.9
Calcium, dissolved (Ca)	---	---	---	---	10
Magnesium, dissolved (Mg)	---	---	---	---	2.9
Sodium, dissolved (Na)	---	---	---	---	2.1
Potassium, dissolved (K)	---	---	---	---	0.5
Alkalinity, (as $CaCO_3$)	---	---	---	---	36
Sulfate, dissolved (SO_4)	---	---	---	---	<4.5
Chloride, dissolved (Cl)	---	---	---	---	2
Silica, dissolved (SiO_2)	---	---	---	---	12.2
Solids, dissolved, at 180°C	---	---	---	---	62
Iron, dissolved (Fe) µg/L	---	---	---	---	430
Manganese, dissolved (Mn) µg/L	---	---	---	---	35

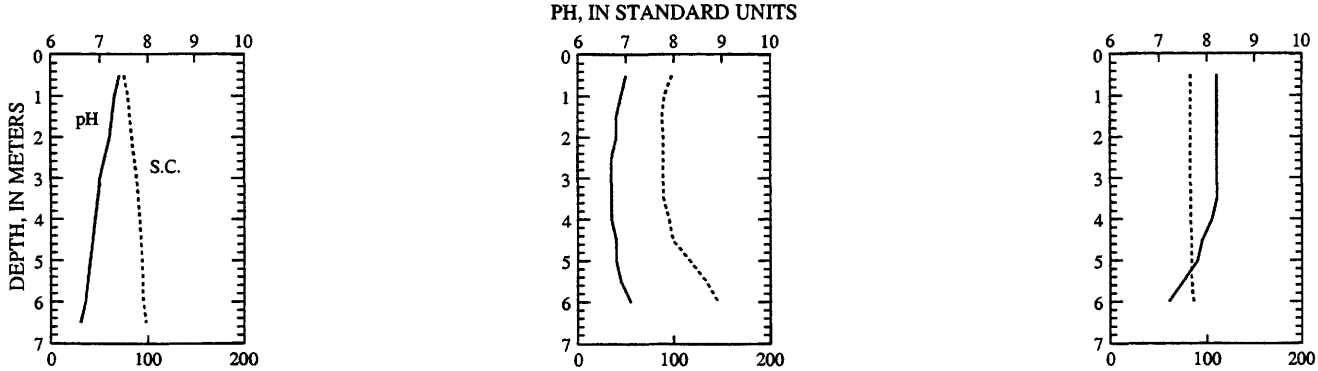
1-17-01 3-22-01 5-1-01

DISSOLVED OXYGEN (D.O.), IN MILLIGRAMS PER LITER



WATER TEMPERATURE (W.T.), IN DEGREES CELSIUS

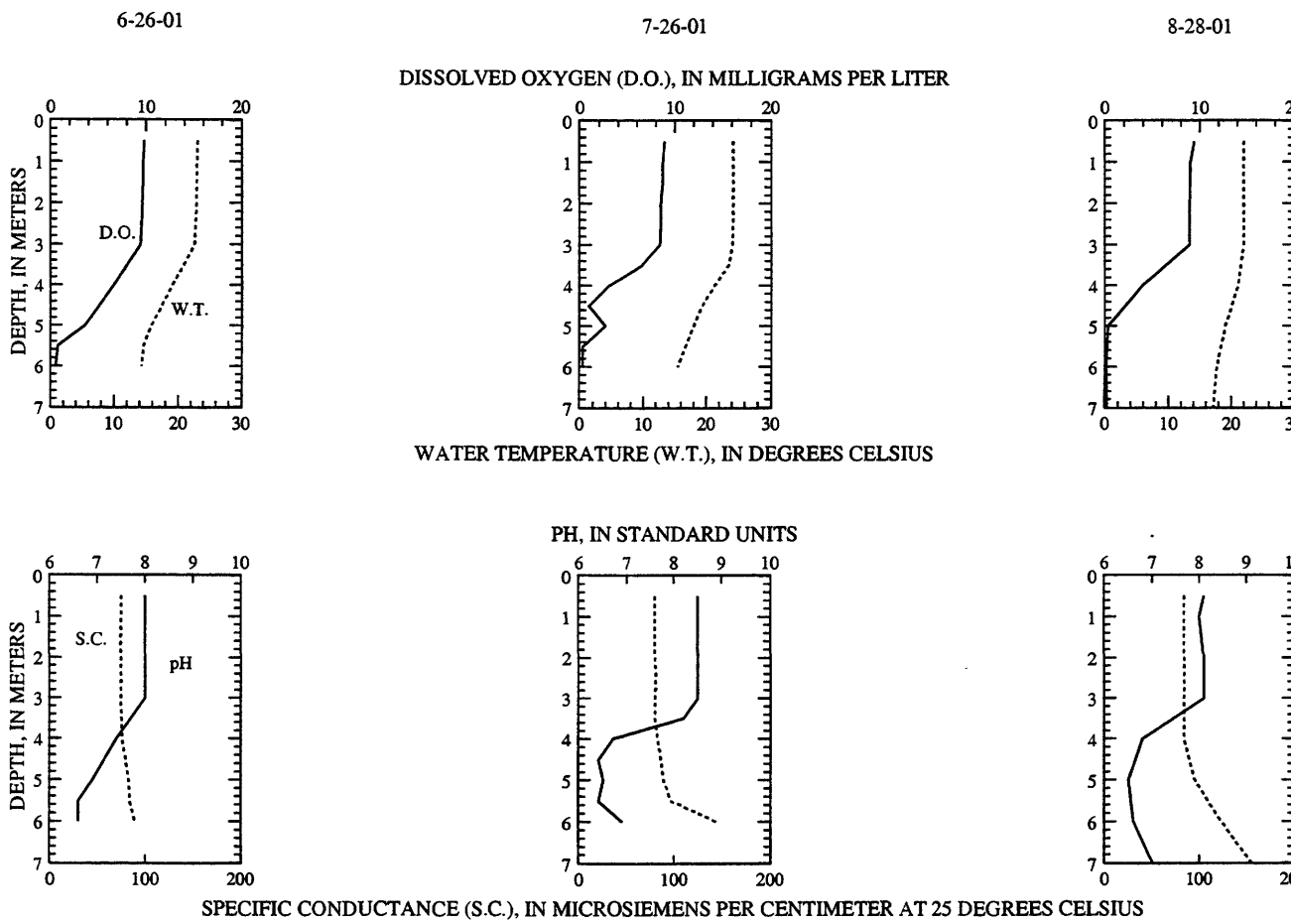
PH, IN STANDARD UNITS

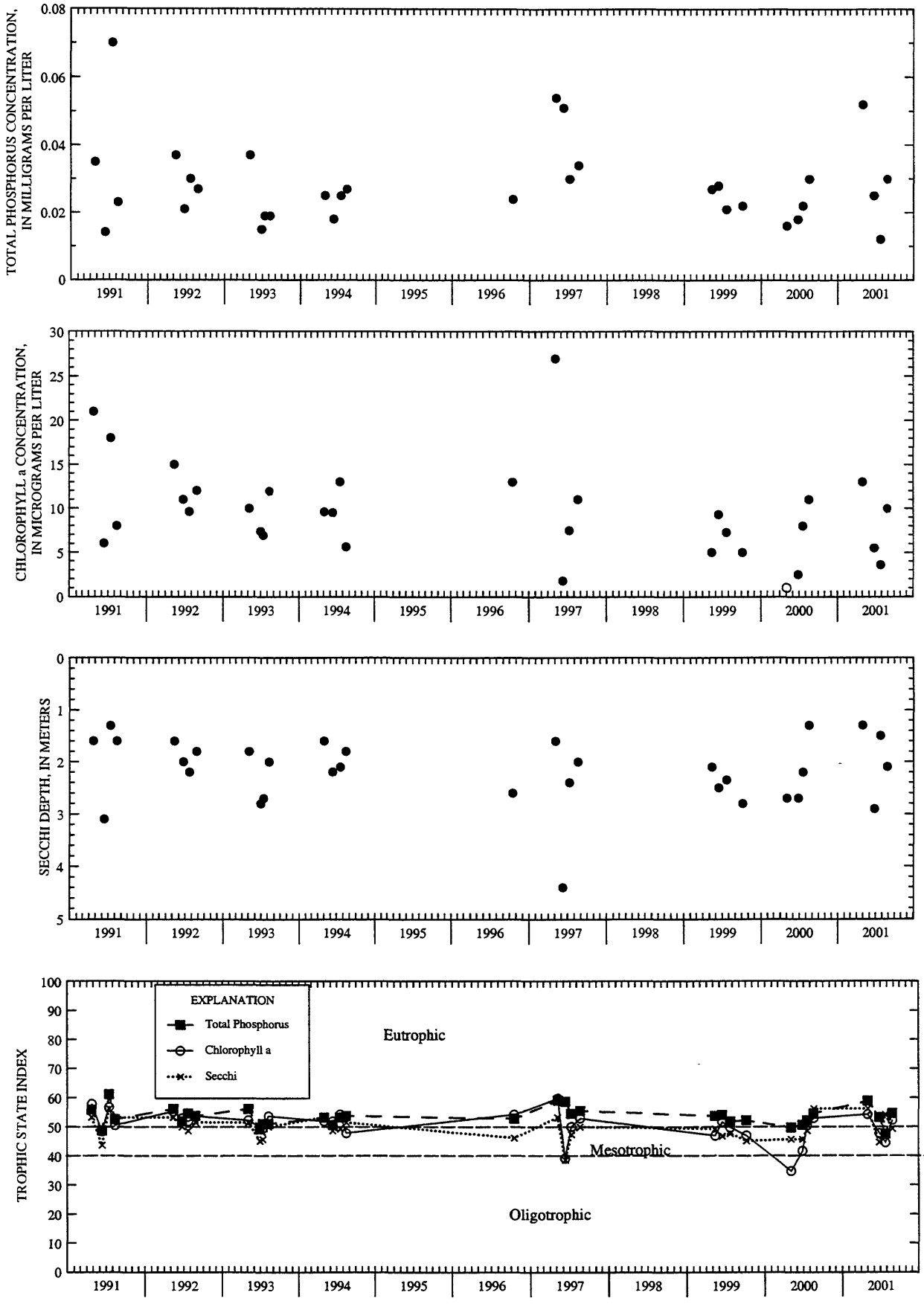


SPECIFIC CONDUCTANCE (S.C.), IN MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS

WATER-QUALITY DATA, JUNE 26 TO AUGUST 28, 2001
(Milligrams per liter unless otherwise indicated)

	Jun-26		Jul-26		Aug-28		
Lake stage (ft)	13.70		13.52		13.30		
Secchi-depth (m)	2.9		1.5		2.1		
Chlorophyll a, phytoplankton (µg/L)	5.5		3.6		10		
Depth of sample (m)	0.5	5.5	0.5	6.0	0.5	5.0	7.0
Water temperature (°C)	23.1	14.6	24.2	15.5	22.0	19.1	17.2
Specific conductance (µS/cm)	75	84	80	145	84	95	155
pH (units)	8.0	6.6	8.5	6.9	8.1	6.5	7.0
Dissolved oxygen (mg/L)	9.8	0.7	8.9	0.3	9.4	0.3	0.2
Phosphorus, total (as P)	0.025	0.054	0.012	0.108	0.030	0.042	0.087





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Little St. Germain Lake, South Bay, at St. Germain, Wisconsin.

(Circles on the first three plots indicate laboratory detection limit for selected analyses. Actual concentrations for these particular analyses are less than the plotted circles.)

455428089282400 LITTLE ST. GERMAIN LAKE, WEST BAY, AT ST. GERMAIN, WI

LOCATION.--Lat 45°54'28", long 89°28'24", in SW 1/4 NE 1/4 sec.34, T.40 N., R.8 E., Vilas County, Hydrologic Unit 07070001, at St. Germain.

PERIOD OF RECORD.--April 1991 to August 1994, August 1996 to August 1997, March 1999 to current year.

REMARKS.--Lake sampled in west bay at a lake depth of about 18 m. Lake ice-covered during January and March sampling. Water-quality analyses by Wisconsin State Laboratory of Hygiene.

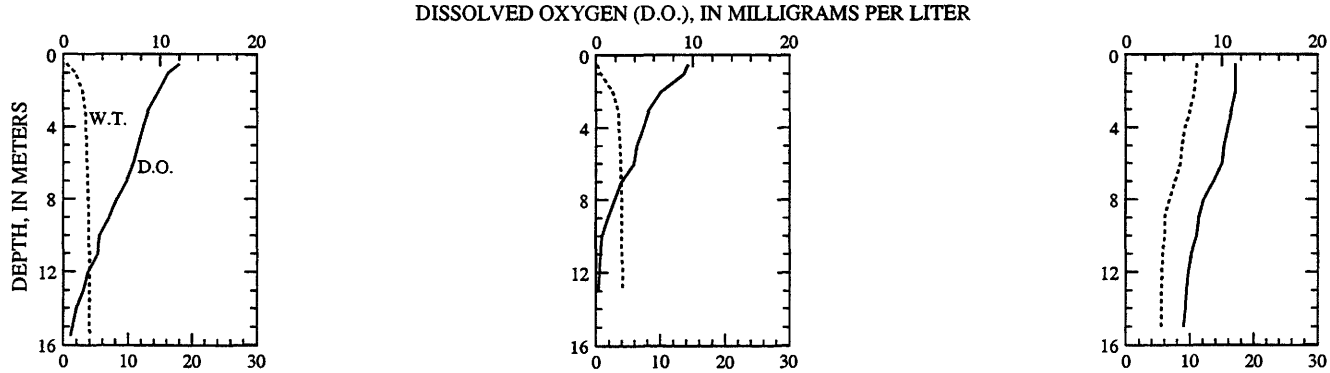
WATER-QUALITY DATA, JANUARY 17 TO MAY 01, 2001

(Milligrams per liter unless otherwise indicated)

	Jan-17		Mar-22		May-1
Lake stage (ft)	12.22		12.34		13.64
Secchi-depth (m)	---		---		1.9
Chlorophyll a, phytoplankton (µg/L)	---		---		10
Depth of sample (m)	0.5	15.0	0.5	12.5	0.5
Water temperature (°C)	0.4	4.1	0.1	4.1	11.1
Specific conductance (µS/cm)	82	80	78	73	75
pH (units)	7.8	6.9	7.0	6.4	7.8
Dissolved oxygen (mg/L)	12.0	0.7	9.5	0.2	11.4
Phosphorus, total (as P)	0.008	0.044	0.014	0.017	0.015
Phosphorus, ortho, dissolved (as P)	---	---	---	---	0.002
Nitrogen, NO2 + NO3, diss. (as N)	---	---	---	---	0.102
Nitrogen, ammonia, dissolved (as N)	---	---	---	---	<0.013
Nitrogen, amm. + org., total (as N)	---	---	---	---	0.46
Nitrogen, total (as N)	---	---	---	---	0.562
Color (Pt-Co. scale)	---	---	---	---	20
Turbidity (NTU)	---	---	---	---	1.9
Hardness, (as $CaCO_3$)	---	---	---	---	32.8
Calcium, dissolved (Ca)	---	---	---	---	8.5
Magnesium, dissolved (Mg)	---	---	---	---	2.8
Sodium, dissolved (Na)	---	---	---	---	2.2
Potassium, dissolved (K)	---	---	---	---	<0.30
Alkalinity, (as $CaCO_3$)	---	---	---	---	32
Sulfate, dissolved (SO_4)	---	---	---	---	<4.5
Chloride, dissolved (Cl)	---	---	---	---	2.1
Silica, dissolved (SiO_2)	---	---	---	---	8.7
Solids, dissolved, at 180°C	---	---	---	---	52
Iron, dissolved (Fe) µg/L	---	---	---	---	50
Manganese, dissolved (Mn) µg/L	---	---	---	---	39

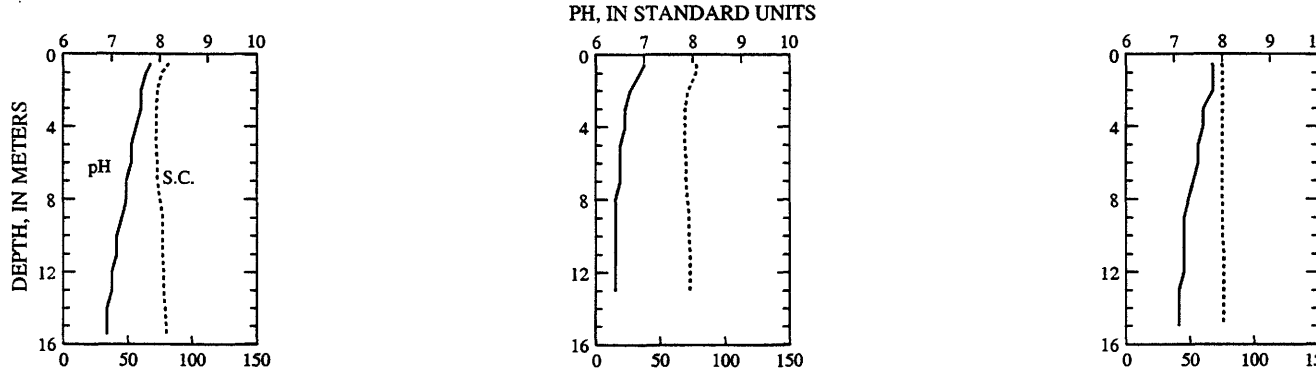
1-17-01 3-22-01 5-1-01

DISSOLVED OXYGEN (D.O.), IN MILLIGRAMS PER LITER



WATER TEMPERATURE (W.T.), IN DEGREES CELSIUS

PH, IN STANDARD UNITS



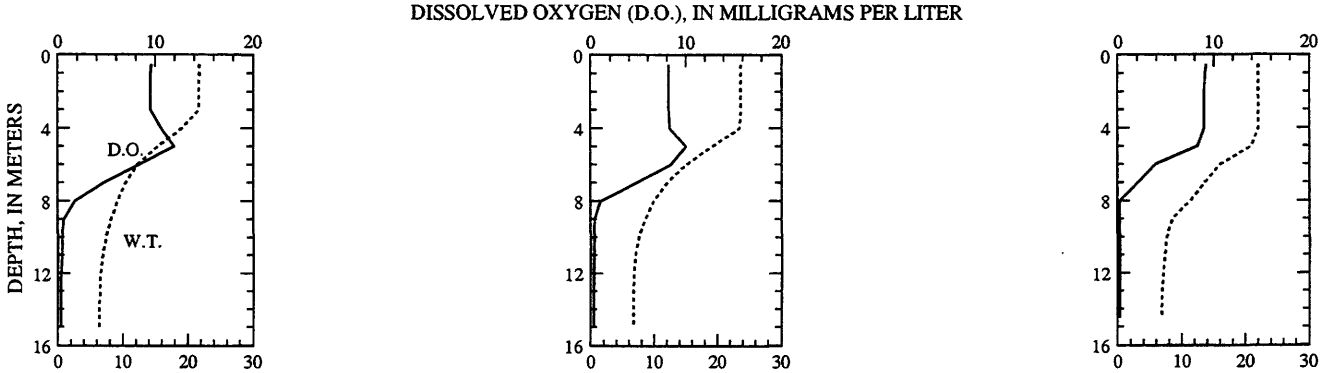
SPECIFIC CONDUCTANCE (S.C.), IN MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS

WATER-QUALITY DATA, JUNE 26 TO AUGUST 28, 2001
(Milligrams per liter unless otherwise indicated)

	Jun-26		Jul-26		Aug-28		
Lake stage (ft)	13.70		13.52		13.30		
Secchi-depth (m)	3.0		3.8		4.1		
Chlorophyll a, phytoplankton (µg/L)	4.2		14		3.2		
Depth of sample (m)	0.5	15.0	0.5	15.0	0.5	8.0	14.0
Water temperature (°C)	21.8	6.4	23.7	6.7	22.0	11.3	6.8
Specific conductance (µS/cm)	71	84	75	97	76	74	115
pH (units)	7.3	6.5	7.6	6.6	7.3	6.3	6.7
Dissolved oxygen (mg/L)	9.6	0.3	8.2	0.3	9.2	0.2	0.2
Phosphorus, total (as P)	0.015	0.074	0.026	0.088	0.009	0.023	0.211

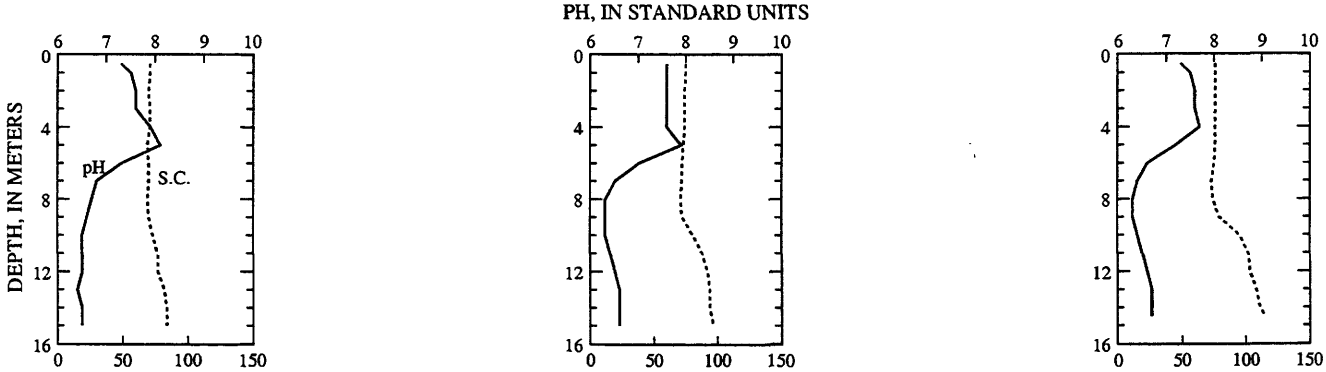
6-26-01 7-26-01 8-28-01

DISSOLVED OXYGEN (D.O.), IN MILLIGRAMS PER LITER

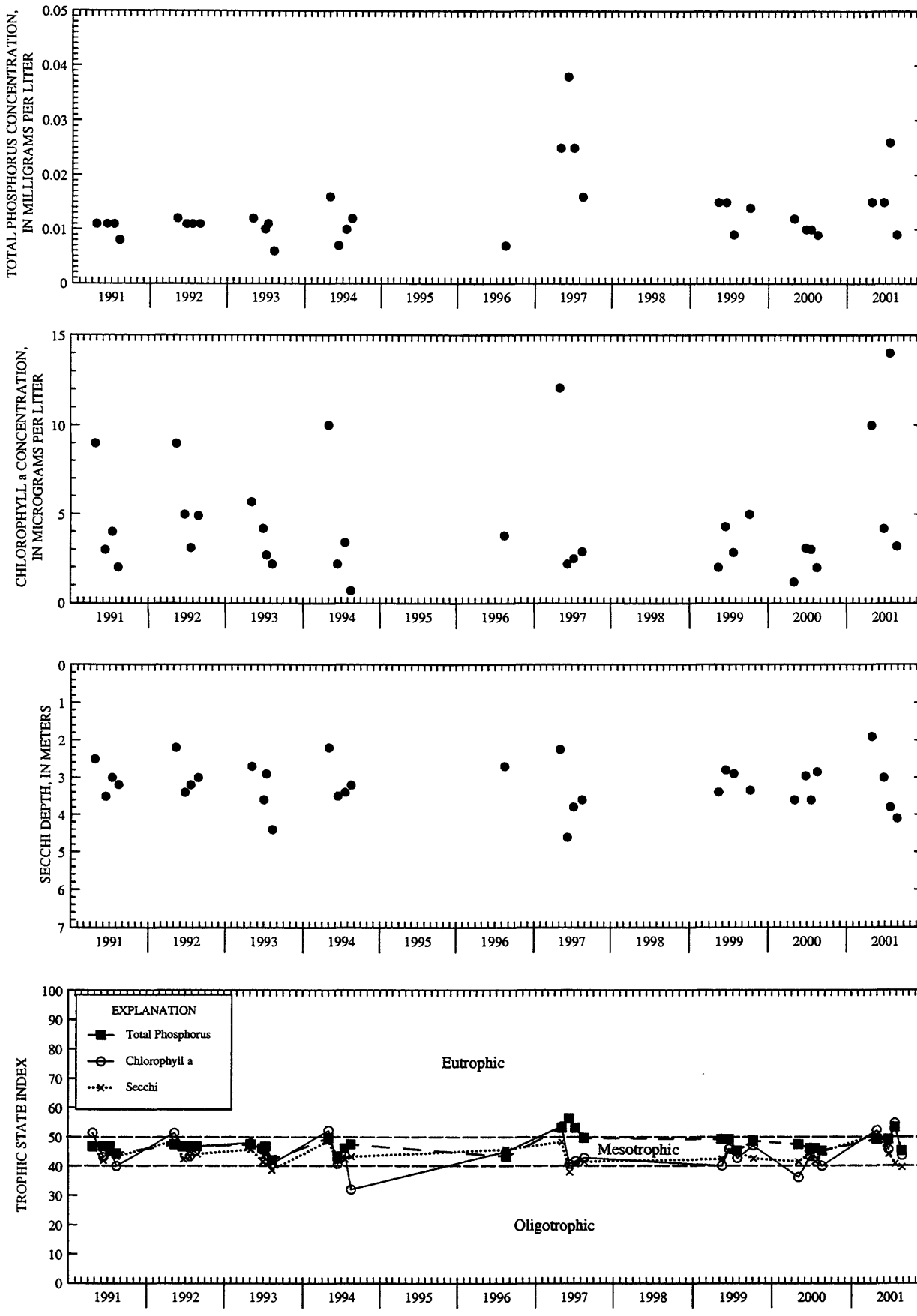


WATER TEMPERATURE (W.T.), IN DEGREES CELSIUS

PH, IN STANDARD UNITS



SPECIFIC CONDUCTANCE (S.C.), IN MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS



Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Little St. Germain Lake, West Bay, at St. Germain, Wisconsin.

452826088544101 LITTLE SAND LAKE--SITE NUMBER 2--NEAR MOLE LAKE, WI

(Formerly 04074691 Little Sand Lake near Mole Lake, WI)

LOCATION.--Lat 45°28'26" long 88°54'41", in SW 1/4 NE 1/4 sec.31, T.35 N., R.13 E., Forest County, Hydrologic Unit 04030202, on left bank 1 mi upstream of outlet, 3 mi southeast of Mole Lake.

PERIOD OF RECORD.--May 1996 to current year. Prior to October 2000 published as "Little Sand Lake near Mole Lake, WI" under station number 04074651.

GAGE.--Water-stage recorder. Datum of gage is 1,587.32 ft above sea level.

REMARKS.--Recorder removed during period of ice, Nov. 11, 2000 to May 1, 2001.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 5.97 ft, May 25, 1997; minimum observed, 3.78 ft, Nov. 7-9, 1999.

EXTREMES FOR CURRENT YEAR.-- Maximum gage height observed, 5.05 ft, Oct. 3; minimum observed, 3.84 ft, Sept. 6.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.05	4.70	---	---	---	---	---	---	4.60	4.39	4.19	3.92
2	5.05	4.69	---	---	---	---	---	4.73	4.60	4.36	4.20	3.90
3	5.05	4.67	---	---	---	---	---	4.74	4.59	4.34	4.19	3.88
4	5.03	4.65	---	---	---	---	---	4.73	4.57	4.33	4.17	3.86
5	5.01	4.64	---	---	---	---	---	4.70	4.55	4.30	4.17	3.85
6	5.01	4.63	---	---	---	---	---	4.68	4.53	4.28	4.16	3.84
7	5.00	4.67	---	---	---	---	---	4.70	4.53	4.26	4.16	3.96
8	4.98	4.67	---	---	---	---	---	4.72	4.52	4.24	4.13	4.02
9	4.96	4.67	---	---	---	---	---	4.68	4.49	4.23	4.11	4.03
10	4.95	4.66	---	---	---	---	---	4.69	4.51	4.22	4.10	4.01
11	4.95	---	---	---	---	---	---	4.69	4.52	4.22	4.07	3.99
12	4.94	---	---	---	---	---	---	4.66	4.54	4.20	4.06	3.97
13	4.94	---	---	---	---	---	---	4.64	4.53	4.17	4.10	3.96
14	4.96	---	---	---	---	---	---	4.64	4.52	4.15	4.07	3.95
15	4.95	---	---	---	---	---	---	4.62	4.53	4.15	4.04	3.94
16	4.95	---	---	---	---	---	---	4.63	4.52	4.13	4.04	3.92
17	4.95	---	---	---	---	---	---	4.61	4.50	4.11	4.04	3.91
18	4.92	---	---	---	---	---	---	4.58	4.52	4.14	4.03	3.91
19	4.89	---	---	---	---	---	---	4.55	4.53	4.15	4.02	3.92
20	4.86	---	---	---	---	---	---	4.53	4.51	4.23	4.01	3.93
21	4.84	---	---	---	---	---	---	4.55	4.54	4.25	4.00	3.92
22	4.83	---	---	---	---	---	---	4.58	4.55	4.24	3.99	3.92
23	4.82	---	---	---	---	---	---	4.57	4.53	4.24	3.99	3.97
24	4.82	---	---	---	---	---	---	4.59	4.51	4.22	3.98	3.97
25	4.80	---	---	---	---	---	---	4.61	4.49	4.20	3.97	3.95
26	4.78	---	---	---	---	---	---	4.62	4.48	4.17	3.97	3.92
27	4.77	---	---	---	---	---	---	4.63	4.47	4.14	3.97	3.91
28	4.76	---	---	---	---	---	---	4.61	4.47	4.16	3.95	3.91
29	4.75	---	---	---	---	---	---	4.61	4.46	4.18	3.94	3.91
30	4.73	---	---	---	---	---	---	4.60	4.44	4.18	3.95	3.90
31	4.71	---	---	---	---	---	---	4.58	---	4.18	3.94	---
MEAN	4.90	---	---	---	---	---	---	---	4.52	4.22	4.06	3.93
MAX	5.05	---	---	---	---	---	---	---	4.60	4.39	4.20	4.03
MIN	4.71	---	---	---	---	---	---	---	4.44	4.11	3.94	3.84

05428000 LAKE MENDOTA AT MADISON, WI

LOCATION.--Lat 43°05'42", long 89°22'12", in SE 1/4 sec.12, T.7 N., R.9 E., Dane County, Hydrologic Unit 07090001, in county boat house at dam at outlet, in Madison.

DRAINAGE AREA.--233 mi^2. Area of Lake Mendota, 15.2 mi^2.

PERIOD OF RECORD.--January 1916 to current year (incomplete).

REVISED RECORDS.--WDR WI-73-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 840.00 ft above sea level, or 5.60 ft below City of Madison datum. Prior to Oct. 1, 1979, at datum 7.82 ft higher; prior to Nov. 15, 1971, nonrecording gage at same site.

REMARKS.--Lake level regulated by concrete dam with two 12-foot gates and 20-foot lock at outlet. Gage-height telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 12.75 ft, June 5, 2000; minimum observed, 8.02 ft, Feb. 24 to Mar. 10, 1920, current datum.

