Water-Quality and Lake-Stage Data for Wisconsin Lakes, Water Year 1998

U.S. GEOLOGICAL SURVEY
Open-File Report 99–98

Prepared in cooperation with the
State of Wisconsin and local agencies

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WATER-QUALITY AND LAKE-STAGE DATA FOR WISCONSIN LAKES, WATER YEAR 1998

By Wisconsin District Lake-Studies Team

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Prepared in cooperation with
THE STATE OF WISCONSIN AND OTHER AGENCIES

Middleton, Wisconsin
1999

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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 1998

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 location of water-quality and lake-stage stations in Wisconsin for water year 1998 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, 1997 through September 30, 1998 is called "water year 1998."

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 usually included for lakes with two or more years of data. 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, 1998."

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 1998 included:

Benedict/Tombeau Lake District
Big Muskego Lake 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
Little Cedar Lake Protection and Rehabilitation District
Little Green Lake Protection and Rehabilitation District
Little Muskego Lake Protection and Rehabilitation District
Middle Genesee Lake District
Montello Lake Inland Protection and Rehabilitation District
Okauchee Lake Management District
Potters Lake Protection and Rehabilitation District
Powers Lake District
Rock County Public Works Department
Town of Auburn
Town of Casey (McKenzie Lakes Association)
Town of Delavan (Delavan Lake)
Town of Namekagon (Namekagon Lakes Association)
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 1998 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 J. Chaplin, G.L. Goddard, J.J. Hanig, D.E. Housner, S.B. Marsh, E.A. Mergener, D.L. Olson, 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
near Birchwood	453907091345800	Mar. 1993–Aug. 1994, Mar. 1996–Aug. 1997
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
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
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
Booth Lake near East Troy	424800088254800	Feb. 1992–Aug. 1994
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
Hemlock Lake near Mikana	453421091333700	Mar. 1993–Aug. 1994, Mar. 1996–Aug. 1997
Hooker Lake at Salem	423335088060300	Feb. 1992–Aug. 1993
Kirby Lake near Cumberland	453554092042101	Nov. 1995–Oct. 1996
Balsam Lake, (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, Center, at Oconomowoc	430733088305900	Feb. 1984–Aug. 1985, Feb.–Sept. 1991
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	4309570088183400	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
Middle at Lauderdale	424621088335500	Nov. 1993–Nov. 1994
Mill at Lauderdale	424555088335700	Nov. 1993–Nov. 1994
Legend Lake (site 1) near Shawano	445342088312700	Feb. 1990–Feb. 1992
Little Rock Lake near Woodruff	455946089415702	Oct. 1983–Sept. 1996
Little St. Germain, Northeast Bay, near St. Germain	455545089262500	Apr. 1991–Aug. 1994, Aug. 1996–Aug. 1997
South Bay, near St. Germain	455437089270800	Apr. 1991–Aug. 1994, Aug. 1996–Aug. 1997
West Bay, at St. Germain	455428089282400	Apr. 1991–Aug. 1994, Aug. 1996–Aug. 1997
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
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
Moon Lake near St. Germain	455504089260500	Feb. 1992–Aug. 1996
Moshawquit Lake near Shawano	445352088295800	Feb. 1990–Aug. 1992
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
Pretty Lake, at Deep Hole, near Dousman	425722088295000	Feb. 1993–Aug. 1997
Red Cedar Lake, Deep Hole, near Mikana	453725091345100	Mar. 1993–Aug. 1994, Mar. 1996–Aug. 1997
South End, at Mikana	453519091352500	Mar. 1993–Aug. 1994, Mar. 1996–Aug. 1997
Rice Lake at Deep Hole near Whitewater	424629088415700	Apr.–Nov. 1991

Table 1. Discontinued lake stations

Station name	Site identification number	Period of record
Round Lake near Shawano	445328088335000	Feb. 1990–Aug. 1992
Sand Lake (Deep Hole) near Keshena	445321088323101	June–Aug. 1992
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
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
Watosah-skice Lake near Keshena	445330088361400	Feb. 1990–Aug. 1992
Waubeesee Lake at Wind Lake	424857088101500	Feb. 1988–Aug. 1989, Feb. 1991–Aug. 1996
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
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 National Water Data Storage and Retrieval System (WATSTORE). Information about access of WATSTORE data is available in the data report: "Water Resources Data – Wisconsin, 1998". WATSTORE parameter codes and minimum concentration reporting limits 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. WATSTORE parameter codes, minimun reporting limits (MRL), and laboratory identifying codes for chemical parameters commonly measured in lakes, and analyzed at the National Water Quality Laboratory (NWQL) or the Wisconsin State Laboratory of Hygiene (WSLH)

Parameter Name	Units	Parameter Code	NWQL MRL	NWQL Lab Code	WSLH MRL	WSLH Lab Code	Remarks
Calcium, dissolved (Ca)	mg/L	00915	0.02	659	0.02	I230IUD	
Magnesium, dissolved (Mg)	mg/L	00925	0.004	663	0.02	I390IUD	
Sodium, dissolved (Na)	mg/L	00930	0.1	675	0.09	I80IUD	
Potassium, dissolved (K)	mg/L	00935	0.1	54	0.3	I540IUD	
Sulfate, dissolved (SO_4)	mg/L	00945	0.1	1572	1.0	I600DLD	
Chloride, dissolved (Cl)	mg/L	00940	0.1	1571	0.1	I240ELD	
Fluoride, dissolved (F)	mg/L	00950	0.1	2002	0.03	I330FLD	
Silica, dissolved (SiO_2)	mg/L	00955	0.1	56	0.008	I560LLD	
Nitrogen, NO_2+NO_3, diss(as N)	mg/L	00631	0.005	1979	0.01	I460MLD	
Nitrogen, ammonia, dissolved (as N)	mg/L	00608	0.002	1980	0.013	I440NLD	
Nitrogen, organic, total (as N)	mg/L						1
Nitrogen, total Kjeldahl nitrogen (as N)	mg/L	00625	0.1	1986	0.2	I470BLT	2
Nitrogen, total (as N)	mg/L						3
Phosphorus, total (as P)	mg/L	00665	0.001	1982	0.005	I520PLT	
Phosphorus, ortho, dissolved (as P)	mg/L	00671	0.001	1978	0.002	I530ALD	
Iron, dissolved (Fe)	µg/L	01046	10	645	10	I370IUD	
Manganese, dissolved (Mn)	µg/L	01056	4	648	0.4	I400IUD	
Chlorophyll *a*	µg/L	70953	0.1	586		I250UNF	

1 Calculated as difference between total ammonia + organic nitrogen (TKN) and ammonia nitrogen
2 Also known as Total Kjeldahl Nitrogen (TKN) calculated as total ammonia + organic nitrogen
3 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. 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 hypereutrophic.

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

423201088180800 BENEDICT LAKE NEAR POWERS LAKE, WI

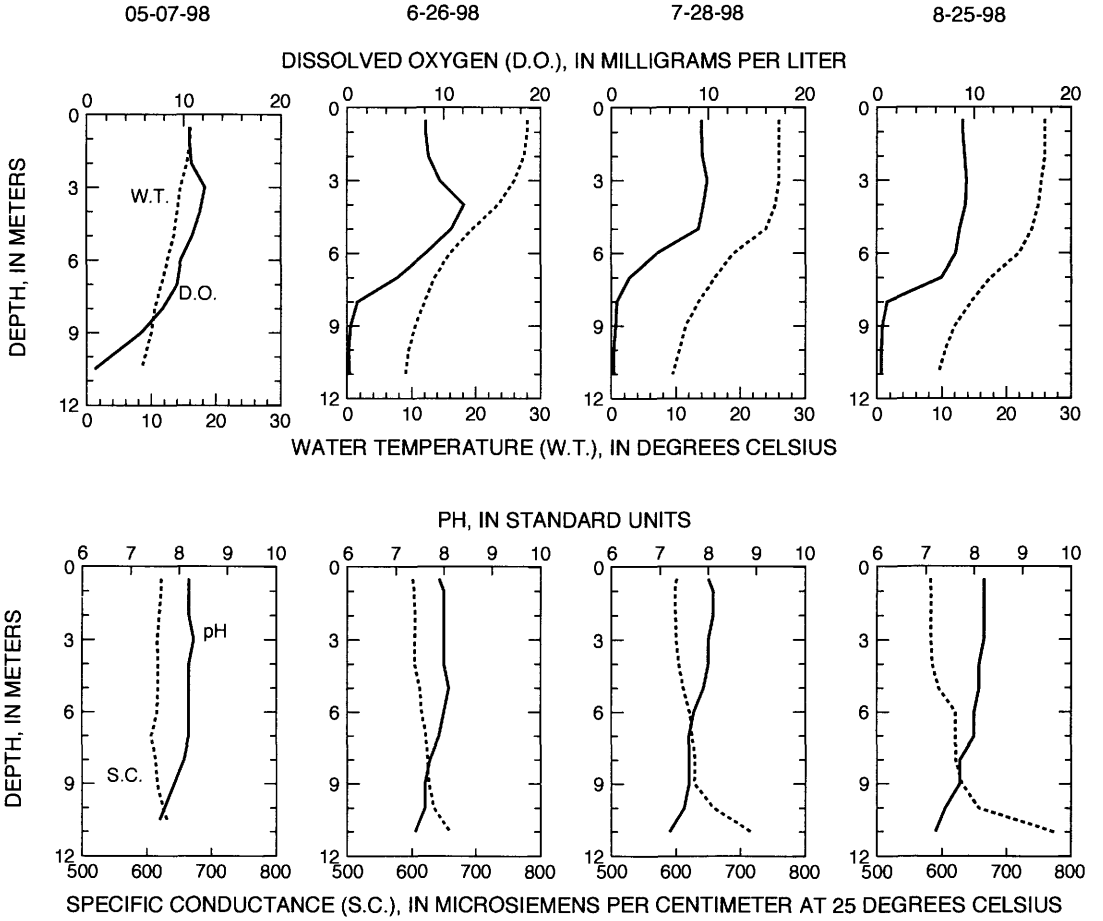
LOCATION.--Lat 42°32'01", long 88°18'08", in NW 1/4 NW 1/4 sec.19, T.1 N., R.19 E., Kenosha County, Hydrologic Unit 07120006, 1.4 mi southwest of Powers Lake.

PERIOD OF RECORD.--May to August 1998.

REMARKS.--Lake sampled near center at deep hole. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, MAY 07 TO AUGUST 25, 1998
(Milligrams per liter unless otherwise indicated)

	May 07		June 26		July 28		Aug. 25		
Lake stage (ft)	826.26		826.22		825.95		825.89		
Secchi-depth (meters)	1.7		1.9		1.9		2.7		
Chlorophyll a, phytoplankton (µg/L)	8.53		1.79		2.96		1.93		
Depth of sample (m)	0.5	10.5	0.5	11	0.5	11	0.5	9	11
Water temperature (°C)	16.0	8.6	28.1	9	25.9	9.3	25.8	11.8	9.5
Specific conductance (µS/cm)	622	631	601	659	601	716	582	631	774
pH (units)	8.2	7.6	7.9	7.4	8.0	7.2	8.2	7.7	7.2
Dissolved oxygen	10.6	0.8	8.1	0.2	9.3	0.2	8.8	0.5	0.4
Phosphorus, total (as P)	0.014	0.024	0.007	0.119	0.010	0.069	0.013	0.052	0.152
Phosphorus, ortho, dissolved (as P)	<0.002	---	---	---	0.002	---	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	0.625	---	---	---	0.377	---	---	---	---
Nitrogen, ammonia, dissolved (as N)	0.117	---	---	---	0.098	---	---	---	---
Nitrogen, amm. + org., total (as N)	0.08	---	---	---	0.58	---	---	---	---
Nitrogen, total (as N)	0.71	---	---	---	0.96	---	---	---	---
Color (Pt-Co. scale)	15	---	---	---	---	---	---	---	---
Turbidity (NTU)	3.6	---	---	---	---	---	---	---	---
Hardness, as CaCO3	260	---	---	---	---	---	---	---	---
Calcium, dissolved (Ca)	46	---	---	---	---	---	---	---	---
Magnesium, dissolved (Mg)	36	---	---	---	---	---	---	---	---
Sodium, dissolved (Na)	25	---	---	---	---	---	---	---	---
Potassium, dissolved (K)	2.3	---	---	---	---	---	---	---	---
Alkalinity, as CaCO3	215	---	---	---	---	---	---	---	---
Sulfate, dissolved (SO4)	33	---	---	---	---	---	---	---	---
Chloride, dissolved (Cl)	56	---	---	---	---	---	---	---	---
Silica, dissolved (SiO2)	3.3	---	---	---	---	---	---	---	---
Solids, dissolved, at 180°C	374	---	---	---	---	---	---	---	---
Iron, dissolved (Fe) µg/L	<10	---	---	---	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	< 0.4	---	---	---	---	---	---	---	---



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, 10.94 ft, Oct. 6, 1995; minimum observed, 8.16 ft, Jan. 26, 1996.

EXTREMES FOR CURRENT YEAR.--Maximum gage height observed, 10.74 ft, May 13 and June 15; minimum observed, 8.50 ft, Feb. 18, 21.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10.52	10.62	9.42	8.88	---	---	10.02	10.46	10.62	10.54	10.46	10.58
2	10.56	10.62	9.40	8.84	---	---	10.10	10.48	10.68	10.56	10.44	10.52
3	10.56	10.62	9.38	---	---	---	10.14	10.46	10.62	10.58	10.46	10.52
4	10.58	10.55	9.36	---	8.56	8.56	10.18	10.44	10.54	10.56	10.44	10.52
5	10.58	10.50	9.36	---	---	---	10.24	10.42	---	10.52	10.46	10.52
6	10.58	10.42	9.34	---	---	---	10.26	10.44	10.50	10.54	10.48	10.52
7	10.70	10.36	9.34	8.70	8.58	8.58	10.32	10.44	10.50	10.52	10.52	10.52
8	10.70	10.30	9.30	---	---	---	10.32	10.50	10.48	10.54	10.54	10.50
9	10.72	10.24	9.28	---	---	---	10.32	10.62	10.48	10.54	10.54	10.50
10	10.64	10.20	9.26	8.66	---	---	10.34	10.62	10.50	10.52	10.60	10.48
11	10.60	10.16	9.24	---	8.56	8.72	10.34	10.60	10.52	10.50	10.60	10.46
12	10.54	10.08	9.22	---	---	---	10.36	10.60	10.68	10.48	10.60	10.46
13	10.62	10.04	9.20	---	---	---	10.40	10.74	10.70	10.44	10.60	10.50
14	10.64	10.00	9.18	8.66	8.52	8.90	10.40	10.68	10.68	10.44	10.58	10.52
15	10.58	9.96	---	---	---	---	10.42	10.64	10.74	10.46	10.58	10.56
16	10.54	9.92	---	---	---	---	10.42	10.60	10.70	10.46	10.58	10.52
17	10.52	9.86	---	8.64	---	---	10.40	10.58	10.70	10.44	10.66	10.50
18	10.50	9.80	---	---	8.50	9.12	10.38	10.56	10.68	10.44	10.64	10.50
19	10.50	9.76	---	---	---	---	10.40	10.56	10.64	10.44	10.62	10.52
20	10.52	9.72	---	---	---	---	10.40	10.54	10.60	10.46	10.60	10.52
21	10.52	9.70	---	8.60	8.50	9.22	10.40	10.50	10.54	10.46	10.58	10.50
22	10.50	9.70	9.04	---	---	---	10.40	10.44	10.54	10.44	10.56	10.50
23	10.48	9.66	9.00	---	---	---	10.40	10.44	10.52	10.42	10.62	10.48
24	10.52	9.62	9.00	8.62	---	---	10.40	10.42	10.54	10.40	10.62	10.48
25	10.54	9.58	9.00	---	8.52	9.38	10.40	10.44	10.54	10.40	10.62	10.48
26	10.54	9.54	8.98	---	---	---	10.40	10.44	10.54	10.42	10.62	10.52
27	10.54	9.52	8.94	---	---	---	10.44	10.50	10.56	10.42	10.62	10.52
28	10.56	9.50	8.92	8.60	8.54	9.62	10.44	10.54	10.64	10.42	10.64	10.52
29	10.56	9.46	8.90	---	---	9.72	10.44	10.54	10.60	10.42	10.60	10.52
30	10.54	9.44	8.88	---	---	9.82	10.46	10.54	10.58	10.42	10.60	10.58
31	10.58	---	8.90	8.58	---	9.88	---	10.62	---	10.40	10.58	---
MEAN	10.57	9.98	---	---	---	---	10.34	10.53	---	10.47	10.57	10.51
MAX	10.72	10.62	---	---	---	---	10.46	10.74	---	10.58	10.66	10.58
MIN	10.48	9.44	---	---	---	---	10.02	10.42	---	10.40	10.44	10.46

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.--1986 to 1996, and October 1997 to September 1998, 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, 6.09 ft, May 7 and Sept. 15, 1991; minimum observed, 4.78 ft, Sept. 15, 16, 1988.

EXTREMES FOR CURRENT YEAR.--Maximum gage height observed, 5.88 ft, June 27; minimum observed, less than 5.00 ft, Sept. 26-30 (stages below 5.00 ft cannot be measured from reference point).

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.56	5.44	---	---	---	---	---	5.69	5.72	5.79	5.37	5.21
2	5.55	5.45	---	---	---	---	---	5.68	5.71	5.77	5.37	5.17
3	5.53	5.45	---	---	---	---	---	5.67	5.69	5.76	5.37	5.16
4	5.51	5.45	---	---	---	---	---	5.66	5.67	5.73	5.36	5.14
5	5.50	5.45	---	---	---	---	---	5.66	5.66	5.72	5.34	5.14
6	5.57	5.44	---	---	---	---	---	5.66	5.65	5.72	5.31	5.13
7	5.59	5.43	---	---	---	---	---	5.67	5.65	5.74	5.34	5.11
8	5.61	5.42	---	---	---	---	---	5.66	5.64	5.73	5.32	5.10
9	5.64	5.42	---	---	---	---	---	5.64	5.63	5.71	5.29	5.09
10	5.65	5.42	---	---	---	---	---	5.63	5.63	5.71	5.29	5.07
11	5.65	5.41	---	---	---	---	---	5.62	5.62	5.7	5.28	5.04
12	5.65	5.40	---	---	---	---	---	5.61	5.67	5.69	5.26	5.03
13	5.63	5.40	---	---	---	---	---	5.66	5.68	5.67	5.23	5.03
14	5.70	5.37	---	---	---	---	---	5.65	5.69	5.66	5.22	5.02
15	5.70	5.37	---	---	---	---	---	5.71	5.68	5.67	5.21	5.02
16	5.63	5.37	---	---	---	---	---	5.72	5.67	5.65	5.21	5.01
17	5.61	5.36	---	---	---	---	---	5.72	5.67	5.64	5.27	5.01
18	5.61	5.35	---	---	---	---	---	5.73	5.69	5.62	5.28	5.00
19	5.58	5.32	---	---	---	---	---	5.73	5.74	5.59	5.26	5.00
20	5.56	5.26	---	---	---	---	---	5.71	5.77	5.58	5.29	5.00
21	5.54	5.23	---	---	---	---	---	5.69	5.76	5.57	5.27	5.00
22	5.52	---	---	---	---	---	---	5.68	5.74	5.55	5.29	5.00
23	5.51	---	---	---	---	---	---	5.67	5.73	5.5	5.31	5.00
24	5.50	---	---	---	---	---	---	5.65	5.79	5.48	5.31	5.00
25	5.47	---	---	---	---	---	---	5.63	5.88	5.47	5.29	5.00
26	5.45	---	---	---	---	---	---	5.62	5.86	5.47	5.27	<5.00
27	5.44	---	---	---	---	---	---	5.61	5.88	5.47	5.28	<5.00
28	5.43	---	---	---	---	---	---	5.62	5.86	5.45	5.26	<5.00
29	5.42	---	---	---	---	---	---	5.61	5.84	5.45	5.25	<5.00
30	5.41	---	---	---	---	---	---	5.71	5.80	5.41	5.24	<5.00
31	5.43	---	---	---	---	---	---	5.72	---	5.38	5.23	---
MEAN	5.55	---	---	---	---	---	---	5.67	5.72	5.61	5.29	---
MAX	5.70	---	---	---	---	---	---	5.73	5.88	5.79	5.37	---
MIN	5.41	---	---	---	---	---	---	5.61	5.62	5.38	5.21	---

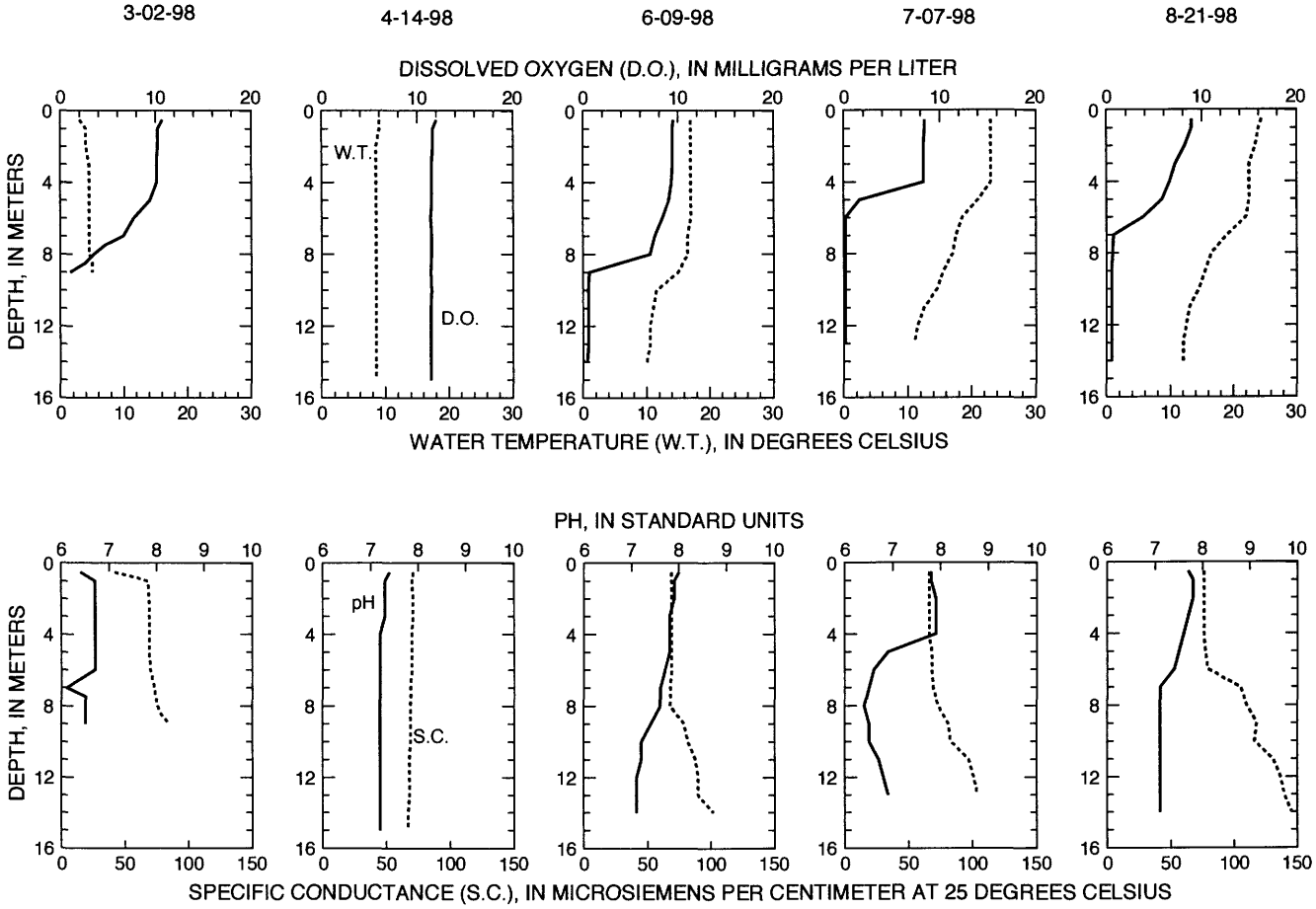
WATER-QUALITY RECORDS

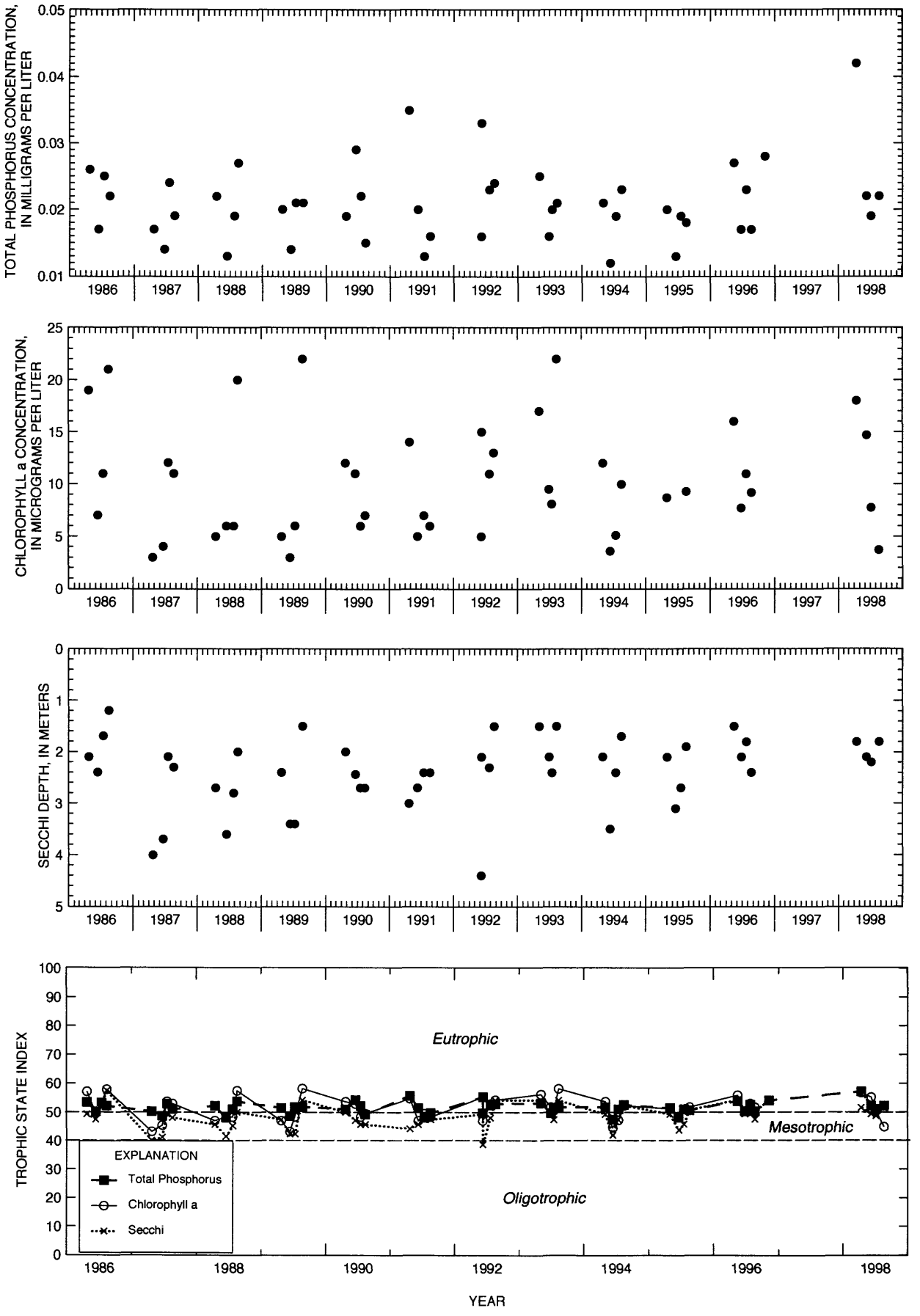
PERIOD OF RECORD.--1986 to 1996, and March to August 1998.

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

WATER-QUALITY DATA, MARCH 02 TO AUGUST 21, 1998
(Milligrams per liter unless otherwise indicated)

	Mar. 02		Apr. 14		June 09		July 07		Aug. 21		
Lake stage (ft)	---		5.88		5.65		5.71		5.29		
Secchi-depth (meters)	---		1.8		2.1		2.2		1.8		
Chlorophyll a, phytoplankton (µg/L)	---		18.0		14.7		7.75		3.71		
Depth of sample (m)	0.5	9.0	0.5	15.0	0.5	14.0	0.5	13.0	0.5	8.0	14.0
Water temperature (°C)	3.0	5.0	8.8	8.5	16.9	10.1	22.8	11.2	24.4	16.5	12.1
Specific conductance (µS/cm)	42	85	71	67	69	102	66	104	76	110	140
pH (units)	6.4	6.5	7.4	7.2	8.0	7.1	7.8	6.9	7.7	7.1	7.1
Dissolved oxygen	10.7	1.0	12.0	11.4	9.5	0.4	8.4	0.1	8.9	0.5	0.6
Phosphorus, total (as P)	0.486	0.655	0.042	0.039	0.022	0.188	0.019	0.095	0.022	0.147	0.234
Phosphorus, ortho, dissolved (as P)	---	---	0.005	---	---	---	<0.002	---	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	0.043	---	---	---	<0.010	0.020	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	<0.013	---	---	---	<0.013	0.705	---	---	---
Nitrogen, amm. + org., total (as N)	---	---	0.40	---	---	---	0.56	1.4	---	---	---
Nitrogen, total (as N)	---	---	0.44	---	---	---	---	1.4	---	---	---
Color (Pt-Co. scale)	---	---	35	---	---	---	---	---	---	---	---
Turbidity (NTU)	---	---	3.3	---	---	---	---	---	---	---	---
Hardness, as CaCO3	---	---	31	---	---	---	---	---	---	---	---
Calcium, dissolved (Ca)	---	---	8.0	---	---	---	---	---	---	---	---
Magnesium, dissolved (Mg)	---	---	2.6	---	---	---	---	---	---	---	---
Sodium, dissolved (Na)	---	---	1.5	---	---	---	---	---	---	---	---
Potassium, dissolved (K)	---	---	0.8	---	---	---	---	---	---	---	---
Alkalinity, as CaCO3	---	---	31	---	---	---	---	---	---	---	---
Sulfate, dissolved (SO4)	---	---	<1.5	---	---	---	---	---	---	---	---
Chloride, dissolved (Cl)	---	---	0.8	---	---	---	---	---	---	---	---
Silica, dissolved (SiO2)	---	---	7.2	---	---	---	---	---	---	---	---
Solids, dissolved, at 180°C	---	---	50	---	---	---	---	---	---	---	---
Iron, dissolved (Fe) µg/L	---	---	230	---	---	---	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	73	---	---	---	---	---	---	---	---





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Big Sissabagama 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.

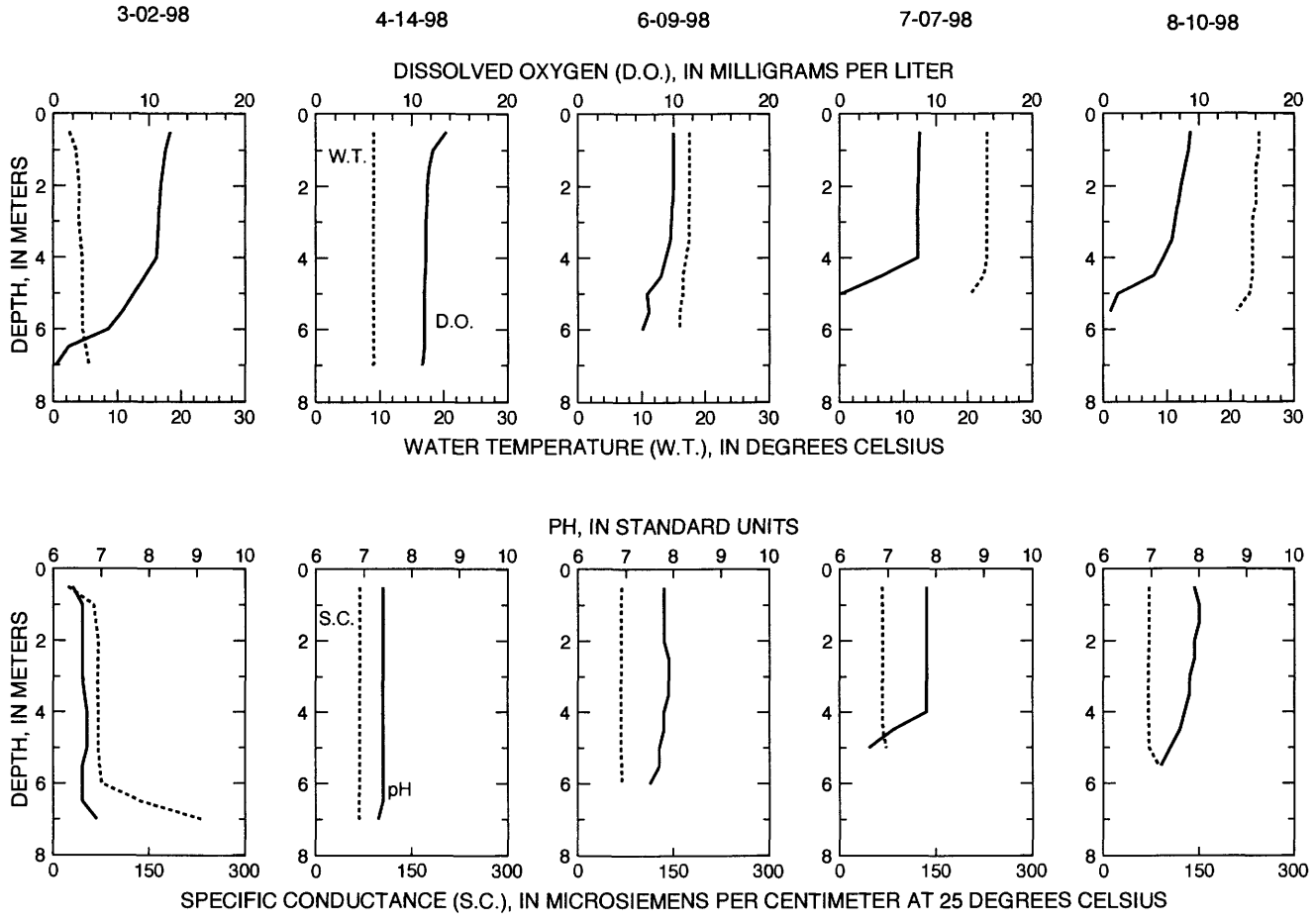
DRAINAGE AREA.--9.47 mi^2.

PERIOD OF RECORD.--March to August 1998.

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

WATER-QUALITY DATA, MARCH 02 TO AUGUST 10, 1998
(Milligrams per liter unless otherwise indicated)

	Mar. 02		Apr. 14	June 09	July 07		Aug. 10	
Lake stage (ft)	---		5.88	5.65	5.71		5.29	
Secchi-depth (meters)	---		2.2	2.4	2.1		2.1	
Chlorophyll a, phytoplankton (µg/L)	---		10.6	7.32	6.83		3.87	
Depth of sample (m)	0.5	7.0	0.5	0.5	0.5	5.0	0.5	5.5
Water temperature (°C)	2.4	5.7	9.1	17.5	22.8	20.4	24.6	20.8
Specific conductance (µS/cm)	23	231	68	68	66	72	71	87
pH (units)	6.4	6.9	7.4	7.8	7.8	6.6	7.9	7.2
Dissolved oxygen	12.2	0.2	13.6	10.0	8.3	0.1	9.1	0.7
Phosphorus, total (as P)	0.469	0.187	0.032	0.017	0.019	0.032	0.020	0.046



434558089260600 BUFFALO LAKE, CENTER SITE, AT PACKWAUKEE, WI

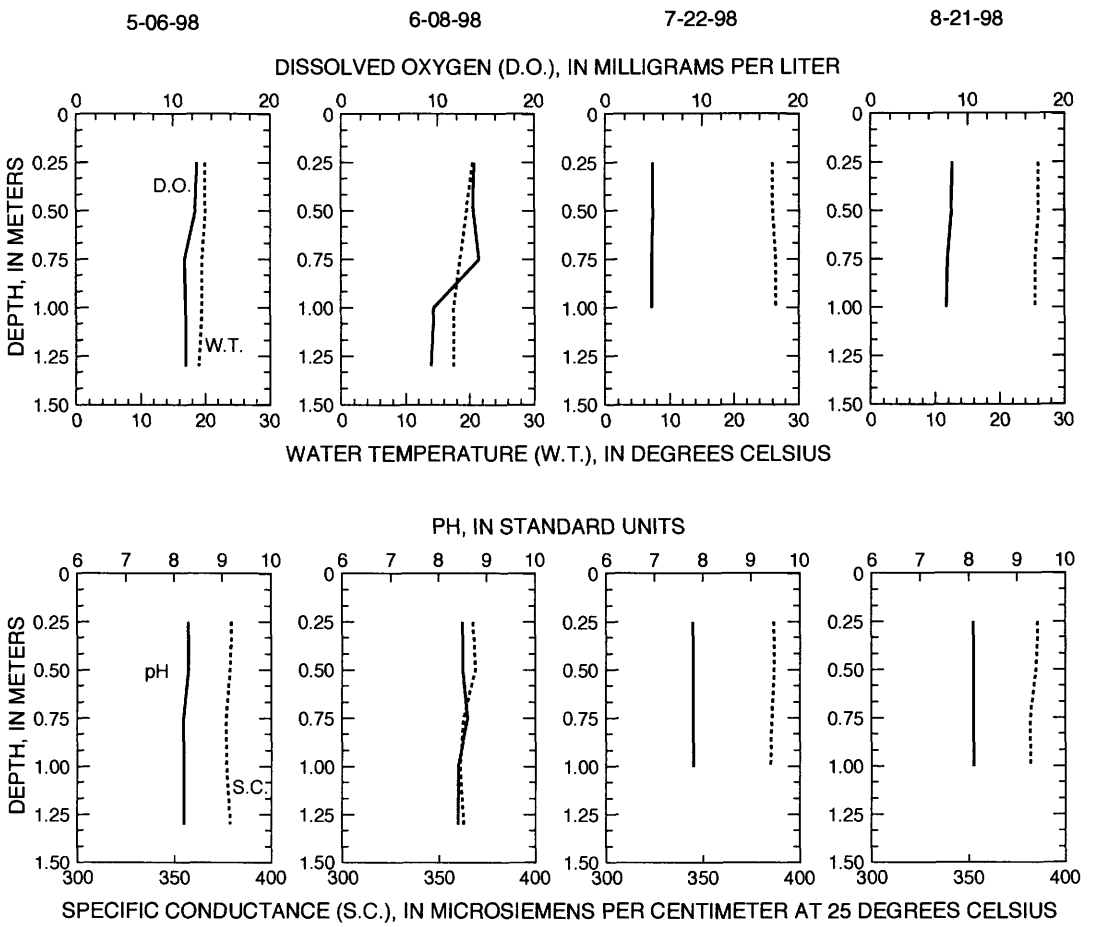
LOCATION.--Lat 43°45'58", long 89°26'06", in NW 1/4 SE 1/4 sec.21, T.15 N., R.9 E., Marquette County, Hydrologic Unit 04030201, 1.1 mi northeast of Packwaukee.

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

REMARKS.--Site sampled near center of lake. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, MAY 06 TO AUGUST 21, 1998
(Milligrams per liter unless otherwise indicated)

	May 06	June 08	July 22	Aug. 21
Lake stage (ft)	89.32	89.56	89.58	89.58
Secchi-depth (meters)	0.8	0.7	0.8	1.1
Chlorophyll a, phytoplankton (µg/L)	42.6	40.9	18.1	8.58
Depth of sample (m)	0.5	0.5	0.5	0.5
Water temperature (°C)	20.1	19.6	26.2	25.9
Specific conductance (µS/cm)	379	369	387	385
pH (units)	8.3	8.5	7.8	8.1
Dissolved oxygen	12.3	13.7	4.9	8.3
Phosphorus, total (as P)	0.074	0.082	0.246	0.171
Phosphorus, ortho, dissolved (as P)	0.006	---	0.151	---
Nitrogen, NO2 + NO3, diss. (as N)	0.413	---	0.035	---
Nitrogen, ammonia, dissolved (as N)	0.016	---	0.171	---
Nitrogen, amm. + org., total (as N)	1.1	---	1.4	---
Nitrogen, total (as N)	1.5	---	1.4	---
Color (Pt-Co. scale)	50	---	---	---
Turbidity (NTU)	5.3	---	---	---
Hardness, as CaCO3	190	---	---	---
Calcium, dissolved (Ca)	40	---	---	---
Magnesium, dissolved (Mg)	22	---	---	---
Sodium, dissolved (Na)	4.8	---	---	---
Potassium, dissolved (K)	1.2	---	---	---
Alkalinity, as CaCO3	179	---	---	---
Sulfate, dissolved (SO4)	9.0	---	---	---
Chloride, dissolved (Cl)	9.1	---	---	---
Silica, dissolved (SiO2)	5.9	---	---	---
Solids, dissolved, at 180°C	234	---	---	---
Iron, dissolved (Fe) µg/L	30	---	---	---
Manganese, dissolved (Mn) µg/L	14	---	---	---

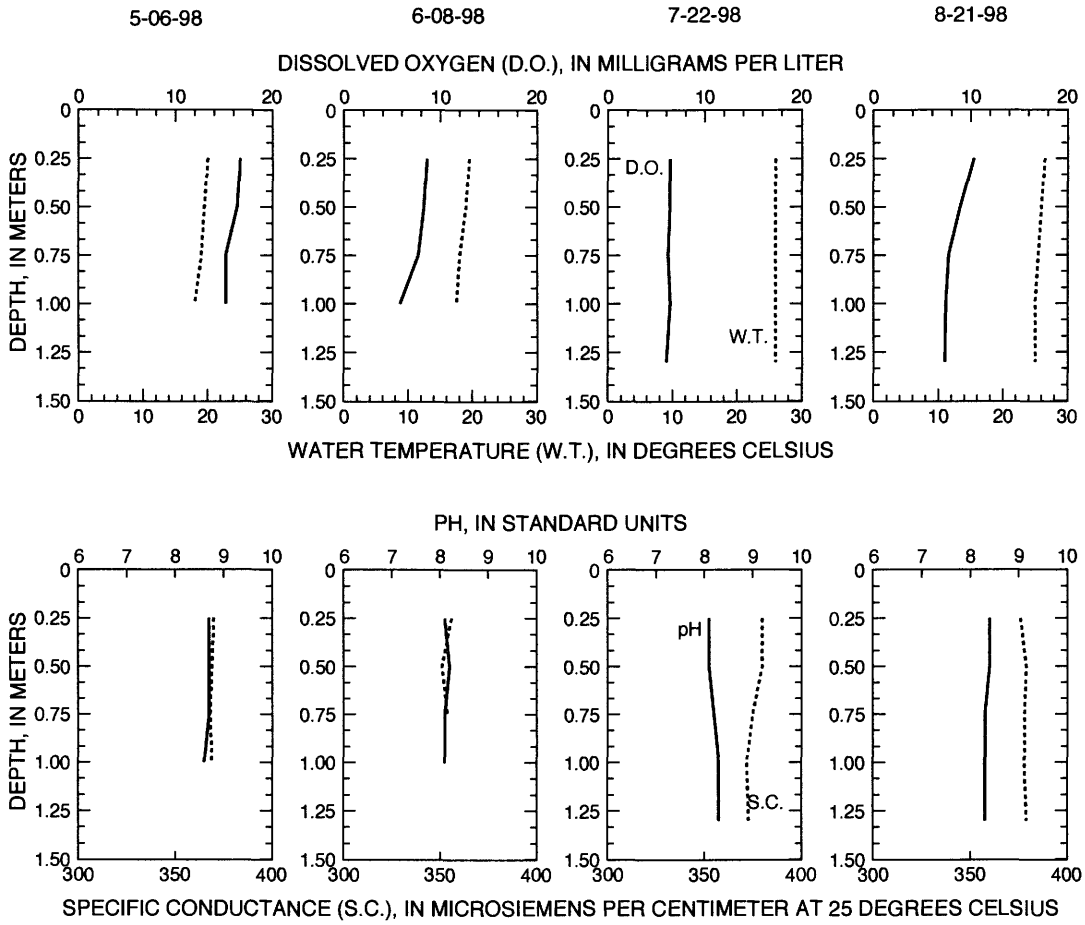


434720089201600 BUFFALO LAKE, EAST END, AT MONTELLO, WI

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 to August 1998. Data collected 1991-94 by Wisconsin Department of Natural Resources are available.
REMARKS.--Site sampled at east end of lake. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, MAY 06 TO AUGUST 21, 1998
(Milligrams per liter unless otherwise indicated)

	May 06	June 08	July 22	Aug. 21
Lake stage (ft)	89.32	89.56	89.58	89.58
Secchi-depth (meters)	0.7	0.7	0.6	0.6
Chlorophyll a, phytoplankton (µg/L)	49.6	23.9	102	35.2
Depth of sample (m)	0.5	0.5	0.5	0.5
Water temperature (°C)	19.7	18.8	26.2	26.0
Specific conductance (µS/cm)	369	351	380	379
pH (units)	8.7	8.2	8.1	8.4
Dissolved oxygen	16.4	8.3	6.4	8.9
Phosphorus, total (as P)	0.074	0.087	0.319	0.205



434414089282400 BUFFALO LAKE, WEST END, NEAR ENDEAVOR, WI

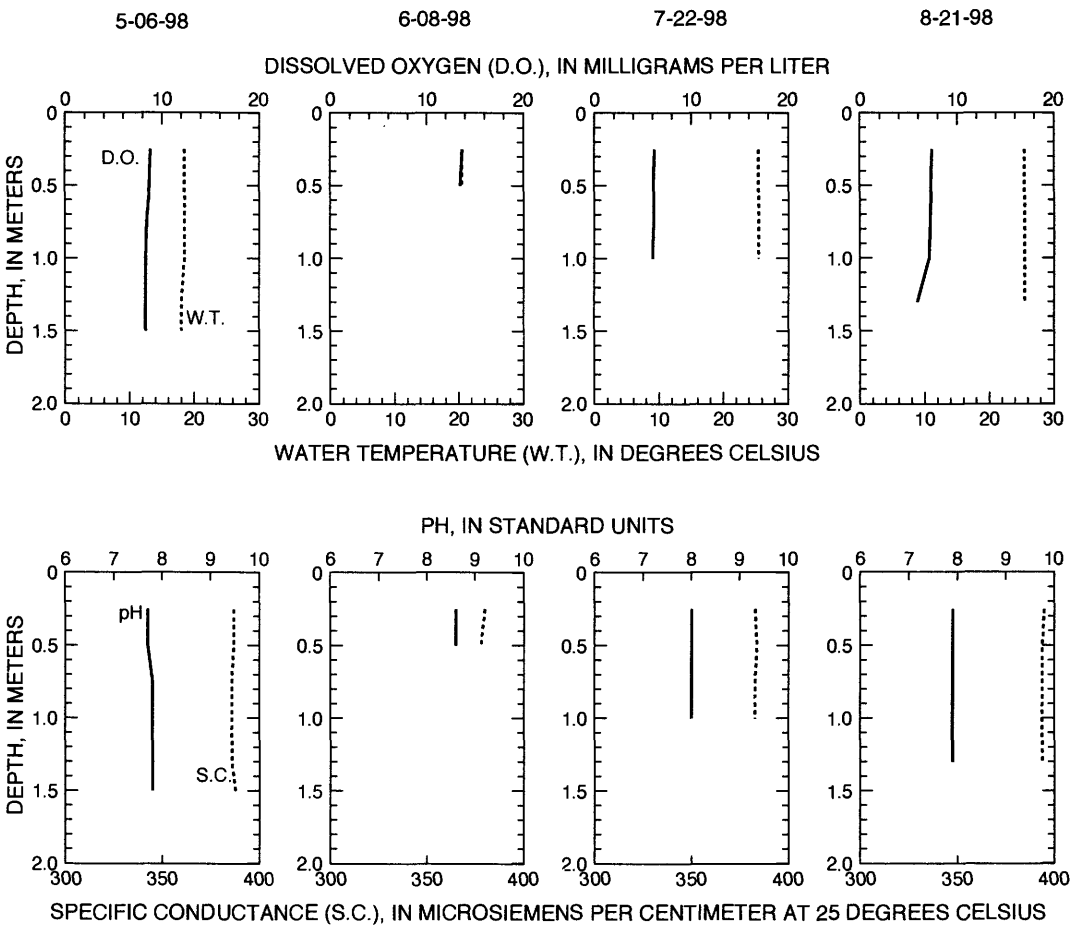
LOCATION.--Lat 43°44'14", long 89°28'24", in NW 1/4 SE 1/4 sec.31, T.15 N., R.9 E., Marquette County, Hydrologic Unit 04030201, 1.5 mi north of Endeavor.

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

REMARKS.--Site sampled near west end of lake. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, MAY 06 TO AUGUST 21, 1998
(Milligrams per liter unless otherwise indicated)

	May 06	June 08	July 22	Aug. 21
Lake stage (ft)	89.32	89.56	89.58	89.58
Secchi-depth (meters)	0.7	0.5	0.8	0.8
Chlorophyll a, phytoplankton (µg/L)	34.3	19.7	25.8	9.46
Depth of sample (m)	0.5	0.5	0.5	0.5
Water temperature (°C)	18.3	20.7	25.4	25.5
Specific conductance (µS/cm)	387	378	384	394
pH (units)	7.7	8.6	8.0	7.9
Dissolved oxygen	8.7	13.5	6.1	7.3
Phosphorus, total (as P)	0.108	0.115	0.193	0.142



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.--No estimated daily gage heights. Records good. Lake was ice covered from Jan. 11 to Feb. 26. Lake levels controlled by Delavan Lake Sanitary District.

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, 5.33 ft, June 28; minimum, 4.78 ft, Oct. 26.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.90	4.83	4.90	4.97	5.00	4.97	5.12	4.96	5.10	4.98	4.89	4.94
2	4.89	4.82	4.91	4.96	5.02	4.96	5.11	4.97	5.07	4.98	4.87	4.93
3	4.89	4.82	4.93	4.96	5.03	4.96	5.08	4.98	5.04	5.00	4.86	4.91
4	4.88	4.83	4.95	5.02	5.03	4.96	5.03	4.98	5.01	5.07	4.88	4.91
5	4.88	4.83	4.96	5.10	5.02	4.97	4.98	4.97	4.98	5.07	4.98	4.90
6	4.87	4.85	4.96	5.16	5.01	4.98	4.94	4.99	4.97	5.06	5.15	4.89
7	4.87	4.85	4.96	5.20	4.99	4.98	4.95	5.11	4.96	5.05	5.03	4.98
8	4.86	4.85	4.96	5.21	4.97	5.02	5.02	5.25	4.95	5.03	5.04	4.98
9	4.86	4.85	4.97	5.20	4.96	5.08	5.08	5.21	4.96	5.02	5.03	4.97
10	4.85	4.85	5.00	5.15	4.96	5.06	5.07	5.13	4.98	5.02	5.01	4.96
11	4.84	4.84	5.01	5.09	5.00	5.06	5.04	5.06	5.02	5.02	4.99	4.94
12	4.84	4.84	5.01	5.04	5.08	5.04	4.99	4.99	5.08	5.02	4.98	4.92
13	4.87	4.83	5.00	4.99	5.09	5.03	4.99	5.03	5.12	5.02	4.97	4.91
14	4.87	4.83	5.00	4.97	5.06	5.01	5.02	5.03	5.10	5.01	4.97	4.97
15	4.86	4.85	5.00	4.98	5.02	5.00	5.03	5.03	5.06	4.99	4.97	5.04
16	4.84	4.85	5.00	4.98	4.99	4.99	5.06	5.02	5.01	4.98	4.96	5.06
17	4.84	4.84	5.00	4.98	5.02	4.98	5.04	4.99	4.96	4.97	4.96	5.06
18	4.83	4.84	5.01	4.99	5.01	5.03	5.01	4.97	4.97	4.96	4.94	5.06
19	4.82	4.83	5.01	4.99	4.98	5.07	5.00	4.97	5.03	4.97	4.93	5.05
20	4.81	4.83	5.01	4.99	4.98	5.07	5.01	4.97	5.02	4.97	4.92	5.04
21	4.80	4.83	5.01	5.00	4.98	5.05	5.05	4.97	5.00	5.01	4.91	5.03
22	4.79	4.83	5.02	5.01	4.98	5.03	5.07	4.96	4.97	5.02	4.92	5.02
23	4.79	4.83	5.01	5.02	4.97	5.01	5.05	4.97	4.94	5.02	4.92	5.00
24	4.80	4.83	5.01	5.01	4.98	5.00	5.02	5.01	4.92	5.01	4.92	4.99
25	4.80	4.82	5.03	5.00	4.97	4.98	4.99	5.03	4.93	4.99	4.95	4.98
26	4.81	4.82	5.02	4.98	4.96	4.98	4.99	5.03	5.10	4.98	4.95	4.98
27	4.83	4.83	5.00	4.98	4.98	4.99	4.96	5.02	5.09	4.96	4.94	4.96
28	4.82	4.85	4.99	4.98	4.98	5.00	4.94	5.07	5.27	4.95	4.96	4.96
29	4.82	4.87	4.99	4.99	---	4.99	4.94	5.13	5.25	4.93	4.97	4.96
30	4.82	4.90	4.98	4.99	---	4.98	4.95	5.12	5.09	4.92	4.96	4.96
31	4.82	---	4.98	5.00	---	5.06	---	5.12	---	4.90	4.95	---
MEAN	4.84	4.84	4.99	5.03	5.00	5.01	5.02	5.03	5.03	5.00	4.96	4.98
MAX	4.90	4.90	5.03	5.21	5.09	5.08	5.12	5.25	5.27	5.07	5.15	5.06
MIN	4.79	4.82	4.90	4.96	4.96	4.96	4.94	4.96	4.92	4.90	4.86	4.89

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.

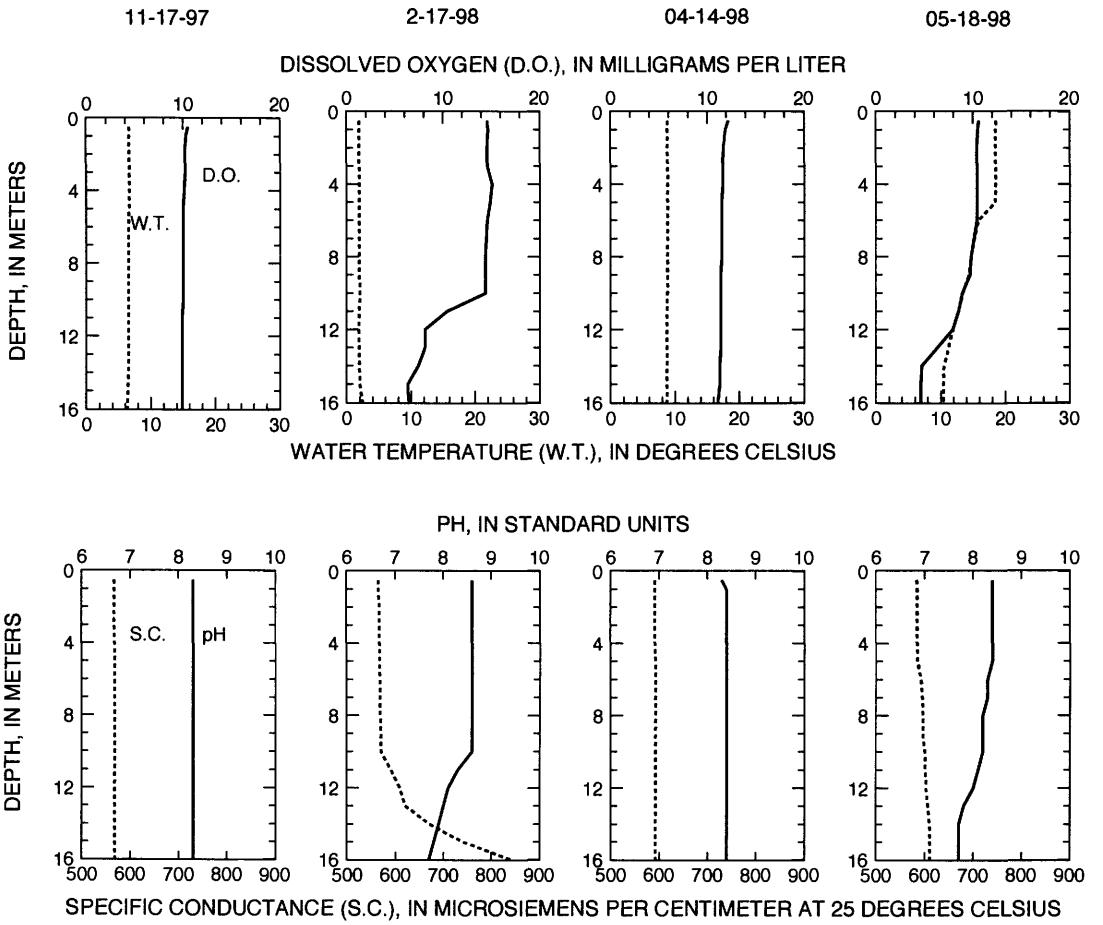
DRAINAGE AREA.--41.4 mi^2, of which 2.3 mi^2 is non-contributing.

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.

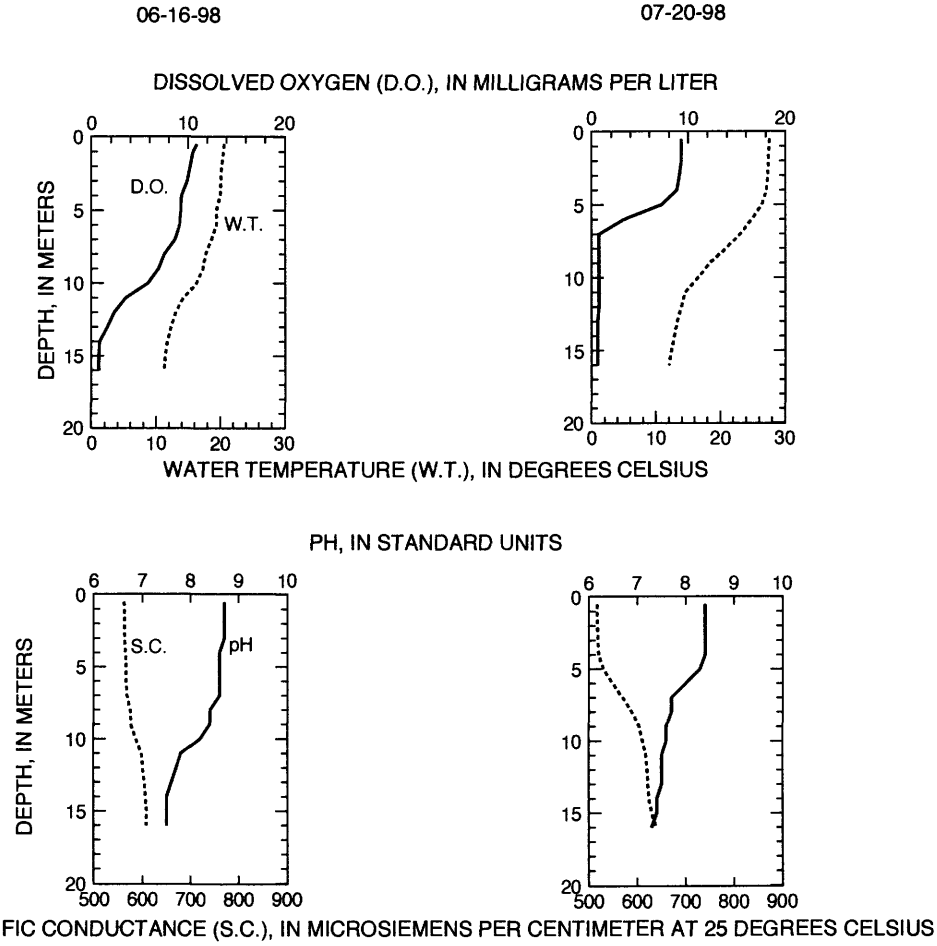
WATER-QUALITY DATA, NOVEMBER 17, 1997 TO MAY 18, 1998
(Milligrams per liter unless otherwise indicated)

	Nov. 17		Feb. 17		Apr. 14		May 18			
Lake stage (ft)	4.84		5.02		5.02		4.97			
Secchi-depth (meters)	5.0		1.8		4.4		6.6			
Chlorophyll a, phytoplankton (µg/L)	0.59		24.0		0.87		1.2			
Depth of sample (m)	0.5	16.3	0.5	15.0	0.5	16.0	0.5	5.0	12.0	16.0
Water temperature (°C)	6.6	6.3	1.9	2.0	8.8	8.6	18.6	18.4	11.9	10.4
Specific conductance (µS/cm)	566	568	565	740	591	592	584	585	603	610
pH (units)	8.3	8.3	8.6	7.8	8.3	8.4	8.4	8.4	8.0	7.7
Dissolved oxygen	10.5	9.8	14.6	6.3	12.2	11.1	10.6	10.4	7.9	4.6
Phosphorus, total (as P)	0.120	0.121	0.112	0.111	0.086	0.074	0.051	0.050	0.094	0.166
Phosphorus, ortho, dissolved (as P)	0.092	---	0.050	0.083	0.042	0.046	0.010	0.020	0.059	---
Nitrogen, NO2 + NO3, diss. (as N)	0.123	---	0.179	---	0.207	0.210	0.207	---	---	---
Nitrogen, ammonia, dissolved (as N)	0.119	---	<0.002	---	0.077	0.091	0.028	---	---	---
Nitrogen, amm. + org., total (as N)	0.63	---	0.75	---	0.76	0.80	0.56	---	---	---
Nitrogen, total (as N)	0.75	---	0.93	---	0.97	1.00	0.77	---	---	---
Color (Pt-Co. scale)	---	---	---	---	11	12	---	---	---	---
Turbidity (NTU)	---	---	---	---	1.0	1.4	---	---	---	---
Hardness, as CaCO3	---	---	---	---	249	250	---	---	---	---
Calcium, dissolved (Ca)	---	---	---	---	46	46	---	---	---	---
Magnesium, dissolved (Mg)	---	---	---	---	32	33	---	---	---	---
Sodium, dissolved (Na)	---	---	---	---	25	24	---	---	---	---
Potassium, dissolved (K)	---	---	---	---	3	3	---	---	---	---
Alkalinity, as CaCO3	---	---	---	---	190	189	---	---	---	---
Sulfate, dissolved (SO4)	---	---	---	---	31	31	---	---	---	---
Chloride, dissolved (Cl)	---	---	---	---	58	59	---	---	---	---
Fluoride, dissolved (F)	---	---	---	---	141	145	---	---	---	---
Silica, dissolved (SiO2)	---	---	---	---	0.2	0.2	---	---	---	---
Solids, dissolved, at 180°C	---	---	---	---	329	329	---	---	---	---
Iron, dissolved (Fe) µg/L	---	---	---	---	<10	<10	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	---	---	<0.40	4.2	---	---	---	---



WATER-QUALITY DATA, JUNE 16 TO JULY 20, 1998
(Milligrams per liter unless otherwise indicated)

	June 16				July 20			
Lake stage (ft)			5.01				4.97	
Secchi-depth (meters)			4.3				2.7	
Chlorophyll a, phytoplankton (µg/L)			8.2				3.1	
Depth of sample (m)	0.5	6.0	13.0	16.0	0.5	5.0	13.0	16.0
Water temperature (°C)	20.6	19.4	12.3	11.2	27.6	26.4	13.3	12.0
Specific conductance (µS/cm)	562	566	604	608	516	529	622	639
pH (units)	8.7	8.6	7.6	7.5	8.4	8.3	7.5	7.3
Dissolved oxygen	10.9	9.1	1.6	0.7	9.3	7.2	0.6	0.6
Phosphorus, total (as P)	0.062	0.040	0.186	0.175	0.028	0.027	0.447	1.019
Phosphorus, ortho, dissolved (as P)	0.010	0.009	0.107	0.251	0.004	0.002	0.427	0.662
Nitrogen, NO2 + NO3, diss. (as N)	0.016	---	---	---	<0.005	---	---	---
Nitrogen, ammonia, dissolved (as N)	0.034	---	---	---	0.020	---	---	---
Nitrogen, amm. + org., total (as N)	0.87	---	---	---	0.78	---	---	---
Nitrogen, total (as N)	0.89	---	---	---	0.78	---	---	---

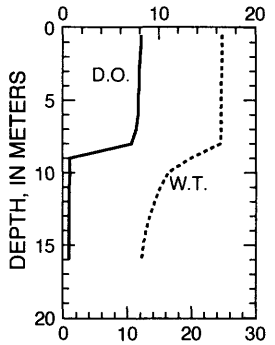


WATER-QUALITY DATA, AUGUST 18, 1998
(Milligrams per liter unless otherwise indicated)

	Aug. 18							
Lake stage (ft)				4.94				
Secchi-depth (meters)				2.6				
Chlorophyll a, phytoplankton (µg/L)				5.8				
Depth of sample (m)	0.5	4.0	8.0	9.0	11.0	13.0	15	16.0
Water temperature (°C)	24.8	24.7	24.6	20.0	15.2	13.5	12.5	12.2
Specific conductance (µS/cm)	518	518	521	589	611	626	638	655
pH (units)	8.4	8.4	8.4	7.7	7.7	7.6	7.5	7.4
Dissolved oxygen	8.1	7.9	7.1	0.7	0.6	0.6	0.6	0.6
Phosphorus, total (as P)	0.041	0.027	0.025	0.138	0.459	0.626	0.653	0.928
Phosphorus, ortho, dissolved (as P)	<0.001	---	<0.001	0.097	---	---	---	0.804
Nitrogen, NO2 + NO3, diss. (as N)	<0.005	---	---	---	---	---	---	---
Nitrogen, ammonia, dissolved (as N)	0.008	---	---	---	---	---	---	---
Nitrogen, amm. + org., total (as N)	0.61	---	---	---	---	---	---	---
Nitrogen, total (as N)	0.61	---	---	---	---	---	---	---

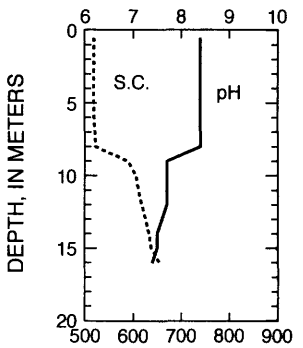
08-18-98

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



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

PH, IN STANDARD UNITS



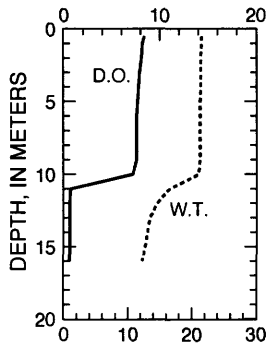
SPECIFIC CONDUCTANCE (S.C.), IN MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS

WATER-QUALITY DATA, SEPTEMBER 23, 1998
(Milligrams per liter unless otherwise indicated)

	Sept. 23			
Lake stage (ft)		5.00		
Secchi-depth (meters)		3.3		
Chlorophyll a, phytoplankton (µg/L)		6.2		
Depth of sample (m)	0.5	10.0	13.0	16.0
Water temperature (°C)	21.5	21.1	13.5	12.3
Specific conductance (µS/cm)	525	530	637	662
pH (units)	8.5	8.4	7.4	7.2
Dissolved oxygen	8.4	7.2	0.6	0.6
Phosphorus, total (as P)	0.030	0.032	0.653	0.861
Phosphorus, ortho, dissolved (as P)	<0.001	0.004	0.583	0.721
Nitrogen, NO2 + NO3, diss. (as N)	0.007	---	---	---
Nitrogen, ammonia, dissolved (as N)	<0.002	---	---	---
Nitrogen, amm. + org., total (as N)	0.68	---	---	---
Nitrogen, total (as N)	0.68	---	---	---

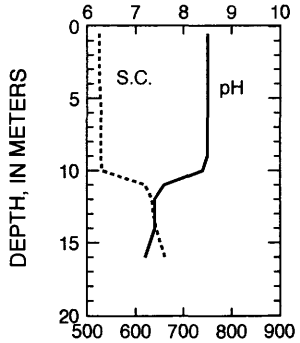
09-23-98

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

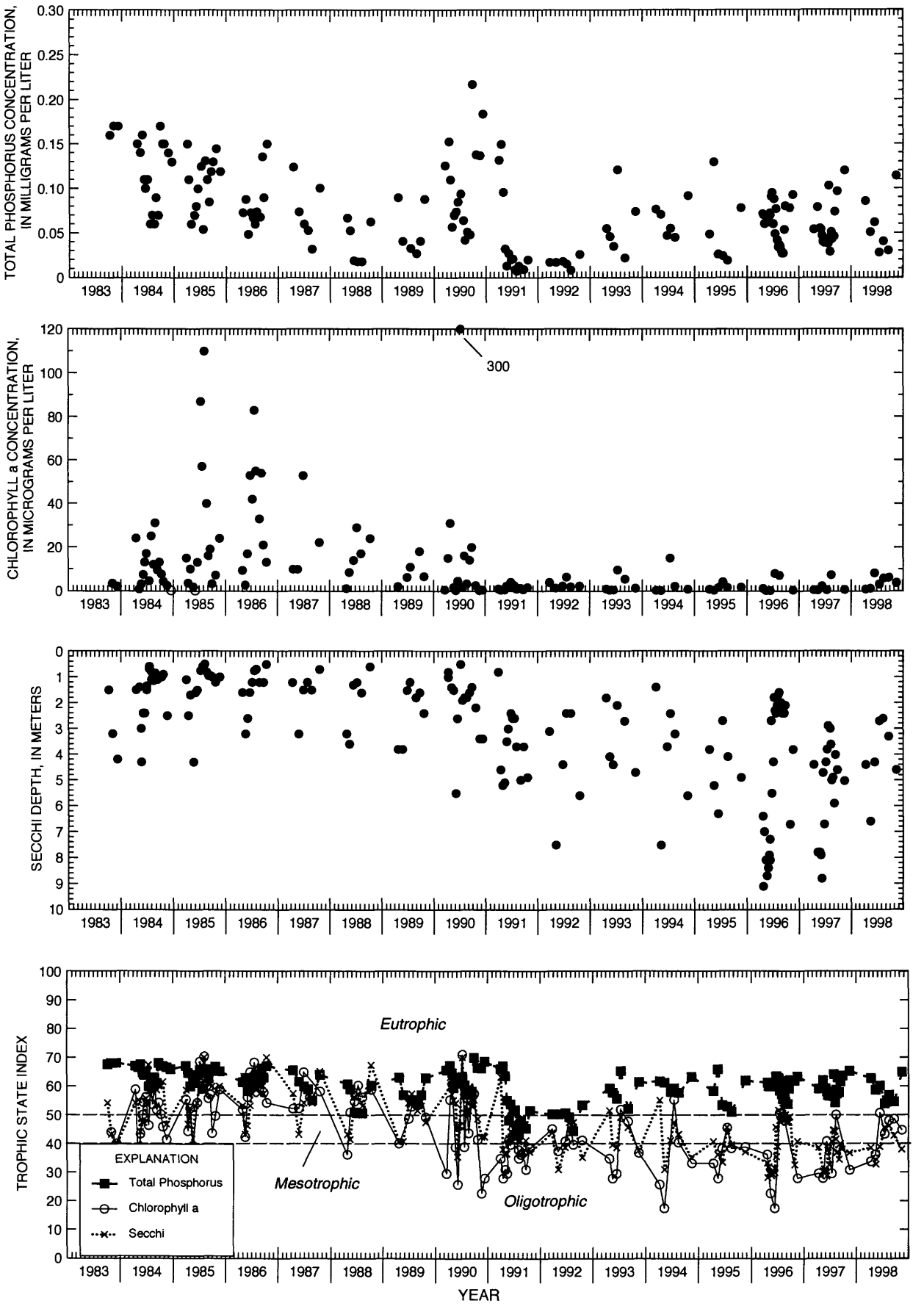


WATER TEMPERATURE (W.T.), IN DEGREES CELSIUS

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 3, 1997 TO SEPTEMBER 28, 1998
(Milligrams per liter unless otherwise indicated)

	Oct. 3	Oct. 7	Oct. 16	Oct. 20	Oct. 29	Apr. 24	Apr. 29	May 6
Lake stage (ft)	4.89	4.87	4.84	4.81	4.82	5.02	4.94	4.99
Secchi-depth (meters)	4.7	4.1	5.2	5.2	4.3	9.0	10.7	7.3
Depth of sample (meters)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Water temperature (°c)	17.5	18.5	16.5	14.5	11.0	10.8	11.0	13.5
Phosphorus, total (as P)	0.119	0.120	0.126	0.121	0.121	0.069	0.075	0.074

	May 19	May 27	June 1	June 8	June 22	June 29	July 13
Lake stage (ft)	4.97	5.02	5.10	4.95	4.97	5.25	5.02
Secchi-depth (meters)	7.9	3.4	5.3	5.0	4.1	3.1	3.3
Depth of sample (meters)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Water temperature (°c)	20.5	20.2	20.5	18.8	23.5	26.5	26.0
Phosphorus, total (as P)	0.045	0.039	0.045	0.036	0.043	0.036	0.033

	July 20					July 22				
Lake stage (ft)			4.97					5.02		
Secchi-depth (meters)			3.8					3.0		
Depth of sample (meters)	0.5	5.0	7.0	9.0	11.0	0.5	5.0	7.0	9.0	11.0
Water temperature (°c)	28.0	---	---	---	---	27.0	---	---	---	---
Phosphorus, total (as P)	0.023	0.026	0.039	0.028	0.212	0.026	0.026	<0.005	0.041	0.227
Phosphorus,ortho,dissolved (as P)	0.005	0.003	0.003	0.002	0.167	0.005	0.003	0.002	0.014	0.193

	July 27	Aug. 3	Aug. 10	Aug. 17	Aug. 24	Aug. 31				
Lake stage (ft)	4.96	4.86	5.01	4.96	4.92			4.95		
Secchi-depth (meters)	2.1	1.5	2.7	2.7	2.7			2.4		
Depth of sample (meters)	0.5	0.5	0.5	0.5	0.5	0.5	6.0	8.0	10.0	12.0
Water temperature (°c)	25.0	25.0	26.0	25.0	25.0	25.5	---	---	---	---
Phosphorus, total (as P)	0.027	0.025	0.022	0.028	0.027	0.026	0.021	0.019	0.647	0.810
Phosphorus,ortho,dissolved (as P)	---	---	---	---	---	0.005	0.002	<0.002	0.600	0.770

	Sept. 8					Sept. 15				
Lake stage (ft)			4.98					5.04		
Secchi-depth (meters)			1.8					2.8		
Depth of sample (meters)	0.5	6.0	8.0	10.0	12.0	0.5	6.0	8.0	10.0	12.0
Water temperature (°c)	23.0	---	---	---	---	22.8	---	---	---	---
Phosphorus, total (as P)	0.014	0.014	0.017	0.060	0.255	0.028	0.030	0.023	0.030	0.421
Phosphorus,ortho,dissolved (as P)	0.002	0.002	<0.002	0.015	0.208	0.002	0.002	0.002	0.010	0.397

	Sept. 21					Sept. 28
Lake stage (ft)			5.03			4.96
Secchi-depth (meters)			2.2			4.3
Depth of sample (meters)	0.5	6.0	8.0	10.0	12.0	0.5
Water temperature (°c)	22.5	---	---	---	---	21.0
Phosphorus, total (as P)	0.031	0.025	0.022	0.020	0.433	0.035
Phosphorus,ortho,dissolved (as P)	<0.002	0.002	0.002	0.003	0.390	---

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, APRIL 14 TO AUGUST 18, 1998

	Apr. 14	May 18	June 16	July 20	Aug. 18
Secchi-depth (meters)	4.3	5.2	4.5	2.6	2.0

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, APRIL 14 TO AUGUST 18, 1998

	Apr. 14	May 18	June 16	July 20	Aug. 18
Secchi-depth (meters)	4.4	6.4	1.9	2.7	2.7

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 (fragmentary). October 1981 to September 1984, data unpublished in district files. October 1984 to current year.

