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Water-Quality and Lake-Stage Data for Wisconsin Lakes, Water Years 2012–2013

Open-File Report 2016–1050

U.S. Department of the Interior
U.S. Geological Survey

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By S. Bridgett Manteufel and Dale M. Robertson

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U.S. Department of the Interior
U.S. Geological Survey

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Water-Quality and Lake-Stage Data for Wisconsin Lakes, Water Year 2012

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

Multiply	By	To Obtain
mile (mi)	1.609	kilometer
pound (lb)	453.6	gram
acre	0.4048	hectare
foot (ft)	0.3048	meter
meter (m)	3.281	foot
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 either 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– or the North American Vertical Datum of 1988 (NAVD 88).

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 (mmho/cm) at 25 degrees Celsius, formerly used by the U.S. Geological Survey.

WATER-QUALITY AND LAKE-STAGE DATA FOR WISCONSIN LAKES, WATER YEAR 2012

By Wisconsin Water Science Center
Lake-Studies Team

INTRODUCTION

The U.S. Geological Survey (USGS), in cooperation with local and other agencies, collects data at selected lakes throughout Wisconsin. These data, accumulated over many years, provide a data base for developing an improved understanding of the water quality of lakes. To make these data available to interested parties outside the USGS, the data are published annually in this report series. The locations of water-quality and lake-stage stations in Wisconsin for water year 2012 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, 2011 through September 30, 2012 is called “water year 2012.”

The purpose of this report is to provide information about the chemical and physical characteristics of Wisconsin lakes. Data that have been collected at specific lakes, and information to aid in the interpretation of those data, are included in this report. Data collected include measurements of in-lake water quality and lake stage. Time series of Secchi depths, surface total phosphorus and chlorophyll *a* concentrations collected during non-frozen periods are included for all lakes. Graphs of vertical profiles of temperature, dissolved oxygen, pH, and specific conductance are included for sites where these parameters were measured. Descriptive information for each lake includes: location of the lake, area of the lake’s watershed, period for which data are available, revisions to previously published records, and pertinent remarks. Additional data, such as streamflow and water quality in tributary and outlet streams of some of the lakes, are published in another volume: “Water Resources Data-Wisconsin, 2012."

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

Figure 1. Location of USGS 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 2012 included:

Big Cedar Lake Protection and Rehabilitation District

Dane County

Geneva Lake Environmental Agency

Green Lake Sanitary District

Lake Beulah Management District

Little Cedar Lake Protection and Rehabilitation District

Middle Genesee Lake District

Okauchee Lake Management District

Powers Lake District

Rock County Public Works Department

Town of Delavan

Town of Washington

U.S. Army Corps of Engineers

U.S. Environmental Protection Agency

Village of Oconomowoc Lake

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 2012 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: B.W. Olson (Rhinelander), and S.A. March (Middleton). The data were collected and processed by D.E. Housner, D.L. Olson, P.C. Reneau, Z.T. Scott, B.J. Siebers and C. Utzig. S.B. Manteufel assembled, edited, and formatted the report. Additional assistance in preparation of the report was provided by M.M. Greenwood, and D.L. Olson.

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
Balsam Lake near Birchwood	453907091345800	Mar. 1993–Aug. 1994, Mar. 1996–Aug. 1997, Mar.–Sept. 2001
Bass Lake near Shawano	445215088300300	Feb. 1990–Aug. 1992
Bear Lake at Deep Hole near Haugen	453754091490900	Mar. 1992–Aug. 1993
Beaver Dam Lake, South end, at Beaver Dam	432814088515000	June–Oct. 1991
North end, near Beaver Dam	433122088545700	June–Oct. 1991
Benedict Lake near Powers Lake	423201088180800	May 1998–Aug. 2000
Big Blacksmith Lake near Keshena	445401088334500	Feb. 1990–Aug. 1992
Big Hills (Hills) Lake near Wild Rose	440912089092000	June 1983–Aug. 1984, Feb.–Aug. 1987, Feb.–Aug. 1990, Feb.–Aug. 1993, Feb.–Aug. 1996, Feb.–Aug. 1999
Big Muskego Lake, at North Site, near Muskego	425301088061300	Feb.–Aug. 1988
Research Base, near Muskego	425235088075300	May–June 1994
Big Round Lake near Milltown	453142092180100	Feb.–Sept. 2001
Big St. Germain Lake, near St. Germain	455557089311000	Feb. 1992–Aug. 1996
near Lake Tomahawk	05390750	1991–2001
Big Sand Lake, Deep Hole, near Hertel	454910092134000	Feb.–Sept. 2001
East Site, near Hertel	454921092124300	Feb.–Sept. 2001
Big Sissabagama Lake, near Stone Lake	454724091303600	Apr. 1986–Sept. 1996, Oct. 1997–Sept. 2002
North Site, near Stone Lake	454800091312900	Mar. 1998–Sept. 2001
Booth Lake near East Troy	424800088254800	Feb. 1992–Aug. 1994, Feb. 2001–Aug. 2003
Buffalo Lake, Center Site, at Packwaukee	434558089260600	May 1998–Sept. 2001
East End, at Montello	434720089201600	May 1998–Sept. 2001
West End, near Endeavor	434414089282400	May 1998–Sept. 2001

Table 1. Discontinued lake stations--continued

Station name	Site identification number	Period of record
Butternut Lake, near Park Falls	455854090310300	Oct. 2002–Oct. 2004
Deep Hole, near Park Falls	455803090310800	Mar. 2003–Sept. 2004
North Site, near Butternut	455904090303400	Mar. 2003–Sept. 2004
Far South Site, near Park Falls	455651090312700	Mar. 2003–Sept. 2004
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
Eagle Spring Lake at Eagleville	425103088261500	Apr. 1991–Sept. 2001
Elizabeth Lake near Twin Lakes	423051088155300	Feb. 1995–Sept. 1997
Fish Lake near Sauk City	05406050	Nov. 1966–Sept. 1981, Apr. 1985–May 1987, May 1988, Apr. 1989–Oct. 1990, Oct. 1990–Nov. 1996, Nov. 1996–Sept. 2004
Fowler Lake, Center, at Oconomowoc	430653088294601	Jan.–Dec. 1984, Oct. 1986–Sept. 1996
Fox Lake Deep Hole at Fox Lake	433458088560600	June 1991–Mar. 1993
Geneva Lake, Geneva Bay, at Lake Geneva	423455088263800	Apr. 1997–Feb. 1999
Williams Bay, at Williams Bay	423420088320500	Apr. 1997–Feb. 1999
Center, near Lake Geneva	423402088301400	Apr. 1997–Mar. 1999
East End, near Lake Geneva	423421088272300	Apr. 1997–May 2000
Hemlock Lake near Mikana	453421091333700	Mar. 1993–Aug. 1994, Mar. 1996–Aug. 1997, Mar.–Sept. 2001
Hooker Lake at Salem	423335088060300	Feb. 1992–Aug. 1993
Kawaguesaga, Deep Hole, near Minocqua	455208089435800	May–Sept. 2003
South Site, near Minocqua	455145089442600	May–Sept. 2003
Kirby Lake near Cumberland	453554092042101	Nov. 1995–Oct. 1996
(Site 1) near Cumberland	453608092035801	Nov. 1995–Nov. 1996
(Site 2) near Cumberland	453601092035301	Nov. 1995–Nov. 1996
(Site 3) near Cumberland	453612092034901	Nov. 1995–Nov. 1996
(Site 4) near Cumberland	453603092035701	Nov. 1995–Nov. 1996
(Site 5) near Cumberland	453608092041201	Nov. 1995–Nov. 1996
(Site 6) near Cumberland	453555092040901	Nov. 1995–Nov. 1996

Table 1. Discontinued lake stations--continued

Station name	Site identification number	Period of record
Lac La Belle at Oconomowoc	430733088305900	Feb. 1984–Aug. 1985, Apr. –Aug. 1991, Feb. 2001–Aug. 2003
NW, at Oconomowoc	430809088313900	Feb. 1984–Aug. 1985
SE, at Oconomowoc	430707088301400	Feb. 1984–Aug. 1985
Lake Bastine, Deep Hole, near Mercer	460511090153800	Apr. 2009–Mar. 2010
Lake Blass at Lake Delton	433545089482400	Mar. 1989–Aug. 1990
Lake Desair near Rice Lake	453446091465100	Aug. 2004
Lake Keesus,		
East Bay, near Merton	430957088183400	Apr. 1991–Aug. 1995
North Bay, near Merton	431006088191000	Apr. 1991–Aug. 1995
Lake Morris at Mount Morris	440654089120500	Jun. 1983–Sept. 1989
Lake Nebagamon, Northeast Bay, at Lake Nebagamon	463050091412300	May 1992–Aug. 1995
Southeast Bay, at Lake Nebagamon	462928091413500	Mar. 1992–Sept. 1995
West Bay, at Lake Nebagamon	463034091425300	May 1992–Aug. 1995
Lake Noquebay near Crivitz	451511087550900	Feb. 1987–Aug. 1988, Apr. 1991–Aug. 1994
East End, near Crivitz	451540087525700	Apr. 1991–Aug. 1994
Lamotte Lake near Shawano	445305088361200	Feb. 1990–Aug. 1992
Lauderdale Lakes at Lauderdale	424554088332700	Oct. 1993–Oct. 1994
Mill, at Lauderdale	424555088335700	Nov. 1993–Nov. 1994, Aug. 2002
Green, Auxiliary, Number 1, near Lauderdale	424640088341900	June 1999–Sept. 2000
Green, near Lauderdale	424652088341500	Nov. 1993–Nov. 1994, Aug. 2002
Legend Lake (site 1) near Shawano	445342088312700	Feb. 1990–Feb. 1992
Little Arbor Vitae near Woodruff	455446089370300	Feb. 1991–Sept. 2002
Little Green Lake, at Center, near Markesan	434412088590700	Feb. 1991–Aug. 2003
Little Muskego Lake at Muskego	425425088083500	Oct. 1986–Aug. 2002
Little Rock Lake near Woodruff	455946089415702	Oct. 1983–Sept. 1996
Little St. Germain Lake, near Eagle River	05390700	(a)
Upper East Bay, at St. Germain	455532089253900	Dec. 1996–Mar. 97, Mar. 1999, Mar. 2000–Aug. 2003
Northeast Bay, near St. Germain	455545089262500	Apr. 1991–Aug. 1994, Aug. 1996–Aug. 1997, Mar. 1999–Aug. 2003
South Bay, near St. Germain	455437089270800	Apr. 1991–Aug. 1994, Aug. 1996–Aug. 1997, Mar. 1999–Aug. 2003
West Bay, at St. Germain	455428089282400	Apr. 1991–Aug. 1994, Aug. 1996–Aug. 1997, Mar. 1999–Aug. 2003