EXTREMES FOR CURRENT YEAR.--Maximum recorded gage height, 11.66 ft, Aug. 9; minimum recorded, 8.09 ft, Feb. 2, 3.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10.12	9.65	9.29	9.10	8.14	8.66	9.28	10.01	9.88	10.41	9.95	11.18
2	10.12	9.65	9.29	9.08	8.12	8.67	9.30	10.01	9.93	10.34	10.74	11.15
3	10.11	9.62	9.27	9.05	8.12	8.68	9.32	10.04	9.92	10.31	11.26	11.13
4	10.10	9.58	9.27	9.02	8.14	8.69	9.33	10.06	9.92	10.28	11.38	11.11
5	10.09	9.53	9.27	8.98	8.14	8.69	9.36	10.03	9.96	10.22	11.41	11.07
6	10.09	9.50	9.24	8.94	8.15	8.70	9.41	10.01	10.02	10.18	11.43	11.04
7	10.04	9.56	9.22	8.91	8.15	8.70	9.44	10.02	10.04	10.16	11.43	11.05
8	9.99	9.54	9.22	8.88	8.19	8.71	9.45	10.02	10.06	10.16	11.43	11.16
9	9.97	9.55	9.20	8.85	8.35	8.72	9.56	9.99	10.08	10.16	11.42	11.21
10	9.95	9.53	9.21	8.81	8.41	8.73	9.61	9.99	10.10	10.14	11.38	11.23
11	9.93	9.51	9.22	8.77	8.44	8.75	9.67	10.04	10.11	10.10	11.33	11.21
12	9.90	9.49	9.22	8.73	8.46	8.77	9.74	10.02	10.34	10.08	11.31	11.20
13	9.89	9.49	9.21	8.69	8.48	8.79	9.76	9.99	10.41	10.05	11.29	11.18
14	9.88	9.48	9.21	8.68	8.50	8.82	9.78	9.95	10.47	10.03	11.25	11.14
15	9.87	9.44	9.21	8.65	8.51	8.86	9.80	9.93	10.65	10.00	11.21	11.12
16	9.86	9.46	9.21	8.62	8.52	8.88	9.84	9.92	10.69	9.97	11.21	11.10
17	9.84	9.46	9.21	8.58	8.52	8.90	9.84	9.90	10.69	10.01	11.17	11.10
18	9.84	9.43	9.21	8.54	8.52	8.92	9.83	9.88	10.71	10.04	11.13	11.11
19	9.83	9.41	9.21	8.51	8.53	8.95	9.83	9.84	10.72	10.05	11.11	11.15
20	9.81	9.42	9.21	8.46	8.53	8.98	9.89	9.80	10.70	10.05	11.08	11.15
21	9.80	9.37	9.21	8.42	8.53	9.02	9.97	9.89	10.69	10.05	11.05	11.17
22	9.78	9.34	9.21	8.38	8.54	9.06	10.00	9.92	10.68	10.04	11.05	11.15
23	9.77	9.33	9.21	8.34	8.54	9.10	10.03	9.92	10.65	10.04	11.06	11.30
24	9.78	9.32	9.21	8.31	8.57	9.13	10.03	9.93	10.62	10.03	11.04	11.38
25	9.77	9.31	9.21	8.27	8.61	9.15	10.04	9.92	10.59	10.02	11.15	11.38
26	9.77	9.31	9.21	8.24	8.63	9.16	10.05	9.90	10.57	9.99	11.30	11.36
27	9.77	9.30	9.21	8.20	8.64	9.18	10.05	9.89	10.54	9.96	11.31	11.33
28	9.75	9.29	9.19	8.16	8.65	9.19	10.03	9.87	10.51	9.94	11.30	11.30
29	9.72	9.30	9.17	8.15	---	9.21	10.01	9.85	10.48	9.95	11.27	11.28
30	9.68	9.30	9.15	8.19	---	9.23	10.00	9.84	10.45	9.94	11.25	11.25
31	9.67	---	9.13	8.17	---	9.25	---	9.83	---	9.93	11.22	---
MEAN	9.89	9.45	9.22	8.60	8.42	8.91	9.74	9.94	10.37	10.08	11.19	11.19
MAX	10.12	9.65	9.29	9.10	8.65	9.25	10.05	10.06	10.72	10.41	11.43	11.38
MIN	9.67	9.29	9.13	8.15	8.12	8.66	9.28	9.80	9.88	9.93	9.95	11.04

430309088284800 MIDDLE GENESEE LAKE NEAR OCONOMOWOC, WI

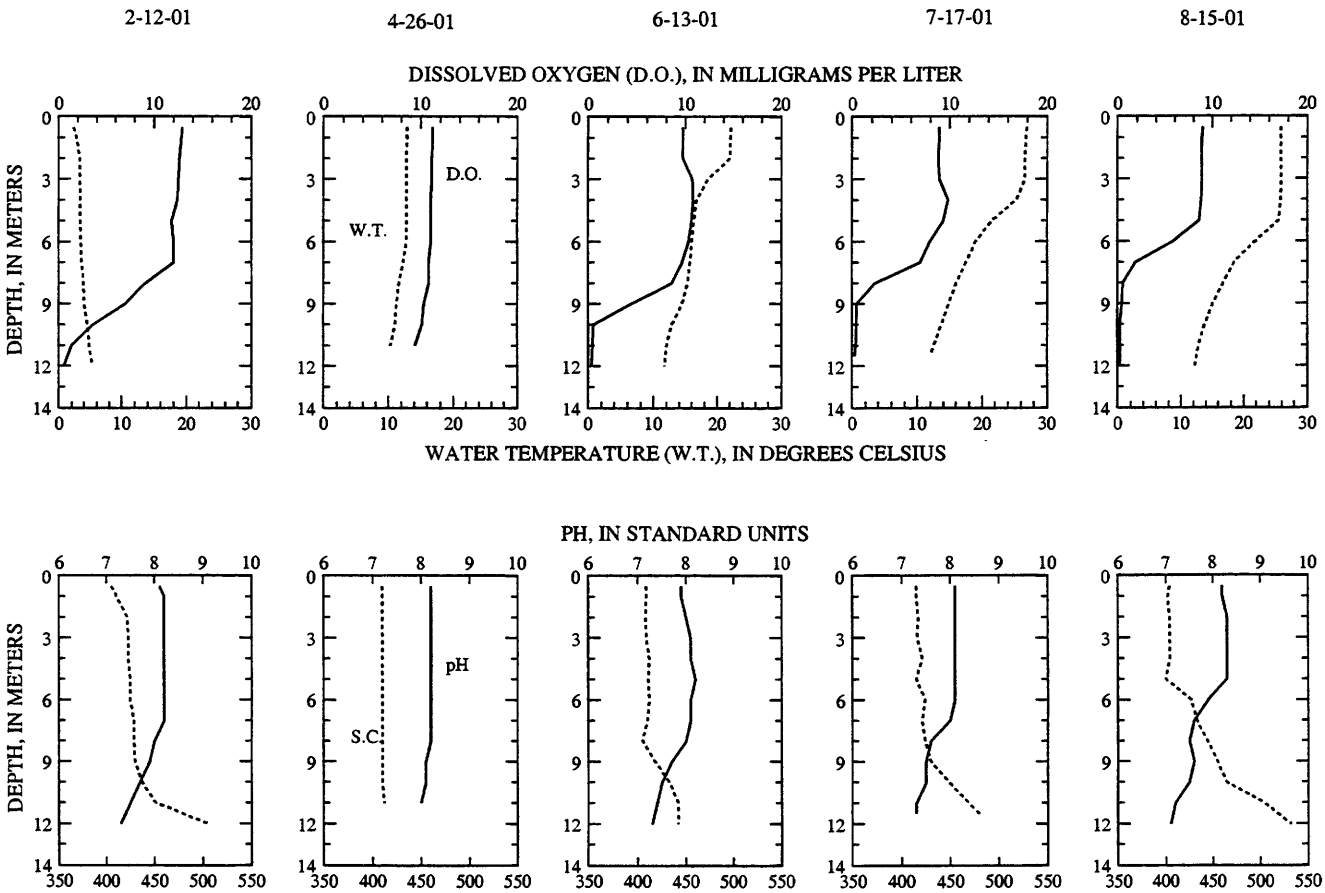
LOCATION.--Lat 43°03'09", long 88°28'48", in NW 1/4 SW 1/4 sec.22, T.7 N., R.17 E., Waukesha County, Hydrologic Unit 07090001, 1.8 mi south of Oconomowoc.

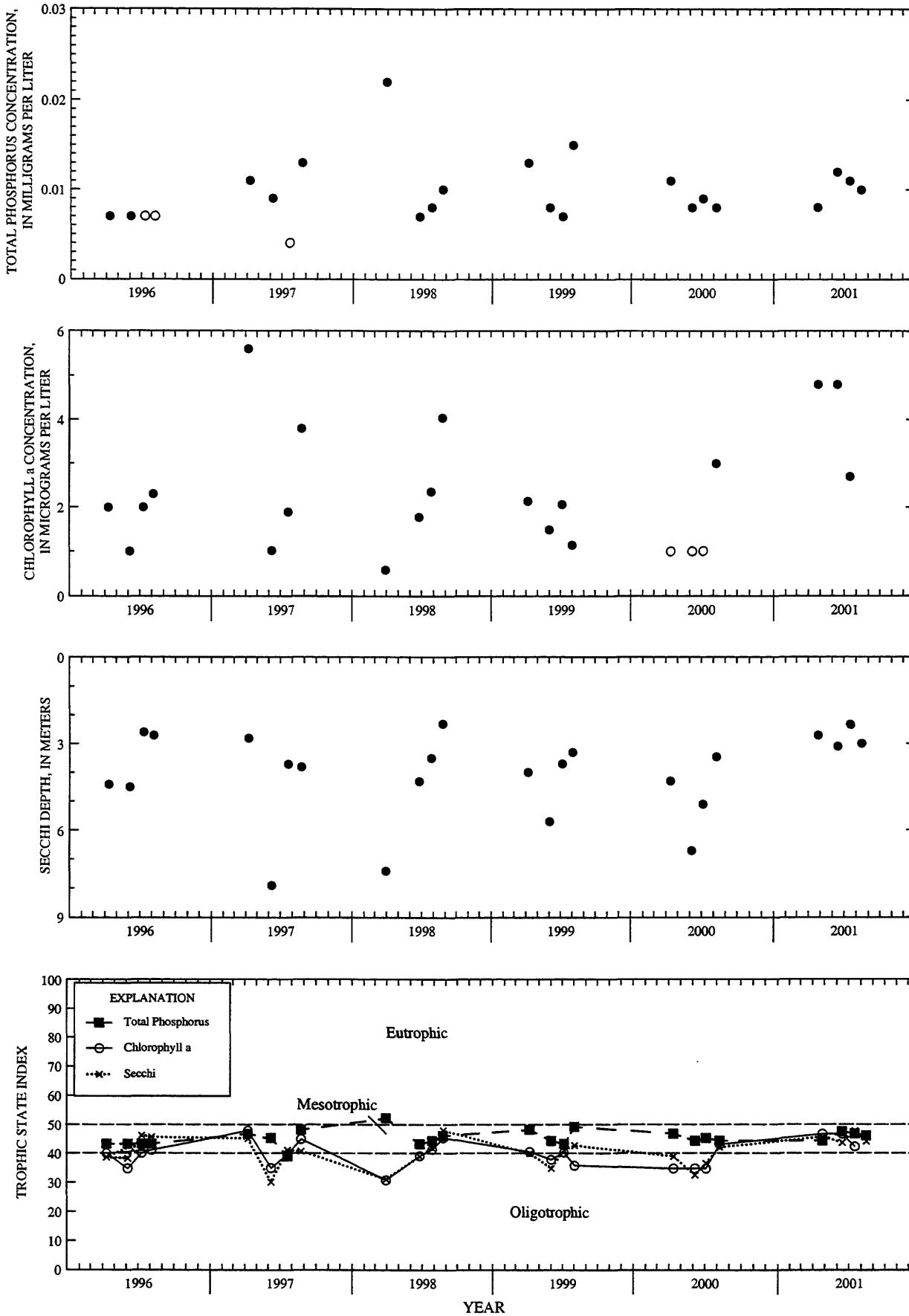
PERIOD OF RECORD.--February 1996 to current year.

REMARKS.--Lake sampled near center at the deep hole. Lake ice-covered during February sampling. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, FEBRUARY 12 TO AUGUST 15, 2001
(Milligrams per liter unless otherwise indicated)

	Feb-12		Apr-26		Jun-13		Jul-17		Aug-15	
Lake stage (ft)	---		867.07		867.18		866.79		866.35	
Secchi-depth (m)	---		2.7		3.1		2.3		3.0	
Chlorophyll a, phytoplankton (µg/L)	---		4.8		4.8		2.7		---	
Depth of sample (m)	0.5	12.0	0.5	11.0	0.5	12.0	0.5	11.5	0.5	12.0
Water temperature (°C)	2.3	5.3	12.9	10.3	22.1	11.7	26.9	12.0	25.9	12.2
Specific conductance (µS/cm)	405	506	410	412	409	442	415	480	404	532
pH (units)	8.1	7.3	8.2	8.0	7.9	7.3	8.1	7.3	8.2	7.1
Dissolved oxygen (mg/L)	12.9	0.5	11.2	9.4	9.7	0.3	8.9	0.2	9.0	0.2
Phosphorus, total (as P)	0.008	0.024	0.008	0.009	0.012	0.031	0.011	0.050	0.010	0.068
Phosphorus, ortho, dissolved (as P)	---	---	<0.002	---	---	---	---	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	0.114	---	---	---	---	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	0.12	---	---	---	---	---	---	---
Nitrogen, amm. + org., total (as N)	---	---	0.91	---	---	---	---	---	---	---
Nitrogen, total (as N)	---	---	1.02	---	---	---	---	---	---	---
Color (Pt-Co. scale)	---	---	10	---	---	---	---	---	---	---
Turbidity (NTU)	---	---	1.9	---	---	---	---	---	---	---
Hardness, (as $CaCO_3$)	---	---	187	---	---	---	---	---	---	---
Calcium, dissolved (Ca)	---	---	32	---	---	---	---	---	---	---
Magnesium, dissolved (Mg)	---	---	26	---	---	---	---	---	---	---
Sodium, dissolved (Na)	---	---	11	---	---	---	---	---	---	---
Potassium, dissolved (K)	---	---	1.2	---	---	---	---	---	---	---
Alkalinity, (as $CaCO_3$)	---	---	160	---	---	---	---	---	---	---
Sulfate, dissolved (SO_4)	---	---	14.1	---	---	---	---	---	---	---
Chloride, dissolved (Cl)	---	---	26	---	---	---	---	---	---	---
Silica, dissolved (SiO_2)	---	---	1.0	---	---	---	---	---	---	---
Solids, dissolved, at 180°C	---	---	244	---	---	---	---	---	---	---
Iron, dissolved (Fe) µg/L	---	---	<10	---	---	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	<0.4	---	---	---	---	---	---	---





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Middle Genesee Lake, near Oconomowoc, Wisconsin.

(Circles on the first three plots indicate laboratory detection limit for selected analyses. Actual concentrations for these particular analyses are less than the plotted circles.)

05429000 LAKE MONONA AT MADISON, WI

LOCATION.--Lat 43°03'48", long 89°23'49', in SW 1/4 sec.23, T.7 N., R.9 E., Dane County, Hydrologic Unit 07090001, in Brittingham Park, in Madison.

DRAINAGE AREA.--279 mi^2. Area of Lake Monona, 5.3 mi^2.

PERIOD OF RECORD.--September 1915 to current year (fragmentary) in reports of the Geological Survey. For 1856 to March 1917 in reports of Wisconsin Railroad Commission, volume 19.

REVISED RECORDS.--WSP 1338: Lake area. WDR WI-73-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 840.00 ft above sea level, or 5.60 ft below City of Madison datum. Prior to Oct. 1, 1979, datum 3.61 ft higher; prior to Nov. 15, 1971, nonrecording gage at same site at the higher datum.

REMARKS.--Lake level regulated by concrete dam with four 12-foot stop-log sections and 12-foot lock at outlet of Lake Waubesa. Gage-height telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 7.48 ft, June 14, 15, 2000; minimum observed, 3.22 ft, Jan. 20, 1965, current datum.

EXTREMES FOR CURRENT YEAR.--Maximum recorded gage height, 6.58 ft, Aug. 9; minimum recorded, 4.08, Apr. 7.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.52	4.55	4.27	4.51	5.07	4.29	4.14	4.59	5.22	5.89	5.42	6.28
2	5.49	4.53	4.25	4.53	5.04	4.27	4.13	4.60	5.22	5.86	6.21	6.24
3	5.45	4.53	4.24	4.55	4.96	4.27	4.13	4.64	5.19	5.84	6.46	6.21
4	5.42	4.54	4.23	4.58	4.88	4.26	4.13	4.71	5.17	5.82	6.52	6.18
5	5.39	4.55	4.21	4.63	4.80	4.24	4.14	4.76	5.20	5.80	6.54	6.15
6	5.32	4.62	4.19	4.68	4.74	4.22	4.18	4.79	5.22	5.77	6.55	6.11
7	5.26	4.71	4.20	4.72	4.68	4.21	4.17	4.84	5.20	5.72	6.56	6.12
8	5.21	4.70	4.20	4.75	4.66	4.20	4.21	4.87	5.19	5.69	6.56	6.26
9	5.16	4.70	4.20	4.79	4.82	4.18	4.39	4.89	5.18	5.66	6.55	6.28
10	5.13	4.64	4.20	4.81	4.86	4.18	4.46	4.95	5.18	5.62	6.55	6.30
11	5.10	4.61	4.22	4.84	4.83	4.18	4.53	5.06	5.19	5.58	6.52	6.28
12	5.07	4.59	4.23	4.86	4.78	4.20	4.56	5.09	5.45	5.55	6.49	6.25
13	5.04	4.55	4.24	4.87	4.73	4.21	4.56	5.09	5.54	5.52	6.48	6.22
14	5.01	4.51	4.26	4.91	4.69	4.21	4.55	5.11	5.62	5.49	6.43	6.18
15	4.98	4.48	4.26	4.93	4.65	4.22	4.54	5.12	5.73	5.46	6.40	6.13
16	4.95	4.48	4.27	4.94	4.60	4.22	4.51	5.13	5.78	5.44	6.38	6.10
17	4.92	4.45	4.26	4.94	4.56	4.21	4.49	5.13	5.81	5.47	6.34	6.09
18	4.89	4.42	4.27	4.95	4.52	4.21	4.49	5.14	5.91	5.49	6.31	6.09
19	4.85	4.40	4.29	4.95	4.48	4.21	4.49	5.13	5.93	5.47	6.28	6.10
20	4.82	4.35	4.30	4.95	4.43	4.21	4.55	5.14	5.94	5.46	6.25	6.08
21	4.80	4.34	4.31	4.95	4.39	4.21	4.58	5.24	5.94	5.45	6.22	6.08
22	4.76	4.33	4.31	4.95	4.37	4.21	4.62	5.27	5.94	5.48	6.22	6.06
23	4.75	4.32	4.32	4.95	4.33	4.20	4.61	5.32	5.94	5.52	6.22	6.23
24	4.74	4.31	4.32	4.94	4.33	4.18	4.58	5.34	5.94	5.51	6.19	6.32
25	4.72	4.30	4.32	4.94	4.38	4.16	4.57	5.34	5.93	5.51	6.29	6.29
26	4.70	4.29	4.31	4.94	4.37	4.14	4.56	5.35	5.93	5.47	6.44	6.24
27	4.67	4.28	4.32	4.94	4.34	4.13	4.55	5.34	5.93	5.44	6.43	6.21
28	4.65	4.27	4.36	4.93	4.32	4.13	4.57	5.34	5.92	5.42	6.41	6.19
29	4.61	4.28	4.42	4.96	---	4.13	4.58	5.32	5.91	5.42	6.37	6.17
30	4.59	4.28	4.46	5.07	---	4.13	4.58	5.30	5.90	5.42	6.34	6.15
31	4.56	---	4.49	5.07	---	4.13	---	5.24	---	5.41	6.31	---
MEAN	4.98	4.46	4.28	4.85	4.63	4.20	4.44	5.07	5.61	5.57	6.36	6.19
MAX	5.52	4.71	4.49	5.07	5.07	4.29	4.62	5.35	5.94	5.89	6.56	6.32
MIN	4.56	4.27	4.19	4.51	4.32	4.13	4.13	4.59	5.17	5.41	5.42	6.06

425344088070100 MUSKEGO (BIG MUSKEGO) LAKE, BASS BAY, NEAR MUSKEGO, WI

(Formerly Big Muskego Lake, Bass Bay, near Muskego, WI)

LOCATION.--Lat 42°53'44", long 88°07'01", in SW 1/4 NE 1/4 sec.15, T.5 N., R.20 E., Waukesha County, Hydrologic Unit 07120006, 1.3 mi southeast of Muskego.

PERIOD OF RECORD.--February 1988 to current year. Prior to October 2000, publsihed as "Big Muskego Lake".

REMARKS.--Lake sampled near center at the deep hole. Lake ice-covered during January and February sampling. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

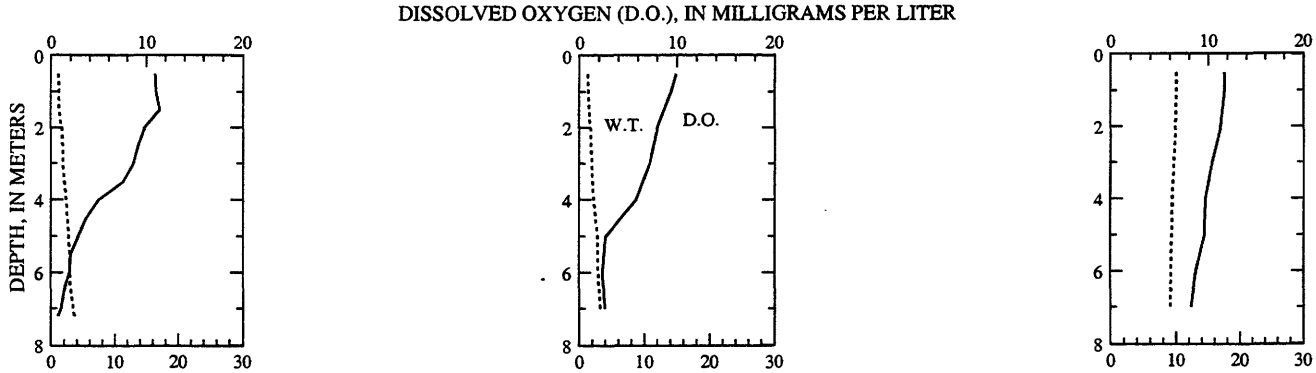
WATER-QUALITY DATA, JANUARY 10 TO APRIL 19, 2001

(Milligrams per liter unless otherwise indicated)

	Jan-10		Feb-13		Apr-19	
Lake stage (ft)	11.70		12.12		11.64	
Secchi-depth (m)	---		---		1.4	
Chlorophyll a, phytoplankton (µg/L)	---		---		16	
Depth of sample (m)	0.5	7.2	0.5	7.0	0.5	7.0
Water temperature (°C)	1.1	3.6	1.3	3.2	10.0	9.1
Specific conductance (µS/cm)	---	---	501	940	577	579
pH (units)	7.9	7.4	7.8	7.3	8.1	7.7
Dissolved oxygen (mg/L)	10.9	0.7	9.9	2.6	11.7	8.2
Phosphorus, total (as P)	---	---	0.296	0.051	0.031	0.032
Phosphorus, ortho, dissolved (as P)	---	---	---	---	0.002	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	---	---	0.376	---
Nitrogen, ammonia, dissolved (as N)	---	---	---	---	<0.013	---
Nitrogen, amm. + org., total (as N)	---	---	---	---	0.78	---
Nitrogen, total (as N)	---	---	---	---	1.16	---
Color (Pt-Co. scale)	---	---	---	---	25	---
Turbidity (NTU)	---	---	---	---	4.2	---
Hardness, (as $CaCO_3$)	---	---	---	---	234	---
Calcium, dissolved (Ca)	---	---	---	---	51	---
Magnesium, dissolved (Mg)	---	---	---	---	26	---
Sodium, dissolved (Na)	---	---	---	---	26	---
Potassium, dissolved (K)	---	---	---	---	2.1	---
Alkalinity, (as $CaCO_3$)	---	---	---	---	172	---
Sulfate, dissolved (SO_4)	---	---	---	---	36.5	---
Chloride, dissolved (Cl)	---	---	---	---	57.7	---
Silica, dissolved (SiO_2)	---	---	---	---	0.8	---
Solids, dissolved, at 180°C	---	---	---	---	340	---
Iron, dissolved (Fe) µg/L	---	---	---	---	<10	---
Manganese, dissolved (Mn) µg/L	---	---	---	---	0.4	---

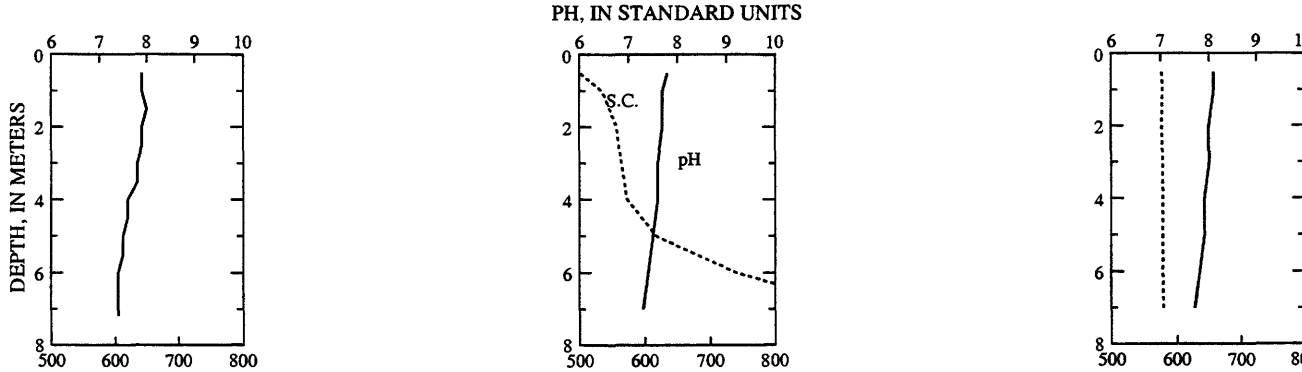
1-10-01 2-13-01 4-19-01

DISSOLVED OXYGEN (D.O.), IN MILLIGRAMS PER LITER



WATER TEMPERATURE (W.T.), IN DEGREES CELSIUS

PH, IN STANDARD UNITS



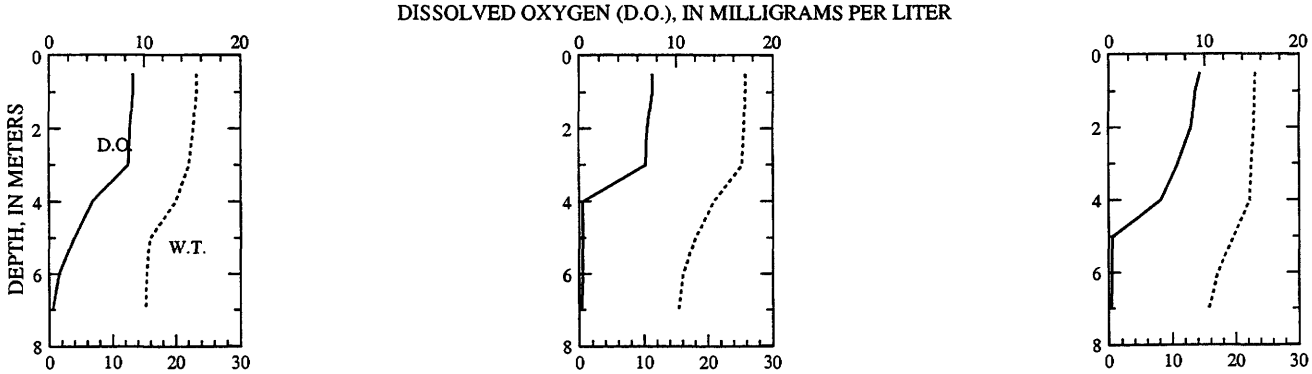
SPECIFIC CONDUCTANCE (S.C.), IN MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS

WATER-QUALITY DATA, JUNE 19 TO AUGUST 21, 2001
(Milligrams per liter unless otherwise indicated)

	Jun-19		Jul-26		Aug-21			
Lake stage (ft)	11.55		11.14		10.92			
Secchi-depth (m)	2.8		1.1		0.9			
Chlorophyll a, phytoplankton (µg/L)	5.4		25		21			
Depth of sample (m)	0.5	7.0	0.5	7.0	0.5	5.0	6.0	7.0
Water temperature (°C)	23.3	15.2	25.8	15.4	23.1	19.6	17.1	15.7
Specific conductance (µS/cm)	558	586	535	623	532	596	619	645
pH (units)	7.8	7.3	8.3	7.9	8.3	7.2	7.0	7.0
Dissolved oxygen (mg/L)	8.8	0.3	7.7	0.2	9.5	0.3	0.3	0.2
Phosphorus, total (as P)	0.047	0.118	0.035	0.278	0.034	0.058	0.252	0.366

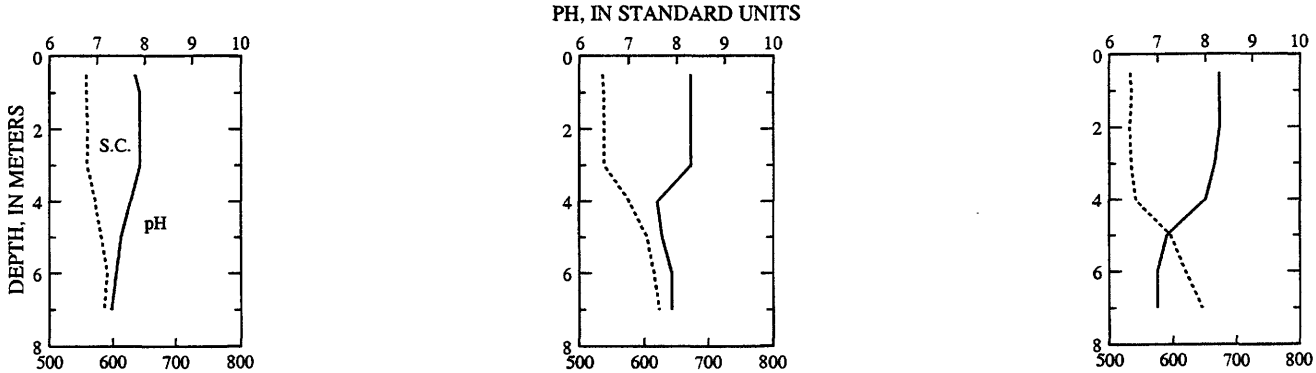
6-19-01 7-26-01 8-21-01

DISSOLVED OXYGEN (D.O.), IN MILLIGRAMS PER LITER

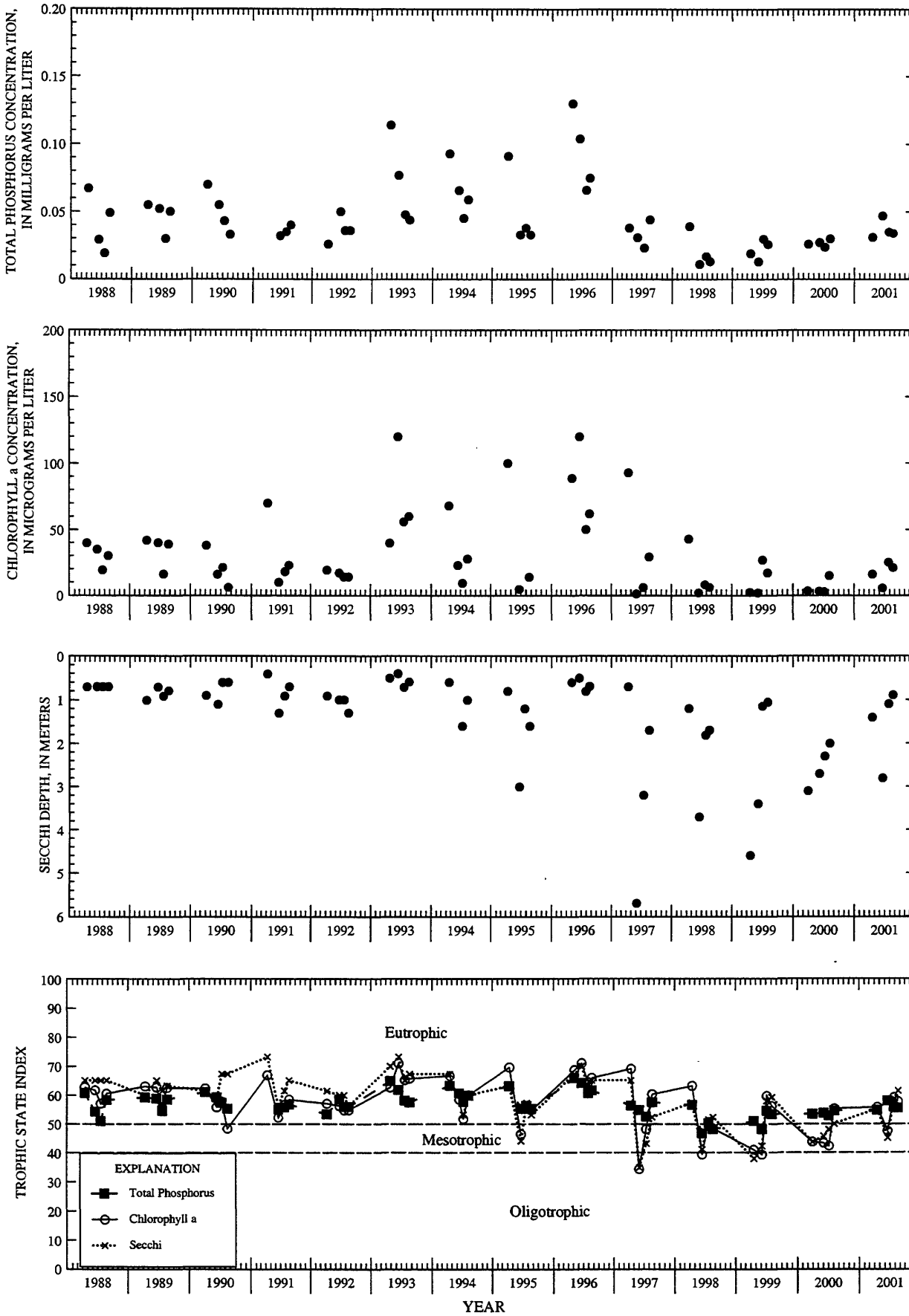


WATER TEMPERATURE (W.T.), IN DEGREES CELSIUS

PH, IN STANDARD UNITS



SPECIFIC CONDUCTANCE (S.C.), IN MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS



Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Muskego (Big Muskego) Lake, Bass Bay, near Muskego, Wisconsin.

425109088075000 MUSKEGO (BIG MUSKEGO) LAKE NEAR WIND LAKE, WI

(Formerly Big Muskego Lake near Wind Lake, WI)

LOCATION.--Lat 42°51'09", long 88°07'50", in SE 1/4 NE 1/4 sec.33, T.5 N., R.20 E., Waukesha County, Hydrologic Unit 07120006, on left bank 8 ft upstream of dam outlet of Muskego Lake, 700 ft north of Muskego Dam Drive, 2 mi northeast of Wind Lake.

DRAINAGE AREA.--33.9 mi^2 (revised).

PERIOD OF RECORD.--October 1987 to September 1989, January 1991 to current year. Prior to October 1993, published as Muskego Lake Outlet near Wind Lake, WI. October 1993 to September 2000, published as "Big Muskego Lake".

GAGE.--Water-stage recorder. Datum of gage is 760.00 ft above sea level. October to December 1987 and January 1991 to September 1995, nonrecording gage at the same datum. December 1987 through September 1989, data collected using water-stage recorder at the same datum.

REMARKS.--Lake levels regulated by concrete dam with one 5-ft lift gate.

EXTREMES FOR PERIOD OF RECORD.--Maximum observed gage height, 12.60 ft, Oct. 7, 1991 and Aug. 8, 1994; minimum instantaneous, less than 8.72 ft, July 12, 1996 to Feb. 18, 1997, due to drawdown of lake.