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.--No estimated daily gage heights. Records good. Lake has no surface outlet.

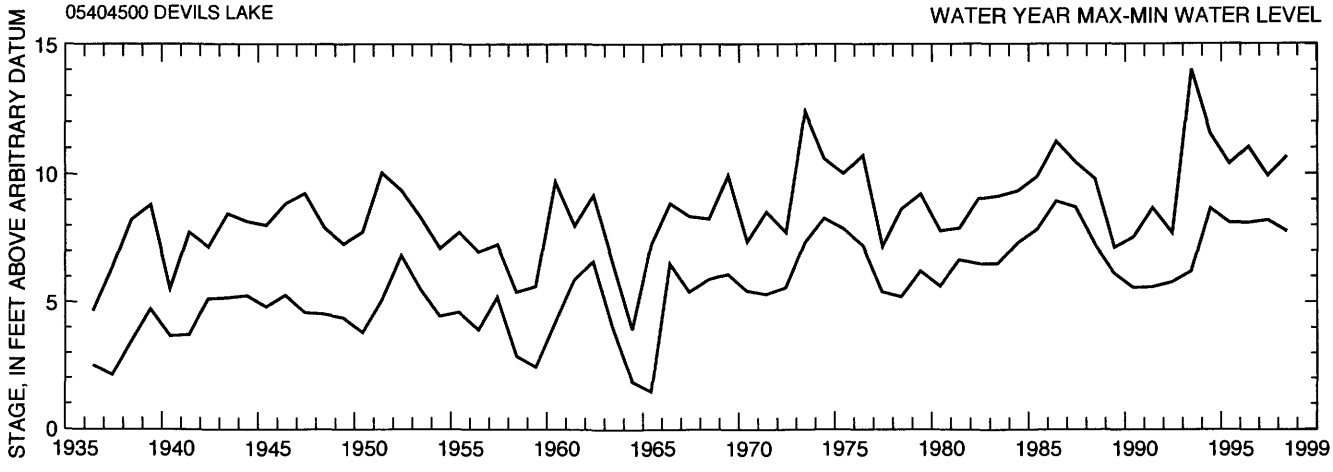
EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 14.13 ft, July 18, 1993; minimum observed, 1.49 ft Feb. 8, 1965.

EXTREMES FOR CURRENT YEAR.--Maximum recorded gage height, 10.70 ft, June 29 and 30; minimum recorded, 7.71 ft, Jan. 1.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.62	8.20	7.90	7.76	7.84	8.11	9.54	10.32	10.23	10.67	10.00	9.84
2	8.60	8.19	7.89	7.76	7.86	8.12	9.61	10.34	10.19	10.65	9.98	9.81
3	8.59	8.18	7.92	7.76	7.86	8.14	9.64	10.39	10.16	10.66	9.96	9.78
4	8.57	8.17	7.93	7.76	7.86	8.14	9.67	10.39	10.13	10.66	10.06	9.75
5	8.56	8.16	7.92	7.80	7.85	8.14	9.68	10.39	10.10	10.64	10.19	9.73
6	8.54	8.16	7.91	7.81	7.84	8.16	9.69	10.38	10.07	10.61	10.26	9.71
7	8.53	8.15	7.90	7.81	7.84	8.16	9.70	10.40	10.04	10.60	10.28	9.69
8	8.52	8.14	7.89	7.81	7.84	8.21	9.75	10.45	10.02	10.58	10.27	9.65
9	8.52	8.14	7.89	7.83	7.83	8.26	9.81	10.44	10.04	10.56	10.25	9.62
10	8.49	8.13	7.90	7.82	7.83	8.25	9.82	10.43	10.06	10.54	10.24	9.60
11	8.47	8.11	7.90	7.82	7.84	8.25	9.83	10.42	10.11	10.51	10.21	9.57
12	8.46	8.10	7.89	7.81	7.84	8.24	9.84	10.41	10.23	10.48	10.19	9.54
13	8.50	8.09	7.88	7.81	7.84	8.24	9.86	10.40	10.24	10.45	10.17	9.52
14	8.47	8.07	7.87	7.83	7.84	8.23	9.91	10.39	10.23	10.43	10.15	9.68
15	8.45	8.07	7.87	7.83	7.83	8.23	9.98	10.37	10.22	10.40	10.16	9.82
16	8.43	8.05	7.86	7.83	7.84	8.22	10.20	10.37	10.21	10.37	10.13	9.80
17	8.41	8.04	7.85	7.83	7.88	8.23	10.27	10.34	10.19	10.34	10.13	9.78
18	8.39	8.02	7.84	7.83	7.89	8.30	10.30	10.31	10.25	10.31	10.12	9.77
19	8.36	8.01	7.84	7.82	7.90	8.37	10.31	10.31	10.39	10.31	10.10	9.75
20	8.34	8.00	7.84	7.82	7.90	8.38	10.33	10.29	10.40	10.31	10.07	9.73
21	8.31	7.99	7.83	7.83	7.91	8.38	10.34	10.26	10.41	10.34	10.06	9.69
22	8.28	7.98	7.83	7.83	7.91	8.39	10.35	10.23	10.40	10.31	10.05	9.66
23	8.28	7.97	7.83	7.85	7.92	8.40	10.35	10.19	10.38	10.28	10.02	9.63
24	8.26	7.95	7.82	7.85	7.94	8.42	10.35	10.23	10.40	10.24	10.01	9.62
25	8.24	7.95	7.81	7.85	7.95	8.45	10.34	10.24	10.39	10.21	10.00	9.60
26	8.24	7.94	7.80	7.85	7.97	8.52	10.36	10.22	10.36	10.18	9.98	9.59
27	8.24	7.94	7.79	7.85	8.05	8.58	10.35	10.20	10.48	10.15	9.96	9.58
28	8.23	7.92	7.79	7.85	8.09	8.60	10.33	10.24	10.66	10.12	9.94	9.56
29	8.21	7.92	7.78	7.85	---	8.63	10.32	10.26	10.68	10.09	9.92	9.55
30	8.21	7.91	7.77	7.84	---	8.72	10.31	10.24	10.68	10.06	9.89	9.55
31	8.20	---	7.77	7.84	---	9.31	---	10.25	---	10.03	9.87	---
MEAN	8.40	8.05	7.86	7.82	7.89	8.35	10.04	10.33	10.28	10.39	10.08	9.67
MAX	8.62	8.20	7.93	7.85	8.09	9.31	10.36	10.45	10.68	10.67	10.28	9.84
MIN	8.20	7.91	7.77	7.76	7.83	8.11	9.54	10.19	10.02	10.03	9.87	9.52



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.

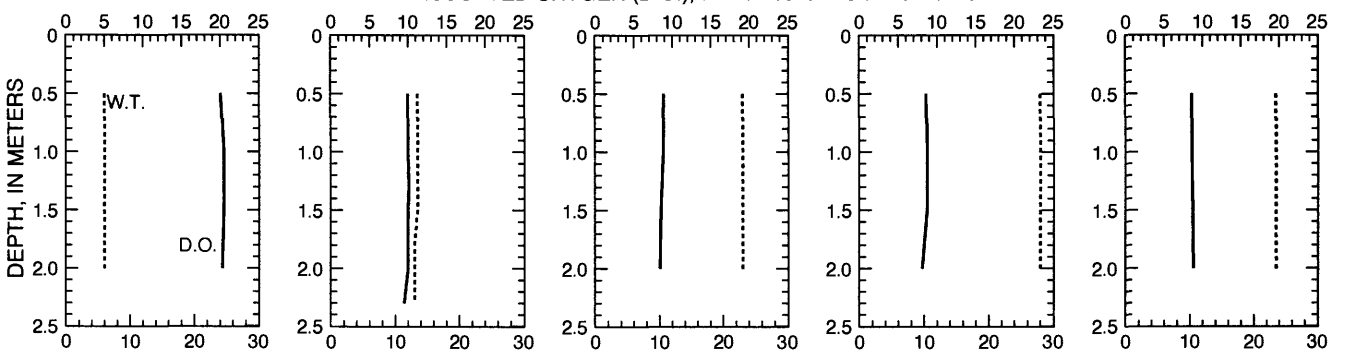
REMARKS.--Lake sampled near southeast end at a lake depth of about 3 m. Water-quality analyses done by Wisconsin State Laboratory of Hygiene. Lake-stage readings from 1991 to 1993 (except 2/4/93 and 4/19/93) were previously reported 1 ft too high.

WATER-QUALITY DATA, FEBRUARY 17 TO AUGUST 19, 1998
(Milligrams per liter unless otherwise indicated)

	Feb. 17		Apr. 14		June 01		July 17		Aug. 19	
Lake stage (ft)	9.57		9.49		9.59		9.50		9.50	
Secchi-depth (meters)	---		1.7		1.3		1.2		1.5	
Chlorophyll a, phytoplankton (µg/L)	---		4.48		5.08		7.21		5.32	
Depth of sample (m)	0.5	2.0	0.5	2.0	0.5	2.0	0.5	2.0	0.5	2.0
Water temperature (°C)	5.9	6.2	13.6	13.1	23.1	22.9	27.9	27.8	23.5	23.7
Specific conductance (µS/cm)	560	571	450	452	450	451	462	475	491	491
pH (units)	7.9	8.0	8.2	8.2	8.0	8.0	8.0	8.0	8.0	8.0
Dissolved oxygen	20.1	20.3	10.0	10.0	8.9	8.4	8.6	8.1	8.6	8.8
Phosphorus, total (as P)	0.019	---	0.021	0.022	0.020	0.021	0.021	0.023	0.020	0.020
Phosphorus, ortho, dissolved (as P)	---	---	<0.002	<0.002	---	---	---	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	0.490	0.521	---	---	---	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	0.039	0.035	---	---	---	---	---	---
Nitrogen, amm. + org., total (as N)	---	---	0.42	0.44	---	---	---	---	---	---
Nitrogen, total (as N)	---	---	0.91	0.96	---	---	---	---	---	---
Color (Pt-Co. scale)	---	---	15	45	---	---	---	---	---	---
Turbidity (NTU)	---	---	4.5	4.7	---	---	---	---	---	---
Hardness, as CaCO3	---	---	230	230	---	---	---	---	---	---
Calcium, dissolved (Ca)	---	---	47	47	---	---	---	---	---	---
Magnesium, dissolved (Mg)	---	---	27	27	---	---	---	---	---	---
Sodium, dissolved (Na)	---	---	5.9	5.9	---	---	---	---	---	---
Potassium, dissolved (K)	---	---	1.1	1.0	---	---	---	---	---	---
Alkalinity, as CaCO3	---	---	209	208	---	---	---	---	---	---
Sulfate, dissolved (SO4)	---	---	12	12	---	---	---	---	---	---
Chloride, dissolved (Cl)	---	---	15	15	---	---	---	---	---	---
Silica, dissolved (SiO2)	---	---	4.4	4.5	---	---	---	---	---	---
Solids, dissolved, at 180°C	---	---	256	254	---	---	---	---	---	---
Iron, dissolved (Fe) µg/L	---	---	<10	<10	---	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	<0.40	<0.40	---	---	---	---	---	---

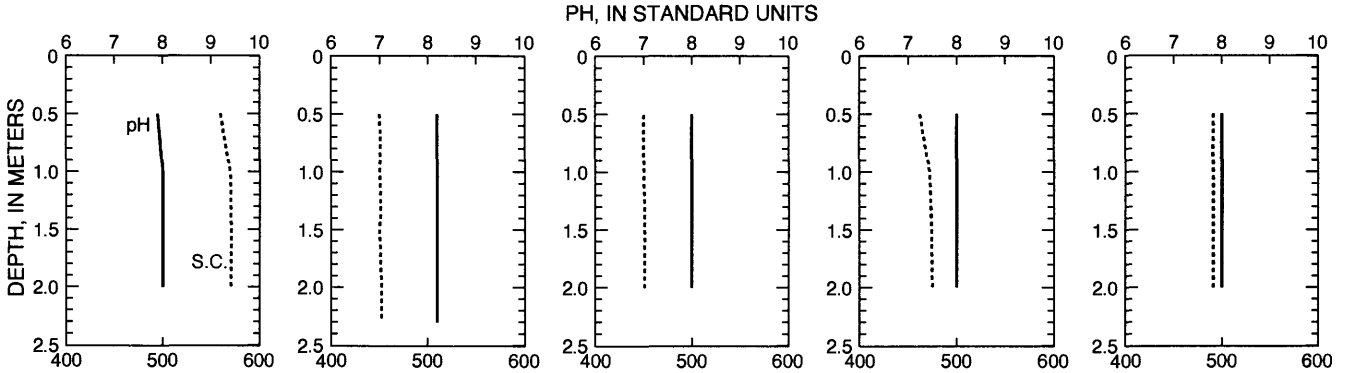
2-17-98 4-14-98 6-01-98 7-17-98 8-19-98

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

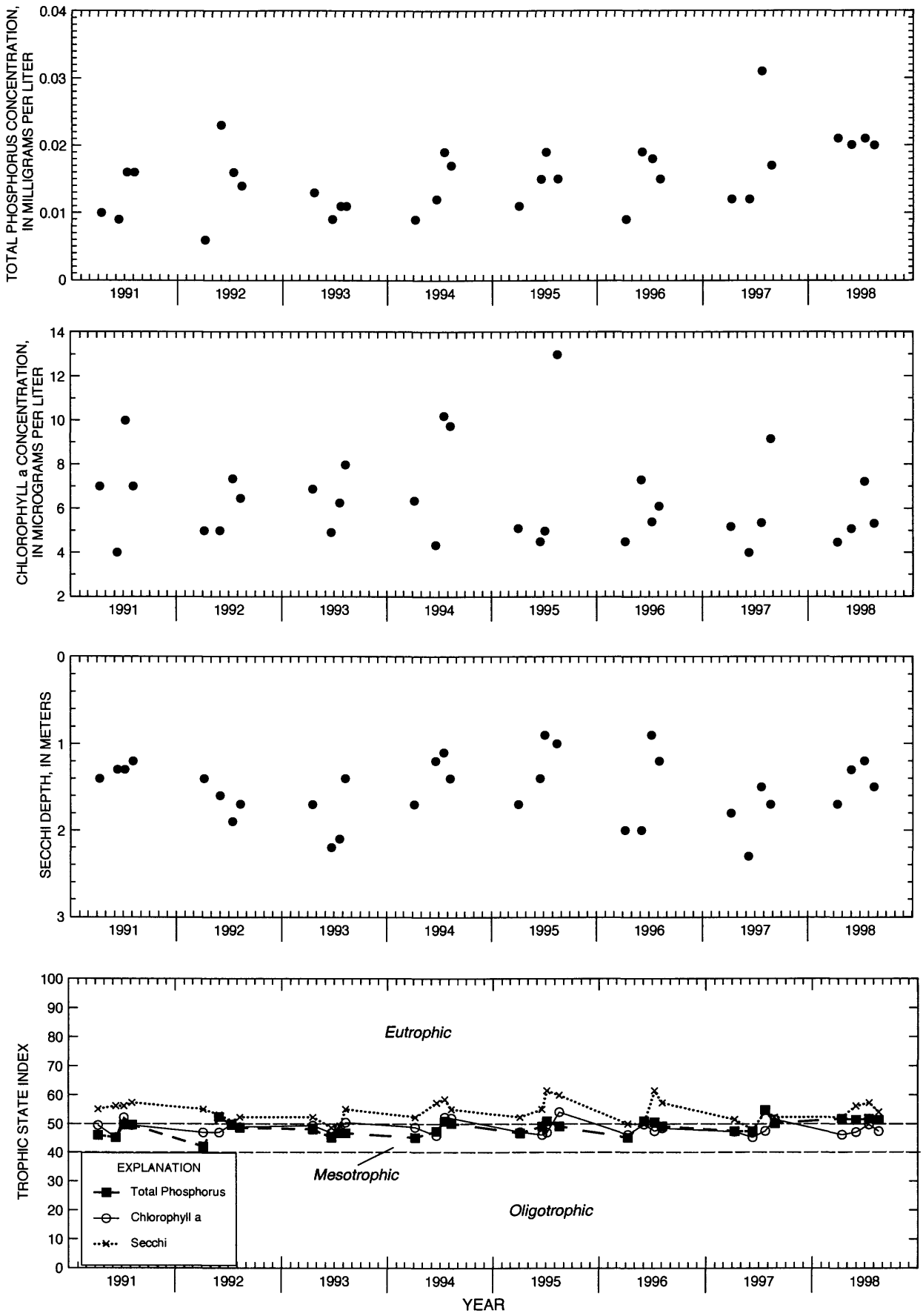


WATER TEMPERATURE (W.T.), IN DEGREES CELSIUS

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.

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 11, 1990 (fragmentary); continuous record from Oct. 23, 1990 to Nov. 22, 1996; nonrecording gage Nov. 23, 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 2-3 times per week when lake is ice-free.

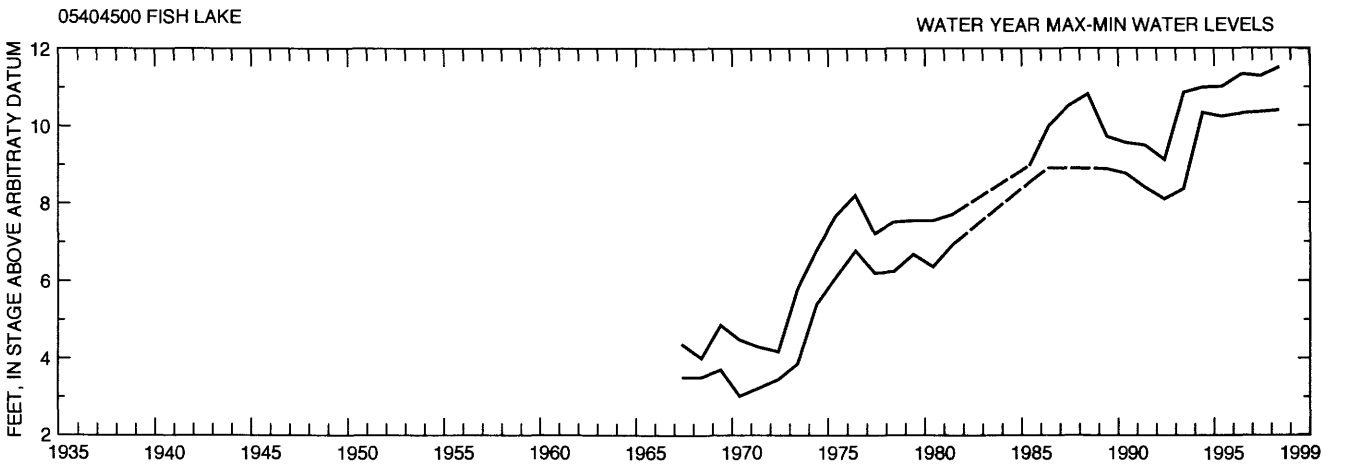
REMARKS.--Lake has no surface outlet.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 11.52 ft, July 3, 1998; minimum observed, 3.02 ft, Aug. 29, 1970.

EXTREMES FOR CURRENT YEAR.--Maximum gage height observed, 11.52 ft, July 3; minimum observed, 10.40 ft, Nov. 17 and Jan. 7.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	---	---	---	---
2	10.68	---	---	---	---	---	---	---	---	---	11.10	---
3	---	---	---	---	---	---	---	---	---	11.52	---	---
4	---	---	---	---	---	---	---	---	---	---	11.32	11.32
5	---	---	---	---	---	---	---	---	11.10	11.49	11.42	11.30
6	---	---	---	---	---	---	---	---	11.08	11.48	---	11.30
7	---	---	---	10.40	---	---	---	---	---	11.48	11.43	---
8	---	---	---	---	---	---	---	---	---	---	---	11.25
9	---	---	---	---	---	---	---	---	---	---	11.43	---
10	---	---	---	---	---	---	---	---	11.08	11.45	11.42	---
11	---	---	---	---	---	---	---	---	---	---	11.39	---
12	---	---	---	---	---	---	---	---	---	---	---	11.19
13	---	---	---	---	---	---	---	---	---	---	---	11.17
14	---	---	---	---	---	---	---	---	11.12	---	11.33	11.38
15	---	---	---	---	---	---	---	---	---	---	---	11.37
16	---	---	---	---	---	---	---	---	---	---	11.36	---
17	---	10.40	---	---	---	---	---	---	11.14	---	11.39	11.36
18	---	---	---	---	---	---	---	---	11.30	---	---	---
19	---	---	---	---	10.48	---	---	11.16	---	11.31	---	11.34
20	---	---	---	---	---	---	---	---	---	---	11.34	11.33
21	---	---	---	---	---	---	11.11	---	11.34	11.32	---	---
22	---	---	---	---	---	---	---	---	11.32	11.31	---	---
23	---	---	---	---	---	---	---	11.13	---	11.29	---	11.27
24	---	---	---	---	---	---	---	---	---	11.26	11.42	---
25	---	---	---	---	---	---	---	---	11.35	---	11.44	---
26	---	---	---	---	---	---	---	---	---	---	---	11.26
27	---	---	---	---	---	---	---	---	---	11.20	11.40	---
28	---	---	---	---	---	---	---	11.10	11.48	11.18	---	---
29	---	---	---	---	---	---	---	---	---	---	11.41	---
30	---	---	---	---	---	---	---	---	11.50	---	---	11.28
31	---	---	---	---	---	---	---	11.18	---	11.13	---	---



423455088263800 GENEVA LAKE AT GENEVA BAY AT LAKE GENEVA, WI

LOCATION.--Lat 42°34'55", long 88°26'38", in NE 1/4 NE 1/4, sec.2, T.1 N., R.17 E., Walworth County, Hydrologic Unit 07120006, 0.7 mi southwest of outlet at Lake Geneva.

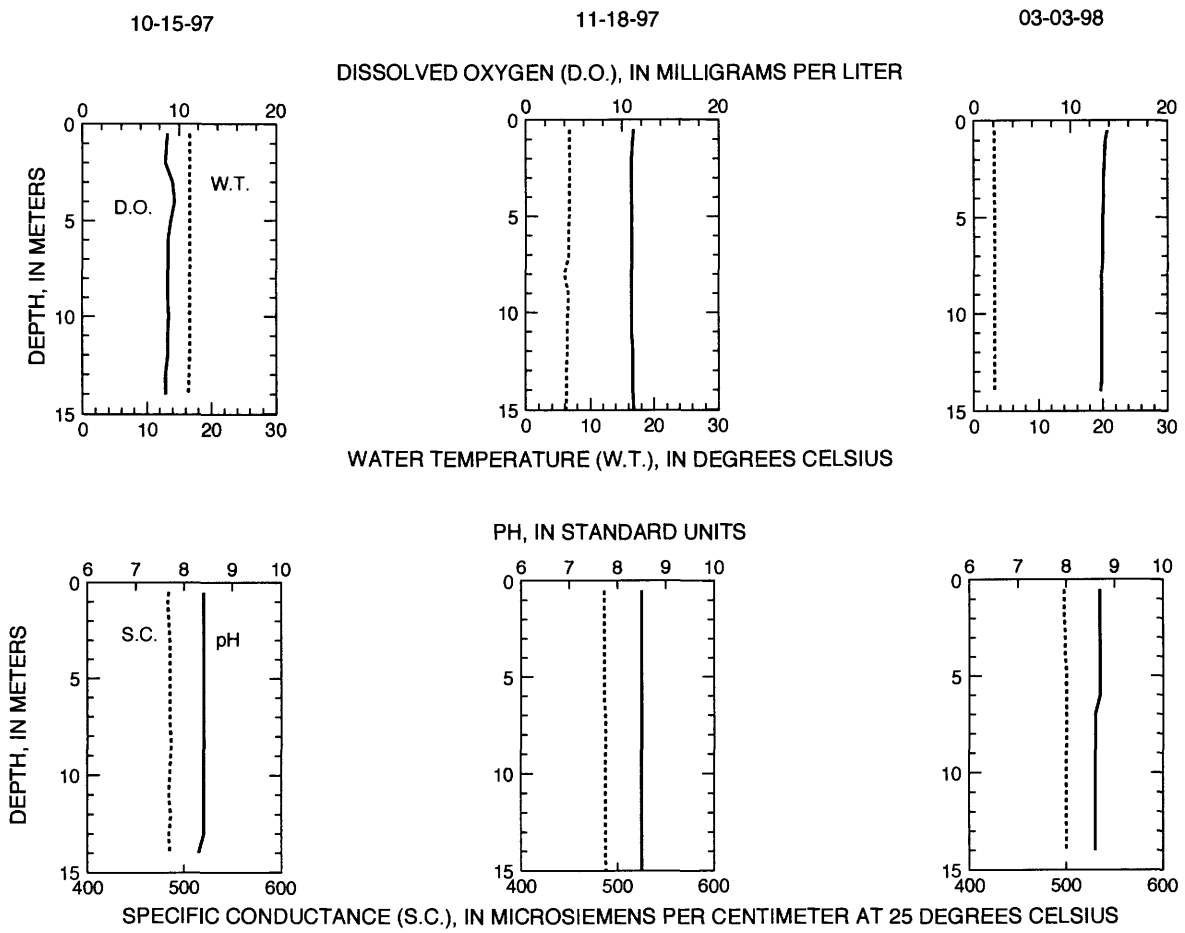
DRAINAGE AREA.--28.7 mi^2.

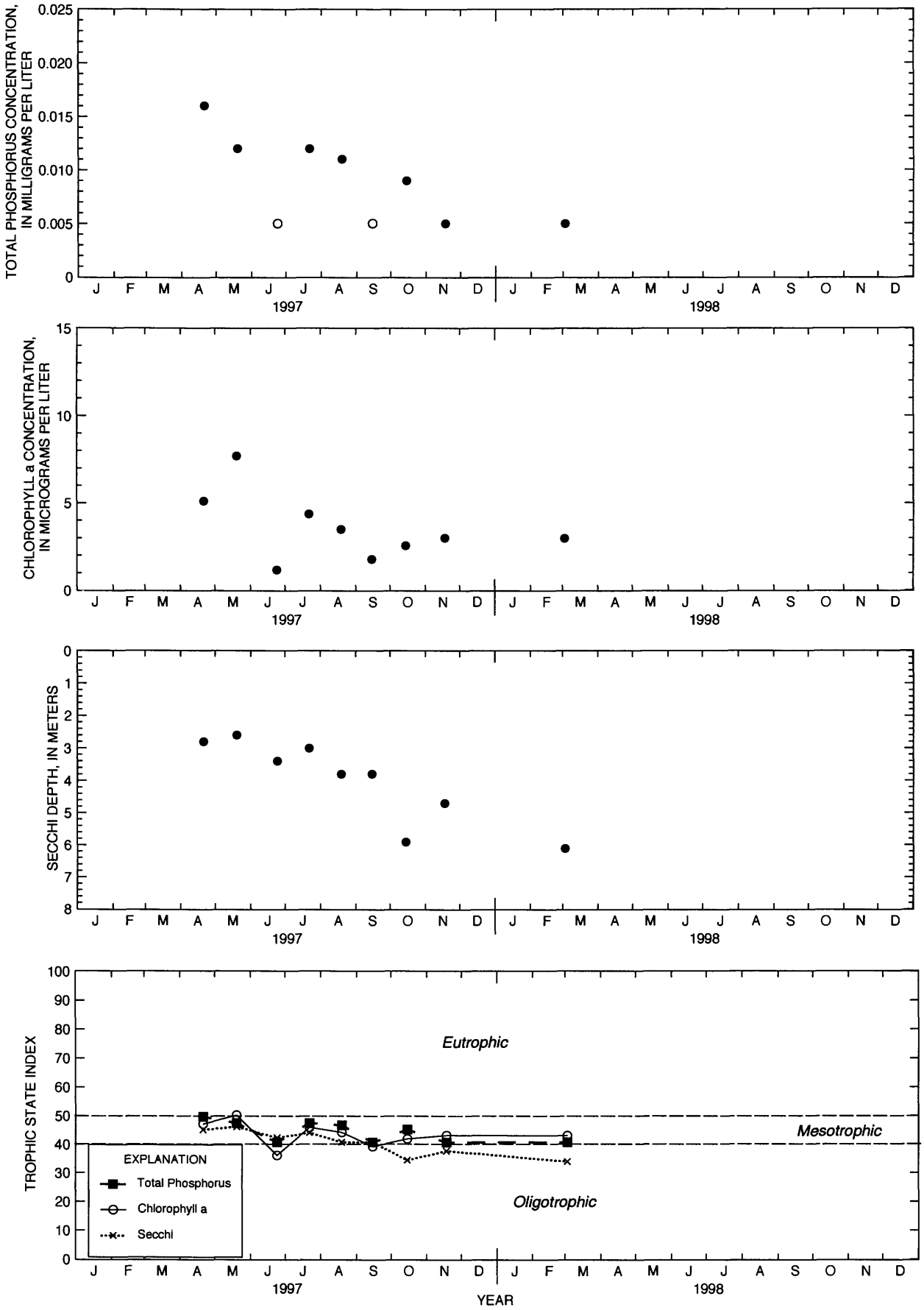
PERIOD OF RECORD.--April 1997 to current year.

REMARKS.--Lake sampled at a depth of about 15 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 15, 1997 TO MARCH 03, 1998
(Milligrams per liter unless otherwise indicated)

	Oct. 15				Nov. 18		Mar. 03	
Lake stage (ft)	2.46				2.26		---	
Secchi-depth (meters)	5.9				4.7		6.1	
Chlorophyll a, phytoplankton (µg/L)	2.58				3.03		3.00	
Depth of sample (m)	0.5	10.0	12.0	14.0	0.5	15.0	0.5	13.0
Water temperature (°C)	16.7	16.6	16.6	16.4	6.8	6.2	3.1	3.2
Specific Conductance (µS/cm)	484	485	486	485	486	488	498	500
pH (units)	8.4	8.4	8.4	8.3	8.5	8.5	8.7	8.6
Dissolved oxygen	8.8	8.9	8.8	8.6	11.2	11.2	13.8	13.2
Phosphorus, total (as P)	0.009	<0.005	0.013	0.009	<0.005	<0.005	<0.005	<0.005
Phosphorus, ortho, dissolved (as P)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Nitrogen, NO2 + NO3, diss. (as N)	<0.010	<0.010	<0.010	<0.010	0.029	0.025	0.051	0.053
Nitrogen, ammonia, dissolved (as N)	<0.013	<0.010	<0.010	<0.010	<0.013	<0.013	<0.013	<0.013
Nitrogen, amm. + org., total (as N)	0.40	0.20	0.30	0.40	0.40	0.30	0.50	0.50
Nitrogen, total (as N)	---	---	---	---	0.43	0.32	0.55	0.55





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Lake Geneva, Geneva Bay, at Lake Geneva, 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.)

423420088320500 GENEVA LAKE AT WILLIAMS BAY AT WILLIAMS BAY, WI

LOCATION.--Lat 42°34'20", long 88°32'05", in NE 1/4 SW 1/4, sec.6, T.1 N., R.17 E., Walworth County, Hydrologic Unit 07120006, at Williams Bay.

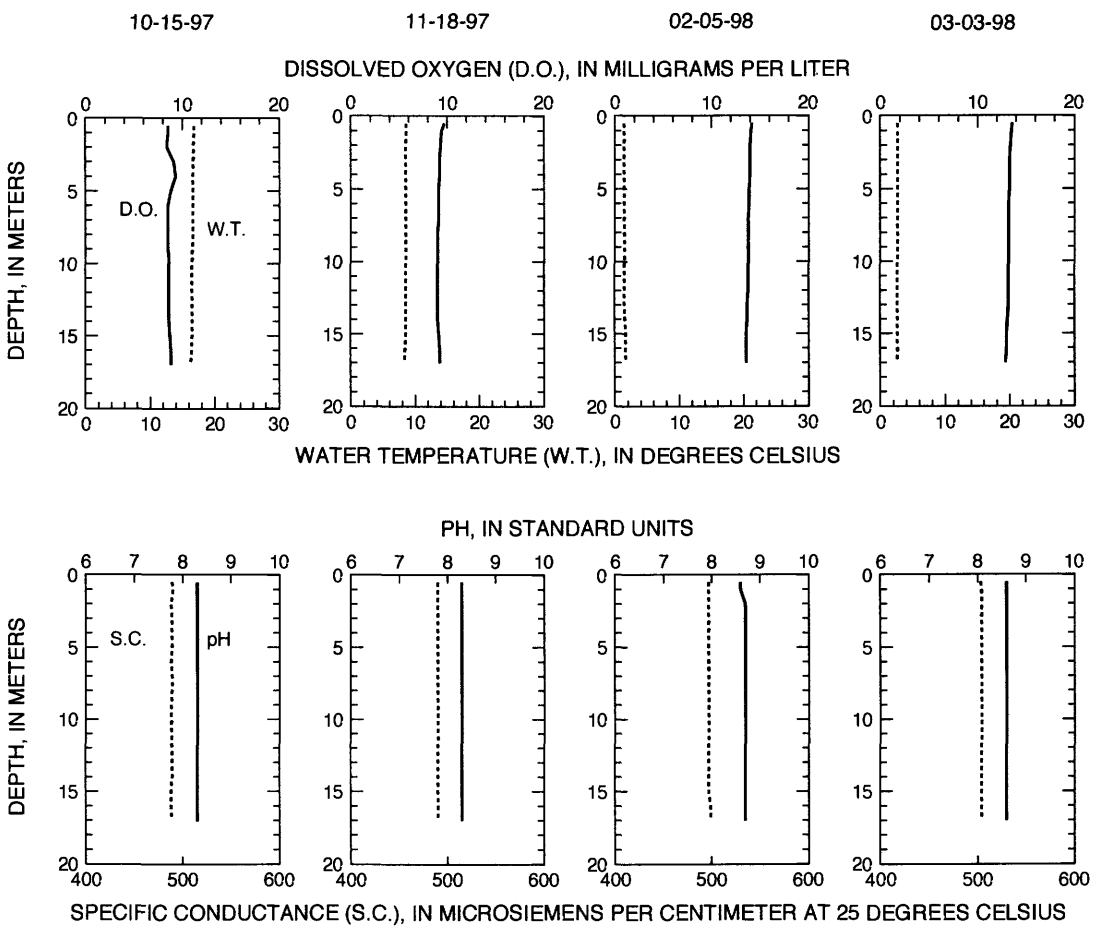
DRAINAGE AREA.--28.7 mi^2.

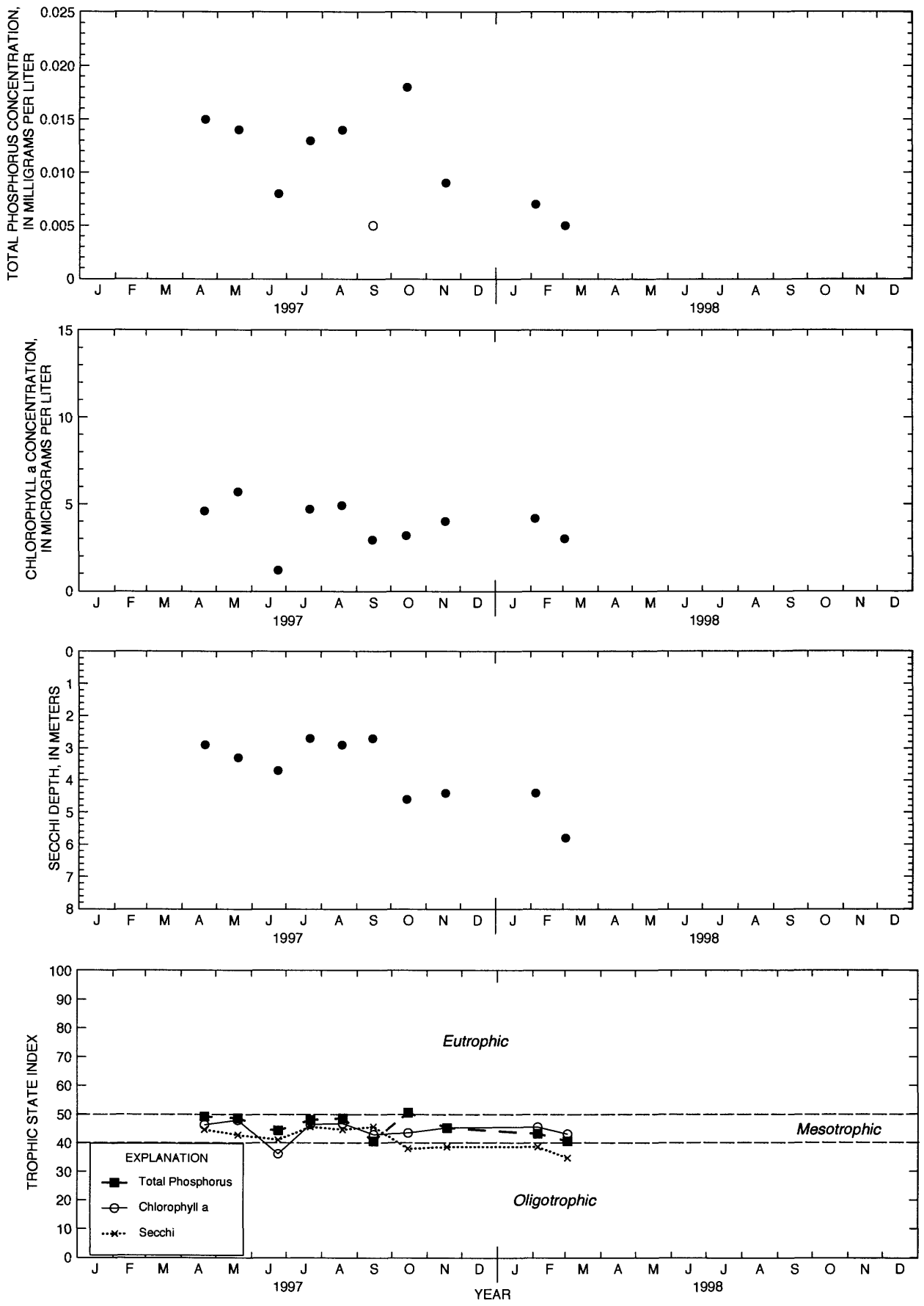
PERIOD OF RECORD.--April 1997 to current year.

REMARKS.--Lake sampled at a depth of about 18 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 15, 1997 TO MARCH 03, 1998
(Milligrams per liter unless otherwise indicated)

	Oct. 15					Nov. 18		Feb. 05		Mar. 03	
Lake stage (ft)			2.46			2.26		---		---	
Secchi-depth (meters)			4.6			4.4		4.4		5.8	
Chlorophyll a, phytoplankton (µg/L)			3.18			4.01		4.18		3.00	
Depth of sample (m)	0.5	10.0	13.0	15.0	17.0	0.5	17.0	0.5	17.0	0.5	17.0
Water temperature (°C)	16.8	16.5	16.5	16.5	16.3	8.6	8.3	1.4	1.6	2.6	2.6
Specific Conductance (µS/cm)	489	488	489	488	489	490	490	497	499	503	504
pH (units)	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.6	8.7	8.6	8.6
Dissolved oxygen	8.5	8.6	8.6	8.7	8.8	9.7	9.2	14.2	13.6	13.6	12.9
Phosphorus, total (as P)	0.018	0.000	0.009	<0.005	0.007	0.009	0.008	0.007	0.007	<0.005	0.007
Phosphorus, ortho, dissolved (as P)	<0.002	<0.002	<0.002	<0.002	<0.002	0.003	0.003	<0.002	<0.002	<0.002	<0.002
Nitrogen, NO2 + NO3, diss. (as N)	0.012	0.012	<0.010	<0.010	0.000	0.044	0.044	0.045	0.055	0.060	0.062
Nitrogen, ammonia, dissolved (as N)	<0.030	<0.010	<0.010	<0.010	<0.010	0.013	<0.013	0.010	0.011	<0.013	<0.013
Nitrogen, amm. + org., total (as N)	0.20	0.30	0.40	0.40	0.20	0.60	0.50	0.70	0.50	0.40	0.50
Nitrogen, total (as N)	0.21	0.31	---	---	---	0.64	0.54	0.75	0.56	0.46	0.56





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Lake Geneva, Williams Bay, at Williams Bay, 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.)

423402088301400 GENEVA LAKE AT CENTER NEAR LAKE GENEVA, WI

LOCATION.--Lat 42°34'02", long 88°30'14", in NE 1/4 NE 1/4, sec.8, T.1 N., R.17 E., Walworth County, Hydrologic Unit 07120006, 3.9 mi southwest of outlet at Lake Geneva.

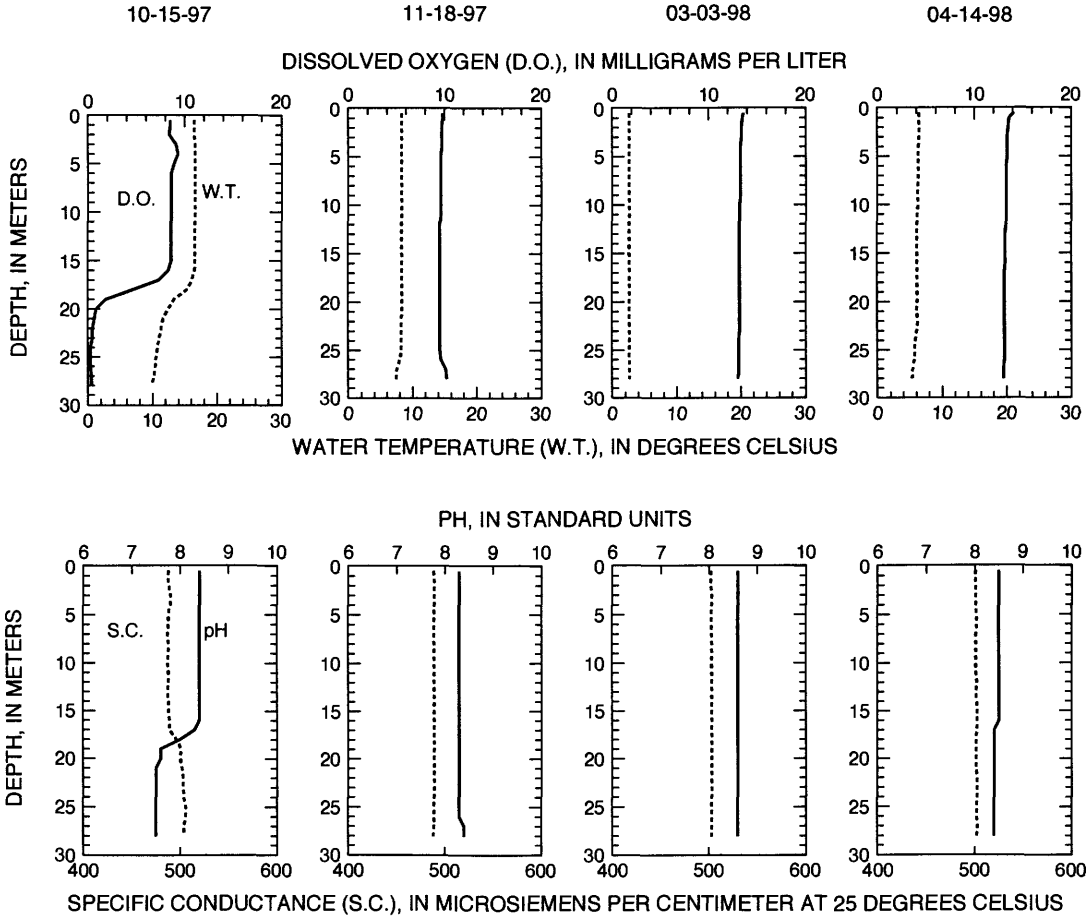
DRAINAGE AREA.--28.7 mi^2.

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

REMARKS.--Lake sampled at a depth of about 29 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.

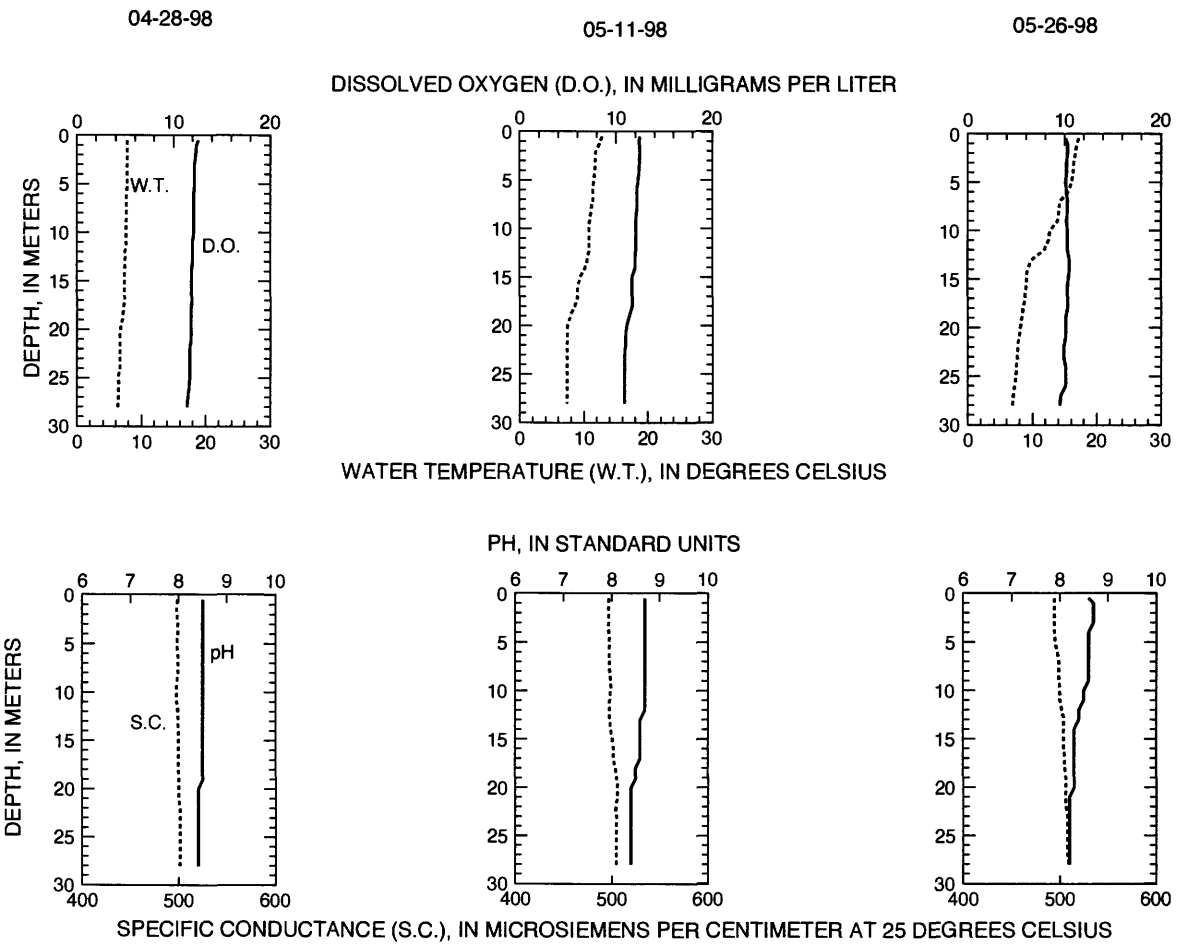
WATER-QUALITY DATA, OCTOBER 15, 1997 TO APRIL 14, 1998
(Milligrams per liter unless otherwise indicated)

	Oct. 15					Nov. 18		Mar. 03		Apr. 14	
Lake stage (ft)			2.46			2.26		---		---	
Secchi-depth (meters)			5.6			4.7		5.6		3.4	
Chlorophyll a, phytoplankton (µg/L)			4.64			3.78		3.00		4.11	
Depth of sample (m)	0.5	17.0	21.0	24.0	27.0	0.5	28.0	0.5	27.5	0.5	28.0
Water temperature (°C)	16.5	16.1	11.6	10.7	10.2	8.3	7.4	2.6	2.6	6.4	5.3
Specific Conductance (µS/cm)	488	489	502	504	504	488	488	502	503	501	503
pH (units)	8.4	8.3	7.5	7.5	7.5	8.3	8.4	8.6	8.6	8.5	8.
Dissolved oxygen	8.5	7.3	0.6	0.2	0.3	9.8	10.2	13.6	13.1	14.1	13.0
Phosphorus, total (as P)	0.008	0.045	0.013	0.000	0.014	0.005	0.006	0.006	0.006	0.009	0.012
Phosphorus, ortho, dissolved (as P)	<0.002	<0.002	<0.002	0.002	0.006	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Nitrogen, NO2 + NO3, diss. (as N)	0.000	0.011	0.118	0.151	0.156	0.037	<0.010	0.057	0.042	0.067	0.073
Nitrogen, ammonia, dissolved (as N)	<0.03	<0.010	<0.010	<0.010	<0.010	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013
Nitrogen, amm. + org., total (as N)	0.50	0.50	0.40	0.40	0.50	0.30	0.30	0.40	0.40	0.43	0.44
Nitrogen, total (as N)	0.50	0.51	0.52	0.55	0.66	0.34	---	0.46	0.44	0.50	0.51
Color (Pt-Co. scale)	---	---	---	---	---	---	---	---	---	5	5
Turbidity (NTU)	---	---	---	---	---	---	---	---	---	1.6	1.0
Hardness, as CaCO3	---	---	---	---	---	---	---	---	---	220	220
Calcium, dissolved (Ca)	---	---	---	---	---	---	---	---	---	34	34
Magnesium, dissolved (Mg)	---	---	---	---	---	---	---	---	---	33	33
Sodium, dissolved (Na)	---	---	---	---	---	---	---	---	---	17	17
Potassium, dissolved (K)	---	---	---	---	---	---	---	---	---	1.7	1.8
Alkalinity, as CaCO3	---	---	---	---	---	---	---	---	---	189	189
Sulfate, dissolved (SO4)	---	---	---	---	---	---	---	---	---	32	33
Chloride, dissolved (Cl)	---	---	---	---	---	---	---	---	---	34	34
Silica, dissolved (SiO2)	---	---	---	---	---	---	---	---	---	0.53	0.68
Solids, dissolved, at 180°C	---	---	---	---	---	---	---	---	---	278	276
Iron, dissolved (Fe) µg/L	---	---	---	---	---	---	---	---	---	<10	<10
Manganese, dissolved (Mn) µg/L	---	---	---	---	---	---	---	---	---	<0.40	<0.40



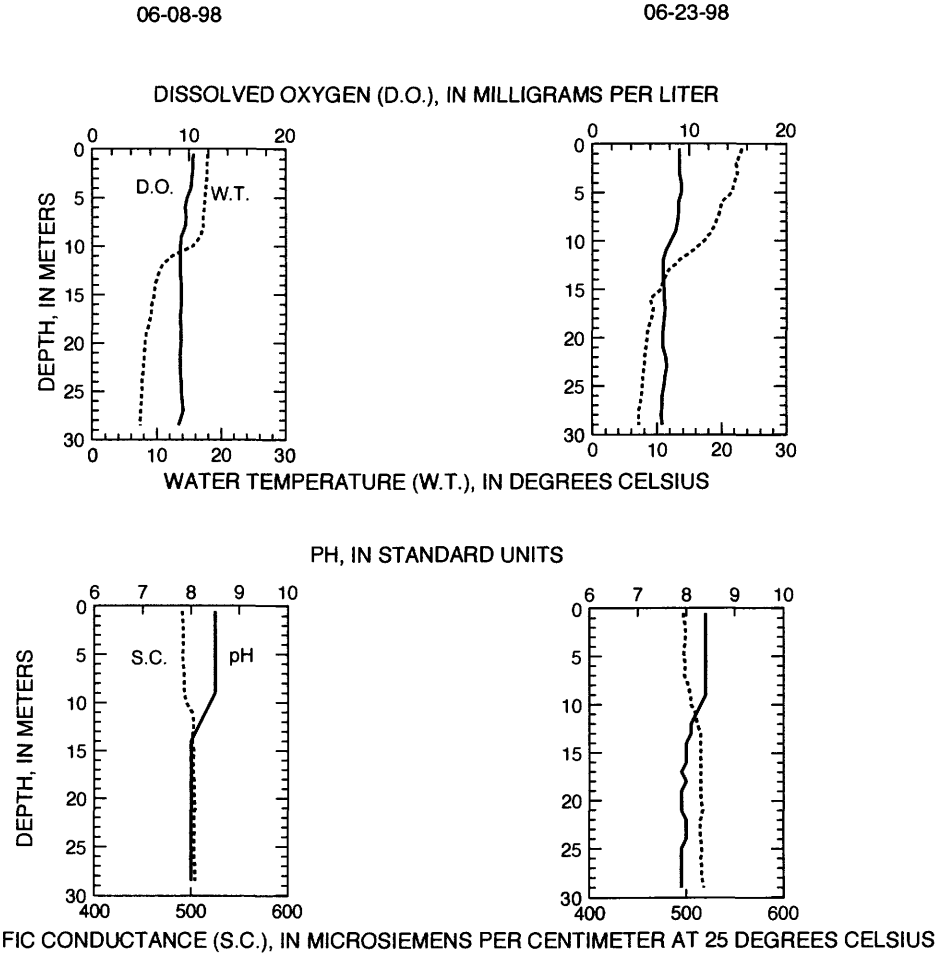
WATER-QUALITY DATA, APRIL 28 TO MAY 26, 1998
(Milligrams per liter unless otherwise indicated)

	Apr. 28		May 11					May 26				
Lake stage (ft)	---		---					---				
Secchi-depth (meters)	2.3		1.7					2.3				
Chlorophyll a, phytoplankton (µg/L)	7.12		6.28					4.24				
Depth of sample (m)	0.5	28.0	0.5	13.0	20.0	24.0	28.0	0.5	5.0	16.0	24.0	28.0
Water temperature (°C)	7.8	6.3	12.8	10.6	7.4	7.3	7.3	17.2	16.1	9.0	7.5	6.9
Specific Conductance (µS/cm)	499	501	497	498	506	505	505	494	495	504	508	509
pH (units)	8.5	8.4	8.7	8.6	8.4	8.4	8.4	8.6	8.6	8.3	8.2	8.2
Dissolved oxygen	12.6	11.4	12.5	12.0	11.1	10.9	10.9	10.1	10.1	10.3	10.1	9.5
Phosphorus, total (as P)	0.010	0.011	0.010	0.013	0.009	0.011	0.012	0.008	0.012	0.013	0.010	0.009
Phosphorus, ortho, dissolved (as P)	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003
Nitrogen, NO2 + NO3, diss. (as N)	0.043	0.072	<0.010	<0.010	0.038	0.050	0.053	<0.010	<0.010	0.018	0.043	0.052
Nitrogen, ammonia, dissolved(as N)	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	0.022	<0.013	<0.013	<0.013	<0.013	0.03
Nitrogen, amm. + org., tota (as N)	0.45	0.43	0.49	0.51	0.51	0.44	0.64	0.58	0.80	0.60	0.29	0.44
Nitrogen, total (as N)	0.49	0.50	---	---	0.55	0.49	0.69	---	---	0.62	0.33	0.49



WATER-QUALITY DATA, JUNE 08 AND 23, 1998
(Milligrams per liter unless otherwise indicated)

	June 08					June 23				
Lake stage (ft)			---					---		
Secchi-depth (meters)			3.0					7.3		
Chlorophyll a, phytoplankton (µg/L)			4.99					1.41		
Depth of sample (m)	0.5	9.0	14.0	24.0	28.5	0.5	9.0	14.0	25.0	29.0
Water temperature (°C)	17.9	16.8	9.7	7.7	7.4	23.2	18.4	11.0	7.7	7.1
Specific Conductance (µS/cm)	491	493	501	503	504	497	504	515	516	518
pH (units)	8.5	8.5	8.0	8.0	8.0	8.4	8.4	8.0	7.9	7.9
Dissolved oxygen	10.5	9.2	9.2	9.2	8.9	9.0	8.6	7.3	7.4	7.2
Phosphorus, total (as P)	0.010	0.009	0.010	0.011	0.011	<0.005	0.009	0.012	0.007	0.011
Phosphorus, ortho, dissolved (as P)	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.002	0.004	0.004	0.005
Nitrogen, NO2 + NO3, diss. (as N)	0.013	<0.010	0.014	0.047	0.043	<0.010	<0.010	0.023	0.051	0.067
Nitrogen, ammonia, dissolved (as N)	0.109	0.011	0.016	0.032	0.043	0.026	0.013	0.047	0.052	0.073
Nitrogen, amm. + org., total (as N)	0.64	0.55	0.56	0.51	0.60	0.51	0.54	0.61	0.61	0.60
Nitrogen, total (as N)	0.65	---	0.57	0.56	0.64	---	---	0.63	0.66	0.67

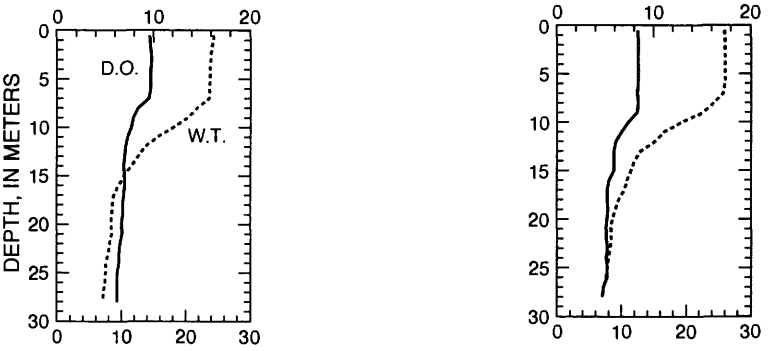


WATER-QUALITY DATA, JULY 08 AND 23, 1998
(Milligrams per liter unless otherwise indicated)

	July 08					July 23				
Lake stage (ft)			---					---		
Secchi-depth (meters)			2.7					3.8		
Chlorophyll a, phytoplankton (µg/L)			3.35					1.98		
Depth of sample (m)	0.5	7.0	17.0	24.0	28.0	0.5	7.0	20.0	24.0	28.0
Water temperature (°C)	24.4	23.7	8.8	7.5	7.1	26.0	25.8	8.6	8.0	7.2
Specific Conductance (µS/cm)	484	483	515	516	517	477	477	513	514	515
pH (units)	8.6	8.6	8.0	7.9	7.9	8.5	8.5	7.8	7.8	7.7
Dissolved oxygen	9.6	9.5	6.9	6.4	6.2	8.4	8.3	5.2	5.1	4.7
Phosphorus, total (as P)	0.008	0.012	0.013	0.015	0.016	0.010	0.010	0.012	0.012	0.020
Phosphorus, ortho, dissolved (as P)	<0.002	0.002	<0.002	0.005	0.006	0.002	0.002	0.002	0.002	0.006
Nitrogen, NO2 + NO3, diss. (as N)	<0.010	<0.010	<0.010	0.130	0.124	<0.010	<0.010	0.113	0.140	0.202
Nitrogen, ammonia, dissolved (as N)	0.028	<0.030	<0.030	0.025	0.038	<0.010	<0.010	<0.010	<0.010	0.013
Nitrogen, amm. + org., total (as N)	0.44	0.53	0.57	0.52	0.54	0.54	0.51	0.45	0.42	0.44
Nitrogen, total (as N)	---	---	---	0.65	0.66	---	---	0.56	0.56	0.64