Table 1. Discontinued lake stations--continued

Station name	Site identification number	Period of record
Little Sand Lake - Site No. 2 - near Mole Lake	452826088544101	May1996–Sept. 2003
Long (Kee Nong Go-Mong) Lake at Wind Lake	424937088103400	Feb. 1988–Aug. 1989, Feb. 1991–Aug. 1996
Loon Lake near Shawano	445009088303700	Feb. 1991–Aug. 1993
Lost Lake near Beaver Dam	432640088580500	June–Oct. 1991
McKenzie Lakes		
McKenzie (Big McKenzie)		
Deep Hole, near Spooner	455507092013500	Feb. 1987–Aug. 1998
Northern Site, near Spooner	455540092022000	June 1997–Aug. 1998
South Site, near Spooner	455437092022300	June 1997–Aug. 1998
Lower McKenzie, near Webb Lake	455902092011900	June 1997–Aug. 1998
Middle McKenzie, near Spooner	455635092021800	June 1997–Aug. 1998
Mary (Marie) Lake at Twin Lakes	423128088151200	Feb. 1995–Aug. 1997
Max Lake near Woodruff	460128089423501	Mar. 1988–Dec. 1996
Mead Lake, East Bay near Willard	444720090445000	Apr. 1991–Aug. 1995
West Bay near Willard	444733090460100	Feb. 1991–Sept. 1995
Mercer Lake, Deep Hole, at Mercer	460937090033100	Mar. 2008–Sept. 2009
West basin, at Mercer	460945090040600	Mar. 2008–Sept. 2009
Minocqua Lake		
Deep Hole, at Minocqua	455214089412800	May–Sept. 2003
North Bay, at Minocqua	455232089424100	May–Sept. 2003
South Bay, at Minocqua	455206089425200	May–Sept. 2003
Montello Lake at Montello	434748089195800	Feb. 1995–Aug. 1998
Moon Lake near St. Germain	455504089260500	Feb. 1992–Aug. 1996
Morgan Lake near Fence	454622088324801	Oct. 1987–Sept. 1998.
Moshawquit Lake near Shawano	445352088295800	Feb. 1990–Aug. 1992
Muskego (Big Muskego)		
Auxiliary Number 1, near Muskego	425329088054000	June 1996–Aug. 2000
Bass Bay, near Muskego	425344008807010	Feb. 1988–Aug. 2002
near Wind Lake	425109088075000	Oct. 1987–Sept. 1989, Jan. 1991–Sept. 2002
South Site, near Muskego	425212088072800	Feb. 1988–Aug. 2002
Muskellunge Lake near Eagle River	455700089224900	June 2000–Aug. 2001
Muskellunge Lake, near Lake Outlet near Eagle River	455706089232400	Nov. 2000–Oct. 2001
Nagawicka Lake, at Deep Hole, at Delafield	430417088230300	Feb. 2003–Sept. 2004

Table 1. Discontinued lake stations--continued

Station name	Site identification number	Period of record
Namekagon Lakes		
Garden, near Cable	461224091033200	Mar. 1998–Aug. 1999
Jackson, near Cable	461457091065900	Mar. 1998–Aug. 1999
Namekagon		
Deep Hole, near Cable	461308091065100	Mar. 1998–Aug. 1999
East Basin, near Cable	461228091044300	Mar. 1998–Aug. 1999
Northeast Basin, near Cable	461410091050700	Mar. 1998–Aug. 1999
Park Lake (site 1) at Pardeeville	433239089175800	Feb. 1986–Aug. 1987, May–Nov. 1993
(site 2) at Pardeeville	433226089175500	May–Nov. 1993
(site 3) at Pardeeville	433245089173000	May–Nov. 1993
(site 4) at Pardeeville	433257089165100	May–Nov. 1993
Pike Lake near Hartford	431916088200501	Dec. 1998–Dec. 2000
Pike Lake-QW Site-near Hartford	431835088200600	Feb.–Aug. 2000
Potter Lake near Mukwonago	424905088204000	Feb. 1993–Sept. 2007
Pretty Lake, at Deep Hole, near Dousman	425722088295000	Feb. 1993–Aug. 1997
Puckaway Lake, West Basin, near Marquette	434515089124000	Apr. 2005–Sept. 2007
East Basin, near Marquette	43454208907300	Apr. 2005–Sept. 2007
River site, near Marquette	434824089083200	Apr. 2005–Sept. 2007
Red Cedar Lake, at Mikana	453522091360600	Mar. 1993–Aug. 1994, Mar. 1996–Aug. 1997, Oct. 2000–Sept. 2001
Deep Hole, near Mikana	453725091345100	Mar. 1993–Aug. 1994, Mar. 1996–Aug. 1997, Mar. –Sept. 2001
South End, at Mikana	453519091352500	Mar. 1993–Aug. 1994, Mar. 1996–Aug. 1997, Mar. –Sept. 2001
Rice Lake at Deep Hole near Whitewater	424629088415700	Apr.–Nov. 1991
Round Lake near Shawano	445328088335000	Feb. 1990–Aug. 1992
Sand Lake (Deep Hole) near Keshena	445321088323101	June–Aug. 1992
Shell Lake at Shell Lake	05334000	Aug. 1936–Sept. 1999
Silver Lake near Oconomowoc	430436088293300	Apr. 1992–Aug. 1996
Silver Lake near West Bend	432322088125000	Feb. 1996–Aug. 1997 Feb. 2009–Aug. 2009

Table 1. Discontinued lake stations--continued

Station name	Site identification number	Period of record
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
Spooner Lake, Deep Hole, near Spooner	455034091493300	June 2002–Aug. 2004
Southeast Site, near Spooner	454945091483900	June 2002–Aug. 2004
Stewart Lake at Mt. Horeb	430117089442701	May 1992–Sept. 1993
Tichigan Lake near Waterford	424854088123300	Mar. 1994–Aug. 1996, Apr. 2003–Aug. 2004
Tombeau Lake near Powers Lake	423153088184800	May 1998–Aug. 2000
Townline Lake near Mercer	460409090084100	Apr. 2009–Mar. 2010
Trude Lake, Deep Hole, near Mercer	460646090091900	Apr. 2009–Mar. 2010
Turtle-Flambeau Flowage, Deep Hole, near Mercer	460458090102700	Apr. 2009–Mar. 2010
SW Basin, near Mercer	460344090124800	Apr. 2009–Mar. 2010
Lake Bastine, Deep Hole, near Mercer	460511090153800	Apr. 2009–Mar. 2010
Townline Lake, near Mercer	460409090084100	Apr. 2009–Mar. 2010
Trude Lake, Deep Hole, near Mercer	460646090091900	Apr. 2009–Mar. 2010
Twin Lake, East Twin, near Westfield	435430089350700	June 2002–Aug. 2004
West Twin, near Westfield	435438089352300	June 2002–Aug. 2004
Winnebago, Buoy Site, near Oshkosh	440128088271201	May 2011–Sept. 2011

(a) Wisconsin Valley Improvement Co. currently collects stage data for this site.

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

quality data is available in the data report: "Water Resources Data – Wisconsin, 2011". NWIS parameter codes and minimum laboratory reporting levels for chemical constituents are given in table 2. The parameter code for turbidity has changed from 00076 to 63675 or 63676 because the method of testing has changed.

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).

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

Parameter Name	Units	CAS Number[1]	Parameter Code[2]	(NWQL) Standard Analysis LRL	(NWQL) Standard Analysis Lab Code	(NWQL) Low-Level Analysis LRL	(NWQL) Low-Level Analysis Lab Code	(WSLH) LRL	(WSLH) Test Code
Calcium, diss. (Ca)	mg/L	7440-70-2	00915	0.020	659	0.002	1895	0.02	I230IUD
Magnesium, diss. (Mg)	mg/L	7439-95-4	00925	0.004	663	0.001	1897	0.02	I390IUD
Sodium, diss. (Na)	mg/L	7440-23-5	00930	0.09	675	0.025	1898	0.09	I80IUD
Potassium, diss. (K)	mg/L	7440-09-7	00935	0.24	54	0.01	833	0.3	I540IUD
Sulfate, diss. (SO4)	mg/L	14808-79-8	00945	0.31	1572	0.01	1263	1.0	I600DLD
Chloride, diss. (Cl)	mg/L	16887-00-6	00940	0.29	1571	0.01	1259	0.1	I240ELD
Fluoride, diss. (F)	mg/L	16984-48-8	00950	0.100	31	0.01	1260	0.03	I330FLD
Iron, diss. (Fe)	(µg/L)	7439-89-6	01046	10	645	3	1896	10	I370IUD
Manganese, diss. (Mn)	(µg/L)	7439-96-5	01056	2.2	648	1	1793	0.4	I400IUD
Silica, diss. (SiO2)	mg/L	7631-86-9	00955	0.1	56	0.02	1899	0.008	I560LLD
Nitrogen, NO2+NO3, diss.	mg/L	--	00631	0.05	1975	0.005	1979	0.01	I460MLD
Nitrogen, ammonia, diss.	mg/L	7664-41-7	00608	0.02	1976	0.002	1980	0.013	I440NLD
Nitrogen, amm.+org., total[4]	mg/L	17778-88-0	00625	0.100	1985	--	--	0.2	I470BLT
Nitrogen, amm.+org.,diss.	mg/L	--	00623	--	--	--	--	--	I470DLD
Nitrogen, total[5]	mg/L	--	00600	--	--	--	--	--	--
Nitrogen, dissolved	mg/L	--	00602	--	--	--	--	--	--
Phosphorus, total	mg/L	7723-14-0	00665	0.05	1984	0.004	2333	0.005	I520PLT
Phosphorus, ortho, diss.	mg/L	14265-44-2	00671	0.01	1262	0.002	1978	0.002	I530CLD
Chlorophyll a, phytoplankton	(µg/L)	479-61-8	70953	0.1	586	--	--	--	--
Chlorophyll a, phytoplankton	(µg/L)	479-61-8	32210	--	--	--	--	0.26	I250UNF

1: CAS (Chemical Abstracting Services) number = unique identification for each constituent

2: Parameter Code - unique number for storage of data in database

3: Calculated as difference between total ammonia + organic nitrogen and ammonia nitrogen

4: Also known as Total Kjeldahl Nitrogen (TKN)

5: Calculated as sum of TKN + Nitrogen as (NO2+NO3)

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).