EXTREMES FOR CURRENT YEAR.--Maximum observed gage-height, 12.18 ft, Feb. 11; minimum observed, 10.73 ft, Aug. 15.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11.45	11.26	11.31	11.65	11.84	11.87	11.72	11.42	11.40	11.43	10.95	10.91
2	11.42	11.25	11.32	11.65	11.84	11.86	11.71	11.38	11.46	11.37	11.00	10.88
3	11.40	11.22	11.33	11.65	11.84	11.89	11.73	11.40	11.49	11.34	11.02	10.86
4	11.38	11.22	11.33	11.66	11.84	11.92	11.68	11.41	11.51	11.36	11.00	10.97
5	11.34	11.20	11.35	11.66	11.83	11.93	11.67	11.33	11.56	11.35	10.96	11.04
6	11.28	11.21	11.35	11.67	11.82	11.92	11.69	11.26	11.62	11.29	10.92	10.90
7	11.23	11.25	11.37	11.68	11.81	11.90	11.54	11.26	11.61	11.29	10.92	10.88
8	11.21	11.28	11.38	11.68	11.84	11.88	11.66	11.24	11.59	e11.27	10.89	10.92
9	11.19	11.38	11.38	11.69	12.06	11.86	11.84	11.27	11.56	e11.25	10.83	11.04
10	11.19	11.38	11.40	11.70	12.14	11.85	11.84	11.26	11.51	e11.22	10.90	11.05
11	11.19	11.38	11.42	11.70	12.17	11.85	11.80	11.46	11.50	e11.18	10.86	11.07
12	11.20	11.38	11.44	11.70	12.16	11.85	11.73	11.48	11.66	e11.16	10.82	11.08
13	11.19	11.34	11.45	11.71	12.12	11.85	11.89	11.45	11.78	e11.12	10.88	11.19
14	11.18	11.34	11.47	11.73	12.09	11.85	11.86	11.51	11.82	e11.08	10.80	11.14
15	11.21	11.34	11.47	11.75	12.04	11.93	11.82	11.67	11.78	e11.05	10.79	11.11
16	11.19	11.35	11.49	11.76	11.98	11.97	11.78	11.74	11.76	e11.01	10.89	11.11
17	11.19	11.35	11.50	11.76	11.92	11.95	11.78	11.73	11.71	e10.98	10.88	11.11
18	11.18	11.33	11.51	11.76	11.86	11.94	11.69	11.74	11.60	e10.99	10.88	11.13
19	11.19	11.33	11.53	11.76	11.79	11.93	11.64	11.67	11.55	e10.97	11.01	11.29
20	11.19	11.32	11.54	11.76	11.72	11.92	11.65	11.61	11.54	e10.96	10.95	11.20
21	11.26	11.31	11.57	11.76	11.67	11.91	11.64	11.57	11.49	e10.98	10.92	11.25
22	11.25	11.29	11.57	11.76	11.60	11.90	11.76	11.51	11.50	e11.00	10.94	11.24
23	11.26	11.27	11.58	11.76	11.57	11.88	11.59	11.51	11.52	11.09	10.98	11.35
24	11.31	11.24	11.58	11.75	11.60	11.86	11.71	11.53	11.47	11.10	10.98	11.45
25	11.31	11.23	11.58	11.74	11.75	11.84	11.67	11.50	11.44	11.17	10.93	11.47
26	11.30	11.24	11.59	11.74	11.83	11.82	11.59	11.48	11.42	11.14	10.96	11.53
27	11.34	11.23	11.59	11.74	11.87	11.79	11.66	11.48	11.39	11.08	10.94	11.54
28	11.35	11.24	11.60	11.73	11.88	11.77	11.59	11.45	11.39	11.03	10.96	11.55
29	11.31	11.27	11.63	11.75	---	11.76	11.54	11.45	11.40	11.03	10.94	11.54
30	11.31	11.29	11.65	11.82	---	11.74	11.49	11.40	11.38	11.03	10.89	11.53
31	e11.28	---	11.65	11.84	---	11.73	---	11.39	---	10.99	10.95	---
MEAN	11.27	11.29	11.48	11.72	11.87	11.87	11.70	11.47	11.55	11.14	10.92	11.18
MAX	11.45	11.38	11.65	11.84	12.17	11.97	11.89	11.74	11.82	11.43	11.02	11.55
MIN	11.18	11.20	11.31	11.65	11.57	11.73	11.49	11.24	11.38	10.96	10.79	10.86

e Estimated

425212088072800 MUSKEGO (BIG MUSKEGO) LAKE, SOUTH SITE, NEAR MUSKEGO, WI

(Formerly Big Muskego Lake, South Site, near Muskego, WI)

LOCATION.--Lat 42°52'12", long 88°07'28", in NW 1/4 NW 1/4 sec.27, T.5 N., R.20 E., Waukesha County, Hydrologic Unit 07120006, near Muskego.

DRAINAGE AREA.--33.9 mi^2.

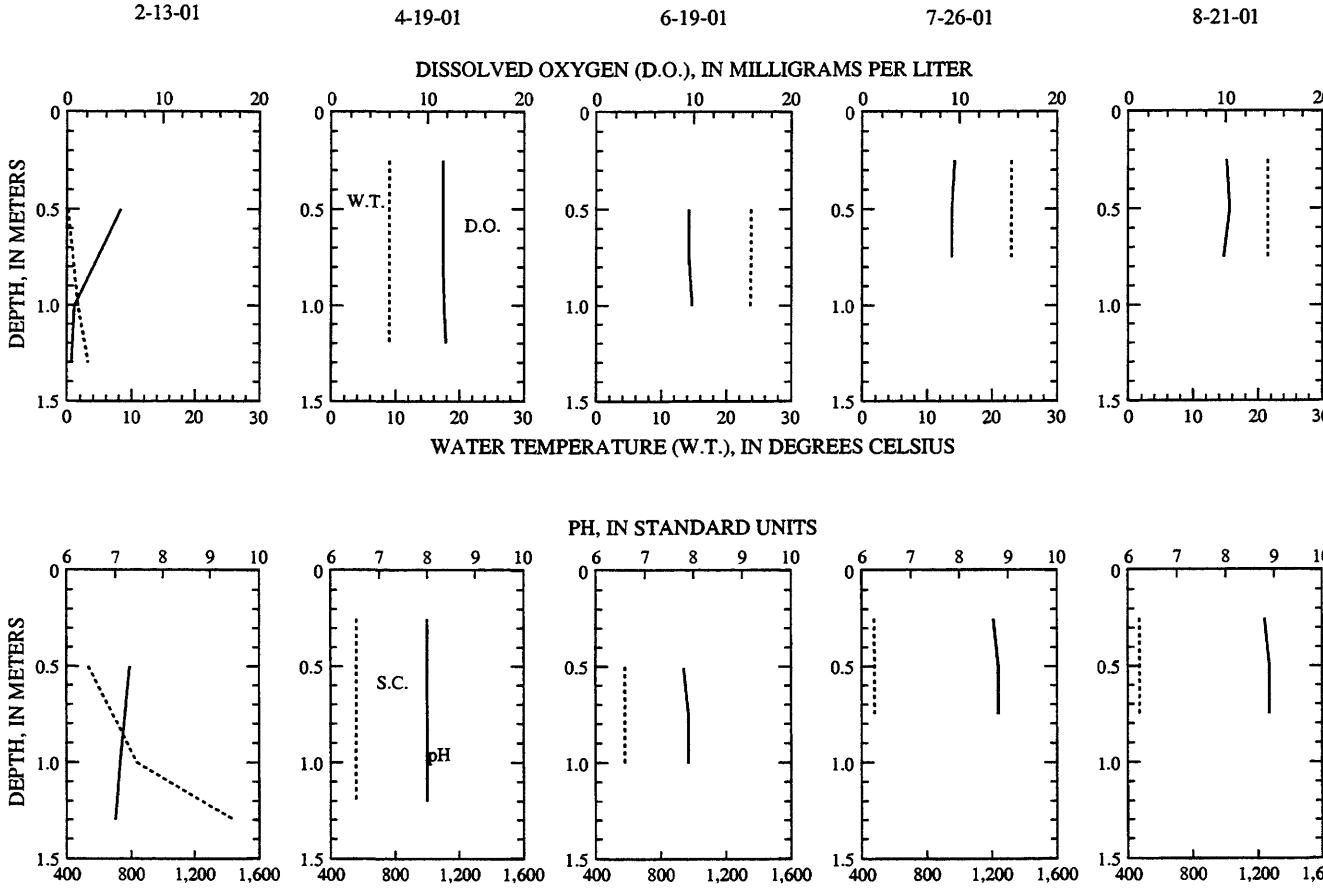
PERIOD OF RECORD.--February 1988 to current year. Prior to October 2000, published as "Big Muskego Lake".

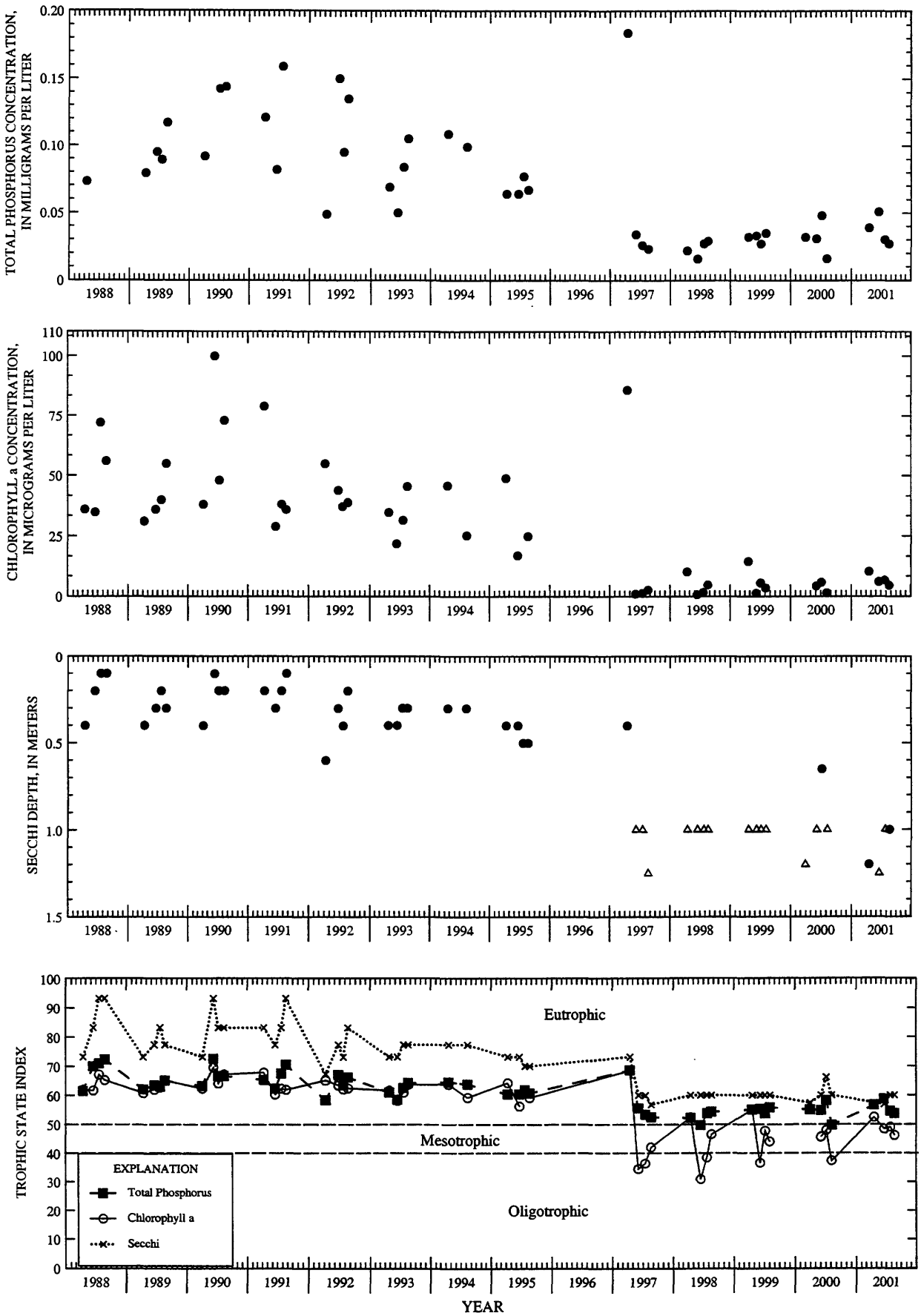
REMARKS.--Lake sampled at south end of lake at a depth of about 1 m. Lake ice-covered during February sampling. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, FEBRUARY 13 TO AUGUST 21, 2001

(Milligrams per liter unless otherwise indicated)

	Feb-13	Apr-19	Jun-19		Jul-26	Aug-21
Lake stage (ft)	12.12	11.64	11.55		11.14	10.92
Secchi-depth (m)	---	1.2	>1.25		>1	1.0
Chlorophyll a, phytoplankton (µg/L)	---	10.3	6		6.6	4.5
Depth of sample (m)	0.5	0.5	0.5	1.0	0.5	0.5
Water temperature (°C)	0.1	9.0	23.8	23.7	23.0	21.5
Specific conductance (µS/cm)	529	557	576	576	476	469
pH (units)	7.3	8.0	7.8	7.9	8.8	8.9
Dissolved oxygen (mg/L)	5.5	11.6	9.5	9.8	9.2	10.4
Phosphorus, total (as P)	0.255	0.039	0.051	0.039	0.030	0.027
Phosphorus, ortho, dissolved (as P)	---	<0.002	---	---	---	0.003
Nitrogen, NO2 + NO3, diss. (as N)	---	0.102	---	---	---	<0.010
Nitrogen, ammonia, dissolved (as N)	---	0.086	---	---	---	0.024
Nitrogen, amm. + org., total (as N)	---	1.2	---	---	---	---
Nitrogen, total (as N)	---	1.26	---	---	---	---
Color (Pt-Co. scale)	---	30	---	---	---	---
Turbidity (NTU)	---	6.1	---	---	---	---
Hardness, (as $CaCO_3$)	---	224	---	---	---	---
Calcium, dissolved (Ca)	---	55	---	---	---	---
Magnesium, dissolved (Mg)	---	21	---	---	---	---
Sodium, dissolved (Na)	---	25	---	---	---	---
Potassium, dissolved (K)	---	2.8	---	---	---	---
Alkalinity, (as $CaCO_3$)	---	185	---	---	---	---
Sulfate, dissolved (SO_4)	---	28.3	---	---	---	---
Chloride, dissolved (Cl)	---	49.3	---	---	---	---
Silica, dissolved (SiO_2)	---	1.7	---	---	---	---
Solids, dissolved, at 180°C	---	330	---	---	---	---
Iron, dissolved (Fe) µg/L	---	20	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	1.2	---	---	---	---





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Muskego (Big Muskego) Lake, South Site, near Muskego, Wisconsin.

(Triangles indicate maximum depth at sampling site. Actual Secchi depth on these days was greater than plotted triangles.)

455706089232400 MUSKELLUNGE LAKE NEAR LAKE OUTLET NEAR EAGLE RIVER, WI

LOCATION.--Lat 45°57'06", long 89°23'24", in SE 1/4 NE 1/4 sec.17, T.40 N., R.9 E., Vilas County, Hydrologic Unit 07070001, about 12 mi northwest of Eagle River.

DRAINAGE AREA.--4.49 mi^2.

PERIOD OF RECORD.--November 2000 to October 2001 (discontinued).

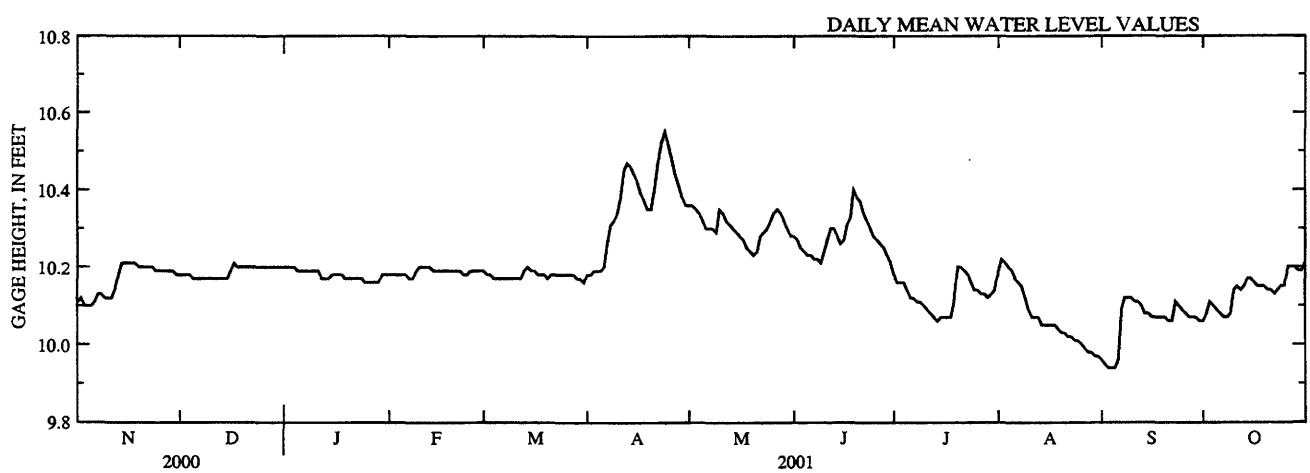
GAGE.--Water-stage recorder. Elevation of gage is about 1,612 ft above sea level.

EXTREMES FOR CURRENT YEAR.--Maximum gage height observed, 10.56 ft, Apr. 24; minimum observed, 9.93 ft, Sept. 5 and 6.

GAGE HEIGHT, FEET, YEAR NOVEMBER 2000 TO OCTOBER 2001
DAILY MEAN VALUES

DAY	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
1	10.11	e10.18	10.20	10.18	10.19	10.18	10.36	10.28	10.18	10.19	9.96	10.06
2	10.12	e10.18	10.20	10.18	10.18	10.18	10.36	10.27	10.16	10.22	9.9	08
3	10.10	e10.18	10.20	10.18	10.18	10.19	10.35	10.25	10.16	10.21	9.9	1
4	10.10	e10.18	10.20	10.18	10.17	10.19	10.34	10.24	10.16	10.20	9.9	10
5	10.10	e10.17	10.19	10.18	10.17	10.19	10.32	10.23	10.14	10.19	9.9	09
6	10.11	e10.17	10.19	10.18	10.17	10.20	10.30	10.23	10.12	10.17	9.96	10.08
7	10.13	10.17	10.19	10.17	10.17	10.26	10.30	10.22	10.12	10.16	10.09	10.07
8	10.13	10.17	10.19	10.17	10.17	10.31	10.30	10.22	10.11	10.15	10.12	10.07
9	10.12	10.17	10.19	10.19	10.17	10.32	10.29	10.21	10.11	10.12	10.12	10.08
10	10.12	10.17	10.19	10.20	10.17	10.34	10.35	10.24	10.10	10.09	10.12	10.14
11	10.12	10.17	10.19	10.20	10.17	10.38	10.34	10.27	10.09	10.07	10.11	10.15
12	10.14	10.17	10.17	10.20	10.17	10.45	10.32	10.30	10.08	10.07	10.11	10.14
13	10.18	10.17	10.17	10.20	10.19	10.47	10.31	10.30	10.07	10.07	10.10	10.15
14	10.21	10.17	10.17	10.19	10.20	10.46	10.30	10.28	10.06	10.05	10.08	10.17
15	10.21	10.17	10.18	10.19	10.19	10.44	10.29	10.26	10.07	10.05	10.08	10.17
16	10.21	10.19	10.18	10.19	10.19	10.42	10.28	10.27	10.07	10.05	10.07	10.16
17	e10.21	10.21	e10.18	10.19	10.18	10.39	10.27	10.31	10.07	10.05	10.07	10.15
18	e10.21	10.20	e10.18	10.19	10.18	10.37	10.25	10.33	10.07	10.05	10.07	10.15
19	e10.20	10.20	e10.17	10.19	10.18	10.35	10.24	10.40	10.11	10.04	10.07	10.15
20	e10.20	10.20	10.17	10.19	10.17	10.35	10.23	10.38	10.20	10.03	10.07	10.14
21	e10.20	10.20	10.17	10.19	10.18	10.40	10.24	10.37	10.20	10.03	10.06	10.14
22	e10.20	10.20	10.17	10.19	10.18	10.47	10.28	10.34	10.19	10.02	10.06	10.13
23	e10.20	10.20	10.17	10.18	10.18	10.52	10.29	10.32	10.18	10.02	10.11	10.14
24	e10.19	10.20	10.17	10.18	10.18	10.55	10.30	10.30	10.16	10.01	10.10	10.15
25	e10.19	10.20	10.16	10.19	10.18	10.52	10.32	10.28	10.14	10.01	10.09	10.15
26	e10.19	10.20	10.16	10.19	10.18	10.48	10.34	10.27	e10.14	10.00	10.08	10.20
27	e10.19	10.20	10.16	10.19	10.18	10.44	10.35	10.26	e10.13	9.99	10.07	10.20
28	e10.19	10.20	10.16	10.19	10.18	10.41	10.34	10.25	e10.13	9.98	10.07	10.20
29	e10.19	10.20	10.16	---	10.17	10.38	10.32	10.23	10.12	9.98	10.07	10.19
30	e10.18	10.20	10.18	---	10.17	10.36	10.30	10.21	10.13	9.97	10.06	10.19
31	---	10.20	10.18	---	10.16	---	10.28	---	10.14	9.97	---	10.21
MEAN	10.16	10.19	10.18	10.19	10.18	10.37	10.31	10.28	10.13	10.07	10.06	10.14
MAX	10.21	10.21	10.20	10.20	10.20	10.55	10.36	10.40	10.20	10.22	10.12	10.21
MIN	10.10	10.17	10.16	10.17	10.16	10.18	10.23	10.21	10.06	9.97	9.94	10.06

e Estimated



455700089224900 MUSKELLUNGE LAKE NEAR EAGLE RIVER, WI

LOCATION.--Lat 45°57'00", long 89°22'49", in SE 1/4 NW 1/4 sec.16, T.40 N., R.9 E., Vilas County, Hydrologic Unit 07070001, 7 mi northwest of Eagle River.

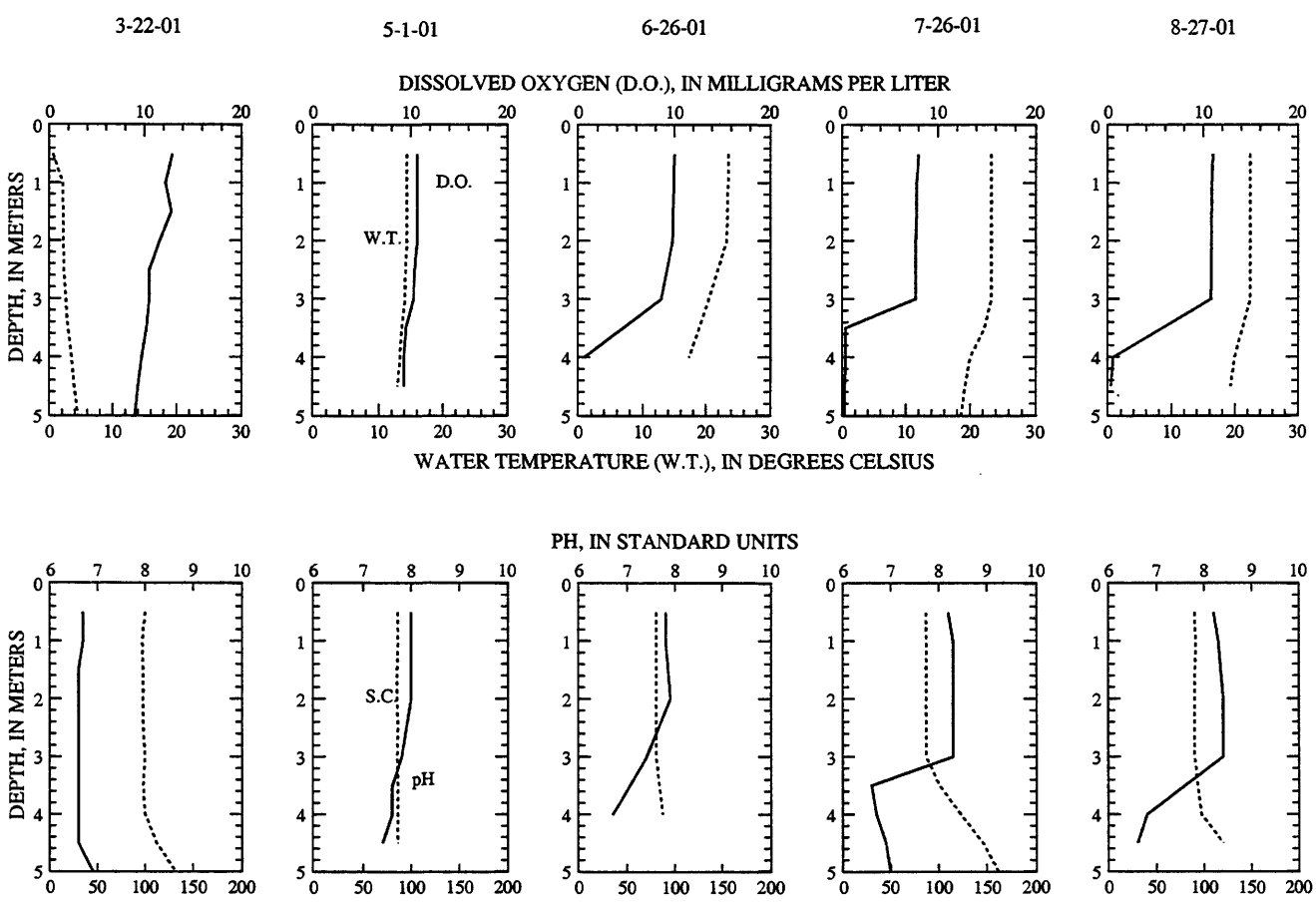
PERIOD OF RECORD.--June 2000 to August 2001 (discontinued).

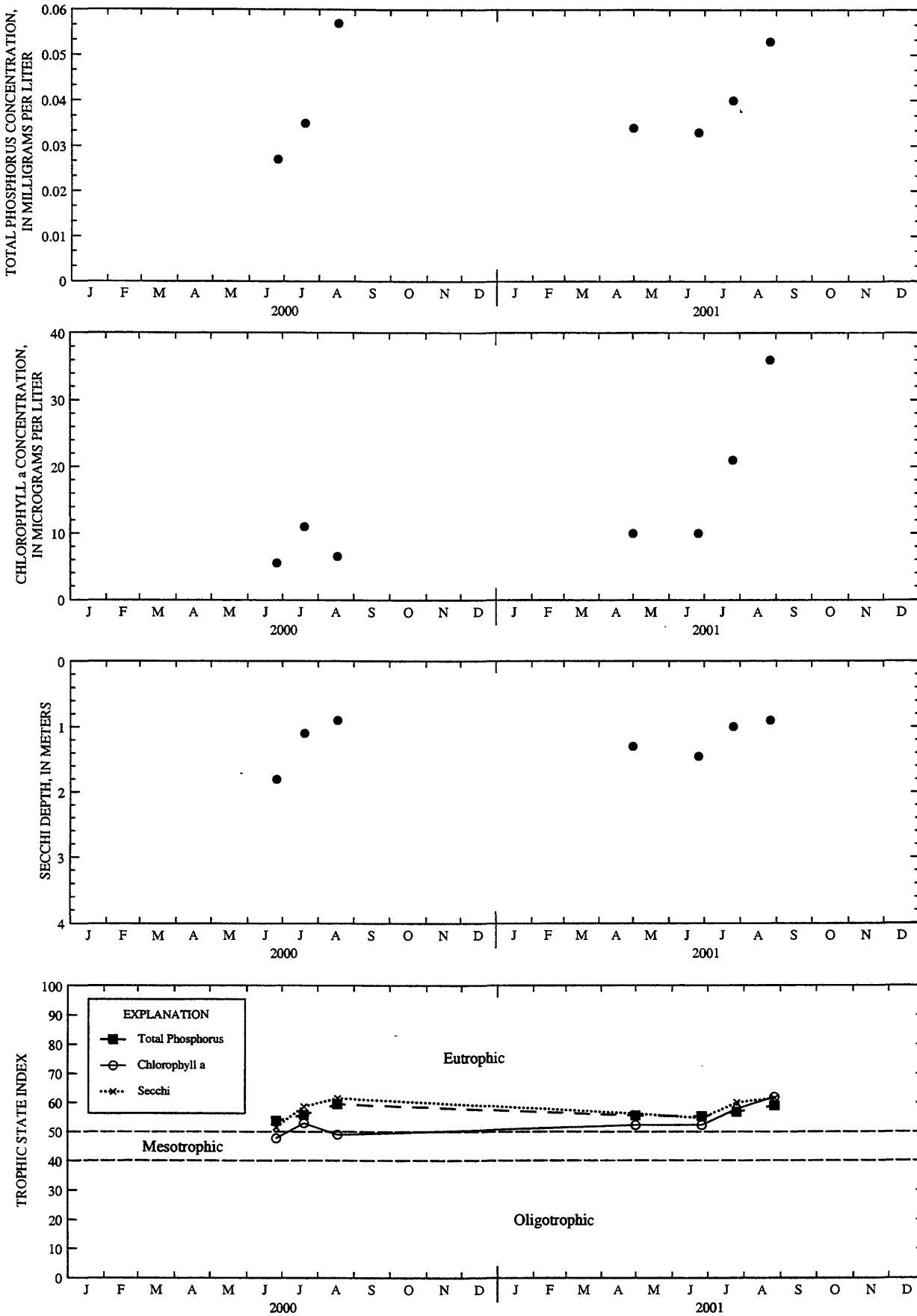
REMARKS.--Lake ice-covered during March sampling. Water-quality analyses by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, MARCH 22 TO AUGUST 27, 2001

(Milligrams per liter unless otherwise indicated)

	Mar-22		May-1		Jun-26		Jul-26		Aug-27		
Lake stage (ft)	10.18		10.36		10.27		10.14		9.98		
Secchi-depth (m)	---		1.3		1.5		1.0		0.90		
Chlorophyll a, phytoplankton (µg/L)	---		10		10		21		36		
Depth of sample (m)	0.5	4.5	0.5	4.5	0.5	4.0	0.5	4.5	0.5	4.0	4.5
Water temperature (°C)	0.5	3.9	14.4	12.9	23.6	17.3	23.3	19.2	22.4	20.0	19.3
Specific conductance (µS/cm)	100	112	86	86	80	87	87	146	90	97	120
pH (units)	6.7	6.6	8.0	7.4	7.8	6.7	8.2	6.9	8.2	6.8	6.6
Dissolved oxygen (mg/L)	12.9	9.3	10.7	9.4	10.0	0.6	8.0	0.2	11.0	0.5	0.3
Phosphorus, total (as P)	0.027	0.036	0.034	0.077	0.033	0.049	0.040	0.159	0.053	0.058	0.058
Phosphorus, ortho, dissolved (as P)	---	---	0.005	---	---	---	0.004	---	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	0.084	---	---	---	0.008	---	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	0.083	---	---	---	<0.013	---	---	---	---
Nitrogen, amm. + org., total (as N)	---	---	0.59	---	---	---	0.74	---	---	---	---
Nitrogen, total (as N)	---	---	0.674	---	---	---	0.748	---	---	---	---
Color (Pt-Co. scale)	---	---	40	---	---	---	---	---	---	---	---
Turbidity (NTU)	---	---	4.8	---	---	---	---	---	---	---	---
Hardness, (as $CaCO_3$)	---	---	38.2	---	---	---	---	---	---	---	---
Calcium, dissolved (Ca)	---	---	10	---	---	---	---	---	---	---	---
Magnesium, dissolved (Mg)	---	---	3.2	---	---	---	---	---	---	---	---
Sodium, dissolved (Na)	---	---	2.2	---	---	---	---	---	---	---	---
Potassium, dissolved (K)	---	---	0.4	---	---	---	---	---	---	---	---
Alkalinity, (as $CaCO_3$)	---	---	36	---	---	---	---	---	---	---	---
Sulfate, dissolved (SO_4)	---	---	<4.5	---	---	---	---	---	---	---	---
Chloride, dissolved (Cl)	---	---	2.7	---	---	---	---	---	---	---	---
Silica, dissolved (SiO_2)	---	---	14.6	---	---	---	---	---	---	---	---
Solids, dissolved, at 180°C	---	---	66	---	---	---	---	---	---	---	---
Iron, dissolved (Fe) µg/L	---	---	40	---	---	---	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	5.6	---	---	---	---	---	---	---	---





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Muskellunge Lake, near Eagle River, Wisconsin.

430551088273500 OCONOMOWOC LAKE NO. 1 (CENTER) AT OCONOMOWOC, WI

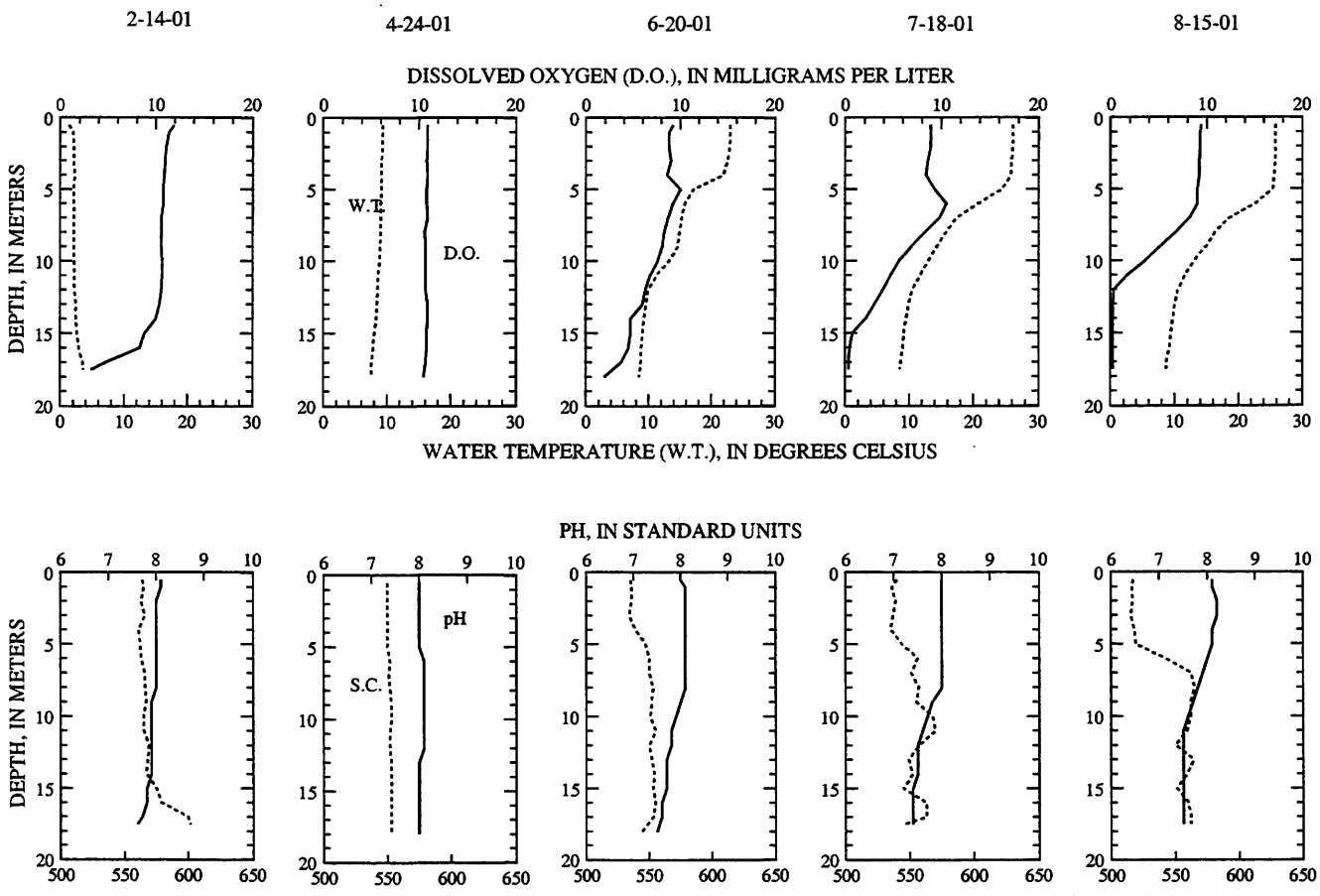
LOCATION.--Lat 43°05'51", long 88°27'35", in NW 1/4 SE 1/4 sec.2, T.7 N., R.17 E., Waukesha County, Hydrologic Unit 07090001, at Oconomowoc.