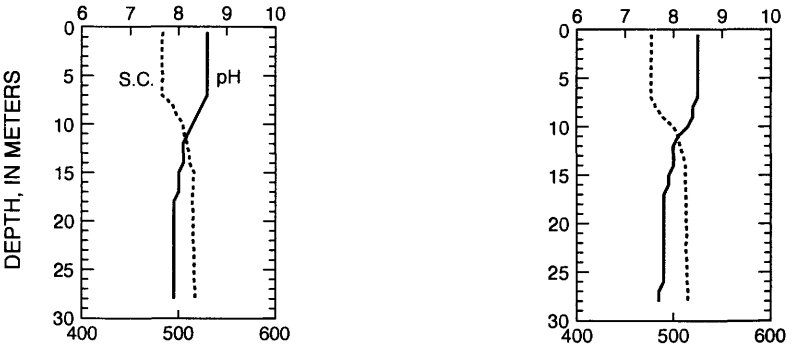
07-08-98 07-23-98

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



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

PH, IN STANDARD UNITS



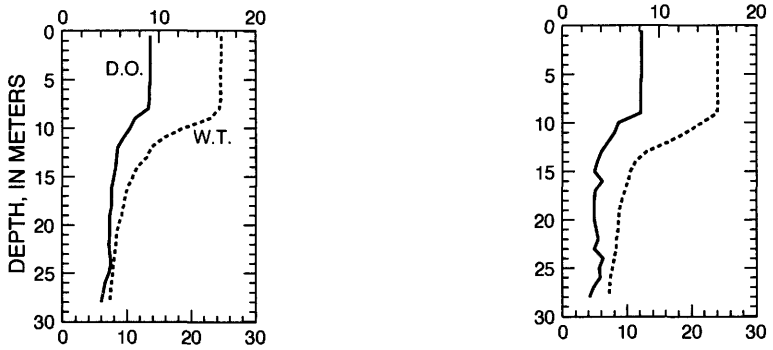
SPECIFIC CONDUCTANCE (S.C.), IN MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS

WATER-QUALITY DATA, AUGUST 03 AND 19, 1998
(Milligrams per liter unless otherwise indicated)

	Aug. 03					Aug. 19				
Lake stage (ft)			---					---		
Secchi-depth (meters)			3.8					3.0		
Chlorophyll a, phytoplankton (µg/L)			3.57					3.11		
Depth of sample (m)	0.5	8.0	20.0	23.0	28.0	0.5	9.0	19.0	24.0	28.0
Water temperature (°C)	24.7	24.4	8.7	8.1	7.3	24.1	24.0	8.8	8.0	7.2
Specific Conductance (µS/cm)	475	476	511	512	513	482	485	517	517	519
pH (units)	8.6	8.6	7.7	7.7	7.6	8.7	8.6	7.7	7.8	7.7
Dissolved oxygen	9.1	8.9	4.9	4.9	4.0	8.2	8.1	3.3	4.2	2.8
Phosphorus, total (as P)	0.006	0.007	0.008	0.009	0.013	0.011	0.013	0.012	0.011	0.011
Phosphorus, ortho, dissolved (as P)	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Nitrogen, NO2 + NO3, diss. (as N)	<0.010	<0.010	0.065	0.096	0.177	<0.010	<0.030	0.073	0.127	0.094
Nitrogen, ammonia, dissolved (as N)	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	0.013
Nitrogen, amm. + org., total (as N)	0.47	0.51	0.52	0.47	0.36	0.51	0.92	0.51	0.45	0.48
Nitrogen, total (as N)	---	---	0.58	0.57	0.54	---	---	0.58	0.58	0.57

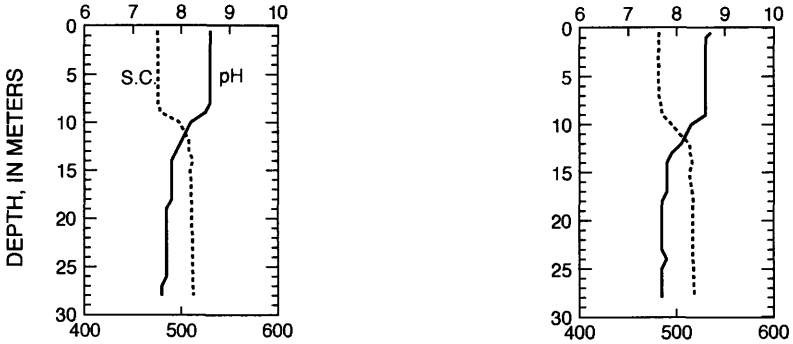
08-03-98 08-19-98

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

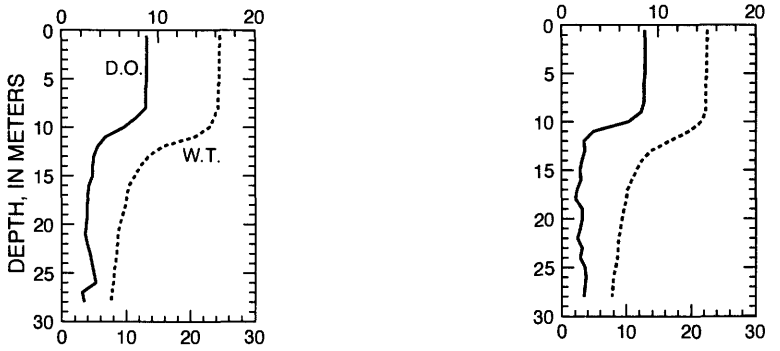
WATER-QUALITY DATA, SEPTEMBER 01 AND 16, 1998
(Milligrams per liter unless otherwise indicated)

	Sept. 01					Sept. 16				
Lake stage (ft)			---					---		
Secchi-depth (meters)			3.2					4.1		
Chlorophyll a, phytoplankton (µg/L)			2.97					3.14		
Depth of sample (m)	0.5	8.0	18.0	23.0	28.0	0.5	9.0	18.0	23.0	28.0
Water temperature (°C)	24.6	24.3	9.9	8.5	7.6	22.6	22.3	10.0	8.7	7.8
Specific Conductance (µS/cm)	472	472	513	513	515	477	477	517	517	515
pH (units)	8.4	8.4	7.6	7.6	7.6	8.6	8.6	7.6	7.6	7.6
Dissolved oxygen	8.8	8.7	2.6	2.9	2.3	8.6	8.2	1.4	2.1	2.3
Phosphorus, total (as P)	0.012	0.011	0.012	0.014	0.011	0.008	0.009	0.007	0.007	0.009
Phosphorus, ortho, dissolved (as P)	<0.002	<0.002	<0.002	0.002	0.006	0.002	0.002	0.002	0.002	0.003
Nitrogen, NO2 + NO3, diss. (as N)	<0.010	<0.010	0.055	0.109	0.093	<0.010	<0.010	0.048	0.107	0.184
Nitrogen, ammonia, dissolved (as N)	0.017	<0.013	<0.013	0.017	0.023	<0.013	<0.013	<0.013	<0.013	<0.013
Nitrogen, amm. + org., total (as N)	0.53	0.55	0.43	0.45	0.54	0.59	0.57	0.48	0.54	0.51
Nitrogen, total (as N)	---	---	0.49	0.56	0.63	---	---	0.53	0.65	0.70

09-01-98

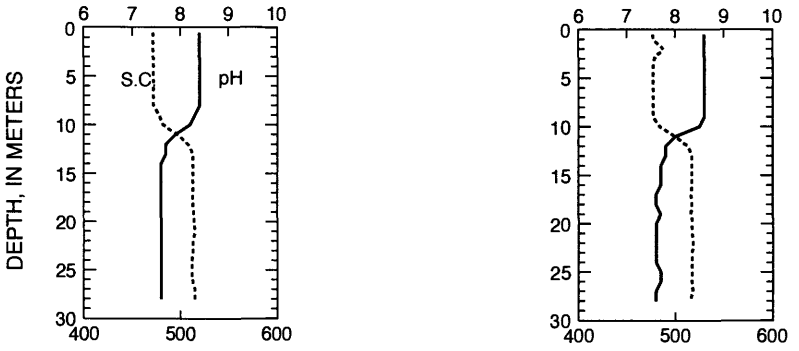
09-16-98

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



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

PH, IN STANDARD UNITS



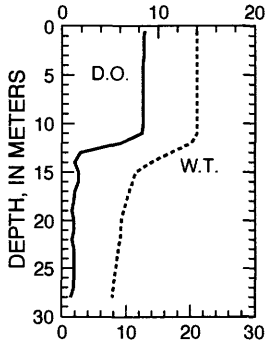
SPECIFIC CONDUCTANCE (S.C.), IN MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS

WATER-QUALITY DATA, SEPTEMBER 29, 1998
(Milligrams per liter unless otherwise indicated)

	Sept. 29				
Lake stage (ft)			---		
Secchi-depth (meters)			4.1		
Chlorophyll a, phytoplankton (µg/L)			2.97		
Depth of sample (m)	0.5	12.0	18.0	23.0	28.0
Water temperature (°C)	21.0	20.2	10.0	8.7	7.8
Specific Conductance (µS/cm)	479	488	517	518	519
pH (units)	8.6	8.3	7.6	7.5	7.5
Dissolved oxygen	8.6	6.1	1.2	1.2	0.9
Phosphorus, total (as P)	0.011	0.014	0.011	0.014	0.017
Phosphorus, ortho, dissolved (as P)	0.002	0.002	0.002	0.002	0.006
Nitrogen, NO2 + NO3, diss. (as N)	<0.010	<0.010	0.032	0.115	0.165
Nitrogen, ammonia, dissolved (as N)	<0.013	<0.013	<0.013	<0.013	0.017
Nitrogen, amm. + org., total (as N)	0.51	0.48	0.45	0.47	0.51
Nitrogen, total (as N)	---	---	0.48	0.58	0.68

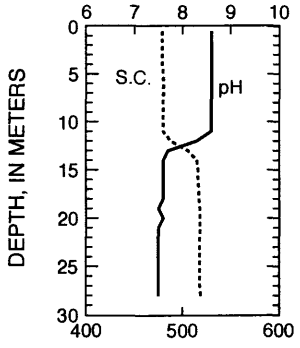
09-29-98

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

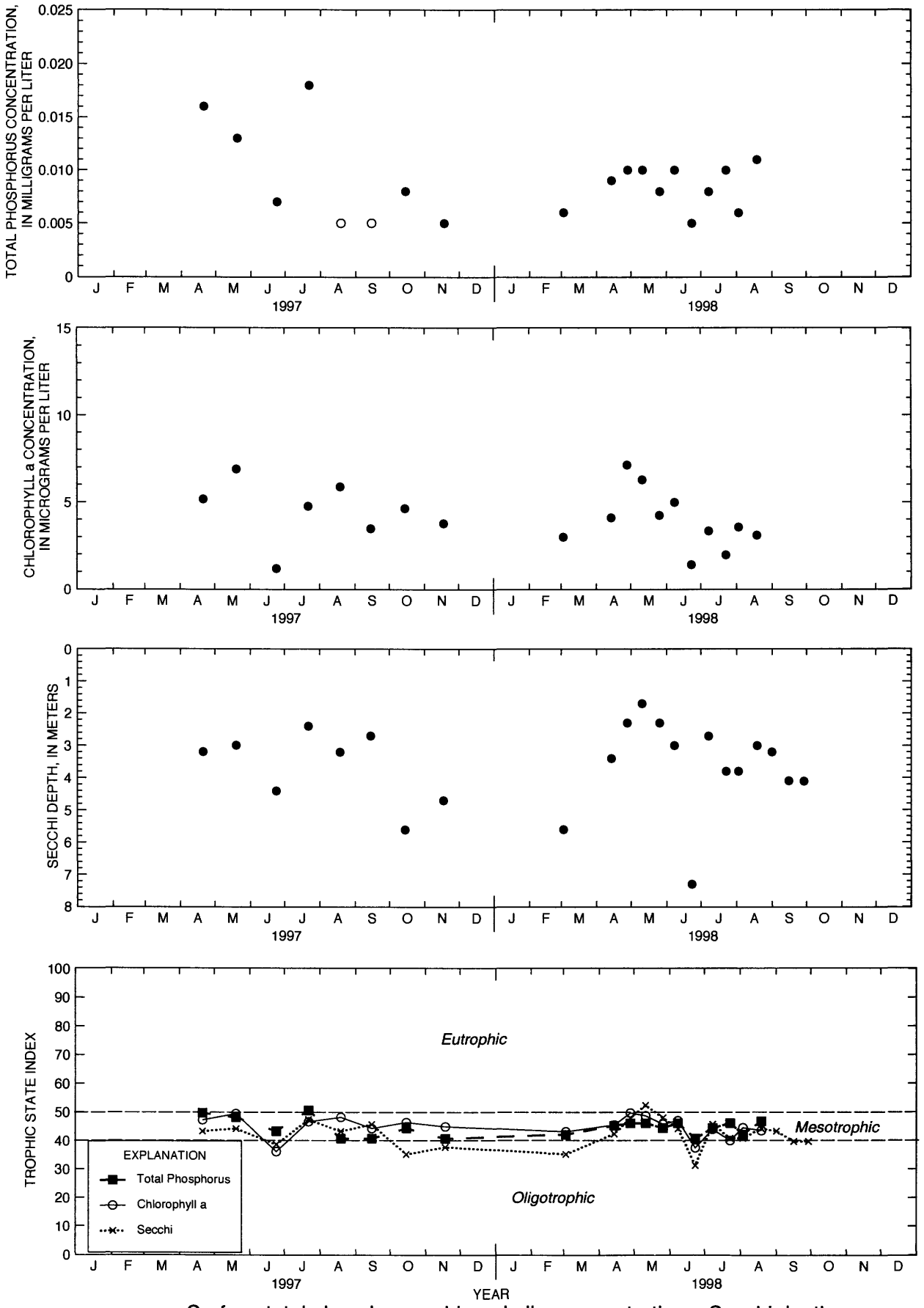


WATER TEMPERATURE (W.T.), IN DEGREES CELSIUS

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, Center Site, near Lake Geneva, 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.)

423421088272300 GENEVA LAKE AT EAST END NEAR LAKE GENEVA, WI

LOCATION.--Lat 42°34'21", long 88°27'23", in NE 1/4 SW 1/4, sec.2, T.1 N., R.17 E., Walworth County, Hydrologic Unit 07120006, 1.6 mi southwest of outlet at Lake Geneva.

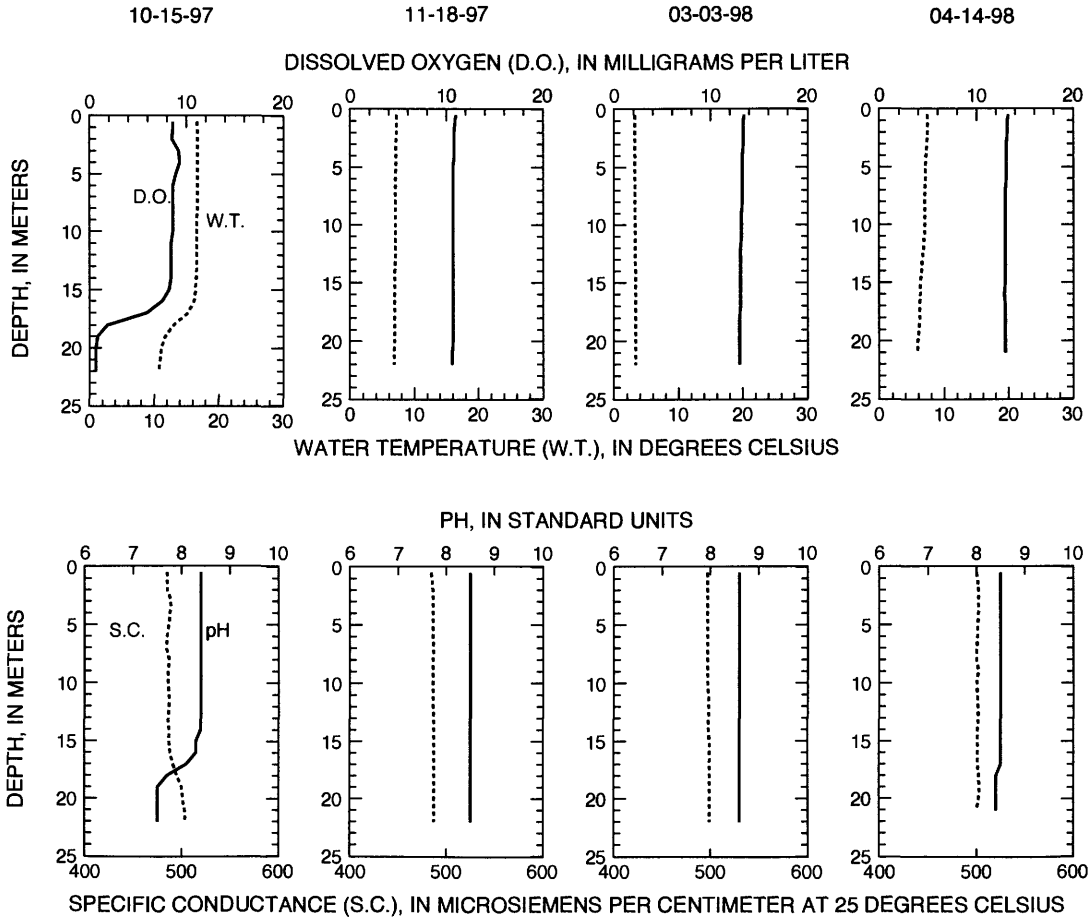
DRAINAGE AREA.--28.7 mi^2.

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

REMARKS.--Lake sampled at a depth of about 23 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 15, 1997 TO APRIL 14, 1998
(Milligrams per liter unless otherwise indicated)

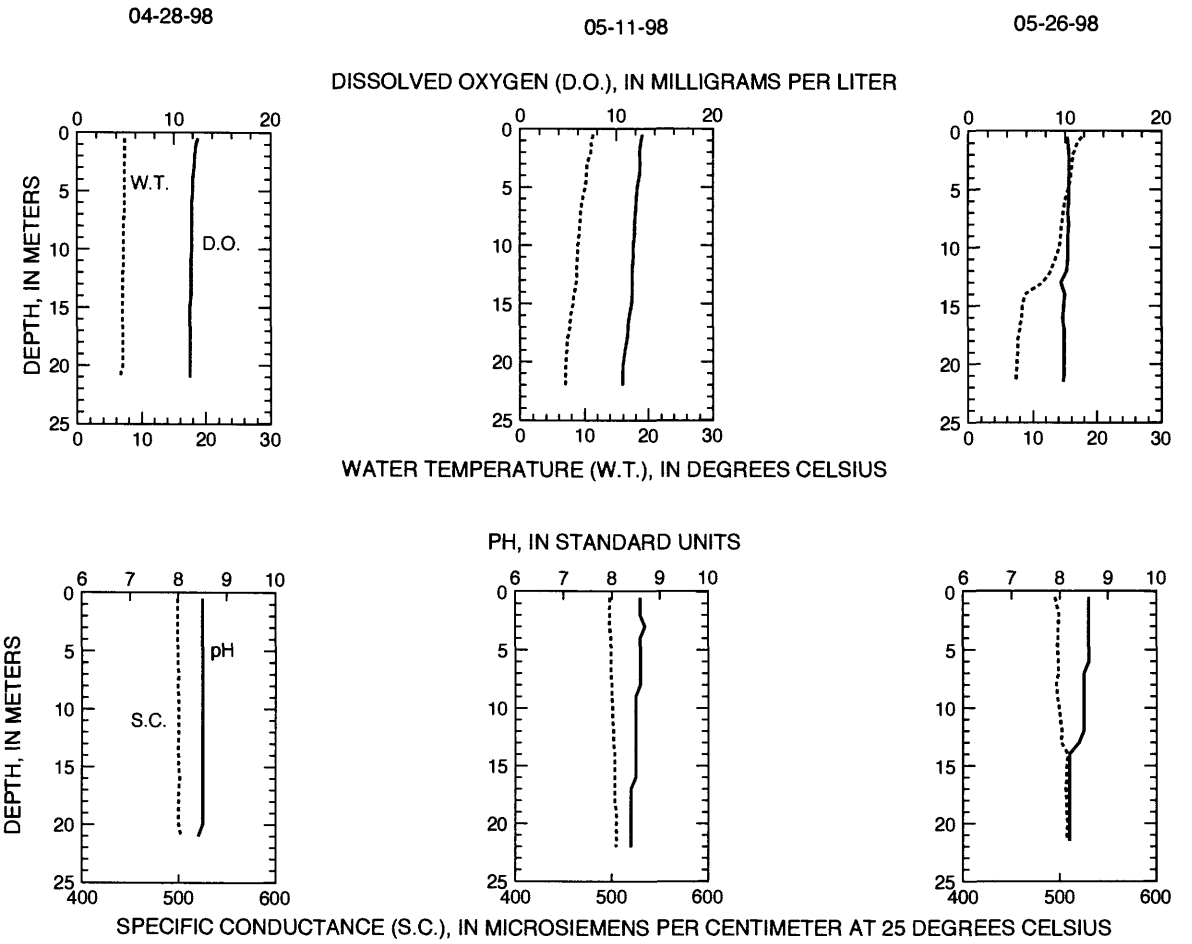
	Oct. 15					Nov. 18		Mar. 03		Apr. 14	
Lake stage (ft)			2.46			2.26		---		---	
Secchi-depth (meters)			5.8			5.0		4.4		3.4	
Chlorophyll a, phytoplankton (µg/L)			3.35			3.99		3.00		3.90	
Depth of sample (m)	0.5	16.0	18.0	20.0	21.0	0.5	22.0	0.5	21.0	0.5	21.0
Water temperature (°C)	16.6	16.2	13.0	11.1	10.8	7.2	6.8	3.2	3.3	7.4	5.9
Specific Conductance (µS/cm)	485	488	495	501	504	484	487	497	499	500	503
pH (units)	8.4	8.3	7.7	7.5	7.5	8.5	8.5	8.6	8.6	8.5	8.4
Dissolved oxygen	8.6	7.5	1.8	0.6	0.6	11.0	10.6	13.5	13.0	13.3	13.0
Phosphorus, total (as P)	0.008	0.012	0.012	<0.005	0.014	<0.005	<0.005	0.007	<0.005	0.010	0.011
Phosphorus, ortho, dissolved (as P)	<0.002	<0.002	<0.002	0.003	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Nitrogen, NO2 + NO3, diss. (as N)	<0.010	<0.010	0.087	0.126	0.140	0.028	0.026	0.050	0.053	0.057	0.071
Nitrogen, ammonia, dissolved (as N)	<0.013	<0.010	<0.010	<0.010	<0.010	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013
Nitrogen, amm. + org., total (as N)	0.40	0.40	0.40	0.30	0.40	0.20	0.30	0.40	0.60	0.45	0.45
Nitrogen, total (as N)	---	---	0.49	0.43	0.54	0.23	0.33	0.45	0.65	0.51	0.52
Color (Pt-Co. scale)	---	---	---	---	---	---	---	---	---	10	10
Turbidity (NTU)	---	---	---	---	---	---	---	---	---	1.5	1.3
Hardness, as CaCO3	---	---	---	---	---	---	---	---	---	220	220
Calcium, dissolved (Ca)	---	---	---	---	---	---	---	---	---	34	34
Magnesium, dissolved (Mg)	---	---	---	---	---	---	---	---	---	33	34
Sodium, dissolved (Na)	---	---	---	---	---	---	---	---	---	17	17
Potassium, dissolved (K)	---	---	---	---	---	---	---	---	---	1.8	1.7
Alkalinity, as CaCO3	---	---	---	---	---	---	---	---	---	189	189
Sulfate, dissolved (SO4)	---	---	---	---	---	---	---	---	---	32	32
Chloride, dissolved (Cl)	---	---	---	---	---	---	---	---	---	34	34
Silica, dissolved (SiO2)	---	---	---	---	---	---	---	---	---	0.53	0.63
Solids, dissolved, at 180°C	---	---	---	---	---	---	---	---	---	278	278
Iron, dissolved (Fe) µg/L	---	---	---	---	---	---	---	---	---	<10	<10
Manganese, dissolved (Mn) µg/L	---	---	---	---	---	---	---	---	---	<0.40	<0.40



423421088272300 GENEVA LAKE AT EAST END NEAR LAKE GENEVA, WI

WATER-QUALITY DATA, APRIL 28 TO MAY 26, 1998
(Milligrams per liter unless otherwise indicated)

	Apr. 28		May 11					May 26				
Lake stage (ft)	---		---					---				
Secchi-depth (meters)	2.4		1.8					2.1				
Chlorophyll a, phytoplankton (µg/L)	6.48		5.86					4.02				
Depth of sample (m)	0.5	21.0	0.5	6.0	13.0	17.0	22.0	0.5	6.0	13.0	17.0	21.0
Water temperature (°C)	7.4	6.6	11.4	9.7	8.8	7.7	7.0	17.6	14.9	11.6	7.9	7.4
Specific Conductance (µS/cm)	499	502	498	499	502	503	505	495	498	501	506	508
pH (units)	8.5	8.4	8.6	8.6	8.5	8.4	8.4	8.6	8.6	8.4	8.2	8.2
Dissolved oxygen	12.5	11.7	12.7	12.1	11.7	11.2	10.6	10.2	10.4	9.6	9.9	9.8
Phosphorus, total (as P)	0.009	0.008	0.011	0.012	0.010	0.010	0.012	0.010	0.016	0.014	0.010	0.010
Phosphorus, ortho, dissolved (as P)	0.002	0.002	0.002	0.002	0.003	0.002	0.003	0.003	0.003	0.003	0.003	0.00
Nitrogen, NO2 + NO3, diss. (as N)	0.056	0.059	<0.010	<0.010	0.028	0.041	0.054	<0.010	<0.010	<0.010	0.049	0.037
Nitrogen, ammonia, dissolved(as N)	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	0.023	<0.013	<0.013	<0.013	<0.013	<0.013
Nitrogen, amm. + org., total(as N)	0.44	0.35	0.61	0.67	0.63	0.65	0.60	0.48	0.60	0.43	0.72	0.35
Nitrogen, total (as N)	0.50	0.41	---	---	0.66	0.69	0.65	---	---	---	0.77	0.39



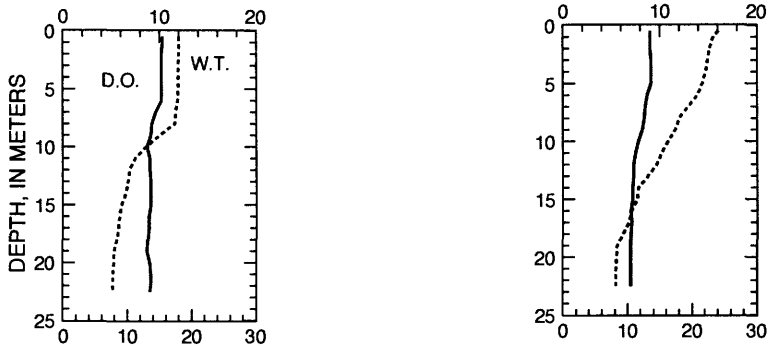
423421088272300 GENEVA LAKE AT EAST END NEAR LAKE GENEVA, WI

WATER-QUALITY DATA, JUNE 08 AND 23, 1998
(Milligrams per liter unless otherwise indicated)

	June 08					June 23				
Lake stage (ft)			---					---		
Secchi-depth (meters)			3.4					7.2		
Chlorophyll a, phytoplankton (µg/L)			4.32					1.63		
Depth of sample (m)	0.5	8.0	13.0	18.0	22.0	0.5	7.0	14.0	19.0	22.0
Water temperature (°C)	18.0	17.4	10.1	8.4	7.7	24.1	19.4	11.7	8.4	8.2
Specific Conductance (µS/cm)	490	492	502	505	504	495	502	512	517	516
pH (units)	8.7	8.6	8.2	8.1	8.1	8.4	8.3	8.0	7.9	7.9
Dissolved oxygen	10.3	9.2	9.1	8.8	9.0	9.0	8.5	7.2	7.0	7.0
Phosphorus, total (as P)	0.013	0.012	0.011	0.014	0.013	0.005	0.014	0.010	0.009	<0.005
Phosphorus, ortho, dissolved (as P)	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.002	0.002	<0.002	<0.002
Nitrogen, NO2 + NO3, diss. (as N)	<0.010	<0.010	0.015	0.037	0.044	<0.010	<0.010	0.016	<0.010	<0.010
Nitrogen, ammonia, dissolved (as N)	0.006	0.009	0.013	0.024	0.033	0.015	0.026	0.039	0.011	0.012
Nitrogen, amm. + org., total (as N)	0.65	0.68	0.57	0.59	0.72	0.54	0.82	0.81	0.70	0.74
Nitrogen, total (as N)	---	---	0.58	0.63	0.76	---	---	0.83	---	---

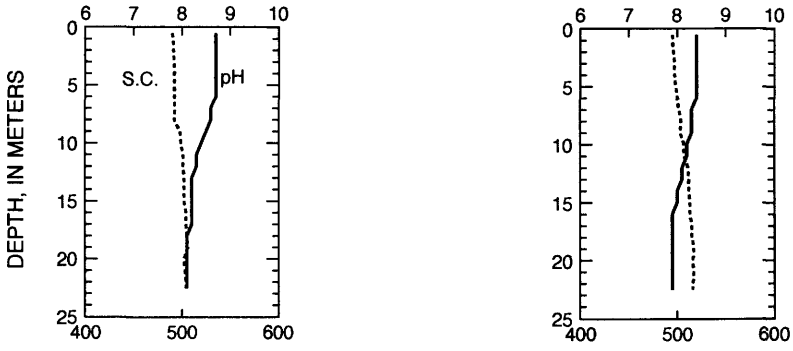
06-08-98 06-23-98

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

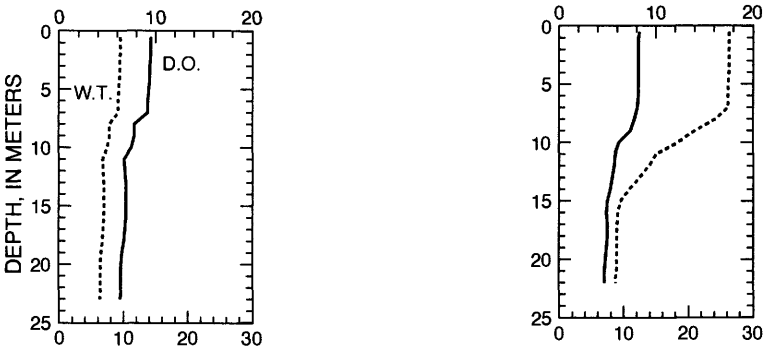
423421088272300 GENEVA LAKE AT EAST END NEAR LAKE GENEVA, WI

WATER-QUALITY DATA, JULY 08 AND 23, 1998
(Milligrams per liter unless otherwise indicated)

	July 08					July 23				
Lake stage (ft)			---					---		
Secchi-depth (meters)			3.2					4.3		
Chlorophyll a, phytoplankton (µg/L)			3.14					1.86		
Depth of sample (m)	0.5	7.0	13.0	18.0	23.0	0.5	7.0	15.0	19.0	21.0
Water temperature (°C)	24.4	23.6	13.1	8.9	8.7	26.3	26.2	9.5	8.9	8.8
Specific Conductance (µS/cm)	485	486	511	516	516	476	477	515	515	515
pH (units)	8.6	8.6	8.1	7.9	7.9	8.4	8.4	7.8	7.8	7.8
Dissolved oxygen	9.5	9.2	6.9	6.7	6.3	8.3	8.1	5.0	4.9	4.7
Phosphorus, total (as P)	0.009	0.010	0.011	<0.005	<0.005	0.010	0.013	0.011	0.010	0.011
Phosphorus, ortho, dissolved (as P)	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.002	0.002	0.002	0.002
Nitrogen, NO2 + NO3, diss. (as N)	<0.010	<0.010	0.010	0.025	<0.010	<0.010	<0.010	0.043	0.104	0.104
Nitrogen, ammonia, dissolved (as N)	<0.009	<0.009	<0.009	0.014	<0.009	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrogen, amm. + org., total (as N)	0.59	0.59	0.72	0.64	0.63	0.52	0.49	0.50	0.38	0.42
Nitrogen, total (as N)	---	---	0.73	0.67	---	---	---	0.54	0.48	0.52

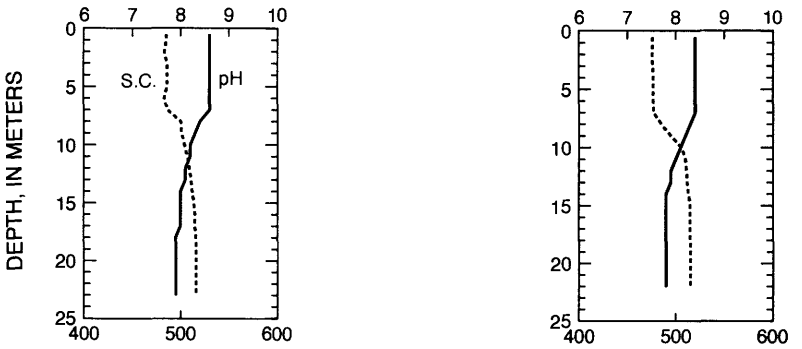
07-08-98 07-23-98

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

423421088272300 GENEVA LAKE AT EAST END NEAR LAKE GENEVA, WI

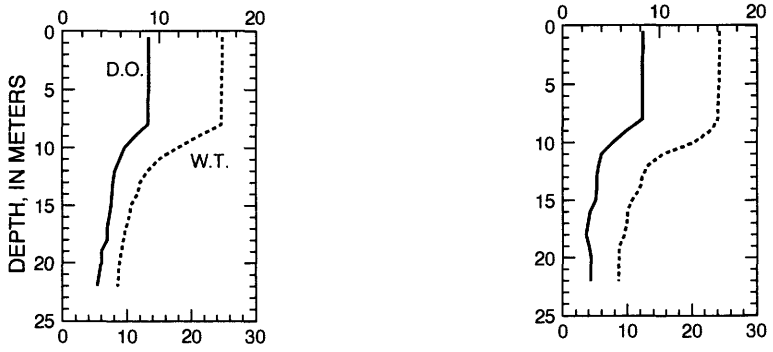
WATER-QUALITY DATA, AUGUST 03 AND 19, 1998
(Milligrams per liter unless otherwise indicated)

	Aug. 03					Aug. 19				
Lake stage (ft)			---					---		
Secchi-depth (meters)			4.1					3.2		
Chlorophyll a, phytoplankton (µg/L)			2.23					2.85		
Depth of sample (m)	0.5	8.0	16.0	19.0	22.0	0.5	8.0	13.0	18.0	22.0
Water temperature (°C)	24.8	24.6	10.3	9.1	8.6	24.3	24.0	12.3	9.5	8.7
Specific Conductance (µS/cm)	477	477	510	512	513	483	483	516	517	519
pH (units)	8.5	8.5	7.7	7.6	7.6	8.6	8.5	7.8	7.6	7.6
Dissolved oxygen	8.9	8.8	4.8	4.0	3.6	8.3	8.2	3.5	2.4	2.9
Phosphorus, total (as P)	0.006	0.007	0.009	0.007	0.010	0.011	0.012	0.012	0.015	0.014
Phosphorus, ortho, dissolved (as P)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Nitrogen, NO2 + NO3, diss. (as N)	<0.010	<0.010	0.018	0.037	0.057	<0.010	<0.010	<0.010	0.058	0.088
Nitrogen, ammonia, dissolved (as N)	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	0.038	0.029
Nitrogen, amm. + org., total (as N)	0.31	0.60	0.52	0.47	0.47	0.64	0.60	0.54	0.51	0.54
Nitrogen, total (as N)	---	---	0.54	0.51	0.53	---	---	---	0.57	0.63

08-03-98

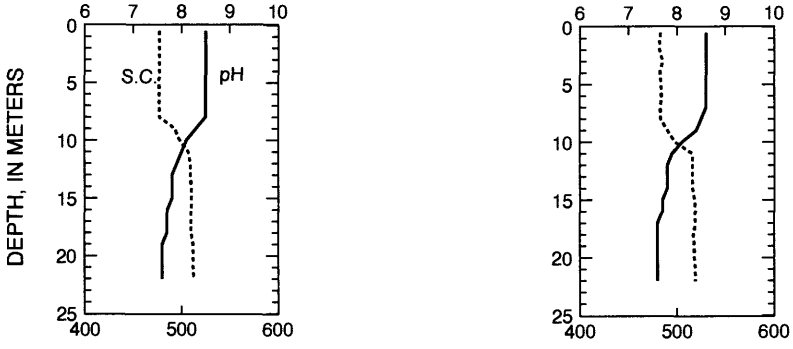
08-19-98

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

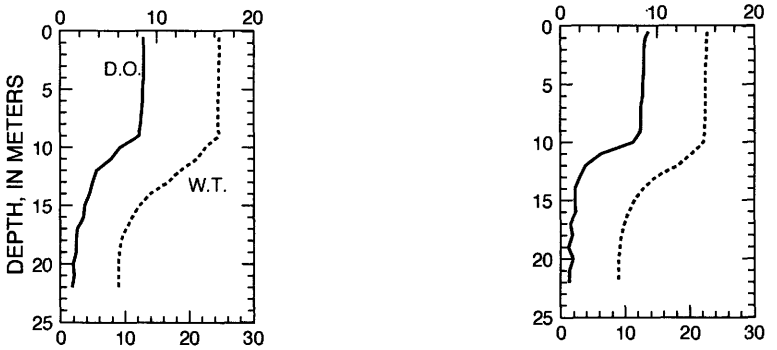
423421088272300 GENEVA LAKE AT EAST END NEAR LAKE GENEVA, WI

WATER-QUALITY DATA, SEPTEMBER 01 and 16, 1998
(Milligrams per liter unless otherwise indicated)

	Sept. 01					Sept. 16				
Lake stage (ft)			---					---		
Secchi-depth (meters)			3.2					4.3		
Chlorophyll a, phytoplankton (µg/L)			7.03					1.83		
Depth of sample (m)	0.5	9.0	13.0	18.0	22.0	0.5	10.0	16.0	19.0	22.0
Water temperature (°C)	24.7	24.3	16.7	9.4	9.0	22.7	22.1	10.6	9.2	9.0
Specific Conductance (µS/cm)	475	475	507	516	516	478	480	521	516	518
pH (units)	8.5	8.4	7.7	7.5	7.5	8.6	8.5	7.6	7.6	7.6
Dissolved oxygen	8.6	8.1	3.3	1.6	1.2	9.1	7.5	1.6	0.8	0.9
Phosphorus, total (as P)	0.014	0.012	0.015	0.019	0.019	0.007	0.006	0.011	0.012	0.013
Phosphorus, ortho, dissolved (as P)	<0.002	<0.002	<0.002	<0.002	0.007	0.002	0.002	0.002	0.002	0.003
Nitrogen, NO2 + NO3, diss. (as N)	<0.010	<0.010	<0.010	0.059	0.073	<0.010	<0.010	0.030	0.068	0.068
Nitrogen, ammonia, dissolved (as N)	<0.013	<0.013	<0.013	0.040	0.055	<0.013	<0.013	<0.013	<0.013	0.025
Nitrogen, amm. + org., total (as N)	0.61	0.45	0.50	0.53	1.40	0.62	0.58	0.54	0.50	0.52
Nitrogen, total (as N)	---	---	---	0.59	1.40	---	---	0.57	0.57	0.59

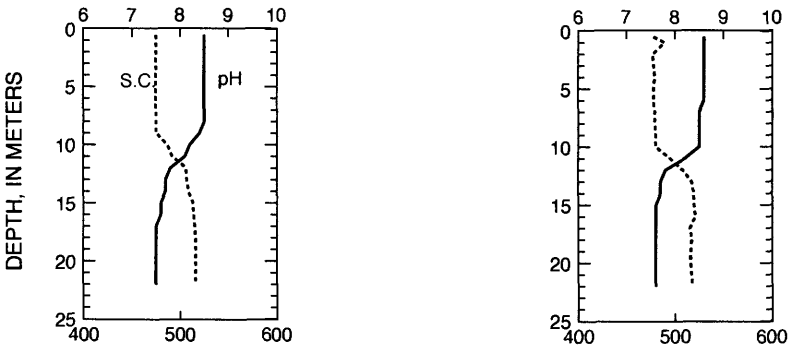
09-01-98 09-16-98

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

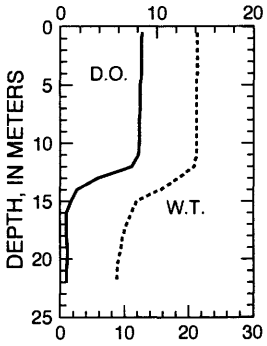
423421088272300 GENEVA LAKE AT EAST END NEAR LAKE GENEVA, WI

WATER-QUALITY DATA, SEPTEMBER 29, 1998
(Milligrams per liter unless otherwise indicated)

	Sept. 29				
Lake stage (ft)			---		
Secchi-depth (meters)			4.0		
Chlorophyll a, phytoplankton (µg/L)			4.08		
Depth of sample (m)	0.5	12.0	16.0	20.0	22.0
Water temperature (°C)	21.3	20.8	11.1	9.0	8.7
Specific Conductance (µS/cm)	480	482	516	519	519
pH (units)	8.6	8.4	7.5	7.5	7.5
Dissolved oxygen	8.5	7.4	0.6	0.7	0.6
Phosphorus, total (as P)	0.008	0.009	0.008	0.011	0.015
Phosphorus, ortho, dissolved (as P)	<0.002	<0.002	<0.002	<0.002	0.003
Nitrogen, NO2 + NO3, diss. (as N)	<0.010	<0.010	<0.010	0.057	0.097
Nitrogen, ammonia, dissolved (as N)	<0.013	<0.013	<0.013	0.016	0.026
Nitrogen, amm. + org., total (as N)	0.54	0.52	0.46	0.43	0.50
Nitrogen, total (as N)	---	---	---	0.49	0.60

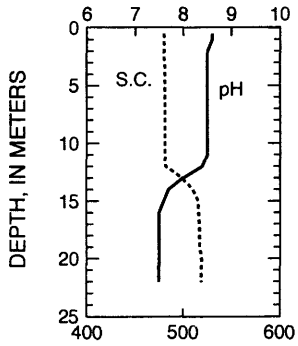
09-29-98

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

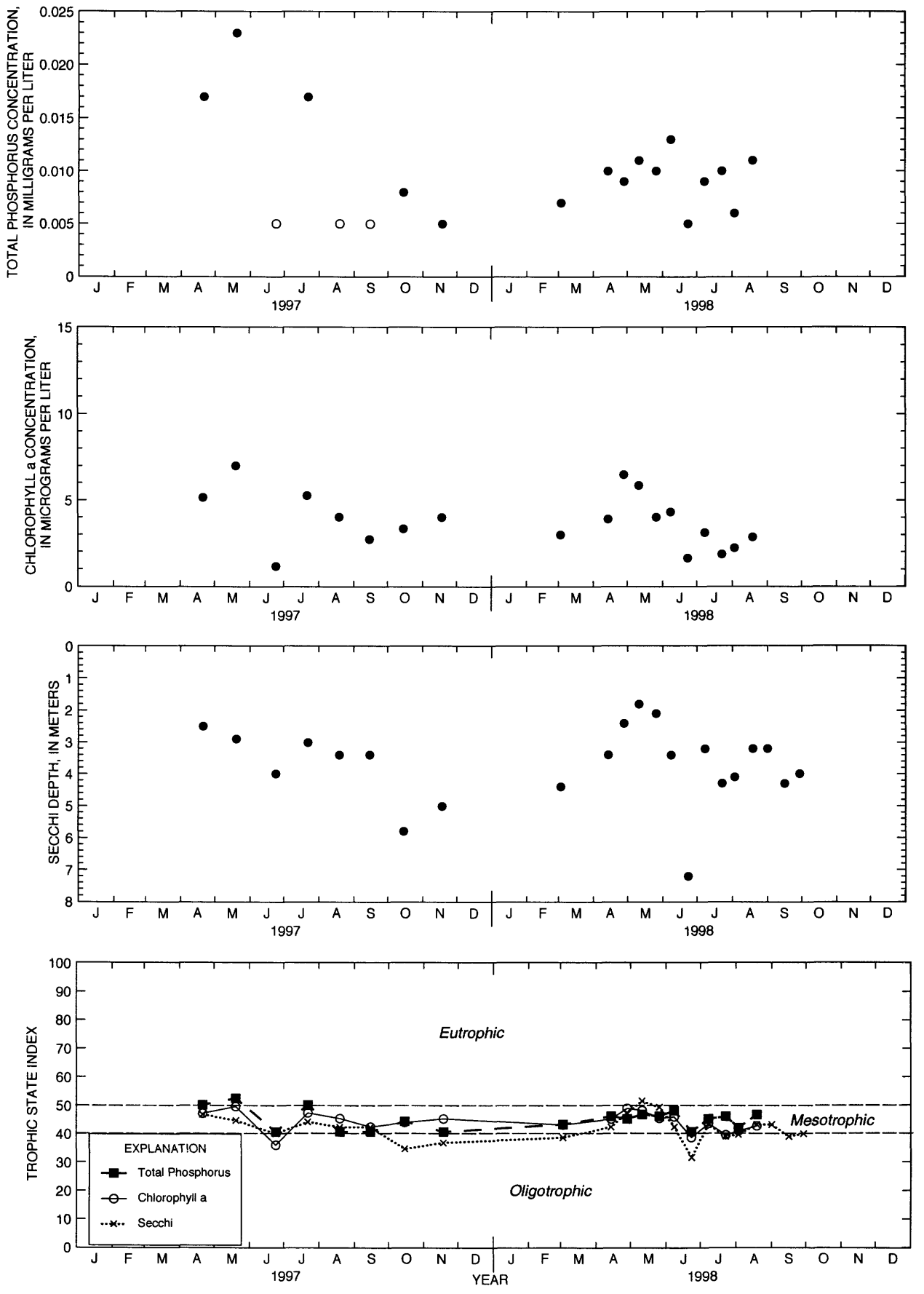


WATER TEMPERATURE (W.T.), IN DEGREES CELSIUS

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, East End, near Lake Geneva, 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.)

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.

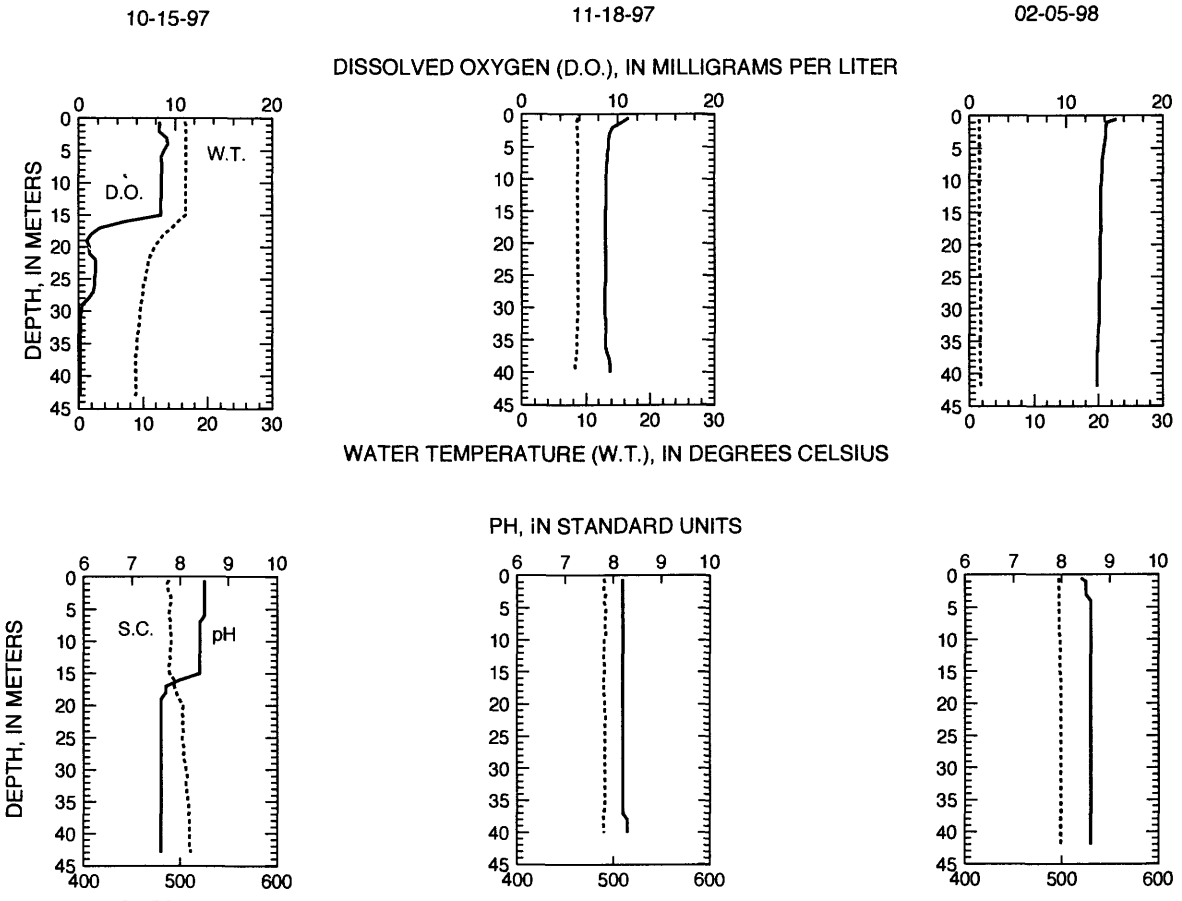
DRAINAGE AREA.--28.7 mi^2.

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.

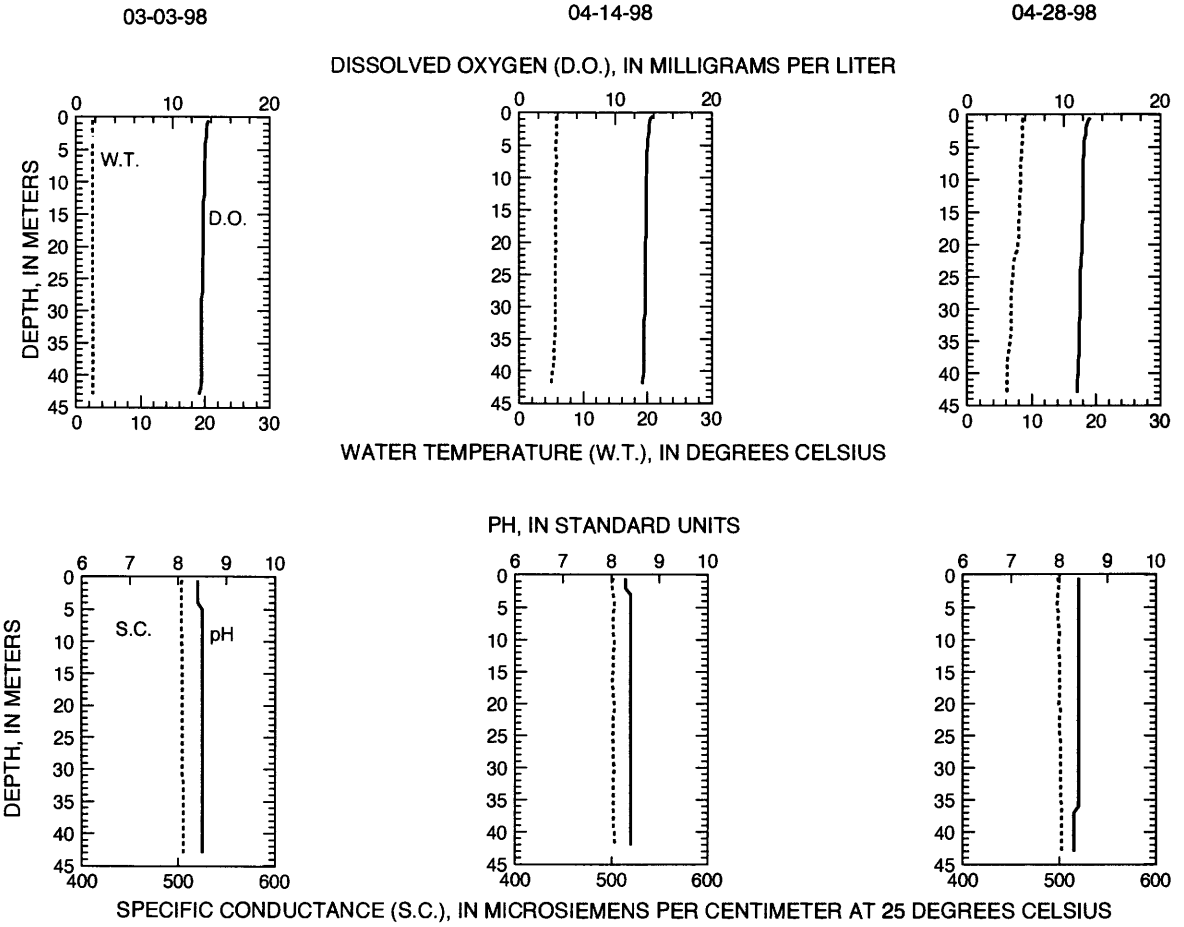
WATER-QUALITY DATA, OCTOBER 15, 1997 TO FEBRUARY 05, 1998
(Milligrams per liter unless otherwise indicated)

	Oct. 15						Nov. 18		Feb. 05	
Lake stage (ft)			2.46				2.26		---	
Secchi-depth (meters)			4.9				4.4		4.6	
Chlorophyll a, phytoplankton (µg/L)			5.57				3.83		4.01	
Depth of sample (m)	0.5	15.0	24.0	32.0	37.0	42.0	0.5	40.0	0.5	42.0
Water temperature (°C)	16.5	16.6	10.5	9.3	8.8	8.8	8.7	8.3	1.5	1.7
Specific Conductance (µS/cm)	488	489	503	506	509	511	490	490	497	499
pH (units)	8.5	8.4	7.6	7.6	7.6	7.6	8.2	8.3	8.4	8.6
Dissolved oxygen	8.4	8.5	1.7	0.1	0.1	0.1	11.1	9.2	15.2	13.2
Phosphorus, total (as P)	0.007	0.007	0.007	0.023	0.045	0.008	0.005	0.007	0.007	0.007
Phosphorus, ortho, dissolved (as P)	<0.002	<0.002	0.002	0.017	0.041	<0.002	0.003	0.002	<0.002	<0.002
Nitrogen, NO2 + NO3, diss. (as N)	0.000	0.000	0.131	0.093	<0.010	0.011	0.048	0.029	0.084	<0.010
Nitrogen, ammonia, dissolved (as N)	<0.010	<0.010	<0.010	<0.010	0.121	<0.010	0.017	<0.013	0.012	0.012
Nitrogen, amm. + org., total (as N)	0.50	---	0.50	0.40	0.70	0.50	0.40	0.60	0.50	0.50
Nitrogen, total (as N)	---	---	---	0.53	---	0.51	0.45	0.63	0.58	---



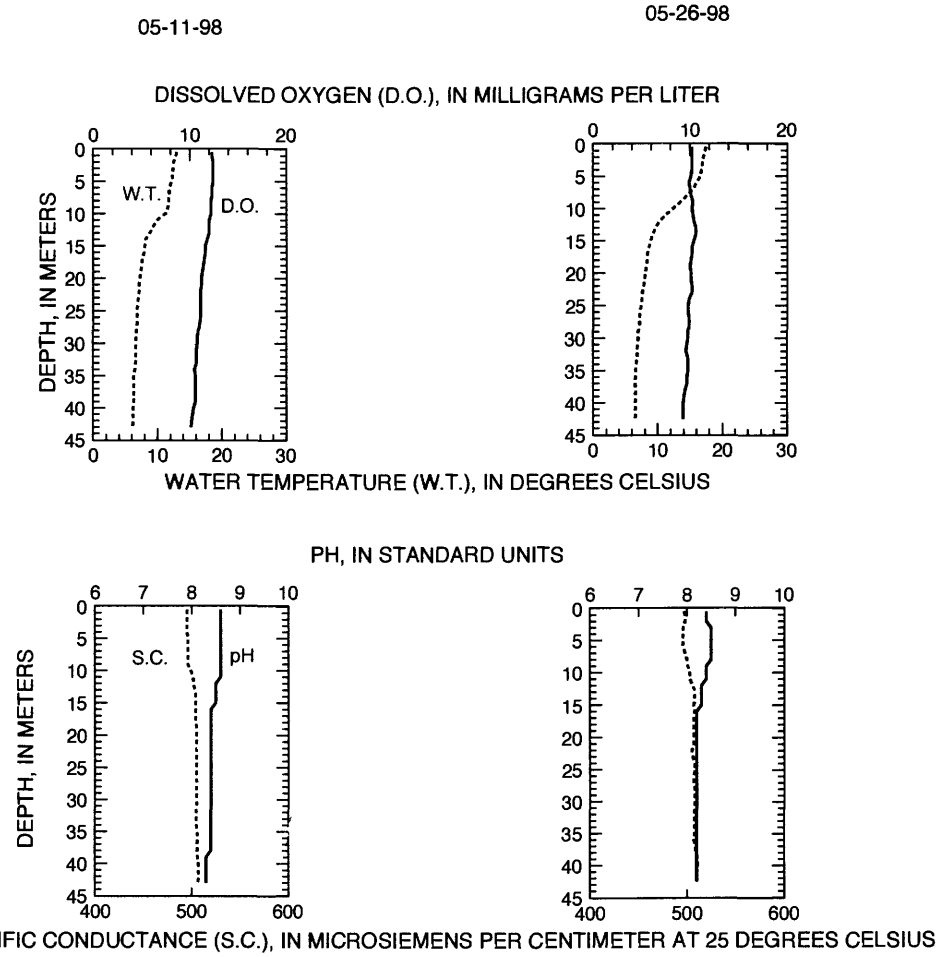
WATER-QUALITY DATA, MARCH 03 TO APRIL 28, 1998
(Milligrams per liter unless otherwise indicated)

	Mar. 03		Apr. 14		Apr. 28		
Lake stage (ft)	---		---		---		
Secchi-depth (meters)	5.0		3.4		2.1		
Chlorophyll a, phytoplankton (µg/L)	3.00		4.18		7.45		
Depth of sample (m)	0.5	43.0	0.5	41.0	0.5	12.0	42.0
Water temperature (°C)	2.5	2.6	5.8	9.0	8.6	8.2	6.1
Specific Conductance (µS/cm)	504	505	502	510	498	499	502
pH (units)	8.4	8.5	8.3	8.4	8.4	8.4	8.3
Dissolved oxygen	13.7	12.7	13.9	11.7	12.7	12.0	11.4
Phosphorus, total (as P)	0.007	0.010	0.010	0.012	0.010	0.010	0.011
Phosphorus, ortho, dissolved (as P)	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	0.002
Nitrogen, NO2 + NO3, diss. (as N)	0.059	0.061	0.074	0.073	<0.010	0.043	0.073
Nitrogen, ammonia, dissolved (as N)	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013
Nitrogen, amm. + org., total (as N)	0.40	0.30	0.44	0.54	0.43	0.40	0.38
Nitrogen, total (as N)	0.46	0.36	0.51	0.61	---	0.44	0.45
Color (Pt-Co. scale)	---	---	10	5	---	---	---
Turbidity (NTU)	---	---	1.6	1.4	---	---	---
Hardness, as CaCO3	---	---	217	221	---	---	---
Calcium, dissolved (Ca)	---	---	34	34	---	---	---
Magnesium, dissolved (Mg)	---	---	32	33	---	---	---
Sodium, dissolved (Na)	---	---	16	16	---	---	---
Potassium, dissolved (K)	---	---	1.8	1.9	---	---	---
Alkalinity, as CaCO3	---	---	189	189	---	---	---
Sulfate, dissolved (SO4)	---	---	31	32	---	---	---
Chloride, dissolved (Cl)	---	---	34	34	---	---	---
Silica, dissolved (SiO2)	---	---	0.55	0.67	---	---	---
Solids, dissolved, at 180°C	---	---	278	276	---	---	---
Iron, dissolved (Fe) µg/L	---	---	<10	<10	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	<0.40	<0.40	---	---	---



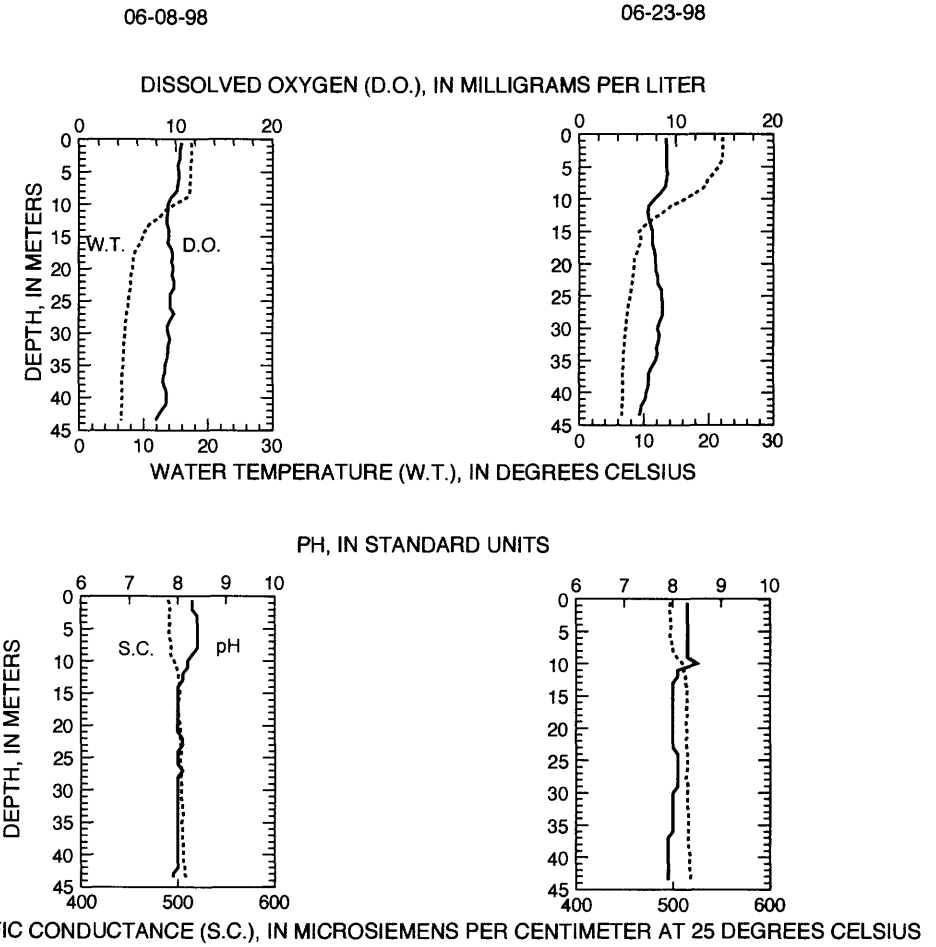
WATER-QUALITY DATA, MAY 11 AND 26, 1998
(Milligrams per liter unless otherwise indicated)

	May 11					May 26					
Lake stage (ft)			---					---			
Secchi-depth (meters)			1.7					2.4			
Chlorophyll a, phytoplankton (µg/L)			6.60					3.62			
Depth of sample (m)	0.5	13.0	34.0	39.0	42.0	0.5	6.0	24.0	34.0	39.0	42.0
Water temperature (°C)	13.0	8.8	6.5	6.3	6.2	17.5	16.0	7.5	6.7	6.5	6.5
Specific Conductance (µS/cm)	495	503	505	506	507	497	496	508	508	511	510
pH (units)	8.6	8.5	8.4	8.3	8.3	8.4	8.5	8.2	8.2	8.2	8.2
Dissolved oxygen	12.3	12.0	10.5	10.6	10.2	10.2	9.9	9.9	9.8	9.4	9.3
Phosphorus, total (as P)	0.010	0.012	0.010	0.012	0.016	0.010	0.011	0.009	0.008	0.011	0.013
Phosphorus, ortho, dissolved (as P)	0.002	0.003	0.003	0.003	0.004	0.003	0.003	0.003	0.003	0.005	0.006
Nitrogen, NO2 + NO3, diss. (as N)	<0.010	<0.010	0.060	0.062	0.063	<0.010	<0.010	0.049	0.059	0.061	0.061
Nitrogen, ammonia, dissolved (as N)	<0.013	<0.013	0.038	0.041	0.063	<0.013	<0.013	<0.013	0.043	0.057	0.058
Nitrogen, amm. + org., total (as N)	0.48	0.50	0.47	0.46	0.49	0.68	0.59	0.60	0.66	0.74	1.23
Nitrogen, total (as N)	---	---	0.53	0.52	0.55	---	---	0.65	0.72	0.80	1.29



WATER-QUALITY DATA, JUNE 08 AND 23, 1998
(Milligrams per liter unless otherwise indicated)

	June 08						June 23					
Lake stage (ft)				---						---		
Secchi-depth (meters)				3.0						6.9		
Chlorophyll a, phytoplankton (µg/L)				5.52						1.47		
Depth of sample (m)	0.5	9.0	14.0	34.0	39.0	43.0	0.5	8.0	14.0	34.0	39.0	43.0
Water temperature (°C)	17.4	16.7	10.3	6.8	6.6	6.5	22.3	19.5	10.2	6.8	6.7	8.0
Specific Conductance (µS/cm)	490	492	502	506	506	508	498	500	515	516	517	530
pH (units)	8.3	8.3	8.0	8.0	8.0	7.9	8.3	8.3	8.0	8.0	7.9	7.7
Dissolved oxygen	10.6	9.5	9.3	9.1	9.0	7.9	9.0	8.9	7.4	8.0	7.1	1.1
Phosphorus, total (as P)	0.012	0.011	0.009	0.008	0.010	0.022	0.007	0.007	0.010	0.007	0.012	0.118
Phosphorus, ortho, dissolved (as P)	<0.002	<0.002	<0.002	0.002	0.004	0.014	0.002	<0.002	0.002	0.002	0.006	0.108
Nitrogen, NO2 + NO3, diss. (as N)	<0.010	<0.010	0.012	0.068	0.065	0.062	0.012	<0.010	0.014	0.065	0.086	<0.010
Nitrogen, ammonia, dissolved (as N)	0.006	0.010	0.011	0.063	0.075	0.113	0.032	0.018	0.018	0.051	0.071	0.426
Nitrogen, amm. + org., total (as N)	0.54	0.46	0.38	0.61	0.59	0.68	0.53	0.53	0.56	0.55	0.54	0.65
Nitrogen, total (as N)	---	---	0.39	0.68	0.66	0.74	0.54	---	0.57	0.62	0.63	0.75



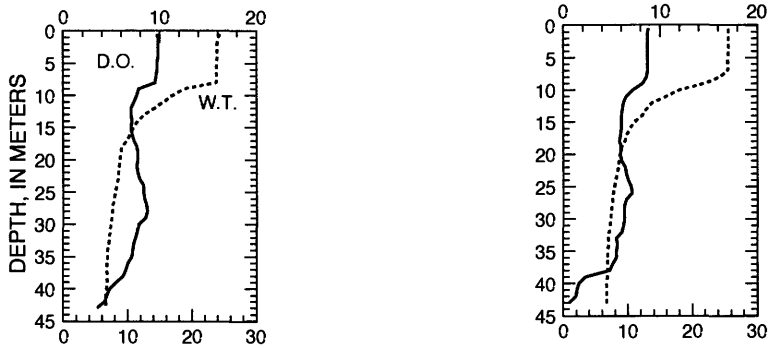
WATER-QUALITY DATA, JULY 08 AND 23, 1998
(Milligrams per liter unless otherwise indicated)