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 a 20-cm.-diameter disc with alternating black-and-white quadrants, is lowered to a depth at which it is no longer visible. This depth is referred to as the Secchi depth. Clarity can be reduced by algae, zooplankton, water color, and suspended sediment. Algae are often the most dominant influence on clarity in lakes and, therefore, Secchi depth is usually correlated with the algal abundance. Secchi depths are generally the least during summer when algal populations are largest.

pH

The pH is a measure of the acidity of the water. It is defined as the negative logarithm of hydrogen-ion concentration and varies over a 14-unit log scale, with a pH of 7 being neutral. Values less than 7 indicate acidic conditions; the lower the value, the stronger the acidity. Values greater than 7 indicate alkaline conditions. The pH of water is influenced in part by photosynthesis and respiration of planktonic algae and aquatic plants. It is important because it affects the solubility of many chemical constituents, and because aquatic organisms have

limited pH tolerances. Planktonic algae and aquatic plants produce oxygen and consume carbon dioxide as they photosynthesize during daytime; they consume oxygen and produce carbon dioxide when they respire at night. Carbon dioxide combines with the water molecule to form carbonic acid; therefore respiration causes a decrease in pH at night and photosynthesis during the day causes an increase in pH. The result is a daily cycle in pH. Because phytoplankton are usually concentrated in the near-surface water, changes in pH in the epilimnion are more extreme than in the hypolimnion, where less photosynthesis usually occurs.

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

Dissolved Oxygen

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

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

Anoxia in the hypolimnion is common in stratified eutrophic (nutrient-rich) lakes in Wisconsin. Complete anoxia, however, is often not detected because of meter constraints. During anoxic conditions, many aquatic organisms cannot survive, but many other species

(primarily bacteria) actually function only in such conditions. Therefore, a shift from oxic to anoxic conditions produces a rapid and dramatic change in the biological community and chemical environment. Anoxia also can cause release of phosphorus from the bottom sediments. This phosphorus then mixes throughout the water column during spring and fall turnover.

Phosphorus

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

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

Nitrogen

Nitrogen, like phosphorus, is an essential nutrient for plant and algal growth. Usually in Wisconsin lakes, nitrogen is in abundant supply from the atmosphere and other sources. If phosphorus is abundant relative to algal needs, nitrogen can become the limiting nutrient. In that case, algal blooms are more likely to be triggered by increases in nitrogen than by increases in phosphorus. Some bluegreen algal species can fix nitrogen from the atmosphere

(Wetzel, 1983). Therefore, in situations where other types of algae are excluded because of a shortage of nitrogen, the nitrogen-fixing bluegreen algae have a competitive advantage and may be present in abundance.

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

Chlorophyll *a*

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

CLASSIFICATION OF LAKES

Two methods are commonly used to classify and evaluate Wisconsin lakes according to their water quality or trophic state: Lillie and Mason's (1983) water-quality index and Carlson's (1977) trophic state index (TSI). In previous USGS data reports, a modification of Carlson's trophic state index for Wisconsin lakes by Lillie and others (1993) had been used; however, this approach did not properly classify oligotrophic and highly euthrophic lakes and, therefore, was discontinued.

Lillie and Mason's (1983) water quality indices for Wisconsin lakes were developed based on summer measurements of total phosphorus and chlorophyll *a* concentrations, and Secchi depth from a random set of lakes in Wisconsin. These data were used to classify the lakes's 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

Carlson's (1977) 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.

Carlson's (1977) TSI values are also based on near-surface total phosphorus and chlorophyll *a* concentrations, and Secchi depths. The indices were developed to place these three characteristics on similar scales to allow comparison of different lakes. TSI values based on phosphorus concentrations (TSI_P), Secchi depths (TSI_{SD}), and chlorophyll *a* concentrations (TSI_C) typically are computed only for measurements collected during the open-water period.

TSI values for a lake can be calculated using the following equations (Carlson, 1977):

TSI_P = 4.15 + 14.42 x (ln [total phosphorus concentration x 1,000])

TSI_{SD} = 60.0 – 14.41 x (ln Secchi depth)

TSI_C = 30.6 + 9.81 x (ln chlorophyll *a* concentration)

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

The three main trophic conditions (Carlson, 1977) 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----------	-------0.024--------	---------2.0---------	---------7.2---------
Mesotrophic				
----------	---------40----------	-------0.012--------	---------4.0---------	---------2.6---------
Oligotrophic				

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LAKE DATA

Remarks codes and symbols used in the following tables:

[<, less than; >, greater than; --, not available; E, estimated]

455638089034501 ANVIL LAKE, DEEP HOLE, NEAR EAGLE RIVER, WI

LOCATION.--Lat 45°56'38", long 89°03'45", in SW ¼ sec.13, T.40 N., R.11 E., Vilas County, Hydrologic Unit 07070001, near Eagle River.

SURFACE AREA.—0.62 mi^2.

PERIOD OF RECORD.—May 2012 to August 2012.

REMARKS.--Lake sampled at the deep hole at a depth of 9 m. Water-quality analyses by Wisconsin State Laboratory of Hygiene. A "*" indicates data that were collected by a Citizen Lake Monitoring Volunteer.

WATER-QUALITY DATA, MARCH 13 TO SEPTEMBER 25, 2012

(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro -matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Total nitro-gen, water, unfltrd mg/L (00600)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia + org-N, water, fltrd, mg/L as N (00623)	Ammonia + org-N, water, unfltrd mg/L as N (00625)
MAR 2012													
*13...	--	.50	--	--	--	--	1.01	.008	--	--	--	--	--
*13...	--	--	--	--	--	--	--	.011	--	--	--	--	--
26...	3.10	--	--	--	--	--	--	--	--	--	--	--	--
26...	--	.50	6.8	38	7.1	9.3	2.47	.019	<.002	.36	<.015	--	.24
APR													
*05...	4.30	--	--	--	--	--	--	.008	--	--	--	--	--
*17...	3.10	.50	--	--	--	--	--	.021	--	--	--	--	--
*17...	--	8.5	--	--	--	--	--	.019	--	--	--	--	--
MAY													
*01...	4.30	.50	--	--	--	--	3.23	.015	--	--	--	--	--
*11...	3.70	.50	--	--	--	--	2.85	.013	--	--	--	--	--
*19...	4.30	.50	--	--	--	--	2.10	.013	--	--	--	--	--
22...	3.40	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	.50	17.8	38	8.0	9.3	2.06	.022	--	--	--	--	--
22...	--	8.5	13.1	42	6.4	2.8	--	.026	--	--	--	--	--
*23...	--	--	--	--	--	--	--	.019	--	--	--	--	--
*29...	2.90	--	--	--	--	--	3.23	--	--	--	--	--	--
JUN													
*03...	3.70	--	--	--	--	--	--	--	--	--	--	--	--
*04...	3.20	--	--	--	--	--	--	--	--	--	--	--	--
*15...	3.20	--	--	--	--	--	4.37	.017	--	--	--	--	--
18...	3.50	--	--	--	--	--	--	--	--	--	--	--	--
18...	--	.50	--	--	--	--	5.77	.024	--	--	--	--	--
18...	--	8.5	--	--	--	--	--	.023	--	--	--	--	--
*25...	3.51	.50	--	--	--	--	3.38	--	--	--	--	--	--

455638089034501 ANVIL LAKE, DEEP HOLE, NEAR EAGLE RIVER, WI

WATER-QUALITY DATA, MARCH 13 TO SEPTEMBER 25, 2012

(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro-matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Total nitro-gen, water, unfltrd mg/L (00600)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia + org-N, water, fltrd, mg/L as N (00623)	Ammonia + org-N, water, unfltrd mg/L as N (00625)
JUL													
*03...	3.43	.50	--	--	--	--	2.82	--	--	--	--	--	--
*08...	3.66	.50	--	--	--	--	2.86	--	--	--	--	--	--
17...	3.95	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	.50	26.3	40	8.8	8.2	5.10	.024	.007	<.30	<.015	.37	.28
17...	--	8.0	--	--	--	--	--	.028	--	--	--	--	--
*19...	3.20	.50	--	--	--	--	3.89	.011	--	--	--	--	--
*24...	3.96	.50	--	--	--	--	4.07	.010	--	--	--	--	--
*31...	2.74	.50	--	--	--	--	--	.012	--	--	--	--	--
AUG													
*12...	2.59	--	--	--	--	--	--	.013	--	--	--	--	--
*13...	--	--	--	--	--	--	7.73	.012	--	--	--	--	--
14...	2.40	--	--	--	--	--	--	--	--	--	--	--	--
14...	--	8.0	--	--	--	--	--	.017	--	--	--	--	--
14...	--	4.0	--	--	--	--	--	.013	--	--	--	--	--
14...	--	5.0	--	--	--	--	--	.016	--	--	--	--	--
*19...	2.16	--	--	--	--	--	5.17	--	--	--	--	--	--
*30...	1.83	--	--	--	--	--	14.1	--	--	--	--	--	--
SEP													
*09...	1.68	--	--	--	--	--	9.23	.021	--	--	--	--	--
18...	1.80	--	--	--	--	--	--	--	--	--	--	--	--
18...	--	.50	--	--	--	--	27.9	.021	--	--	--	--	--
*18...	--	--	--	--	--	--	--	.021	--	--	--	--	--
*25...	1.75	--	--	--	--	--	8.46	.021	--	--	--	--	--