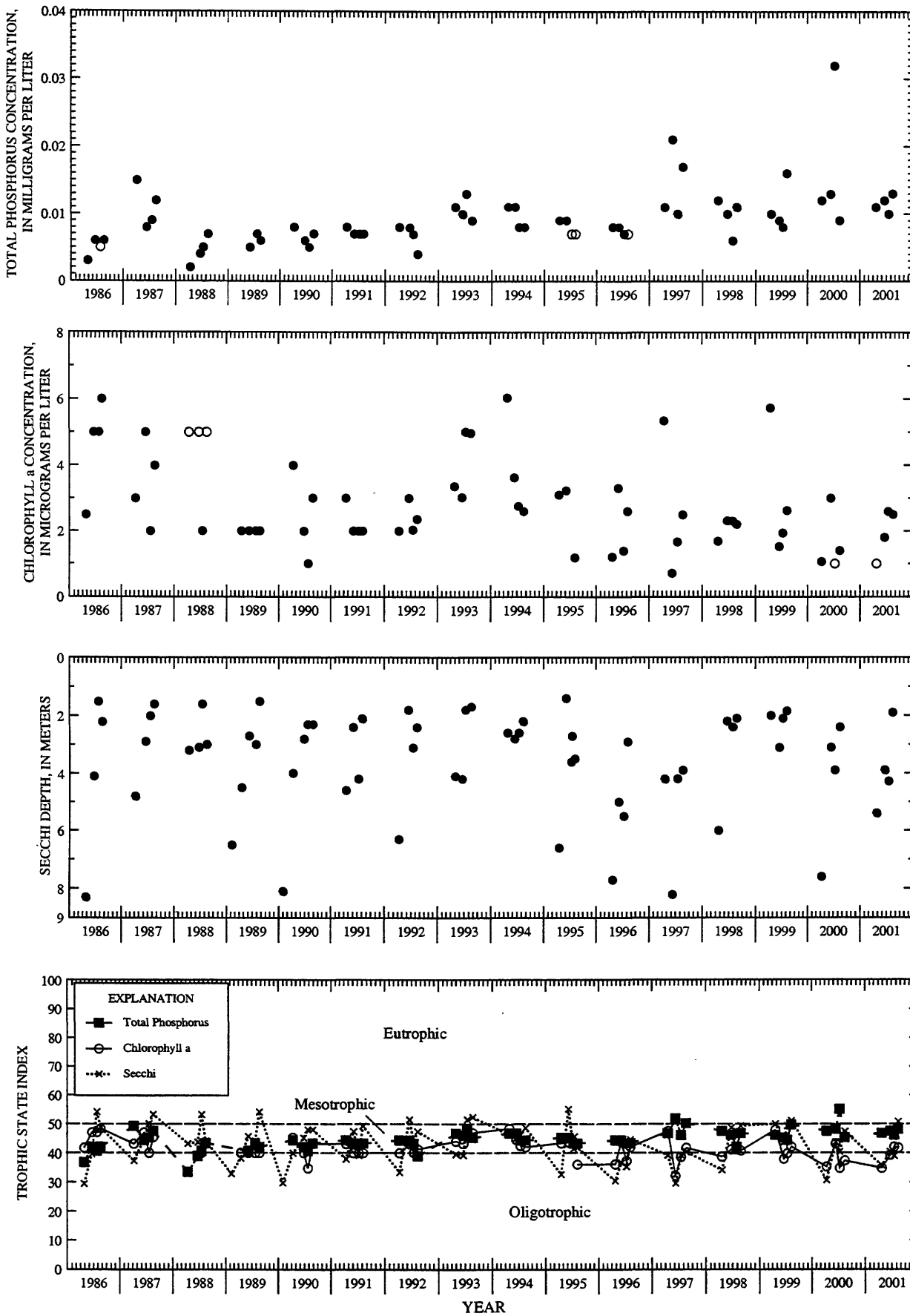
PERIOD OF RECORD.--March 1986 to current year.

REMARKS.--Lake sampled near center at the deep hole. Lake ice-covered during February sampling. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, FEBRUARY 14 TO AUGUST 15, 2001
(Milligrams per liter unless otherwise indicated)

	Feb-14		Apr-24		Jun-20		Jul-18		Aug-15		
Lake stage (ft)	---		---		8.14		8.15		8.05		
Secchi-depth (m)	---		5.4		3.9		4.3		1.9		
Chlorophyll a, phytoplankton (µg/L)	---		<1.0		1.8		2.6		2.5		
Depth of sample (m)	0.5	17.0	0.5	18.0	0.5	18.0	0.5	17.5	0.5	12.0	17.5
Water temperature (°C)	1.3	3.6	9.3	7.5	23.0	8.5	26.1	8.6	25.8	10.5	8.7
Specific conductance (µS/cm)	564	602	550	553	535	544	540	546	517	550	562
pH (units)	8.1	7.6	8.0	8.0	8.0	7.5	8.0	7.4	8.1	7.5	7.5
Dissolved oxygen (mg/L)	11.9	3.2	10.9	10.5	9.2	1.9	8.9	0.3	9.4	0.3	0.2
Phosphorus, total (as P)	<0.005	0.018	0.011	0.009	0.012	0.033	0.010	0.040	0.013	0.046	0.029
Phosphorus, ortho, dissolved (as P)	---	---	0.002	---	---	---	---	---	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	0.37	---	---	---	---	---	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	0.027	---	---	---	---	---	---	---	---
Nitrogen, amm. + org., total (as N)	---	---	0.49	---	---	---	---	---	---	---	---
Nitrogen, total (as N)	---	---	0.86	---	---	---	---	---	---	---	---
Color (Pt-Co. scale)	---	---	15	---	---	---	---	---	---	---	---
Turbidity (NTU)	---	---	1.2	---	---	---	---	---	---	---	---
Hardness, (as $CaCO_3$)	---	---	257	---	---	---	---	---	---	---	---
Calcium, dissolved (Ca)	---	---	50	---	---	---	---	---	---	---	---
Magnesium, dissolved (Mg)	---	---	32	---	---	---	---	---	---	---	---
Sodium, dissolved (Na)	---	---	16	---	---	---	---	---	---	---	---
Potassium, dissolved (K)	---	---	1.6	---	---	---	---	---	---	---	---
Alkalinity, (as $CaCO_3$)	---	---	213	---	---	---	---	---	---	---	---
Sulfate, dissolved (SO_4)	---	---	25.3	---	---	---	---	---	---	---	---
Chloride, dissolved (Cl)	---	---	36.4	---	---	---	---	---	---	---	---
Silica, dissolved (SiO_2)	---	---	5.2	---	---	---	---	---	---	---	---
Solids, dissolved, at 180°C	---	---	320	---	---	---	---	---	---	---	---
Iron, dissolved (Fe) µg/L	---	---	<10	---	---	---	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	<0.4	---	---	---	---	---	---	---	---





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Oconomowoc Lake, Center Site, at Oconomowoc, Wisconsin.

(Circles on the first three plots indicate laboratory detection limit for selected analyses. Actual concentrations for these particular analyses are less than the plotted circles.)

430609088262200 OCONOMOWOC LAKE NO. 2 (OFF HEWITT POINT) AT OCONOMOWOC, WI

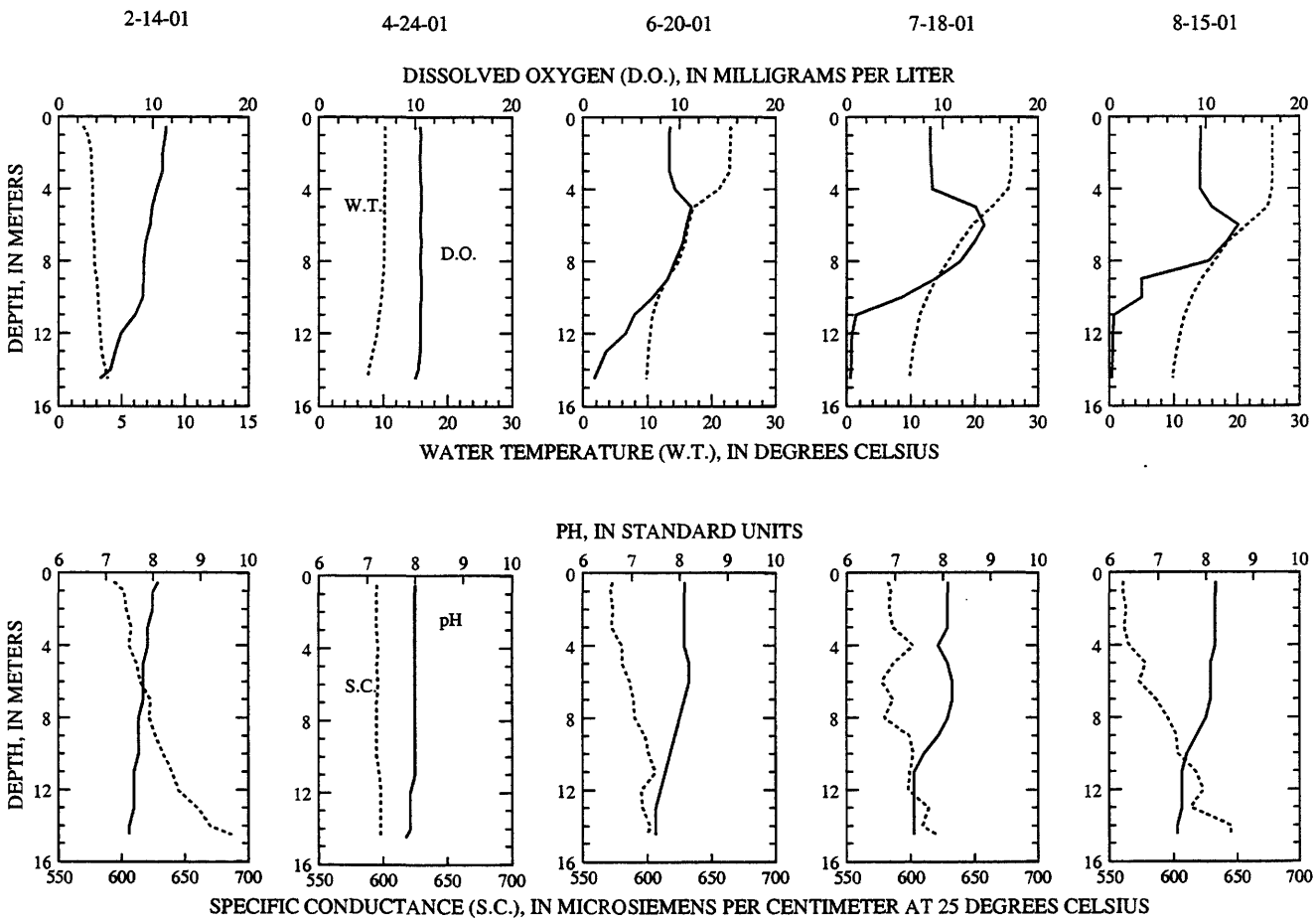
LOCATION.--Lat 43°06'09", long 88°26'22", in NW 1/4 NW 1/4 sec.1, T.7 N., R.17 E., Waukesha County, Hydrologic Unit 07090001, at Oconomowoc.

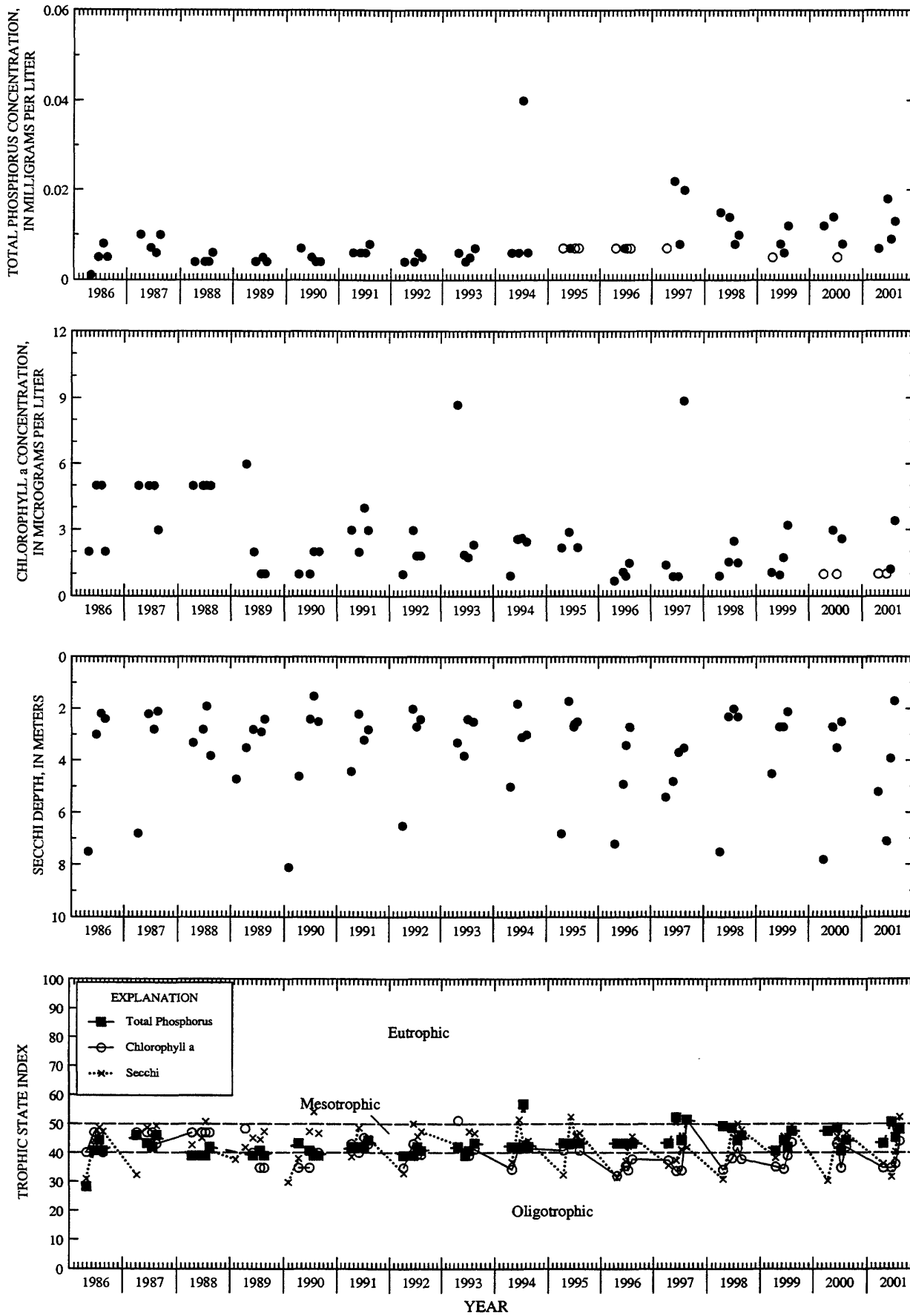
PERIOD OF RECORD.--March 1986 to current year.

REMARKS.--Lake sampled at the deepest point in northeast bay near Hewitt Point. Lake ice-covered during February sampling. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, FEBRUARY 14 TO AUGUST 15, 2001
(Milligrams per liter unless otherwise indicated)

	Feb-14		Apr-24		Jun-20		Jul-18		Aug-15		
Lake stage (ft)	---		---		8.14		8.15		8.05		
Secchi-depth (m)	---		5.2		7.1		3.9		1.70		
Chlorophyll a, phytoplankton (µg/L)	---		---		---		1.2		3.4		
Depth of sample (m)	0.5	14.0	0.5	14.0	0.5	14.5	0.5	14.5	0.5	11.0	14.5
Water temperature (°C)	1.9	3.9	10.3	7.6	23.0	9.8	25.9	9.8	25.7	11.7	9.8
Specific conductance (µS/cm)	594	687	595	598	572	600	582	621	560	617	645
pH (units)	8.1	7.5	8.0	7.8	8.1	7.5	8.1	7.4	8.2	7.5	7.4
Dissolved oxygen (mg/L)	11.4	4.4	10.5	10.0	9.0	1.1	8.7	0.3	9.5	0.4	0.2
Phosphorus, total (as P)	0.009	0.012	---	0.012	0.010	0.018	0.009	0.097	0.013	0.028	0.046





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Oconomowoc Lake, Hewitt Point, at Oconononomowoc, Wisconsin.

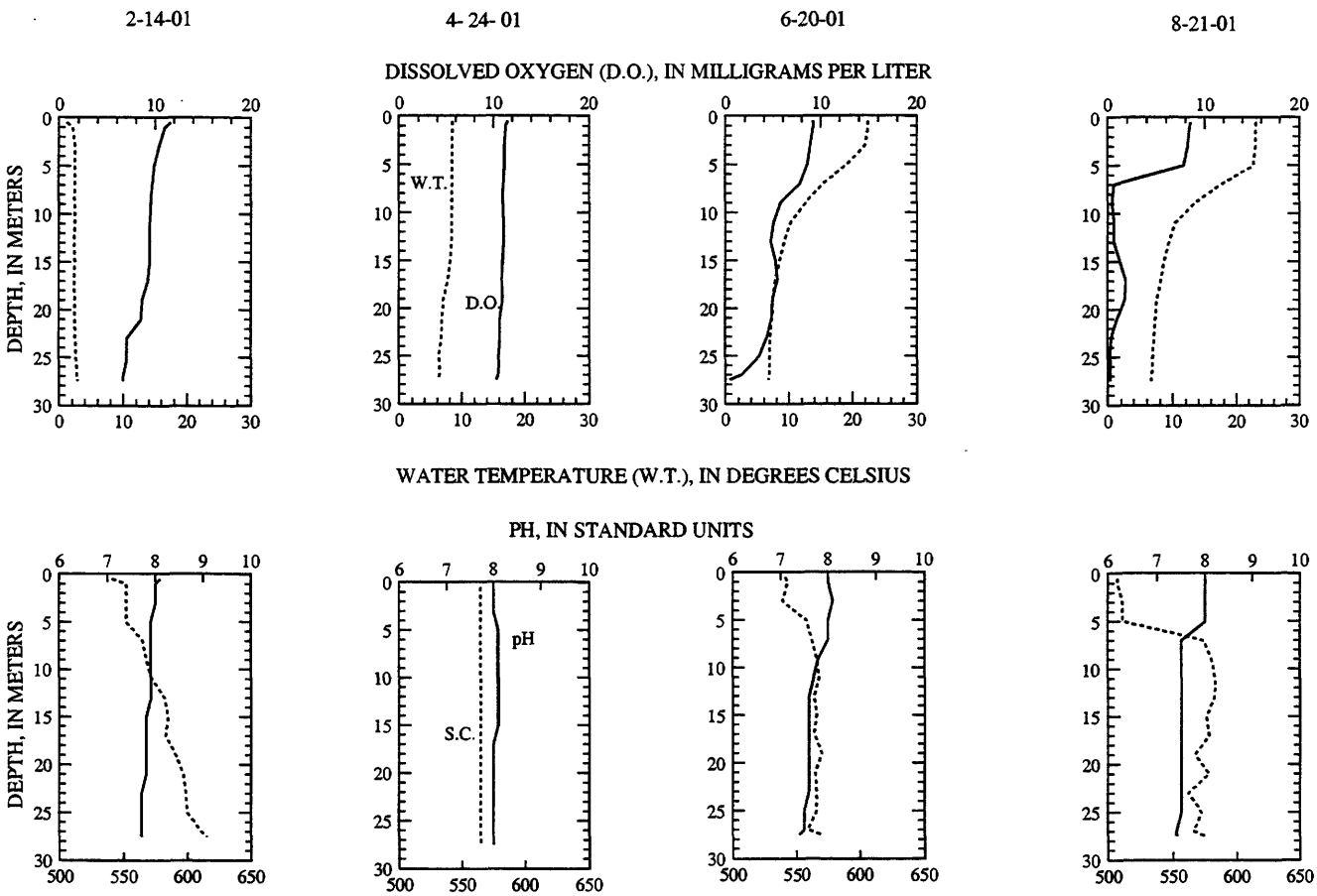
(Circles on the first three plots indicate laboratory detection limit for selected analyses. Actual concentrations for these particular analyses are less than the plotted circles.)

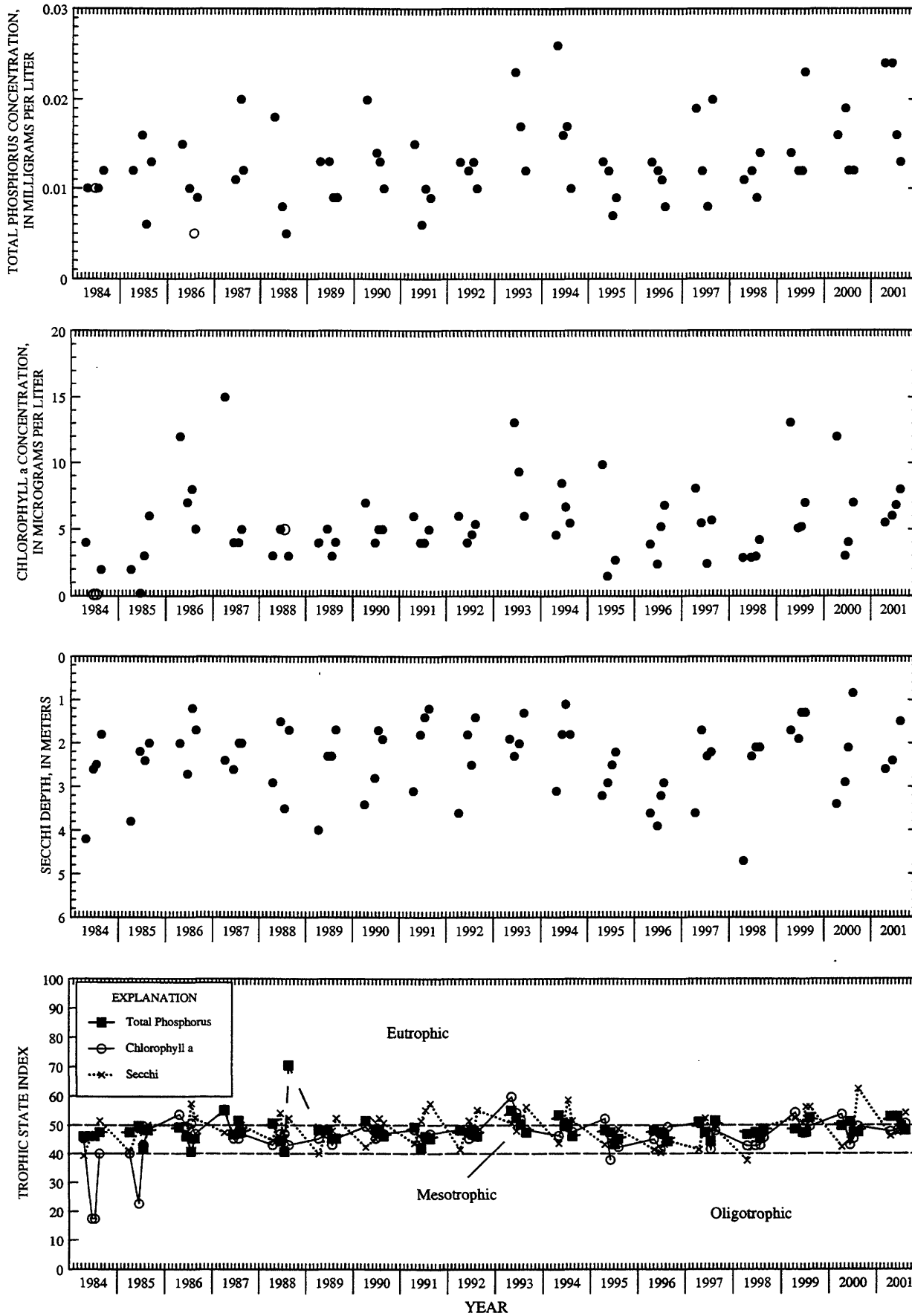
430723088252100 OKAUCHEE LAKE AT OKAUCHEE, WI

LOCATION.--Lat 43°07'23", long 88°25'21", in SE 1/4 SE 1/4, sec.25, T.8 N., R.17 E., Waukesha County, Hydrologic Unit 07090001, at Okauchee.
DRAINAGE AREA.--80.7 mi^2.
PERIOD OF RECORD.--February 1984 to current year.
LAKE-STAGE GAGE.--Datum of gage is 869.00 ft above sea level.
REMARKS.--Lake sampled near center at the deep hole. Lake ice-covered during February sampling. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, FEBRUARY 14 TO AUGUST 21, 2001
(Milligrams per liter unless otherwise indicatedd

	Feb-14		Apr-24		Jun-20		Jul-20		Aug-21		
Lake stage (ft)	---		3.76		3.90		---		3.81		
Secchi-depth (m)	---		2.6		2.4		---		1.5		
Chlorophyll a, phytoplankton (µg/L)	---		5.5		6		6.8		8		
Depth of sample (m)	0.5	27.0	0.5	27.0	0.5	27.5	0.5	27.0	0.5	7.0	27.5
Water temperature (°C)	1.2	2.8	8.5	6.2	22.4	6.7	---	---	23.2	17.4	6.6
Specific conductance (µS/cm)	541	615	565	565	541	570	---	---	507	574	575
pH (units)	8.1	7.7	8.0	8.0	8.0	7.4	---	---	8.0	7.5	7.4
Dissolved oxygen (mg/L)	11.6	6.6	11.3	10.3	9.2	0.4	---	---	8.5	0.6	0.2
Phosphorus, total (as P)	0.015	0.014	0.024	0.041	0.024	0.024	0.016	0.092	0.013	0.015	0.103
Phosphorus, ortho, dissolved (as P)	---	---	0.002	---	---	---	---	---	0.003	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	0.618	---	---	---	---	---	0.051	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	<0.013	---	---	---	---	---	0.023	---	---
Nitrogen, amm. + org., total (as N)	---	---	0.59	---	---	---	---	---	---	---	---
Nitrogen, total (as N)	---	---	1.21	---	---	---	---	---	---	---	---
Color (Pt-Co. scale)	---	---	20	---	---	---	---	---	---	---	---
Turbidity (NTU)	---	---	2.7	---	---	---	---	---	---	---	---
Hardness, (as $CaCO_3$)	---	---	278	---	---	---	---	---	---	---	---
Calcium, dissolved (Ca)	---	---	57	---	---	---	---	---	---	---	---
Magnesium, dissolved (Mg)	---	---	33	---	---	---	---	---	---	---	---
Sodium, dissolved (Na)	---	---	14	---	---	---	---	---	---	---	---
Potassium, dissolved (K)	---	---	1.8	---	---	---	---	---	---	---	---
Alkalinity, (as $CaCO_3$)	---	---	230	---	---	---	---	---	---	---	---
Sulfate, dissolved (SO_4)	---	---	24.6	---	---	---	---	---	---	---	---
Chloride, dissolved (Cl)	---	---	32.3	---	---	---	---	---	---	---	---
Silica, dissolved (SiO_2)	---	---	3.8	---	---	---	---	---	---	---	---
Solids, dissolved, at 180°C	---	---	338	---	---	---	---	---	---	---	---
Iron, dissolved (Fe) µg/L	---	---	<10	---	---	---	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	<0.4	---	---	---	---	---	---	---	---





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Okauchee Lake, near Okauchee, Wisconsin.

(Circles on the first three plots indicate laboratory detection limit for selected analyses. Actual concentrations for these particular analyses are less than the plotted circles.)

430759088244200 OKAUCHEE LAKE, NO. 1, NEAR OKAUCHEE, WI

LOCATION.--Lat 43°07'59", long 88°24'42", in NE 1/4 NW 1/4 sec.30, T.8 N., R.18 E., Waukesha County, Hydrologic Unit 07090001, near Okauchee.

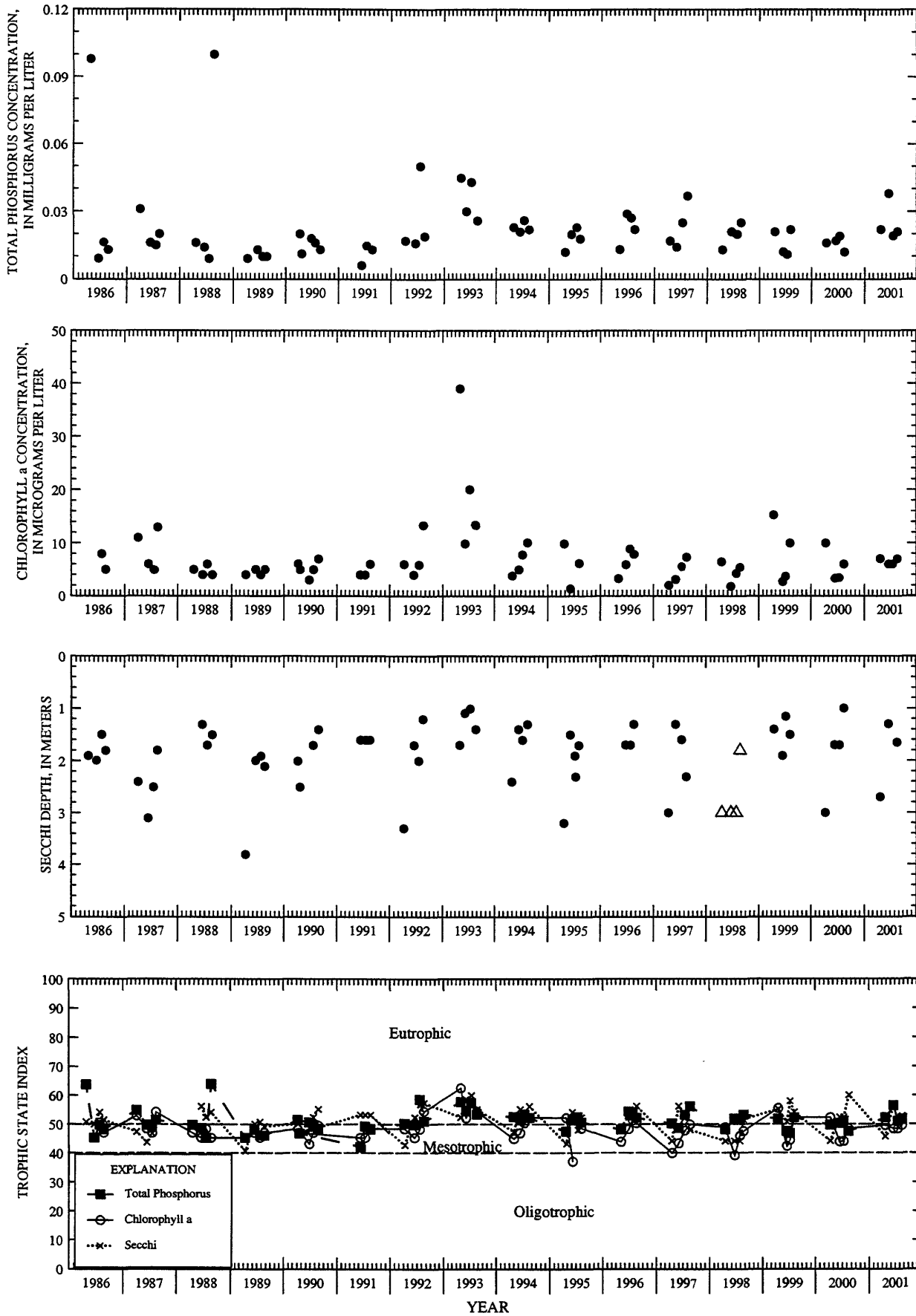
PERIOD OF RECORD.--April 1986 to current year.

LAKE-STAGE GAGE.--Datum of gage is 869.00 ft above sea level.

REMARKS.--Lake sampled in Crane's Nest Bay, in the northeast part of the lake, at an approximate depth of 2 m. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, APRIL 24 TO AUGUST 21, 2001
(Milligrams per liter unless otherwise indicated)

	Apr-24	Jun-20	Jul-20	Aug-21
Lake stage (ft)	3.76	3.90	---	3.81
Secchi-depth (m)	2.7	1.3	---	1.7
Chlorophyll a, phytoplankton (µg/L)	7	6	6	7
Depth of sample (m)	0.5	0.5	0.5	0.5
Water temperature (°C)	8.6	21.9	---	23.3
Specific conductance (µS/cm)	566	576	---	525
pH (units)	8.1	8.0	---	8.2
Dissolved oxygen (mg/L)	11.6	8.4	---	8.8
Phosphorus, total (as P)	0.022	0.038	0.019	0.021



Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Okauchee Lake, No. 1, near Okauchee, Wisconsin.

(Circles on the first three plots indicate laboratory detection limit for selected analyses. Actual concentrations for these particular analyses are less than the plotted circles.)