	July 08						July 23					
Lake stage (ft)			---						---			
Secchi-depth (meters)			2.8						3.5			
Chlorophyll a, phytoplankton (µg/L)			3.38						2.92			
Depth of sample (m)	0.5	8.0	18.0	34.0	39.0	43.0	0.5	7.0	19.0	34.0	39.0	43.0
Water temperature (°C)	24.3	23.8	9.1	6.9	6.7	6.6	25.6	25.5	8.9	7.0	6.8	6.7
Specific Conductance (µS/cm)	482	484	514	515	516	519	476	476	512	513	516	519
pH (units)	8.4	8.4	8.0	8.0	7.8	7.7	8.6	8.5	7.8	7.8	7.6	7.5
Dissolved oxygen	9.7	9.5	7.6	7.2	5.5	3.5	8.8	8.7	6.0	5.6	2.3	0.6
Phosphorus, total (as P)	0.010	0.011	0.010	0.012	0.016	0.060	<0.005	0.010	0.010	0.014	0.052	0.039
Phosphorus, ortho, dissolved (as P)	0.002	<0.002	<0.002	<0.002	0.007	0.043	0.002	0.002	0.002	0.004	0.035	0.026
Nitrogen, NO2 + NO3, diss. (as N)	<0.010	<0.010	0.021	<0.010	0.172	0.205	<0.010	<0.010	0.032	0.231	0.325	0.309
Nitrogen, ammonia, dissolved (as N)	<0.009	<0.009	0.014	<0.009	0.014	0.105	<0.010	<0.010	<0.013	<0.010	0.013	0.011
Nitrogen, amm. + org., total (as N)	1.51	0.61	0.60	0.61	0.62	0.74	0.65	0.54	0.44	0.43	0.53	0.48
Nitrogen, total (as N)	---	---	0.62	---	0.79	0.94	---	---	0.47	0.66	0.86	0.79

07-08-98

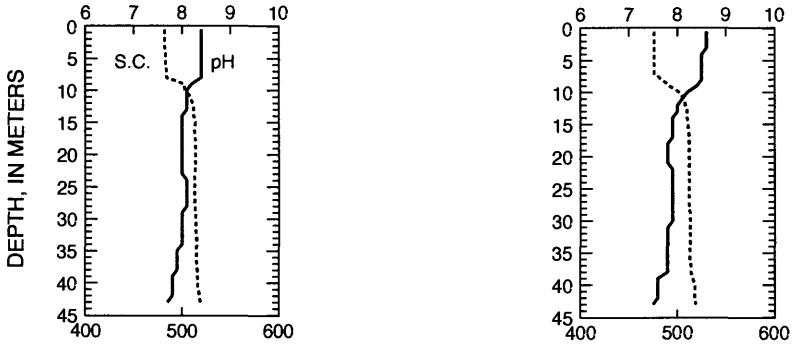
07-23-98

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



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

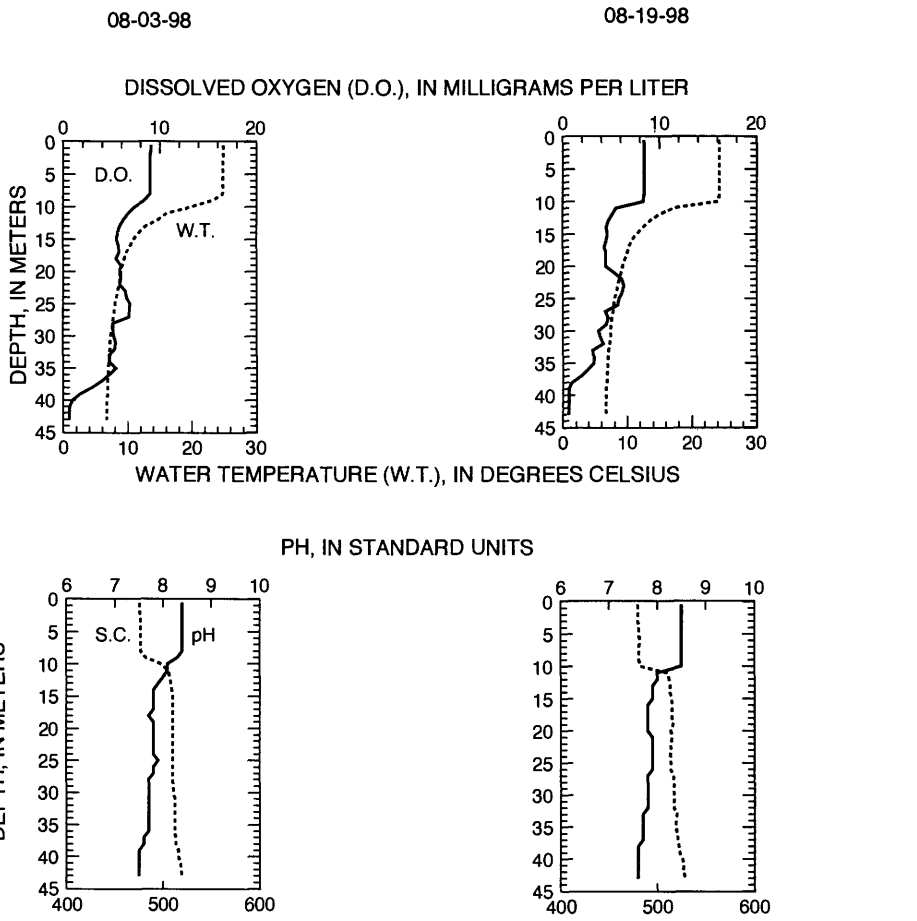
PH, IN STANDARD UNITS



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

WATER-QUALITY DATA, AUGUST 03 AND 19, 1998
(Milligrams per liter unless otherwise indicated)

	Aug. 03						Aug. 19					
Lake stage (ft)			---						---			
Secchi-depth (meters)			3.8						3.4			
Chlorophyll a, phytoplankton (µg/L)			2.85						2.14			
Depth of sample (m)	0.5	8.0	25.0	34.0	38.0	43.0	0.5	10.0	25.0	33.0	38.0	42.0
Water temperature (°C)	24.9	24.8	8.0	7.0	6.8	6.7	24.2	24.1	8.0	7.1	6.8	6.7
Specific Conductance (µS/cm)	476	477	510	512	513	519	480	483	514	520	522	528
pH (units)	8.4	8.4	7.9	7.7	7.6	7.5	8.5	8.5	7.9	7.7	7.6	7.6
Dissolved oxygen	9.1	9.0	6.9	4.7	2.9	0.6	8.4	8.3	5.8	3.1	0.9	0.6
Phosphorus, total (as P)	0.007	0.008	0.006	0.007	0.016	0.063	0.010	0.011	0.010	0.009	0.013	0.101
Phosphorus, ortho, dissolved (as P)	0.004	<0.002	<0.002	<0.002	0.007	0.048	<0.002	<0.002	<0.002	<0.002	0.077	0.003
Nitrogen, NO2 + NO3, diss. (as N)	<0.010	<0.010	0.057	0.201	0.294	0.332	<0.010	0.002	0.101	0.243	0.340	<0.030
Nitrogen, ammonia, dissolved (as N	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	0.243
Nitrogen, amm. + org., total (as N	0.35	0.38	0.35	0.47	0.44	0.53	0.62	0.62	0.51	0.50	0.48	0.88
Nitrogen, total (as N)	---	---	0.41	0.67	0.73	0.86	---	0.62	0.61	0.74	0.82	---

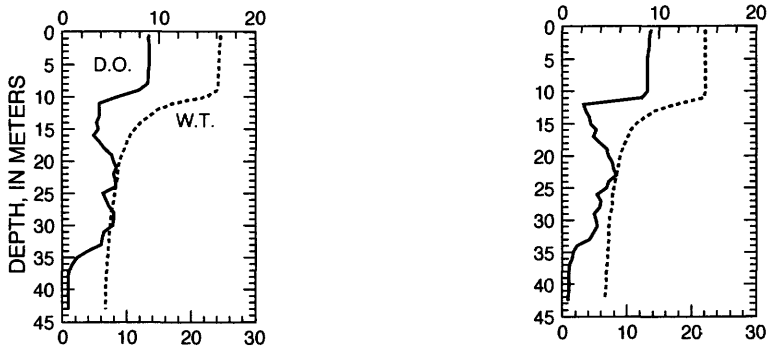


WATER-QUALITY DATA, SEPTEMBER 01 AND 16, 1998
(Milligrams per liter unless otherwise indicated)

	Sept. 01						Sept. 16					
Lake stage (ft)			---						---			
Secchi-depth (meters)			2.9						4.6			
Chlorophyll a, phytoplankton (µg/L)			2.54						4.94			
Depth of sample (m)	0.5	9.0	21.0	33.0	38.0	43.0	0.5	11.0	23.0	32.0	38.0	42.0
Water temperature (°C)	24.6	24.0	8.7	7.2	6.8	6.7	22.2	22.0	8.4	7.2	6.8	6.7
Specific Conductance (µS/cm)	471	472	510	511	518	524	475	477	515	517	523	529
pH (units)	8.5	8.4	7.7	7.6	7.5	7.4	8.6	8.5	7.8	7.7	7.6	7.6
Dissolved oxygen	9.0	7.9	5.6	4.0	0.6	0.6	9.2	8.2	5.6	3.2	0.7	0.6
Phosphorus, total (as P)	0.009	0.012	0.008	0.010	0.043	0.106	0.013	0.015	0.009	0.006	0.029	0.106
Phosphorus, ortho, dissolved (as P)	0.002	<0.002	<0.002	<0.002	0.025	0.076	<0.002	<0.002	<0.002	<0.002	0.020	0.093
Nitrogen, NO2 + NO3, diss. (as N)	<0.010	<0.010	0.022	0.212	0.097	<0.010	<0.010	<0.010	0.047	0.239	0.076	<0.010
Nitrogen, ammonia, dissolved (as N)	0.013	0.014	<0.013	<0.013	0.117	0.340	<0.013	<0.013	<0.013	<0.013	0.119	0.438
Nitrogen, amm. + org., total (as N)	0.53	0.42	0.51	0.33	0.59	1.04	0.51	0.57	0.48	0.46	0.61	1.15
Nitrogen, total (as N)	---	---	0.53	0.54	0.69	---	---	---	0.53	0.70	0.69	---

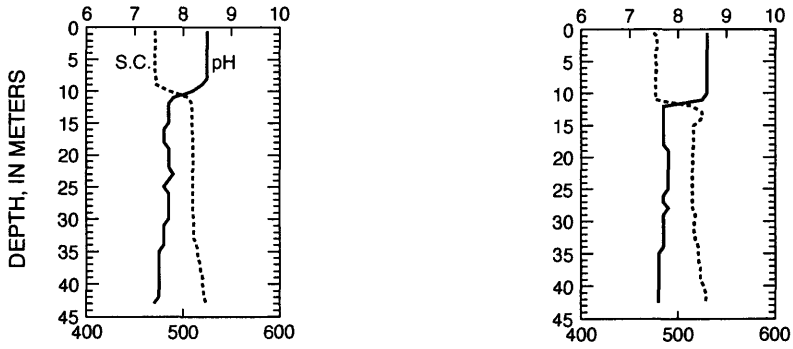
09-01-98 09-16-98

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



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

PH, IN STANDARD UNITS



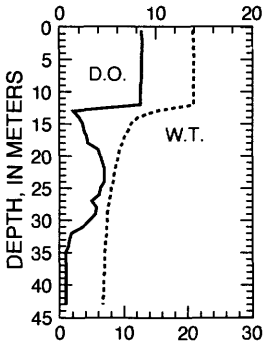
SPECIFIC CONDUCTANCE (S.C.), IN MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS

WATER-QUALITY DATA, SEPTEMBER 29, 1998
(Milligrams per liter unless otherwise indicated)

	Sept. 29					
Lake stage (ft)			---			
Secchi-depth (meters)			3.7			
Chlorophyll a, phytoplankton (µg/L)			5.85			
Depth of sample (m)	0.5	12.0	23.0	33.0	38.0	42.0
Water temperature (°C)	20.9	20.9	8.4	7.2	6.9	6.7
Specific Conductance (µS/cm)	479	482	514	521	524	528
pH (units)	8.4	8.4	7.7	7.6	7.5	7.5
Dissolved oxygen	8.5	8.4	4.6	1.0	0.6	0.6
Phosphorus, total (as P)	0.011	<0.005	<0.005	0.007	0.037	0.092
Phosphorus, ortho, dissolved (as P)	0.003	0.002	0.002	0.002	0.018	0.065
Nitrogen, NO2 + NO3, diss. (as N)	<0.010	<0.010	0.040	0.252	0.017	<0.010
Nitrogen, ammonia, dissolved (as N)	0.018	<0.013	<0.013	<0.013	0.146	0.400
Nitrogen, amm. + org., total (as N)	0.55	0.60	0.44	0.42	0.73	0.99
Nitrogen, total (as N)	---	---	0.48	0.67	0.75	---

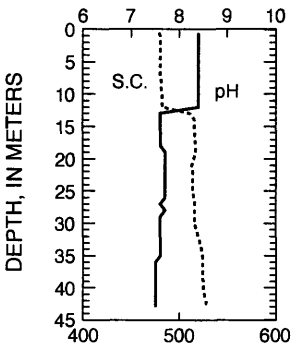
09-29-98

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

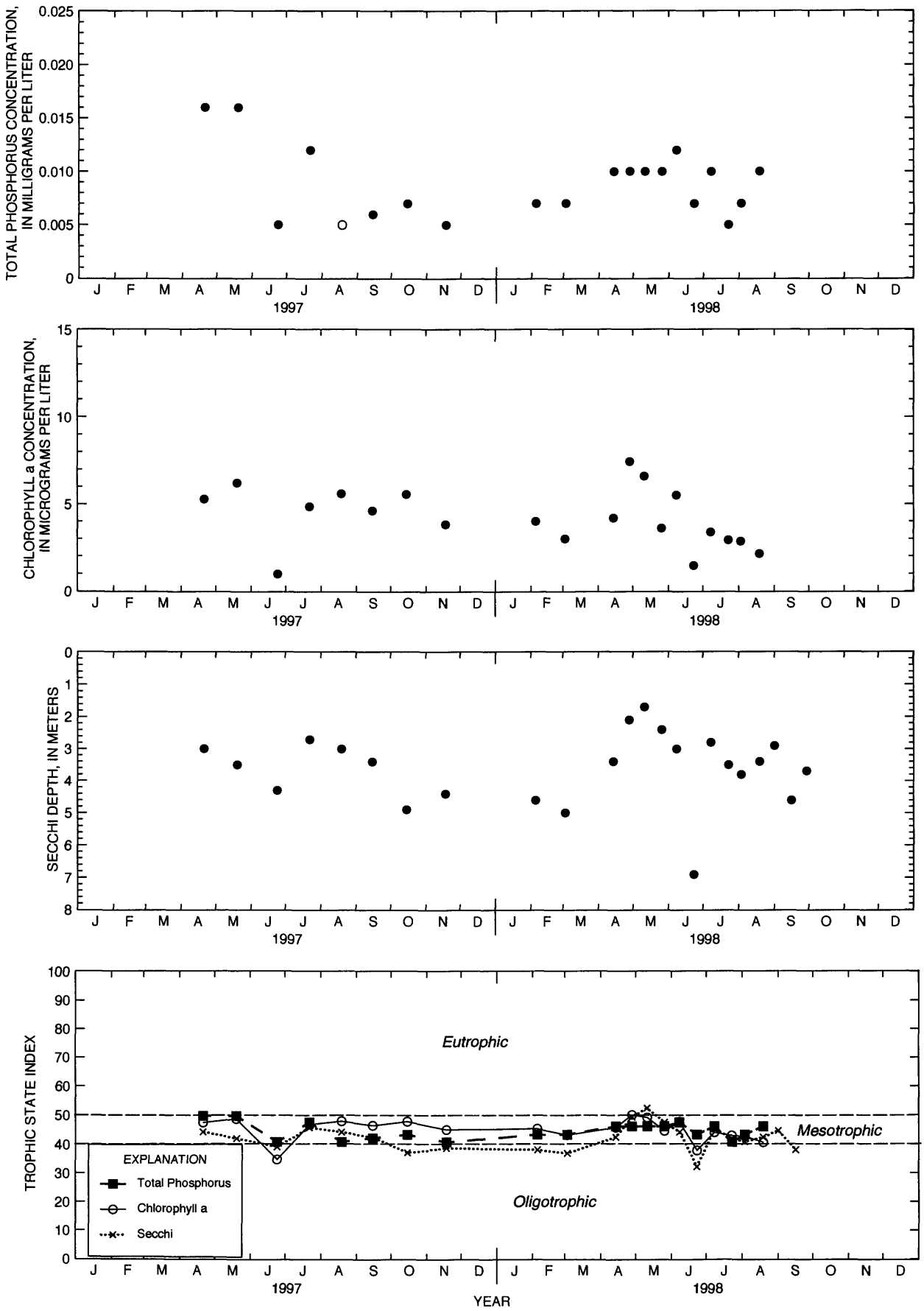


WATER TEMPERATURE (W.T.), IN DEGREES CELSIUS

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.

(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.)

434928088553601 (REVISED) GREEN LAKE AT COUNTY TRUNK HIGHWAY A NEAR GREEN LAKE, WI

LOCATION.--Lat 43°49'28" (revised), 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.--No estimated daily gage heights. Records are good. Lake level regulated by dam at outlet at Green Lake. Gage-height telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum recorded gage height, 7.03 ft, June 20, 1996; minimum recorded, 5.41 ft, Jan. 17, 1995.

EXTREMES FOR CURRENT YEAR.--Maximum recorded gage height, 6.95 ft, Mar. 31 and Apr. 1; minimum recorded, 5.82 ft, Sept. 12, 13, and. 14.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.15	6.04	5.96	6.03	6.21	6.46	6.93	6.46	6.36	6.53	6.11	6.02
2	6.15	6.03	5.95	6.03	6.23	6.47	6.92	6.48	6.35	6.52	6.10	6.00
3	6.14	6.02	5.98	6.03	6.23	6.48	6.90	6.49	6.33	6.50	6.07	5.96
4	6.16	6.02	6.02	6.04	6.23	6.49	6.87	6.50	6.31	6.45	6.07	5.96
5	6.15	6.02	6.02	6.09	6.23	6.49	6.84	6.50	6.30	6.42	6.09	5.95
6	6.13	6.03	6.02	6.11	6.23	6.51	6.81	6.49	6.30	6.41	6.11	5.94
7	6.13	6.03	6.01	6.11	6.23	6.51	6.77	6.50	6.29	6.38	6.13	5.92
8	6.14	6.04	6.00	6.12	6.23	6.53	6.74	6.51	6.28	6.38	6.14	5.90
9	6.16	6.04	6.00	6.18	6.23	6.57	6.71	6.50	6.27	6.37	6.14	5.88
10	6.12	6.05	6.01	6.19	6.22	6.57	6.68	6.49	6.31	6.34	6.13	5.88
11	6.11	6.04	6.01	6.13	6.23	6.57	6.65	6.49	6.33	6.31	6.10	5.85
12	6.10	6.03	6.05	6.13	6.24	6.56	6.61	6.47	6.42	6.31	6.09	5.83
13	6.18	6.01	6.03	6.13	6.23	6.56	6.58	6.48	6.40	6.30	6.09	5.82
14	6.14	6.01	6.02	6.13	6.24	6.56	6.58	6.47	6.39	6.29	6.09	5.89
15	6.10	6.01	6.02	6.15	6.24	6.53	6.56	6.46	6.39	6.28	6.09	5.99
16	6.09	6.03	6.02	6.14	6.24	6.53	6.61	6.51	6.40	6.25	6.07	5.99
17	6.09	6.00	6.02	6.15	6.27	6.53	6.60	6.46	6.39	6.24	6.10	5.99
18	6.08	6.00	6.02	6.15	6.29	6.59	6.59	6.45	6.40	6.22	6.10	5.99
19	6.08	5.99	6.02	6.15	6.29	6.63	6.56	6.43	6.48	6.23	6.09	5.99
20	6.07	5.98	6.03	6.15	6.31	6.63	6.54	6.41	6.48	6.21	6.08	5.99
21	6.05	5.97	6.02	6.15	6.31	6.62	6.52	6.38	---	6.36	6.08	5.96
22	6.03	5.99	6.03	6.16	6.32	6.61	6.50	6.34	---	6.33	6.08	5.93
23	6.02	5.98	6.03	6.18	6.33	6.61	6.49	6.31	---	6.31	6.14	5.91
24	6.02	5.96	6.03	6.18	6.35	6.60	6.47	6.31	---	6.28	6.12	5.91
25	6.01	5.96	6.04	6.18	6.35	6.60	6.45	6.31	---	6.25	6.11	5.90
26	6.00	5.97	6.05	6.19	6.35	6.61	6.46	6.31	6.56	6.24	6.10	5.91
27	6.01	5.95	6.03	6.19	6.42	6.61	6.46	6.31	---	6.23	6.09	5.91
28	6.01	5.95	6.03	6.19	6.44	6.61	6.45	6.34	---	6.21	6.07	5.90
29	6.01	5.95	6.03	6.20	---	6.61	6.44	6.36	6.58	6.18	6.07	5.89
30	6.01	5.96	6.03	6.20	---	6.65	6.43	6.32	6.56	6.15	6.05	5.89
31	6.01	---	6.03	6.20	---	6.87	---	6.37	---	6.12	6.03	---
MEAN	6.09	6.00	6.02	6.14	6.28	6.57	6.62	6.43	---	6.31	6.09	5.93
MAX	6.18	6.05	6.05	6.20	6.44	6.87	6.93	6.51	---	6.53	6.14	6.02
MIN	6.00	5.95	5.95	6.03	6.21	6.46	6.43	6.31	---	6.12	6.03	5.82

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.--No estimated daily gage heights. Records good. 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, 5.40 ft, Dec. 26, 27, 1989.

EXTREMES FOR CURRENT YEAR.--Maximum recorded gage height, 9.77 ft, Apr. 23; minimum recorded, 5.57 ft, Oct. 30.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.13	5.74	5.77	5.60	5.73	7.26	7.88	9.11	6.49	6.97	6.05	6.10
2	6.10	5.76	5.73	5.59	5.74	7.28	8.20	9.01	6.47	7.05	6.06	6.13
3	6.09	5.78	5.75	5.61	5.76	7.29	8.47	8.96	6.41	7.14	6.06	6.13
4	6.08	5.78	5.81	5.67	5.78	7.27	8.68	8.87	6.34	7.26	6.09	6.14
5	6.06	5.78	5.84	5.79	5.82	7.24	8.83	8.77	6.28	7.25	6.28	6.15
6	6.04	5.82	5.81	5.90	5.84	7.23	8.95	8.69	6.24	7.23	6.50	6.16
7	6.01	5.75	5.80	6.02	5.86	7.19	9.04	8.65	6.19	7.20	6.62	6.17
8	5.97	5.69	5.79	6.14	5.87	7.19	9.17	8.65	6.12	7.15	6.72	6.14
9	5.99	5.65	5.79	6.26	5.87	7.25	9.26	8.60	6.09	7.09	6.82	6.10
10	5.94	5.63	5.80	6.28	5.86	7.13	9.30	8.56	6.11	7.00	6.91	6.10
11	5.90	5.64	5.79	6.29	5.88	7.05	9.34	8.50	6.23	6.92	6.92	6.10
12	5.86	5.65	5.77	6.30	5.96	7.01	9.35	8.43	6.37	6.83	6.88	6.09
13	5.91	5.66	5.75	6.30	6.03	6.96	9.38	8.41	6.42	6.72	6.82	6.09
14	5.94	5.69	5.71	6.29	6.16	6.92	9.43	8.30	6.45	6.61	6.75	6.14
15	5.90	5.73	5.70	6.27	6.27	6.88	9.42	8.19	6.47	6.49	6.68	6.24
16	5.93	5.75	5.70	6.23	6.38	6.84	9.48	8.13	6.45	6.38	6.56	6.19
17	5.96	5.74	5.71	6.18	6.52	6.81	9.52	8.00	6.39	6.25	6.45	6.17
18	6.00	5.75	5.71	6.14	6.66	6.83	9.59	7.86	6.34	6.17	6.32	6.16
19	6.04	5.77	5.72	6.09	6.80	6.88	9.65	7.73	6.40	6.12	6.20	6.19
20	6.07	5.80	5.72	6.05	6.92	6.98	9.68	7.54	6.43	6.05	6.14	6.24
21	6.10	5.82	5.71	6.01	7.02	7.05	9.73	7.34	6.50	6.08	6.13	6.27
22	6.04	5.81	5.70	5.97	7.11	7.11	9.73	7.13	6.54	6.05	6.12	6.27
23	6.00	5.79	5.70	5.94	7.16	7.18	9.72	6.96	6.57	6.06	6.12	6.24
24	5.99	5.75	5.70	5.91	7.22	7.22	9.69	6.85	6.58	6.03	6.12	6.25
25	5.91	5.73	5.70	5.87	7.22	7.24	9.63	6.75	6.58	5.99	6.15	6.25
26	5.87	5.72	5.69	5.84	7.20	7.29	9.58	6.64	6.57	5.97	6.14	6.27
27	5.80	5.70	5.67	5.80	7.22	7.32	9.48	6.54	6.57	5.94	6.13	6.29
28	5.72	5.72	5.66	5.78	7.24	7.36	9.38	6.50	6.68	5.95	6.16	6.27
29	5.68	5.73	5.65	5.76	---	7.32	9.29	6.56	6.76	6.00	6.18	6.27
30	5.66	5.79	5.63	5.74	---	7.36	9.20	6.52	6.89	6.03	6.16	6.29
31	5.68	---	5.62	5.73	---	7.58	---	6.57	---	6.04	6.12	---
MEAN	5.95	5.74	5.73	5.98	6.40	7.15	9.27	7.85	6.43	6.52	6.37	6.19
MAX	6.13	5.82	5.84	6.30	7.24	7.58	9.73	9.11	6.89	7.26	6.92	6.29
MIN	5.66	5.63	5.62	5.59	5.73	6.81	7.88	6.50	6.09	5.94	6.05	6.09

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, 8.00 ft, Sept. 16, 1994, and July 15, 19, 1997; minimum observed, 7.72 ft, Feb. 28, June 12, 1991, Oct. 13, 1994, and Sept.. 1-30, 1998.

EXTREMES FOR CURRENT YEAR.--Maximum gage height observed, 7.92 ft, June 29; minimum observed, 7.72 ft, Sept. 1-30.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	7.84	---	---	7.85	7.85	7.85	---	---	7.86	---	7.72
2	---	---	---	---	---	---	---	---	7.80	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---	---	---	---
5	7.84	---	---	---	7.84	---	7.84	7.78	---	---	---	---
6	---	7.84	7.84	---	---	---	---	---	7.78	---	---	---
7	---	---	---	---	---	7.84	---	7.78	---	---	7.84	---
8	---	---	---	---	---	---	---	---	---	7.82	---	7.72
9	---	---	---	7.82	---	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---	---	---	---	---	---
11	7.86	---	---	---	7.84	---	7.85	---	7.82	---	---	---
12	---	7.82	7.84	---	---	7.84	---	7.80	---	---	7.78	---
13	---	---	---	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---	---	7.78	---	---	7.72
15	7.88	---	---	---	---	---	---	---	---	7.82	7.74	---
16	---	---	7.84	7.82	7.83	7.83	7.88	7.84	---	---	---	---
17	---	7.80	---	---	---	---	---	---	---	---	7.76	---
18	---	---	---	---	---	---	---	---	---	---	---	---
19	7.88	---	---	---	7.84	---	---	---	7.85	7.82	---	7.72
20	---	---	7.84	---	---	---	---	---	---	---	---	---
21	---	---	---	---	---	7.83	7.84	7.78	---	---	---	---
22	---	---	---	7.84	7.84	---	---	---	---	---	---	---
23	---	7.82	---	---	---	---	---	7.76	7.86	7.82	---	---
24	---	---	---	---	---	---	---	---	---	---	7.76	---
25	7.84	---	7.82	---	---	---	---	---	---	---	---	7.72
26	---	---	---	---	---	7.83	7.82	---	---	---	---	---
27	---	---	---	---	7.83	---	---	7.78	7.88	---	7.76	---
28	---	---	7.82	7.84	---	7.83	---	---	---	7.84	---	---
29	---	---	---	---	---	---	---	---	7.92	---	---	---
30	---	7.82	---	---	---	---	7.80	---	7.89	---	---	7.72
31	---	---	7.82	---	---	---	---	7.78	---	7.82	7.74	---
MAX	---	---	---	---	---	---	---	---	---	---	---	---
MIN	---	---	---	---	---	---	---	---	---	---	---	---

432255088134700 LITTLE CEDAR LAKE, NORTH SITE, NEAR WEST BEND, WI

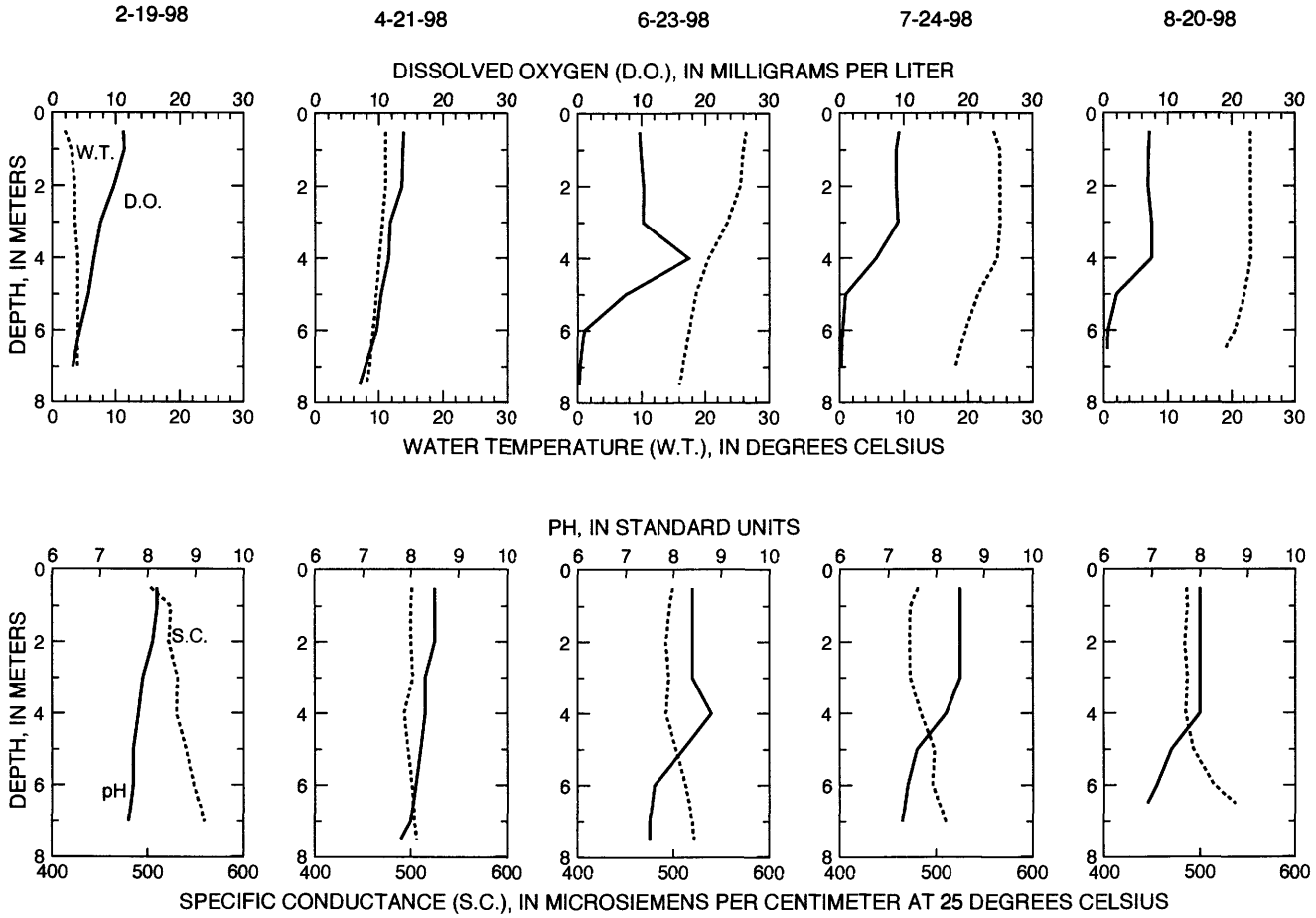
LOCATION.--Lat 43°22'55", long 88°13'47", in NW 1/4 NE 1/4 sec.33, T.11 N., R.19 E., Washington County, Hydrologic Unit 04040003, 2.6 mi southwest of West Bend.

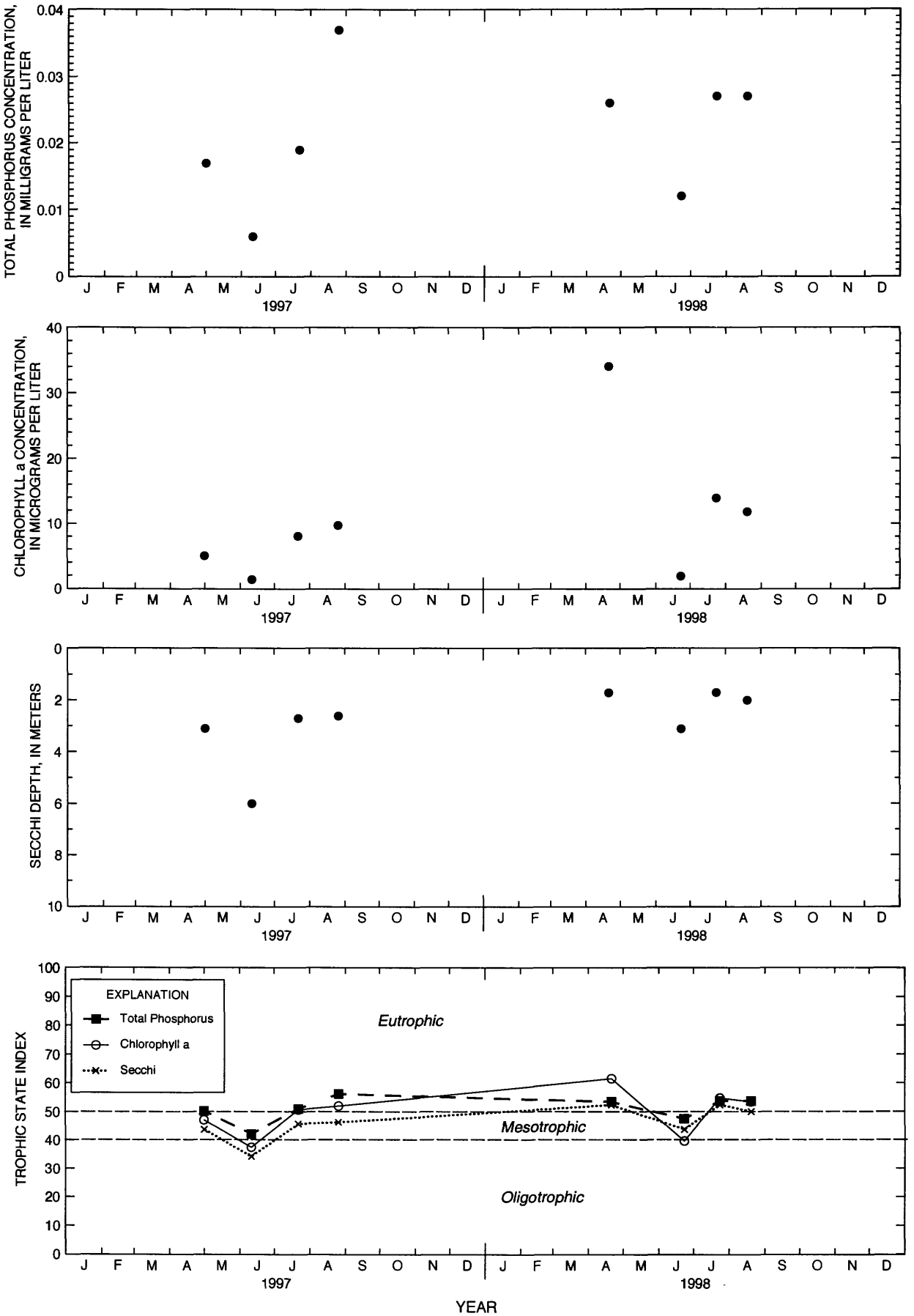
PERIOD OF RECORD.--February 1997 to current year.

REMARKS.--Lake sampled at center of northern basin at deep hole. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, FEBRUARY 19 TO AUGUST 20, 1998
(Milligrams per liter unless otherwise indicated)

	Feb. 19		Apr. 21		June 23		July 24		Aug. 20	
Lake stage (ft)	---		8.44		8.31		8.24		8.23	
Secchi-depth (meters)	---		1.7		3.1		1.7		2.0	
Chlorophyll a, phytoplankton (µg/L)	---		34.1		1.89		13.9		11.8	
Depth of sample (m)	0.5	7.0	0.5	7.5	0.5	7.5	0.5	7.0	0.5	6.5
Water temperature (°C)	2.1	4.2	11.0	8.1	26.6	16.0	24.2	18.1	23.1	19.0
Specific conductance (µS/cm)	503	559	501	506	499	522	481	510	486	537
pH (units)	8.2	7.6	8.5	7.8	8.4	7.5	8.5	7.3	8.0	6.9
Dissolved oxygen	11.2	3.2	13.9	7.0	9.7	0.2	9.2	0.2	7.1	0.5
Phosphorus, total (as P)	0.010	0.043	0.026	0.020	0.012	0.186	0.027	0.144	0.027	0.094





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

432249088134500 LITTLE CEDAR LAKE, SOUTH SITE, NEAR WEST BEND, WI

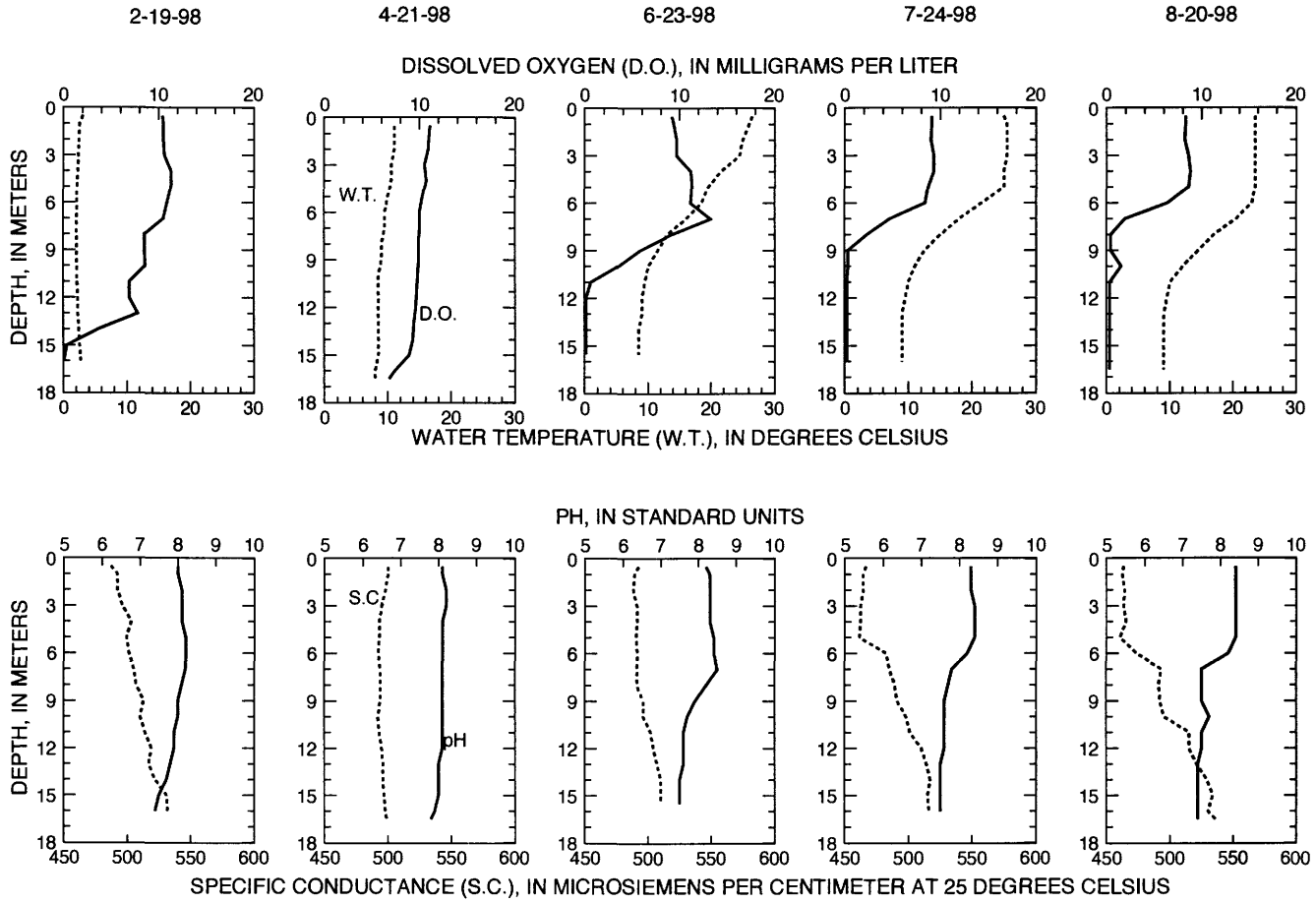
LOCATION.--Lat 43°22'49", long 88°13'45", in NW 1/4 SE 1/4 sec.33, T.11 N., R.19 E., Washington County, Hydrologic Unit 04040003, 2.8 mi southwest of West Bend.

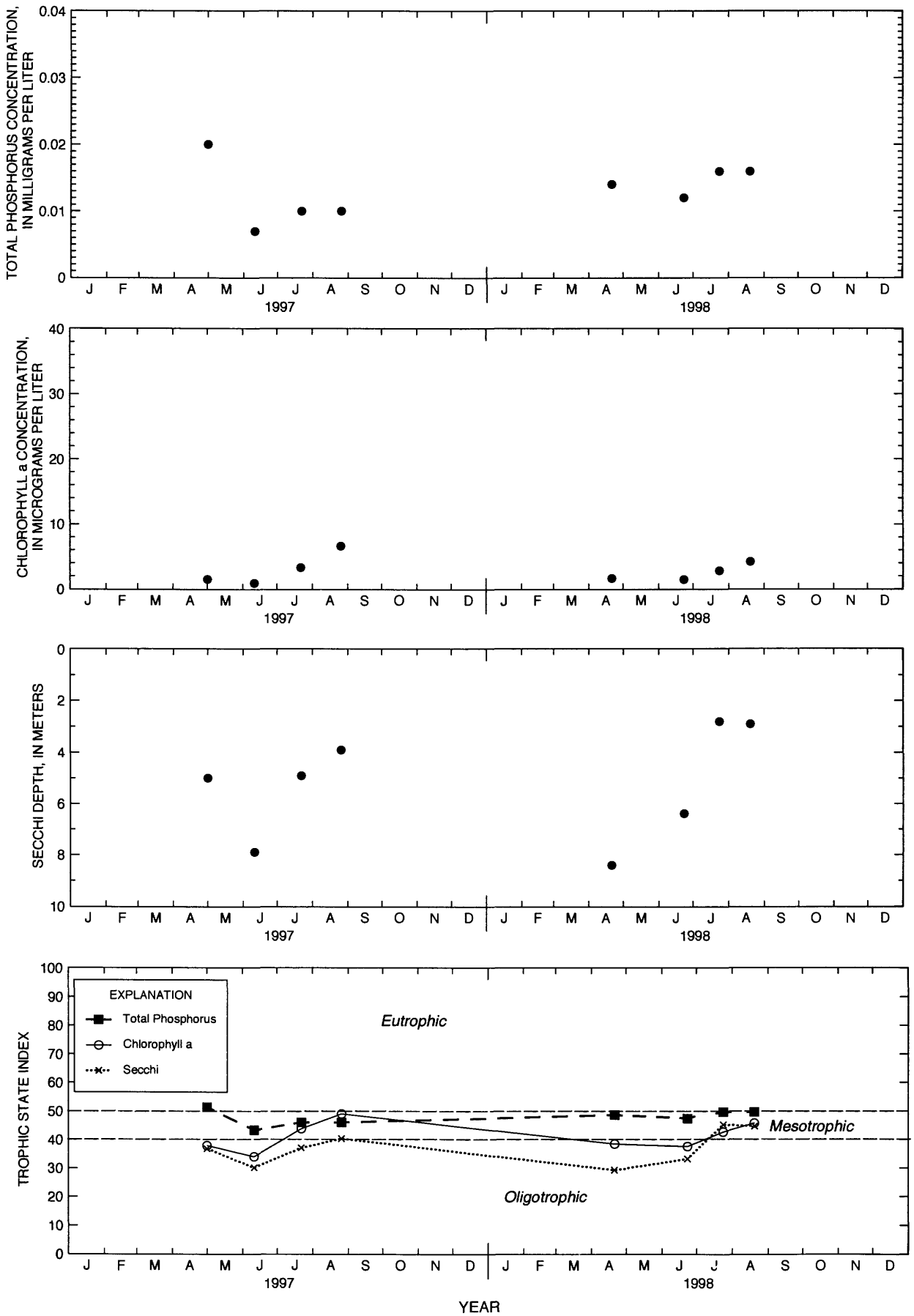
PERIOD OF RECORD.--February 1997 to current year.

REMARKS.--Lake sampled in southern basin at deep hole. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, FEBRUARY 19 TO AUGUST 20, 1998
(Milligrams per liter unless otherwise indicated)

	Feb. 19		Apr. 21		June 23		July 24		Aug. 20	
Lake stage (ft)	---		8.44		8.31		8.24		8.23	
Secchi-depth (meters)	---		8.4		6.4		2.8		2.9	
Chlorophyll a, phytoplankton (µg/L)	---		1.62		1.44		2.80		4.20	
Depth of sample (m)	0.5	16.0	0.5	16.5	0.5	15.5	0.5	16.0	0.5	16.5
Water temperature (°C)	3.0	2.7	10.9	8.1	26.5	8.6	25.2	8.8	23.6	8.8
Specific conductance (µS/cm)	487	532	500	499	492	510	466	516	463	536
pH (units)	8.0	7.4	8.1	7.8	8.2	7.5	8.3	7.5	8.4	7.4
Dissolved oxygen	10.4	0.0	11.1	6.8	9.2	0.1	9.1	0.2	8.3	0.3
Phosphorus, total (as P)	0.019	0.225	0.014	0.069	0.012	0.269	0.016	0.305	0.016	0.378
Phosphorus, ortho, dissolved (as P)	---	---	0.007	0.059	---	---	---	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	0.094	0.059	---	---	---	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	0.091	0.262	---	---	---	---	---	---
Nitrogen, amm. + org., total (as N)	---	---	0.44	0.68	---	---	---	---	---	---
Nitrogen, total (as N)	---	---	0.53	0.74	---	---	---	---	---	---
Color (Pt-Co. scale)	---	---	10	15	---	---	---	---	---	---
Turbidity (NTU)	---	---	0.70	0.90	---	---	---	---	---	---
Hardness, as CaCO3	---	---	220	220	---	---	---	---	---	---
Calcium, dissolved (Ca)	---	---	36	37	---	---	---	---	---	---
Magnesium, dissolved (Mg)	---	---	31	31	---	---	---	---	---	---
Sodium, dissolved (Na)	---	---	18	18	---	---	---	---	---	---
Potassium, dissolved (K)	---	---	1.6	1.8	---	---	---	---	---	---
Alkalinity, as CaCO3	---	---	192	194	---	---	---	---	---	---
Sulfate, dissolved (SO4)	---	---	12	5.6	---	---	---	---	---	---
Chloride, dissolved (Cl)	---	---	38	38	---	---	---	---	---	---
Silica, dissolved (SiO2)	---	---	0.7	2.3	---	---	---	---	---	---
Solids, dissolved, at 180°C	---	---	286	292	---	---	---	---	---	---
Iron, dissolved (Fe) µg/L	---	---	<10	10	---	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	5.3	52	---	---	---	---	---	---





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

04073000 LITTLE GREEN LAKE NEAR MARKESAN, WI

LOCATION.--Lat 43°44'04", long 88°58'23" in NW1/4 NE1/4 sec.32,T.15N.,R.13E., Green Lake County, Hydrologic Unit 04030201, near lake outlet, and 2 mi north of Markesan.

DRAINAGE AREA.-- 3.35 mi.^{2}

PERIOD OF RECORD.--August 1936 to September 1964, 1978, 1991 to current year. Amount of data available for each year is variable, ranging from 4 to about 200 stage values per year.

GAGE.--Nonrecording staff gage. Datum of gage is 90.00 ft above Public Service Commission datum and 921.65 ft above sea level.

REMARKS.--Lake level is influenced by lake outlet structure.

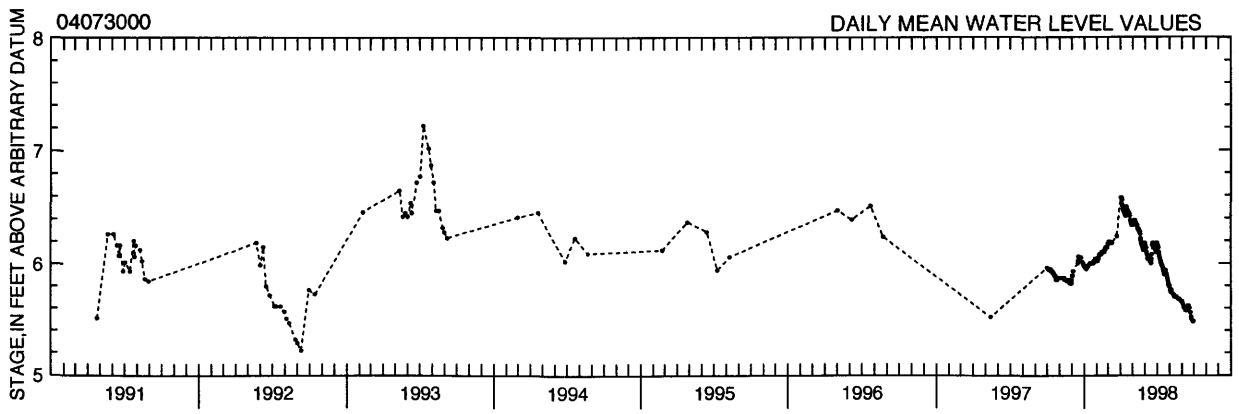
EXTREMES FOR PERIOD OF RECORD.--Maximum observed gage height, 7.36 ft, July 23, 24, 1960: minimum observed, 4.02 ft, Dec. 25-31, 1958.

EXTREMES FOR CURRENT YEAR.--Maximum observed gage height, 6.58 ft, Apr. 1-2; minimum observed, 5.48 Sept. 28 and 30.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.96	5.87	5.85	5.97	6.02	6.17	6.58	6.34	6.18	6.18	5.80	5.66
2	---	5.87	5.89	5.97	6.02	6.17	6.58	6.34	6.16	6.16	5.78	---
3	---	5.87	5.89	5.96	6.02	6.19	6.56	6.36	6.14	6.16	5.76	5.64
4	5.95	5.87	5.93	5.97	6.04	6.19	6.56	6.36	6.14	6.14	5.74	---
5	---	---	5.93	5.96	6.04	6.19	6.52	6.38	6.10	6.10	5.74	5.62
6	5.94	5.87	---	5.95	6.04	6.19	6.50	6.38	6.08	6.08	5.76	---
7	---	---	---	5.95	6.06	6.18	6.48	6.38	6.04	6.06	5.74	5.60
8	5.95	5.87	---	5.97	6.08	6.18	6.48	6.36	6.06	6.04	---	---
9	5.95	5.87	---	5.97	6.08	6.18	6.46	6.36	6.04	6.02	---	---
10	5.93	5.87	---	5.97	6.08	6.18	6.46	6.34	6.04	6.02	---	5.58
11	5.93	---	---	5.98	6.08	6.18	6.44	6.34	6.04	6.00	5.72	---
12	5.93	5.87	---	---	6.08	---	6.44	6.34	6.04	6.00	5.72	---
13	---	5.85	---	---	6.08	---	6.42	6.32	6.02	5.98	5.70	---
14	5.93	---	---	---	6.10	---	6.42	6.30	6.02	5.98	---	5.58
15	5.91	---	---	6.00	6.10	---	6.44	6.30	6.02	5.96	---	---
16	5.91	---	6.0	6.00	6.10	---	6.50	6.30	6.00	5.94	5.70	5.62
17	5.91	---	6.02	6.00	6.10	---	6.48	6.30	6.04	5.94	---	---
18	5.91	---	6.06	6.00	6.10	---	6.46	6.28	6.08	5.92	---	5.62
19	5.89	5.84	6.05	6.00	6.10	---	6.46	6.28	6.16	5.90	5.70	---
20	5.89	5.85	6.04	---	6.10	---	6.46	6.26	6.18	5.90	---	5.60
21	5.89	5.85	6.03	---	6.12	---	6.44	6.22	6.18	5.94	---	---
22	5.87	5.85	6.04	6.00	6.12	---	6.44	6.20	6.16	5.94	---	---
23	5.85	5.84	6.04	6.00	6.14	6.24	6.44	6.18	6.16	5.92	5.68	5.56
24	5.85	5.84	6.05	6.00	6.14	---	6.42	6.16	6.14	5.90	---	5.52
25	5.85	5.84	---	6.02	6.14	---	6.38	6.16	6.14	5.90	---	5.50
26	5.85	5.82	---	6.02	6.14	---	6.38	6.14	6.12	5.88	5.68	---
27	5.87	5.82	---	6.02	6.14	---	6.36	6.12	6.12	5.86	---	---
28	5.87	5.82	6.01	6.02	---	---	6.36	6.12	6.10	5.84	---	5.48
29	5.87	5.82	6.00	6.04	---	---	6.34	6.16	6.10	5.82	---	---
30	---	5.82	5.99	6.04	---	---	6.34	6.16	6.18	5.80	5.66	5.48
31	5.87	---	5.98	6.04	---	---	---	6.18	---	5.80	5.66	---
MEAN	---	---	---	---	---	---	6.45	6.27	6.10	5.97	---	---
MAX	---	---	---	---	---	---	6.58	6.38	6.18	6.18	---	---
MIN	---	---	---	---	---	---	6.34	6.12	6.00	5.80	---	---



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.

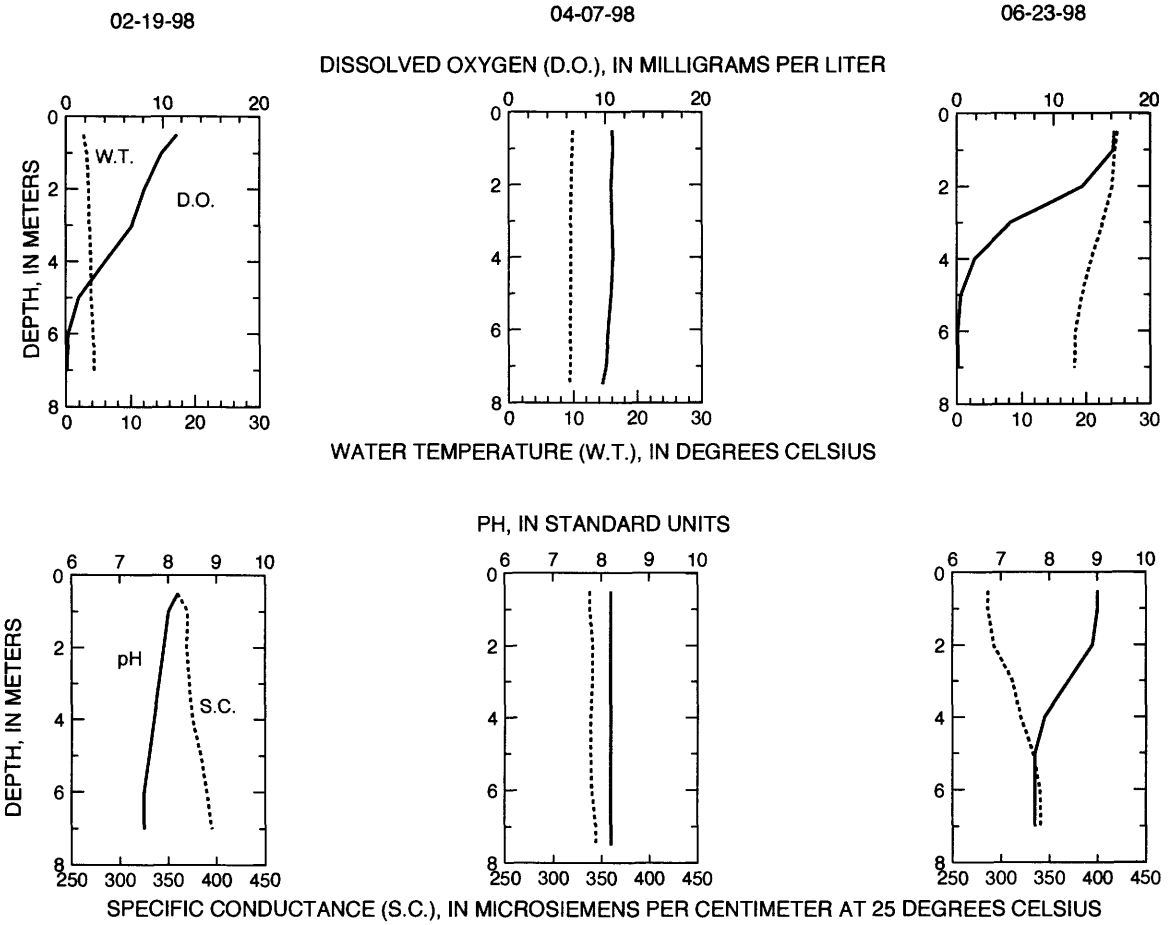
PERIOD OF RECORD.--February 1991 to current year.

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

WATER-QUALITY DATA, FEBRUARY 19 TO JUNE 23, 1998

(Milligrams per liter unless otherwise indicated)

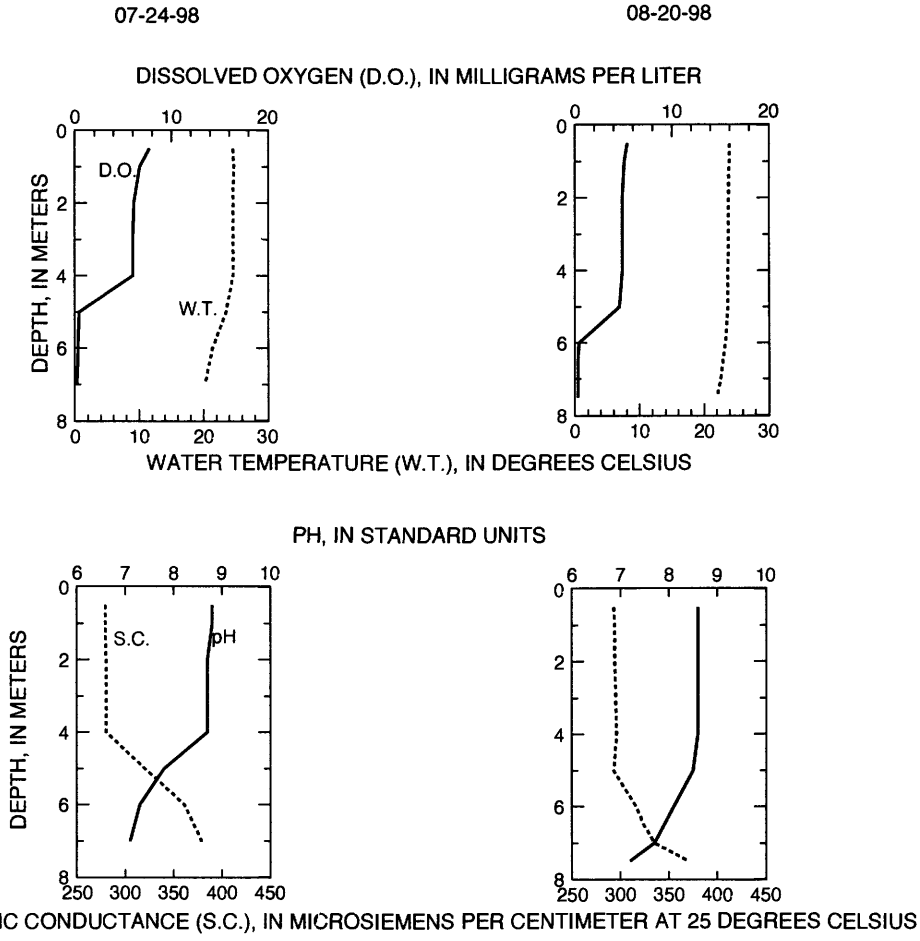
	Feb. 19		Apr. 07		June 23	
Lake stage (ft)	4.96		6.48		6.16	
Secchi-depth (meters)	---		2.1		0.6	
Chlorophyll a, phytoplankton (µg/L)	---		8.90		100	
Depth of sample (m)	0.5	7.0	0.5	7.5	0.5	7.0
Water temperature (°C)	2.7	4.3	9.9	9.4	24.9	18.2
Specific conductance (µS/cm)	359	395	338	344	286	341
pH (units)	8.2	7.5	8.2	8.2	9.0	7.7
Dissolved oxygen	11.5	0.0	10.7	9.7	>16.3	0.1
Phosphorus, total (as P)	0.032	0.062	0.034	0.035	0.08	0.167
Phosphorus, ortho, dissolved (as P)	---	---	<0.002	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	0.018	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	<0.013	---	---	---
Nitrogen, amm. + org., total (as N)	---	---	0.50	---	---	---
Nitrogen, total (as N)	---	---	0.52	---	---	---
Color (Pt-Co. scale)	---	---	10	---	---	---
Turbidity (NTU)	---	---	2.2	---	---	---
Hardness, as CaCO3	---	---	160	---	---	---
Calcium, dissolved (Ca)	---	---	31	---	---	---
Magnesium, dissolved (Mg)	---	---	21	---	---	---
Sodium, dissolved (Na)	---	---	7.3	---	---	---
Potassium, dissolved (K)	---	---	3.7	---	---	---
Alkalinity, as CaCO3	---	---	153	---	---	---
Sulfate, dissolved (SO4)	---	---	6.0	---	---	---
Chloride, dissolved (Cl)	---	---	15	---	---	---
Silica, dissolved (SiO2)	---	---	1.3	---	---	---
Solids, dissolved, at 180°C	---	---	196	---	---	---
Iron, dissolved (Fe) µg/L	---	---	<10	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	<0.40	---	---	---

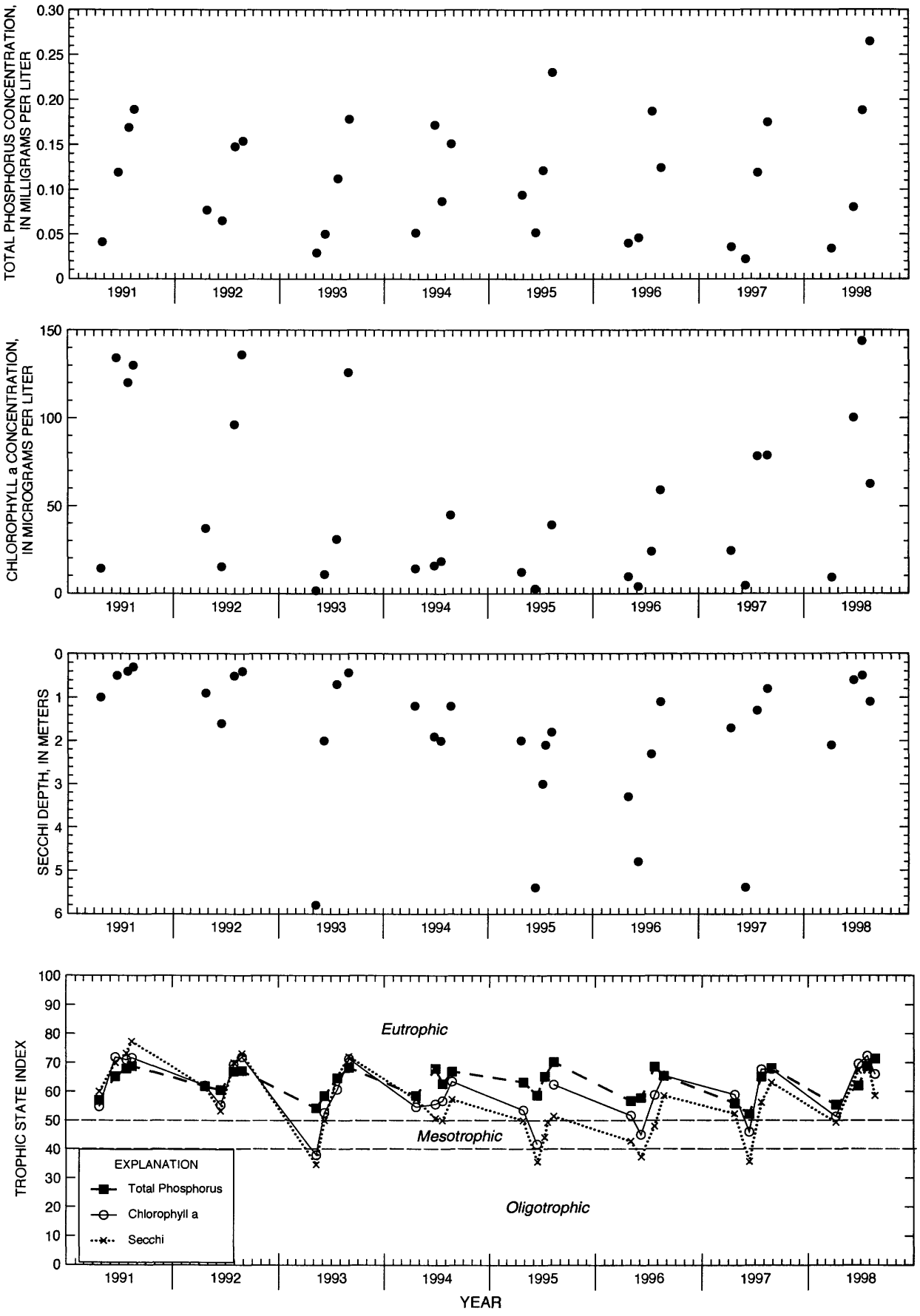


WATER-QUALITY DATA, JULY 24 TO AUGUST 20,1998

(Milligrams per liter unless otherwise indicated)

	July 24				Aug. 20				
Lake stage (ft)	5.90				5.68				
Secchi-depth (meters)	0.5				1.1				
Chlorophyll a, phytoplankton (µg/L)	144				62.5				
Depth of sample (m)	0.5	4.0	5.0	7.0	0.5	4.0	6.0	6.5	7.5
Water temperature (°C)	24.6	24.6	23.5	20.2	23.9	23.7	23.3	22.9	22.0
Specific Conductance (µS/cm)	279	280	320	379	293	296	316	324	370
pH (units)	8.8	8.7	7.8	7.1	8.6	8.6	8.1	7.9	7.2
Dissolved oxygen	7.7	6.0	0.4	0.2	5.4	4.9	0.4	0.3	0.3
Phosphorus, total (as P)	0.188	0.185	0.364	0.733	0.265	0.287	0.480	0.528	1.320





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

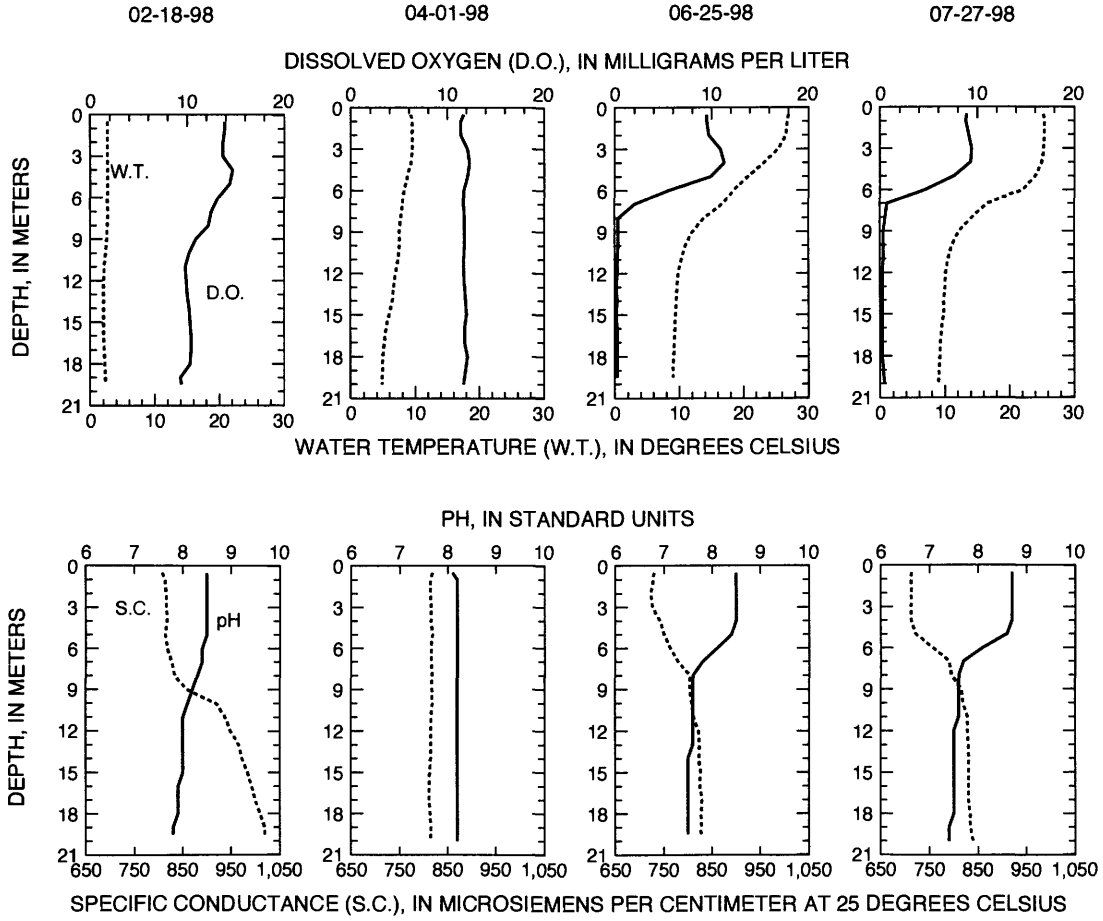
PERIOD OF RECORD.--October 1986 to current year.