455638089034501 ANVIL LAKE, DEEP HOLE, NEAR EAGLE RIVER, WI

WATER-QUALITY DATA, MARCH 13 TO SEPTEMBER 25, 2012

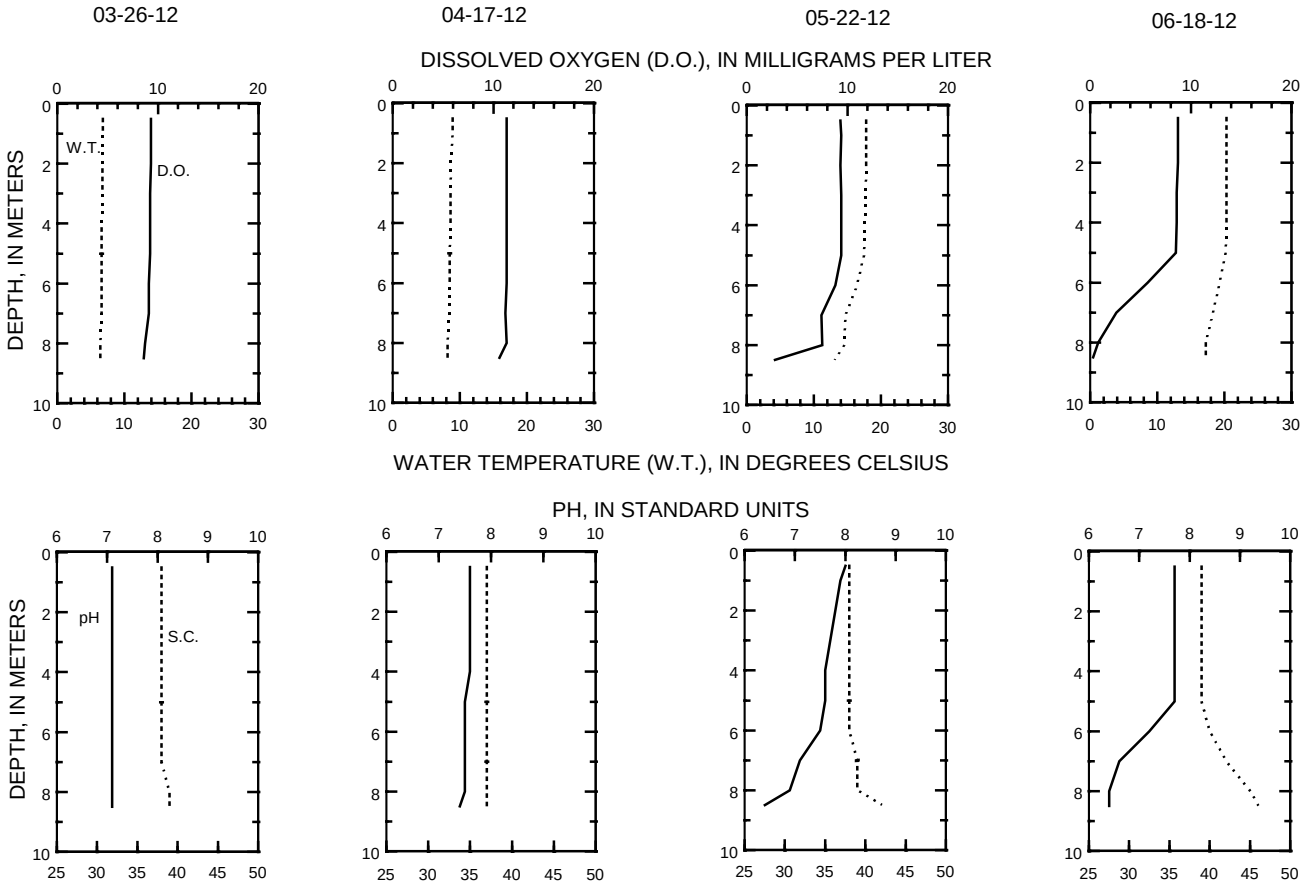
(Milligrams per liter unless otherwise indicated)

Date	Nitrate + nitrite water, fltrd, mg/L as N (00631)	Turbdty white light, det ang 90+/-30 degrees NTU (63675)	Appar-ent color, water, unfltrd Pt-Co units (00081)	Hard-ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Sodium, water, fltrd, mg/L (00930)	Potas-sium, water, fltrd, mg/L (00935)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor-ide, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Silica, water, fltrd, mg/L as SiO2 (00955)	Iron, water, fltrd, ug/L (01046)
MAR 2012													
*13...	--	--	--	--	--	--	--	--	--	--	--	--	--
*13...	--	--	--	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--	--	--	--
26...	.125	2.3	<5	15.6	3.60	1.60	1.50	.30	16	1.1	<4.5	.472	<100
JUL													
*03...	--	--	--	--	--	--	--	--	--	--	--	--	--
*08...	--	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--	--	--
17...	<.019	--	--	--	--	--	--	--	--	--	--	--	--
17...	<.019	--	--	--	--	--	--	--	--	--	--	--	--
17...	<.019	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--	--	--
*19...	--	--	--	--	--	--	--	--	--	--	--	--	--
*24...	--	--	--	--	--	--	--	--	--	--	--	--	--
*31...	--	--	--	--	--	--	--	--	--	--	--	--	--

Date	Manga-nese, water, fltrd, ug/L (01056)	Dis-solved solids dried @ 180degC wat flt mg/L (70300)
MAR 2012		
*13...	--	--
*13...	--	--
26...	--	--
26...	<1.0	<50

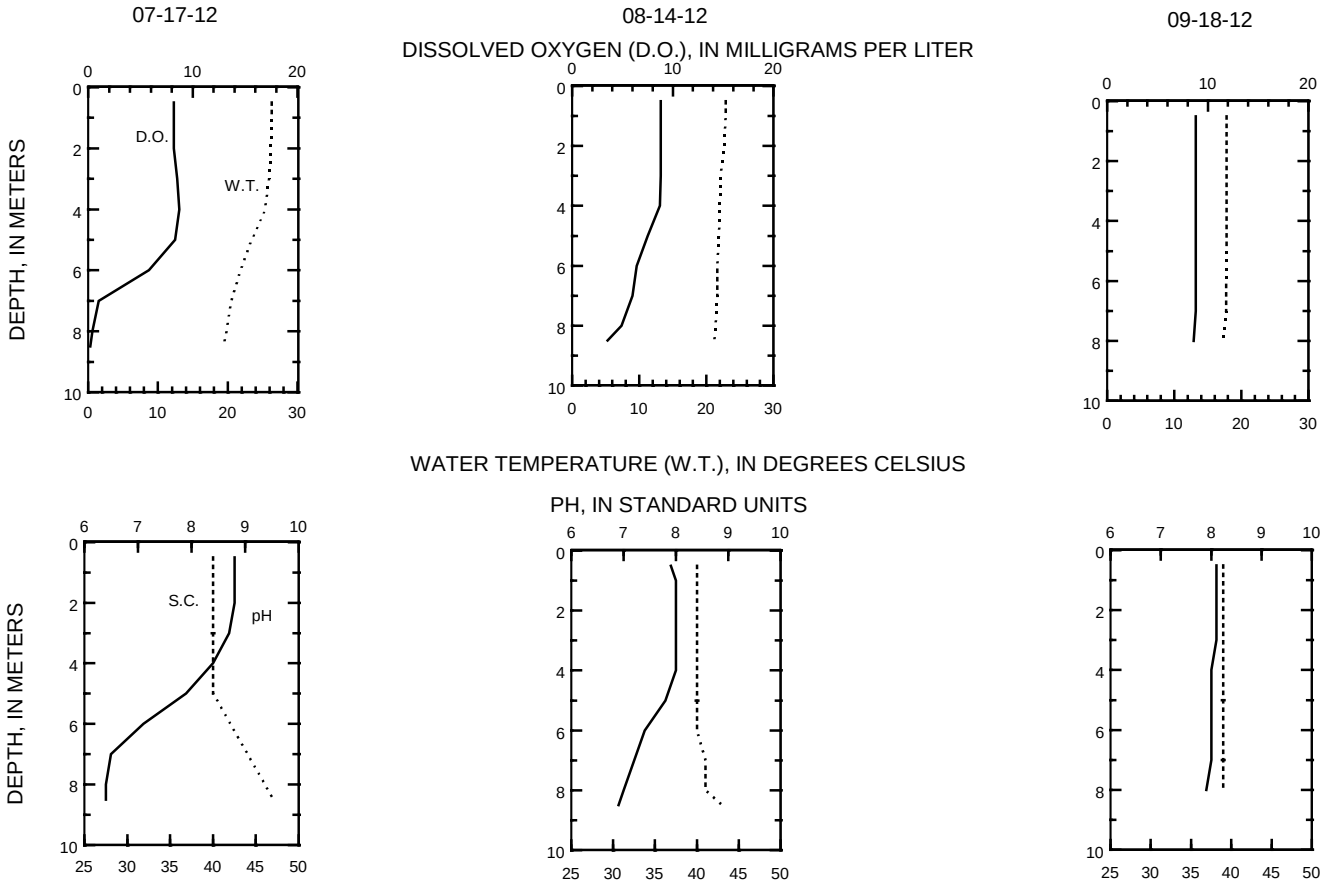
455638089034501 ANVIL LAKE, DEEP HOLE, NEAR EAGLE RIVER, WI

LAKE-DEPTH PROFILES, MARCH 26 TO JUNE 18, 2012



455638089034501 ANVIL LAKE, DEEP HOLE, NEAR EAGLE RIVER, WI

LAKE-DEPTH PROFILES, JULY 17 TO SEPTEMBER 18, 2012



424840088241600 LAKE BEULAH AT DEEP HOLE NEAR EAST TROY, WI

LOCATION.--Lat 42°48'40", long 88°24'16", in SW ¼ NW ¼ NW ¼ sec.17, T.4 N., R.18 E., Walworth County, Hydrologic Unit 07120006, near East Troy.

SURFACE AREA.--1.30 mi^2.

PERIOD OF RECORD.--August 2007 to August 2012.