430645088264500 OKAUCHEE LAKE, NO. 2, AT OKAUCHEE, WI

LOCATION.--Lat 43°06'45", long 88°26'45", in SE 1/4 NE 1/4 sec.35, T.8 N., R.17 E., Waukesha County, Hydrologic Unit 07090001, at Okauchee.

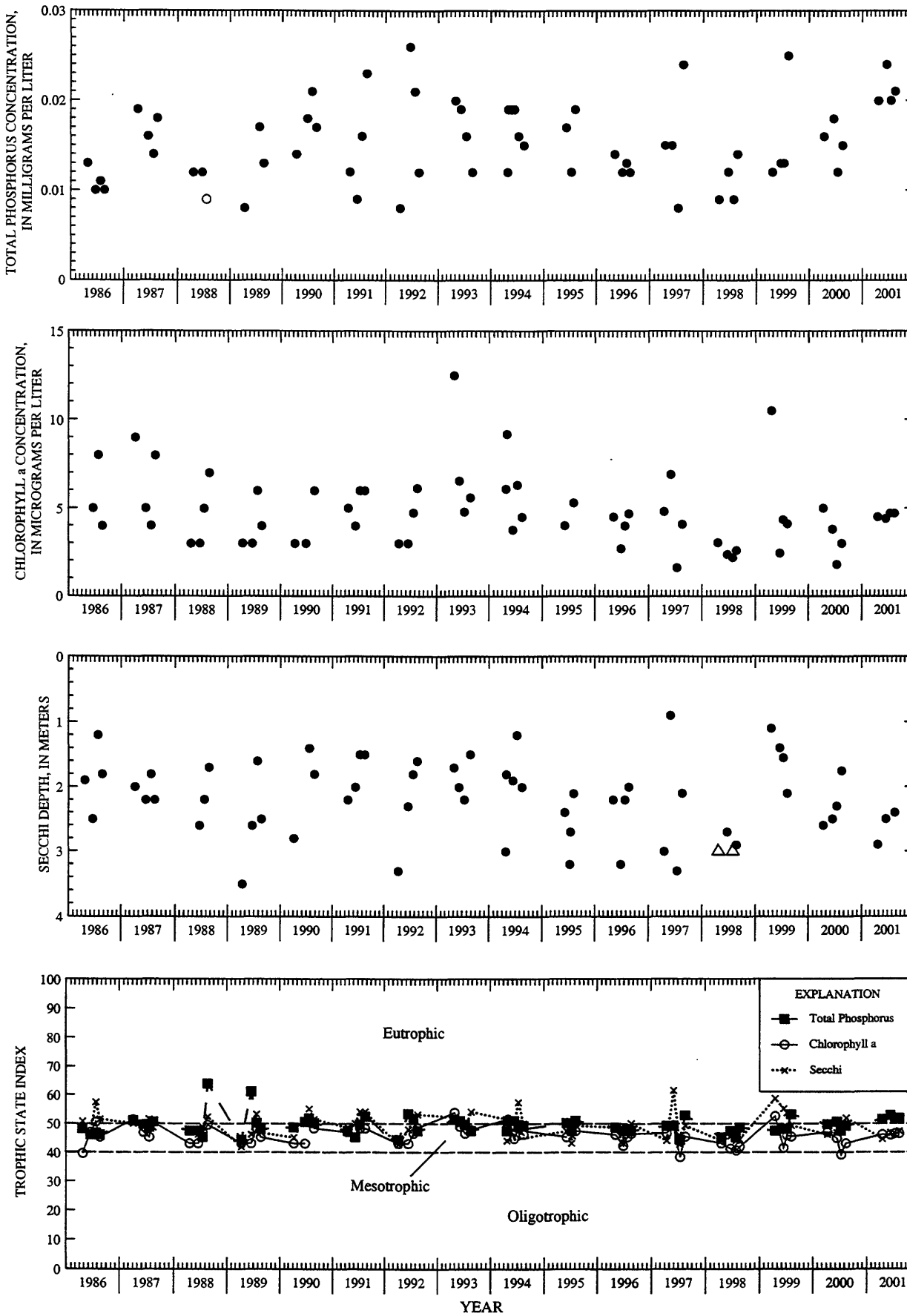
PERIOD OF RECORD.--April 1986 to current year.

LAKE-STAGE GAGE.--Datum of gage is 869.00 ft above sea level.

REMARKS.--Lake sampled in Lower Okauchee Lake, at an approximate depth of 5 m. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, APRIL 24 TO AUGUST 21, 2001
(Milligrams per liter unless otherwise indicated)

	Apr-24	Jun-20	Jul-20	Aug-21
Lake stage (ft)	3.76	3.90	---	3.81
Secchi-depth (m)	2.6	2.5	---	2.4
Chlorophyll a, phytoplankton (µg/L)	4.5	4.4	4.7	4.7
Depth of sample (m)	0.5	0.5	0.5	0.5
Water temperature (°C)	11.0	23.7	---	23.9
Specific conductance (µS/cm)	562	530	---	474
pH (units)	8.2	8.1	---	8.3
Dissolved oxygen (mg/L)	10.4	8.9	---	9.8
Phosphorus, total (as P)	0.020	0.024	0.020	0.021



Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Okauchee Lake, No. 2, near Okauchee, Wisconsin.

(Circles on the first three plots indicate laboratory detection limit for selected analyses. Actual concentrations for these particular analyses are less than the plotted circles. Triangles Indicate maximum depth at sampling site. Actual secchi depth on these days was greater than plotted triangles.)

430642088252400 OKAUCHEE LAKE, NO. 3, AT OKAUCHEE, WI

LOCATION.--Lat 43°06'42", long 88°25'24", in NE 1/4 SE 1/4 sec.36, T.8 N., R.17 E., Waukesha County, Hydrologic Unit 07090001, at Okauchee.

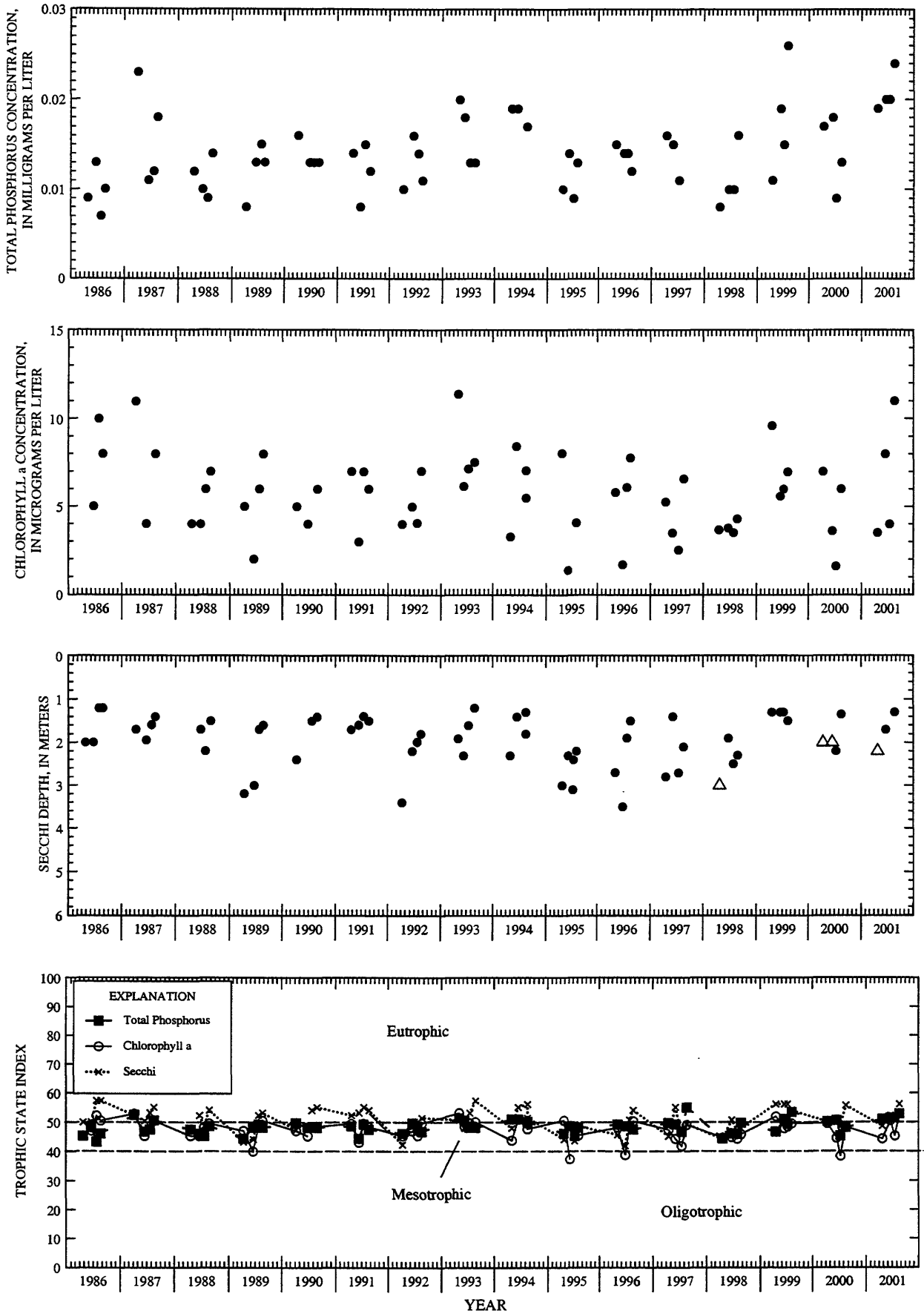
PERIOD OF RECORD.--April 1986 to current year.

LAKE-STAGE GAGE.--Datum of gage is 869.00 ft above sea level.

REMARKS.--Lake sampled in Ice House Bay, in the southern part of the lake, at an approximate depth of 4 m. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, APRIL 24 TO AUGUST 21, 2001
(Milligrams per liter unless otherwise indicated)

	Apr-24	Jun-20	Jul-20	Aug-21
Lake stage (ft)	3.76	3.90	---	3.81
Secchi-depth (m)	2.2	1.7	---	1.3
Chlorophyll a, phytoplankton (µg/L)	3.5	8	4	11
Depth of sample (m)	0.5	0.5	0.5	0.5
Water temperature (°C)	9.8	23.4	---	23.3
Specific conductance (µS/cm)	562	521	---	485
pH (units)	8.2	8.2	---	8.3
Dissolved oxygen (mg/L)	11.1	10.3	---	9.5
Phosphorus, total (as P)	0.019	0.020	0.020	0.024



Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Okauchee Lake, No. 3, near Okauchee, Wisconsin.

(Triangles indicate maximum depth at sampling site. Actual Secchi depth on these days was greater thank the plotted triangles.)

430757088261700 OKAUCHEE LAKE, NO. 4, AT OKAUCHEE, WI

LOCATION.--Lat 43°07'57", long 88°26'17", in NW 1/4 NW 1/4 sec.25, T.8 N., R.17 E., Waukesha County, Hydrologic Unit 07090001, at Okauchee.

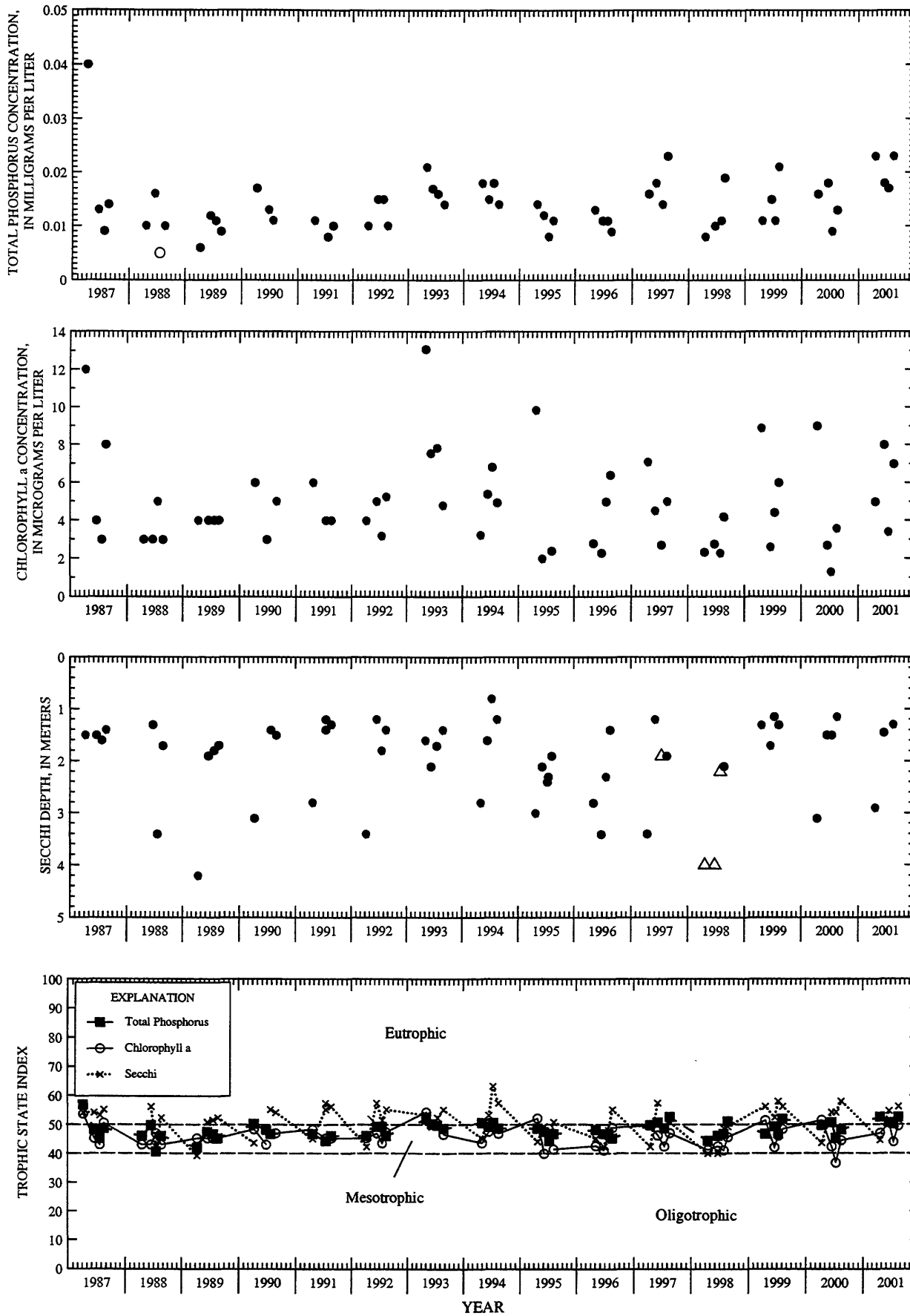
PERIOD OF RECORD.--June 1986 to current year.

LAKE-STAGE GAGE.--Datum of gage is 869.00 ft above sea level.

REMARKS.--Lake sampled near McDowell (Crazyman's) Island, in the northwest bay of the lake, at an approximate depth of 2 m. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, APRIL 24 TO AUGUST 21, 2001
(Milligrams per liter unless otherwise indicated)

	Apr-24	Jun-20	Jul-20	Aug-21
Lake stage (ft)	3.76	3.90	---	3.81
Secchi-depth (m)	2.9	1.5	---	1.3
Chlorophyll a, phytoplankton (µg/L)	5	8	3.4	7
Depth of sample (m)	0.5	0.5	0.5	0.5
Water temperature (°C)	8.7	23.2	---	23.4
Specific conductance (µS/cm)	564	510	---	496
pH (units)	8.1	8.2	---	8.2
Dissolved oxygen (mg/L)	11.4	10.7	---	9.7
Phosphorus, total (as P)	0.023	0.018	0.017	0.023



Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Okauchee Lake, No. 4, near Okauchee, Wisconsin.

(Circles on the first three plots indicate laboratory detection limit for selected analyses. Actual concentrations for these particular analyses are less than the plotted circles. Triangles indicate maximum depth at sampling site. Actual Secchi depth on these days was greater than the plotted triangles.)

424905088204000 POTTER LAKE NEAR MUKWONAGO, WI

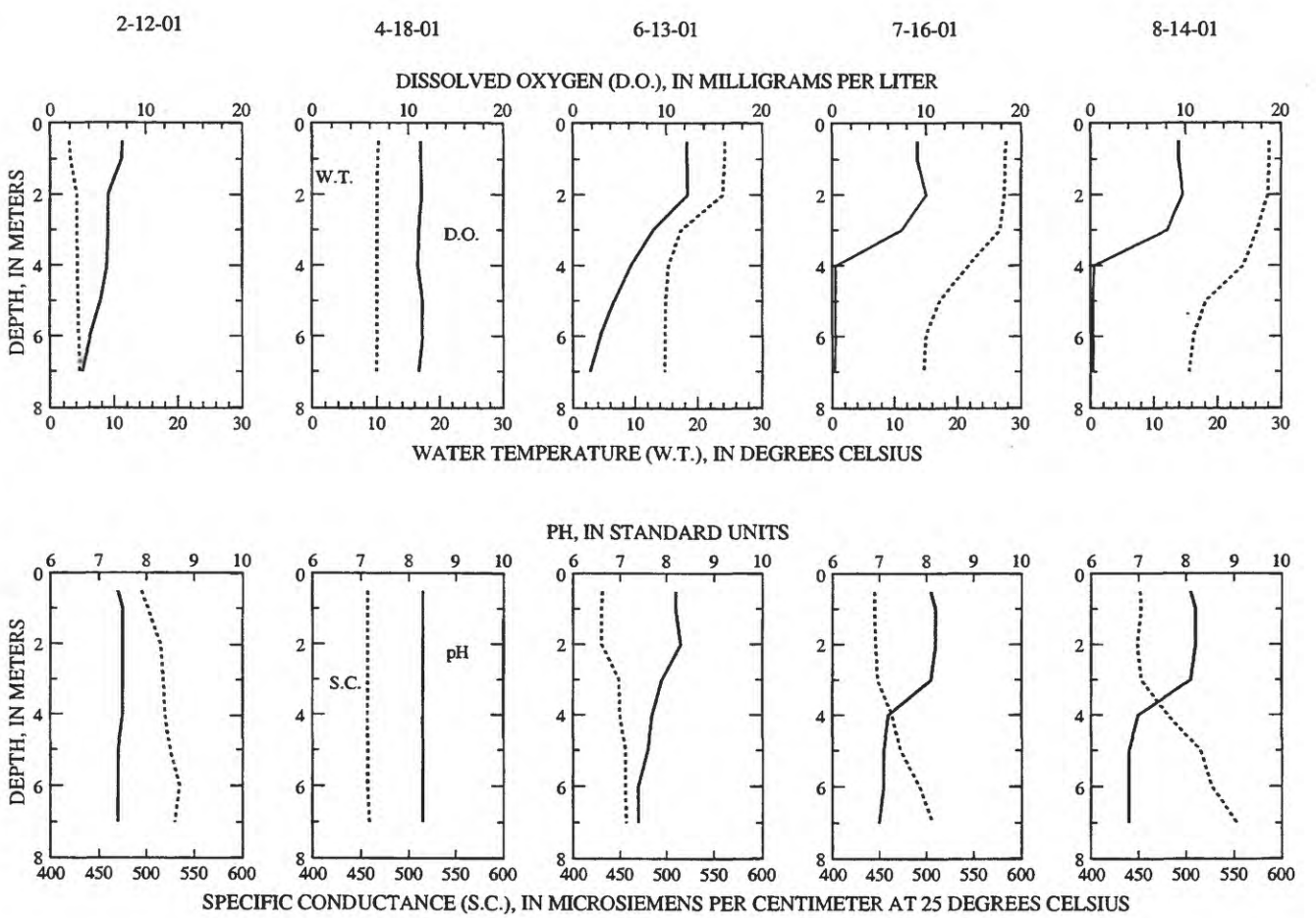
OCATION.--Lat 42°49'05", long 88°20'40", in NW 1/4 SW 1/4 sec.11, T.4 N., R.18 E., Walworth County, Hydrologic Unit 07120006, 3.3 mi south of Mukwonago.

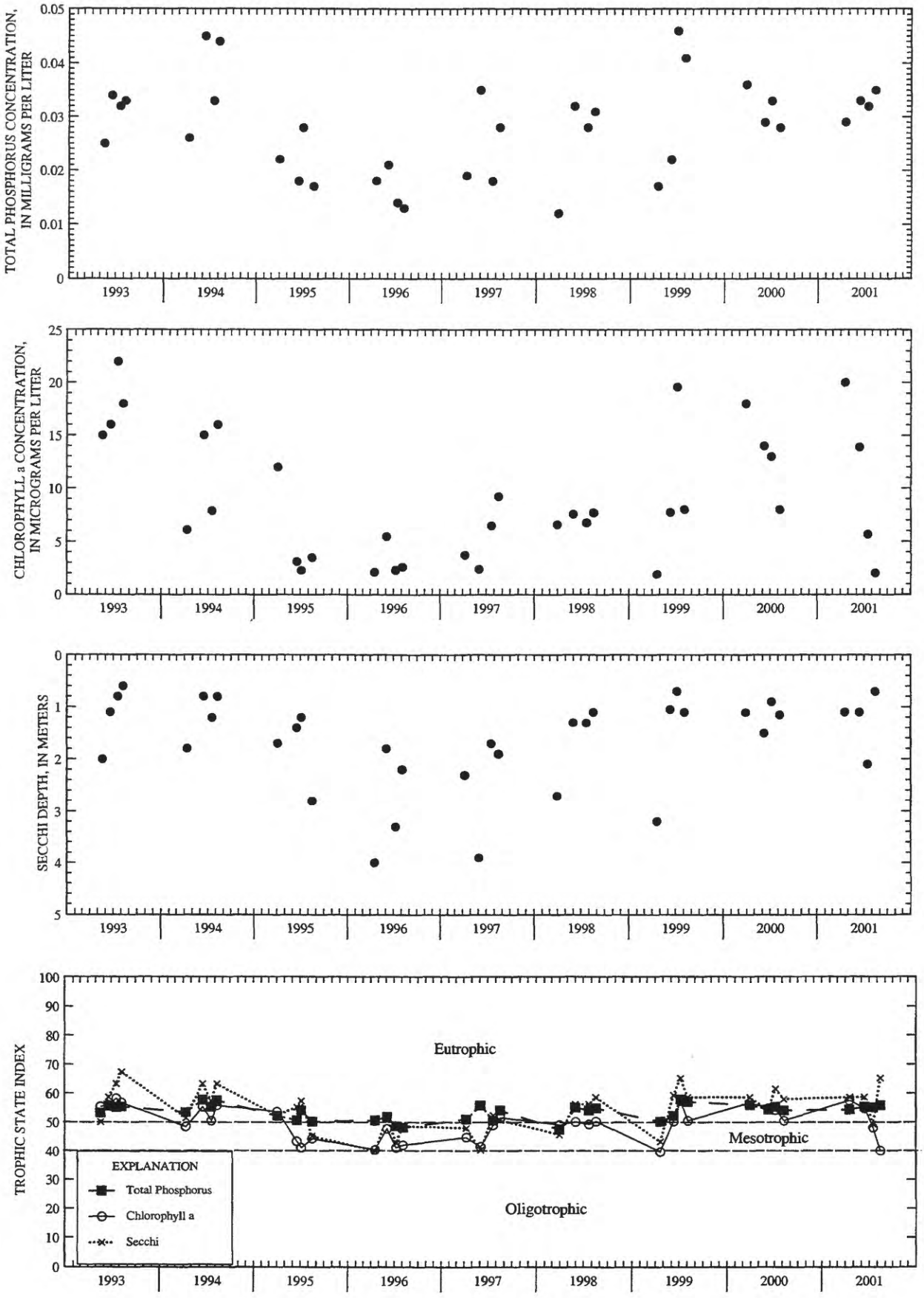
RIOD OF RECORD.--February 1993 to current year.

EMARKS.--Lake sampled at the deep hole. Lake ice-covered during February sampling. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, FEBRUARY 12 TO AUGUST 14, 2001
(Milligrams per liter unless otherwise indicated)

	Feb-12		Apr-18		Jun-13		Jul-16		Aug-14		
ke stage (ft)	8.16		8.54		8.58		---		---		
cchi-depth (m)	---		1.1		1.1		0.7		0.7		
lorophyll a, phytoplankton (µg/L)	---		20		13.9		5.7		2		
pth of sample (m)	0.5	7.0	0.5	7.0	0.5	7.0	0.5	7.0	0.5	4.0	7.0
ter temperature (°C)	2.9	4.5	10.3	10.0	24.2	14.8	27.7	14.7	28.2	24.1	15.6
ecific conductance (µS/cm)	495	530	457	459	431	457	445	507	452	481	553
(units)	7.4	7.4	8.3	8.3	8.2	7.7	8.1	7.0	8.1	7.0	6.8
ssolved oxygen (mg/L)	7.5	3.3	11.3	11.1	12.2	1.8	9.1	0.2	9.3	0.3	0.2
osphorus, total (as P)	0.016	0.029	0.029	0.025	0.033	0.052	0.032	0.064	0.035	0.046	0.069
osphorus, ortho, dissolved (as P)	---	---	0.01	---	---	---	---	---	0.019	---	---
trogen, NO2 + NO3, diss. (as N)	---	---	0.115	---	---	---	---	---	0.012	---	---
trogen, ammonia, dissolved (as N)	---	---	0.177	---	---	---	---	---	0.022	---	---
trogen, amm. + org., total (as N)	---	---	1.3	---	---	---	---	---	---	---	---
trogen, total (as N)	---	---	1.44	---	---	---	---	---	---	---	---
lor (Pt-Co. scale)	---	---	15	---	---	---	---	---	---	---	---
rbidity (NTU)	---	---	4.1	---	---	---	---	---	---	---	---
rdness, (as $CaCO_3$)	---	---	182	---	---	---	---	---	---	---	---
lcium, dissolved (Ca)	---	---	40	---	---	---	---	---	---	---	---
gnesium, dissolved (Mg)	---	---	20	---	---	---	---	---	---	---	---
dium, dissolved (Na)	---	---	20	---	---	---	---	---	---	---	---
tassium, dissolved (K)	---	---	2.1	---	---	---	---	---	---	---	---
talinity, (as $CaCO_3$)	---	---	158	---	---	---	---	---	---	---	---
fate, dissolved (SO_4)	---	---	<4.5	---	---	---	---	---	---	---	---
loride, dissolved (Cl)	---	---	44.9	---	---	---	---	---	---	---	---
lica, dissolved (SiO_2)	---	---	1.5	---	---	---	---	---	---	---	---
lids, dissolved, at 180°C	---	---	264	---	---	---	---	---	---	---	---
on, dissolved (Fe) µg/L	---	---	<10	---	---	---	---	---	---	---	---
nganese, dissolved (Mn) µg/L	---	---	<0.4	---	---	---	---	---	---	---	---





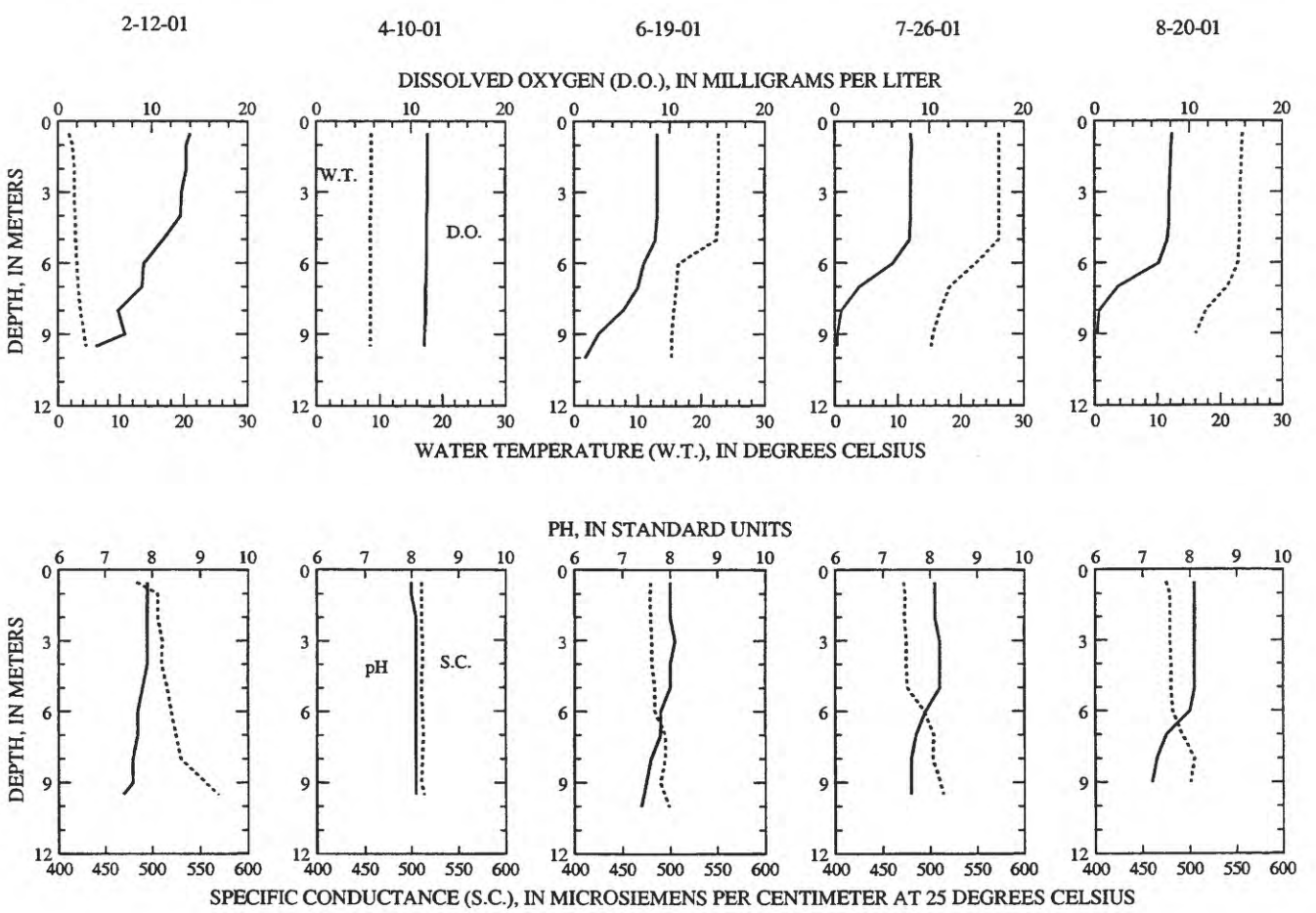
Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Potter Lake near Mukwonago, Wisconsin.