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. 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 18 TO JULY 27, 1998
(Milligrams per liter unless otherwise indicated)

	Feb. 18		Apr. 01		June 25		July 27	
Lake stage (ft)	97.23		98.41		98.81		98.66	
Secchi-depth (meters)	---		1.3		2.5		2.4	
Chlorophyll a, phytoplankton (µg/L)	---		19.1		5.71		3.53	
Depth of sample (m)	0.5	19.5	0.5	20.0	0.5	19.5	0.5	20.0
Water temperature (°C)	2.6	2.3	9.3	4.8	27.0	9.0	25.3	9.0
Specific conductance (µS/cm)	808	1020	818	814	729	827	712	840
pH (units)	8.5	7.8	8.1	8.2	8.5	7.5	8.7	7.4
Dissolved oxygen	13.9	9.4	11.7	11.7	9.5	0.2	8.9	0.4
Phosphorus, total (as P)	0.015	0.108	0.020	0.018	0.012	0.146	0.013	0.263
Phosphorus, ortho, dissolved (as P)	---	---	<0.002	---	---	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	0.456	---	---	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	0.049	---	---	---	---	---
Nitrogen, amm. + org., total (as N)	---	---	0.70	---	---	---	---	---
Nitrogen, total (as N)	---	---	1.20	---	---	---	---	---
Color (Pt-Co. scale)	---	---	15	---	---	---	---	---
Turbidity (NTU)	---	---	4.8	---	---	---	---	---
Hardness, as CaCO3	---	---	260	---	---	---	---	---
Calcium, dissolved (Ca)	---	---	52	---	---	---	---	---
Magnesium, dissolved (Mg)	---	---	32	---	---	---	---	---
Sodium, dissolved (Na)	---	---	58	---	---	---	---	---
Potassium, dissolved (K)	---	---	2.3	---	---	---	---	---
Alkalinity, as CaCO3	---	---	202	---	---	---	---	---
Sulfate, dissolved (SO4)	---	---	40	---	---	---	---	---
Chloride, dissolved (Cl)	---	---	120	---	---	---	---	---
Silica, dissolved (SiO2)	---	---	<0.008	---	---	---	---	---
Solids, dissolved, at 180°C	---	---	466	---	---	---	---	---
Iron, dissolved (Fe) µg/L	---	---	<10	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	<0.40	---	---	---	---	---



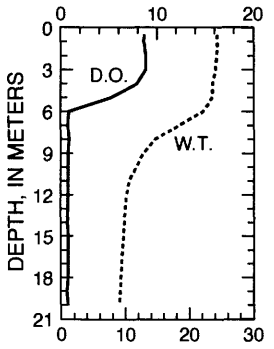
425425088083500 LITTLE MUSKEGO LAKE AT MUSKEGO, WI

WATER-QUALITY DATA, AUGUST 19, 1998
(Milligrams per liter unless otherwise indicated)

	Aug. 19				
Lake stage (ft)			98.77		
Secchi-depth (meters)			2.1		
Chlorophyll a, phytoplankton (µg/L)			9.58		
Depth of sample (m)	0.5	3.0	8.0	19.0	20.0
Water temperature (°C)	24.4	24.1	14.6	9.2	9.1
Specific Conductance (µS/cm)	662	662	799	844	843
pH (units)	8.7	8.7	7.6	7.4	7.4
Dissolved oxygen	8.7	8.8	0.8	0.6	0.7
Phosphorus, total (as P)	0.019	0.021	0.021	0.298	0.304

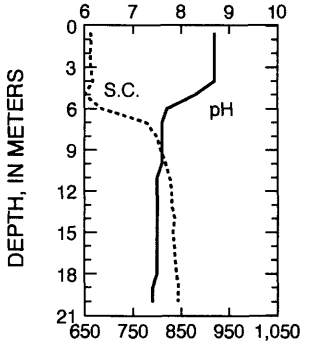
08-19-98

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

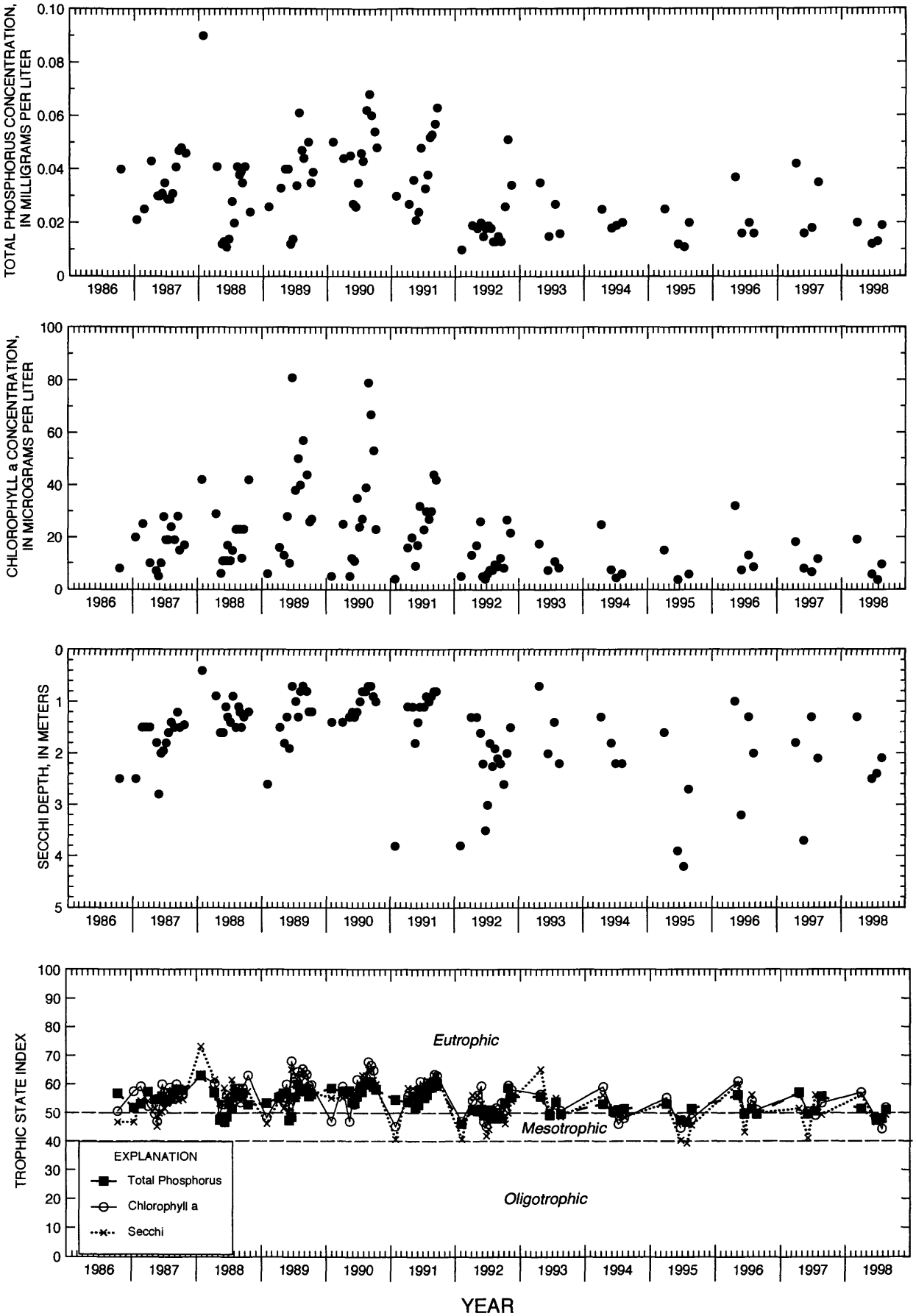


WATER TEMPERATURE (W.T.), IN DEGREES CELSIUS

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 Muskego Lake at Muskego, Wisconsin.

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, Oct. 14-18, 21; minimum observed, 12.26 ft, Feb. 7, 11.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAILY MEAN VALUE

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13.80	13.76	13.34	12.84	---	---	13.16	13.52	13.48	13.72	13.38	13.18
2	13.78	13.76	13.32	12.82	---	---	13.22	13.52	13.52	13.70	13.36	13.18
3	13.76	13.76	13.32	---	---	12.40	13.24	13.52	13.50	13.70	13.34	13.16
4	13.76	13.70	13.30	---	12.34	12.48	13.26	13.52	13.46	13.70	13.32	13.14
5	13.76	13.65	13.32	---	---	12.48	13.30	13.52	---	13.70	13.30	13.14
6	13.76	13.60	13.34	---	---	---	13.32	13.50	13.44	13.74	13.30	13.14
7	13.82	13.58	13.32	12.74	12.26	12.52	13.36	13.50	13.42	13.74	13.30	13.12
8	13.80	13.54	13.30	---	---	---	13.40	13.50	13.42	13.74	13.30	13.10
9	13.78	13.48	13.32	---	---	---	13.40	13.48	13.42	13.72	13.30	13.08
10	13.78	13.46	13.32	12.66	---	---	13.40	13.48	13.44	13.70	13.28	13.08
11	13.76	13.42	13.30	---	12.26	12.56	13.38	13.48	13.42	13.70	13.28	13.06
12	13.72	13.40	13.28	---	---	---	13.42	13.46	13.64	13.68	13.26	13.06
13	13.84	13.38	13.24	---	---	---	13.46	13.48	13.68	13.66	13.24	13.04
14	13.86	13.36	13.22	12.64	12.28	12.60	13.50	13.50	13.70	13.64	13.22	13.04
15	13.86	13.38	---	---	---	---	13.50	13.50	13.72	13.64	13.22	13.04
16	13.86	13.36	---	---	---	---	13.54	13.52	13.76	13.64	13.20	13.02
17	13.86	13.36	---	12.58	---	---	13.54	13.50	13.74	13.60	13.28	13.02
18	13.86	13.38	---	---	12.32	12.66	13.52	13.48	13.74	13.58	13.28	13.00
19	13.84	13.36	---	---	---	---	13.54	13.48	13.72	13.56	13.26	12.98
20	13.84	13.36	---	---	---	---	13.56	13.48	13.70	13.56	13.24	12.98
21	13.86	13.36	---	12.56	12.34	12.70	13.56	13.46	13.70	13.54	13.24	12.98
22	13.84	13.38	13.04	---	---	---	13.56	13.44	13.70	13.50	13.22	12.96
23	13.82	13.38	13.00	---	---	---	13.56	13.42	13.70	13.52	13.26	12.94
24	13.82	13.38	13.00	12.48	---	---	13.58	13.40	13.74	13.48	13.26	12.92
25	13.80	13.38	12.98	---	12.34	12.72	13.56	13.40	13.74	13.44	13.26	12.92
26	13.78	13.36	12.96	---	---	---	13.54	13.38	13.74	13.42	13.24	13.02
27	13.76	13.38	12.92	---	---	---	13.54	13.38	13.76	13.42	13.24	13.00
28	13.74	13.36	12.90	12.46	12.38	12.90	13.54	13.40	13.80	13.40	13.24	13.00
29	13.74	13.34	12.92	---	---	12.94	13.52	13.42	13.76	13.40	13.22	13.02
30	13.72	13.34	12.90	---	---	13.04	13.52	13.40	13.76	13.40	13.20	13.02
31	13.75	---	12.88	12.36	---	13.08	---	13.50	---	13.38	13.20	---
MEAN	13.80	13.46	---	---	---	---	13.45	13.47	---	13.59	13.27	13.04
MAX	13.86	13.76	---	---	---	---	13.58	13.52	---	13.74	13.38	13.18
MIN	13.72	13.34	---	---	---	---	13.16	13.38	---	13.38	13.20	12.92

04074651 LITTLE SAND LAKE NEAR MOLE LAKE, WI

LOCATION.--Lat 45°28'26" long 88°54'41" (revised), 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.

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

REMARKS.--Recorder removed during period of ice, Nov. 6, 1997 to Apr. 29, 1998. Gage heights are obtained from reference point during this period.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 5.97 ft, May 25, 1997; minimum observed, 3.83 ft, Sept. 25, 1998.

EXTREMES FOR CURRENT YEAR.-- Maximum gage height observed, 5.67 ft, Oct. 5; minimum observed, 3.83 ft, Sept. 25.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.59	5.47	---	---	---	---	---	5.29	4.78	4.65	4.13	4.10
2	5.62	5.46	---	---	---	---	---	5.24	4.71	4.63	4.15	4.11
3	5.63	5.46	---	---	---	---	---	5.21	4.66	4.62	4.08	4.09
4	5.64	5.46	---	---	---	---	---	5.18	4.64	4.63	4.08	4.07
5	5.67	5.45	---	---	---	---	---	5.15	4.63	4.61	4.09	4.06
6	5.65	5.45	---	---	---	---	---	5.14	4.61	4.59	4.11	4.05
7	5.56	---	---	---	---	---	---	5.10	4.60	4.58	4.12	4.04
8	5.57	---	---	---	---	---	---	5.08	4.59	4.56	4.09	4.02
9	5.56	---	---	---	---	---	---	5.06	4.58	4.56	4.15	4.03
10	5.57	---	---	---	---	---	---	5.06	4.56	4.59	4.11	4.00
11	5.58	---	---	---	---	---	---	5.06	4.57	4.53	4.11	3.98
12	5.60	---	---	---	---	---	---	5.02	4.65	4.51	4.11	3.98
13	5.50	---	---	---	---	---	---	5.03	4.74	4.49	4.10	3.97
14	5.50	---	---	---	---	---	---	4.99	4.77	4.47	4.11	3.96
15	5.50	---	---	---	---	---	---	4.97	4.69	4.45	4.15	3.97
16	5.50	---	---	---	---	---	---	4.99	4.69	4.47	4.13	3.97
17	5.50	---	---	---	---	---	---	4.98	4.72	4.42	4.15	3.96
18	5.51	---	---	---	---	---	---	4.95	4.71	4.44	4.15	3.94
19	5.50	---	---	---	---	---	---	4.96	4.67	4.37	4.13	3.92
20	5.50	---	---	---	---	---	---	4.99	4.72	4.36	4.12	3.90
21	5.50	---	---	---	---	---	---	4.98	4.67	4.30	4.12	3.87
22	5.50	---	---	---	---	---	---	4.92	4.67	4.33	4.13	3.86
23	5.50	---	---	---	---	---	---	4.88	4.64	4.31	4.21	3.84
24	5.50	---	---	---	---	---	---	4.85	4.62	4.29	4.20	3.84
25	5.50	---	---	---	---	---	---	4.83	4.63	4.28	4.19	3.83
26	5.51	---	---	---	5.54	---	---	4.82	4.64	4.24	4.18	3.87
27	5.51	---	---	---	---	---	---	4.81	4.66	4.21	4.16	3.88
28	5.51	---	---	---	---	---	---	4.82	4.68	4.20	4.13	3.88
29	5.52	---	---	---	---	---	5.33	4.75	4.65	4.17	4.12	3.88
30	5.51	---	---	5.56	---	---	5.30	4.76	4.63	4.15	4.10	3.88
31	5.49	---	---	---	---	---	---	4.78	---	4.16	4.09	---
MEAN	5.54	---	---	---	---	---	---	4.99	4.66	4.42	4.13	3.96
MAX	5.67	---	---	---	---	---	---	5.29	4.78	4.65	4.21	4.11
MIN	5.49	---	---	---	---	---	---	4.75	4.56	4.15	4.08	3.83

455507092013500 MCKENZIE LAKE, AT DEEP HOLE, NEAR SPOONER, WI

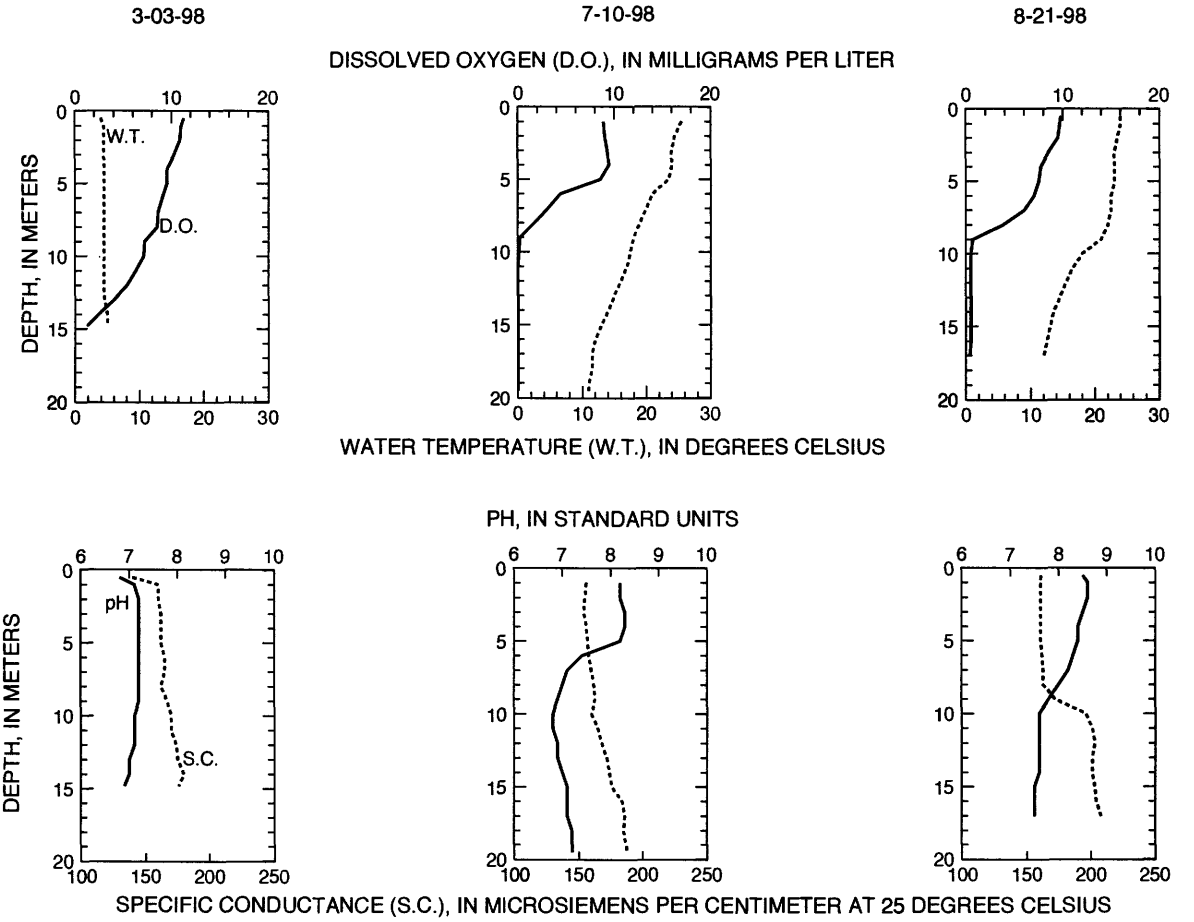
LOCATION.--Lat 45°55'07", long 92°01'35", in NW 1/4 SW 1/4 sec.30, T.40 N., R.13 W., Washburn County, Hydrologic Unit 07030002, 9.4 mi northwest of Spooner.

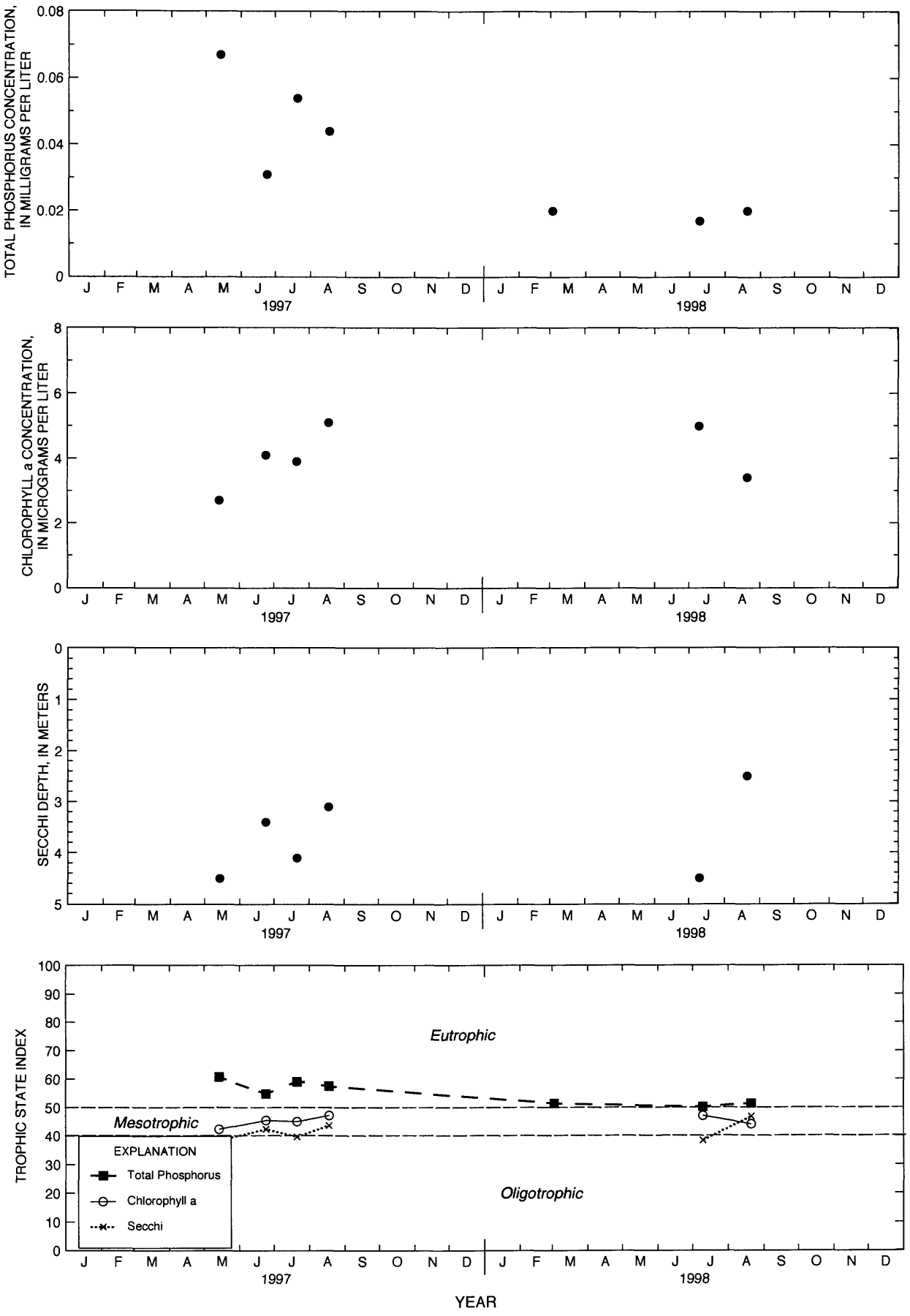
PERIOD OF RECORD.--February 1987 to current year. (Data collected by Wisconsin Department of Natural Resources before 1997 available, but not published in this report series.)

REMARKS.--Lake sampled at deepest point in the lake. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, MARCH 03 TO AUGUST 21, 1998
(Milligrams per liter unless otherwise indicated)

	Mar. 03		July 10		Aug. 21		
Lake stage (ft)	---		0.31		0.17		
Secchi-depth (meters)	---		4.5		2.5		
Chlorophyll a, phytoplankton (µg/L)	---		4.98		3.36		
Depth of sample (m)	0.5	14.3	0.5	19.5	0.5	9.0	17.0
Water temperature (°C)	4.2	---	25.4	10.9	24.0	20.9	12.1
Specific conductance (µS/cm)	140	---	158	188	161	172	208
pH (units)	6.8	---	8.2	7.2	8.5	7.8	7.5
Dissolved oxygen	11.3	---	8.9	0.0	9.8	0.7	0.4
Phosphorus, total (as P)	0.020	0.051	0.017	0.218	0.020	0.075	0.390





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for McKenzie Lake, Deep Hole, near Spooner, Wisconsin.

455540092022600 MCKENZIE LAKE, NORTHERN SITE, NEAR SPOONER, WI

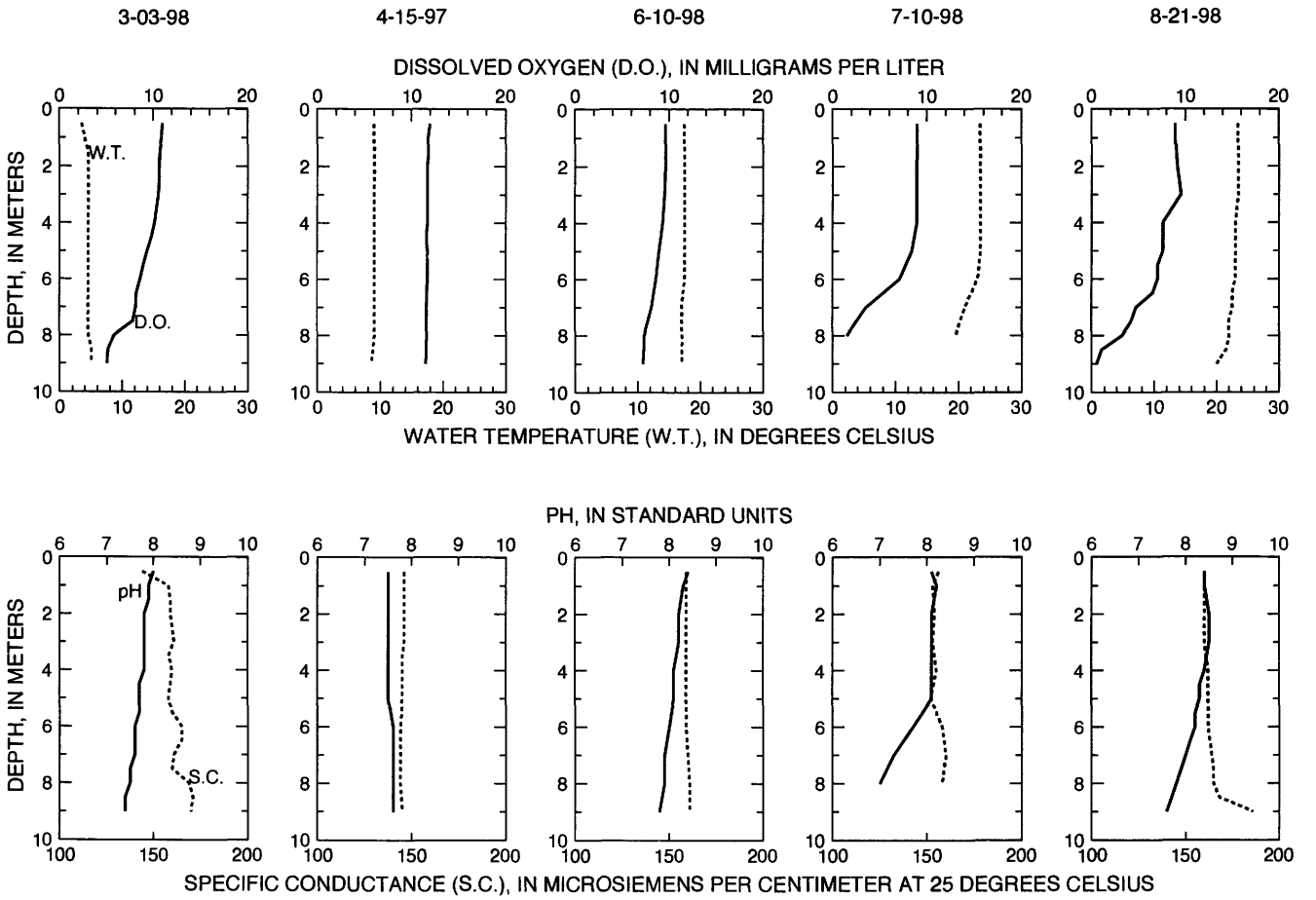
LOCATION.--Lat 45°55'40", long 92°02'26", in NW 1/4 NE 1/4 sec.25, T.40 N., R.14 W., Burnett County, Hydrologic Unit 07030002, 10.3 mi northwest of Spooner.

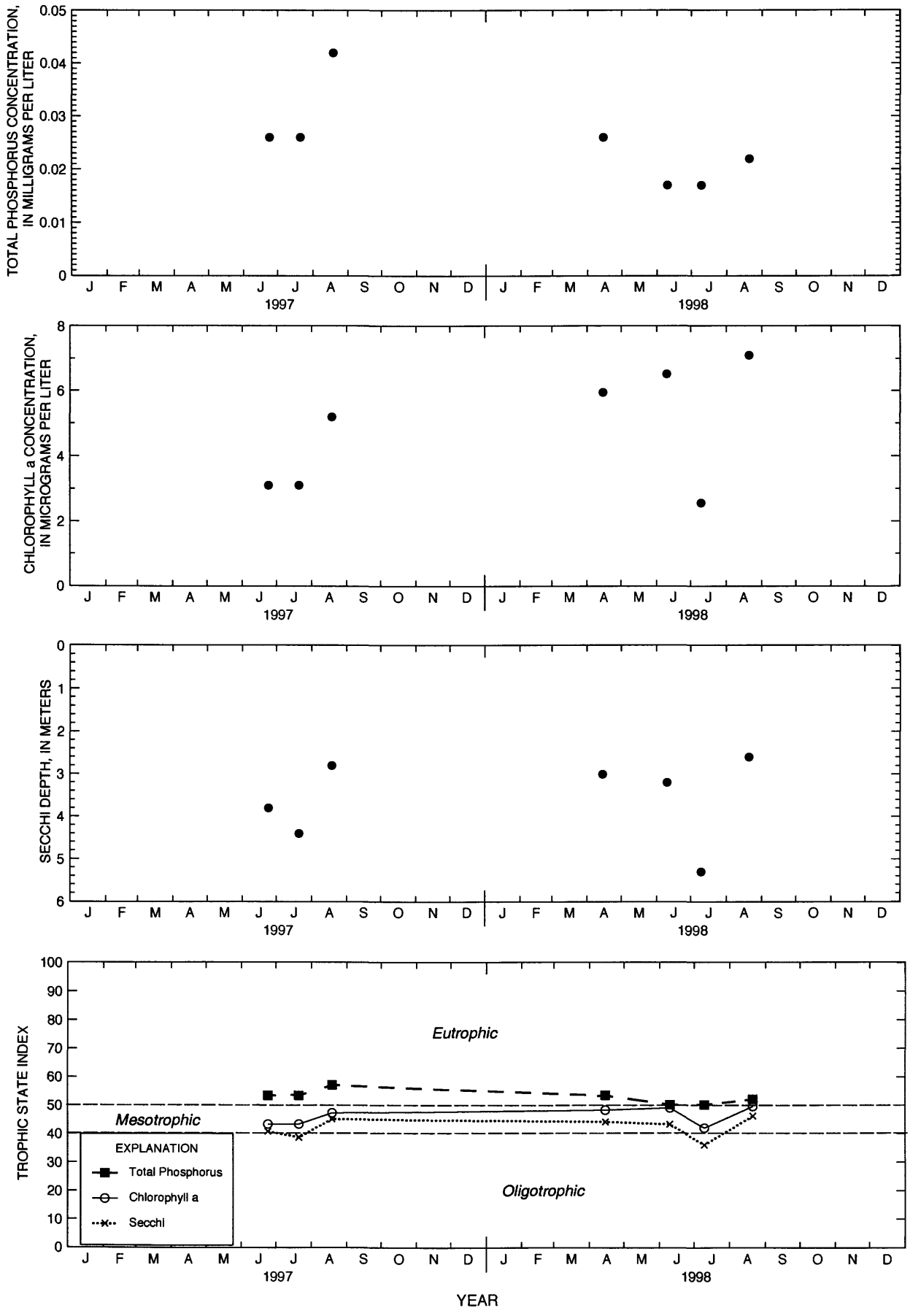
PERIOD OF RECORD.--June 1997 to current year.

REMARKS.--Lake sampled at about 8-meter depth in northern region of lake. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, MARCH 03 TO AUGUST 21, 1998
(Milligrams per liter unless otherwise indicated)

	Mar. 03	Apr. 15	June 10	July 10		Aug. 21	
Lake stage (ft)	---	0.83	0.17	0.31		0.17	
Secchi-depth (meters)	---	3.0	3.2	5.3		2.6	
Chlorophyll a, phytoplankton (µg/L)	---	5.96	6.52	2.56		7.1	
Depth of sample (m)	0.5	0.5	0.5	0.5	8.0	0.5	9.0
Water temperature (°C)	3.7	9.0	17.5	23.5	19.3	23.5	19.9
Specific conductance (µS/cm)	144	146	159	156	158	160	186
pH (units)	8.0	7.5	8.4	7.1	7.0	8.4	7.6
Dissolved oxygen	11.0	12.0	9.6	9.0	1.5	8.9	0.5
Phosphorus, total (as P)	0.684	0.026	0.017	0.017	0.017	0.022	0.092





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for McKenzie Lake, North Site, near Spooner, Wisconsin.

455437092022300 MCKENZIE LAKE, SOUTH SITE, NEAR SPOONER, WI

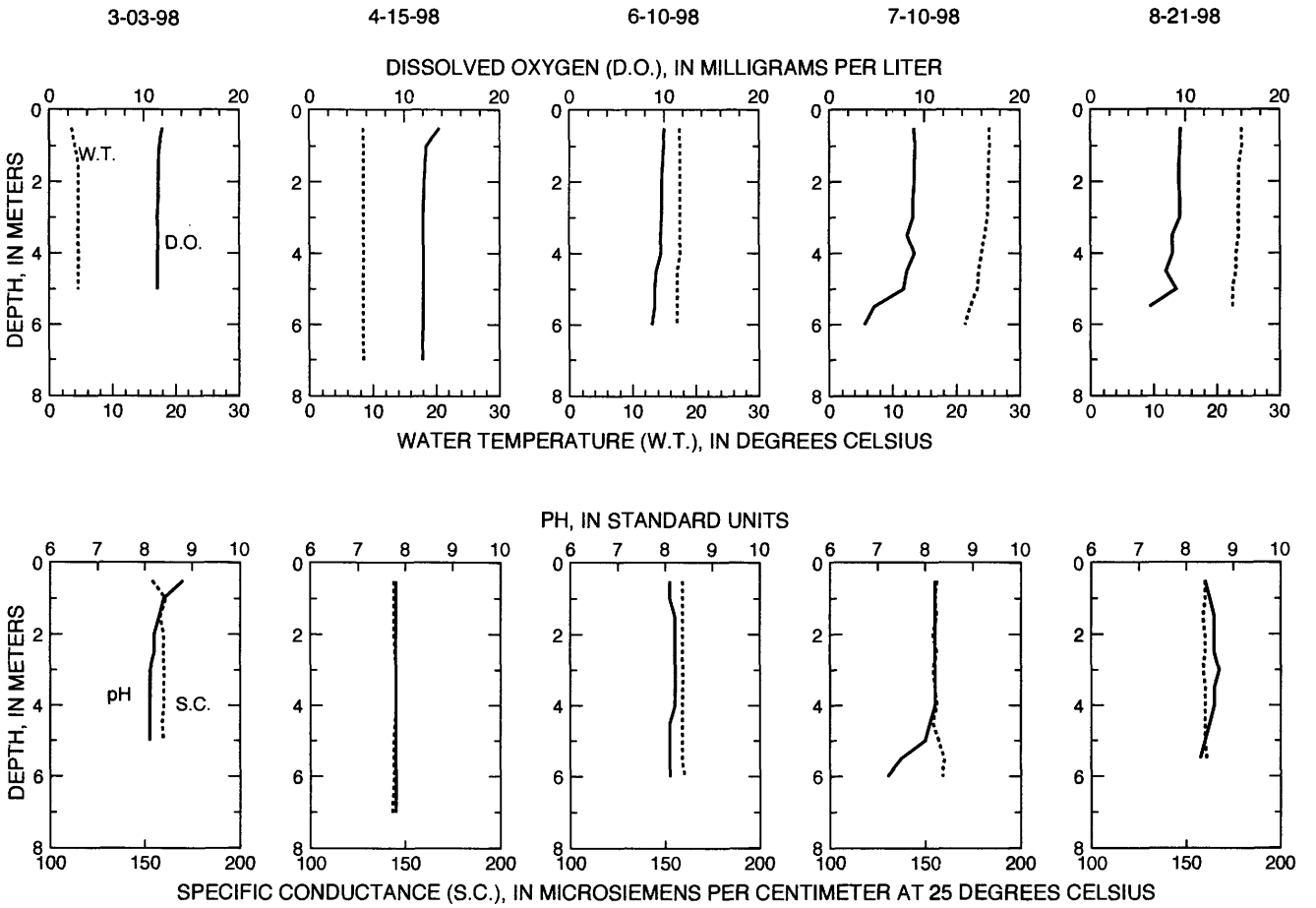
LOCATION.--Lat 45°54'37", long 92°02'23", in SW 1/4 NE 1/4 sec.36, T.40 N., R.14 W., Burnett County, Hydrologic Unit 07030002, 9.2 mi northwest of Spooner.

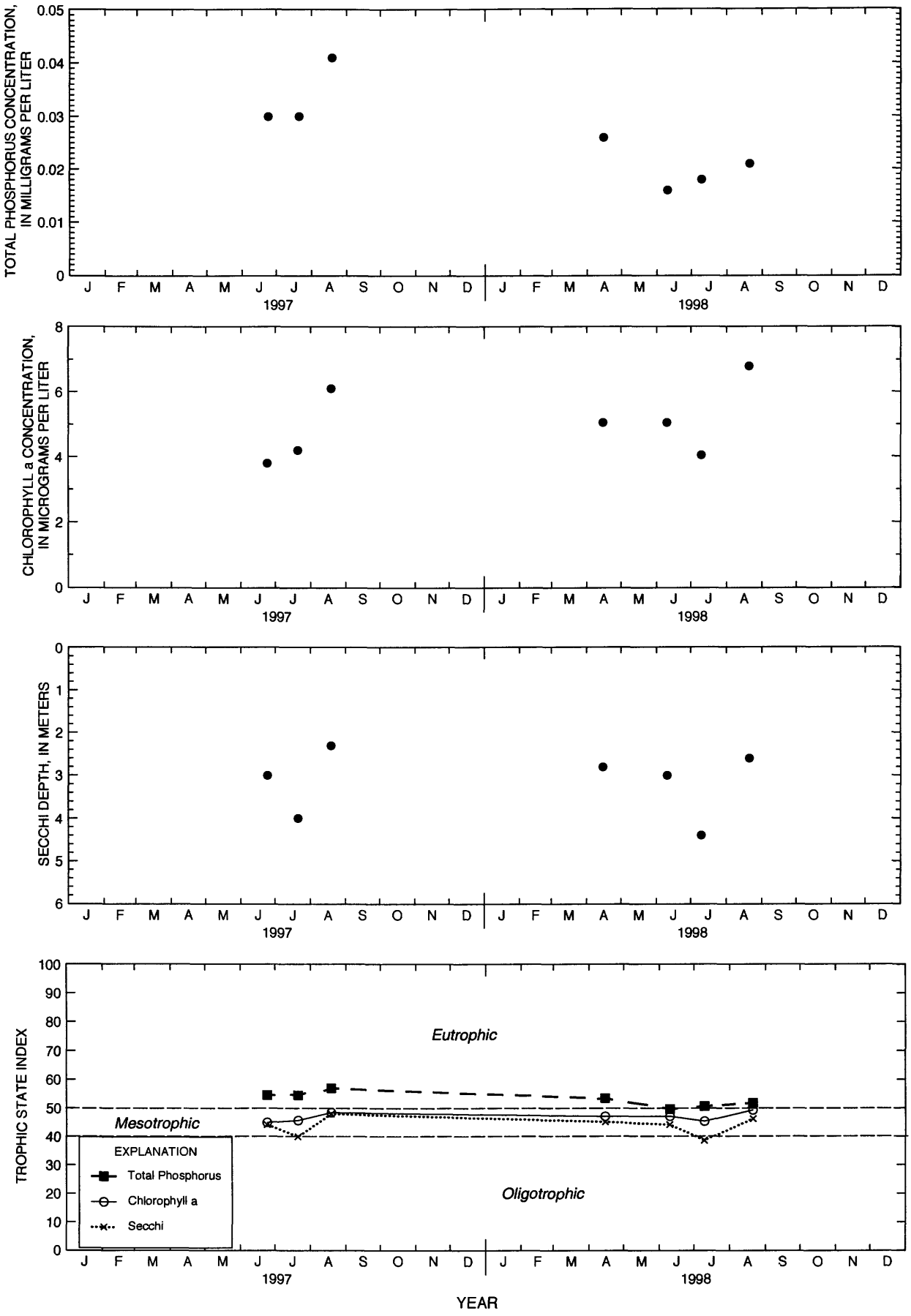
PERIOD OF RECORD.--June 1997 to current year.

REMARKS.--Lake sampled at about 8-meter depth in southern region of lake. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, MARCH 03 TO AUGUST 21, 1998
(Milligrams per liter unless otherwise indicated)

	Mar. 03	Apr. 15	June 10	July 10		Aug. 21	
Lake stage (ft)	---	0.83	0.17	0.31		0.17	
Secchi-depth (meters)	---	2.8	3.0	4.4		2.6	
Chlorophyll a, phytoplankton (µg/L)	---	5.06	5.05	4.05		6.79	
Depth of sample (m)	0.5	0.5	0.5	0.5	6.0	0.5	5.5
Water temperature (°C)	3.3	8.6	17.3	25.2	21.4	24.1	22.6
Specific conductance (µS/cm)	154	144	159	156	159	160	161
pH (units)	8.8	7.8	8.1	8.2	7.2	8.4	8.3
Dissolved oxygen	12.0	12.7	10.0	8.9	3.7	9.5	6.2
Phosphorus, total (as P)	0.032	0.026	0.016	0.018	0.021	0.021	0.032





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for McKenzie Lake, South Site, near Spooner, Wisconsin.

455902092011900 LOWER MCKENZIE LAKE NEAR WEBB LAKE, WI

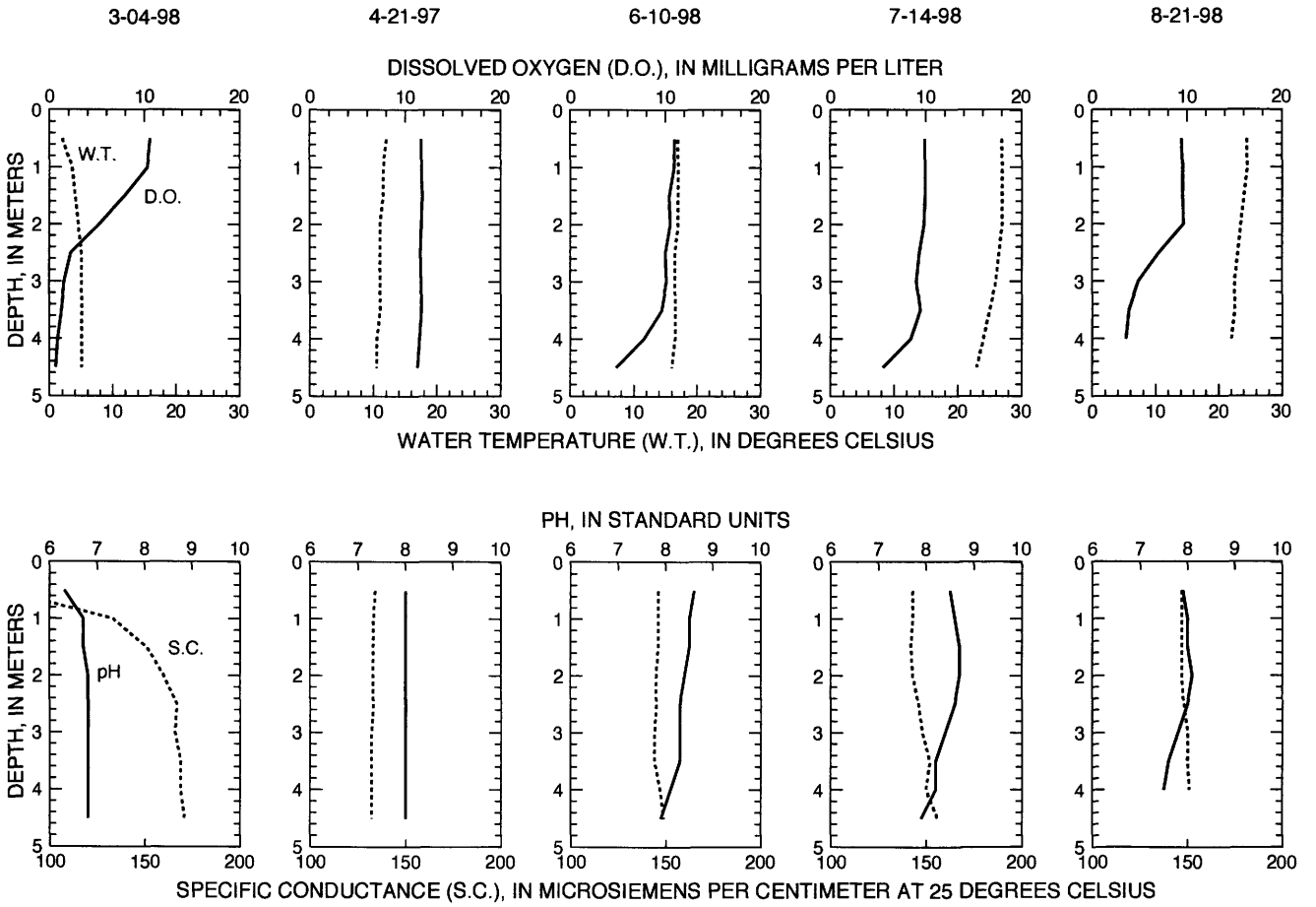
LOCATION.--Lat 45°59'02", long 92°01'19", in NW 1/4 NE 1/4 sec.6, T.40 N., R.13 W., Washburn County, Hydrologic Unit 07030002, 13.8 mi northwest of Spooner.

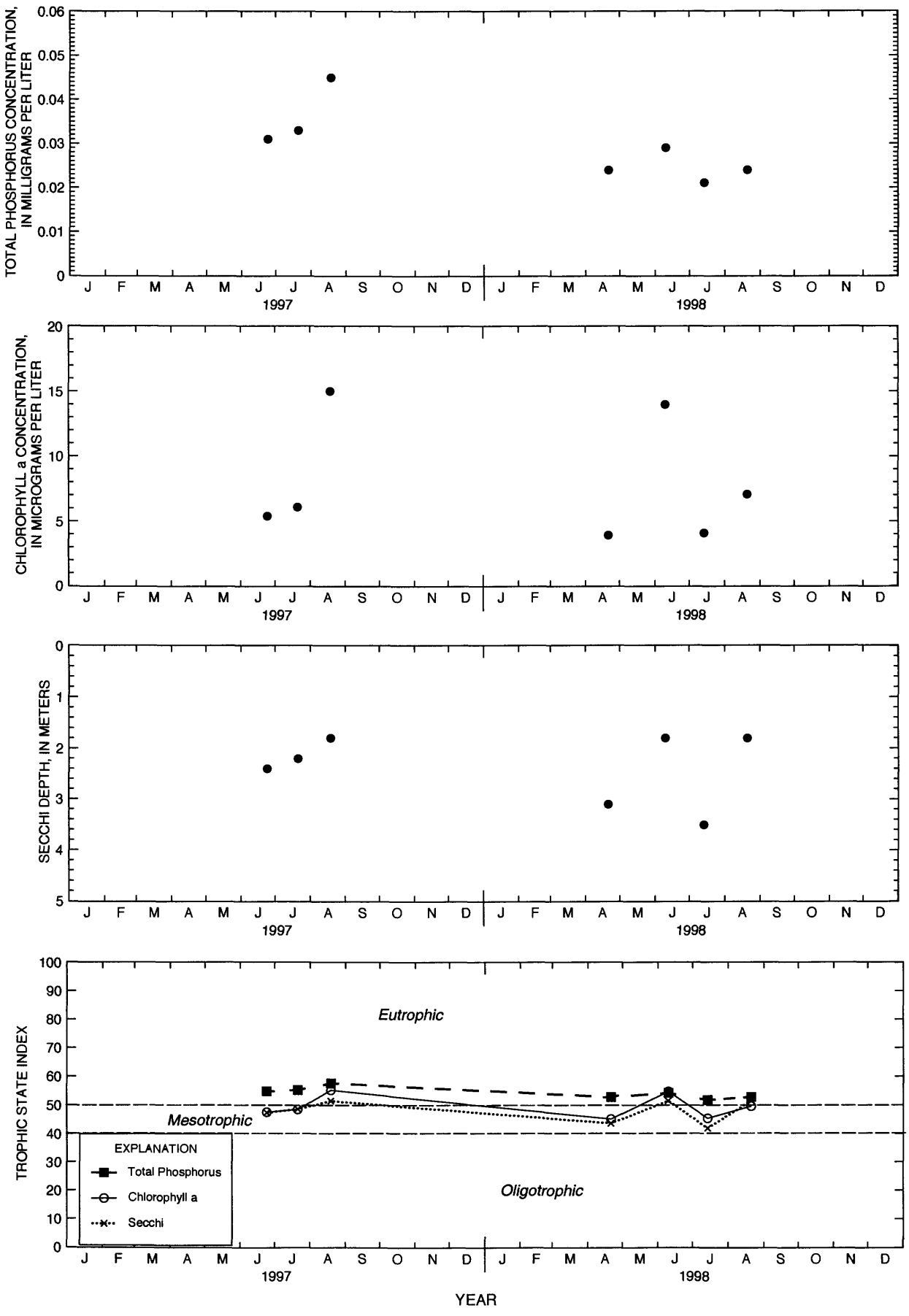
PERIOD OF RECORD.--June 1997 to current year.

REMARKS.--Lake sampled at deepest point. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, MARCH 04 TO AUGUST 21, 1998
(Milligrams per liter unless otherwise indicated)

	Mar. 04		Apr. 21		June 10		July 14		Aug. 21	
Lake stage (ft)	---		92.58		92.33		92.35		92.31	
Secchi-depth (meters)	---		3.1		1.8		3.5		1.8	
Chlorophyll a, phytoplankton (µg/L)	---		3.92		14		4.05		7.06	
Depth of sample (m)	0.5	4.5	0.5	4.5	0.5	4.5	0.5	4.5	0.5	4.0
Water temperature (°C)	2.2	5.0	12.0	10.7	17.0	15.9	26.8	22.9	24.5	22.0
Specific conductance (µS/cm)	75	171	134	132	146	149	143	156	147	151
pH (units)	6.3	6.8	8.0	8.0	8.6	7.9	8.5	7.9	7.9	7.5
Dissolved oxygen	10.6	0.6	11.7	11.3	11.0	4.8	9.9	5.5	9.4	3.5
Phosphorus, total (as P)	0.031	0.027	0.024	0.031	0.029	0.027	0.021	0.035	0.024	0.039
Phosphorus, ortho, dissolved (as P)	---	---	0.001	<0.002	---	---	---	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	<0.010	<0.010	---	---	---	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	<0.013	<0.013	---	---	---	---	---	---
Nitrogen, amm. + org., total (as N)	---	---	0.13	0.27	---	---	---	---	---	---
Nitrogen, total (as N)	---	---	---	---	---	---	---	---	---	---
Color (Pt-Co. scale)	---	---	15	10	---	---	---	---	---	---
Turbidity (NTU)	---	---	1.4	1.8	---	---	---	---	---	---
Hardness, as CaCO3	---	---	70	69	---	---	---	---	---	---
Calcium, dissolved (Ca)	---	---	19	19	---	---	---	---	---	---
Magnesium, dissolved (Mg)	---	---	5.4	5.3	---	---	---	---	---	---
Sodium, dissolved (Na)	---	---	2.7	2.7	---	---	---	---	---	---
Potassium, dissolved (K)	---	---	0.7	0.6	---	---	---	---	---	---
Alkalinity, as CaCO3	---	---	68	68	---	---	---	---	---	---
Sulfate, dissolved (SO4)	---	---	2.8	2.6	---	---	---	---	---	---
Chloride, dissolved (Cl)	---	---	2.4	2.4	---	---	---	---	---	---
Silica, dissolved (SiO2)	---	---	14	14	---	---	---	---	---	---
Solids, dissolved, at 180°C	---	---	108	108	---	---	---	---	---	---
Iron, dissolved (Fe) µg/L	---	---	30	20	---	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	2.4	4.2	---	---	---	---	---	---





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

455635092021800 MIDDLE MCKENZIE LAKE NEAR SPOONER, WI

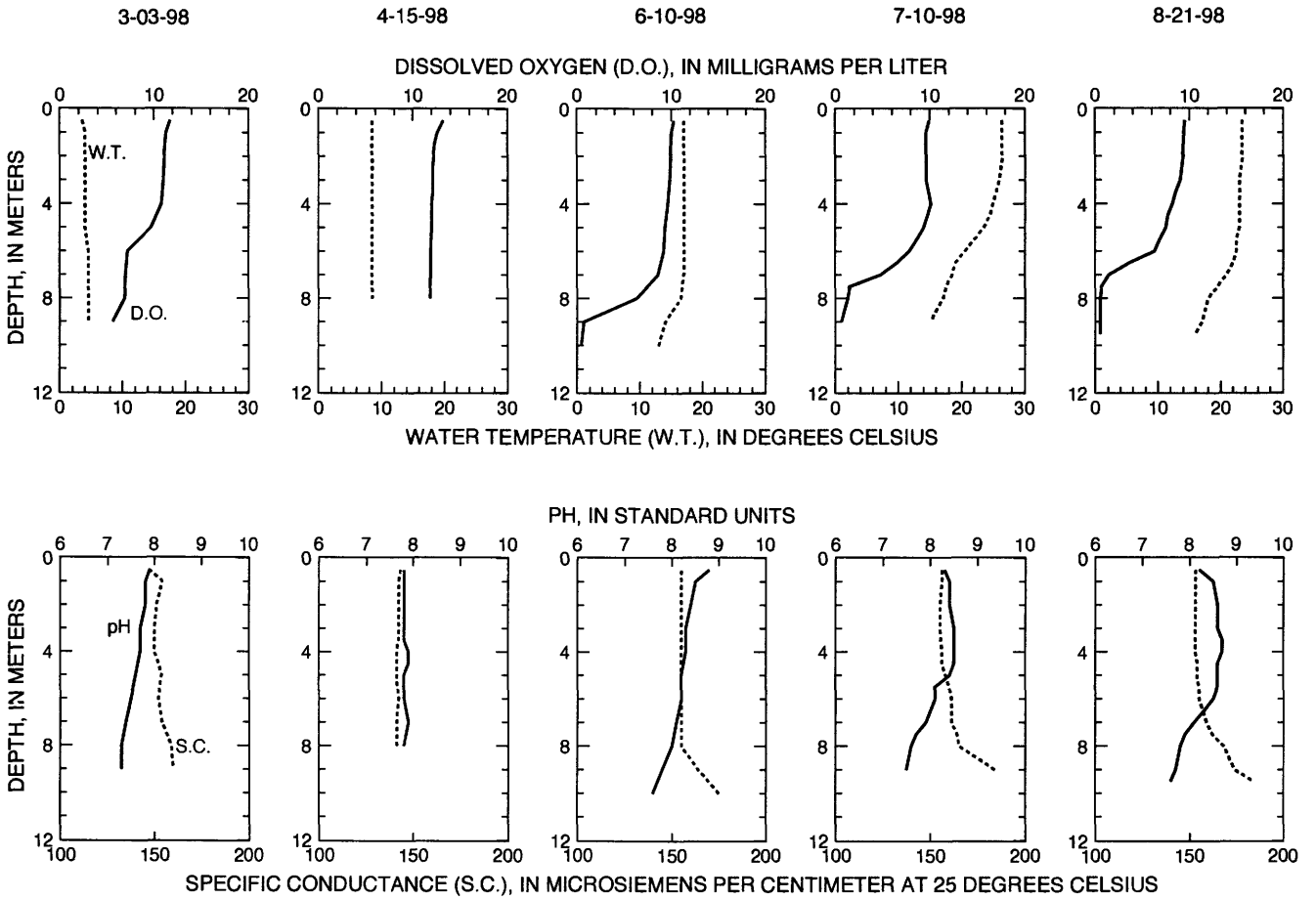
LOCATION.--Lat 45°56'35", long 92°02'18", in SW 1/4 SE 1/4 sec.13, T.40 N., R.14 W., Burnett County, Hydrologic Unit 07030002, 11.2 mi northwest of Spooner.

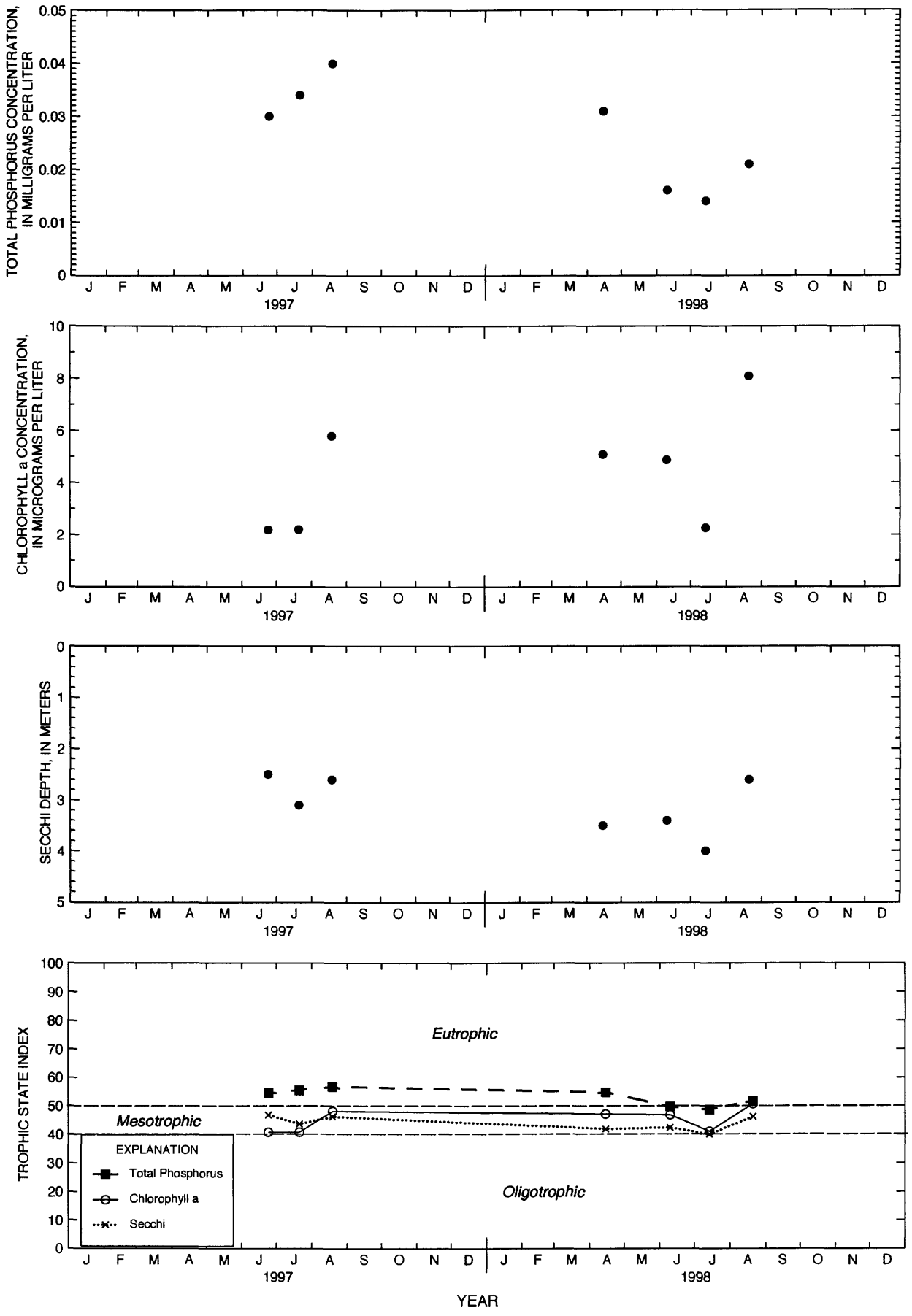
PERIOD OF RECORD.--June 1997 to current year.

REMARKS.--Lake sampled near center at deep hole. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, MARCH 03 TO AUGUST 21, 1998
(Milligrams per liter unless otherwise indicated)

	Mar. 03	Apr. 15		June 10		July 14		Aug. 21	
Lake stage (ft)	---	92.36		91.83		91.94		91.87	
Secchi-depth (meters)	---	3.5		3.4		4.0		2.6	
Chlorophyll a, phytoplankton (µg/L)	---	5.08		4.87		2.27		8.11	
Depth of sample (m)	0.5	0.5	8.0	0.5	10.0	0.5	9.0	0.5	9.5
Water temperature (°C)	3.3	8.6	8.5	17.2	12.9	26.5	15.1	23.5	16.2
Specific conductance (µS/cm)	147	143	141	155	175	156	184	153	184
pH (units)	7.9	7.8	7.8	8.8	7.6	8.3	7.5	8.2	7.6
Dissolved oxygen	11.7	13.2	11.8	10.3	0.4	9.9	0.6	9.5	0.5
Phosphorus, total (as P)	<0.005	0.031	0.032	0.016	0.033	0.014	0.059	0.021	0.052
Phosphorus, ortho, dissolved (as P)	---	<0.002	<0.002	---	---	---	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	0.040	0.039	---	---	---	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	<0.013	<0.013	---	---	---	---	---	---
Nitrogen, amm. + org., total (as N)	---	0.28	0.29	---	---	---	---	---	---
Nitrogen, total (as N)	---	0.32	0.33	---	---	---	---	---	---
Color (Pt-Co. scale)	---	10	10	---	---	---	---	---	---
Turbidity (NTU)	---	2.8	3	---	---	---	---	---	---
Hardness, as CaCO3	---	74	74	---	---	---	---	---	---
Calcium, dissolved (Ca)	---	20	20	---	---	---	---	---	---
Magnesium, dissolved (Mg)	---	5.8	5.8	---	---	---	---	---	---
Sodium, dissolved (Na)	---	2.9	2.9	---	---	---	---	---	---
Potassium, dissolved (K)	---	0.7	0.5	---	---	---	---	---	---
Alkalinity, as CaCO3	---	72	73	---	---	---	---	---	---
Sulfate, dissolved (SO4)	---	2.7	2.7	---	---	---	---	---	---
Chloride, dissolved (Cl)	---	2.9	3.0	---	---	---	---	---	---
Silica, dissolved (SiO2)	---	17	17	---	---	---	---	---	---
Solids, dissolved, at 180°C	---	100	100	---	---	---	---	---	---
Iron, dissolved (Fe) µg/L	---	10	10	---	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	50	49	---	---	---	---	---	---





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

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 city boat house at dam at outlet, in Madison.

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

PERIOD OF RECORD.--December 1902 to May 1903, 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.--No estimated daily gage heights. Records are good. 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, 12.20 ft, July 14–15, 1993; minimum observed, 8.02 ft, Feb. 24 to Mar. 10, 1920, current datum.