REMARKS.--Lake sampled at the deep hole at a depth of 19 m. Water-quality analyses by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, MAY 23 TO AUGUST 29, 2012

(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro-matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Total nitro-gen, water, unfltrd mg/L (00600)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrate + nitrite water, fltrd, mg/L as N (00631)
MAY 2012													
23...	5.45	--	--	--	--	--	--	--	--	--	--	--	--
23...	--	.50	20.9	526	8.4	11.4	5.17	.013	<.002	.70	.031	.30	.400
AUG													
29...	2.35	--	--	--	--	--	--	--	--	--	--	--	--
29...	--	2.0	24.7	499	8.4	9.7	6.11	.016	<.002	<.48	<.015	.46	<.019
29...	--	8.0	16.7	551	7.6	3.1	--	.013	<.002	1.0	.188	.62	.379
29...	--	14.0	7.5	566	8.0	.1	--	.019	<.002	.88	.255	.49	.392
29...	--	17.0	6.6	577	7.7	0.0	--	.041	.002	1.3	.584	1.3	.030
29...	--	18.0	6.3	595	7.5	0.0	--	.034	<.002	1.8	1.26	1.8	.022

424840088241600 LAKE BEULAH AT DEEP HOLE NEAR EAST TROY, WI

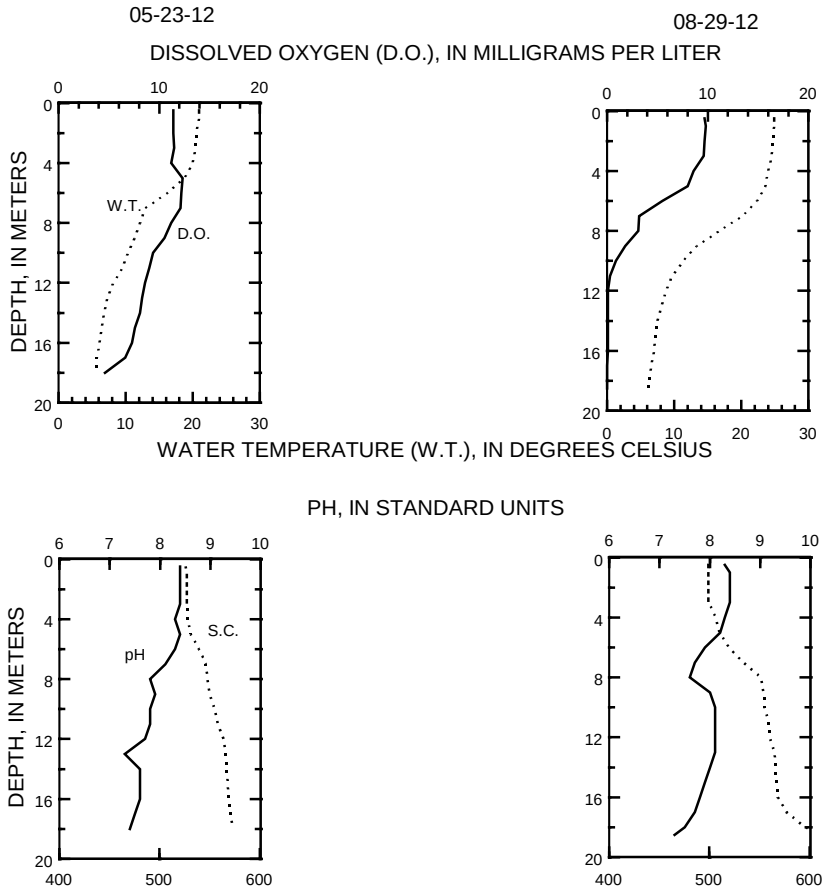
WATER-QUALITY DATA, MAY 23 TO AUGUST 29, 2012

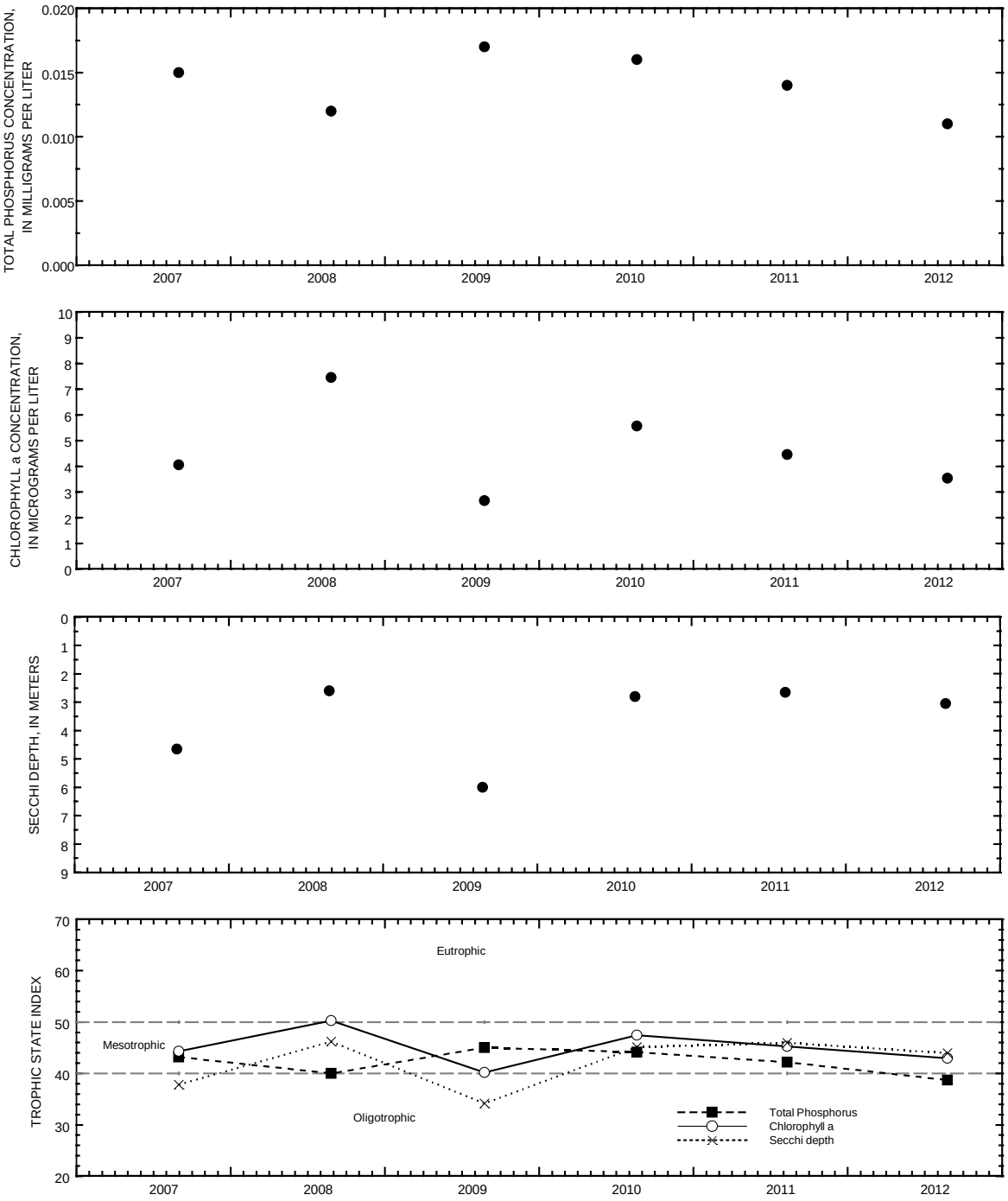
(Milligrams per liter unless otherwise indicated)

Date	Turbdty white light, det ang 90+/-30 degrees NTU (63675)	Hard-ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Sodium, water, fltrd, mg/L (00930)	Potas-sium, water, fltrd, mg/L (00935)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor-ide, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Silica, water, fltrd, mg/L as SiO2 (00955)	Iron, water, fltrd, ug/L (01046)	Manga-nese, water, fltrd, ug/L (01056)	Dis-solved solids dried @ 180degC wat flt mg/L (70300)
MAY 2012													
23...	--	--	--	--	--	--	--	--	--	--	--	--	--
23...	<1.0	264	49.3	34.3	10.7	2.20	220	25.1	30.4	6.38	<100	<1.0	296
AUG													
29...	--	--	--	--	--	--	--	--	--	--	--	--	--
29...	<1.0	248	36.6	38.1	12.1	1.80	205	27.1	32.5	14.5	<100	<1.0	278
29...	<1.0	287	54.7	36.5	10.7	1.90	240	24.7	31.5	9.61	<100	<1.0	304
29...	<1.0	288	57.4	35.2	10.8	1.90	250	24.7	31.1	16.0	<100	130	322
29...	<1.0	282	56.5	34.3	10.9	1.80	255	24.8	30.9	17.8	<100	250	324
29...	<1.0	300	60.4	36.2	10.5	2.00	264	25.0	27.4	20.7	<100	430	336

424840088241600 LAKE BEULAH AT DEEP HOLE NEAR EAST TROY, WI

LAKE-DEPTH PROFILES, MAY 23 TO AUGUST 29, 2012





August surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Lake Beulah, Deep Hole, near East Troy, Wisconsin.

424929088231300 LAKE BEULAH STATION 2 NEAR EAST TROY, WI

LOCATION.--Lat 42°49'29", long 88°23'13", in SE ¼ NE ¼ NE ¼ sec.8, T.4 N., R.18 E., Walworth County, Hydrologic Unit 07120006, near East Troy.

SURFACE AREA.--1.30 mi^2.

PERIOD OF RECORD.--August 2007 to August 2012.

REMARKS.--Lake sampled at a depth of 15 m. Water-quality analyses by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, MAY 23 TO AUGUST 29, 2012

(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro-matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Total nitro-gen, water, unfltrd mg/L (00600)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrate + nitrite water, fltrd, mg/L as N (00631)
MAY 2012													
23...	7.35	--	--	--	--	--	--	--	--	--	--	--	--
23...	--	.50	21.4	468	8.5	10.5	4.74	.015	<.002	.44	.021	.42	.021
AUG													
29...	3.25	--	--	--	--	--	--	--	--	--	--	--	--
29...	--	2.0	25.0	456	8.5	9.4	5.03	.015	<.002	<.65	<.015	.63	<.019
29...	--	9.0	14.2	484	7.8	3.3	--	.012	--	--	--	--	--
29...	--	12.0	8.5	505	7.6	.3	--	.020	--	--	--	--	--
29...	--	14.0	7.2	516	7.4	.1	--	.045	--	--	--	--	--
29...	--	15.0	6.9	529	7.2	.1	--	.047	<.002	<1.8	1.37	1.8	<.019

424929088231300 LAKE BEULAH STATION 2 NEAR EAST TROY, WI

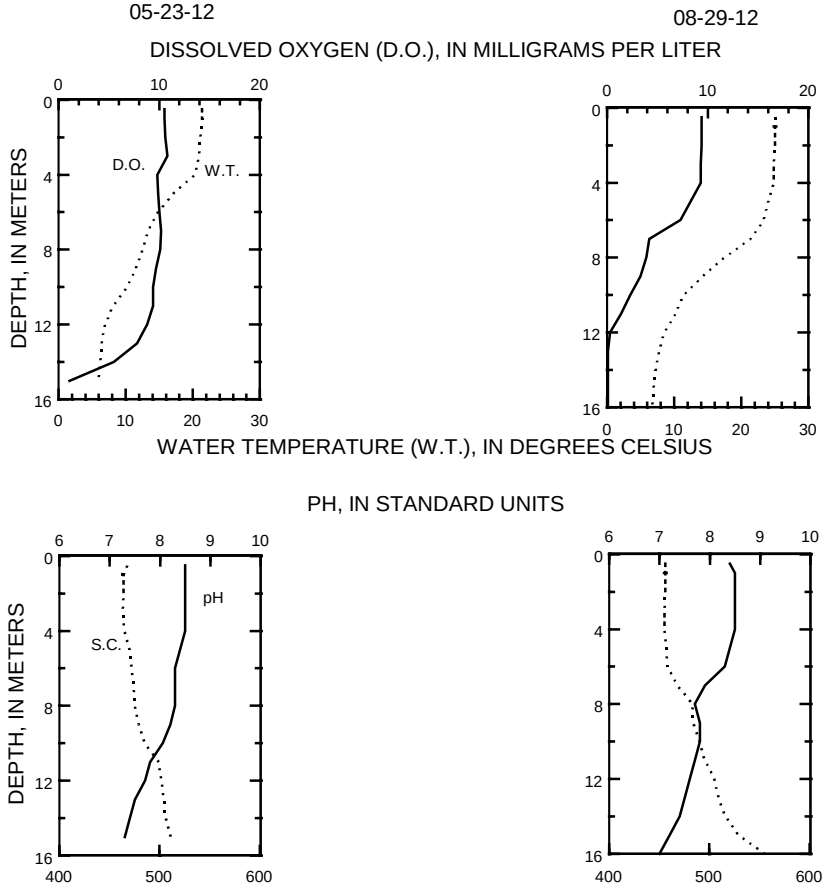
WATER-QUALITY DATA, MAY 23 TO AUGUST 29, 2012