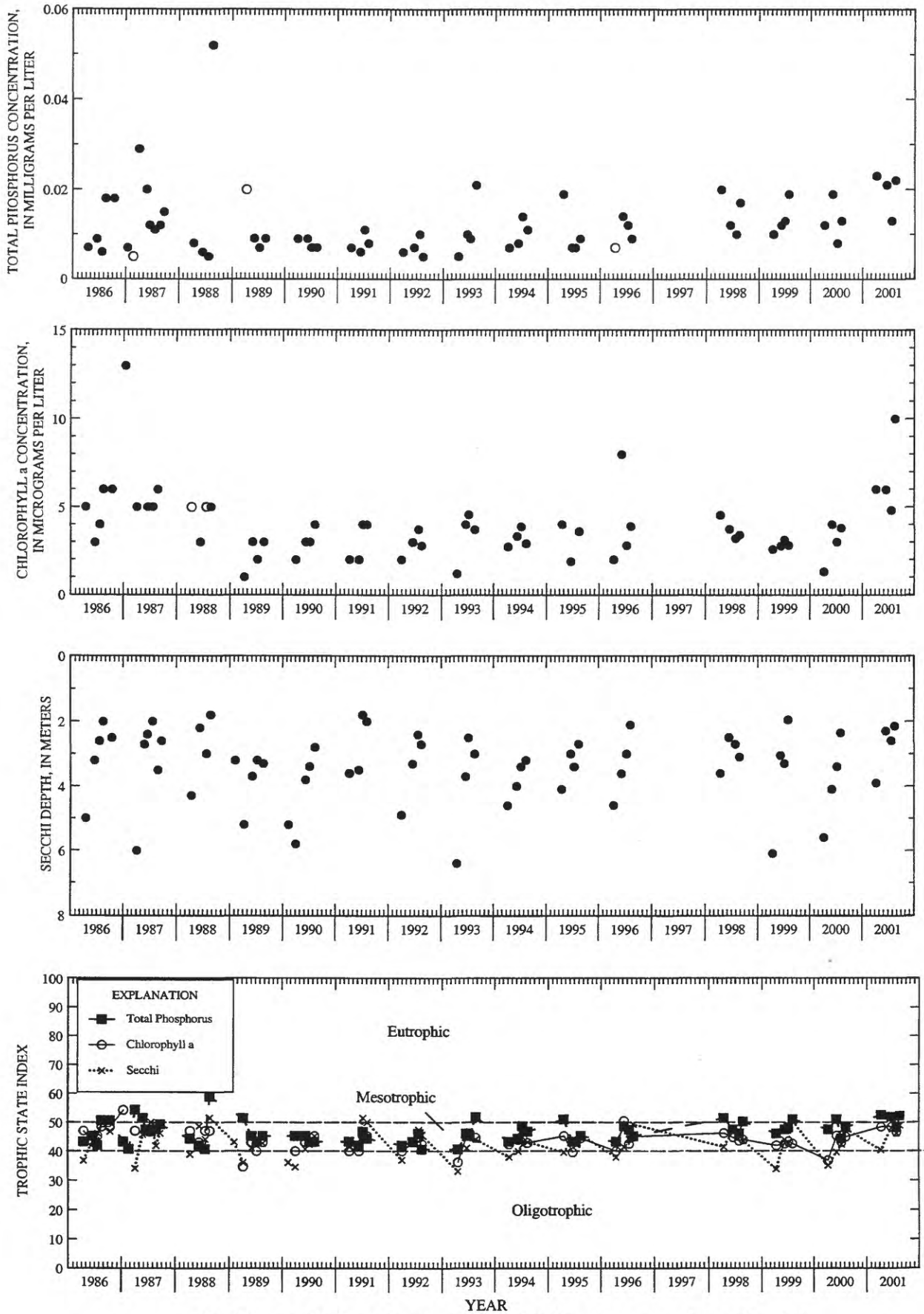
423246088175800 POWERS LAKE AT POWERS LAKE, WI

LOCATION.--Lat 42°32'46", long 88°17'58", in NW 1/4 SE 1/4 sec.13, T.1 N., R.18 E., Walworth County, Hydrologic Unit 07120006, at Powers Lake.
DRAINAGE AREA.--3.42 mi^2.
PERIOD OF RECORD.--March 1986 to August 1996, and April 1998 to current year.
REMARKS.--Lake sampled near center at the deep hole. Lake ice-covered during February sampling. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, FEBRUARY 12 TO AUGUST 20, 2001
(Milligrams per liter unless otherwise indicated)

	Feb-12		Apr-10		Jun-19		Jul-26		Aug-20		
Lake stage (ft)	10.15		10.17		12.37		10.03		9.92		
Secchi-depth (m)	---		3.9		2.3		2.6		2.15		
Chlorophyll a, phytoplankton (µg/L)	---		6		6		4.8		10		
Depth of sample (m)	0.5	9.5	0.5	9.5	0.5	10.0	0.5	9.5	0.5	8.0	9.0
Water temperature (°C)	1.7	4.5	8.6	8.5	22.8	15.3	26.2	15.3	23.6	17.7	16.1
Specific conductance (µS/cm)	484	569	511	514	480	499	475	514	478	505	501
pH (units)	7.9	7.4	8.0	8.1	8.0	7.4	8.1	7.6	8.1	7.3	7.2
Dissolved oxygen (mg/L)	14.0	4.1	11.8	11.5	8.7	1.1	8.0	0.2	8.2	0.4	0.2
Phosphorus, total (as P)	0.017	0.009	0.023	0.012	0.021	0.019	0.013	0.013	0.022	0.028	0.034
Phosphorus, ortho, dissolved (as P)	---	---	0.003	---	---	---	---	---	<0.002	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	0.06	---	---	---	---	---	0.01	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	0.041	---	---	---	---	---	0.032	---	---
Nitrogen, amm. + org., total (as N)	---	---	0.51	---	---	---	---	---	---	---	---
Nitrogen, total (as N)	---	---	0.57	---	---	---	---	---	---	---	---
Color (Pt-Co. scale)	---	---	10	---	---	---	---	---	---	---	---
Turbidity (NTU)	---	---	1.2	---	---	---	---	---	---	---	---
Hardness, (as $CaCO_3$)	---	---	217	---	---	---	---	---	---	---	---
Calcium, dissolved (Ca)	---	---	39	---	---	---	---	---	---	---	---
Magnesium, dissolved (Mg)	---	---	29	---	---	---	---	---	---	---	---
Sodium, dissolved (Na)	---	---	16	---	---	---	---	---	---	---	---
Potassium, dissolved (K)	---	---	2.5	---	---	---	---	---	---	---	---
Alkalinity, (as $CaCO_3$)	---	---	177	---	---	---	---	---	---	---	---
Sulfate, dissolved (SO_4)	---	---	28.2	---	---	---	---	---	---	---	---
Chloride, dissolved (Cl)	---	---	35.2	---	---	---	---	---	---	---	---
Silica, dissolved (SiO_2)	---	---	9.4	---	---	---	---	---	---	---	---
Solids, dissolved, at 180°C	---	---	278	---	---	---	---	---	---	---	---
Iron, dissolved (Fe) µg/L	---	---	<10	---	---	---	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	4.2	---	---	---	---	---	---	---	---





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Powers Lake, at Powers Lake, Wisconsin.

(Circles on the first three plots indicate laboratory detection limit for selected analyses. Actual concentrations for these particular analyses are less than the plotted circles.)

453522091360600 RED CEDAR LAKE AT MIKANA, WI

LOCATION.--Lat 45°35'22", long 91°36'06", in SE ¼ SE ¼ NE ¼ sec. 21, T.36 N., R.10 W., Barron County, Hydrologic Unit 07050007, on end of left wingwall of dam at outlet to the Red Cedar River.

DRAINAGE AREA.--151 mi^2. Area of Red Cedar Lake, 1,841 acres.

PERIOD OF RECORD.--March 1993 to August 1994, March 1996 to August 1997, and October 2000 to September 2001.

GAGE.--Water-stage recorder. Elevation of gage is 1,170 ft above sea level, from topographic map.

REMARKS.--Gage-height telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum recorded gage height, 11.38 ft, Apr. 12, 2001; minimum recorded, 9.69 ft, Mar. 8, 1993.

EXTREMES FOR CURRENT YEAR.--Maximum recorded gage height, 11.38 ft, Apr. 12; minimum recorded, 9.84 ft, June 14.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10.62	10.48	10.20	10.24	10.21	10.19	10.22	10.66	10.72	10.60	10.88	10.61
2	10.63	10.65	10.20	10.23	10.21	10.18	10.24	10.67	10.68	10.56	10.75	10.60
3	10.63	10.71	10.21	10.23	10.21	10.18	10.26	10.67	10.63	10.56	10.69	10.61
4	10.63	10.79	10.22	10.23	10.21	10.17	10.29	10.71	10.62	10.55	10.77	10.60
5	10.65	10.86	10.22	10.22	10.21	10.16	10.34	10.77	10.62	10.55	10.85	10.62
6	10.65	10.93	10.23	10.22	10.21	10.16	10.43	10.82	10.63	10.57	10.86	10.64
7	10.65	10.94	10.25	10.21	10.21	10.15	10.69	10.83	10.67	10.61	10.84	10.71
8	10.64	10.95	10.25	10.21	10.23	10.15	11.03	10.83	10.70	10.65	10.80	10.76
9	10.64	10.96	10.25	10.20	10.24	10.15	11.16	10.81	10.72	10.68	10.75	10.75
10	10.65	10.94	10.27	10.20	10.23	10.15	11.08	10.78	10.79	10.71	10.69	10.71
11	10.65	10.90	10.27	10.20	10.22	10.14	11.10	10.74	10.86	10.73	10.65	10.67
12	10.66	10.87	10.26	10.19	10.22	10.16	11.09	10.75	10.72	10.75	10.65	10.67
13	10.68	10.85	10.26	10.19	10.22	10.17	10.91	10.76	10.57	10.78	10.66	10.66
14	10.70	10.82	10.27	10.20	10.22	10.16	10.92	10.77	10.41	10.80	10.65	10.66
15	10.71	10.79	10.27	10.21	10.21	10.16	10.99	10.80	10.74	10.82	10.65	10.68
16	10.72	10.73	10.28	10.21	10.21	10.16	10.85	10.86	10.78	10.84	10.70	10.69
17	10.70	10.66	10.28	10.20	10.20	10.15	10.67	10.91	10.75	11.06	10.70	10.70
18	10.69	10.60	10.28	10.20	10.19	10.14	10.58	10.92	10.61	10.92	10.73	10.72
19	10.66	10.54	10.30	10.20	10.19	10.14	10.67	10.85	10.63	10.75	10.76	10.73
20	10.63	10.48	10.29	10.19	10.18	10.14	10.66	10.78	10.68	10.66	10.76	10.74
21	10.57	10.42	10.28	10.19	10.17	10.15	10.55	10.77	10.72	10.70	10.76	10.74
22	10.54	10.35	10.28	10.19	10.17	10.15	10.44	10.76	10.72	10.72	10.76	10.71
23	10.52	10.28	10.28	10.18	10.16	10.15	10.58	10.78	10.70	10.73	10.76	10.68
24	10.49	10.23	10.27	10.17	10.18	10.15	10.80	10.79	10.67	10.74	10.72	10.64
25	10.46	10.19	10.26	10.17	10.21	10.15	10.90	10.83	10.63	10.74	10.69	10.61
26	10.44	10.14	10.26	10.17	10.20	10.16	10.89	10.86	10.59	10.73	10.66	10.59
27	10.42	10.10	10.25	10.16	10.19	10.17	10.86	10.85	10.65	10.71	10.65	10.60
28	10.40	10.13	10.25	10.16	10.19	10.18	10.85	10.81	10.66	10.76	10.63	10.60
29	10.38	10.15	10.26	10.16	---	10.18	10.75	10.77	10.63	10.77	10.61	10.61
30	10.37	10.18	10.25	10.21	---	10.19	10.67	10.75	10.62	10.77	10.64	10.62
31	10.38	---	10.25	10.22	---	10.21	---	10.75	---	10.77	10.63	---
MEAN	10.59	10.59	10.26	10.20	10.20	10.16	10.72	10.79	10.67	10.72	10.72	10.66
MAX	10.72	10.96	10.30	10.24	10.24	10.21	11.16	10.92	10.86	11.06	10.88	10.76
MIN	10.37	10.10	10.20	10.16	10.16	10.14	10.22	10.66	10.41	10.55	10.61	10.59

453725091345100 RED CEDAR LAKE, DEEP HOLE, NEAR MIKANA, WI

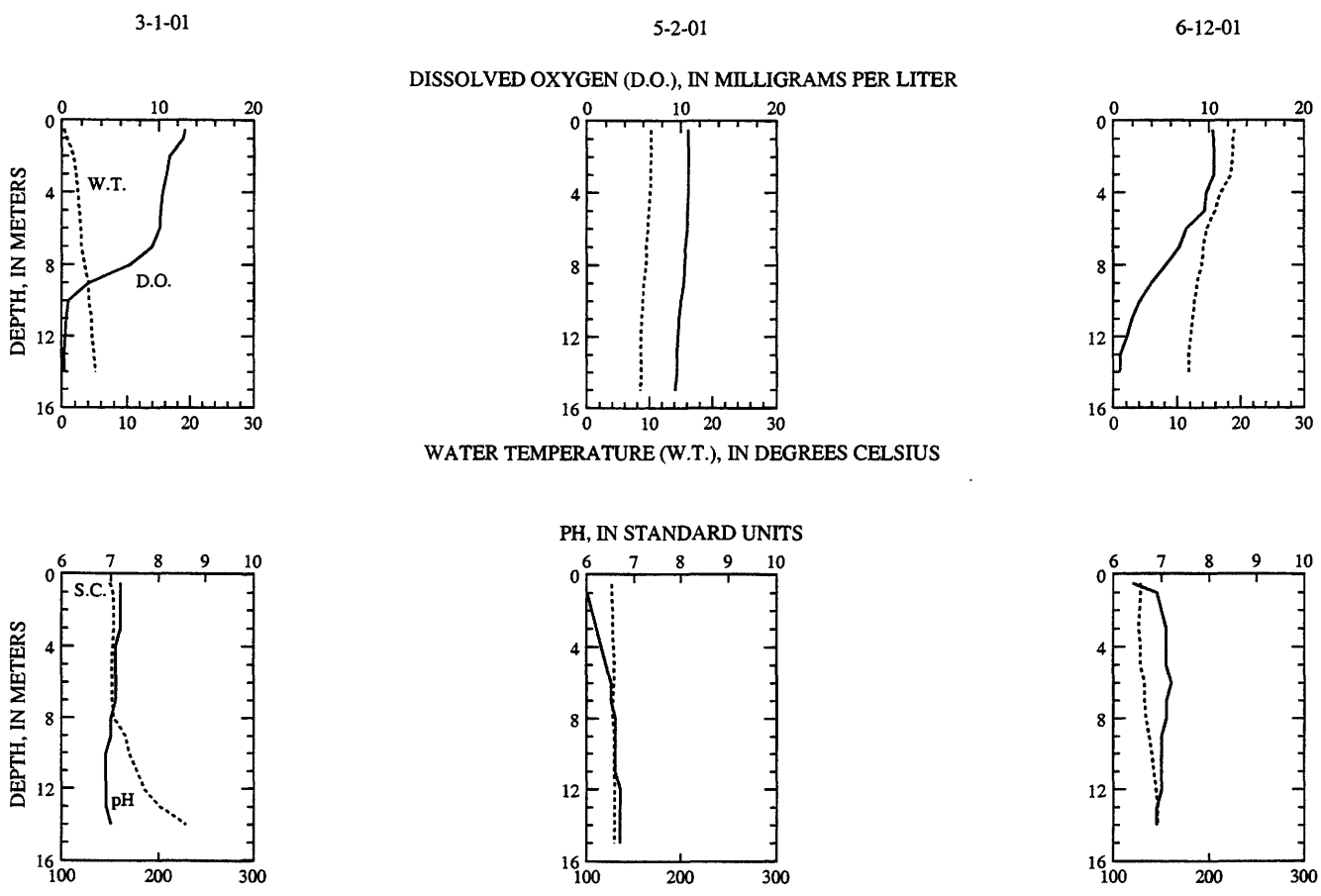
LOCATION.--Lat 45°37'25", long 91°34'51", in NW 1/4 NW 1/4 sec.11, T.36 N., R.10 W., Barron County, Hydrologic Unit 07050007, 2.4 mi northeast of Mikana.

PERIOD OF RECORD.--March 1993 to August 1994, March 1996 to August 1997, and March to September 2001.

REMARKS.--Lake sampled in northern part of lake at deep hole. Lake ice-covered during March sampling. Water-quality analyses by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, MARCH 01 TO JUNE 12, 2001
(Milligrams per liter unless otherwise indicated)

	Mar-1		May-2		Jun-12	
Lake stage (ft)	---		10.94		10.66	
Secchi-depth (m)	---		1.8		3.1	
Chlorophyll a, phytoplankton (µg/L)	---		11		7	
Depth of sample (m)	0.5	14.0	0.5	15.0	0.5	14.0
Water temperature (°C)	0.3	5.1	10.3	8.5	19.0	11.8
Specific conductance (µS/cm)	149	229	126	129	128	146
pH (units)	7.2	7.0	5.7	6.7	6.4	6.9
Dissolved oxygen (mg/L)	12.8	0.2	10.8	9.4	10.4	0.6
Phosphorus, total (as P)	0.037	0.152	0.037	0.031	0.025	0.081
Phosphorus, ortho, dissolved (as P)	---	---	0.003	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	0.25	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	0.015	---	---	---
Nitrogen, amm. + org., total (as N)	---	---	0.65	---	---	---
Nitrogen, total (as N)	---	---	0.9	---	---	---
Color (Pt-Co. scale)	---	---	30	---	---	---
Turbidity (NTU)	---	---	3.1	---	---	---
Hardness, (as $CaCO_3$)	---	---	65.5	---	---	---
Calcium, dissolved (Ca)	---	---	17	---	---	---
Magnesium, dissolved (Mg)	---	---	5.6	---	---	---
Sodium, dissolved (Na)	---	---	2.8	---	---	---
Potassium, dissolved (K)	---	---	0.5	---	---	---
Alkalinity, (as $CaCO_3$)	---	---	59	---	---	---
Sulfate, dissolved (SO_4)	---	---	<4.5	---	---	---
Chloride, dissolved (Cl)	---	---	2.6	---	---	---
Silica, dissolved (SiO_2)	---	---	14.2	---	---	---
Solids, dissolved, at 180°C	---	---	88	---	---	---
Iron, dissolved (Fe) µg/L	---	---	50	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	1.8	---	---	---

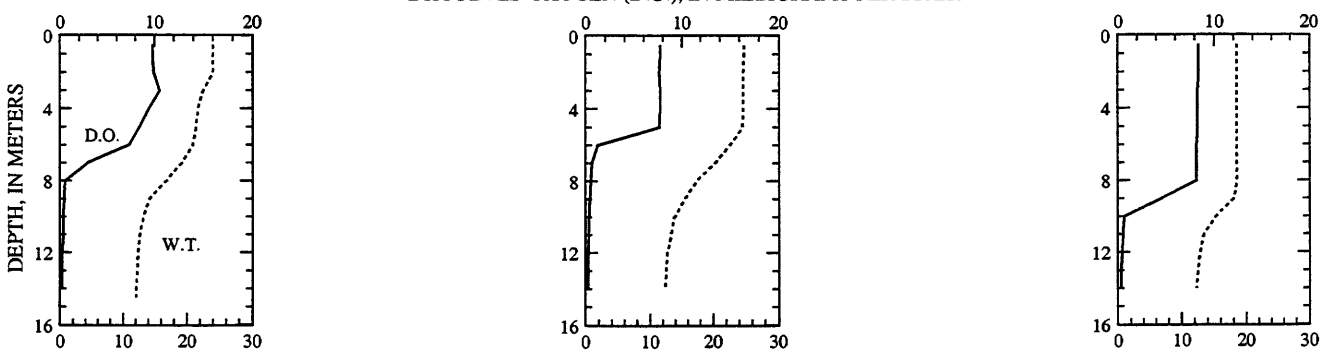


WATER-QUALITY DATA, JULY 10 TO SEPTEMBER 20, 2001
(Milligrams per liter unless otherwise indicated)

	Jul-10		Aug-13			Sep-20		
Lake stage (ft)	10.72		10.67			10.74		
Secchi-depth (m)	3.5		3.20			1.90		
Chlorophyll a, phytoplankton (µg/L)	5.2		7			18		
Depth of sample (m)	0.5	14.0	0.5	8.0	14.0	0.5	10.0	14.0
Water temperature (°C)	24.0	12.1	24.7	17.3	12.4	18.5	15.2	12.3
Specific conductance (µS/cm)	123	174	121	143	181	131	194	226
pH (units)	8.6	7.2	7.9	7.1	7.1	7.2	7.0	7.0
Dissolved oxygen (mg/L)	9.8	0.2	7.7	0.5	0.2	8.4	0.6	0.3
Phosphorus, total (as P)	0.021	0.187	0.021	0.060	0.457	0.022	0.079	0.719

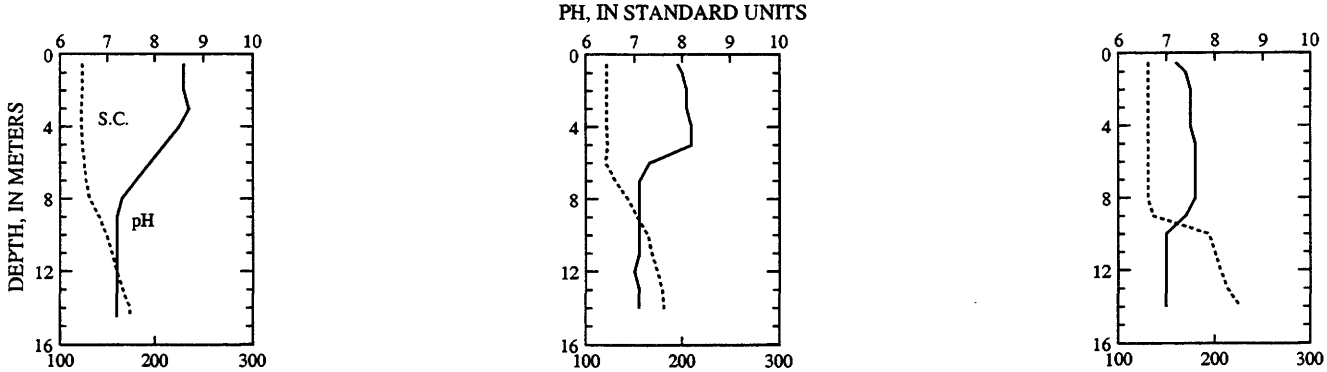
7-10-01 8-13-01 9-20-01

DISSOLVED OXYGEN (D.O.), IN MILLIGRAMS PER LITER

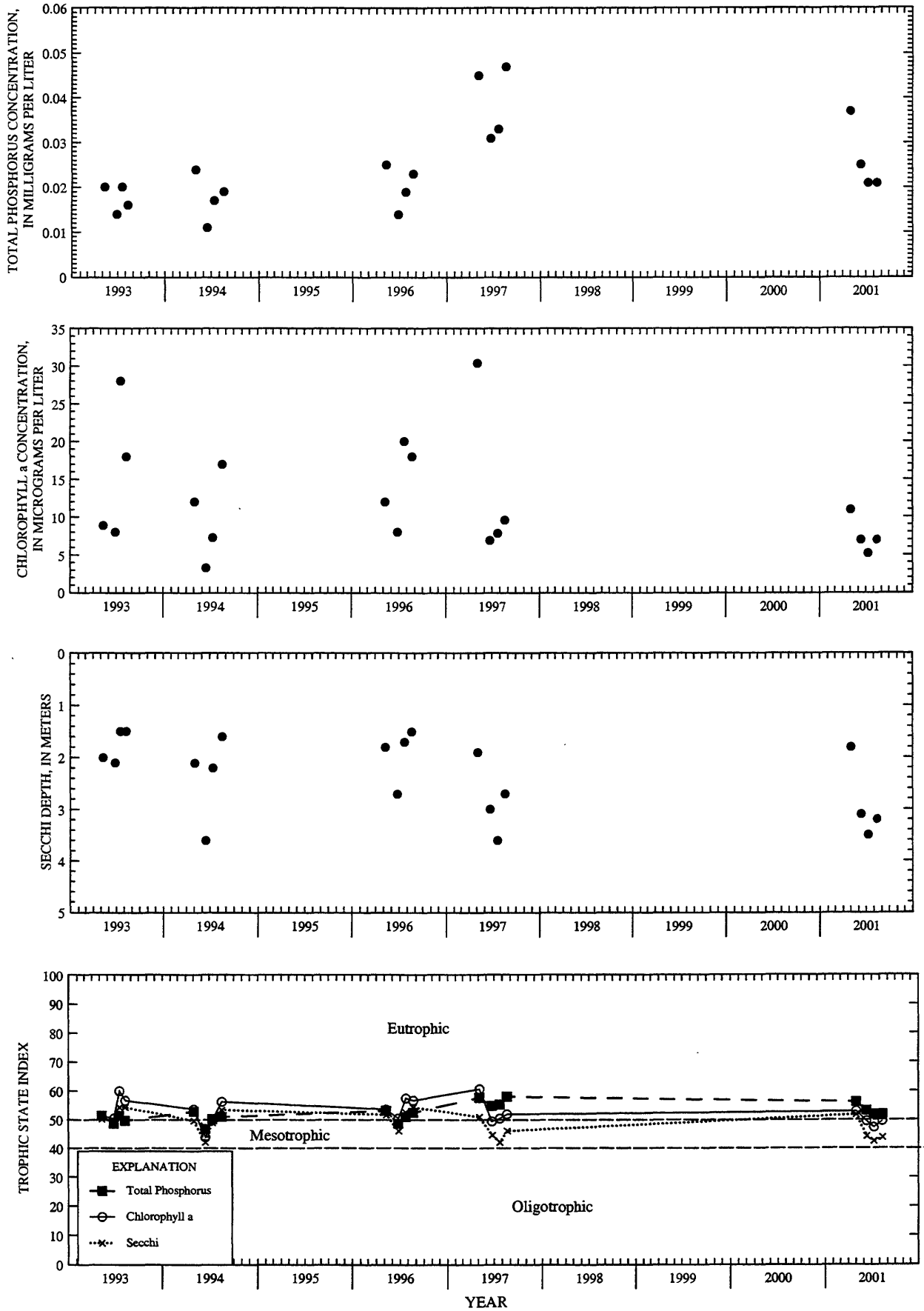


WATER TEMPERATURE (W.T.), IN DEGREES CELSIUS

PH, IN STANDARD UNITS



SPECIFIC CONDUCTANCE (S.C.), IN MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS



Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Red Cedar Lake, Deep Hole, near Mikana, Wisconsin.

453519091352500 RED CEDAR LAKE, SOUTH END, AT MIKANA, WI

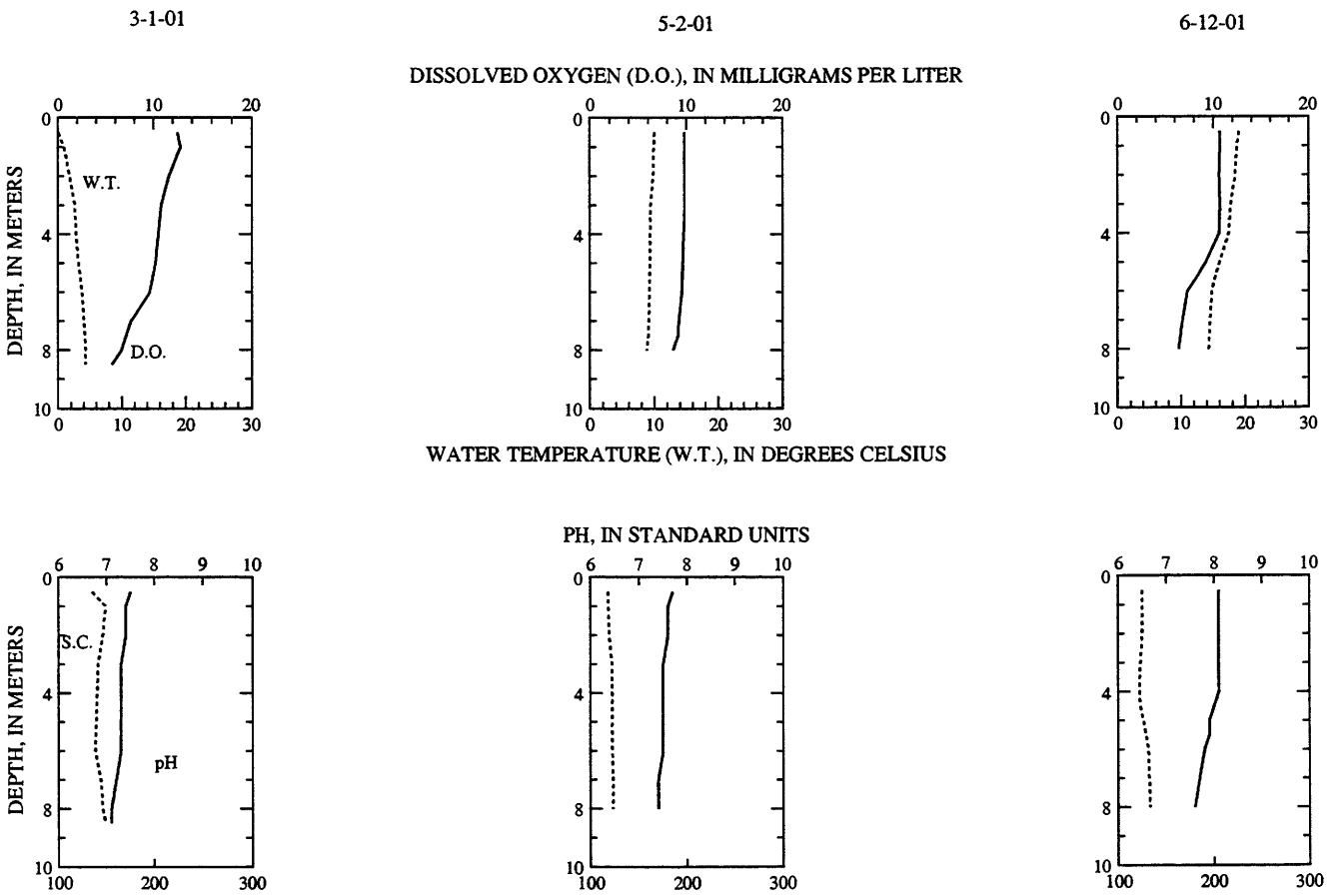
LOCATION.--Lat 45°35'19", long 91°35'25", in SW 1/4 NE 1/4 sec.22, T.36 N., R.10 W., Barron County, Hydrologic Unit 07050007, at Mikana.

PERIOD OF RECORD.--March 1993 to August 1994, March 1996 to August 1997, and March to September 2001.

REMARKS.--Lake sampled 0.2 mi northwest of Honeymoon Island. Lake ice-covered during March sampling. Water-quality analyses by Wisconsin State Laboratory of Hygiene.

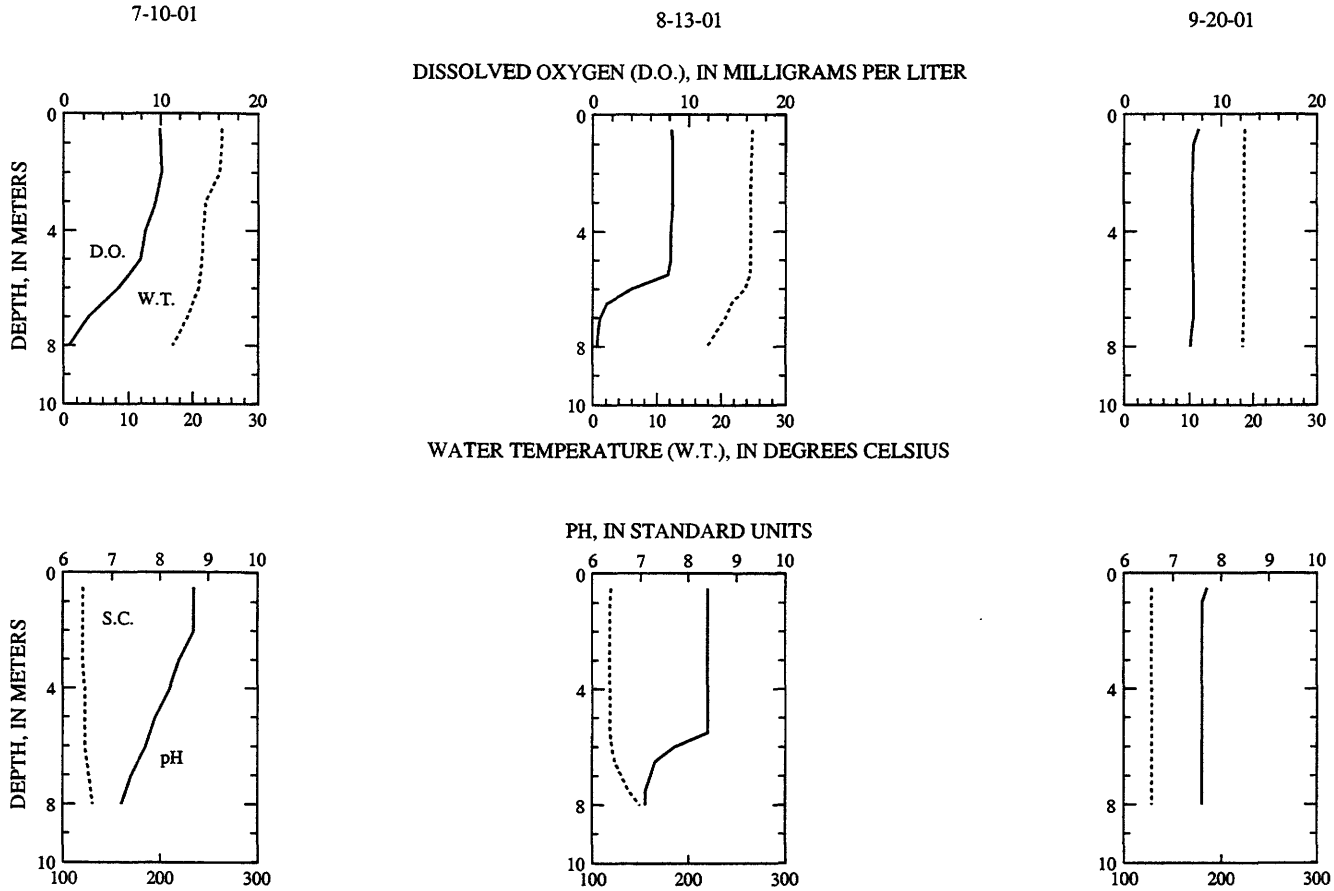
WATER-QUALITY DATA, MARCH 01 TO JUNE 12, 2001
(Milligrams per liter unless otherwise indicated)

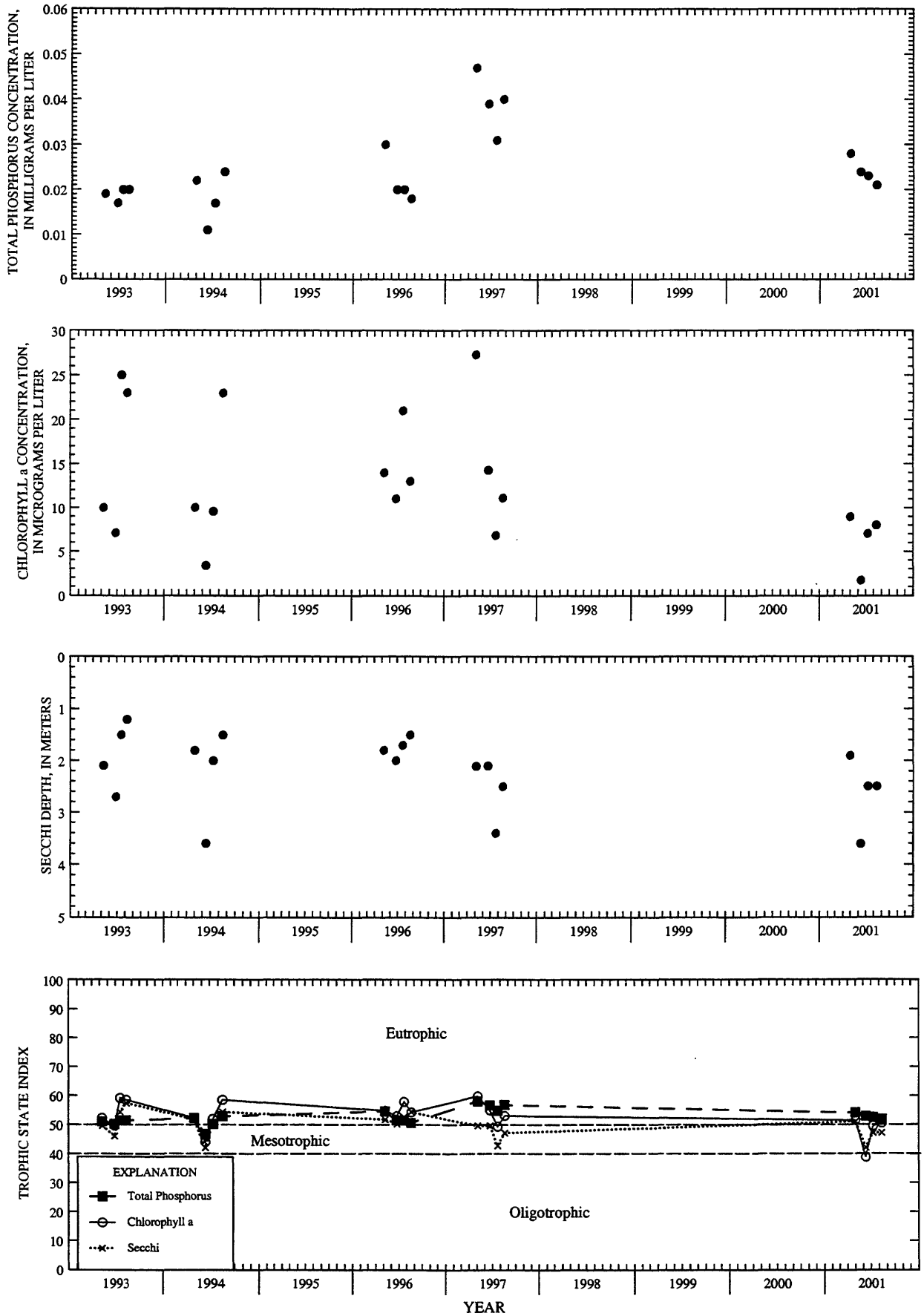
	Mar-1	May-2	Jun-12
Lake stage (ft)	10.19	10.67	10.66
Secchi-depth (m)	---	1.9	3.6
Chlorophyll a, phytoplankton (µg/L)	---	9	1.7
Depth of sample (m)	0.5	0.5	0.5
Water temperature (°C)	0.0	10.0	19.0
Specific conductance (µS/cm)	135	118	125
pH (units)	7.5	7.7	8.1
Dissolved oxygen (mg/L)	12.5	9.8	10.7
Phosphorus, total (as P)	0.024	0.028	0.024



WATER-QUALITY DATA, JULY 10 TO SEPTEMBER 20, 2001
(Milligrams per liter unless otherwise indicated)

	Jul-10	Aug-13		Sep-20	
Lake stage (ft)	10.72	10.67		10.74	
Secchi-depth (m)	2.5	2.5		1.90	
Chlorophyll a, phytoplankton (µg/L)	7	8		13	
Depth of sample (m)	0.5	0.5	6.0	8.0	0.5	8.0
Water temperature (°C)	24.5	24.9	23.7	17.8	18.7	18.4
Specific conductance (µS/cm)	120	119	120	149	128	128
pH (units)	8.7	8.4	7.7	7.1	7.7	7.6
Dissolved oxygen (mg/L)	9.9	8.2	3.9	0.4	7.6	6.8
Phosphorus, total (as P)	0.023	0.021	0.032	0.040	0.035	0.037





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Red Cedar Lake, South End, near Mikana, Wisconsin.