EXTREMES FOR CURRENT YEAR.--Maximum recorded gage height, 11.16 ft, July 4; minimum recorded, 8.99 ft, Dec. 23.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.52	9.47	9.08	9.22	9.58	10.13	10.80	10.52	10.31	11.07	10.07	10.16
2	9.51	9.46	9.06	9.22	9.60	10.14	10.85	10.51	10.31	11.06	10.04	10.14
3	9.52	9.44	9.10	9.23	9.61	10.16	10.85	10.58	10.27	11.07	10.01	10.10
4	9.52	9.42	9.14	9.25	9.62	10.16	10.83	10.56	10.24	11.10	10.08	10.08
5	9.52	9.40	9.15	9.31	9.62	10.16	10.80	10.53	10.21	11.08	10.14	10.06
6	9.52	9.41	9.14	9.34	9.62	10.18	10.77	10.49	10.19	11.06	10.18	10.05
7	9.52	9.41	9.12	9.36	9.63	10.18	10.74	10.51	10.16	11.07	10.21	10.04
8	9.52	9.40	9.11	9.39	9.63	10.25	10.80	10.53	10.13	11.06	10.21	10.00
9	9.54	9.39	9.12	9.42	9.64	10.32	10.82	10.50	10.11	11.00	10.21	9.97
10	9.53	9.38	9.15	9.42	9.65	10.27	10.80	10.45	10.11	10.96	10.21	9.95
11	9.51	9.36	9.15	9.40	9.68	10.25	10.77	10.40	10.16	10.90	10.19	9.92
12	9.50	9.34	9.15	9.41	9.71	10.22	10.72	10.35	10.25	10.85	10.17	9.91
13	9.56	9.31	9.15	9.41	9.72	10.21	10.72	10.34	10.26	10.79	10.15	9.91
14	9.55	9.30	9.15	9.43	9.73	10.18	10.75	10.30	10.24	10.74	10.16	10.00
15	9.53	9.30	9.14	9.45	9.74	10.16	10.79	10.29	10.23	10.69	10.18	10.13
16	9.53	9.28	9.15	9.45	9.77	10.14	10.91	10.33	10.22	10.63	10.15	10.15
17	9.53	9.25	9.15	9.46	9.84	10.14	10.92	10.31	10.20	10.57	10.17	10.16
18	9.52	9.23	9.15	9.46	9.87	10.21	10.91	10.29	10.26	10.51	10.16	10.16
19	9.52	9.21	9.16	9.47	9.89	10.25	10.88	10.30	10.50	10.51	10.14	10.16
20	9.51	9.20	9.18	9.47	9.91	10.27	10.85	10.29	10.57	10.47	10.14	10.17
21	9.51	9.19	9.17	9.49	9.93	10.26	10.87	10.27	10.59	10.48	10.14	10.16
22	9.48	9.18	9.18	9.51	9.94	10.26	10.85	10.23	10.60	10.44	10.13	10.14
23	9.48	9.17	9.19	9.52	9.96	10.26	10.82	10.20	10.59	10.41	10.18	10.11
24	9.49	9.13	9.20	9.53	9.98	10.26	10.78	10.24	10.60	10.35	10.21	10.12
25	9.48	9.11	9.22	9.54	10.00	10.26	10.73	10.26	10.60	10.31	10.23	10.12
26	9.48	9.12	9.22	9.55	10.01	10.26	10.72	10.25	10.60	10.27	10.22	10.13
27	9.49	9.08	9.22	9.55	10.07	10.27	10.69	10.23	10.63	10.24	10.20	10.14
28	9.48	9.09	9.21	9.56	10.11	10.27	10.64	10.27	10.92	10.21	10.22	10.13
29	9.47	9.08	9.22	9.56	---	10.25	10.60	10.30	11.03	10.17	10.22	10.13
30	9.45	9.11	9.22	9.57	---	10.28	10.55	10.28	11.07	10.14	10.20	10.15
31	9.44	---	9.22	9.57	---	10.64	---	10.34	---	10.10	10.17	---
MEAN	9.51	9.27	9.16	9.44	9.79	10.23	10.78	10.36	10.41	10.66	10.16	10.09
MAX	9.56	9.47	9.22	9.57	10.11	10.64	10.92	10.58	11.07	11.10	10.23	10.17
MIN	9.44	9.08	9.06	9.22	9.58	10.13	10.55	10.20	10.11	10.10	10.01	9.91

430309088284800 MIDDLE GENESEE LAKE NEAR OCONOMOWOC, WI

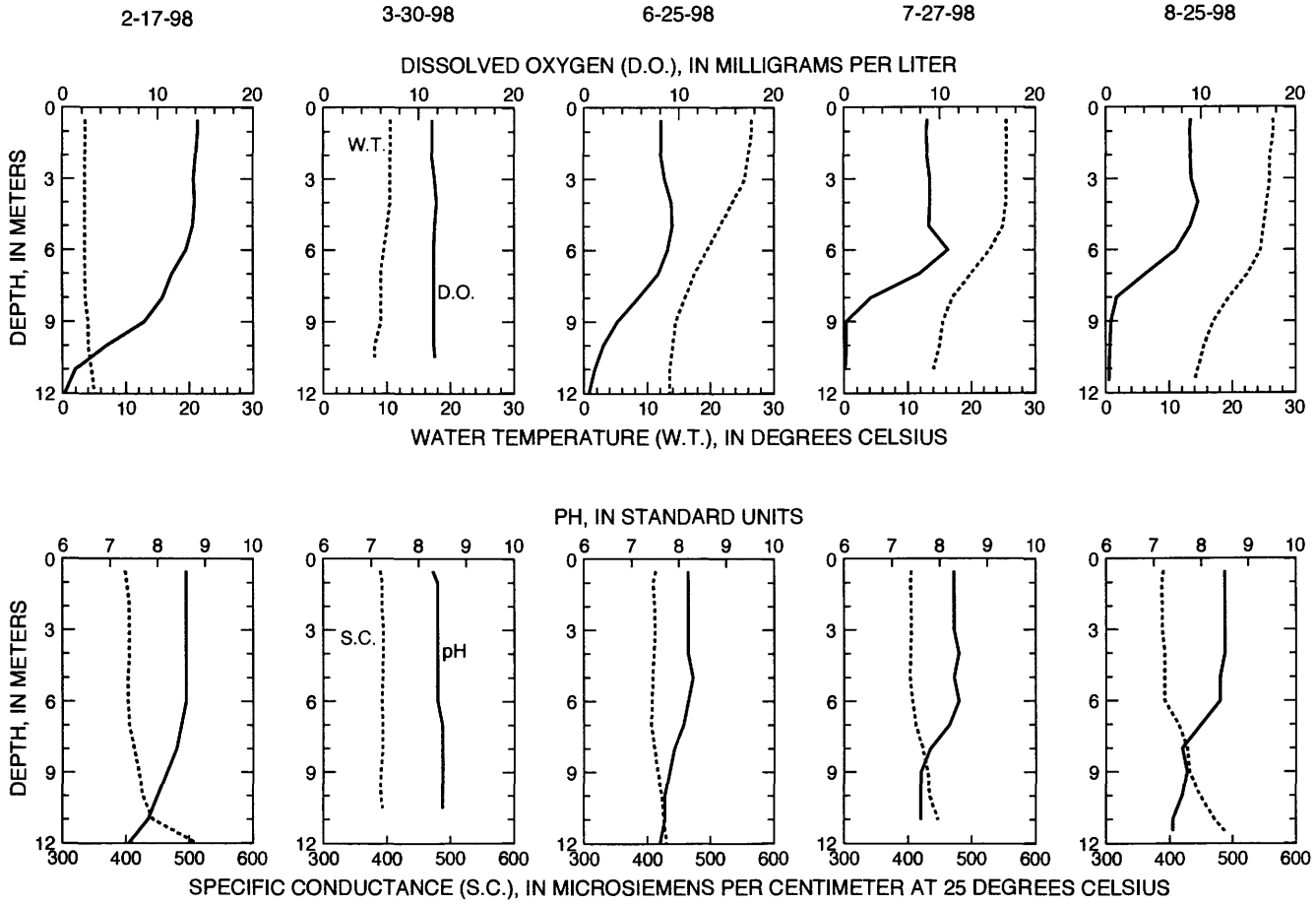
LOCATION.--Lat 43°03'09", long 88°28'48", in NW 1/4 SW 1/4 sec.22, T.7 N., R.17 E., Waukesha County, Hydrologic Unit 07090001, 1.8 mi south of Oconomowoc.

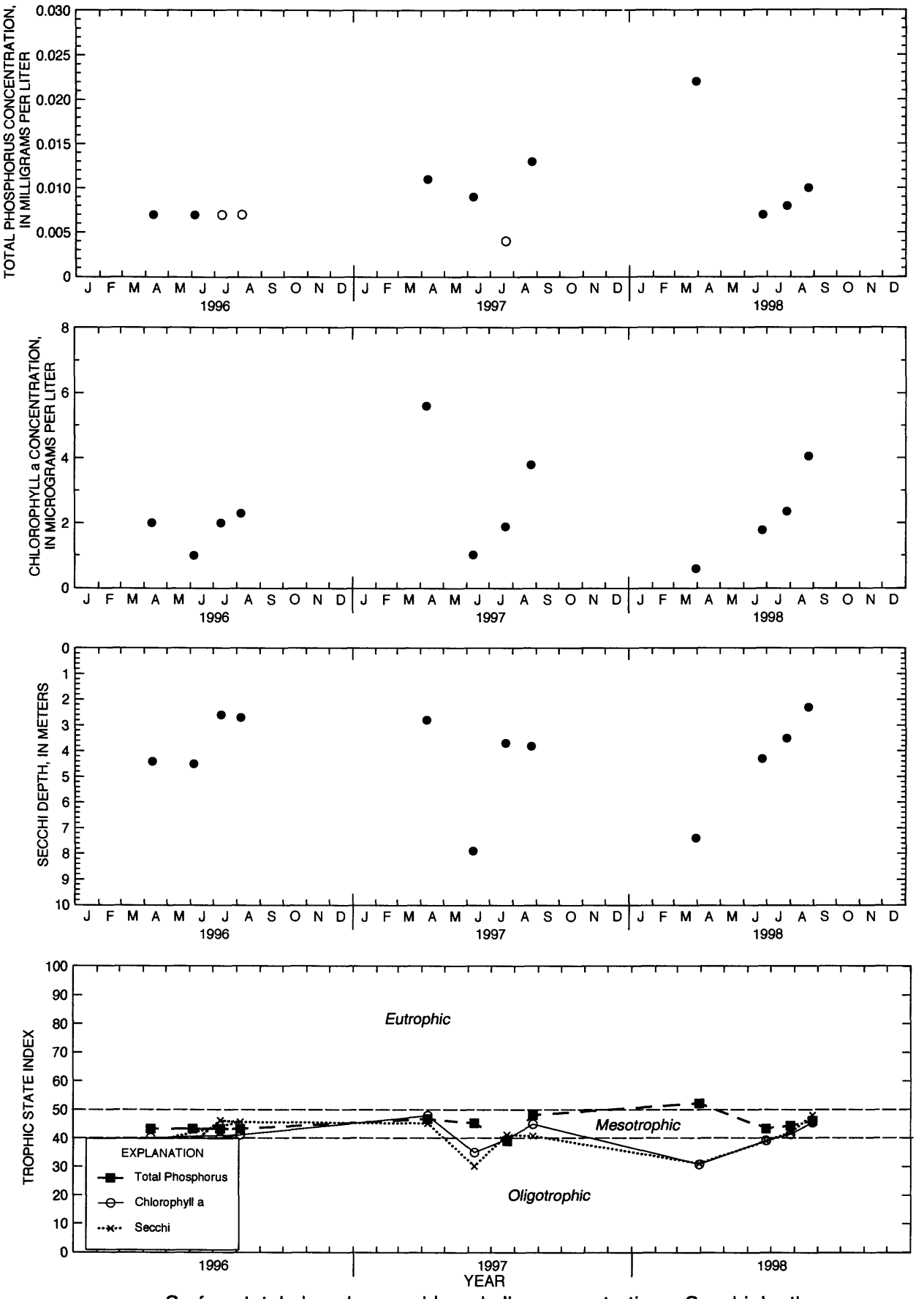
PERIOD OF RECORD.--February 1996 to current year.

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

WATER-QUALITY DATA, FEBRUARY 17 TO AUGUST 25, 1998
(Milligrams per liter unless otherwise indicated)

	Feb. 17		Mar. 30		June 25		July 27		Aug. 25		
Lake stage (ft)	865.25		865.45		866.66		866.37		866.49		
Secchi-depth (meters)	---		7.4		4.3		3.5		2.3		
Chlorophyll a, phytoplankton (µg/L)	---		0.59		0.02		2.4		4.05		
Depth of sample (m)	0.5	12.0	0.5	10.5	0.5	12.0	0.5	11.0	0.5	9.0	11.5
Water temperature (°C)	3.4	5.0	10.6	8.0	26.3	13.5	25.4	14.2	26.4	17.1	14.0
Specific conductance (µS/cm)	399	510	389	393	413	430	405	447	390	431	487
pH (units)	8.6	7.4	8.3	8.5	8.2	7.6	8.3	7.6	8.5	7.7	7.4
Dissolved oxygen	14.2	0.2	11.4	11.7	8.1	0.5	8.7	0.1	8.9	0.5	0.3
Phosphorus, total (as P)	0.008	0.131	0.022	0.033	<0.005	0.024	0.008	<0.005	0.010	0.014	0.038
Phosphorus, ortho, dissolved (as P)	---	---	<0.002	<0.002	---	---	---	---	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	0.062	0.057	---	---	---	---	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	0.142	0.140	---	---	---	---	---	---	---
Nitrogen, amm. + org., total (as N)	---	---	0.64	0.58	---	---	---	---	---	---	---
Nitrogen, total (as N)	---	---	0.70	0.64	---	---	---	---	---	---	---
Color (Pt-Co. scale)	---	---	5	5	---	---	---	---	---	---	---
Turbidity (NTU)	---	---	1.4	1.2	---	---	---	---	---	---	---
Hardness, as CaCO3	---	---	188	185	---	---	---	---	---	---	---
Calcium, dissolved (Ca)	---	---	29	28	---	---	---	---	---	---	---
Magnesium, dissolved (Mg)	---	---	28	28	---	---	---	---	---	---	---
Sodium, dissolved (Na)	---	---	11	11	---	---	---	---	---	---	---
Potassium, dissolved (K)	---	---	1.7	1.4	---	---	---	---	---	---	---
Alkalinity, as CaCO3	---	---	166	166	---	---	---	---	---	---	---
Sulfate, dissolved (SO4)	---	---	16	5	---	---	---	---	---	---	---
Chloride, dissolved (Cl)	---	---	24	28	---	---	---	---	---	---	---
Silica, dissolved (SiO2)	---	---	0.5	0.6	---	---	---	---	---	---	---
Solids, dissolved, at 180°C	---	---	224	228	---	---	---	---	---	---	---
Iron, dissolved (Fe) µg/L	---	---	<10	<10	---	---	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	<0.4	<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.

REMARKS.--No estimated daily gage heights. Records good. 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, 7.28 ft, June 19, 1996; minimum observed, 3.22 ft, Jan. 20, 1965, current datum.

EXTREMES FOR CURRENT YEAR.--Maximum recorded gage height, 6.22 ft, June 28; minimum recorded, 3.67 ft, Jan. 1, 3.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.75	4.47	4.20	3.68	3.71	3.95	5.54	5.58	5.16	6.01	5.44	5.44
2	4.70	4.48	4.20	3.68	3.72	3.94	5.59	5.60	5.13	5.94	5.42	5.41
3	4.67	4.51	4.19	3.68	3.72	3.94	5.61	5.67	5.11	5.93	5.41	5.40
4	4.63	4.54	4.16	3.69	3.71	3.92	5.60	5.67	5.10	5.95	5.47	5.39
5	4.59	4.58	4.10	3.74	3.71	3.92	5.59	5.67	5.10	5.90	5.53	5.38
6	4.56	4.61	4.06	3.77	3.70	3.91	5.56	5.67	5.09	5.85	5.51	5.37
7	4.53	4.59	4.04	3.78	3.70	3.91	5.56	5.74	5.08	5.87	5.52	5.35
8	4.52	4.56	4.03	3.78	3.69	3.96	5.65	5.81	5.09	5.88	5.50	5.31
9	4.51	4.53	4.02	3.78	3.69	3.94	5.69	5.81	5.12	5.88	5.49	5.29
10	4.49	4.50	4.00	3.78	3.68	3.95	5.67	5.79	5.13	5.89	5.46	5.26
11	4.48	4.46	3.98	3.78	3.71	3.99	5.65	5.77	5.28	5.88	5.44	5.24
12	4.48	4.42	3.94	3.77	3.74	4.02	5.64	5.75	5.38	5.86	5.42	5.20
13	4.51	4.40	3.92	3.77	3.74	4.05	5.65	5.68	5.42	5.85	5.40	5.17
14	4.47	4.37	3.90	3.77	3.74	4.06	5.64	5.61	5.46	5.84	5.39	5.27
15	4.45	4.35	3.88	3.78	3.75	4.09	5.73	5.53	5.46	5.82	5.41	5.40
16	4.44	4.31	3.87	3.77	3.76	4.12	5.89	5.43	5.46	5.81	5.39	5.38
17	4.43	4.29	3.85	3.77	3.81	4.17	5.89	5.36	5.46	5.79	5.39	5.35
18	4.41	4.27	3.84	3.76	3.83	4.28	5.87	5.29	5.56	5.79	5.40	5.32
19	4.40	4.25	3.82	3.75	3.84	4.36	5.85	5.24	5.78	5.82	5.38	5.30
20	4.37	4.25	3.81	3.74	3.84	4.40	5.81	5.19	5.81	5.84	5.37	5.27
21	4.34	4.25	3.80	3.75	3.84	4.41	5.84	5.14	5.81	5.90	5.37	5.22
22	4.32	4.23	3.79	3.75	3.84	4.44	5.81	5.09	5.81	5.88	5.37	5.17
23	4.34	4.21	3.78	3.76	3.84	4.46	5.77	5.04	5.81	5.80	5.41	5.13
24	4.34	4.19	3.77	3.75	3.85	4.48	5.73	5.04	5.82	5.74	5.43	5.11
25	4.32	4.19	3.77	3.75	3.86	4.51	5.70	5.02	5.81	5.70	5.44	5.09
26	4.32	4.18	3.75	3.74	3.89	4.53	5.71	5.00	5.80	5.66	5.44	5.06
27	4.30	4.18	3.74	3.74	3.95	4.56	5.65	4.99	5.87	5.62	5.44	5.04
28	4.31	4.18	3.73	3.73	3.96	4.61	5.60	5.09	6.14	5.57	5.48	5.01
29	4.34	4.18	3.72	3.73	---	4.66	5.59	5.15	6.14	5.54	5.48	4.98
30	4.38	4.21	3.70	3.72	---	4.76	5.58	5.15	6.07	5.50	5.47	4.96
31	4.42	---	3.69	3.71	---	5.31	---	5.17	---	5.47	5.45	---
MEAN	4.46	4.36	3.90	3.75	3.78	4.25	5.69	5.41	5.51	5.80	5.44	5.24
MAX	4.75	4.61	4.20	3.78	3.96	5.31	5.89	5.81	6.14	6.01	5.53	5.44
MIN	4.30	4.18	3.69	3.68	3.68	3.91	5.54	4.99	5.08	5.47	5.37	4.96

434748089195800 LAKE MONTELLO AT MONTELLO, WI

LOCATION.--Lat 43°47'48", long 89°19'58", in SW 1/4 NE 1/4 sec.8, T.15 N., R.10 E., Marquette County, Hydrologic Unit 04030201, at Montello.

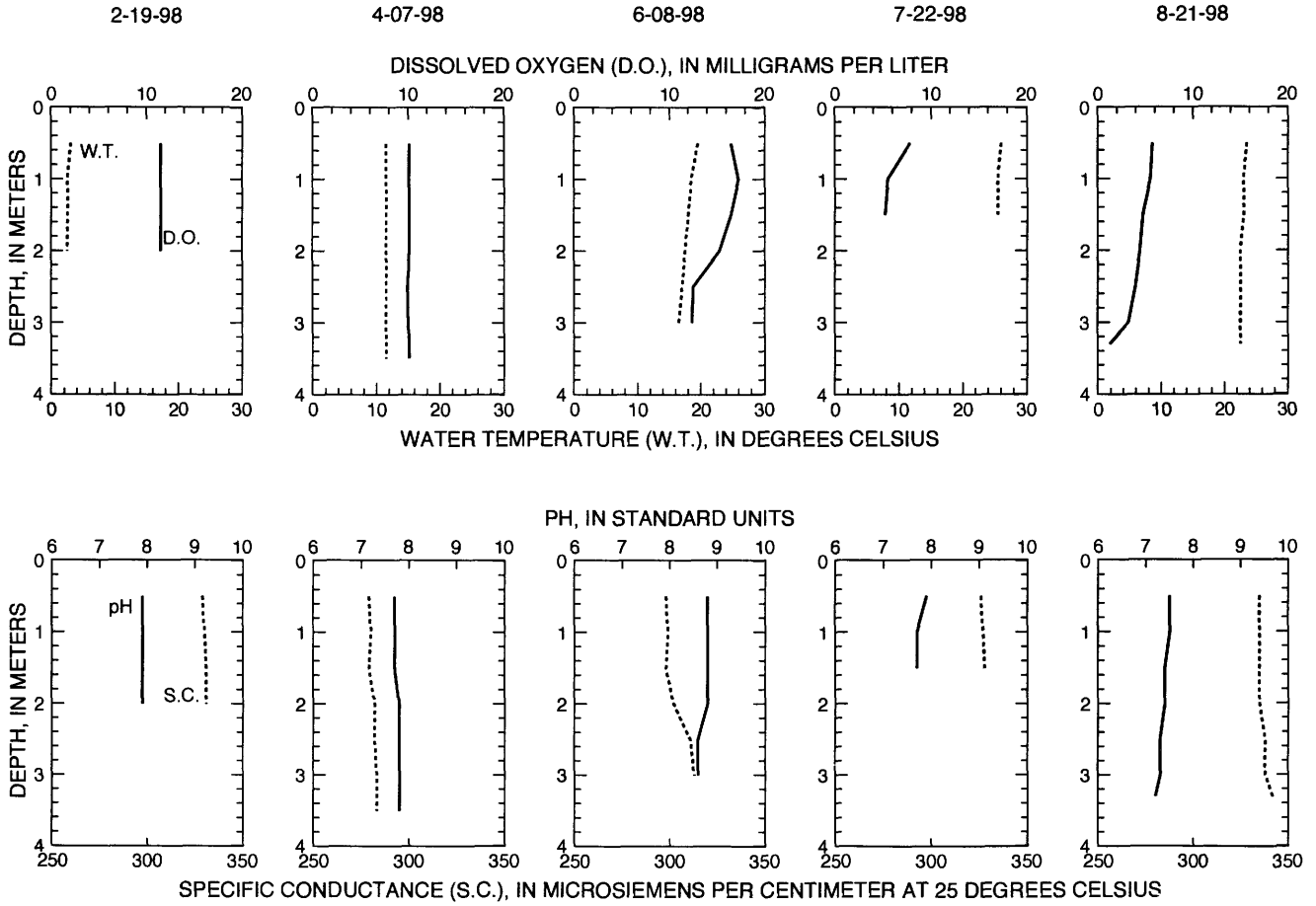
PERIOD OF RECORD.--February 1995 to current year. Lake-stage and secchi measurements for water years 1984 to 1990 were collected at a different site (station number 434813089204000).

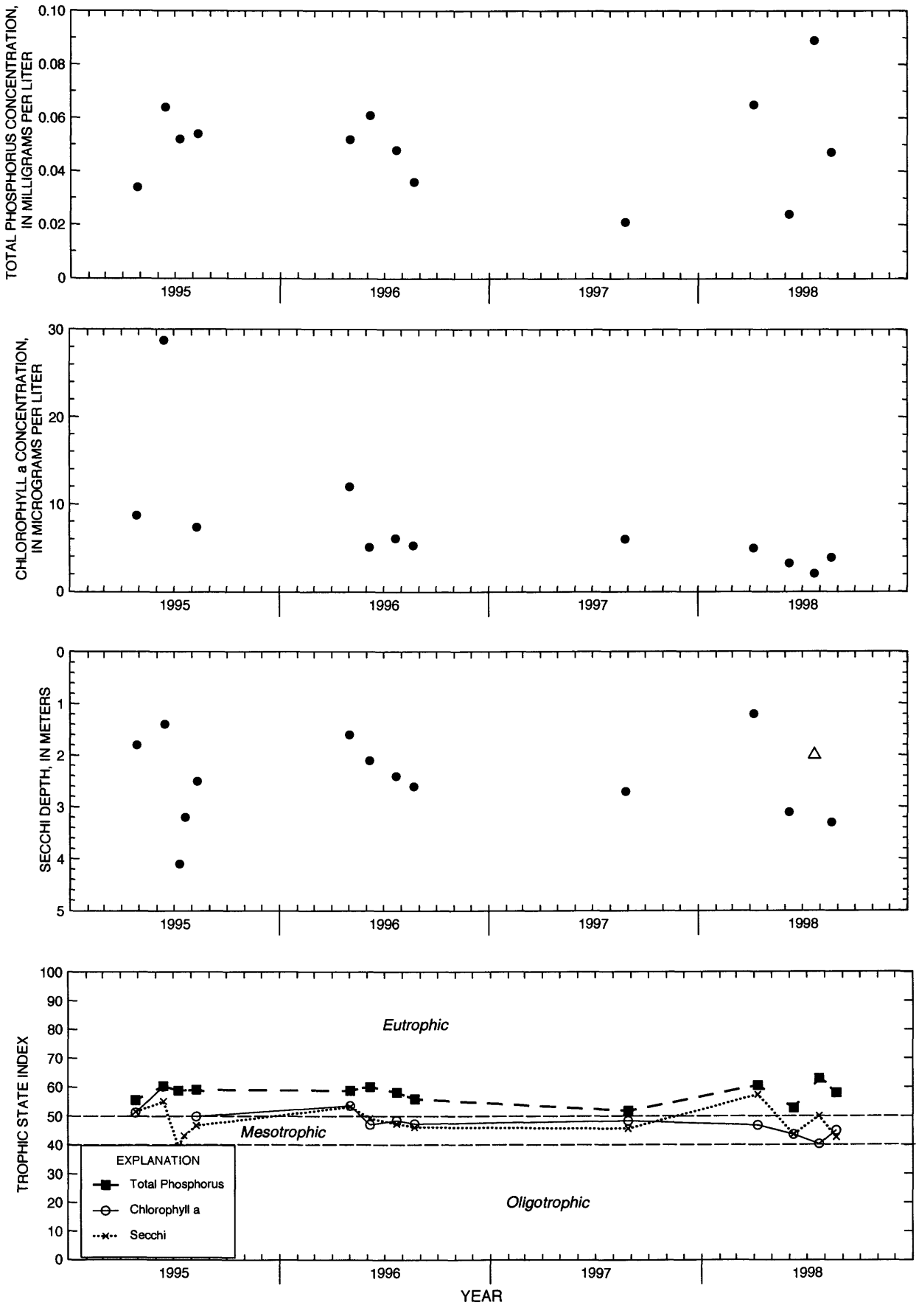
REMARKS.--Lake sampled near southeast end at the deep hole. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, FEBRUARY 19 TO AUGUST 21, 1998

(Milligrams per liter unless otherwise indicated)

	Feb. 19		Apr. 07		June 08		July 22		Aug. 21		
Lake stage (ft)	---		11.76		11.67		11.53		11.44		
Secchi-depth (meters)	---		1.2		3.1		>2.0		3.3		
Chlorophyll a, phytoplankton (µg/L)	---		4.95		3.24		2.07		3.92		
Depth of sample (m)	0.5	2.0	0.5	3.5	0.5	3.0	0.5	1.5	0.5	2.5	3.25
Water temperature (°C)	2.8	2.5	11.6	11.3	19.5	16.7	25.8	25.3	23.4	22.5	22.3
Specific conductance (µS/cm)	329	331	279	283	298	313	326	328	335	338	342
pH (units)	7.9	7.9	7.7	7.8	8.8	8.6	7.9	7.7	7.5	7.3	7.2
Dissolved oxygen	11.5	11.5	10.1	10.1	16.5	12.4	7.8	5.2	5.7	3.9	1.2
Phosphorus, total (as P)	0.068	0.067	0.065	0.066	0.024	0.056	0.089	0.095	0.047	0.058	0.076
Phosphorus, ortho, dissolved (as P)	---	---	0.027	---	---	---	---	---	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	1.20	---	---	---	---	---	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	0.09	---	---	---	---	---	---	---	---
Nitrogen, amm. + org., total (as N)	---	---	0.6	---	---	---	---	---	---	---	---
Nitrogen, total (as N)	---	---	1.8	---	---	---	---	---	---	---	---
Color (Pt-Co. scale)	---	---	60	---	---	---	---	---	---	---	---
Turbidity (NTU)	---	---	4	---	---	---	---	---	---	---	---
Hardness, as CaCO3	---	---	143	---	---	---	---	---	---	---	---
Calcium, dissolved (Ca)	---	---	31	---	---	---	---	---	---	---	---
Magnesium, dissolved (Mg)	---	---	16	---	---	---	---	---	---	---	---
Sodium, dissolved (Na)	---	---	3.2	---	---	---	---	---	---	---	---
Potassium, dissolved (K)	---	---	2.3	---	---	---	---	---	---	---	---
Alkalinity, as CaCO3	---	---	121	---	---	---	---	---	---	---	---
Sulfate, dissolved (SO4)	---	---	14	---	---	---	---	---	---	---	---
Chloride, dissolved (Cl)	---	---	6.5	---	---	---	---	---	---	---	---
Silica, dissolved (SiO2)	---	---	9.3	---	---	---	---	---	---	---	---
Solids, dissolved, at 180°C	---	---	184	---	---	---	---	---	---	---	---
Iron, dissolved (Fe) µg/L	---	---	140	---	---	---	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	30	---	---	---	---	---	---	---	---





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

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

454622088324801 MORGAN LAKE NEAR FENCE, WI

LOCATION.--Lat 45°46'22", long 88°32'48", in NE 1/4 NW 1/4 SW 1/4 sec.18, T.38 N., R.16 E., Florence County, Hydrologic Unit 04030108, at southwest end of lake on dirt road off Forest Service Road 2161, 6 mi west northwest of Fence.

DRAINAGE AREA.--Not determined. Area of lake, 44 acres.

PERIOD OF RECORD.--October 1987 to September 1998 (discontinued).

GAGE.--Water-stage recorder. Datum of gage is approximately 1,400.00 ft above sea level.

REMARKS.--Records good.

EXTREMES FOR PERIOD OF RECORD.--Maximum observed gage height, 66.36 ft, June 21-22, 1993; minimum observed gage height, 63.61 ft, Oct. 19, 1989.

EXTREMES FOR CURRENT YEAR.--Maximum observed gage height, 65.73 ft, Apr. 2-3; minimum observed gage height, 64.10 ft, Sept. 25.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	65.50	65.51	65.40	65.35	65.45	65.47	65.72	65.54	65.27	65.09	64.60	64.42
2	65.49	65.51	65.39	65.35	65.49	65.47	65.73	65.54	65.25	65.07	64.59	64.41
3	65.49	65.51	65.41	65.35	65.49	65.48	65.73	65.53	65.23	65.07	64.57	64.39
4	65.48	65.50	65.42	65.34	65.48	65.47	65.72	65.52	65.21	65.05	64.56	64.38
5	65.47	65.50	65.43	65.38	65.48	65.47	65.72	65.51	65.20	65.02	64.54	64.36
6	65.48	65.49	65.43	65.38	65.47	65.48	65.72	65.49	65.18	65.03	64.54	64.35
7	65.54	65.49	65.42	65.38	65.47	65.48	65.71	65.49	65.17	65.02	64.56	64.33
8	65.54	65.48	65.42	65.37	65.47	65.48	65.71	65.48	65.16	65.00	64.56	64.31
9	65.56	65.48	65.42	65.41	65.46	65.49	65.70	65.46	65.15	64.99	64.56	64.29
10	65.54	65.47	65.41	65.41	65.46	65.48	65.69	65.45	65.15	64.98	64.58	64.28
11	65.53	65.47	65.41	65.41	65.46	65.49	65.68	65.44	65.16	64.96	64.56	64.26
12	65.52	65.46	65.41	65.42	65.45	65.48	65.67	65.43	65.24	64.95	64.55	64.25
13	65.60	65.45	65.40	65.43	65.45	65.48	65.66	65.47	65.24	64.93	64.53	64.24
14	65.59	65.45	65.40	65.46	65.45	65.48	65.68	65.47	65.23	64.92	64.54	64.23
15	65.58	65.45	65.40	65.47	65.45	65.48	65.68	65.47	65.23	64.91	64.54	64.23
16	65.57	65.44	65.39	65.46	65.45	65.49	65.69	65.46	65.22	64.89	64.52	64.21
17	65.57	65.44	65.39	65.46	65.45	65.50	65.69	65.45	65.21	64.87	64.54	64.20
18	65.56	65.43	65.39	65.46	65.45	65.51	65.68	65.45	65.20	64.85	64.53	64.19
19	65.56	65.43	65.38	65.45	65.45	65.55	65.67	65.42	65.18	64.83	64.52	64.18
20	65.55	65.42	65.38	65.44	65.44	65.54	65.67	65.39	65.17	64.81	64.51	64.17
21	65.55	65.42	65.38	65.44	65.44	65.54	65.66	65.38	65.16	64.79	64.50	64.15
22	65.53	65.42	65.37	65.43	65.44	65.52	65.65	65.36	65.14	64.76	64.50	64.13
23	65.53	65.42	65.36	65.44	65.43	65.52	65.64	65.33	65.12	64.73	64.57	64.11
24	65.52	65.42	65.36	65.44	65.44	65.51	65.63	65.31	65.13	64.71	64.56	64.11
25	65.51	65.42	65.36	65.45	65.43	65.51	65.62	65.30	65.14	64.69	64.54	64.10
26	65.50	65.42	65.36	65.45	65.42	65.53	65.60	65.28	65.13	64.67	64.52	64.13
27	65.49	65.42	65.35	65.45	65.44	65.54	65.58	65.27	65.13	64.67	64.51	64.15
28	65.49	65.41	65.35	65.45	65.46	65.55	65.57	65.27	65.12	64.65	64.51	64.13
29	65.48	65.41	65.36	65.44	---	65.57	65.56	65.27	65.11	64.64	64.49	64.14
30	65.47	65.40	65.36	65.44	---	65.65	65.55	65.25	65.10	64.64	64.47	64.14
31	65.49	---	65.36	65.44	---	65.67	---	65.28	---	64.62	64.44	---
MEAN	65.53	65.45	65.39	65.42	65.45	65.51	65.67	65.41	65.18	64.86	64.54	64.23
MAX	65.60	65.51	65.43	65.47	65.49	65.67	65.73	65.54	65.27	65.09	64.60	64.42
MIN	65.47	65.40	65.35	65.34	65.42	65.47	65.55	65.25	65.10	64.62	64.44	64.10

425344088070100 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.

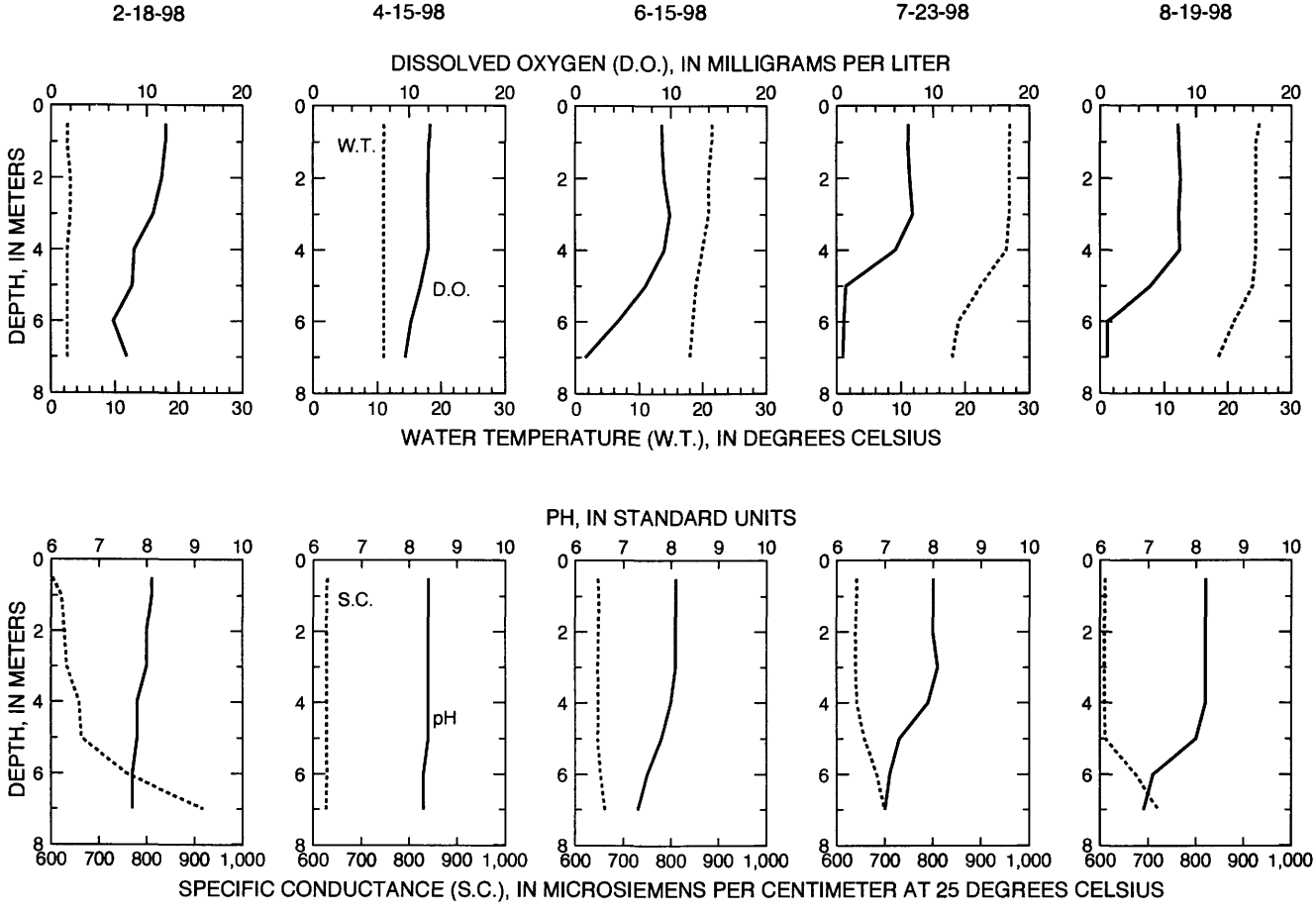
PERIOD OF RECORD.--February 1988 to current year.

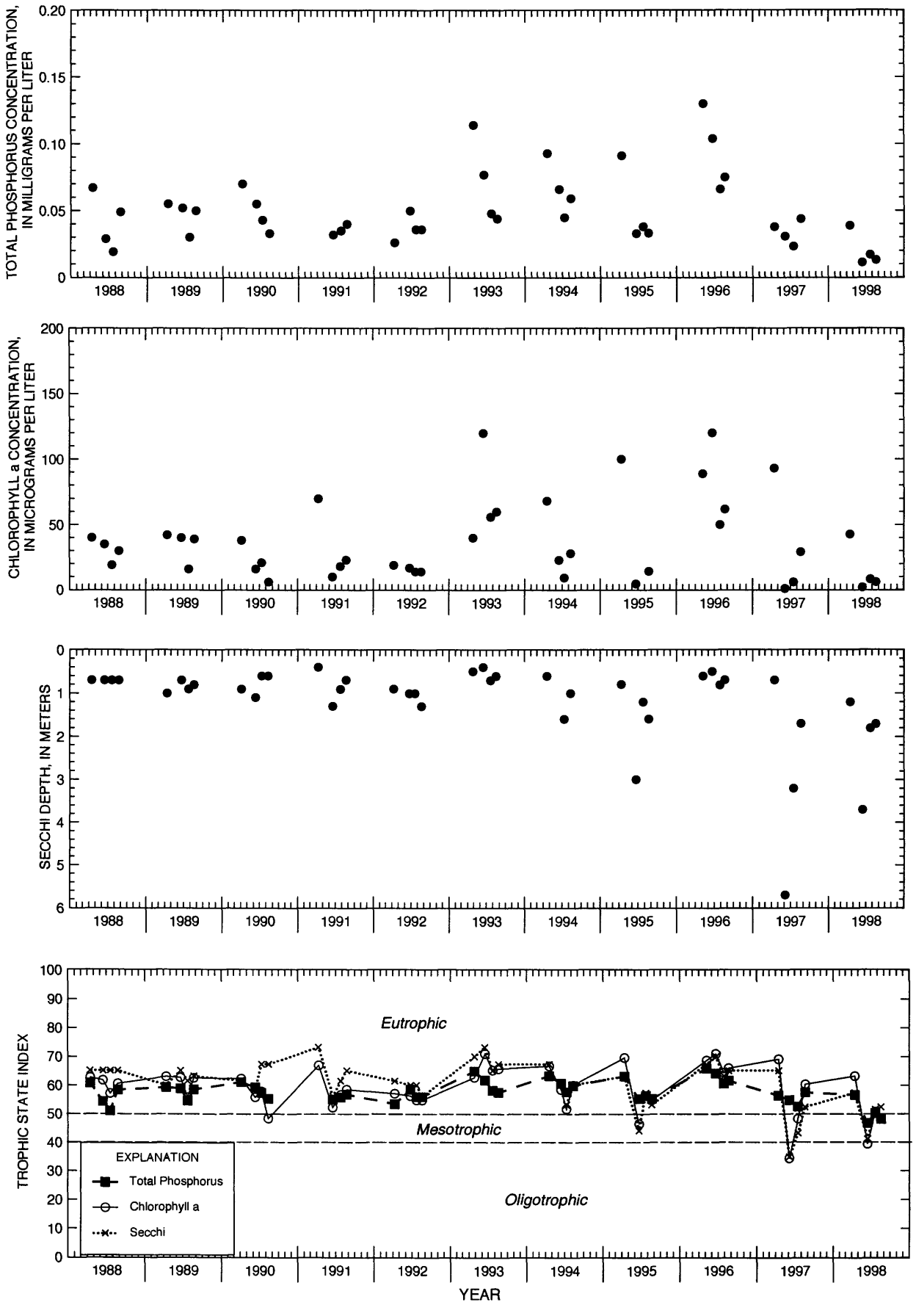
REMARKS.--Lake sampled near center at the deep hole. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, FEBRUARY 18 TO AUGUST 19, 1998

(Milligrams per liter unless otherwise indicated)

	Feb. 18		Apr. 15		June 15		July 23		Aug. 19	
Lake stage (ft)	11.94		11.75		11.62		11.32		11.73	
Secchi-depth (meters)	---		1.2		3.7		1.8		1.7	
Chlorophyll a, phytoplankton (µg/L)	---		42.8		1.84		8.21		6.06	
Depth of sample (m)	0.5	7.0	0.5	7.0	0.5	7.0	0.5	7.0	0.5	7.0
Water temperature (°C)	2.6	2.4	10.9	10.6	21.4	17.8	26.9	18.0	24.8	18.5
Specific conductance (µS/cm)	601	918	628	626	646	661	640	699	609	721
pH (units)	8.1	7.7	8.4	8.3	8.1	7.3	8.0	7.0	8.2	6.9
Dissolved oxygen	12.0	7.9	12.2	9.6	9.0	1.0	7.4	0.6	8.1	0.7
Phosphorus, total (as P)	0.080	0.073	0.039	0.054	0.011	0.098	0.017	0.049	0.013	0.053
Phosphorus, ortho, dissolved (as P)	---	---	<0.002	---	---	---	---	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	0.886	---	---	---	---	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	<0.013	---	---	---	---	---	---	---
Nitrogen, amm. + org., total (as N)	---	---	1.0	---	---	---	---	---	---	---
Nitrogen, total (as N)	---	---	1.9	---	---	---	---	---	---	---
Color (Pt-Co. scale)	---	---	30	---	---	---	---	---	---	---
Turbidity (NTU)	---	---	5.1	---	---	---	---	---	---	---
Hardness, as CaCO3	---	---	260	---	---	---	---	---	---	---
Calcium, dissolved (Ca)	---	---	54	---	---	---	---	---	---	---
Magnesium, dissolved (Mg)	---	---	31	---	---	---	---	---	---	---
Sodium, dissolved (Na)	---	---	26	---	---	---	---	---	---	---
Potassium, dissolved (K)	---	---	2.7	---	---	---	---	---	---	---
Alkalinity, as CaCO3	---	---	192	---	---	---	---	---	---	---
Sulfate, dissolved (SO4)	---	---	60	---	---	---	---	---	---	---
Chloride, dissolved (Cl)	---	---	59	---	---	---	---	---	---	---
Silica, dissolved (SiO2)	---	---	2.9	---	---	---	---	---	---	---
Solids, dissolved, at 180°C	---	---	400	---	---	---	---	---	---	---
Iron, dissolved (Fe) µg/L	---	---	10	---	---	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	<.40	---	---	---	---	---	---	---





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

425109088075000 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.--28.3 mi^2.

PERIOD OF RECORD.--October 1987 to September 1989, January 1991 to current year.

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.--Estimated daily gage heights: Dec. 2-5 and Jan. 12-15. Lake levels regulated by concrete dam with one 5-ft lift gate. Prior to October 1993, published as Muskego Lake Outlet near Wind Lake, WI.

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, 12.05 ft, Jan. 8; minimum observed, 11.09 ft, Aug. 2.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11.59	11.40	11.72	11.66	11.76	11.76	11.63	11.61	11.62	11.58	11.13	11.71
2	11.55	11.39	11.75	11.67	11.79	11.74	11.67	11.62	11.63	11.54	11.10	11.72
3	11.55	11.41	11.70	11.69	11.80	11.75	11.71	11.64	11.62	11.53	11.10	11.70
4	11.54	11.41	11.60	11.74	11.82	11.71	11.66	11.62	11.60	11.60	11.12	11.69
5	11.51	11.42	11.55	11.77	11.82	11.69	11.58	11.59	11.61	11.54	11.42	11.66
6	11.54	11.45	11.57	11.82	11.82	11.66	11.54	11.60	11.58	11.52	11.65	11.65
7	11.53	11.45	11.57	11.95	11.82	11.67	11.52	11.66	11.57	11.54	11.74	11.68
8	11.52	11.43	11.58	11.97	11.82	11.80	11.57	11.72	11.56	11.52	11.82	11.66
9	11.47	11.43	11.59	11.84	11.83	11.84	11.69	11.69	11.57	11.51	11.87	11.63
10	11.52	11.45	11.64	11.81	11.83	11.57	11.61	11.64	11.58	11.51	11.89	11.60
11	11.50	11.42	11.63	11.81	11.87	11.54	11.62	11.59	11.58	11.48	11.88	11.58
12	11.49	11.42	11.59	11.80	11.92	11.52	11.58	11.59	11.57	11.45	11.85	11.58
13	11.44	11.43	11.61	11.79	11.94	11.51	11.63	11.63	11.62	11.43	11.82	11.57
14	11.48	11.45	11.62	11.78	11.93	11.51	11.68	11.64	11.63	11.41	11.80	11.60
15	11.50	11.47	11.63	11.78	11.93	11.49	11.75	11.62	11.62	11.38	11.82	11.69
16	11.54	11.43	11.63	11.77	11.92	11.48	11.82	11.57	11.61	11.40	11.78	11.68
17	11.51	11.42	11.63	11.77	11.94	11.53	11.78	11.61	11.58	11.37	11.76	11.66
18	11.48	11.42	11.63	11.76	11.95	11.64	11.79	11.57	11.59	11.35	11.77	11.65
19	11.46	11.43	11.63	11.76	11.93	11.72	11.79	11.64	11.59	11.32	11.73	11.64
20	11.45	11.44	11.63	11.75	11.91	11.82	11.75	11.64	11.60	11.31	11.70	11.63
21	11.44	11.45	11.64	11.76	11.88	11.71	11.78	11.65	11.59	11.32	11.72	11.63
22	11.42	11.44	11.64	11.76	11.86	11.65	11.76	11.64	11.57	11.33	11.74	11.62
23	11.41	11.44	11.64	11.77	11.84	11.62	11.73	11.62	11.57	11.32	11.71	11.59
24	11.42	11.44	11.65	11.77	11.82	11.58	11.71	11.61	11.54	11.29	11.73	11.58
25	11.45	11.44	11.66	11.76	11.80	11.53	11.68	11.59	11.49	11.28	11.83	11.58
26	11.48	11.44	11.66	11.76	11.77	11.39	11.72	11.57	11.52	11.26	11.81	11.55
27	11.42	11.44	11.66	11.76	11.74	11.42	11.64	11.55	11.54	11.23	11.79	11.58
28	11.37	11.48	11.66	11.76	11.77	11.51	11.58	11.53	11.59	11.18	11.78	11.57
29	11.40	11.57	11.66	11.76	---	11.51	11.57	11.62	11.58	11.18	11.77	11.55
30	11.37	11.69	11.66	11.75	---	11.56	11.57	11.65	11.59	11.18	11.76	11.60
31	11.39	---	11.66	11.75	---	11.66	---	11.64	---	11.17	11.74	---
MEAN	11.48	11.45	11.64	11.78	11.85	11.62	11.67	11.62	11.58	11.39	11.68	11.63
MAX	11.59	11.69	11.75	11.97	11.95	11.84	11.82	11.72	11.63	11.60	11.89	11.72
MIN	11.37	11.39	11.55	11.66	11.74	11.39	11.52	11.53	11.49	11.17	11.10	11.55

425212088072800 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.

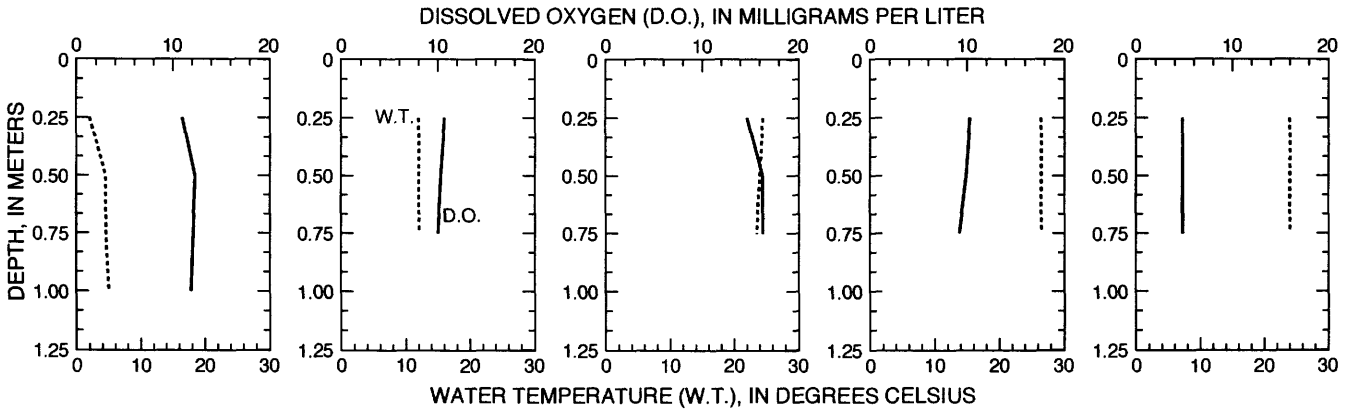
REMARKS.--Lake sampled at south end of lake at a depth of about 1 m. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

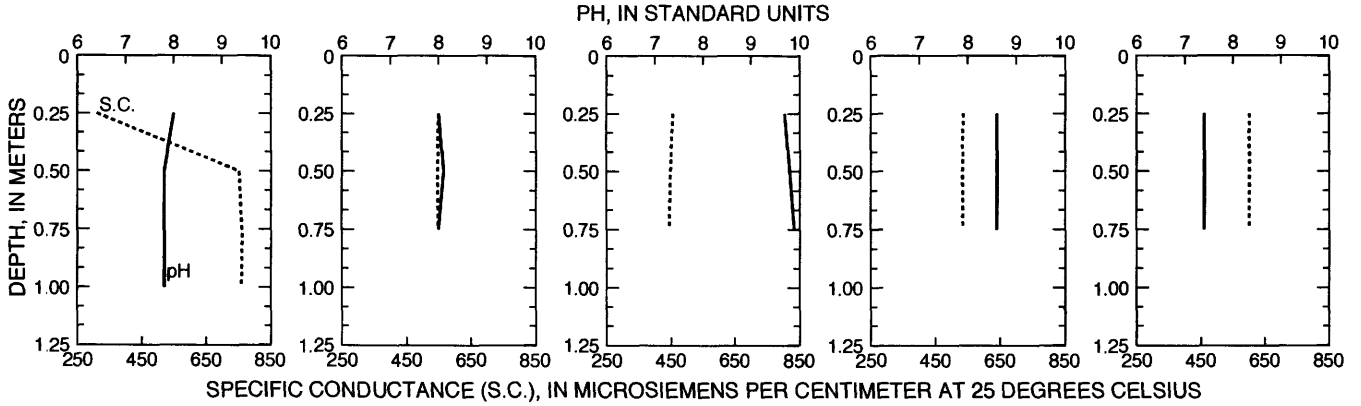
WATER-QUALITY DATA, FEBRUARY 18 TO AUGUST 19, 1998

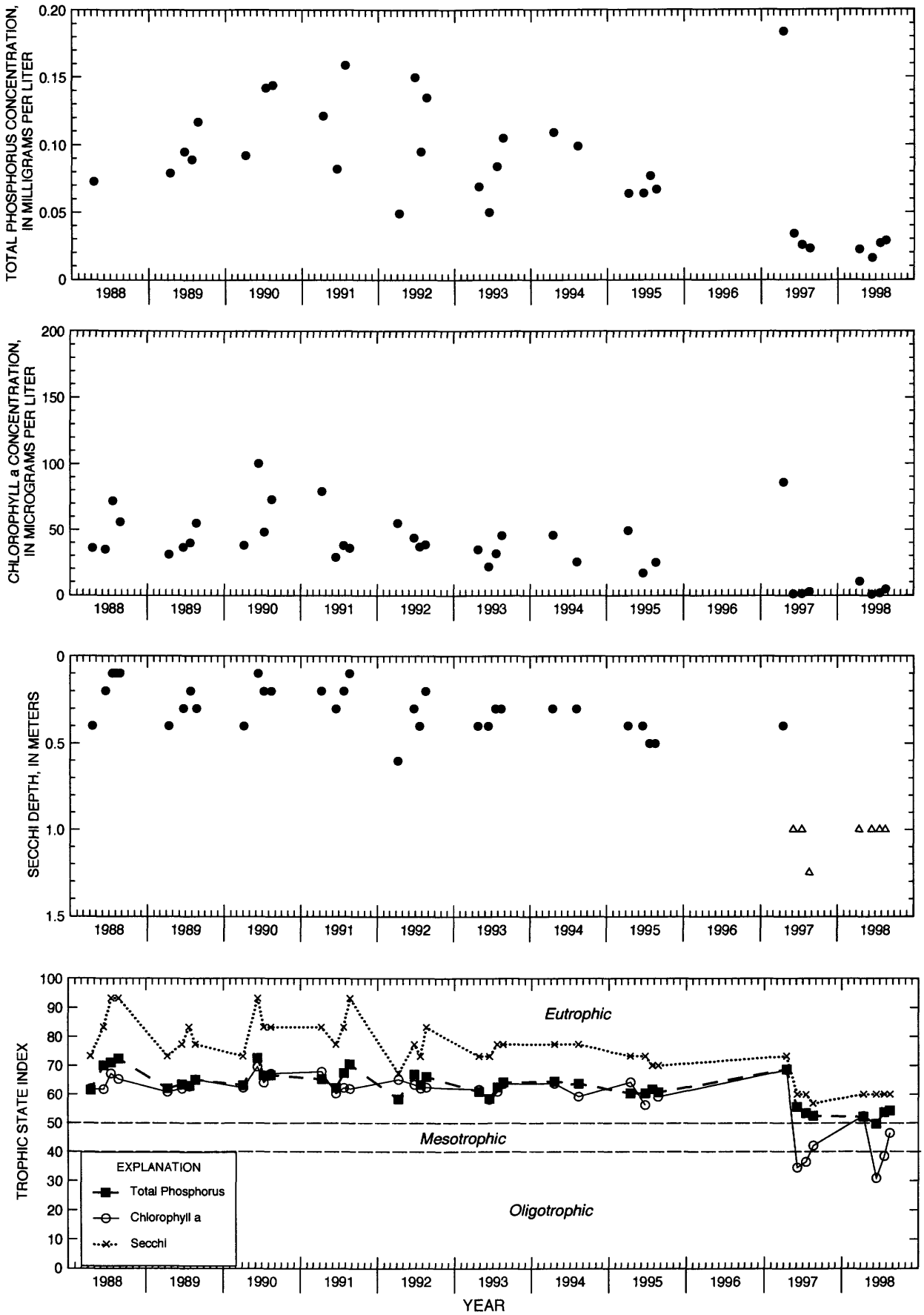
(Milligrams per liter unless otherwise indicated)

	Feb. 18	Apr. 15	June 15	July 23	Aug. 19
Lake stage (ft)	11.95	11.75	11.62	11.32	11.73
Secchi-depth (meters)	---	1.0	1.0	1.0	1.0
Chlorophyll a, phytoplankton (µg/L)	---	10.3	0.60	1.63	4.7
Depth of sample (m)	0.5	0.5	0.5	0.5	0.25
Water temperature (°C)	4.4	11.9	24.4	26.6	23.8
Specific conductance (µS/cm)	753	549	456	533	601
pH (units)	7.8	8.0	9.7	8.6	7.4
Dissolved oxygen	12.3	10.7	14.7	9.9	4.8
Phosphorus, total (as P)	0.017	0.022	0.016	0.027	0.029
Phosphorus, ortho, dissolved (as P)	---	<0.002	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	<0.010	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	<0.013	---	---	---
Nitrogen, amm. + org., total (as N)	---	0.84	---	---	---
Nitrogen, total (as N)	---	---	---	---	---
Color (Pt-Co. scale)	---	30	---	---	---
Turbidity (NTU)	---	1.9	---	---	---
Hardness, as CaCO3	---	210	---	---	---
Calcium, dissolved (Ca)	---	39	---	---	---
Magnesium, dissolved (Mg)	---	27	---	---	---
Sodium, dissolved (Na)	---	29	---	---	---
Potassium, dissolved (K)	---	1.3	---	---	---
Alkalinity, as CaCO3	---	158	---	---	---
Sulfate, dissolved (SO4)	---	39	---	---	---
Chloride, dissolved (Cl)	---	60	---	---	---
Silica, dissolved (SiO2)	---	0.16	---	---	---
Solids, dissolved, at 180°C	---	340	---	---	---
Iron, dissolved (Fe) µg/L	---	<10	---	---	---
Manganese, dissolved (Mn) µg/L	---	13	---	---	---

2-18-98 4-15-98 6-15-98 7-23-98 8-19-98







Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for 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.)

461224091033200 NAMEKAGON LAKES, GARDEN LAKE, NEAR CABLE, WI

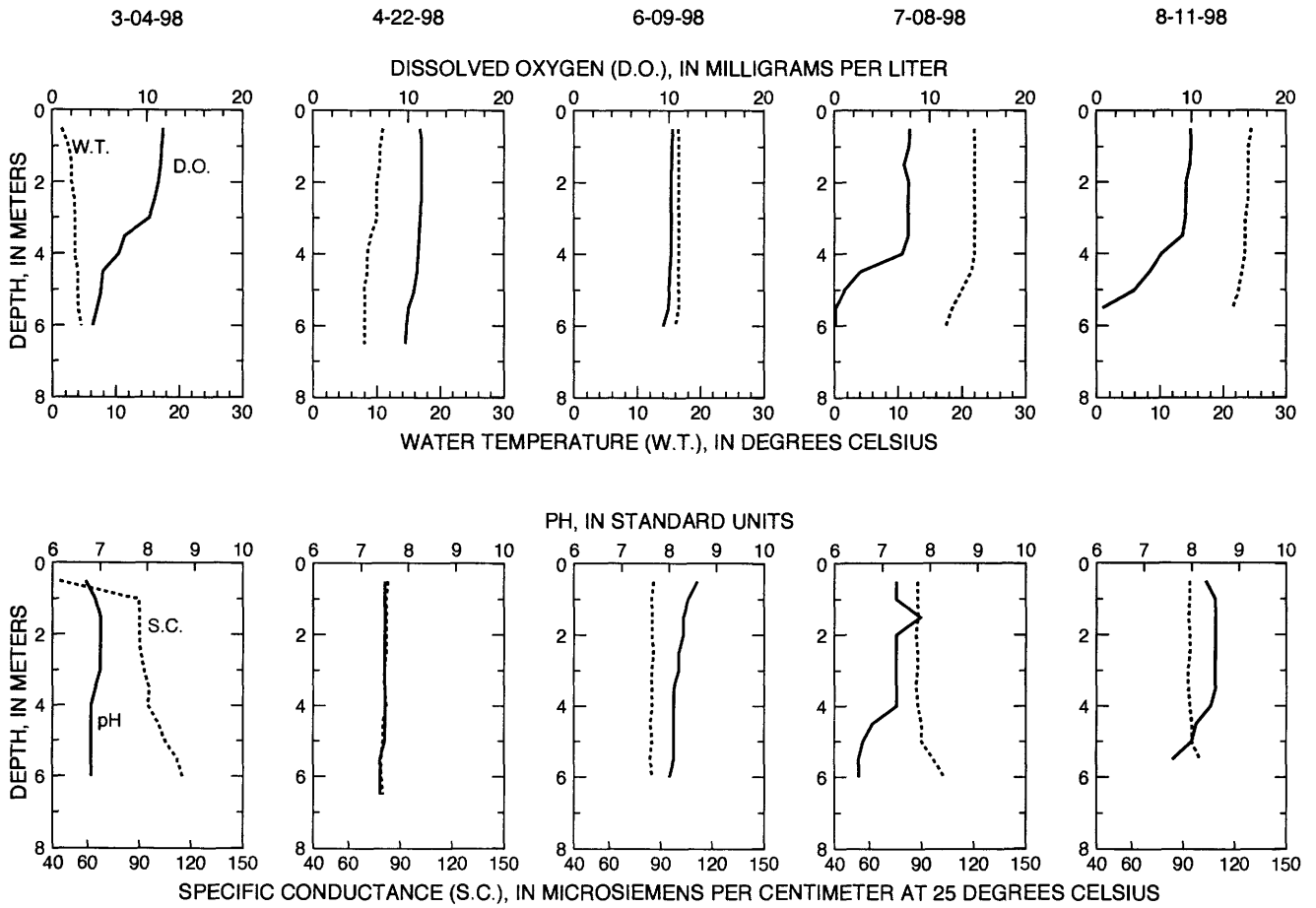
LOCATION.--Lat 46°12'24", long 91°03'32", in NW 1/4 SE 1/4 sec.13, T.43 N., R.6 W., Bayfield County, Hydrologic Unit 07030002, near Cable.

PERIOD OF RECORD.--March to August 1998.

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

WATER-QUALITY DATA, MARCH 04 TO AUGUST 11, 1998
(Milligrams per liter unless otherwise indicated)

	Mar. 04	Apr. 22		June 09		July 08		Aug. 11		
Lake stage (ft)	---	8.86		8.44		8.41		8.04		
Secchi-depth (meters)	---	2.4		1.7		2.1		1.5		
Chlorophyll a, phytoplankton (µg/L)	---	1.82		11.7		11.0		12.3		
Depth of sample (m)	0.5	0.5	6.5	0.5	6.0	0.5	6.0	0.5	4.0	5.5
Water temperature (°C)	1.3	11.2	7.9	16.7	16.0	21.9	17.7	24.4	23.3	21.5
Specific conductance (µS/cm)	44	83	80	86	85	88	103	94	94	100
pH (units)	6.7	7.5	7.4	8.6	8.0	7.3	6.5	8.3	8.4	7.6
Dissolved oxygen	11.7	11.3	9.7	10.4	9.4	7.9	0.1	9.9	6.8	0.6
Phosphorus, total (as P)	0.025	0.042	0.044	0.022	0.023	0.026	0.042	0.034	0.033	0.041
Phosphorus, ortho, dissolved (as P)	---	0.003	---	---	---	<0.002	---	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	0.096	---	---	---	<0.010	<0.010	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	<0.013	---	---	---	<0.013	0.141	---	---	---
Nitrogen, amm. + org., total (as N)	---	0.38	---	---	---	0.56	0.65	---	---	---
Nitrogen, total (as N)	---	0.48	---	---	---	---	---	---	---	---
Color (Pt-Co. scale)	---	50	---	---	---	---	---	---	---	---
Turbidity (NTU)	---	2.5	---	---	---	---	---	---	---	---
Hardness, as CaCO3	---	41	---	---	---	---	---	---	---	---
Calcium, dissolved (Ca)	---	11	---	---	---	---	---	---	---	---
Magnesium, dissolved (Mg)	---	3.4	---	---	---	---	---	---	---	---
Sodium, dissolved (Na)	---	1.9	---	---	---	---	---	---	---	---
Potassium, dissolved (K)	---	0.5	---	---	---	---	---	---	---	---
Alkalinity, as CaCO3	---	37	---	---	---	---	---	---	---	---
Sulfate, dissolved (SO4)	---	6.0	---	---	---	---	---	---	---	---
Chloride, dissolved (Cl)	---	1.8	---	---	---	---	---	---	---	---
Silica, dissolved (SiO2)	---	15	---	---	---	---	---	---	---	---
Solids, dissolved, at 180°C	---	86	---	---	---	---	---	---	---	---
Iron, dissolved (Fe) µg/L	---	170	---	---	---	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	17	---	---	---	---	---	---	---	---



461457091065900 NAMEKAGON LAKES, JACKSON LAKE, NEAR CABLE, WI

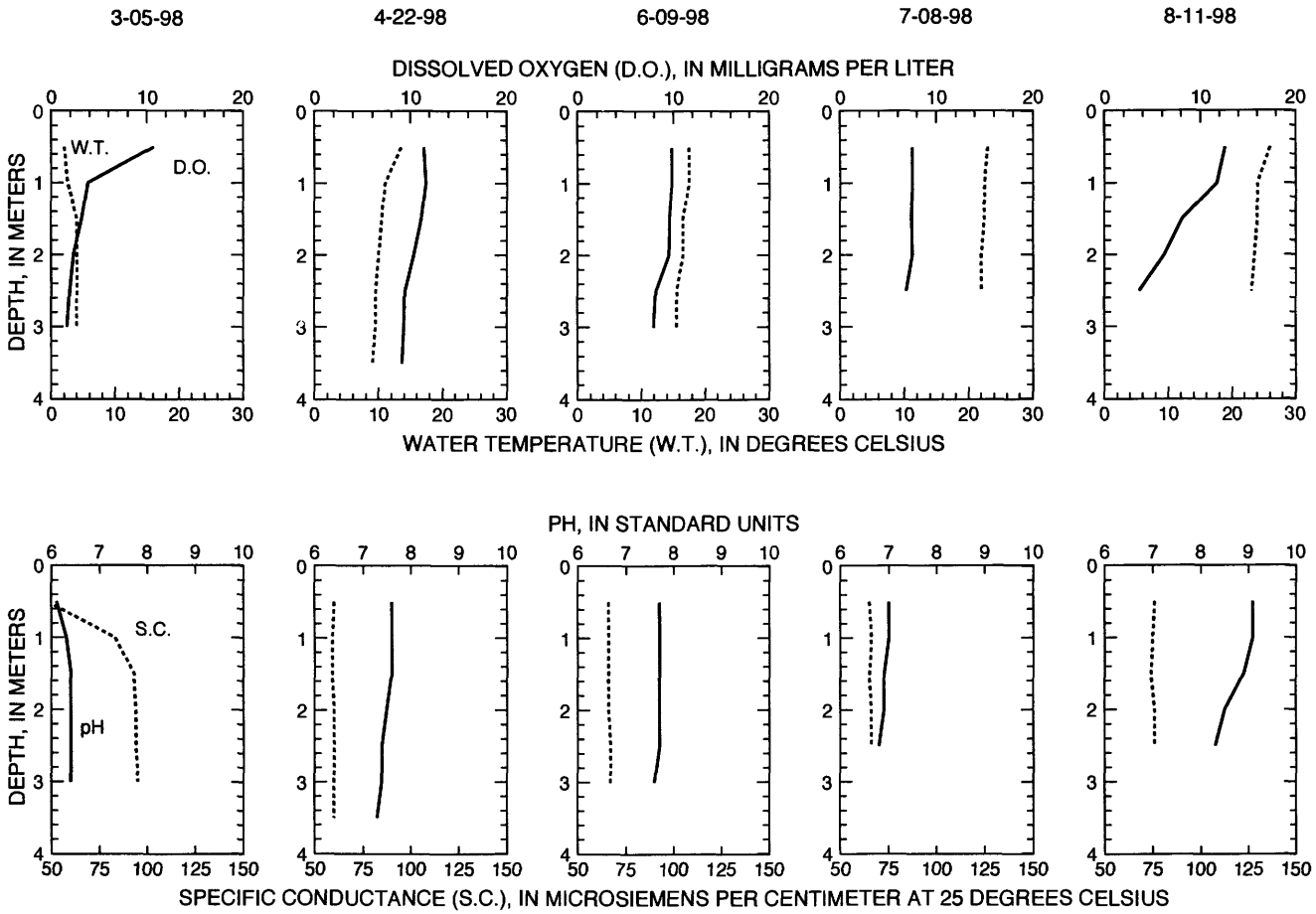
LOCATION.--Lat 46°14'57", long 91°06'59", in NE 1/4 SE 1/4 sec.33, T.44 N., R.6 W., Bayfield County, Hydrologic Unit 07030002, near Cable.