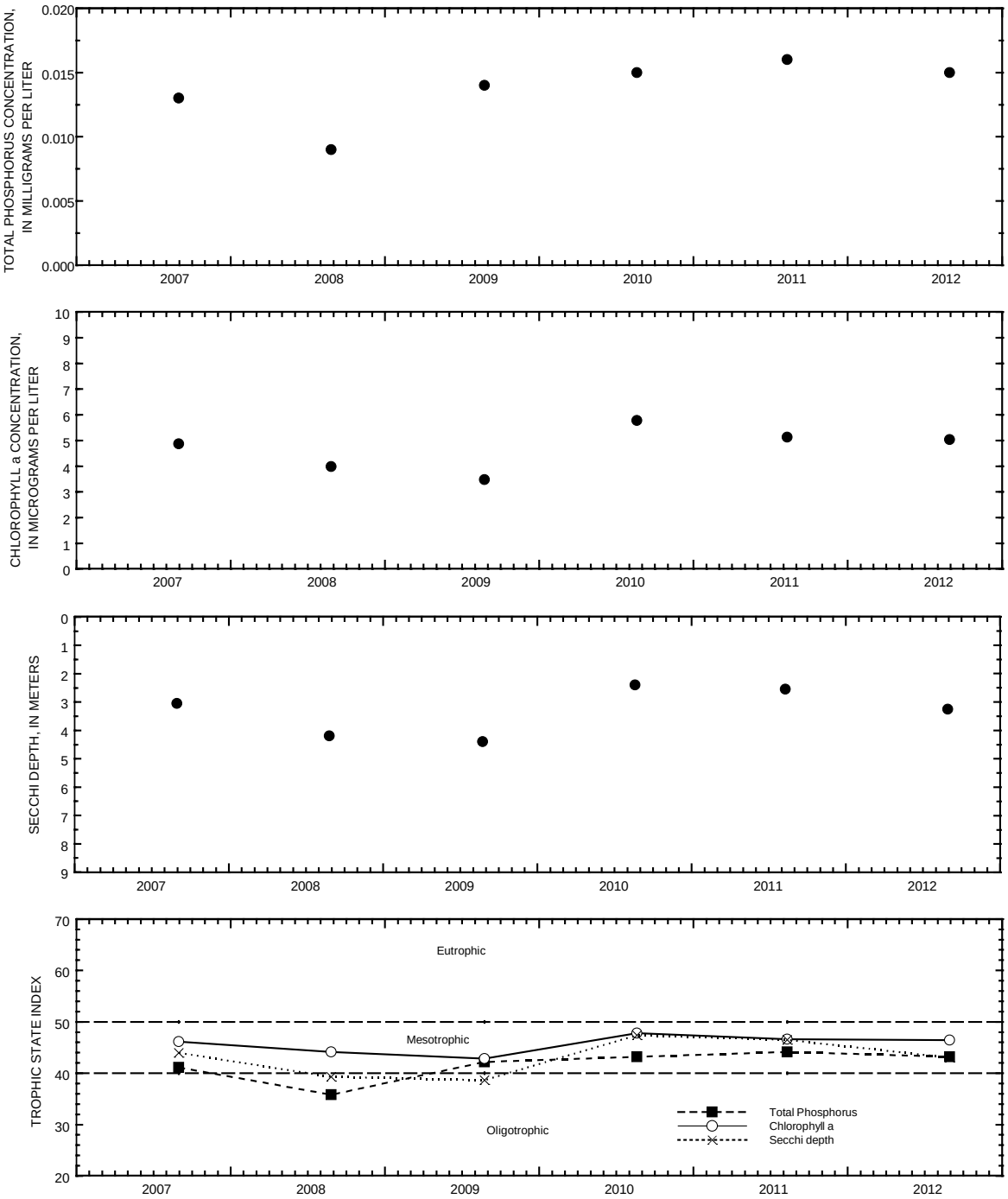
(Milligrams per liter unless otherwise indicated)

Date	Turbdty white light, det ang 90+/-30 degrees NTU (63675)	Hard-ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Sodium, water, fltrd, mg/L (00930)	Potas-sium, water, fltrd, mg/L (00935)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor-ide, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Silica, water, fltrd, mg/L as SiO2 (00955)	Iron, water, fltrd, ug/L (01046)	Manga-nese, water, fltrd, ug/L (01056)	Dis-solved solids dried @ 180degC wat flt mg/L (70300)
MAY 2012													
23...	--	--	--	--	--	--	--	--	--	--	--	--	--
23...	<1.0	223	34.8	33.0	11.4	2.20	182	26.5	27.2	6.70	<100	<1.0	260
AUG													
29...	--	--	--	--	--	--	--	--	--	--	--	--	--
29...	<1.0	226	28.6	37.5	12.3	2.00	182	28.2	29.9	13.1	<100	<1.0	250
29...	--	--	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--	--	--
29...	<1.0	238	42.9	31.9	11.3	1.80	228	28.4	19.8	19.0	<100	260	298

424929088231300 LAKE BEULAH STATION 2 NEAR EAST TROY, WI

LAKE-DEPTH PROFILES, MAY 23 TO AUGUST 29, 2012





August surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Lake Beulah, Station 2, near East Troy, Wisconsin.

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

LOCATION.--Lat 43°24'09", long 88°15'16", in NE ¼ SW ¼ sec. 20, T.11 N., R.19 E., Washington County, Hydrologic Unit 04040003, near West Bend.

SURFACE AREA.--1.46 mi^2.

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

REMARKS.--Lake sampled on north side at a depth of 12 m. The lake was not sampled during winter ice cover because of unsafe winter conditions. Water-quality analyses by Wisconsin State Laboratory of Hygiene.

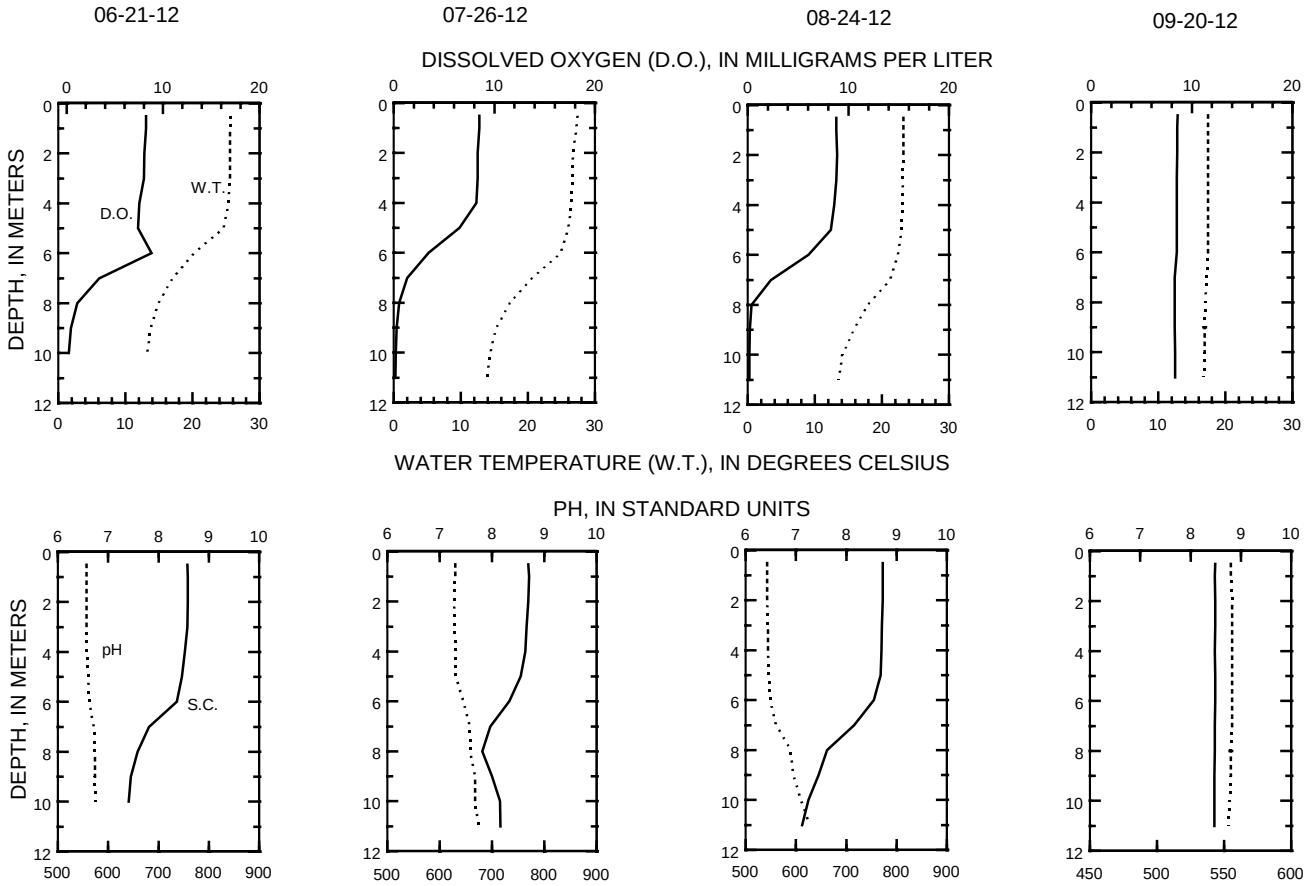
WATER-QUALITY DATA, MAY 4 TO SEPTEMBER 20, 2012