461321091520900 WHITEFISH LAKE, NORTH BASIN, NEAR GORDON, WI

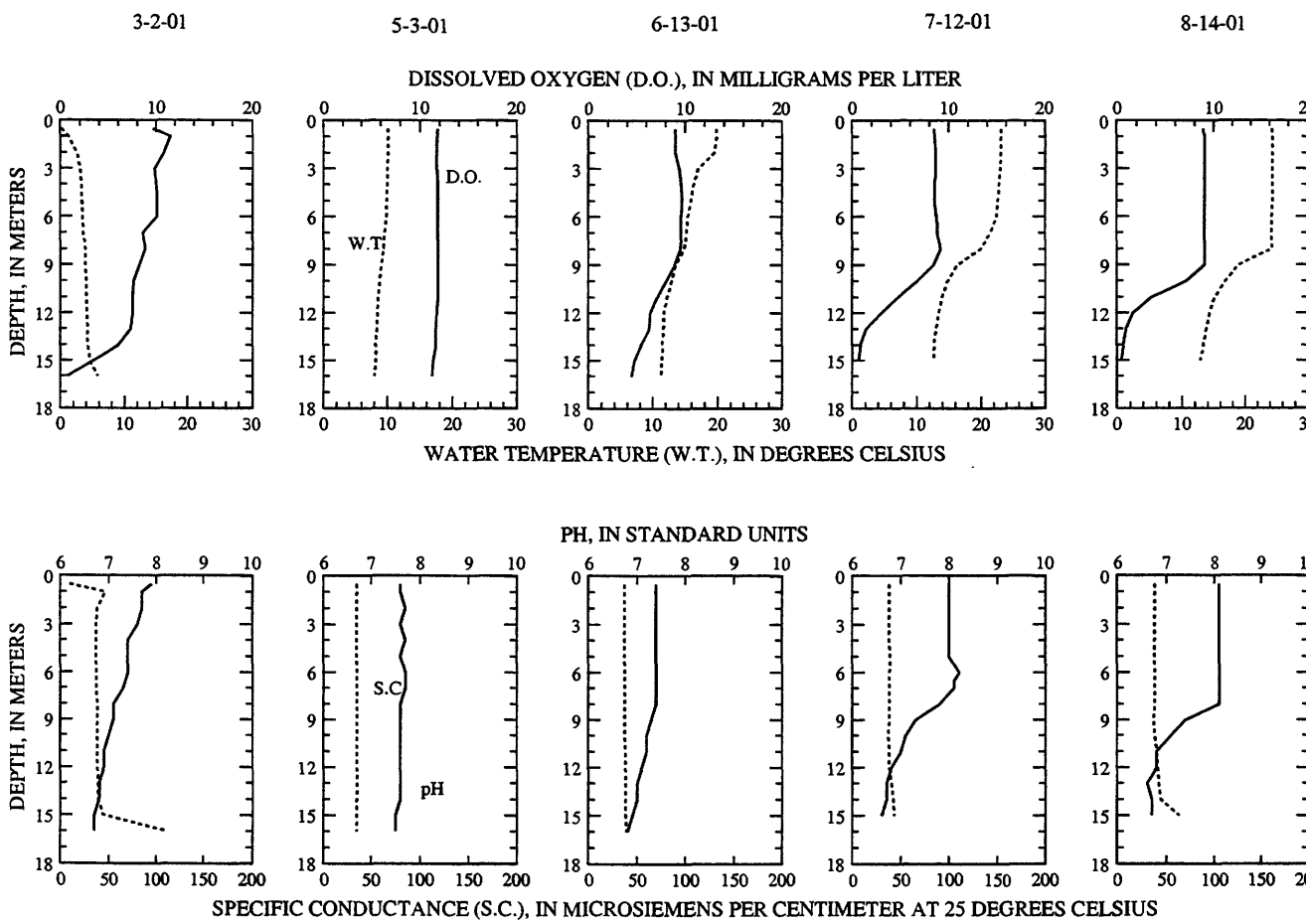
LOCATION.--Lat 46°13'21", long 91°52'09", in NW 1/4 SE 1/4 sec.9, T.43 N., R.12 W., Douglas County, Hydrologic Unit 07030002, near Gordon.

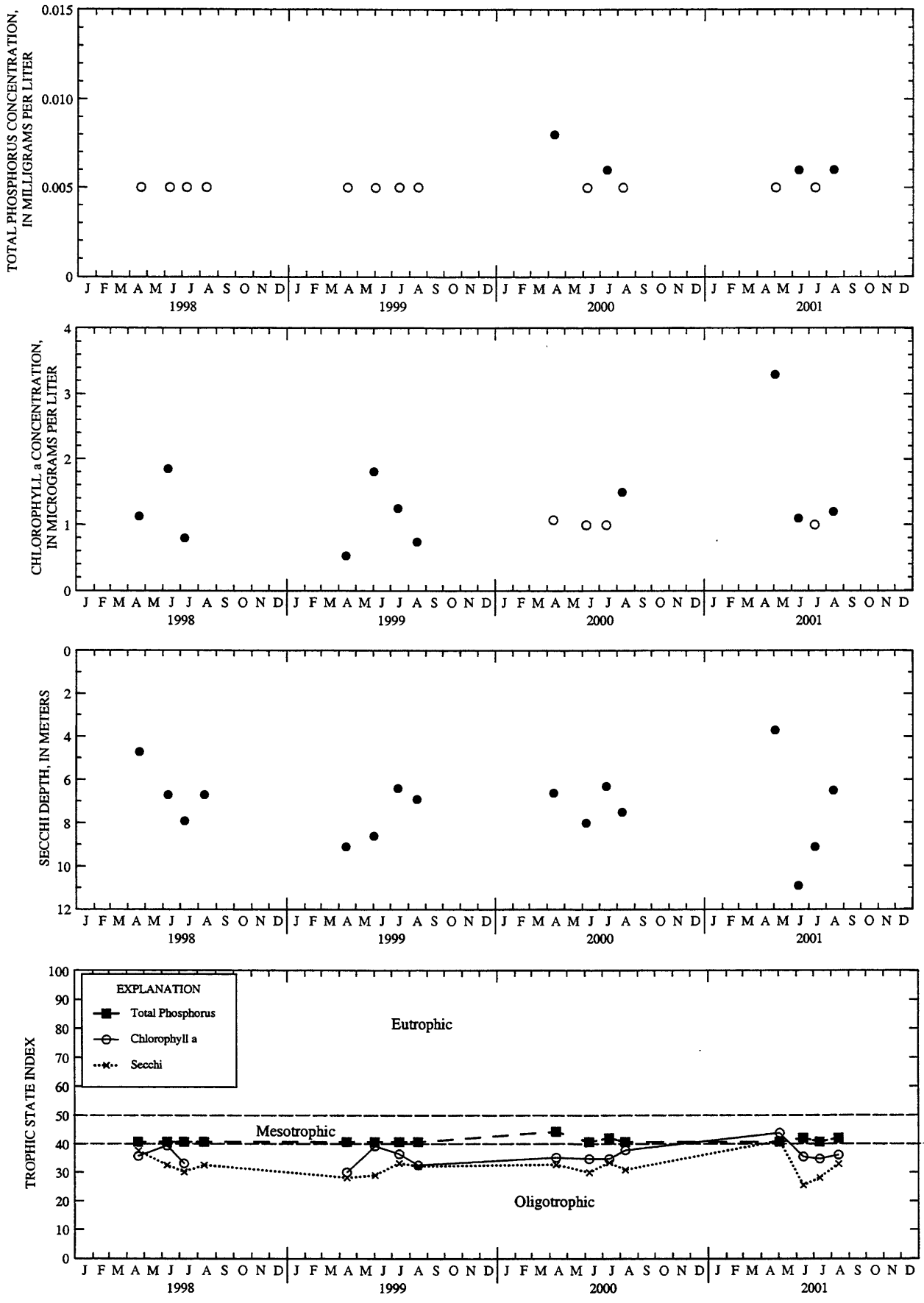
PERIOD OF RECORD.--March 1998 to current year.

REMARKS.--Lake sampled at deepest part of northern basin. Lake ice-covered during March sampling. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, MARCH 02 TO AUGUST 14, 2001
(Milligrams per liter unless otherwise indicated)

	Mar-2		May-3	Jun-13	Jul-12	Aug-14	
Lake stage (ft)	---		5.27	5.39	5.10	5.09	
Secchi-depth (m)	---		3.7	10.9	9.1	6.5	
Chlorophyll a, phytoplankton (µg/L)	---		3.3	1.1	<1	1.2	
Depth of sample (m)	0.5	15.0	0.5	0.5	0.5	0.5	15.0
Water temperature (°C)	0.1	4.5	10.1	19.8	23.2	24.4	12.8
Specific conductance (µS/cm)	9	44	35	37	38	38	63
pH (units)	7.9	6.7	7.6	7.4	8.0	8.1	6.7
Dissolved oxygen (mg/L)	9.7	3.4	11.8	9.0	8.5	8.9	0.4
Phosphorus, total (as P)	0.050	0.153	<0.005	0.006	<0.005	0.006	0.040





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Whitefish Lake, North Basin, near Gordon, Wisconsin.

(Circles on the first three plots indicate laboratory detection limit for selected analyses. Actual concentrations for these particular analyses are less than the plotted circles.)

461212091523200 WHITEFISH LAKE, SOUTH BASIN, NEAR GORDON, WI

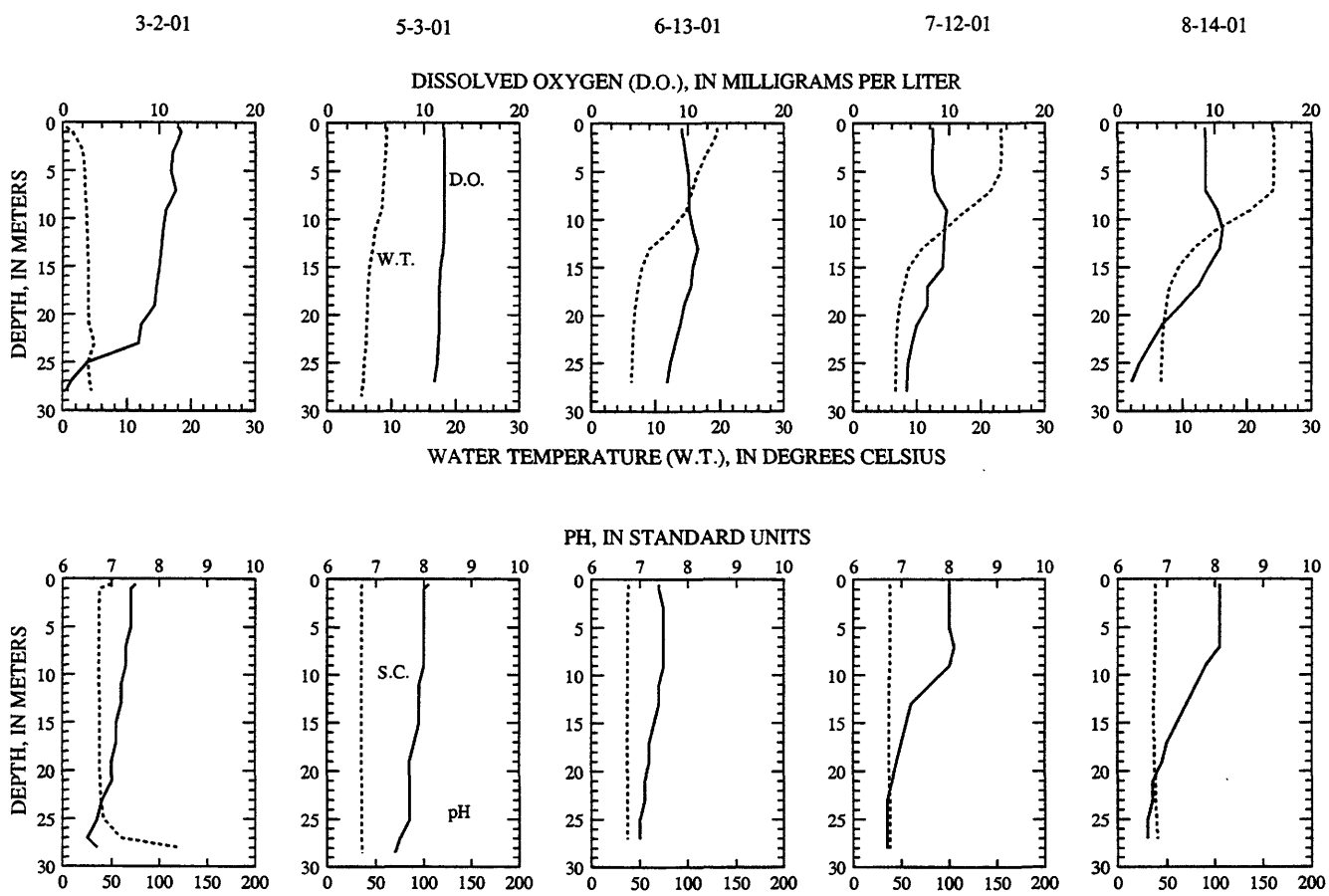
LOCATION.--Lat 46°12'12", long 91°52'32", in SE 1/4 SW 1/4 sec.16, T.43 N., R.12 W., Douglas County, Hydrologic Unit 07030002, near Gordon.

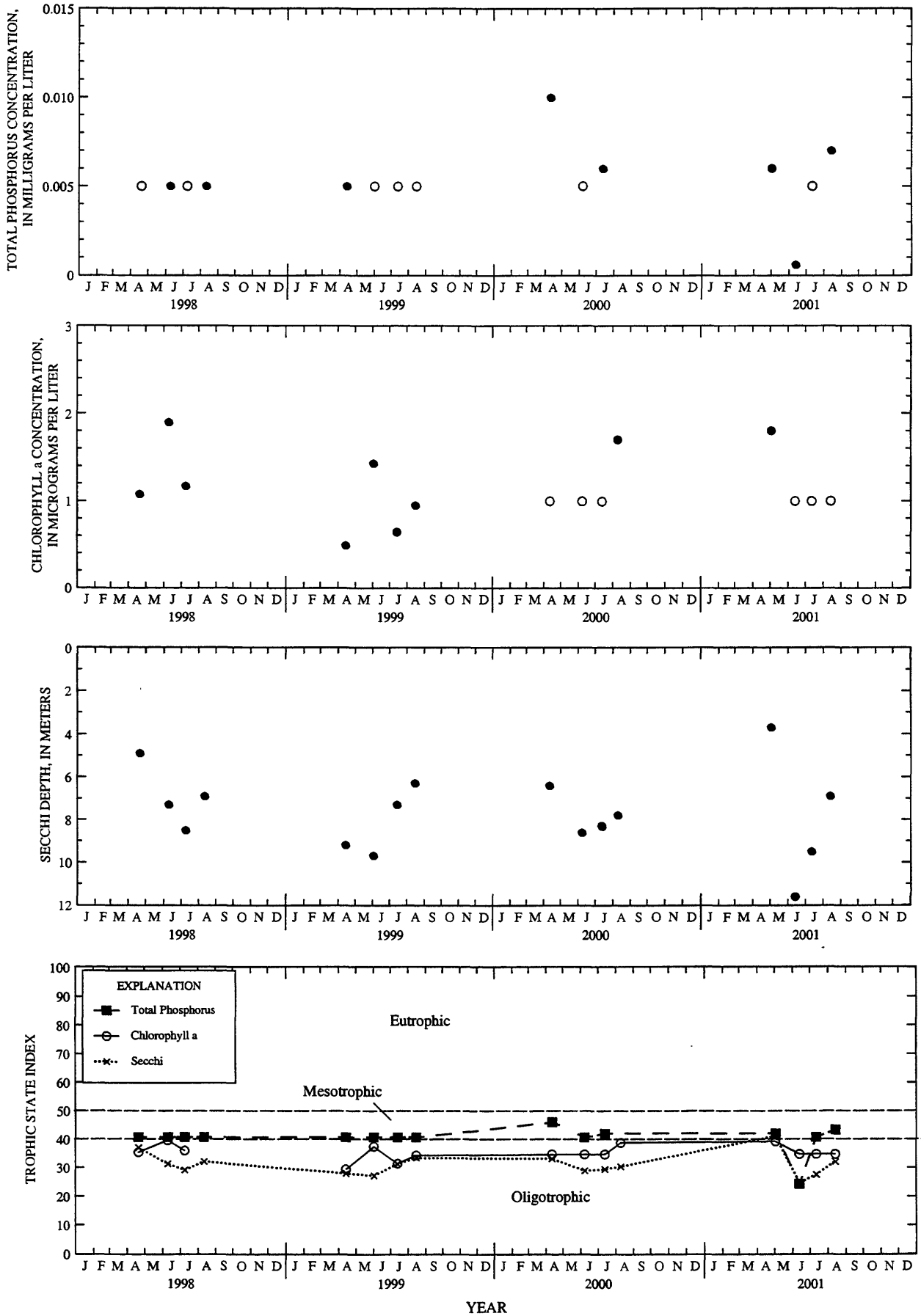
PERIOD OF RECORD.--March 1998 to current year.

REMARKS.--Lake sampled at deepest part of southern basin. Lake ice-covered during March sampling. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, MARCH 02 TO AUGUST 14, 2001
(Milligrams per liter unless otherwise indicated)

	Mar-2		May-3	Jun-13		Jul-12		Aug-14		
Lake stage (ft)	---		5.27	5.39		5.10		5.09		
Secchi-depth (m)	---		3.7	11.6		9.5		6.90		
Chlorophyll a, phytoplankton (µg/L)	---		1.8	<1		---		<1		
Depth of sample (m)	0.5	27.0	0.5	0.5	28.0	0.5	27.0	0.5	11.0	27.0
Water temperature (°C)	0.5	4.1	9.2	19.5	6.2	23.2	6.6	24.2	15.4	6.6
Specific conductance (µS/cm)	50	59	35	38	37	38	38	38	37	40
pH (units)	7.5	6.5	8.1	7.4	7.0	8.0	6.7	8.1	7.6	6.6
Dissolved oxygen (mg/L)	12.1	0.8	12.1	9.4	7.9	8.3	5.6	9.0	10.8	1.4
Phosphorus, total (as P)	<0.005	0.206	0.006	0.006	0.013	---	0.010	0.007	0.009	0.041
Phosphorus, ortho, dissolved (as P)	---	---	<0.002	---	---	---	---	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	0.039	---	---	---	---	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	0.014	---	---	---	---	---	---	---
Nitrogen, amm. + org., total (as N)	---	---	0.24	---	---	---	---	---	---	---
Nitrogen, total (as N)	---	---	0.279	---	---	---	---	---	---	---
Color (Pt-Co. scale)	---	---	20	---	---	---	---	---	---	---
Turbidity (NTU)	---	---	2.1	---	---	---	---	---	---	---
Hardness, (as $CaCO_3$)	---	---	17.6	---	---	---	---	---	---	---
Calcium, dissolved (Ca)	---	---	4.9	---	---	---	---	---	---	---
Magnesium, dissolved (Mg)	---	---	1.3	---	---	---	---	---	---	---
Sodium, dissolved (Na)	---	---	0.9	---	---	---	---	---	---	---
Potassium, dissolved (K)	---	---	0.4	---	---	---	---	---	---	---
Alkalinity, (as $CaCO_3$)	---	---	17	---	---	---	---	---	---	---
Sulfate, dissolved (SO_4)	---	---	<4.5	---	---	---	---	---	---	---
Chloride, dissolved (Cl)	---	---	0.9	---	---	---	---	---	---	---
Silica, dissolved (SiO_2)	---	---	0.5	---	---	---	---	---	---	---
Solids, dissolved, at 180°C	---	---	26	---	---	---	---	---	---	---
Iron, dissolved (Fe) µg/L	---	---	<10	---	---	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	0.8	---	---	---	---	---	---	---





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Whitefish Lake, South Basin, near Gordon, Wisconsin.

(Circles on the first three plots indicate laboratory detection limit for selected analyses. Actual concentrations for these particular analyses are less than the plotted circles.)

424608088414800 WHITEWATER LAKE NEAR WHITEWATER, WI

LOCATION.--Lat 42°46'08", long 88°41'48", in NW 1/4 NW 1/4 sec.35, T.4 N., R.15 E., Walworth County, Hydrologic Unit 07090001, at outlet, 5.0 mi southeast of Whitewater and 10.0 mi north of Delavan.

DRAINAGE AREA.--10.9 mi^2, of which 8.5 mi^2 is non-contributing.

PERIOD OF RECORD.--November 1990 to current year.

GAGE.--Water-stage recorder. Datum of gage is 861.00 ft above sea level (Wisconsin Department of Natural Resources).

REMARKS.--Point of zero flow of dam crest is 10.97 ft. Rainfall data published in 1991 under this station number are now stored under station number 424559088420300.

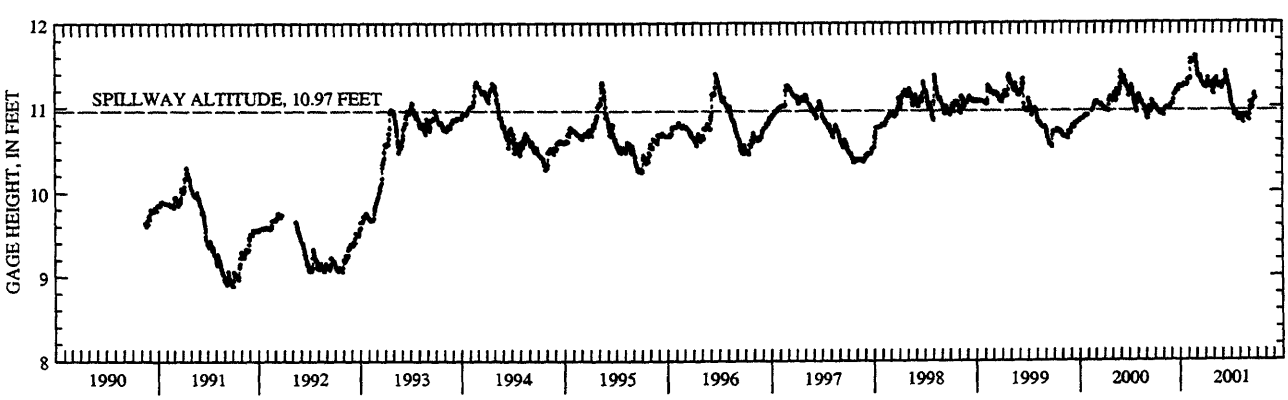
EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 11.61 ft, Feb. 25, 2001; minimum daily gage height, 8.89 ft, Oct. 2, 3, 1991.

EXTREMES FOR CURRENT YEAR.--Maximum recorded gage height, 11.61 ft, Feb. 25; minimum recorded, 10.79 ft, Aug. 15.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11.02	10.91	11.02	11.23	11.32	11.55	11.24	11.16	11.22	11.12	10.84	10.87
2	11.01	10.92	11.02	11.23	11.32	11.52	11.24	11.15	11.26	11.09	10.89	10.86
3	11.00	10.91	11.02	11.24	11.32	11.50	11.23	11.21	11.26	11.07	10.90	10.85
4	11.01	10.90	11.03	11.24	11.32	11.47	11.22	11.31	11.25	11.05	10.90	10.85
5	11.01	10.90	11.03	11.24	11.32	11.44	11.22	11.29	11.27	11.03	10.90	10.84
6	11.01	10.90	11.04	11.24	11.32	11.41	11.24	11.27	11.29	11.02	10.89	10.84
7	10.99	10.96	11.04	11.24	11.32	11.39	11.25	11.27	11.29	11.00	10.88	10.90
8	10.99	10.95	11.04	11.24	11.34	11.37	11.23	11.26	11.28	11.00	10.88	10.95
9	10.98	10.97	11.04	11.24	11.51	11.36	11.28	11.25	11.28	11.00	10.88	10.99
10	10.98	10.98	11.04	11.23	11.56	11.36	11.28	11.26	11.27	10.99	10.89	11.05
11	10.97	10.98	11.08	11.23	11.56	11.36	11.31	11.33	11.27	10.97	10.86	11.05
12	10.97	10.99	11.14	11.24	11.55	11.35	11.34	11.34	11.40	10.95	10.85	11.04
13	10.96	10.99	11.14	11.24	11.55	11.36	11.31	11.32	11.41	10.93	10.84	11.02
14	10.96	10.98	11.14	11.25	11.55	11.34	11.29	11.30	11.39	10.92	10.84	11.01
15	10.95	10.98	11.15	11.26	11.55	11.35	11.29	11.28	11.37	10.91	10.81	11.00
16	10.95	10.98	11.16	11.26	11.55	11.36	11.26	11.27	11.36	10.90	10.89	11.00
17	10.94	10.98	11.16	11.26	11.55	11.35	11.24	11.27	11.35	10.92	10.90	10.99
18	10.94	10.99	11.16	11.26	11.55	11.33	11.23	11.25	11.35	10.94	10.90	10.99
19	10.94	10.99	11.18	11.26	11.54	11.31	11.23	11.24	11.32	10.94	10.89	11.04
20	10.94	10.98	11.18	11.26	11.54	11.30	11.25	11.23	11.30	10.94	10.89	11.05
21	10.93	10.98	11.20	11.25	11.53	11.29	11.28	11.24	11.28	10.93	10.88	11.07
22	10.92	10.97	11.20	11.25	11.53	11.28	11.27	11.24	11.27	10.93	10.89	11.08
23	10.92	10.97	11.20	11.25	11.53	11.28	11.28	11.24	11.26	10.92	10.89	11.13
24	10.93	10.97	11.20	11.25	11.54	11.27	11.26	11.25	11.25	10.91	10.89	11.15
25	10.94	10.97	11.20	11.25	11.60	11.27	11.25	11.27	11.24	10.90	10.90	11.14
26	10.95	10.98	11.20	11.25	11.60	11.26	11.24	11.27	11.22	10.89	10.91	11.12
27	10.94	10.99	11.19	11.25	11.60	11.25	11.23	11.25	11.19	10.87	10.91	11.11
28	10.93	10.99	11.19	11.25	11.58	11.25	11.22	11.24	11.17	10.85	10.91	11.10
29	10.92	11.01	11.22	11.27	---	11.24	11.19	11.24	11.15	10.85	10.90	11.09
30	10.92	11.02	11.24	11.31	---	11.23	11.17	11.22	11.14	10.85	10.89	11.09
31	10.91	---	11.24	11.32	---	11.23	---	11.21	---	10.84	10.88	---
MEAN	10.96	10.97	11.13	11.25	11.49	11.34	11.25	11.26	11.28	10.95	10.88	11.01
MAX	11.02	11.02	11.24	11.32	11.60	11.55	11.34	11.34	11.41	11.12	10.91	11.15
MIN	10.91	10.90	11.02	11.23	11.32	11.23	11.17	11.15	11.14	10.84	10.81	10.84



424848088083100 WIND LAKE AT OUTLET AT WIND LAKE, WI

(Formerly Wind Lake Outlet at Wind Lake, WI)

LOCATION.--Lat 42°48'48" long 88°08'31", in NE 1/4 NW 1/4 sec.16, T.4 N., R.20 E., Racine County, Hydrologic Unit 07120006, at Wind Lake.

DRAINAGE AREA.--39.6 mi^2.

PERIOD OF RECORD.--March 1985 to current year. Prior to October 2000, published as "Wind Lake Outlet".

REVISED RECORDS.--WDR WI-91-1: 1988(m).

GAGE.--Water-stage recorder and concrete dam. Datum of gage is 760.30 ft above sea level. Prior to Oct. 2, 1987, nonrecording gage at same site and datum.

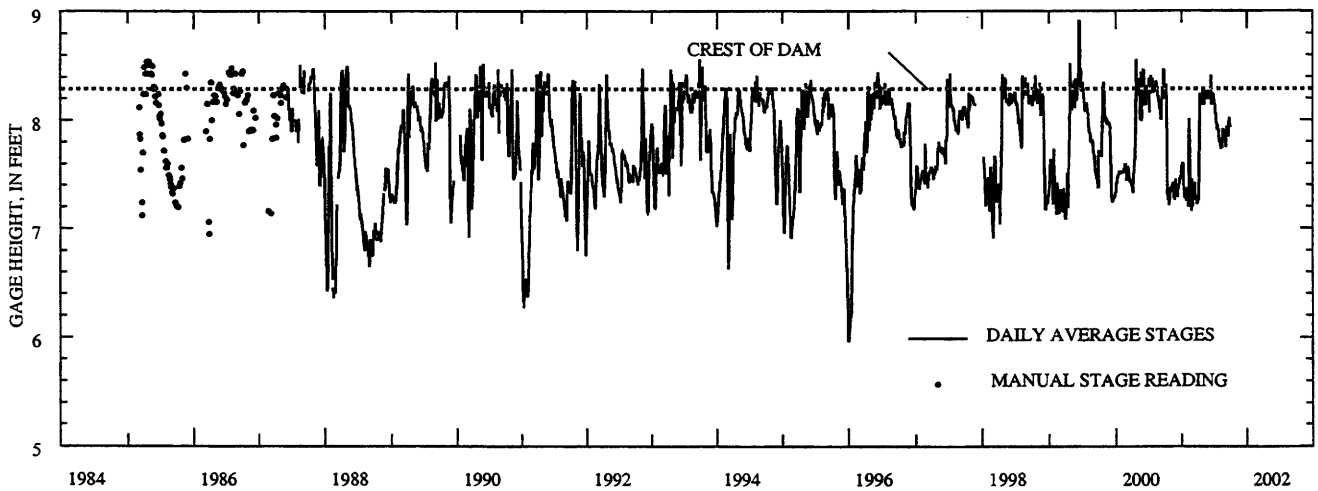
REMARKS.--Lake level regulated by dam with two 10-foot gates at outlet. Lake ice-covered Dec. 5 to Apr. 5. Prior to October 1987, published as Wind Lake at Wind Lake, Wis. Gage-height telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 8.93 ft, June 15, 1999; minimum recorded, 5.95 ft, Jan. 2, 1996.