PERIOD OF RECORD.--March to August 1998.

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

WATER-QUALITY DATA, MARCH 05 TO AUGUST 11, 1998
(Milligrams per liter unless otherwise indicated)

	Mar. 05		Apr. 22		June 09		July 08		Aug. 11		
Lake stage (ft)	---		8.86		8.44		8.41		8.04		
Secchi-depth (meters)	---		1.3		1.4		1.3		0.6		
Chlorophyll a, phytoplankton (µg/L)	---		9.19		6.32		17.8		81.1		
Depth of sample (m)	0.5	3.0	0.5	3.5	0.5	3.0	0.5	2.5	0.5	1.5	2.5
Water temperature (°C)	1.9	4.2	13.7	9.2	17.3	15.4	22.9	22.0	25.9	23.9	23.2
Specific conductance (µS/cm)	48	95	60	60	66	67	65	66	76	74	76
pH (units)	6.1	6.4	7.6	7.3	7.7	7.6	7.0	6.8	9.1	8.9	8.3
Dissolved oxygen	10.7	1.6	11.4	9.1	9.8	7.9	7.5	6.8	12.6	8.1	3.6
Phosphorus, total (as P)	0.046	0.025	0.031	0.037	0.030	0.029	0.046	0.035	0.049	0.047	0.046
Phosphorus, ortho, dissolved (as P)	---	---	0.005	---	---	---	0.003	---	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	0.020	---	---	---	<0.010	<0.010	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	<0.013	---	---	---	<0.013	0.014	---	---	---
Nitrogen, amm. + org., total (as N)	---	---	0.57	---	---	---	0.75	0.78	---	---	---
Nitrogen, total (as N)	---	---	0.59	---	---	---	---	---	---	---	---
Color (Pt-Co. scale)	---	---	100	---	---	---	---	---	---	---	---
Turbidity (NTU)	---	---	3.4	---	---	---	---	---	---	---	---
Hardness, as CaCO3	---	---	28	---	---	---	---	---	---	---	---
Calcium, dissolved (Ca)	---	---	7.3	---	---	---	---	---	---	---	---
Magnesium, dissolved (Mg)	---	---	2.3	---	---	---	---	---	---	---	---
Sodium, dissolved (Na)	---	---	2.2	---	---	---	---	---	---	---	---
Potassium, dissolved (K)	---	---	0.5	---	---	---	---	---	---	---	---
Alkalinity, as CaCO3	---	---	26	---	---	---	---	---	---	---	---
Sulfate, dissolved (SO4)	---	---	6	---	---	---	---	---	---	---	---
Chloride, dissolved (Cl)	---	---	2.6	---	---	---	---	---	---	---	---
Silica, dissolved (SiO2)	---	---	7.0	---	---	---	---	---	---	---	---
Solids, dissolved, at 180°C	---	---	72	---	---	---	---	---	---	---	---
Iron, dissolved (Fe) µg/L	---	---	600	---	---	---	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	8.6	---	---	---	---	---	---	---	---



461308091065100 NAMEKAGON LAKE, DEEP HOLE, NEAR CABLE, WI

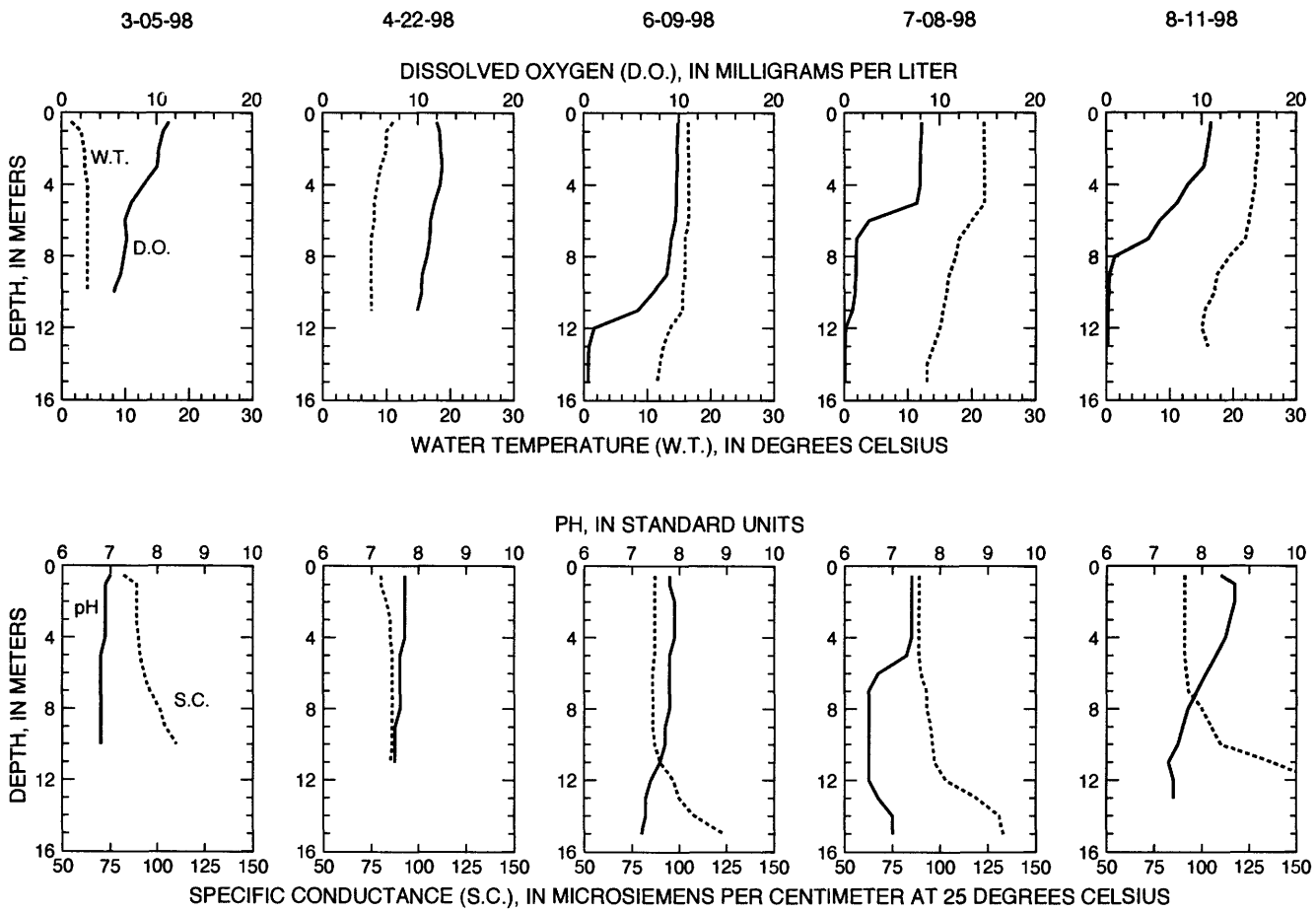
LOCATION.--Lat 46°13'08", long 91°06'51", in NE 1/4 SE 1/4 sec.9, T.43 N., R.6 W., Bayfield County, Hydrologic Unit 07030002, near Cable.

PERIOD OF RECORD.--March to August 1998.

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

WATER-QUALITY DATA, MARCH 05 TO AUGUST 11, 1998
(Milligrams per liter unless otherwise indicated)

	Mar. 05	Apr. 22		June 09		July 08		Aug. 11		
Lake stage (ft)	---	8.86		8.44		8.41		8.04		
Secchi-depth (meters)	---	3.6		2.5		2.4		1.2		
Chlorophyll a, phytoplankton (µg/L)	---	3.88		7.68		7.22		21.1		
Depth of sample (m)	0.5	0.5	11.0	0.5	15.0	0.5	15.0	0.5	8.0	13.0
Water temperature (°C)	1.4	11.2	7.3	16.5	11.4	22.1	13.0	24.2	19.7	16.0
Specific conductance (µS/cm)	82	80	85	87	124	89	133	91	100	165
pH (units)	7.0	7.7	7.5	7.8	7.2	7.4	7.0	8.4	7.7	7.4
Dissolved oxygen	11.3	12.0	9.9	9.9	0.4	8.1	0.0	11.0	0.8	0.1
Phosphorus, total (as P)	0.011	0.032	0.051	0.018	0.057	0.024	0.187	0.039	0.063	0.227
Phosphorus, ortho, dissolved (as P)	---	0.002	---	---	---	<0.002	---	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	0.064	---	---	---	<0.010	0.014	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	<0.013	---	---	---	<0.013	0.774	---	---	---
Nitrogen, amm. + org., total (as N)	---	0.31	---	---	---	0.45	1.4	---	---	---
Nitrogen, total (as N)	---	0.37	---	---	---	---	1.4	---	---	---
Color (Pt-Co. scale)	---	30	---	---	---	---	---	---	---	---
Turbidity (NTU)	---	2.5	---	---	---	---	---	---	---	---
Hardness, as CaCO3	---	38	---	---	---	---	---	---	---	---
Calcium, dissolved (Ca)	---	10	---	---	---	---	---	---	---	---
Magnesium, dissolved (Mg)	---	3.2	---	---	---	---	---	---	---	---
Sodium, dissolved (Na)	---	2.4	---	---	---	---	---	---	---	---
Potassium, dissolved (K)	---	0.4	---	---	---	---	---	---	---	---
Alkalinity, as CaCO3	---	36	---	---	---	---	---	---	---	---
Sulfate, dissolved (SO4)	---	---	---	---	---	---	---	---	---	---
Chloride, dissolved (Cl)	---	2.7	---	---	---	---	---	---	---	---
Silica, dissolved (SiO2)	---	12	---	---	---	---	---	---	---	---
Solids, dissolved, at 180°C	---	86	---	---	---	---	---	---	---	---
Iron, dissolved (Fe) µg/L	---	120	---	---	---	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	19	---	---	---	---	---	---	---	---



461228091044300 NAMEKAGON LAKE, EAST BASIN, NEAR CABLE, WI

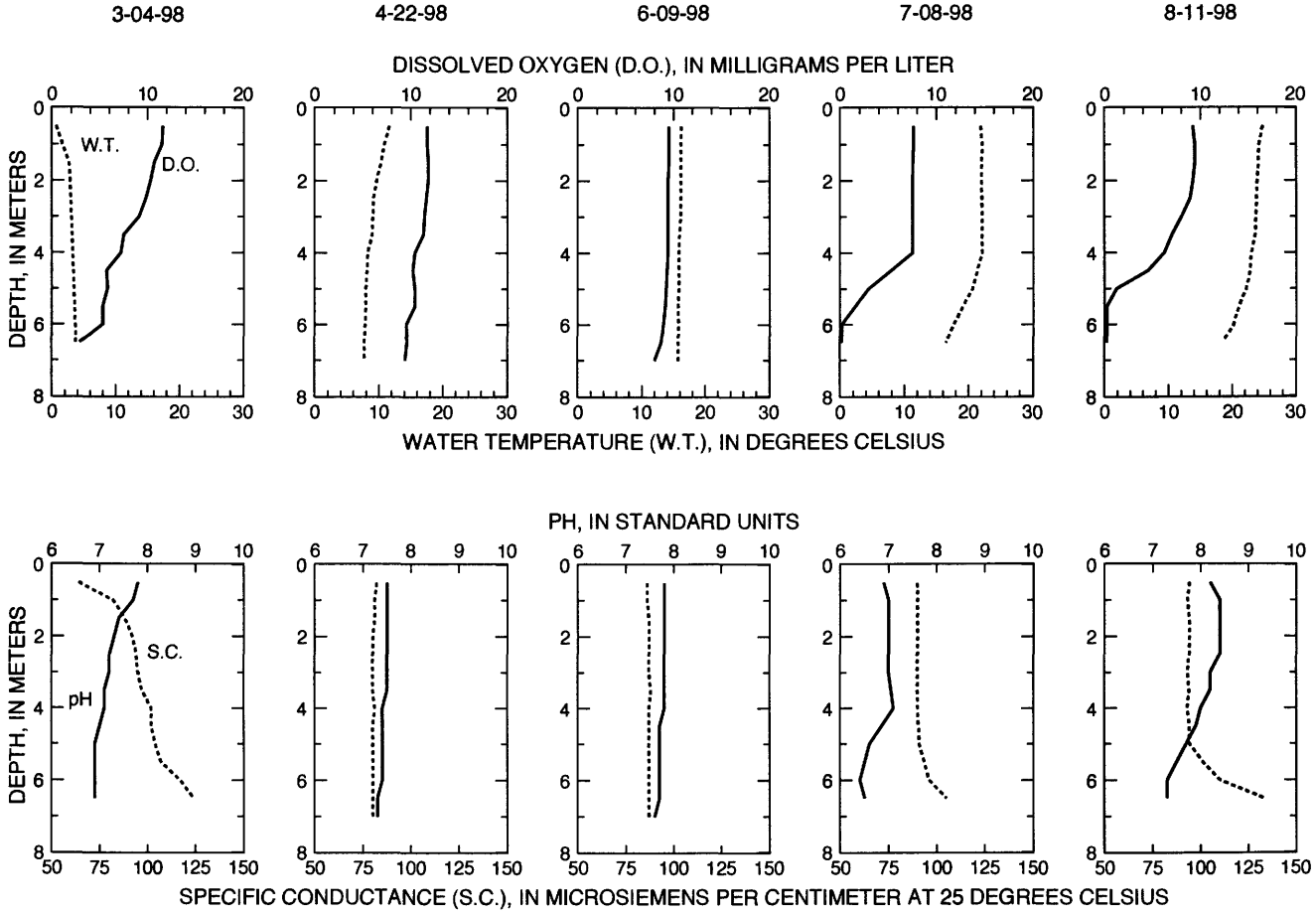
LOCATION.--Lat 46°12'28", long 91°04'43", in NW 1/4 SE 1/4 sec.14, T.43 N., R.6 W., Bayfield County, Hydrologic Unit 07030002, near Cable.

PERIOD OF RECORD.--March to August 1998.

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

WATER-QUALITY DATA, MARCH 04 TO AUGUST 11, 1998
(Milligrams per liter unless otherwise indicated)

	Mar. 04	Apr. 22	June 09	July 08		Aug. 11	
Lake stage (ft)	---	8.86	8.44	8.41		8.04	
Secchi-depth (meters)	---	2.7	2.3	2.5		1.4	
Chlorophyll a, phytoplankton (µg/L)	---	2.64	8.44	6.69		8.88	
Depth of sample (m)	0.5	0.5	0.5	0.5	6.5	0.5	6.5
Water temperature (°C)	0.6	11.6	16.2	21.9	16.5	24.8	18.5
Specific conductance (µS/cm)	64	82	86	90	105	94	133
pH (units)	7.8	7.5	7.8	6.9	6.5	8.2	7.3
Dissolved oxygen	11.6	11.7	9.5	7.6	0.1	9.2	0.2
Phosphorus, total (as P)	<0.005	0.037	0.022	0.022	0.102	0.026	0.206



461410091050700 NAMEKAGON LAKE, NORTHEAST BASIN, NEAR CABLE, WI

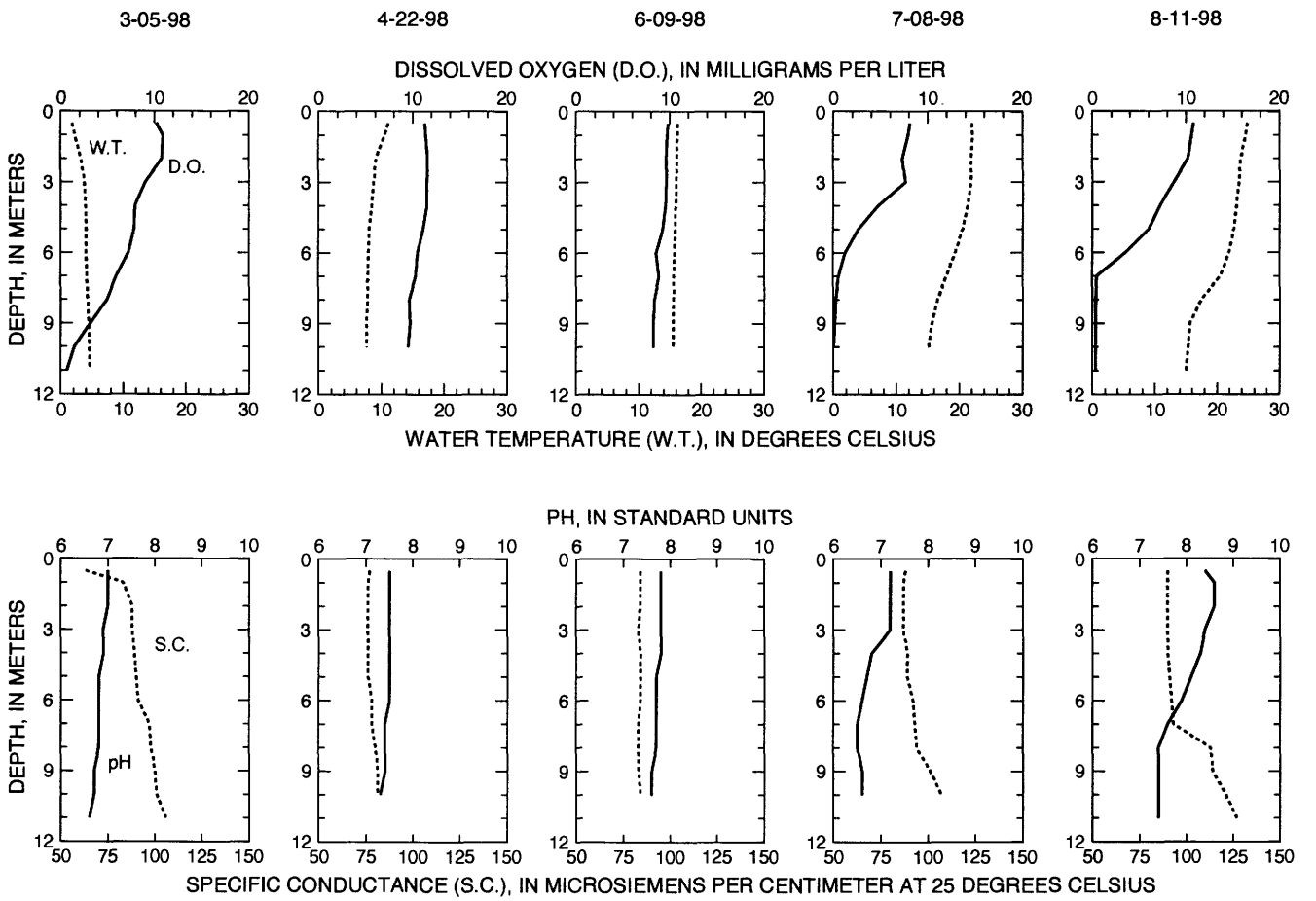
LOCATION.--Lat 46°14'10", long 91°05'07", in SE 1/4 NW 1/4 sec.2, T.43 N., R.6 W., Bayfield County, Hydrologic Unit 07030002, near Cable.

PERIOD OF RECORD.--March to August 1998.

REMARKS.--Lake sampled at deepest part of the northeast bay. Lake ice-covered during March measurements. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, MARCH 05 TO AUGUST 11, 1998
(Milligrams per liter unless otherwise indicated)

	Mar. 05		Apr. 22	June 09	July 08		Aug. 11	
Lake stage (ft)	---		8.86	8.44	8.41		8.04	
Secchi-depth (meters)	---		2.7	2.5	2.1		1.1	
Chlorophyll a, phytoplankton (µg/L)	---		3.11	8.11	4.91		21.2	
Depth of sample (m)	0.5	11.0	0.5	0.5	0.5	10.0	0.5	11.0
Water temperature (°C)	1.8	4.6	11.1	11.2	22.0	15.1	24.9	15.0
Specific conductance (µS/cm)	63	106	77	84	88	107	90	127
pH (units)	7.0	6.6	7.5	7.8	7.2	6.6	8.4	7.4
Dissolved oxygen	10.2	0.6	11.3	9.8	8.1	0.0	10.8	0.3
Phosphorus, total (as P)	0.018	0.040	0.029	0.019	0.021	0.065	0.031	0.197



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

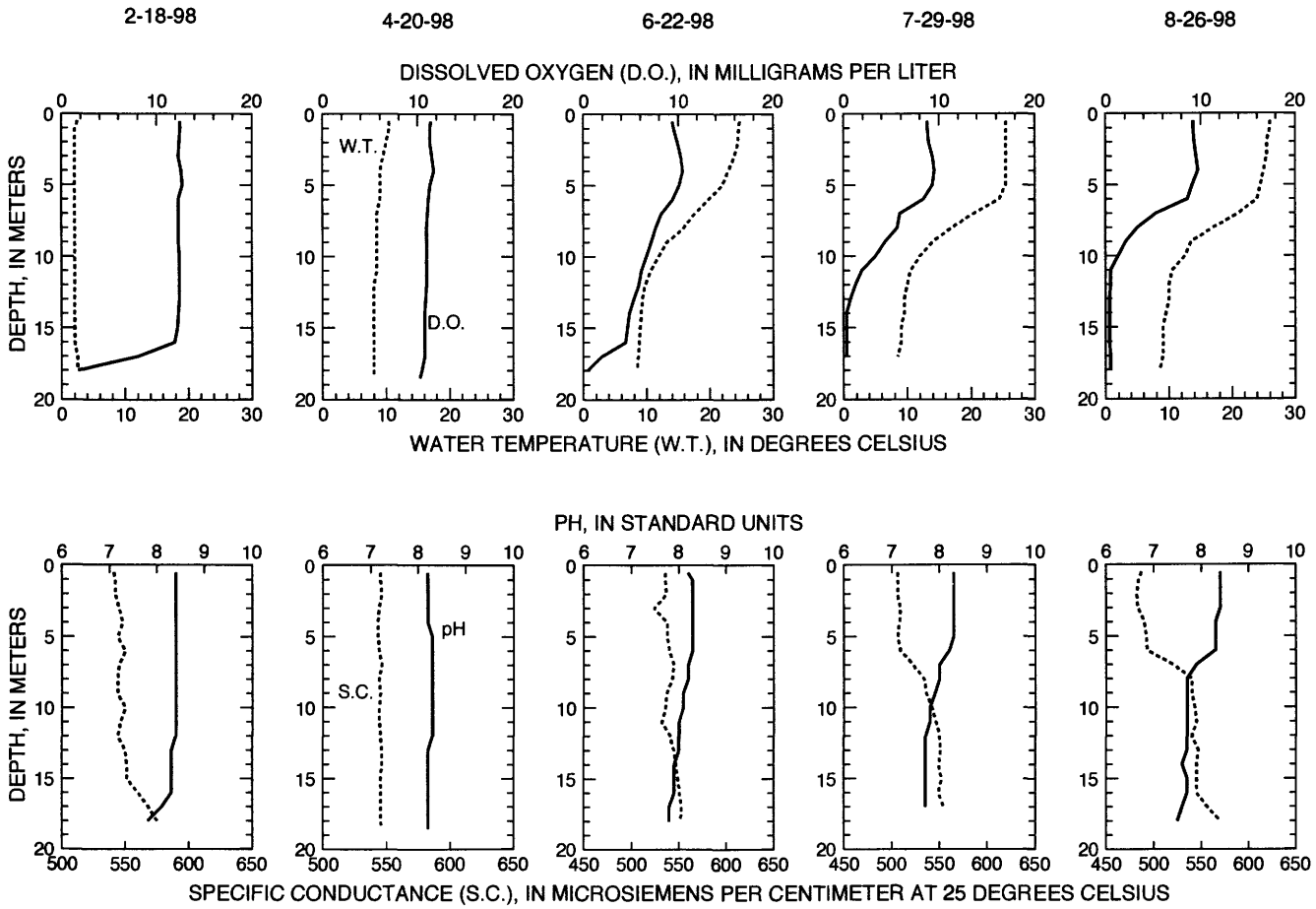
LOCATION.--Lat 43°05'51", long 88°27'35", in NW 1/4 SE 1/4 sec.2, T.7 N., R.17 E., Waukesha County, Hydrologic Unit 07090001, at Oconomowoc.

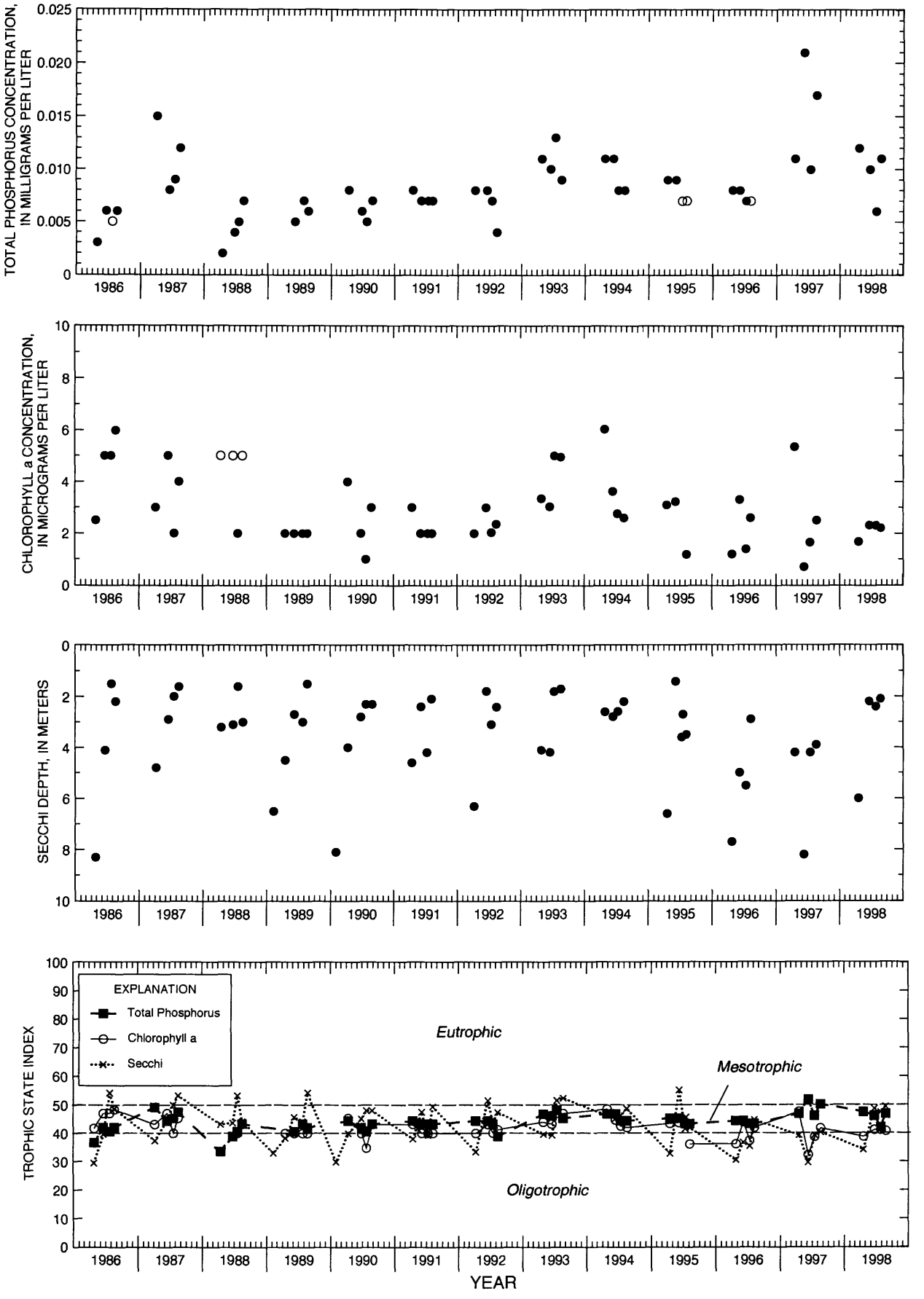
PERIOD OF RECORD.--March 1986 to current year.

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

WATER-QUALITY DATA, FEBRUARY 18 TO AUGUST 26, 1998
(Milligrams per liter unless otherwise indicated)

	Feb. 18		Apr. 20		June 22		July 29		Aug. 26		
Lake stage (ft)	7.33		7.78		7.87		7.63		7.78		
Secchi-depth (meters)	---		6.0		2.2		2.4		2.1		
Chlorophyll a, phytoplankton (µg/L)	---		1.68		2.31		2.30		2.15		
Depth of sample (m)	0.5	18.0	0.5	18.5	0.5	18.0	0.5	17.0	0.5	12.0	18.0
Water temperature (°C)	2.3	2.7	10.4	8.0	24.8	8.4	25.4	8.7	26.1	10.2	8.4
Specific conductance (µS/cm)	541	575	545	546	536	552	506	554	487	540	570
pH (units)	8.4	7.8	8.2	8.2	8.2	7.8	8.3	7.7	8.4	7.7	7.5
Dissolved oxygen	12.5	1.7	11.4	10.2	9.4	0.4	8.8	0.3	9.2	0.5	0.5
Phosphorus, total (as P)	0.020	0.138	0.012	0.015	0.010	0.095	0.006	0.026	0.011	0.013	0.069
Phosphorus, ortho, dissolved (as P)	---	---	<0.002	<0.002	---	---	---	---	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	0.259	0.245	---	---	---	---	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	0.035	0.036	---	---	---	---	---	---	---
Nitrogen, amm. + org., total (as N)	---	---	0.43	0.44	---	---	---	---	---	---	---
Nitrogen, total (as N)	---	---	0.69	0.68	---	---	---	---	---	---	---
Color (Pt-Co. scale)	---	---	15	15	---	---	---	---	---	---	---
Turbidity (NTU)	---	---	0.7	0.6	---	---	---	---	---	---	---
Hardness, as CaCO3	---	---	263	263	---	---	---	---	---	---	---
Calcium, dissolved (Ca)	---	---	51	51	---	---	---	---	---	---	---
Magnesium, dissolved (Mg)	---	---	33	33	---	---	---	---	---	---	---
Sodium, dissolved (Na)	---	---	15	15	---	---	---	---	---	---	---
Potassium, dissolved (K)	---	---	2.1	2.1	---	---	---	---	---	---	---
Alkalinity, as CaCO3	---	---	225	225	---	---	---	---	---	---	---
Sulfate, dissolved (SO4)	---	---	25	26	---	---	---	---	---	---	---
Chloride, dissolved (Cl)	---	---	34	34	---	---	---	---	---	---	---
Silica, dissolved (SiO2)	---	---	4.3	4.9	---	---	---	---	---	---	---
Solids, dissolved, at 180°C	---	---	352	344	---	---	---	---	---	---	---
Iron, dissolved (Fe) µg/L	---	---	<10	<10	---	---	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	<0.4	<0.4	---	---	---	---	---	---	---





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Oconomowoc Lake, No. 1 (Center) 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

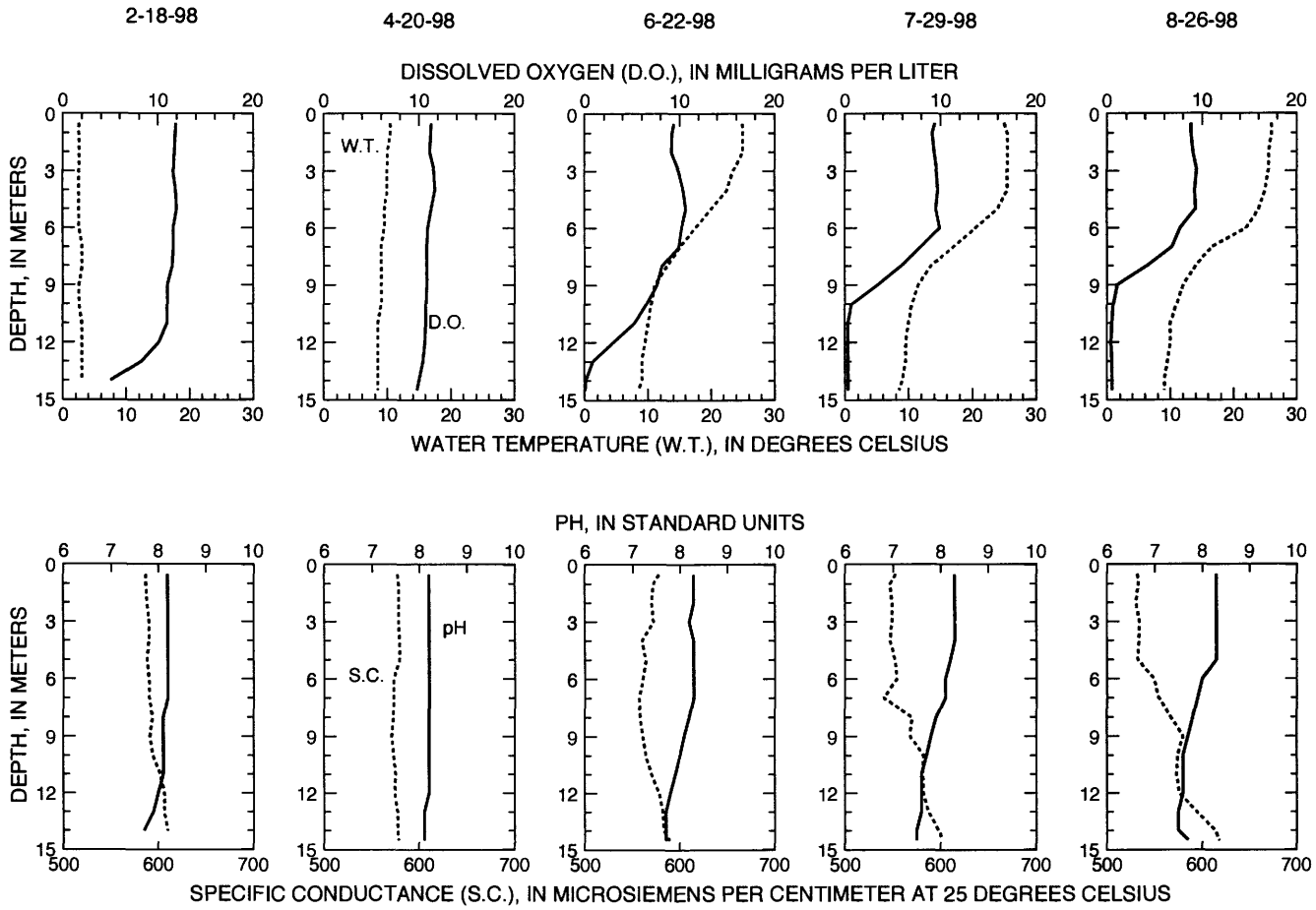
LOCATION.--Lat 43°06'09", long 88°26'22", in NW 1/4 NW 1/4 sec.1, T.7 N., R.17 E., Waukesha County, Hydrologic Unit 07090001, at Oconomowoc.

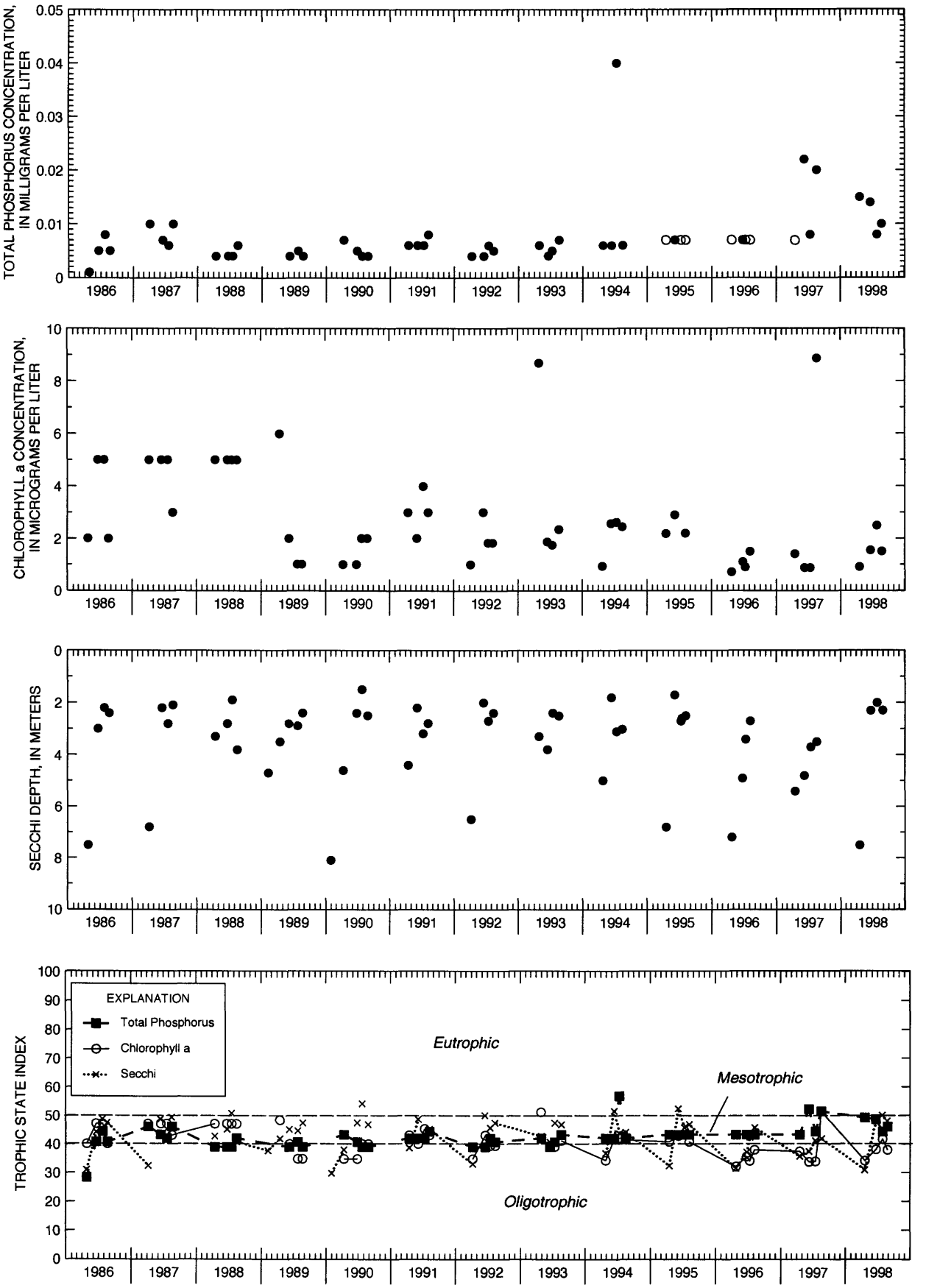
PERIOD OF RECORD.--March 1986 to current year.

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

WATER-QUALITY DATA, FEBRUARY 18 TO AUGUST 26, 1998
(Milligrams per liter unless otherwise indicated)

	Feb. 18	Apr. 20	June 22	July 29	Aug. 26
Lake stage (ft)	7.33	7.78	7.87	7.63	7.78
Secchi-depth (meters)	---	7.5	2.3	2.0	2.3
Chlorophyll a, phytoplankton (µg/L)	---	0.91	1.54	2.50	1.54
Depth of sample (m)	0.5 14.0	0.5 14.5	0.5 14.5	0.5 14.5	0.5 11.0 14.5
Water temperature (°C)	2.5 3.1	10.3 8.3	24.8 8.7	25.1 8.7	26.1 10.2 8.8
Specific conductance (µS/cm)	587 610	577 578	578 589	553 602	532 573 618
pH (units)	8.2 7.7	8.2 8.1	8.3 7.7	8.3 7.5	8.3 7.6 7.7
Dissolved oxygen	11.9 5.0	11.3 9.8	9.4 0.0	9.4 0.3	8.8 0.5 0.5
Phosphorus, total (as P)	0.019 0.049	0.015 0.021	0.014 0.039	0.008 0.056	0.010 0.021 0.060





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Oconomowoc Lake, No. 2 (Hewitt Pt.) 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.)

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.

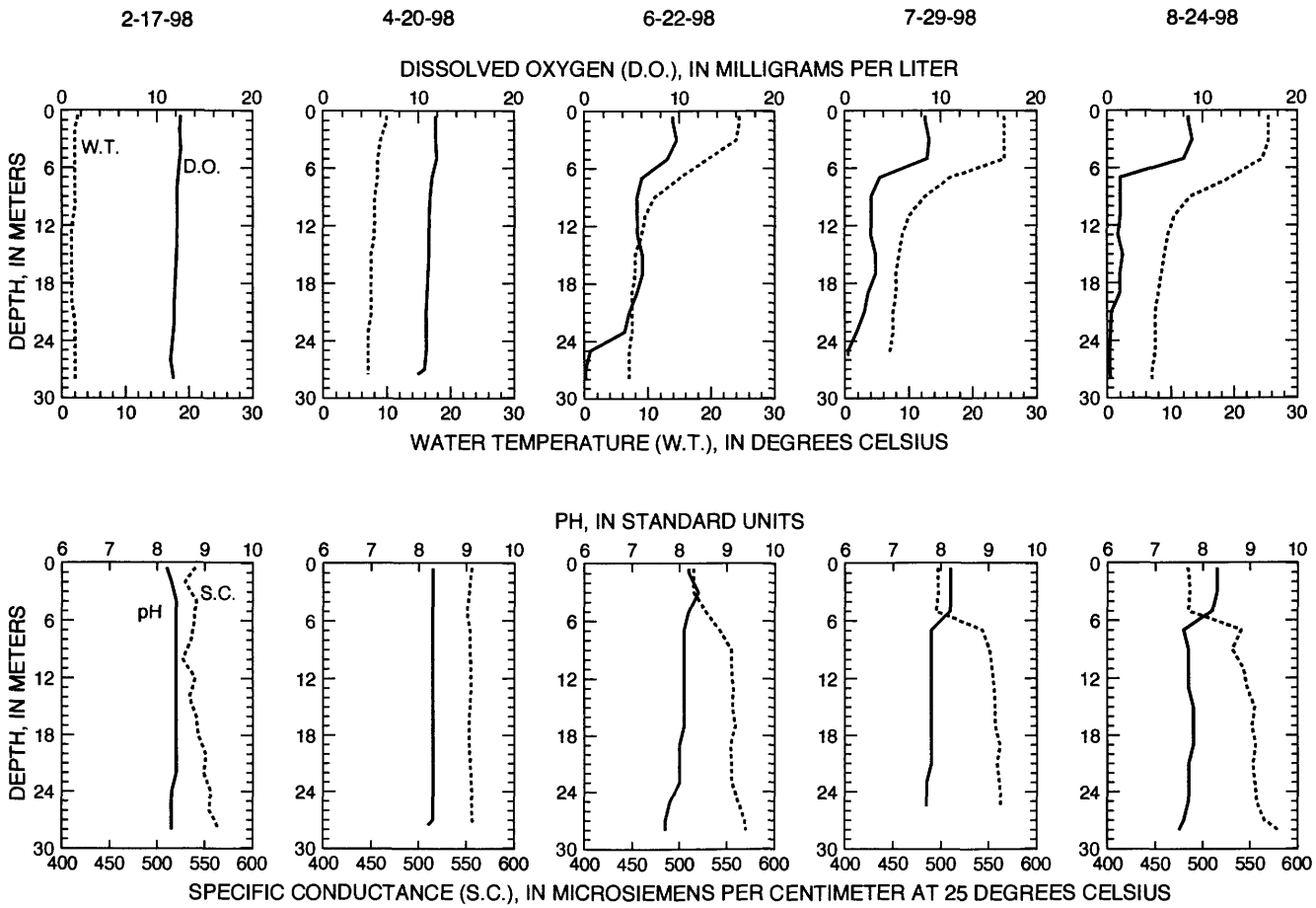
PERIOD OF RECORD.--February 1984 to current year.

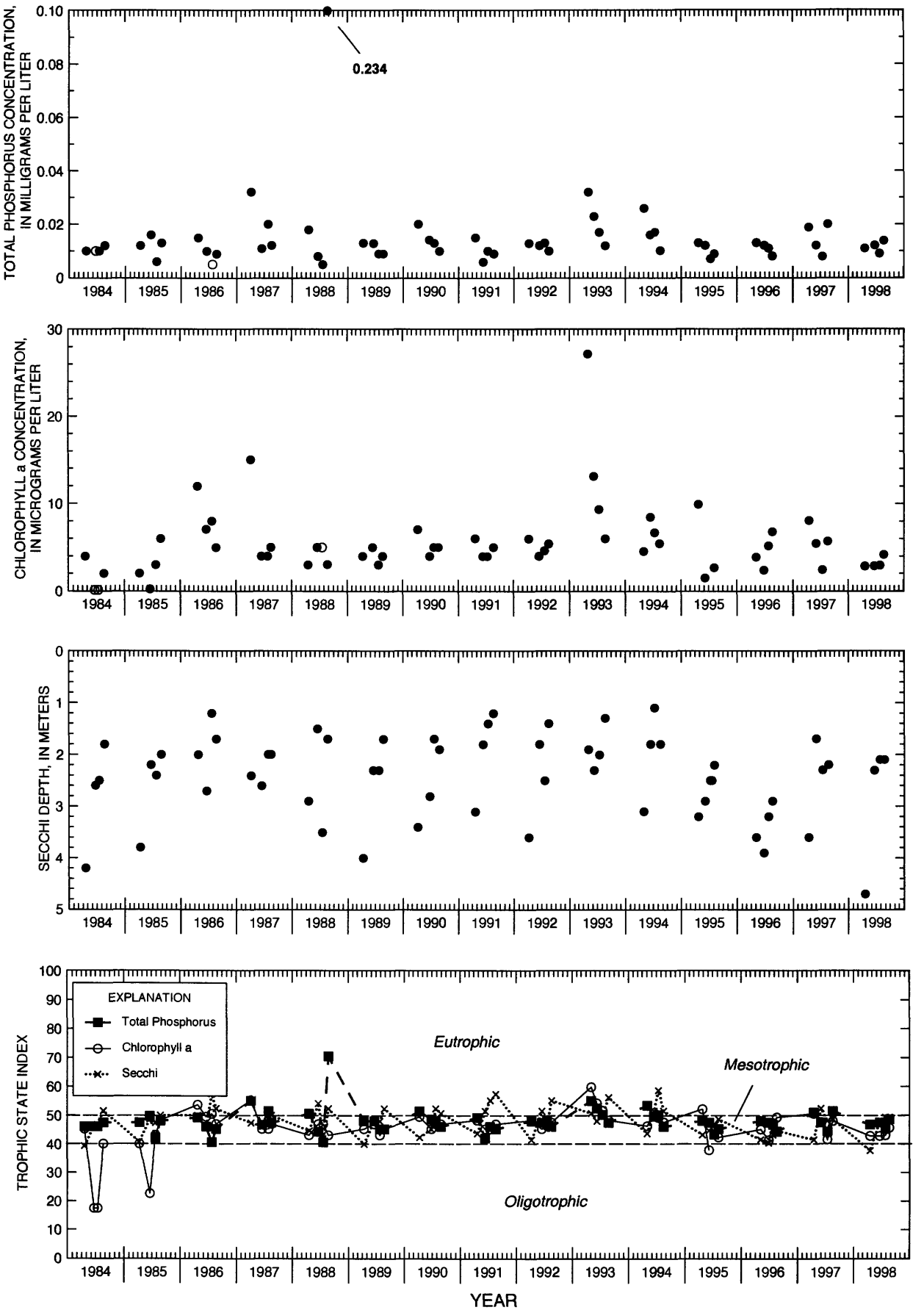
LAKE-STAGE GAGE.--Datum of gage is 869.00 ft above sea level.

REMARKS.--A detailed water quality management plan has been developed for Okauchee Lake by Southeastern Wisconsin Regional Planning Commission; previous water-quality data are available in this report. Lake sampled near center at the deep hole. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, FEBRUARY 17 TO AUGUST 24, 1998
(Milligrams per liter unless otherwise indicatedd)

	Feb. 17		Apr. 20		June 22		July 29		Aug. 24		
Lake stage (ft)	4.45		4.59		4.72		4.65		4.65		
Secchi-depth (meters)	---		4.7		2.3		2.1		2.1		
Chlorophyll a, phytoplankton (µg/L)	---		2.86		2.87		2.96		4.23		
Depth of sample (m)	0.5	28.0	0.5	27.5	0.5	28.0	0.5	25.5	0.5	9.0	28.0
Water temperature (°C)	2.4	1.9	10.1	6.8	24.5	6.8	25.2	7.1	25.5	13.2	6.9
Specific conductance (µS/cm)	540	565	556	560	515	570	497	562	484	531	580
pH (units)	8.2	8.3	8.3	8.2	8.2	7.7	8.2	7.7	8.3	7.7	7.5
Dissolved oxygen	12.5	11.7	11.8	9.9	9.3	0.1	8.4	0.3	8.5	1.3	0.3
Phosphorus, total (as P)	0.015	0.014	0.011	0.013	0.012	0.037	0.009	0.021	0.014	0.015	0.126
Phosphorus, ortho, dissolved (as P)	---	---	<0.002	---	---	---	---	---	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	0.396	---	---	---	---	---	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	<0.013	---	---	---	---	---	---	---	---
Nitrogen, amm. + org., total (as N)	---	---	0.46	---	---	---	---	---	---	---	---
Nitrogen, total (as N)	---	---	0.86	---	---	---	---	---	---	---	---
Color (Pt-Co. scale)	---	---	10	---	---	---	---	---	---	---	---
Turbidity (NTU)	---	---	0.9	---	---	---	---	---	---	---	---
Hardness, as CaCO3	---	---	273	---	---	---	---	---	---	---	---
Calcium, dissolved (Ca)	---	---	55	---	---	---	---	---	---	---	---
Magnesium, dissolved (Mg)	---	---	33	---	---	---	---	---	---	---	---
Sodium, dissolved (Na)	---	---	13	---	---	---	---	---	---	---	---
Potassium, dissolved (K)	---	---	2.0	---	---	---	---	---	---	---	---
Alkalinity, as CaCO3	---	---	239	---	---	---	---	---	---	---	---
Sulfate, dissolved (SO4)	---	---	7	---	---	---	---	---	---	---	---
Chloride, dissolved (Cl)	---	---	30	---	---	---	---	---	---	---	---
Silica, dissolved (SiO2)	---	---	1.6	---	---	---	---	---	---	---	---
Solids, dissolved, at 180°C	---	---	352	---	---	---	---	---	---	---	---
Iron, dissolved (Fe) µg/L	---	---	10	---	---	---	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	<0.40	---	---	---	---	---	---	---	---





Surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Okauchee Lake at 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 20 TO AUGUST 24, 19987
(Milligrams per liter unless otherwise indicated)

	Apr. 20	June 22	July 29	Aug. 24
Lake stage (ft)	4.59	4.72	4.65	4.65
Secchi-depth (meters)	>3.0	>3.0	>3.0	>1.8
Chlorophyll a, phytoplankton (µg/L)	6.41	1.79	4.32	5.40
Depth of sample (m)	0.5	0.5	0.5	0.5
Water temperature (°C)	10.3	25.8	25.4	25.9
Specific conductance (µS/cm)	574	578	560	541
pH (units)	8.4	8.4	8.3	8.2
Dissolved oxygen	12.5	11.3	10.4	8.1
Phosphorus, total (as P)	0.013	0.021	0.020	0.025

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 20 TO AUGUST 24, 1998
(Milligrams per liter unless otherwise indicated)

	Apr. 20	June 22	July 29	Aug. 24
Lake stage (ft)	4.59	4.72	4.65	4.65
Secchi-depth (meters)	>3.0	2.7	>3.0	2.9
Chlorophyll a, phytoplankton (µg/L)	3.04	2.37	2.19	2.57
Depth of sample (m)	0.5	0.5	0.5	0.5
Water temperature (°C)	11.0	26.0	26.3	26.6
Specific conductance (µS/cm)	557	484	467	464
pH (units)	8.3	8.4	8.4	8.4
Dissolved oxygen	12.2	10.3	9.3	8.2
Phosphorus, total (as P)	0.009	0.012	0.009	0.014

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 20 TO AUGUST 24, 1998
(Milligrams per liter unless otherwise indicated)

	Apr. 20	June 22	July 29	Aug. 24
Lake stage (ft)	4.59	4.72	4.65	4.65
Secchi-depth (meters)	>3.0	1.9	2.5	2.3
Chlorophyll a, phytoplankton (µg/L)	3.67	3.77	3.51	4.33
Depth of sample (m)	0.5	0.5	0.5	0.5
Water temperature (°C)	10.7	25.2	25.9	25.8
Specific conductance (µS/cm)	553	492	473	477
pH (units)	8.4	8.4	8.4	8.4
Dissolved oxygen	12.4	10.3	9.2	8.4
Phosphorus, total (as P)	0.008	0.010	0.010	0.016

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 20 TO AUGUST 24, 1998
(Milligrams per liter unless otherwise indicated)

	Apr. 20	June 22	July 29	Aug. 24
Lake stage (ft)	4.59	4.72	4.65	4.65
Secchi-depth (meters)	>4.0	>4.0	>2.2	2.1
Chlorophyll a, phytoplankton (µg/L)	2.34	2.78	2.29	4.19
Depth of sample (m)	0.5	0.5	0.5	0.5
Water temperature (°C)	11.1	24.8	24.8	25.3
Specific conductance (µS/cm)	556	496	492	501
pH (units)	8.3	8.4	8.3	8.3
Dissolved oxygen	12.3	10.4	7.8	7.9
Phosphorus, total (as P)	0.008	0.010	0.011	0.019

424905088204000 POTTER LAKE NEAR MUKWONAGO, WI

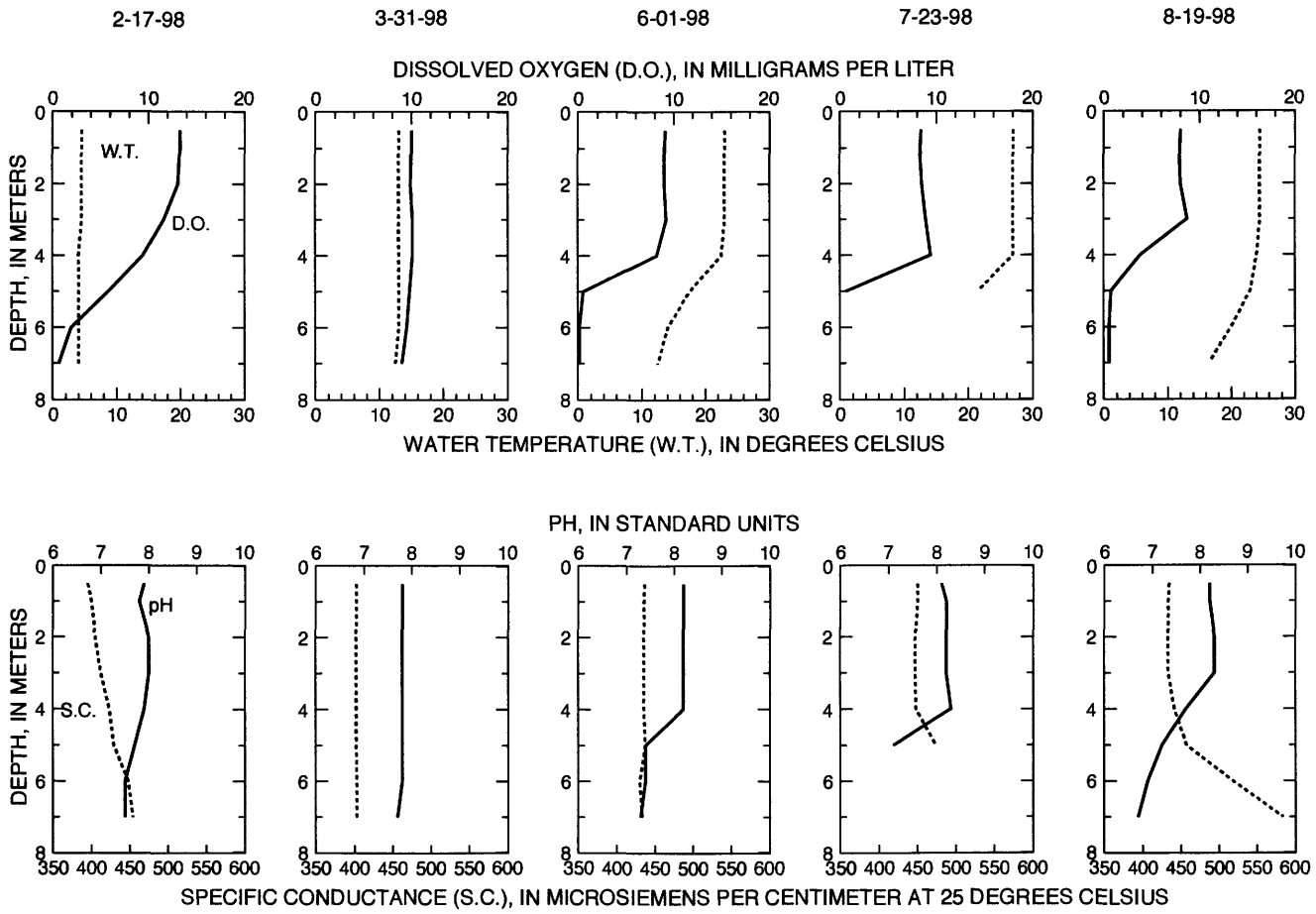
LOCATION.--Lat 42°49'05", long 88°20'40", in NW 1/4 SW 1/4 sec.11, T.4 N., R.18 E., Walworth County, Hydrologic Unit 07120006, 3.3 mi south of Mukwonago.

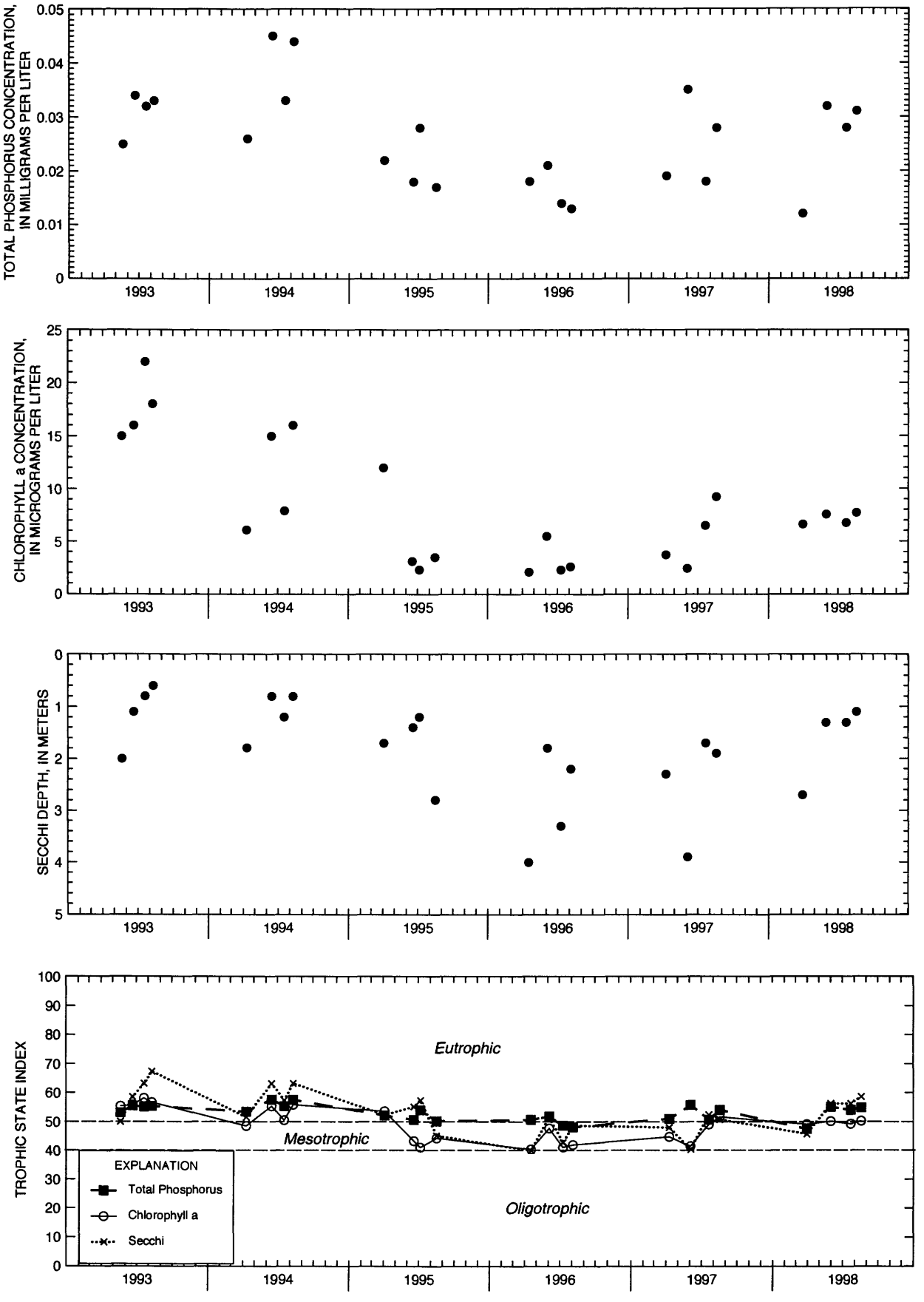
PERIOD OF RECORD.--February 1993 to current year.

REMARKS.--Lake sampled at the deep hole. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, FEBRUARY 17 TO AUGUST 19, 1998
(Milligrams per liter unless otherwise indicated)

	Feb. 17		Mar. 31		June 01		July 23		Aug. 19		
Lake stage (ft)	7.45		7.92		8.07		7.91		7.97		
Secchi-depth (meters)	---		2.7		1.3		1.3		1.1		
Chlorophyll a, phytoplankton (µg/L)	---		6.60		7.57		6.77		7.70		
Depth of sample (m)	0.5	7.0	0.5	7.0	0.5	7.0	0.5	5.0	0.5	5.0	7.0
Water temperature (°C)	4.6	4.0	12.9	12.6	22.8	12.7	26.8	21.4	24.5	23.1	16.5
Specific conductance (µS/cm)	395	454	402	403	436	433	450	474	434	457	584
pH (units)	7.9	7.5	7.8	7.7	8.2	7.3	8.1	7.1	8.2	7.2	6.7
Dissolved oxygen	13.3	0.6	10.0	9.0	9.1	0.1	8.4	0.6	8.0	0.7	0.5
Phosphorus, total (as P)	0.021	0.049	0.012	0.026	0.032	0.156	0.028	0.061	0.031	0.052	0.208
Phosphorus, ortho, dissolved (as P)	---	---	0.005	---	---	---	0.011	---	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	0.002	---	---	---	<0.010	---	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	0.015	---	---	---	<0.030	---	---	---	---
Nitrogen, amm. + org., total (as N)	---	---	0.68	---	---	---	0.87	---	---	---	---
Nitrogen, total (as N)	---	---	0.68	---	---	---	---	---	---	---	---
Color (Pt-Co. scale)	---	---	15	---	---	---	---	---	---	---	---
Turbidity (NTU)	---	---	1.8	---	---	---	---	---	---	---	---
Hardness, as CaCO3	---	---	155	---	---	---	---	---	---	---	---
Calcium, dissolved (Ca)	---	---	29	---	---	---	---	---	---	---	---
Magnesium, dissolved (Mg)	---	---	20	---	---	---	---	---	---	---	---
Sodium, dissolved (Na)	---	---	20	---	---	---	---	---	---	---	---
Potassium, dissolved (K)	---	---	1.3	---	---	---	---	---	---	---	---
Alkalinity, as CaCO3	---	---	135	---	---	---	---	---	---	---	---
Sulfate, dissolved (SO4)	---	---	3	---	---	---	---	---	---	---	---
Chloride, dissolved (Cl)	---	---	45	---	---	---	---	---	---	---	---
Silica, dissolved (SiO2)	---	---	<0.008	---	---	---	---	---	---	---	---
Solids, dissolved, at 180°C	---	---	222	---	---	---	---	---	---	---	---
Iron, dissolved (Fe) µg/L	---	---	<10	---	---	---	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	<0.40	---	---	---	---	---	---	---	---





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.

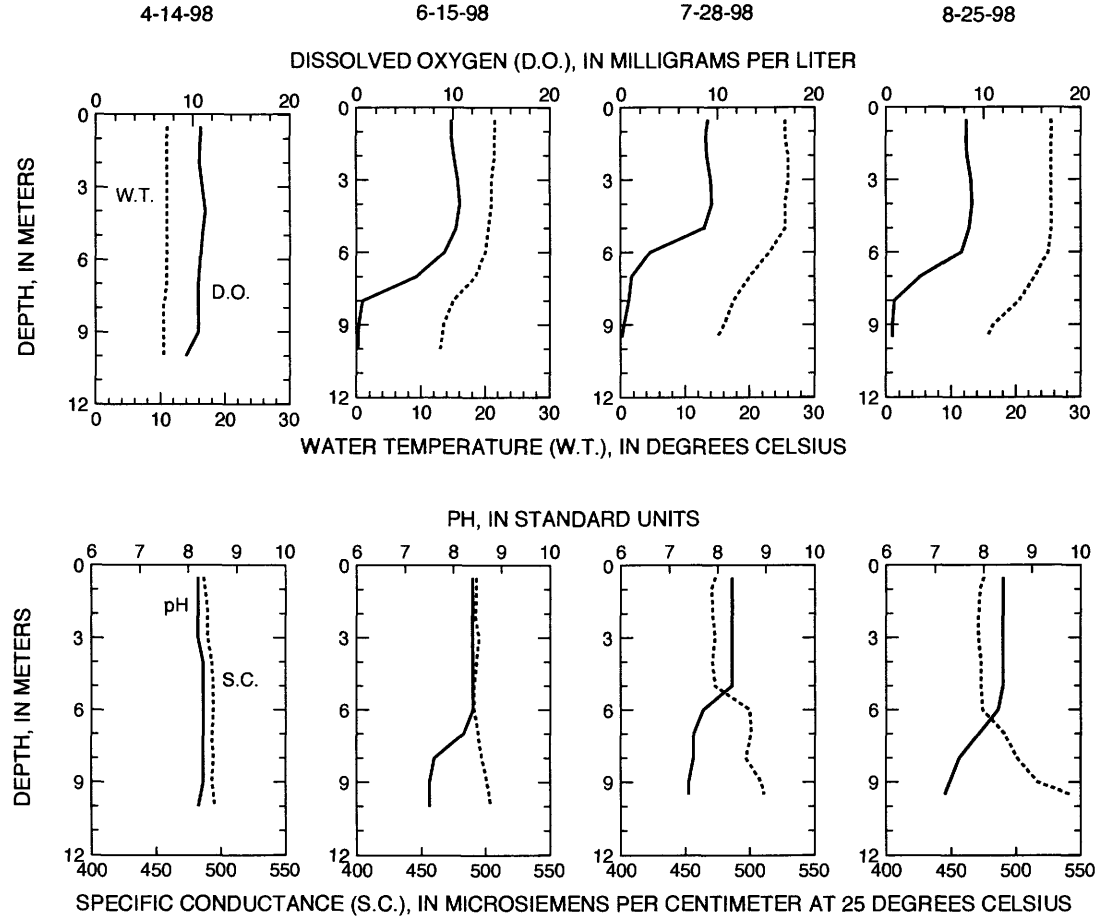
DRAINAGE AREA.--3.42 mi^2.