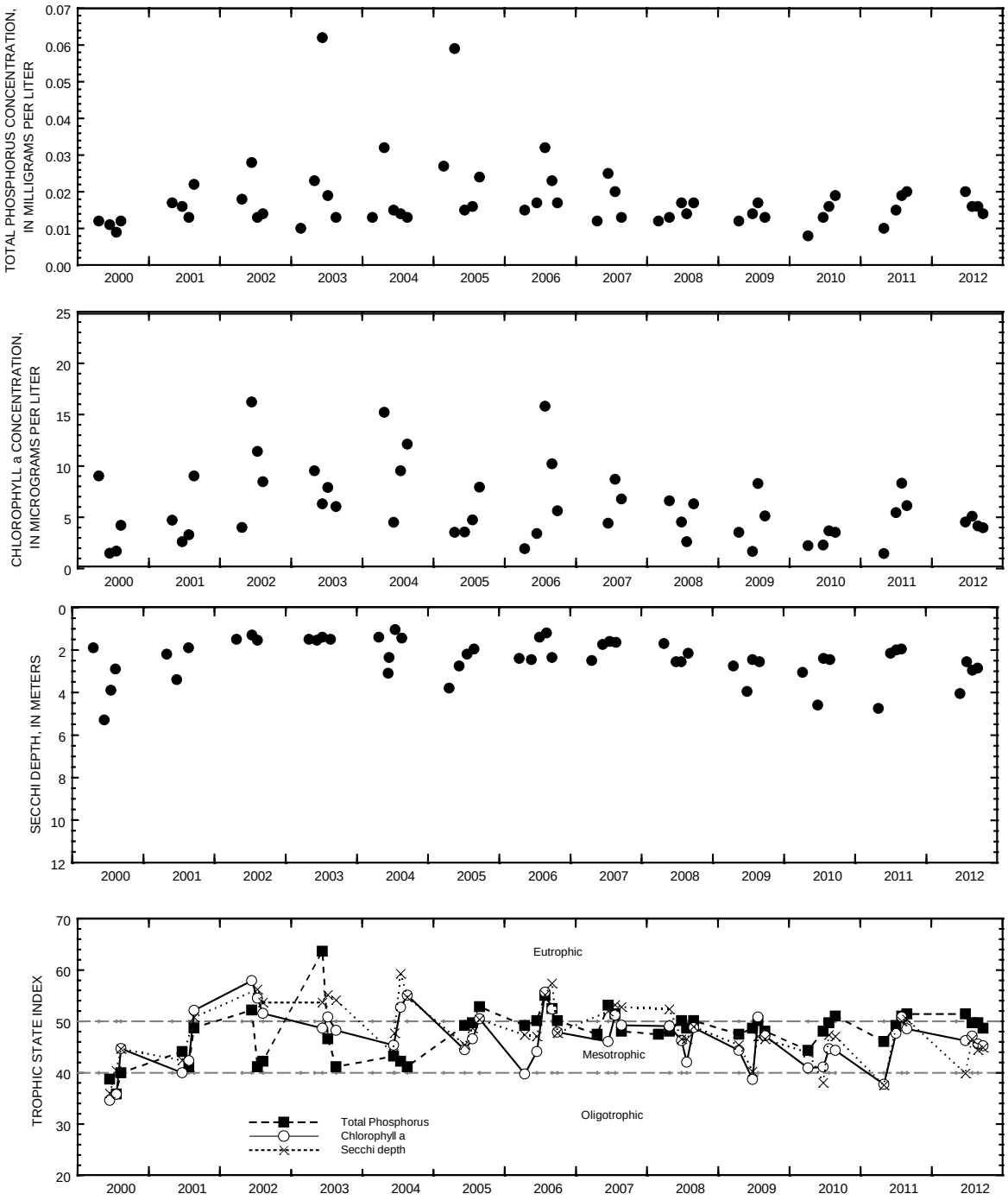
(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro -matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)
JUN 2012								
21...	4.05	--	--	--	--	--	--	--
21...	--	.50	25.6	557	8.6	8.2	4.54	.020
21...	--	10.0	13.3	575	7.4	.3	--	.021
JUL								
26...	2.55	--	--	--	--	--	--	--
26...	--	.50	27.4	630	8.7	8.5	5.08	.016
26...	--	10.5	13.9	674	8.2	.1	--	.038
AUG								
24...	2.95	--	--	--	--	--	--	--
24...	--	.50	23.2	543	8.7	8.8	4.16	.016
24...	--	10.5	13.6	627	7.1	.2	--	.040
SEP								
20...	2.85	--	--	--	--	--	--	--
20...	--	.50	17.4	555	8.5	8.6	3.97	.014
20...	--	11.0	16.8	553	8.5	8.3	--	.015

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

LAKE-DEPTH PROFILES, JUNE 21 TO SEPTEMBER 20, 2012





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

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

LOCATION.--Lat 43°22'24", long 88°15'49", in NE ¼ SE ¼ sec.31, T.11 N., R.19 E., Washington County, Hydrologic Unit 04040003, near West Bend.

SURFACE AREA.--1.46 mi^2.

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

REMARKS.--Lake sampled on south side at deep hole. The lake was not sampled during winter ice cover because of unsafe winter conditions. Water-quality analyses by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, MAY 4 TO SEPTEMBER 20, 2012
(Milligrams per liter unless otherwise indicated)

Date	Transparency Secchi disc, meters (00078)	Sampling depth, meters (00098)	Temperature, water, deg C (00010)	Specific conductance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dissolved oxygen, mg/L (00300)	Chlorophyll a trichro-matic method, uncorr, ug/L (32210)	Phosphorus, water, unfltrd mg/L as P (00665)	Orthophosphate, water, fltrd, mg/L as P (00671)	Total nitrogen, water, unfltrd mg/L (00600)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrate + nitrite water, fltrd, mg/L as N (00631)
MAY 2012													
04...	8.95	--	--	--	--	--	--	--	--	--	--	--	--
04...	--	.50	12.7	548	8.2	10.9	.770	.008	<.002	.95	.057	.72	.230
JUN													
21...	4.25	--	--	--	--	--	--	--	--	--	--	--	--
21...	--	.50	24.3	549	8.6	8.8	2.81	.016	--	--	--	--	--
21...	--	29.0	5.5	573	7.3	.6	--	.050	--	--	--	--	--
JUL													
26...	3.55	--	--	--	--	--	--	--	--	--	--	--	--
26...	--	.50	27.0	615	8.5	8.5	2.85	.011	.004	.45	--	--	--
26...	--	30.0	5.5	669	7.8	.1	--	.042	--	--	--	--	--
AUG													
24...	3.05	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	.50	22.8	532	8.6	9.0	3.53	.011	--	--	--	--	--
24...	--	30.0	5.5	612	7.3	.1	--	.028	--	--	--	--	--
SEP													
20...	4.25	--	--	--	--	--	--	--	--	--	--	--	--
20...	--	.50	18.4	536	8.6	8.7	3.16	.011	--	--	--	--	--
20...	--	30.0	5.7	591	7.0	.2	--	.078	--	--	--	--	--

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

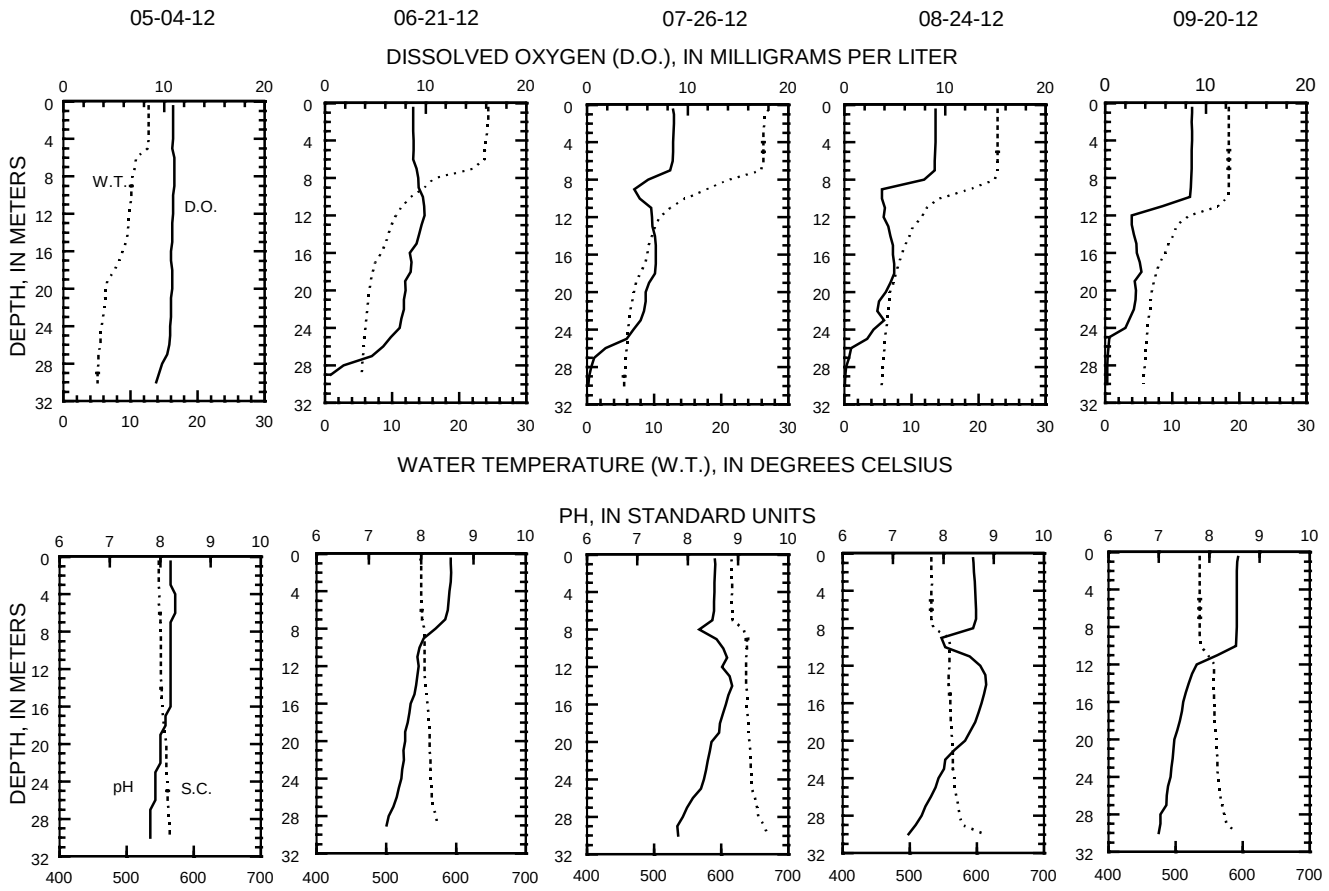
WATER-QUALITY DATA, MARCH 9 TO AUGUST 26, 2011
(Milligrams per liter unless otherwise indicated)