EXTREMES FOR CURRENT YEAR.--Maximum recorded gage height, 8.46 ft, June 12; minimum recorded, 7.13 ft, Feb. 24.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.23	7.37	7.30	7.57	7.36	7.26	7.28	8.24	8.24	8.17	7.79	7.81
2	8.23	7.38	7.30	7.58	7.34	7.20	7.27	8.21	8.25	8.14	7.82	7.79
3	8.26	7.37	7.30	7.59	7.31	7.22	7.26	8.20	8.19	8.14	7.82	7.78
4	8.31	7.36	7.29	7.60	7.29	7.29	7.26	8.19	8.20	8.14	7.80	7.78
5	8.32	7.34	7.31	7.60	7.27	7.31	7.25	8.16	8.24	8.11	7.78	7.76
6	8.32	7.33	7.29	7.60	7.24	7.30	7.29	8.14	8.23	8.08	7.76	7.75
7	8.27	7.38	7.29	7.60	7.21	7.28	7.35	8.19	8.25	8.08	7.75	7.79
8	8.18	7.34	7.30	7.58	7.20	7.28	7.45	8.19	8.24	8.07	7.74	7.84
9	8.01	7.36	7.30	7.53	7.54	7.27	7.63	8.18	8.20	8.06	7.74	7.89
10	7.84	7.41	7.31	7.48	7.88	7.26	7.86	8.19	8.21	8.05	7.82	7.94
11	7.68	7.41	7.33	7.43	8.01	7.28	8.07	8.22	8.22	8.01	7.79	7.92
12	7.53	7.40	7.37	7.40	8.00	7.27	8.22	8.23	8.41	7.99	7.77	7.91
13	7.40	7.39	7.37	7.36	7.93	7.29	8.24	8.20	8.38	7.98	7.78	7.90
14	7.31	7.38	7.39	7.34	7.85	7.29	8.19	8.22	8.22	7.96	7.76	7.88
15	7.27	7.36	7.39	7.34	7.75	7.37	8.16	8.27	8.14	7.93	7.74	7.87
16	7.27	7.34	7.40	7.32	7.64	7.42	8.20	8.24	8.16	7.91	7.83	7.86
17	7.27	7.33	7.40	7.30	7.56	7.37	8.23	8.21	8.17	7.94	7.82	7.85
18	7.27	7.30	7.41	7.28	7.49	7.31	8.22	8.21	8.19	7.96	7.81	7.85
19	7.27	7.28	7.43	7.28	7.38	7.27	8.20	8.21	8.20	7.95	7.91	7.94
20	7.23	7.28	7.43	7.28	7.29	7.27	8.21	8.22	8.24	7.94	7.91	7.93
21	7.23	7.26	7.45	7.28	7.25	7.27	8.24	8.22	8.25	7.93	7.89	7.95
22	7.22	7.32	7.45	7.28	7.23	7.27	8.23	8.21	8.18	7.92	7.89	7.95
23	7.21	7.35	7.46	7.28	7.22	7.27	8.16	8.19	8.14	7.91	7.90	7.99
24	7.23	7.38	7.47	7.28	7.16	7.26	8.14	8.23	8.17	7.90	7.89	8.02
25	7.26	7.41	7.47	7.28	7.32	7.23	8.16	8.22	8.20	7.91	7.89	7.99
26	7.29	7.44	7.47	7.27	7.44	7.23	8.21	8.20	8.23	7.88	7.90	7.97
27	7.33	7.45	7.47	7.27	7.45	7.22	8.28	8.24	8.24	7.85	7.89	7.95
28	7.33	7.41	7.47	7.26	7.37	7.23	8.30	8.26	8.21	7.83	7.88	7.95
29	7.33	7.38	7.50	7.26	---	7.26	8.28	8.26	8.19	7.83	7.86	7.94
30	7.35	7.34	7.53	7.33	---	7.28	8.26	8.23	8.18	7.82	7.84	7.93
31	7.36	---	7.55	7.36	---	7.28	---	8.19	---	7.80	7.83	---
MEAN	7.60	7.36	7.39	7.39	7.46	7.28	7.94	8.21	8.22	7.97	7.83	7.89
MAX	8.32	7.45	7.55	7.60	8.01	7.42	8.30	8.27	8.41	8.17	7.91	8.02
MIN	7.21	7.26	7.29	7.26	7.16	7.20	7.25	8.14	8.14	7.80	7.74	7.75



424915088083900 WIND LAKE AT WIND LAKE, WI

LOCATION.--Lat 42°49'15", long 88°08'39", in NW 1/4 SW 1/4 sec.9, T.4 N., R.20 E., Racine County, Hydrologic Unit 07120006, at Wind Lake.

PERIOD OF RECORD.--February 1985 to current year.

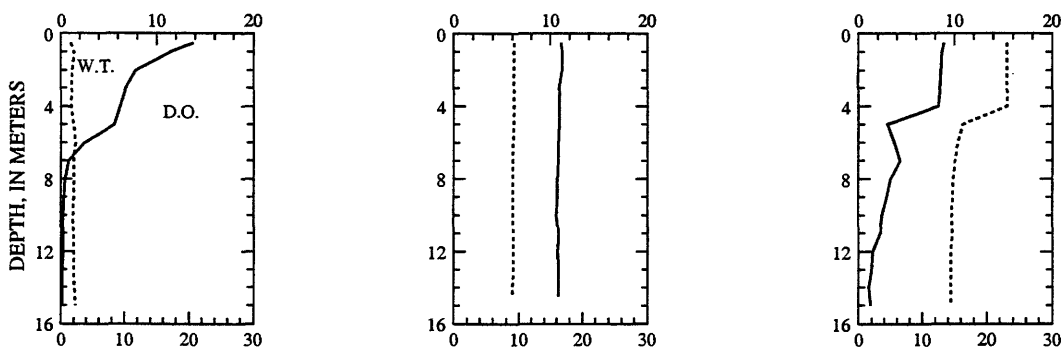
REMARKS.--Lake sampled near center at the deep hole. Lake ice-covered during February sampling. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, FEBRUARY 13 TO JUNE 18, 2001
(Milligrams per liter unless otherwise indicated)

	Feb-13		Apr-18		Jun-18	
Lake stage (ft)	7.93		8.22		8.19	
Secchi-depth (m)	---		1.0		1.9	
Chlorophyll a, phytoplankton (µg/L)	---		42		13	
Depth of sample (m)	0.5	15.0	0.5	14.0	0.5	15.0
Water temperature (°C)	1.6	2.3	9.3	9.0	23.1	14.4
Specific conductance (µS/cm)	620	916	637	640	582	609
pH (units)	8.0	7.2	8.1	8.1	7.9	7.5
Dissolved oxygen (mg/L)	13.8	0.1	11.1	10.8	8.9	1.2
Phosphorus, total (as P)	0.034	0.051	0.042	0.036	0.029	0.144
Phosphorus, ortho, dissolved (as P)	---	---	<0.002	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	0.078	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	0.133	---	---	---
Nitrogen, amm. + org., total (as N)	---	---	1.4	---	---	---
Nitrogen, total (as N)	---	---	1.45	---	---	---
Color (Pt-Co. scale)	---	---	40	---	---	---
Turbidity (NTU)	---	---	8.0	---	---	---
Hardness, (as $CaCO_3$)	---	---	235	---	---	---
Calcium, dissolved (Ca)	---	---	53	---	---	---
Magnesium, dissolved (Mg)	---	---	25	---	---	---
Sodium, dissolved (Na)	---	---	36	---	---	---
Potassium, dissolved (K)	---	---	3.2	---	---	---
Alkalinity, (as $CaCO_3$)	---	---	185	---	---	---
Sulfate, dissolved (SO_4)	---	---	32.1	---	---	---
Chloride, dissolved (Cl)	---	---	70.6	---	---	---
Silica, dissolved (SiO_2)	---	---	0.0	---	---	---
Solids, dissolved, at 180°C	---	---	370	---	---	---
Iron, dissolved (Fe) µg/L	---	---	10	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	0.7	---	---	---

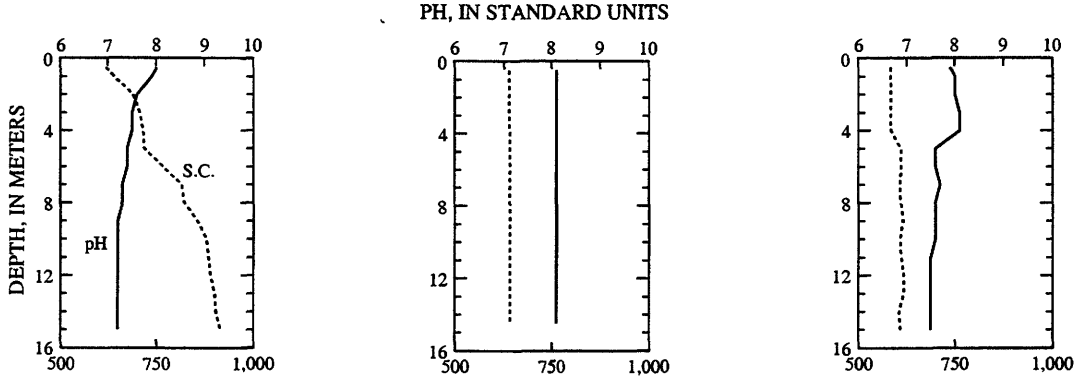
2-13-01 4-18-01 6-18-01

DISSOLVED OXYGEN (D.O.), IN MILLIGRAMS PER LITER



WATER TEMPERATURE (W.T.), IN DEGREES CELSIUS

PH, IN STANDARD UNITS



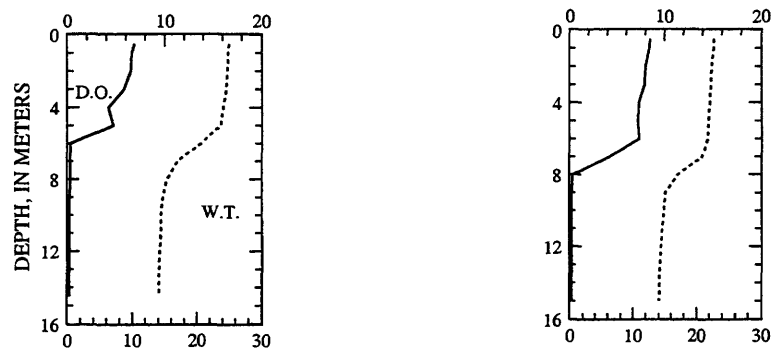
SPECIFIC CONDUCTANCE (S.C.), IN MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS

WATER-QUALITY DATA, JULY 18 TO AUGUST 20, 2001
(Milligrams per liter unless otherwise indicated)

	Jul-18					Aug-20				
Lake stage (ft)			7.96					7.91		
Secchi-depth (m)			1.0					0.75		
Chlorophyll a, phytoplankton (µg/L)			19					8		
Depth of sample (m)	0.5	5.0	9.0	12.0	14.0	0.5	7.0	8.0	9.0	15.0
Water temperature (°C)	25.0	23.7	14.7	14.2	14.1	22.8	20.9	17.1	15.1	14.1
Specific conductance (µS/cm)	578	590	638	640	647	563	573	624	640	649
pH (units)	7.9	7.9	7.7	7.7	7.6	8.1	7.8	7.1	7.1	7.0
Dissolved oxygen (mg/L)	6.9	4.7	0.2	0.2	0.2	8.5	4.2	0.3	0.2	0.2
Phosphorus, total (as P)	0.035	0.028	0.078	0.148	0.162	0.032	0.037	0.032	0.055	0.116
Phosphorus, ortho, dissolved (as P)	---	---	---	---	---	<0.002	---	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	---	---	---	<0.010	---	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	---	---	---	<0.013	---	---	---	---

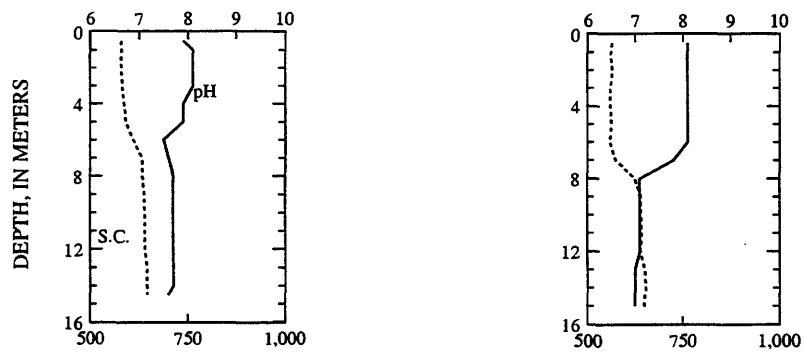
7-18-01 8-20-01

DISSOLVED OXYGEN (D.O.), IN MILLIGRAMS PER LITER

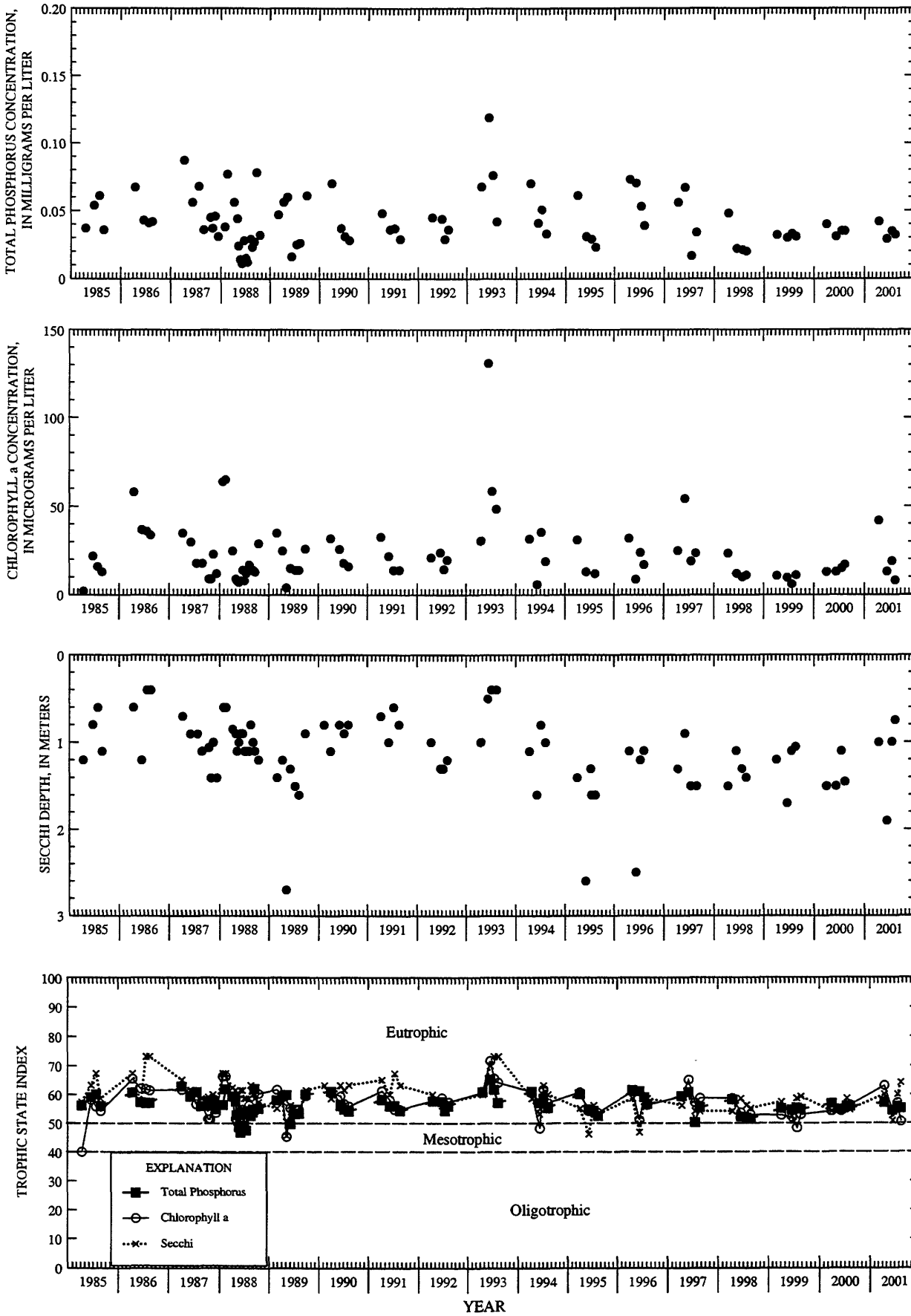


WATER TEMPERATURE (W.T.), IN DEGREES CELSIUS

PH, IN STANDARD UNITS



SPECIFIC CONDUCTANCE (S.C.), IN MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS



Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Wind Lake, Deep Hole, at Wind Lake, Wisconsin.

04082500 LAKE WINNEBAGO AT OSHKOSH, WI

LOCATION.--Lat 44°00'35", long 88°31'38", in NE 1/4 NE 1/4 sec.25, T.18 N., R.16 E., Winnebago County, Hydrologic Unit 04030203, at 905 Bay Shore Drive, 800 ft east of mouth of the upper Fox River.

DRAINAGE AREA.--5,880 mi^2, at lake outlet at Menasha Dam. Area of Lake Winnebago, 215 mi^2.

PERIOD OF RECORD.--October 1938 to current year in reports of Geological Survey. Records from July 1882 to September 1938 in files of Geological Survey and U.S. Army Corps of Engineers. A report on Fox River by U.S. Army Corps of Engineers, published as House Document No. 146, 67th Congress, 2nd session, contains semi-monthly records of inflow of Lake Winnebago for the period 1896-1917.

REVISED RECORD.--WDR WI-83-1: Drainage area.

GAGE.--Water-stage recorder. Nonrecording gage read once daily October 1938 to October 1978. Datum of gage is 745.05 ft above mean tide at New York City (levels by U.S. Army Corps of Engineers). Datum of Deuchman gage is 745.00 ft above mean tide at New York City.

REMARKS.--Lake elevations controlled by dams at Menasha and Neenah, which are operated in the interest of navigation. Crests of both dams are at elevation 746.73 ft. Present limits of regulation are from 21 1/4 in. above the crest of Menasha dam to crest during navigation season, plus additional 18 in. below crest during winter. Oshkosh staff gage gives true level of lake, while Deuchman gage readings are affected by loss of head in the channel between lake and dam. Data-collection platform and gage-height telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 5.33 ft (Deuchman gage) Nov. 8, 1881; minimum observed, -2.00 ft (Deuchman gage) Nov. 28, 1891.

EXTREMES FOR CURRENT YEAR.--Maximum daily mean gage height, 3.18 ft, June 4; minimum recorded, 1.45 ft, June 11.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.86	2.47	2.39	2.05	1.67	1.59	2.00	2.59	3.10	3.06	2.86	2.91
2	2.86	2.40	2.34	2.05	1.64	1.59	2.04	2.65	3.11	3.02	2.93	2.87
3	2.89	2.39	2.31	2.03	1.62	1.59	2.08	2.77	3.16	3.00	2.92	2.87
4	2.90	2.40	2.24	2.01	1.60	1.59	2.11	2.89	3.18	2.99	2.91	2.89
5	2.90	2.39	2.22	1.98	1.59	1.59	2.15	2.93	3.15	3.00	2.89	2.86
6	2.84	2.43	2.26	1.97	1.58	1.60	2.19	2.94	3.10	2.96	2.88	2.85
7	2.86	2.26	2.23	1.95	1.56	1.60	2.28	2.92	3.07	2.94	2.89	2.86
8	2.84	2.32	2.21	1.93	1.56	1.60	2.37	2.95	3.06	2.95	2.87	2.93
9	2.82	2.37	2.18	1.91	1.60	1.60	2.46	3.03	3.03	2.94	2.83	2.99
10	2.81	2.37	2.17	1.89	1.61	1.61	2.47	3.00	3.04	2.93	2.83	2.99
11	2.80	2.41	2.16	1.85	1.59	1.62	2.57	3.11	3.05	2.90	2.79	3.03
12	2.79	2.39	2.15	1.83	1.57	1.62	2.54	3.08	3.13	2.89	2.78	3.03
13	2.79	2.34	2.13	1.80	1.56	1.64	2.68	3.05	3.15	2.87	2.81	3.06
14	2.78	2.36	2.12	1.79	1.56	1.65	2.68	3.05	3.10	2.88	2.77	3.05
15	2.79	2.39	2.10	1.78	1.56	1.65	2.71	3.00	3.08	2.88	2.75	3.04
16	2.78	2.38	2.09	1.76	1.56	1.64	2.70	2.98	3.08	2.87	2.77	3.05
17	2.76	2.39	2.08	1.74	1.56	1.65	2.78	2.96	3.08	2.88	2.78	3.05
18	2.75	2.38	2.07	1.72	1.56	1.67	2.80	2.96	3.06	2.89	2.78	3.08
19	2.73	2.37	2.10	1.70	1.56	1.69	2.80	2.92	2.99	2.89	2.83	3.07
20	2.69	2.31	2.10	1.70	1.56	1.71	2.81	2.90	3.02	2.90	2.80	3.07
21	2.71	2.34	2.12	1.69	1.56	1.74	2.76	2.80	3.00	2.90	2.79	3.06
22	2.66	2.36	2.11	1.69	1.56	1.77	2.86	2.77	2.99	2.89	2.82	3.05
23	2.66	2.37	2.11	1.69	1.55	1.79	2.72	2.85	2.97	2.92	2.86	3.05
24	2.66	2.35	2.11	1.68	1.55	1.82	2.78	2.88	2.94	2.94	2.85	3.07
25	2.63	2.35	2.10	1.68	1.58	1.85	2.78	2.91	2.92	2.97	2.86	3.01
26	2.60	2.35	2.09	1.67	1.59	1.86	2.71	2.96	2.94	2.93	2.92	2.99
27	2.61	2.33	2.08	1.68	1.59	1.87	2.73	2.99	2.98	2.90	2.92	2.99
28	2.58	2.34	2.07	1.67	1.59	1.88	2.68	3.04	3.02	2.84	2.94	2.97
29	2.53	2.38	2.08	1.67	---	1.90	2.60	3.10	3.02	2.87	2.92	2.96
30	2.48	2.38	2.07	1.70	---	1.92	2.55	3.08	3.03	2.86	2.89	2.95
31	2.46	---	2.06	1.68	---	1.95	---	3.09	---	2.85	2.93	---
MEAN	2.74	2.37	2.15	1.80	1.58	1.70	2.55	2.94	3.05	2.92	2.85	2.99
MAX	2.90	2.47	2.39	2.05	1.67	1.95	2.86	3.11	3.18	3.06	2.94	3.08
MIN	2.46	2.26	2.06	1.67	1.55	1.59	2.00	2.59	2.92	2.84	2.75	2.85

04084255 LAKE WINNEBAGO NEAR STOCKBRIDGE, WI

LOCATION.--Lat 44°04'17", long 88°19'52", Stockbridge Indian Reservation, Calumet County, Hydrologic Unit 04030203, on east shore of Lake Winnebago, 300 ft south of County Highway E and 1.6 mi west of Stockbridge.

DRAINAGE AREA.--5,880 mi^2, at lake outlet at Menasha Dam. Area of Lake Winnebago, 215 mi^2.

PERIOD OF RECORD.--November 1982 to current year.

GAGE.--Water-stage recorder. Datum of gage is 745.05 ft above mean tide of New York City (levels by U. S. Army Corps of Engineers).

REMARKS.--Lake elevations controlled by dams at Menasha and Neenah, which are operated in the interest of navigation. Crests of both dams are at elevation 746.73 ft. Present limits of regulation are from 21 1/4 in. above the crest of Menasha dam to crest during navigation season, plus additional 18 in. below crest during winter. Data-collection platform and gage-height telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily mean gage height, 3.85 ft, July 9, 11, 1993; minimum observed, 0.30 ft, Mar. 1, 1986.

EXTREMES FOR CURRENT YEAR.--Maximum daily mean gage height, 3.11 ft, June 3, 12, 13; minimum recorded, 1.46 ft, Feb. 24.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.87	2.40	2.27	2.02	1.64	1.56	1.99	2.55	3.04	3.00	2.86	2.85
2	2.89	2.41	2.30	2.01	1.62	1.56	2.01	2.61	3.08	3.00	2.89	2.87
3	2.87	2.47	2.31	2.00	1.59	1.56	2.05	2.69	3.11	2.97	2.85	2.86
4	2.87	2.41	2.31	1.97	1.58	1.57	2.08	2.79	3.10	3.02	2.86	2.81
5	2.84	2.36	2.28	1.97	1.56	1.59	2.11	2.82	3.06	2.95	2.87	2.81
6	2.92	2.23	2.23	1.94	1.55	1.58	2.15	2.85	3.05	2.96	2.88	2.80
7	2.87	2.29	2.20	1.92	1.53	1.58	2.34	2.92	3.03	2.92	2.85	2.87
8	2.87	2.37	2.18	1.90	1.53	1.58	2.39	3.03	3.01	2.91	2.87	2.94
9	2.84	2.34	2.15	1.88	1.58	1.58	2.37	2.98	3.01	2.90	2.86	2.97
10	2.81	2.43	2.14	1.84	1.59	1.58	2.42	3.01	3.01	2.88	2.77	3.06
11	2.79	2.34	2.14	1.82	1.56	1.60	2.49	3.04	2.99	2.85	2.76	2.99
12	2.78	2.31	2.13	1.79	1.54	1.60	2.72	3.03	3.11	2.83	2.75	3.00
13	2.76	2.43	2.10	1.76	1.53	1.63	2.67	3.03	3.11	2.82	2.74	2.95
14	2.77	2.48	2.09	1.75	1.53	1.62	2.69	2.99	3.08	2.84	2.75	2.95
15	2.74	2.44	2.06	1.75	1.53	1.62	2.71	2.93	3.10	2.85	2.75	2.98
16	2.75	2.37	2.07	1.73	1.54	1.62	2.79	2.92	3.09	2.84	2.76	3.00
17	2.73	2.45	2.06	1.70	1.54	1.64	2.71	2.93	3.05	2.84	2.79	3.01
18	2.72	2.47	2.05	1.67	1.53	1.64	2.77	2.91	3.02	2.84	2.72	2.99
19	2.69	2.43	2.08	1.67	1.53	1.66	2.76	2.88	3.05	2.84	2.72	2.95
20	2.69	2.44	2.08	1.66	1.54	1.69	2.77	2.82	2.99	2.85	2.76	3.08
21	2.62	2.44	2.10	1.66	1.53	1.72	2.83	2.76	2.96	2.85	2.76	3.02
22	2.60	2.37	2.09	1.65	1.53	1.74	2.78	2.88	2.93	2.88	2.78	3.03
23	2.62	2.34	2.08	1.66	1.53	1.78	2.90	2.81	2.93	2.91	2.79	2.93
24	2.62	2.33	2.08	1.65	1.52	1.82	2.81	2.75	2.92	2.92	2.76	2.92
25	2.59	2.31	2.07	1.65	1.57	1.84	2.77	2.85	2.90	2.84	2.80	2.96
26	2.57	2.32	2.06	1.65	1.57	1.84	2.75	2.89	2.91	2.81	2.88	3.01
27	2.51	2.35	2.05	1.65	1.57	1.84	2.65	2.91	2.95	2.78	2.90	2.94
28	2.46	2.33	2.04	1.64	1.56	1.85	2.59	2.99	2.96	2.78	2.90	2.92
29	2.44	2.34	2.05	1.64	---	1.87	2.55	3.01	3.02	2.80	2.90	2.93
30	2.41	2.34	2.05	1.67	---	1.90	2.53	3.03	3.05	2.80	2.91	2.92
31	2.42	---	2.03	1.66	---	1.93	---	3.00	---	2.80	2.86	---
MEAN	2.71	2.38	2.13	1.77	1.55	1.68	2.54	2.89	3.02	2.87	2.82	2.94
MAX	2.92	2.48	2.31	2.02	1.64	1.93	2.90	3.04	3.11	3.02	2.91	3.08
MIN	2.41	2.23	2.03	1.64	1.52	1.56	1.99	2.55	2.90	2.78	2.72	2.80

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APPENDIX

Wisconsin Lakes Team
Quality-Assurance/Quality-Control Plan

Most lake studies and monitoring programs that are conducted by the USGS Wisconsin District entail water sampling and analysis to determine water quality and biological productivity. Because all sampling and analyses are subject to error and random variability, a certain proportion of the sampling effort should include quality-assurance/quality-control (QA/QC) samples. These samples are collected and/or prepared solely for the purpose of assessing the magnitude of error and random variability so that the accuracy and precision of all data can be evaluated. The plan for this quality-assurance sampling is described below.

Three types of QA/QC samples are collected:

1. Blanks - samples that provide information about accuracy and errors due to treatment or reagents.
2. Replicates - samples that provide information about precision (variability).
3. Standard additions (spikes) - samples that provide information about accuracy and matrix interferences.

Blank Sampling

At one randomly-chosen lake each month, a **field blank** is prepared. This consists of deionized water or inorganic blank water treated exactly the same as regular samples. During winter, the field blank is only analyzed for total phosphorus. During summer, it is analyzed for total phosphorus and chlorophyll a, and in the spring, it is analyzed for total and dissolved phosphorus, nitrate plus nitrite, total Kjeldahl nitrogen, and chlorophyll a.

Replicate Sampling

At selected lakes in the program, **triplicate samples** are taken near the water surface in summer for analysis of total phosphorus and chlorophyll a. At two of these lakes, a set of triplicate samples is also taken from near-bottom water, for analysis of total phosphorus.

At three selected lakes in the spring (different lakes each year), **triplicate samples** are taken near water surface for analysis of total and dissolved phosphorus, nitrate plus nitrite, total Kjeldahl nitrogen, and chlorophyll a.

Standard Addition Testing

At Delavan Lake and one other lake (to be determined each year), **5 replicate samples** are taken in August for **a standard addition (spike) test**. The spike consists of addition of a prepared phosphorus solution (standard) of known volume and concentration, such that the expected result of analysis is the natural water total phosphorus concentration plus the known addition. One sample from each set will receive a low-concentration spike, one will receive a high-concentration spike, and three will receive no spike (the mean of these gives the natural water total phosphorus concentration).

Data and results of replicate sampling and field blank testing are shown in Tables A1, A2, and A3.

Table A1. Analyses of replicate samples from Wisconsin lakes in water year 2001. See text for procedures used. All data except chlorophyll in milligrams per liter. (Symbol "<" indicates less than given detection limit (DL); --, not measured or not computed; mean and standard deviation not calculated for datasets containing values less than DL)

Total Phosphorus -- near surface

Lake	Date	Replicate Data				Mean	Standard Deviation	Percent Standard Deviation
Buffalo	July 24	0.276	0.275	0.277	--	0.276	0.001	0.4
Delavan	July 16	0.027	0.027	0.031	--	0.028	0.002	8.2
Delavan	August 20	0.031	0.027	0.035	--	0.031	0.004	12.9
Geneva	July 16	0.005	<0.005	<0.005	--	--	--	--
Little Green	July 24	0.069	0.074	0.072	--	0.072	0.003	3.5
Middle	June 18	0.012	0.012	0.017	0.016	0.014	0.003	18.5
Muskego	April 19	0.039	0.044	0.047	--	0.043	0.004	9.3
Muskego	July 26	0.030	0.031	0.031	--	0.031	0.001	1.9
Oconomowoc	July 18	0.010	0.011	0.010	--	0.010	0.001	5.6
Oconomowoc	August 24	0.011	0.010	0.009	--	0.010	0.001	10.0
Okauchee	August 21	0.013	0.015	0.015	--	0.014	0.001	8.1
Red Cedar	July 10	0.021	0.022	--	--	0.022	0.001	3.3

Total Phosphorus -- near bottom

Lake	Date	Replicate Data				Mean	Standard Deviation	Percent Standard Deviation
Geneva	July 16	0.017	0.020	0.021	--	0.019	0.002	10.8
Red Cedar	July 10	0.187	0.228	0.262	--	0.226	0.038	16.6

Dissolved Phosphorus -- near surface

Lake	Date	Replicate Data				Mean	Standard Deviation	Percent Standard Deviation
Delavan	July 16	0.010	<0.002	<0.007	--	--	--	--
Geneva	April 18	<0.002	<0.002	--	--	--	--	--
Oconomowoc	August 24	0.002	<0.002	<0.002	--	--	--	--

Dissolved Ammonia -- near surface

Lake	Date	Replicate Data				Mean	Standard Deviation	Percent Standard Deviation
Delavan	July 16	0.026	0.013	0.021	--	0.020	0.007	32.8
Geneva	April 18	0.014	0.022	--	--	0.018	0.006	31.4
Muskego	April 19	0.086	0.083	0.084	--	0.084	0.002	1.8
Oconomowoc	August 24	0.027	0.028	0.022	--	0.026	0.003	12.5

Total Kjeldahl Nitrogen -- near surface

Lake	Date	Replicate Data				Mean	Standard Deviation	Percent Standard Deviation
Delavan	July 16	0.560	0.580	0.560	--	0.567	0.012	2.0
Geneva	April 18	0.390	0.390	--	--	0.390	0.000	0.0
Muskego	April 19	1.200	1.100	1.200	--	1.167	0.058	4.9
Oconomowoc	August 24	0.490	0.500	0.520	--	0.503	0.015	3.0

Dissolved Nitrate plus Nitrite -- near surface

Lake	Date	Replicate Data				Mean	Standard Deviation	Percent Standard Deviation
Delavan	July 16	0.014	0.008	0.007	--	0.010	0.004	39.2
Geneva	April 18	0.113	0.115	--	--	0.114	0.001	1.2
Muskego	April 19	0.102	0.103	0.104	--	0.103	0.001	1.0
Oconomowoc	August 24	0.370	0.371	0.369	--	0.370	0.001	0.3

Chlorophyll *a* -- near surface (micrograms per liter)

Lake	Date	Replicate Data				Mean	Standard Deviation	Percent Standard Deviation
Buffalo	July 24	14.0	16.0	17.0	--	15.7	1.5	9.8
Delavan	July 16	4.9	4.0	4.8	--	4.6	0.5	10.8
Geneva	July 16	<1.0	<1.0	1.1	--	--	--	--
Little Green	July 24	23.0	24.0	24.0	--	23.7	0.6	2.4
Middle	June 18	1.6	4.7	--	--	3.2	2.2	69.6
Muskego	July 26	6.6	3.2	3.2	--	4.3	2.0	45.3
Oconomowoc	July 18	2.6	2.8	2.3	--	2.6	0.3	9.8
Okauchee	August 21	8.0	8.0	8.0	--	8.0	0.0	0.0
Powers	July 26	4.8	5.0	5.5	--	5.1	0.4	7.1
Red Cedar	July 10	5.2	3.7	--	--	4.5	1.1	23.8

Table A2. Data from tests of blanks, Delavan Lake project, 2001. Analyses at U.S. Geological Survey National Water-Quality Laboratory, Lakewood, CO. All data in milligrams per liter. (<, less than given detection limit; E, estimated value; –, not measured)

Constituent	February 20	April 18	July 16
Total phosphorus	E 0.003	< 0.004	< 0.004
Dissolved orthophosphate	–	–	< 0.007
Chlorophyll *a*	< 0.1	< 0.1	–
Chlorophyll *b*	< 0.1	–	–
Total Kjeldahl nitrogen (as N)	–	–	< 0.08
Ammonia (as N)	–	–	< 0.02
Nitrate plus nitrite (as N)	–	–	< 0.05

Table A3. Data from standard addition tests using stock solution containing 5.00 mg/L phosphorus. See text for detail of procedures. All concentration data in milligrams per liter

Lake, Date	Original Sample Concentration	Stock Solution Volume	Final Expected Concentration	Actual Detected Concentration	Percent Recovery
Delavan, 20 August 2001	0.031	0.125	0.036	0.046	128
	0.031	0.500	0.051	0.055	108
Okauchee, 21 August 2001	0.014	0.125	0.017	0.025	147
	0.014	0.300	0.026	0.031	119