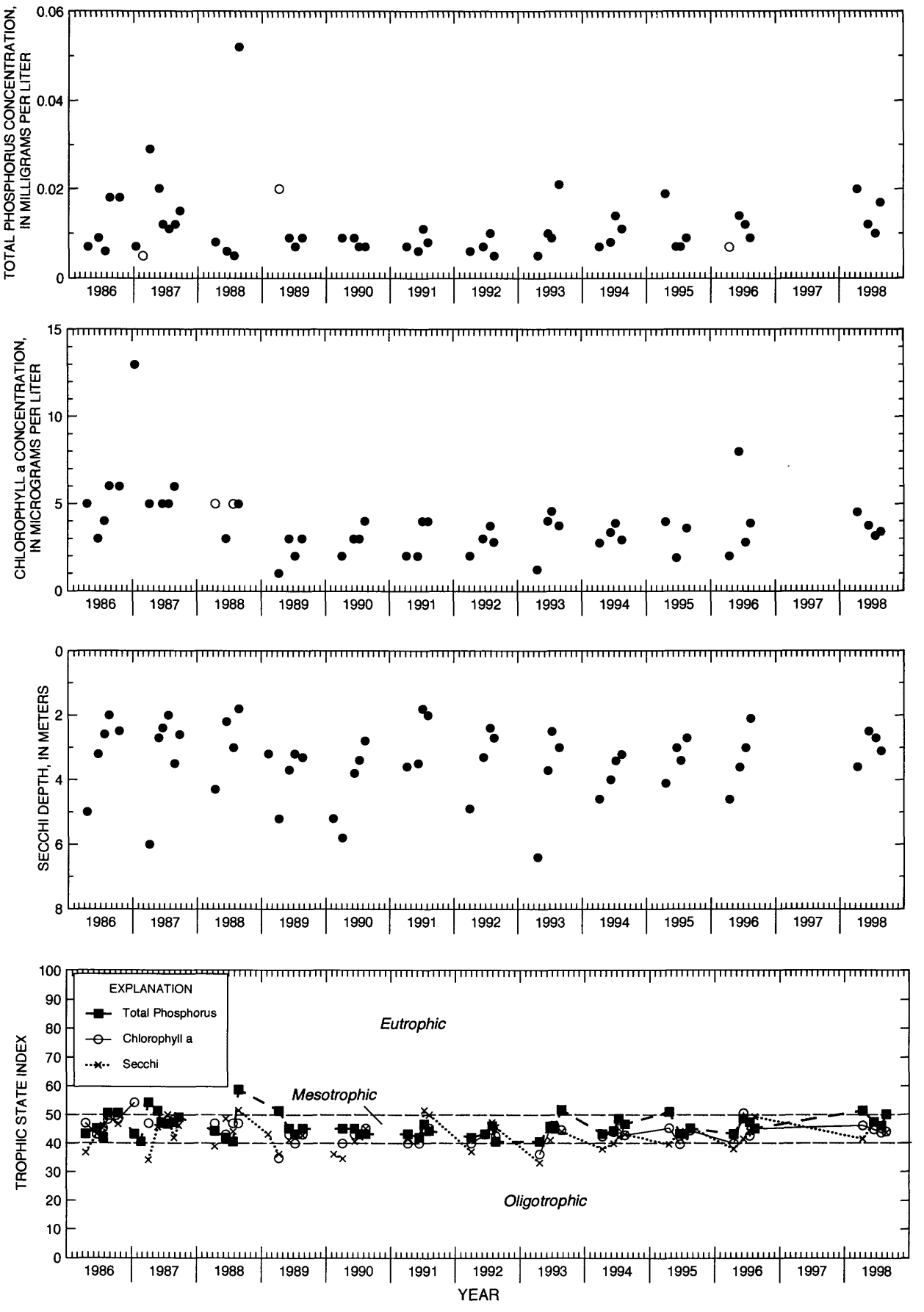
PERIOD OF RECORD.--March 1986 to August 1996, and April to August 1998.

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

WATER-QUALITY DATA, APRIL 14 TO AUGUST 25, 1998
(Milligrams per liter unless otherwise indicated)

	Apr. 14		June 15		July 28		Aug. 25		
Lake stage (ft)	10.1		10.02		9.9		9.8		
Secchi-depth (meters)	3.6		2.5		2.7		3.1		
Chlorophyll a, phytoplankton (µg/L)	4.53		3.75		3.18		3.44		
Depth of sample (m)	0.5	10.0	0.5	10.0	0.5	9.5	0.5	8.0	9.5
Water temperature (°C)	11.2	10.4	21.4	12.8	25.6	15.0	25.6	20.3	15.5
Specific conductance (µS/cm)	487	495	493	504	473	511	475	501	542
pH (units)	8.2	8.2	8.4	7.5	8.3	7.4	8.4	7.5	7.2
Dissolved oxygen	10.8	9.3	9.8	0.1	9.0	0.1	8.2	0.8	0.6
Phosphorus, total (as P)	0.020	0.022	0.012	0.031	0.010	0.036	0.017	0.023	0.067
Phosphorus, ortho, dissolved (as P)	<0.002	---	---	---	<0.002	---	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	0.015	---	---	---	<0.010	---	---	---	---
Nitrogen, ammonia, dissolved (as N)	<0.013	---	---	---	<0.030	---	---	---	---
Nitrogen, amm. + org., total (as N)	0.49	---	---	---	0.65	---	---	---	---
Nitrogen, total (as N)	0.50	---	---	---	---	---	---	---	---
Color (Pt-Co. scale)	15	---	---	---	---	---	---	---	---
Turbidity (NTU)	1.6	---	---	---	---	---	---	---	---
Hardness, as CaCO3	218	---	---	---	---	---	---	---	---
Calcium, dissolved (Ca)	36	---	---	---	---	---	---	---	---
Magnesium, dissolved (Mg)	31	---	---	---	---	---	---	---	---
Sodium, dissolved (Na)	17	---	---	---	---	---	---	---	---
Potassium, dissolved (K)	2.3	---	---	---	---	---	---	---	---
Alkalinity, as CaCO3	184	---	---	---	---	---	---	---	---
Sulfate, dissolved (SO4)	31	---	---	---	---	---	---	---	---
Chloride, dissolved (Cl)	36	---	---	---	---	---	---	---	---
Silica, dissolved (SiO2)	6.1	---	---	---	---	---	---	---	---
Solids, dissolved, at 180°C	282	---	---	---	---	---	---	---	---
Iron, dissolved (Fe) µg/L	<10	---	---	---	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	<0.40	---	---	---	---	---	---	---	---





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.)

423153088184800 TOMBEAU LAKE NEAR POWERS LAKE, WI

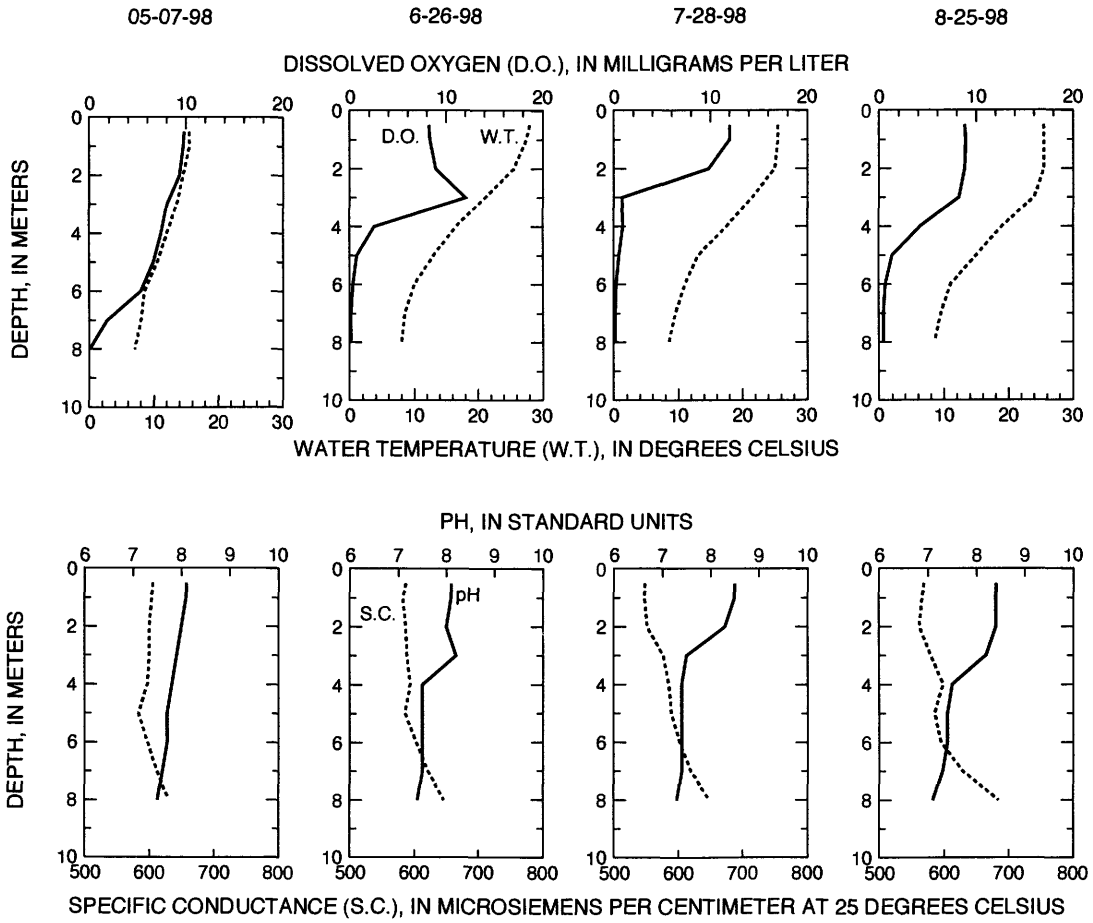
LOCATION.--Lat 42°31'53", long 88°18'48", in SE 1/4 NE 1/4 sec.24, T.1 N., R.18 E., Walworth County, Hydrologic Unit 07120006, 1.5 mi southwest of Powers Lake.

PERIOD OF RECORD.--May to August 1998.

REMARKS.--Lake sampled near center at deep hole. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, MAY 07 TO AUGUST 25, 1998
(Milligrams per liter unless otherwise indicated)

	May 07		June 26		July 28		Aug. 25		
Lake stage (ft)	826.26		826.22		825.95		825.89		
Secchi-depth (meters)	3.2		3.1		1.3		2.5		
Chlorophyll a, phytoplankton (µg/L)	10.50		2.56		18.90		4.24		
Depth of sample (m)	0.5	8.0	0.5	8.0	0.5	8.0	0.5	5.0	8.0
Water temperature (°C)	15.3	7.1	27.8	7.8	25.3	8.5	25.6	15.0	8.3
Specific conductance (µS/cm)	605	630	586	646	547	648	568	585	684
pH (units)	8.1	7.5	8.1	7.4	8.5	7.3	8.4	7.4	7.1
Dissolved oxygen	9.8	0.0	8.2	0.1	12.0	0.1	8.8	1.3	0.4
Phosphorus, total (as P)	0.024	0.214	0.015	0.597	0.026	0.131	0.020	0.071	0.113
Phosphorus, ortho, dissolved (as P)	0.003	---	---	---	0.002	---	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	1.110	---	---	---	0.096	---	---	---	---
Nitrogen, ammonia, dissolved (as N)	0.072	---	---	---	<0.013	---	---	---	---
Nitrogen, amm. + org., total (as N)	0.84	---	---	---	0.86	---	---	---	---
Nitrogen, total (as N)	1.95	---	---	---	0.96	---	---	---	---
Color (Pt-Co. scale)	30	---	---	---	---	---	---	---	---
Turbidity (NTU)	1.7	---	---	---	---	---	---	---	---
Hardness, as CaCO3	278	---	---	---	---	---	---	---	---
Calcium, dissolved (Ca)	57	---	---	---	---	---	---	---	---
Magnesium, dissolved (Mg)	33	---	---	---	---	---	---	---	---
Sodium, dissolved (Na)	16	---	---	---	---	---	---	---	---
Potassium, dissolved (K)	2.2	---	---	---	---	---	---	---	---
Alkalinity, as CaCO3	227	---	---	---	---	---	---	---	---
Sulfate, dissolved (SO4)	40	---	---	---	---	---	---	---	---
Chloride, dissolved (Cl)	37	---	---	---	---	---	---	---	---
Silica, dissolved (SiO2)	6	---	---	---	---	---	---	---	---
Solids, dissolved, at 180°C	396	---	---	---	---	---	---	---	---
Iron, dissolved (Fe) µg/L	<10	---	---	---	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	7.9	---	---	---	---	---	---	---	---



455909089405602 VANDERCOOK LAKE NEAR WOODRUFF, WI

LOCATION.--Lat 45°59'09", long 89°40'56", in SW 1/4 NE 1/4 SE 1/4 sec.36, T.41 N., R.6 E., Vilas County, Hydrologic Unit 07070001, at north end of lake on dirt road off County Trunk Highway M, 6.1 mi north of Woodruff.

DRAINAGE AREA.--1.11 mi^2. Area of lake, 0.17 mi^2.

PERIOD OF RECORD.--November 1980 to August 1998 (discontinued).

GAGE.--Water-stage recorder. Datum of gage is 1,600.00 ft above sea level.

REMARKS.--Lake does not have surface inlet or outlet.

EXTREMES FOR PERIOD OF RECORD.--Maximum observed gage height, 32.26 ft, Apr. 8–10, 1986; minimum observed gage height, 28.97 ft, Oct. 28, 1989.

EXTREMES FOR CURRENT YEAR.--Maximum observed gage height, 31.62 ft, Mar. 1; minimum observed gage height, 30.48 ft, Aug. 26.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	31.48	---	---	31.39	---	31.44	31.62	31.38	31.10	31.12	30.65	---
2	31.47	---	---	31.39	---	31.44	31.61	31.37	31.12	31.11	30.64	---
3	31.47	---	---	31.39	---	31.44	31.61	31.35	31.09	31.09	30.62	---
4	31.46	---	---	31.38	---	31.44	31.60	31.34	31.07	31.08	30.60	---
5	31.44	---	---	31.40	---	31.44	31.59	31.33	31.05	31.06	30.59	---
6	31.46	---	---	31.40	---	31.44	31.59	31.32	31.04	31.09	30.58	---
7	31.52	---	---	---	---	31.44	31.61	31.30	31.02	31.09	30.58	---
8	31.52	---	---	---	---	31.43	31.60	31.29	31.01	31.08	30.59	---
9	31.53	---	---	---	31.47	31.43	31.59	31.28	31.00	31.06	30.61	---
10	31.52	---	---	---	31.46	31.43	31.58	31.26	31.00	31.04	30.59	---
11	31.51	---	---	---	31.46	31.43	31.57	31.25	31.03	31.03	30.58	---
12	31.50	---	---	---	31.45	31.43	31.56	31.24	31.19	31.01	30.56	---
13	31.58	---	---	---	31.45	31.43	31.55	31.26	31.19	30.99	30.55	---
14	31.57	---	---	---	31.45	31.44	31.55	31.25	31.18	30.98	30.54	---
15	31.56	---	---	---	31.45	31.44	31.54	31.24	31.17	30.97	30.53	---
16	31.55	---	---	---	31.45	31.44	31.52	31.26	31.16	30.95	30.51	---
17	31.54	---	---	---	31.44	31.44	31.51	31.24	31.14	30.93	30.55	---
18	31.52	---	---	---	31.44	31.44	31.50	31.23	31.13	30.91	30.54	---
19	31.53	---	---	---	31.44	31.45	31.51	31.22	31.11	30.89	30.52	---
20	31.52	---	---	---	31.43	31.44	31.52	31.19	31.10	30.87	30.51	---
21	31.51	---	---	---	31.43	31.44	31.52	31.18	31.09	30.85	30.50	---
22	31.50	---	31.39	---	31.42	31.43	31.50	31.15	31.07	30.82	30.50	---
23	---	---	31.39	---	31.42	31.42	31.49	31.13	31.06	30.79	30.52	---
24	---	---	31.39	---	31.43	31.41	31.48	31.12	31.08	30.77	30.51	---
25	---	---	31.39	---	31.42	31.41	31.46	31.10	31.10	30.75	30.49	---
26	---	---	31.38	---	31.42	31.42	31.44	31.09	31.10	30.73	30.48	---
27	---	---	31.38	---	31.43	31.48	31.43	31.07	31.09	30.73	---	---
28	---	---	31.39	---	31.44	31.53	31.41	31.10	31.15	30.71	---	---
29	---	---	31.39	---	---	31.54	31.40	31.08	31.15	30.69	---	---
30	---	---	31.40	---	---	31.57	31.39	31.09	31.14	30.68	---	---
31	---	---	31.39	---	---	31.58	---	31.12	---	30.67	---	---
MEAN	---	---	---	---	---	31.45	31.53	31.22	31.10	30.92	---	---
MAX	---	---	---	---	---	31.58	31.62	31.38	31.19	31.12	---	---
MIN	---	---	---	---	---	31.41	31.39	31.07	31.00	30.67	---	---

461321091520900 WHITEFISH LAKE, NORTH SITE, NEAR GORDON, WI

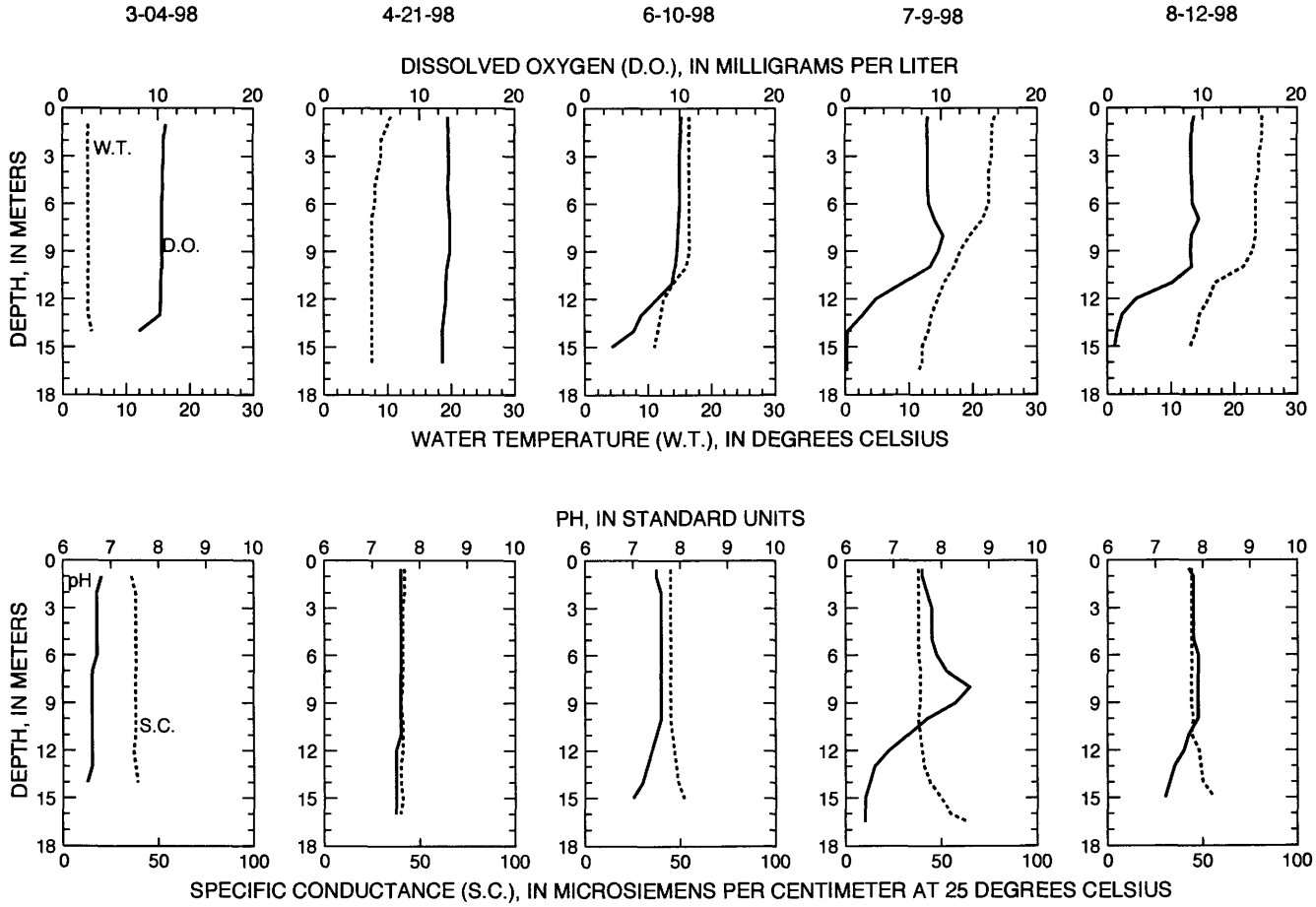
LOCATION.--Lat 46°13'21", long 91°52'09", in NW 1/4 SE 1/4 sec.9, T.43 N., R.12 W., Douglas County, Hydrologic Unit 07030002, near Gordon.

PERIOD OF RECORD.--March to August 1998.

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

WATER-QUALITY DATA, MARCH 04 TO AUGUST 12, 1998
(Milligrams per liter unless otherwise indicated)

	Mar. 04	Apr. 21	June 10	July 09		Aug. 12	
Lake stage (ft)	---	5.45	5.31	5.28		5.00	
Secchi-depth (meters)	---	4.7	6.7	7.9		6.7	
Chlorophyll a, phytoplankton (µg/L)	---	1.13	1.85	0.80		1.01	
Depth of sample (m)	0.5	0.5	0.5	0.5	16.5	0.5	15.0
Water temperature (°C)	3.0	10.5	16.7	23.3	11.6	24.6	13.1
Specific conductance (µS/cm)	34	42	45	38	64	44	56
pH (units)	6.9	7.6	7.5	7.6	6.4	7.7	7.2
Dissolved oxygen	11.5	13.0	10.2	8.6	0.1	9.1	0.7
Phosphorus, total (as P)	<0.005	<0.005	<0.005	<0.005	0.033	<0.005	0.035



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.

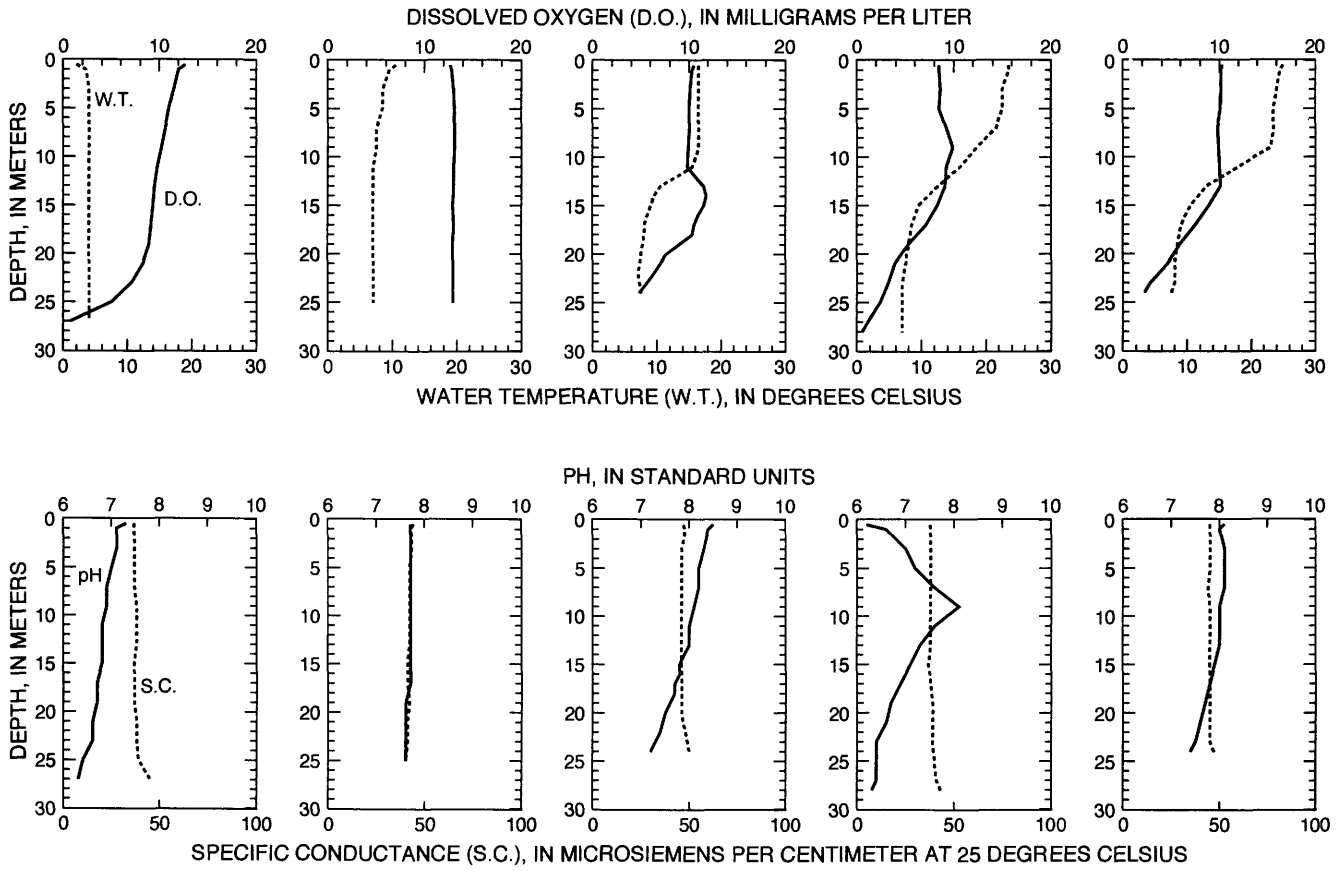
PERIOD OF RECORD.--March to August 1998.

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

WATER-QUALITY DATA, MARCH 04 TO AUGUST 12, 1998
(Milligrams per liter unless otherwise indicated)

	Mar. 04		Apr. 21		June 10		July 09		Aug. 12		
Lake stage (ft)	---		5.45		5.31		5.28		5.00		
Secchi-depth (meters)	---		4.9		7.3		8.5		6.9		
Chlorophyll a, phytoplankton (µg/L)	---		1.08		1.90		1.17		1.57		
Depth of sample (m)	0.5	28.0	0.5	28.5	0.5	24.0	0.5	28.0	0.5	11.0	28.0
Water temperature (°C)	2.1	---	10.5	---	16.7	7.4	23.4	7.0	24.8	18.2	---
Specific conductance (µS/cm)	37	---	44	---	47	50	38	43	45	45	---
pH (units)	7.3	---	7.7	---	8.5	7.2	6.2	6.3	8.1	8.0	---
Dissolved oxygen	12.7	---	12.7	---	10.5	4.8	8.5	0.5	10.3	10.0	---
Phosphorus, total (as P)	<0.005	0.156	<0.005	<0.005	<0.005	0.027	<0.005	0.087	<0.005	0.011	0.130
Phosphorus, ortho, dissolved (as P)	---	---	<0.002	---	---	---	<0.002	---	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	0.065	---	---	---	<0.010	0.083	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	<0.013	---	---	---	<0.013	0.358	---	---	---
Nitrogen, amm. + org., total (as N)	---	---	<0.200	---	---	---	0.37	0.66	---	---	---
Nitrogen, total (as N)	---	---	---	---	---	---	---	0.74	---	---	---
Color (Pt-Co. scale)	---	---	5	---	---	---	---	---	---	---	---
Turbidity (NTU)	---	---	1.0	---	---	---	---	---	---	---	---
Hardness, as CaCO3	---	---	18	---	---	---	---	---	---	---	---
Calcium, dissolved (Ca)	---	---	4.9	---	---	---	---	---	---	---	---
Magnesium, dissolved (Mg)	---	---	1.3	---	---	---	---	---	---	---	---
Sodium, dissolved (Na)	---	---	0.95	---	---	---	---	---	---	---	---
Potassium, dissolved (K)	---	---	0.4	---	---	---	---	---	---	---	---
Alkalinity, as CaCO3	---	---	18	---	---	---	---	---	---	---	---
Sulfate, dissolved (SO4)	---	---	<2.0	---	---	---	---	---	---	---	---
Chloride, dissolved (Cl)	---	---	0.6	---	---	---	---	---	---	---	---
Silica, dissolved (SiO2)	---	---	0.69	---	---	---	---	---	---	---	---
Solids, dissolved, at 180°C	---	---	44	---	---	---	---	---	---	---	---
Iron, dissolved (Fe) µg/L	---	---	20	---	---	---	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	5.3	---	---	---	---	---	---	---	---

3-04-98 4-21-98 6-10-98 7-09-98 8-12-98



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, revised, (Wisconsin Department of Natural Resources).

REMARKS.--No estimated daily gage heights. Records good. 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, 11.42 ft, June 18, 19, 1996; minimum daily gage height, 8.89 ft, Oct. 2, 3, 1991.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 11.40 ft, Aug. 6; minimum daily gage height, 10.34 ft, Oct. 26.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10.50	10.39	10.41	10.53	10.79	10.92	11.09	11.13	11.13	11.24	10.88	11.07
2	10.49	10.38	10.41	10.53	10.79	10.92	11.05	11.13	11.11	11.21	10.87	11.05
3	10.49	10.38	10.42	10.53	10.79	10.92	11.04	11.14	11.09	11.20	10.85	11.04
4	10.48	10.38	10.44	10.58	10.79	10.92	10.98	11.14	11.07	11.18	10.87	11.03
5	10.48	10.37	10.44	10.63	10.79	10.91	10.99	11.14	11.05	11.20	11.07	11.03
6	10.47	10.39	10.43	10.66	10.80	10.91	10.99	11.13	11.04	11.18	11.38	11.02
7	10.47	10.39	10.43	10.69	10.81	10.90	11.03	11.19	11.02	11.19	11.38	11.00
8	10.47	10.39	10.43	10.71	10.81	10.90	11.04	11.22	11.01	11.19	11.36	10.98
9	10.47	10.39	10.44	10.76	10.80	10.92	11.06	11.21	11.01	11.18	11.34	10.97
10	10.45	10.39	10.45	10.76	10.79	10.92	11.10	11.19	11.01	11.16	11.32	10.97
11	10.44	10.39	10.46	10.76	10.80	10.91	11.11	11.18	11.05	11.13	11.29	10.94
12	10.44	10.39	10.46	10.76	10.83	10.90	11.14	11.18	11.08	11.11	11.26	10.93
13	10.46	10.38	10.45	10.76	10.83	10.90	11.12	11.17	11.09	11.09	11.24	10.92
14	10.43	10.38	10.45	10.76	10.83	10.90	11.14	11.17	11.09	11.06	11.23	10.95
15	10.42	10.39	10.45	10.76	10.83	10.90	11.15	11.17	11.07	11.04	11.22	11.00
16	10.41	10.39	10.45	10.76	10.84	10.90	11.18	11.15	11.07	11.02	11.20	10.99
17	10.40	10.39	10.45	10.76	10.86	10.89	11.17	11.14	11.06	11.02	11.18	11.01
18	10.40	10.38	10.45	10.76	10.87	10.90	11.16	11.10	11.08	10.98	11.16	11.00
19	10.39	10.37	10.45	10.76	10.87	10.91	11.16	11.11	11.12	11.00	11.14	11.00
20	10.38	10.37	10.45	10.77	10.87	10.91	11.16	11.05	11.13	11.02	11.12	10.99
21	10.37	10.37	10.46	10.77	10.87	10.92	11.19	11.02	11.11	11.05	11.11	10.98
22	10.35	10.37	10.46	10.77	10.87	10.93	11.20	11.03	11.11	11.04	11.11	10.97
23	10.35	10.37	10.46	10.77	10.87	10.94	11.19	11.05	11.08	11.03	11.10	10.95
24	10.36	10.36	10.47	10.77	10.89	10.92	11.18	11.05	11.07	11.01	11.09	10.94
25	10.36	10.36	10.51	10.78	10.89	10.95	11.17	11.06	11.07	10.99	11.11	10.94
26	10.36	10.37	10.50	10.78	10.89	10.96	11.17	11.05	11.10	10.98	11.10	10.95
27	10.38	10.38	10.50	10.78	10.92	10.97	11.15	11.04	11.17	10.96	11.10	10.94
28	10.38	10.38	10.51	10.78	10.92	10.99	11.14	11.06	11.28	10.95	11.11	10.93
29	10.37	10.39	10.52	10.80	---	11.01	11.13	11.08	11.30	10.93	11.11	10.93
30	10.39	10.41	10.52	10.80	---	11.02	11.13	11.09	11.26	10.91	11.09	10.93
31	10.39	---	10.53	10.79	---	11.11	---	11.15	---	10.89	11.08	---
MEAN	10.42	10.38	10.46	10.73	10.84	10.93	11.12	11.12	11.10	11.07	11.14	10.98
MAX	10.50	10.41	10.53	10.80	10.92	11.11	11.20	11.22	11.30	11.24	11.38	11.07
MIN	10.35	10.36	10.41	10.53	10.79	10.89	10.98	11.02	11.01	10.89	10.85	10.92

424915088083900 WIND LAKE AT WIND LAKE, WI

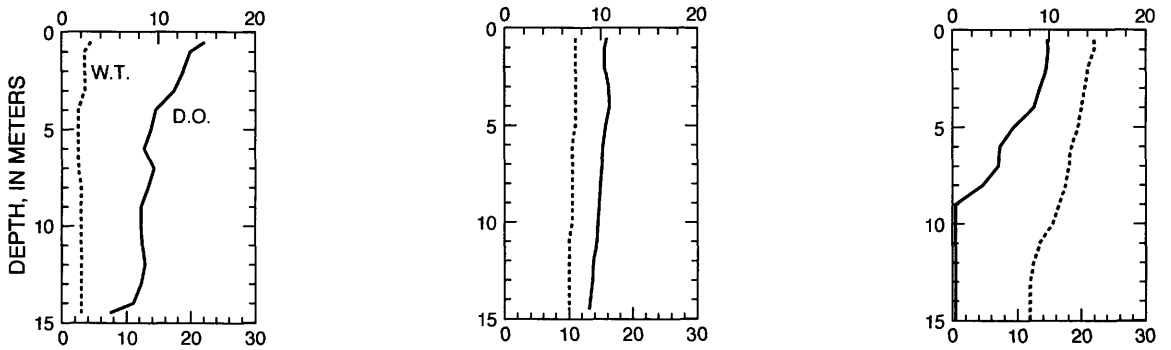
LOCATION.--Lat 42°49'15", long 88°08'39", in NW 1/4 SW 1/4 sec.9, T.4 N., R.20 E., Racine County, Hydrologic Unit 07120006, at Wind Lake.
PERIOD OF RECORD.--February 1985 to current year.
REMARKS.--Lake sampled near center at the deep hole. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, FEBRUARY 18 TO JUNE 16, 1998
(Milligrams per liter unless otherwise indicated)

	Feb. 18			Apr. 15		June 16		
Secchi-depth (meters)		---		1.5			1.1	
Chlorophyll a, phytoplankton (µg/L)		---		23.4			12	
Depth of sample (m)	0.5	7.0	14.5	0.5	14.5	0.5	9.0	15.0
Water temperature (°C)	4.4	2.7	3.1	11.1	9.9	21.9	16.5	11.8
Specific conductance (µS/cm)	660	764	804	670	673	664	672	707
pH (units)	8.4	7.7	7.5	8.0	7.9	8.4	7.4	7.2
Dissolved oxygen	14.8	9.5	5.0	10.6	8.8	9.8	0.3	0.3
Phosphorus, total (as P)	0.046	0.043	0.075	0.048	0.060	0.022	0.020	0.051
Phosphorus, ortho, dissolved (as P)	---	---	---	<0.002	---	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	---	0.249	---	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	---	0.067	---	---	---	---
Nitrogen, amm. + org., total (as N)	---	---	---	1.2	---	---	---	---
Nitrogen, total (as N)	---	---	---	1.4	---	---	---	---
Color (Pt-Co. scale)	---	---	---	30	---	---	---	---
Turbidity (NTU)	---	---	---	5.8	---	---	---	---
Hardness, as CaCO3	---	---	---	251	---	---	---	---
Calcium, dissolved (Ca)	---	---	---	51	---	---	---	---
Magnesium, dissolved (Mg)	---	---	---	30	---	---	---	---
Sodium, dissolved (Na)	---	---	---	41	---	---	---	---
Potassium, dissolved (K)	---	---	---	2.7	---	---	---	---
Alkalinity, as CaCO3	---	---	---	182	---	---	---	---
Sulfate, dissolved (SO4)	---	---	---	50	---	---	---	---
Chloride, dissolved (Cl)	---	---	---	80	---	---	---	---
Silica, dissolved (SiO2)	---	---	---	<0.008	---	---	---	---
Solids, dissolved, at 180°C	---	---	---	414	---	---	---	---
Iron, dissolved (Fe) µg/L	---	---	---	<10	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	---	<0.40	---	---	---	---

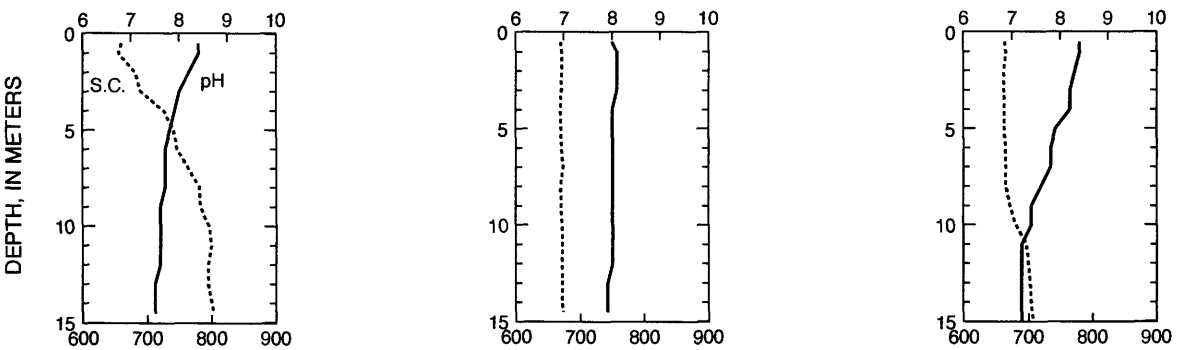
02-18-98 04-15-98 06-16-98

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

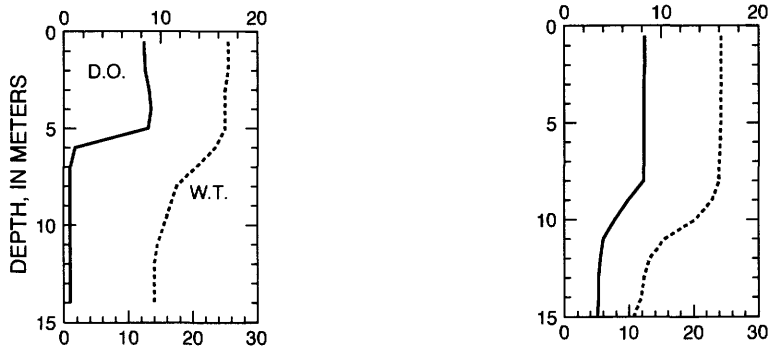
424915088083900 WIND LAKE AT WIND LAKE, WI

WATER-QUALITY DATA, JULY 27 TO AUGUST 26, 1998
(Milligrams per liter unless otherwise indicated)

	July 27					Aug. 26				
Secchi-depth (meters)			1.3					1.4		
Chlorophyll a, phytoplankton (µg/L)			9.96					10.8		
Depth of sample (m)	0.5	5.0	7.0	11.0	14.0	0.5	4.0	8.0	12.0	15.0
Water temperature (°C)	25.3	25.0	20.7	14.6	13.8	25.7	25.2	20.9	14.5	13.8
Specific Conductance (µS/cm)	646	647	663	703	714	611	614	660	720	734
pH (units)	8.3	8.3	7.4	7.2	7.1	8.5	8.4	7.2	7.1	7.0
Dissolved oxygen	8.3	8.7	0.6	0.6	0.6	8.7	8.7	0.5	0.5	0.6
Phosphorus, total (as P)	0.021	0.020	0.026	0.028	0.039	0.020	0.021	0.030	0.031	0.038

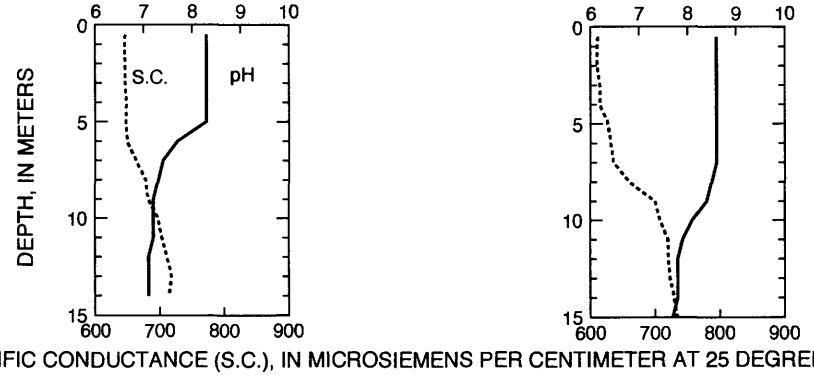
07-27-98 08-26-98

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

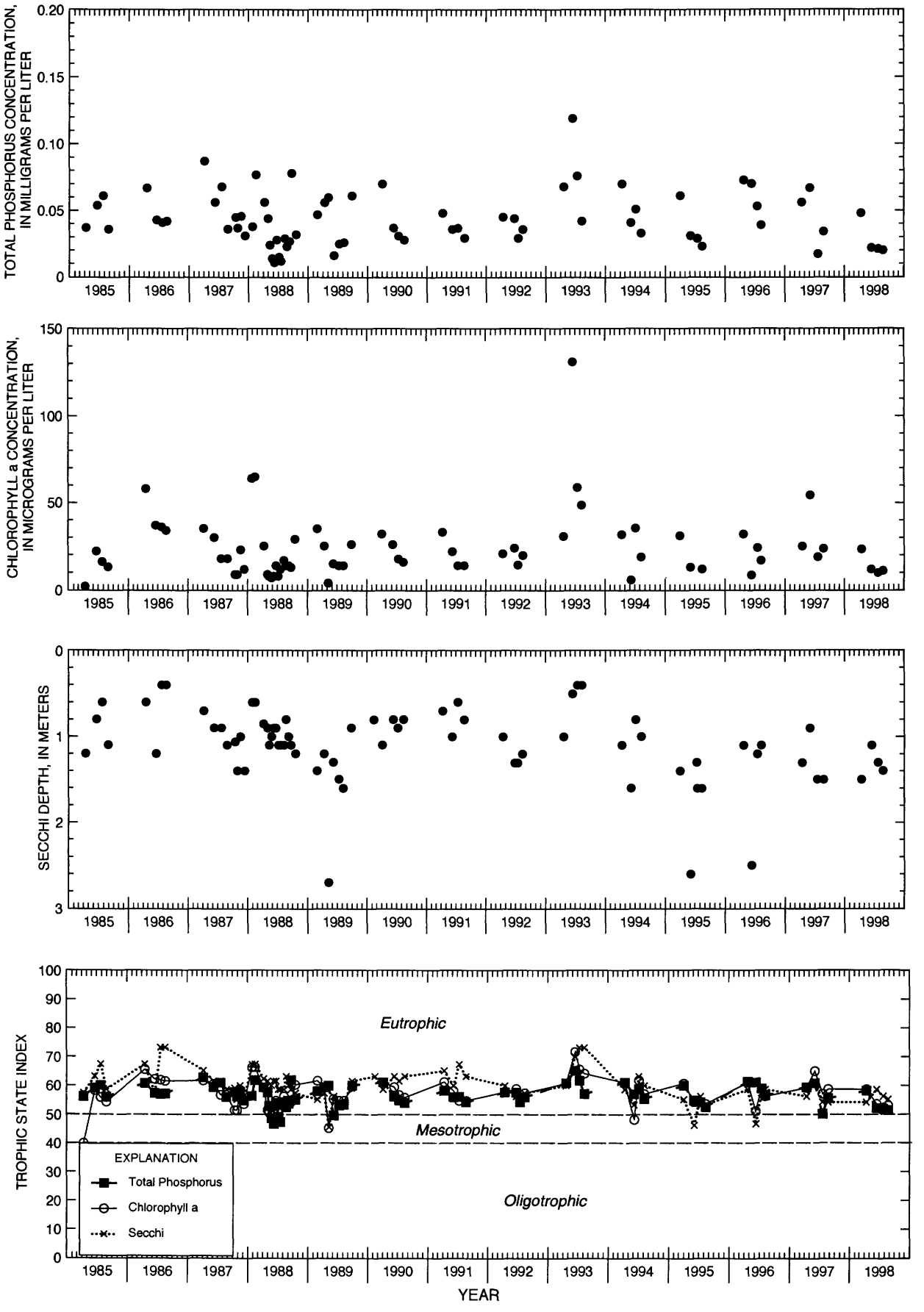


WATER TEMPERATURE (W.T.), IN DEGREES CELSIUS

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.

424938088080800 WIND LAKE, NORTHEAST BASIN, AT WIND LAKE, WI

LOCATION.--Lat 42°49'38", long 88°08'08", in SW 1/4 SE 1/4 sec.4, T.4 N., R.20 E., Racine County, Hydrologic Unit 07120006, at Wind Lake.

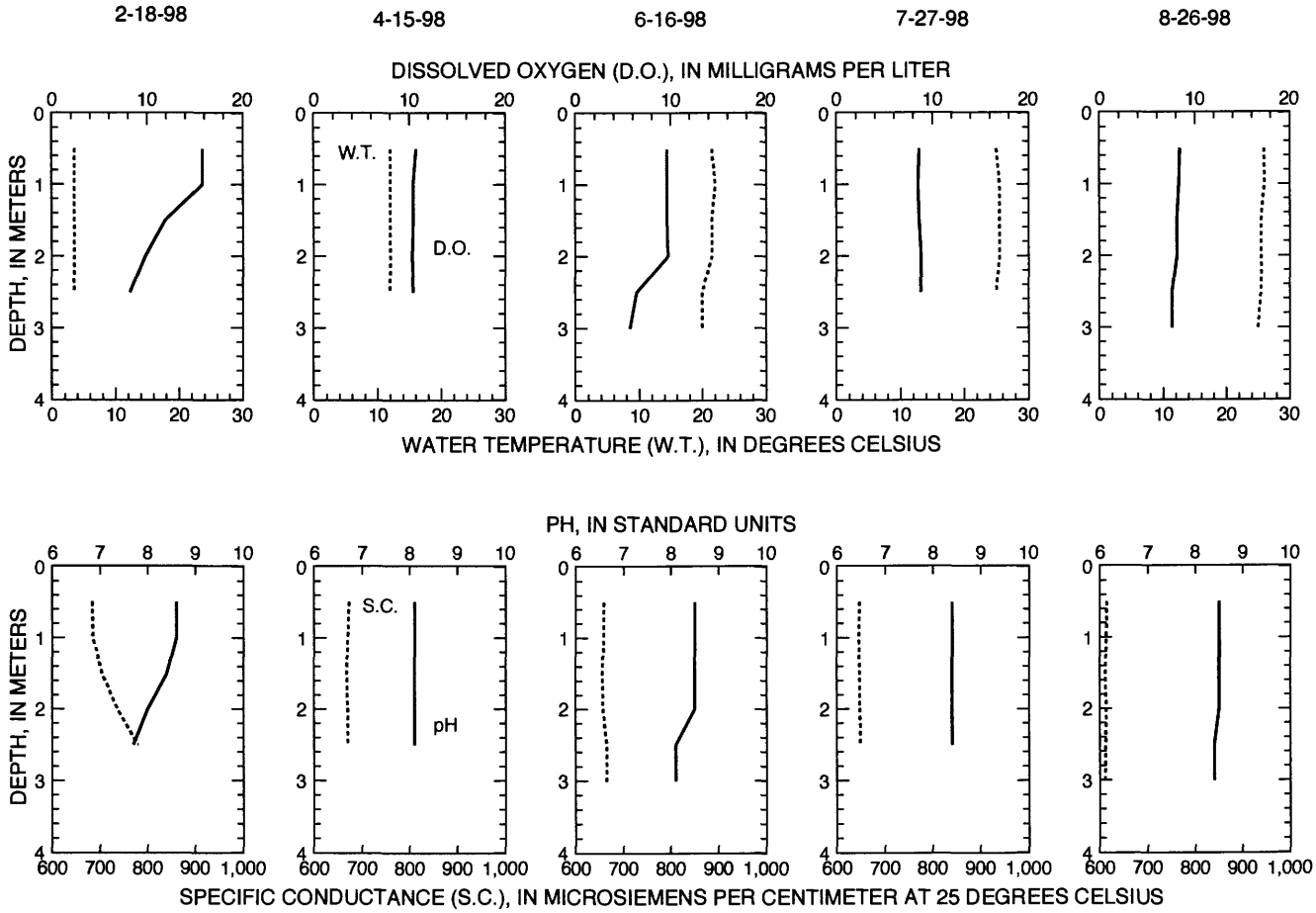
PERIOD OF RECORD.--February 1997 to current year.

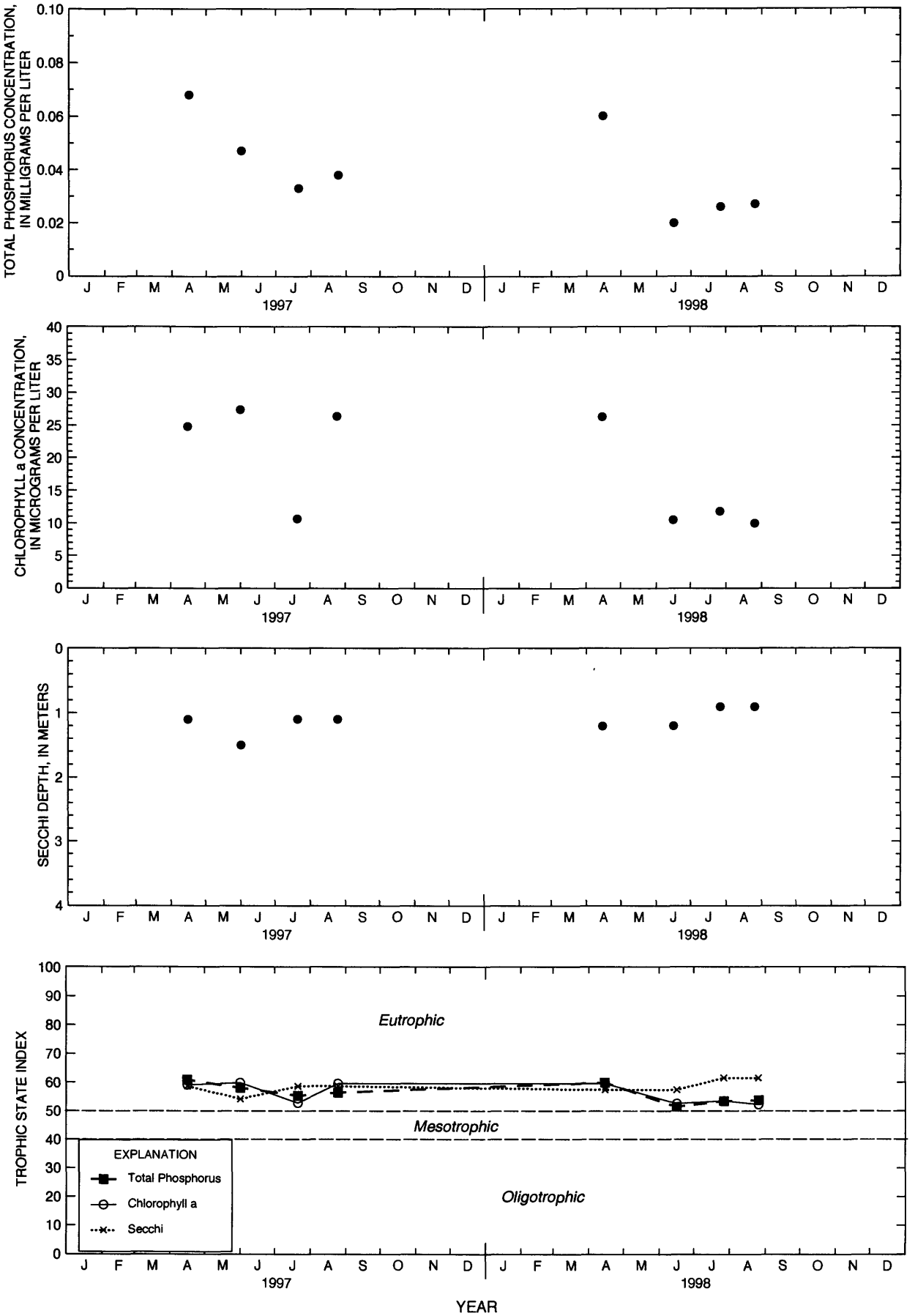
REMARKS.--Lake sampled in northeast basin about 1/3 mi south of Muskego Canal inlet. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, FEBRUARY 18 TO AUGUST 26, 1998

(Milligrams per liter unless otherwise indicated)

	Feb. 18		Apr. 15		June 16	July 27	Aug. 26
Secchi-depth (meters)	---		1.2		1.2	0.9	0.9
Chlorophyll a, phytoplankton (µg/L)	---		26.3		10.5	11.8	10.1
Depth of sample (m)	0.5	2.5	0.5	2.5	0.5	0.5	0.5
Water temperature (°C)	3.5	3.4	11.9	12.2	21.7	25.5	26.0
Specific conductance (µS/cm)	683	779	672	669	658	646	613
pH (units)	8.6	7.7	8.1	8.1	8.5	8.4	8.5
Dissolved oxygen	15.8	8.2	10.7	10.4	9.6	8.6	8.4
Phosphorus, total (as P)	0.070	0.065	0.060	0.056	0.020	0.026	0.027





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

424848088083100 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.

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 ice-covered Dec. 14-22 and Jan. 11 to Feb. 24. Records good. Lake level regulated by dam with two 10-foot gates at outlet. Prior to October 1987, published as Wind Lake at Wind Lake, Wis.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 8.61 ft, Sept. 1, 1989; minimum recorded, 5.95 ft, Jan. 2, 1996.

EXTREMES FOR CURRENT YEAR.--Maximum recorded gage height, 8.44 ft, May 7; minimum recorded, 6.88 ft, Mar. 2.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.05	8.22	---	---	7.41	6.92	7.41	8.32	8.24	8.21	7.77	8.31
2	8.05	8.22	---	---	7.45	6.91	7.37	8.32	8.23	8.18	7.76	8.33
3	8.04	8.21	---	---	7.47	7.05	7.29	8.31	8.22	8.17	7.74	8.32
4	8.04	8.21	---	---	7.47	7.18	7.21	8.29	8.20	8.18	7.77	8.32
5	8.03	8.20	---	---	7.42	7.30	7.11	8.27	8.20	8.14	8.06	8.31
6	8.02	8.21	---	---	7.36	7.41	7.04	8.30	8.18	8.13	8.26	8.30
7	8.01	8.21	---	---	7.30	7.42	7.06	8.39	8.17	8.15	8.31	8.34
8	8.01	8.21	---	7.66	7.24	7.48	7.13	8.33	8.15	8.16	8.35	8.29
9	8.01	8.20	---	7.64	7.19	7.59	7.25	8.23	8.16	8.15	8.39	8.24
10	7.99	8.20	---	7.55	7.16	7.53	7.34	8.23	8.18	8.14	8.41	8.20
11	7.98	8.19	---	7.58	7.19	7.67	7.36	8.22	8.20	8.12	8.30	8.18
12	7.97	8.17	---	7.55	7.35	7.63	7.44	8.16	8.23	8.10	8.20	8.16
13	7.97	8.16	---	7.48	7.48	7.65	7.50	8.18	8.23	8.08	8.20	8.15
14	7.96	8.16	---	7.47	7.55	7.60	7.56	8.18	8.22	8.06	8.23	8.18
15	7.94	8.18	---	7.45	7.56	7.50	7.62	8.18	8.22	8.04	8.26	8.22
16	7.93	8.17	---	7.39	7.56	7.39	7.86	8.19	8.21	8.03	8.26	8.22
17	8.00	8.15	---	7.33	7.53	7.27	8.07	8.17	8.21	8.01	8.27	8.22
18	8.09	8.14	---	7.28	7.52	7.29	8.16	8.16	8.21	7.99	8.27	8.22
19	8.18	8.15	---	7.23	7.49	7.28	8.25	8.18	8.23	7.97	8.27	8.22
20	8.25	8.14	---	7.21	7.45	7.24	8.34	8.18	8.22	7.97	8.26	8.22
21	8.22	8.15	---	7.23	7.39	7.26	8.42	8.17	8.22	8.00	8.25	8.21
22	8.16	8.14	---	7.25	7.32	7.32	8.37	8.16	8.20	7.99	8.25	8.20
23	8.11	8.14	---	7.29	7.24	7.35	8.26	8.14	8.20	7.97	8.25	8.18
24	8.09	8.15	---	7.30	7.18	7.31	8.19	8.15	8.19	7.93	8.25	8.17
25	8.11	---	---	7.32	7.14	7.27	8.22	8.15	8.18	7.91	8.39	8.16
26	8.16	---	---	7.33	7.04	7.25	8.31	8.14	8.18	7.90	8.30	8.16
27	8.22	---	---	7.34	7.01	7.27	8.35	8.13	8.19	7.88	8.23	8.16
28	8.22	---	---	7.35	6.97	7.29	8.36	8.15	8.25	7.86	8.25	8.15
29	8.22	---	---	7.37	---	7.30	8.33	8.23	8.25	7.83	8.29	8.14
30	8.23	---	---	7.38	---	7.31	8.31	8.23	8.23	7.81	8.30	8.15
31	8.23	---	---	7.39	---	7.37	---	8.25	---	7.79	8.31	---
MEAN	8.08	---	---	---	7.34	7.34	7.78	8.22	8.21	8.03	8.21	8.22
MAX	8.25	---	---	---	7.56	7.67	8.42	8.39	8.25	8.21	8.41	8.34
MIN	7.93	---	---	---	6.97	6.91	7.04	8.13	8.15	7.79	7.74	8.14

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 1882 to 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.--No estimated daily gage heights. Records good. 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 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, 3.24 ft, July 4; minimum recorded, 1.78 ft, Feb. 14, 17.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.98	2.72	2.45	2.17	2.02	2.02	2.65	2.64	2.79	3.21	2.63	2.68
2	2.93	2.74	2.45	2.16	2.02	2.06	2.73	2.69	2.78	3.19	2.62	2.67
3	2.93	2.74	2.46	2.16	2.00	2.10	2.85	2.73	2.79	3.19	2.62	2.66
4	2.89	2.75	2.46	2.15	1.99	2.12	2.85	2.75	2.78	3.24	2.65	2.65
5	2.86	2.76	2.45	2.18	1.97	2.14	2.84	2.76	2.78	3.20	2.71	2.63
6	2.89	2.77	2.47	2.19	1.96	2.14	2.84	2.78	2.76	3.16	2.76	2.64
7	2.89	2.75	2.49	2.19	1.94	2.18	2.85	2.81	2.77	3.17	2.75	2.63
8	2.89	2.74	2.49	2.20	1.92	2.28	2.94	2.86	2.78	3.15	2.77	2.61
9	2.82	2.74	2.49	2.19	1.91	2.18	2.88	2.84	2.79	3.13	2.79	2.57
10	2.89	2.72	2.50	2.19	1.89	2.25	2.83	2.83	2.77	3.11	2.81	2.53
11	2.85	2.68	2.46	2.18	1.88	2.24	2.82	2.84	2.80	3.04	2.82	2.53
12	2.85	2.65	2.40	2.17	1.88	2.23	2.85	2.82	2.81	2.99	2.79	2.53
13	2.77	2.62	2.43	2.17	1.86	2.21	2.77	2.80	2.90	2.95	2.78	2.52
14	2.82	2.61	2.42	2.16	1.84	2.24	2.76	2.83	2.92	2.95	2.78	2.58
15	2.85	2.58	2.41	2.16	1.83	2.27	2.89	2.83	2.93	2.93	2.80	2.68
16	2.86	2.52	2.39	2.15	1.82	2.24	2.86	2.76	2.95	2.94	2.76	2.67
17	2.84	2.52	2.38	2.14	1.80	2.23	2.80	2.86	2.97	2.91	2.78	2.67
18	2.82	2.45	2.36	2.13	1.81	2.28	2.81	2.85	2.97	2.88	2.80	2.67
19	2.80	2.46	2.36	2.12	1.83	2.30	2.78	2.86	2.97	2.85	2.75	2.66
20	2.81	2.46	2.35	2.11	1.84	2.30	2.74	2.88	3.02	2.83	2.72	2.64
21	2.79	2.48	2.34	2.12	1.85	2.27	2.68	2.87	3.03	2.80	2.75	2.64
22	2.80	2.42	2.31	2.12	1.86	2.25	2.63	2.86	3.05	2.81	2.75	2.63
23	2.79	2.39	2.30	2.13	1.87	2.23	2.60	2.82	3.06	2.78	2.76	2.60
24	2.84	2.43	2.29	2.12	1.90	2.23	2.59	2.80	3.05	2.78	2.77	2.57
25	2.81	2.43	2.28	2.11	1.92	2.20	2.57	2.80	3.08	2.77	2.77	2.58
26	2.84	2.40	2.27	2.11	1.89	2.18	2.57	2.81	3.11	2.73	2.77	2.60
27	2.76	2.42	2.26	2.10	1.93	2.19	2.48	2.79	3.18	2.71	2.74	2.61
28	2.75	2.43	2.23	2.09	1.97	2.19	2.49	2.77	3.17	2.69	2.74	2.62
29	2.75	2.44	2.22	2.08	---	2.23	2.52	2.83	3.19	2.69	2.73	2.60
30	2.74	2.45	2.21	2.06	---	2.27	2.56	2.82	3.21	2.68	2.73	2.61
31	2.76	---	2.19	2.04	---	2.61	---	2.79	---	2.65	2.72	---
MEAN	2.83	2.58	2.37	2.14	1.90	2.22	2.73	2.81	2.94	2.94	2.75	2.62
MAX	2.98	2.77	2.50	2.20	2.02	2.61	2.94	2.88	3.21	3.24	2.82	2.68
MIN	2.74	2.39	2.19	2.04	1.80	2.02	2.48	2.64	2.76	2.65	2.62	2.52

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.--No estimated daily gage heights. Records good. 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 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, 3.22 ft, June 29; minimum recorded, 1.71 ft, Feb. 14.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.93	2.61	2.39	2.12	1.97	1.98	2.66	2.58	2.86	3.17	2.59	2.70
2	2.93	2.65	2.40	2.10	1.98	2.02	2.74	2.63	2.80	3.17	2.58	2.68
3	2.89	2.58	2.43	2.09	1.96	2.04	2.74	2.66	2.80	3.17	2.54	2.63
4	2.90	2.58	2.49	2.09	1.95	2.07	2.79	2.72	2.77	3.14	2.52	2.62
5	2.89	2.55	2.54	2.14	1.93	2.09	2.81	2.74	2.72	3.14	2.56	2.63
6	2.83	2.54	2.51	2.15	1.91	2.11	2.80	2.74	2.75	3.13	2.64	2.60
7	2.83	2.57	2.48	2.14	1.90	2.11	2.78	2.73	2.75	3.11	2.71	2.55
8	2.85	2.57	2.45	2.13	1.88	1.99	2.66	2.72	2.73	3.10	2.75	2.53
9	2.94	2.56	2.43	2.19	1.86	2.04	2.67	2.75	2.66	3.09	2.77	2.53
10	2.85	2.59	2.39	2.18	1.85	2.22	2.80	2.77	2.72	3.02	2.78	2.55
11	2.81	2.58	2.41	2.14	1.85	2.22	2.83	2.79	2.74	3.00	2.73	2.53
12	2.80	2.55	2.45	2.13	1.84	2.21	2.82	2.77	2.89	2.99	2.74	2.48
13	2.93	2.43	2.41	2.13	1.82	2.22	2.75	2.79	2.87	2.96	2.75	2.48
14	2.94	2.43	2.38	2.12	1.80	2.23	2.76	2.79	2.86	2.93	2.77	2.56
15	2.83	2.49	2.36	2.12	1.78	2.20	2.69	2.80	2.88	2.94	2.73	2.60
16	2.81	2.61	2.35	2.11	1.77	2.19	2.70	2.92	2.90	2.91	2.72	2.62
17	2.81	2.55	2.33	2.10	1.76	2.17	2.85	2.85	2.93	2.87	2.74	2.63
18	2.83	2.51	2.32	2.09	1.78	2.19	2.82	2.85	2.89	2.86	2.69	2.63
19	2.82	2.47	2.32	2.08	1.79	2.21	2.75	2.85	2.97	2.87	2.71	2.63
20	2.79	2.43	2.31	2.07	1.80	2.20	2.69	2.85	2.99	2.85	2.73	2.64
21	2.80	2.40	2.29	2.07	1.81	2.21	2.64	2.79	3.03	2.85	2.71	2.63
22	2.78	2.46	2.27	2.07	1.82	2.21	2.60	2.72	3.03	2.83	2.71	2.56
23	2.74	2.48	2.27	2.08	1.83	2.20	2.57	2.70	3.01	2.82	2.78	2.56
24	2.67	2.41	2.23	2.07	1.86	2.18	2.53	2.70	3.01	2.76	2.78	2.60
25	2.67	2.39	2.25	2.07	1.87	2.16	2.44	2.77	3.05	2.72	2.76	2.57
26	2.59	2.40	2.25	2.07	1.85	2.16	2.32	2.77	3.08	2.74	2.74	2.58
27	2.66	2.39	2.22	2.06	1.88	2.19	2.36	2.76	3.10	2.76	2.72	2.61
28	2.65	2.38	2.20	2.05	1.93	2.18	2.43	2.82	3.18	2.73	2.73	2.59
29	2.61	2.38	2.18	2.05	---	2.19	2.48	2.80	3.22	2.68	2.75	2.58
30	2.59	2.39	2.17	2.02	---	2.20	2.52	2.73	3.19	2.64	2.71	2.56
31	2.58	---	2.15	1.99	---	2.45	---	2.83	---	2.59	2.68	---
MEAN	2.79	2.50	2.34	2.10	1.86	2.16	2.67	2.76	2.91	2.92	2.70	2.59
MAX	2.94	2.65	2.54	2.19	1.98	2.45	2.85	2.92	3.22	3.17	2.78	2.70
MIN	2.58	2.38	2.15	1.99	1.76	1.98	2.32	2.58	2.66	2.59	2.52	2.48

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