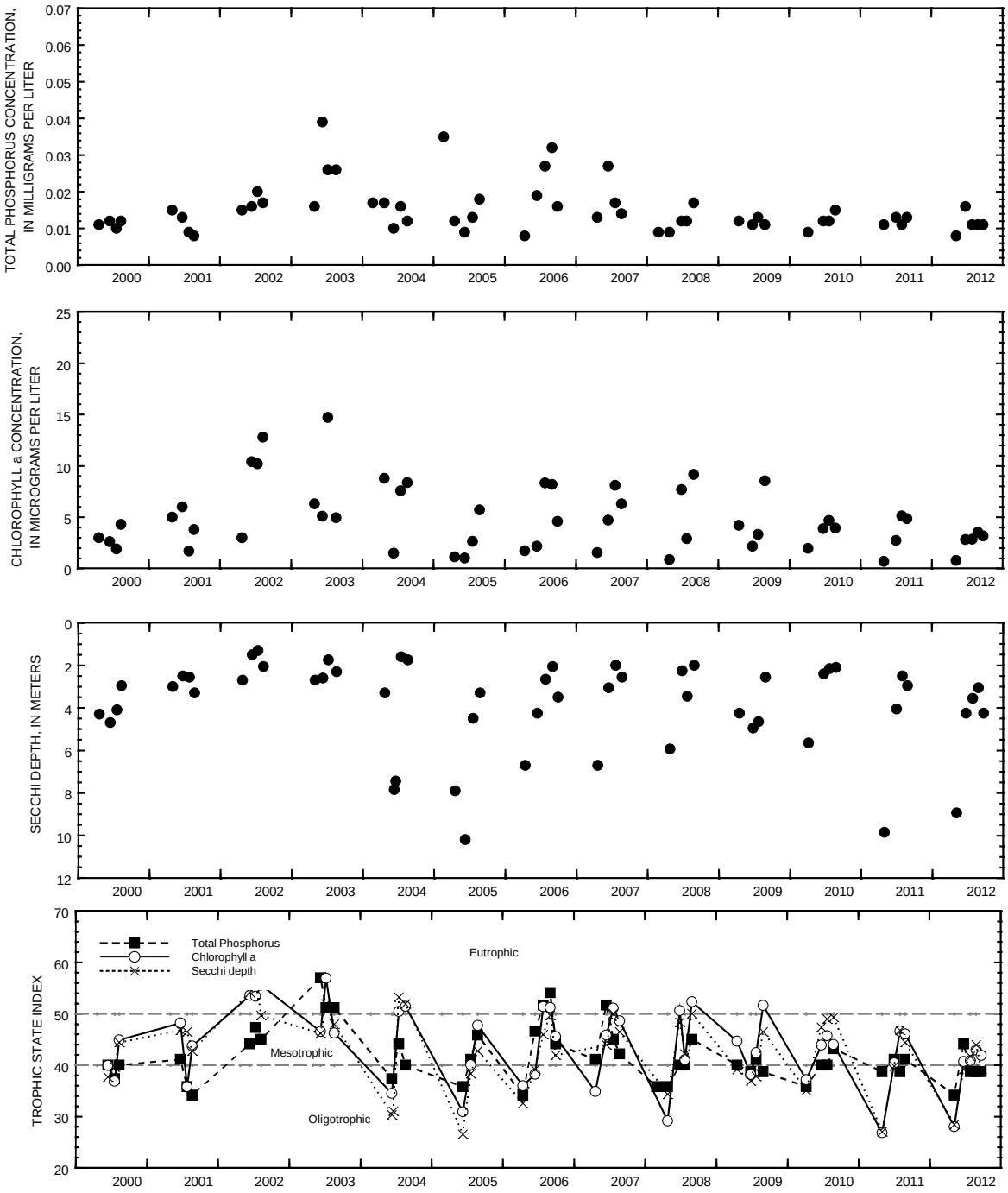
Date	Turbdty white light, det ang 90+/-30 degrees NTU (63675)	Appar-ent color, water, unfltrd Pt-Co units (00081)	Hard-ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Sodium, water, fltrd, mg/L (00930)	Potas-sium, water, fltrd, mg/L (00935)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor-ide, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Silica, water, fltrd, mg/L as SiO2 (00955)	Iron, water, fltrd, ug/L (01046)	Manga-nese, water, fltrd, ug/L (01056)
MAY 2012													
04...	--	--	--	--	--	--	--	--	--	--	--	--	--
04...	<1.0	5	230	35.4	34.3	24.2	2.10	191	52.2	21.5	2.83	<100	<1.0
JUN													
21...	--	--	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUL													
26...	--	--	--	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--	--	--	--
AUG													
24...	--	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--	--	--
SEP													
20...	--	--	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--	--	--

Date	Dis-solved solids dried @ 180degC wat flt mg/L (70300)
MAY 2012	
04...	--
04...	296

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

LAKE-DEPTH PROFILES, MAY 4 TO SEPTEMBER 20, 2012





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

423556088365001 DELAVAN LAKE AT CENTER NEAR DELAVAN LAKE, WI

LOCATION.--Lat 42°35'56", long 88°36'50", in SE ¼ SW ¼ sec.28, T.2 N., R.16 E., Walworth County, Hydrologic Unit 07090001, 2.6 mi southeast of Delavan.

SURFACE AREA.--3.24 mi^2.

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

PERIOD OF RECORD.--October 1983 to September 2009, October 2011 to September 2012.

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

WATER-QUALITY DATA, MARCH 15 TO SEPTEMBER 26, 2012

(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro-matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Total nitro-gen, water, unfltrd mg/L (00600)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia + org-N, water, fltrd, mg/L as N (00623)	Ammonia + org-N, water, unfltrd mg/L as N (00625)
MAR 2012													
15...	2.85	--	--	--	--	--	--	--	--	--	--	--	--
15...	--	.50	5.6	563	8.2	15.1	15.4	.007	<.002	.83	.021	--	.58
15...	--	16.0	5.0	564	8.4	14.8	--	.029	.002	--	--	--	--
APR													
11...	6.85	--	--	--	--	--	--	--	--	--	--	--	--
11...	--	.50	10.3	568	8.0	10.7	5.10	.020	.006	.73	.045	--	.52
11...	--	16.0	10.1	571	8.2	10.4	--	.026	--	--	--	--	--
MAY													
22...	4.40	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	.50	18.8	572	8.5	10.7	15.4	.025	<.002	.59	.016	--	.55
22...	--	7.0	18.0	574	8.4	9.9	--	.026	<.002	--	--	--	--
22...	--	10.0	15.1	578	8.0	6.6	--	.032	.012	--	--	--	--
22...	--	16.0	13.6	583	7.7	3.8	--	.072	.047	--	--	--	--
JUN													
27...	3.55	--	--	--	--	--	--	--	--	--	--	--	--
27...	--	.50	23.8	578	8.2	8.6	7.12	.025	<.002	<.69	<.015	--	.67
27...	--	9.0	23.5	580	8.3	7.8	--	.034	.016	--	--	--	--
27...	--	14.0	15.6	595	7.4	.3	--	.317	.292	--	--	--	--
27...	--	16.0	14.8	599	7.4	.2	--	.418	.418	--	--	--	--
JUL													
24...	2.25	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	.50	26.8	574	8.4	8.0	8.11	.024	<.002	<.43	<.015	.59	.41
24...	--	8.0	26.0	577	8.3	5.3	--	.026	<.002	--	--	--	--
24...	--	13.0	16.4	605	7.5	.1	--	.431	.394	--	--	--	--
24...	--	15.0	15.2	619	7.5	.1	--	.512	.465	--	--	--	--

423556088365001 DELAVAN LAKE AT CENTER NEAR DELAVAN LAKE, WI

WATER-QUALITY DATA, MARCH 15 TO SEPTEMBER 26, 2012

(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro-matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Total nitro-gen, water, unfltrd mg/L (00600)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia + org-N, water, fltrd, mg/L as N (00623)	Ammonia + org-N, water, unfltrd mg/L as N (00625)
AUG													
22...	3.35	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	.50	24.0	571	8.4	9.5	8.09	.022	<.002	.57	<.015	--	--
22...	--	10.0	22.8	578	7.9	3.1	--	.040	.042	--	--	--	--
22...	--	11.0	20.8	595	7.5	.3	--	.132	--	--	--	--	--
22...	--	12.0	18.3	605	7.4	.3	--	.263	--	--	--	--	--
22...	--	13.0	16.7	616	7.2	.2	--	.468	--	--	--	--	--
22...	--	14.0	16.1	618	7.2	.2	--	.461	.457	--	--	--	--
22...	--	15.0	15.2	637	7.1	.1	--	.501	.439	--	--	--	--

Date	Nitrate + nitrite water, fltrd, mg/L as N (00631)	Turbdty white light, det ang 90+/-30 degrees NTU (63675)	Appar-ent color, water, unfltrd Pt-Co units (00081)	Hard-ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Sodium, water, fltrd, mg/L (00930)	Potas-sium, water, fltrd, mg/L (00935)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor-ide, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Silica, water, fltrd, mg/L as SiO2 (00955)	Iron, water, fltrd, ug/L (01046)
MAR 2012													
15...	--	--	--	--	--	--	--	--	--	--	--	--	--
15...	.250	--	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--	--	--
APR													
11...	--	--	--	--	--	--	--	--	--	--	--	--	--
11...	.214	<1.0	5	230	40.5	31.3	29.8	2.40	188	60.4	25.2	.532	<100
11...	--	--	--	--	--	--	--	--	--	--	--	--	--
MAY													
22...	--	--	--	--	--	--	--	--	--	--	--	--	--
22...	.035	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUN													
27...	--	--	--	--	--	--	--	--	--	--	--	--	--
27...	<.019	--	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--	--	--

423556088365001 DELAVAN LAKE AT CENTER NEAR DELAVAN LAKE, WI

WATER-QUALITY DATA, MARCH 15 TO SEPTEMBER 26, 2012

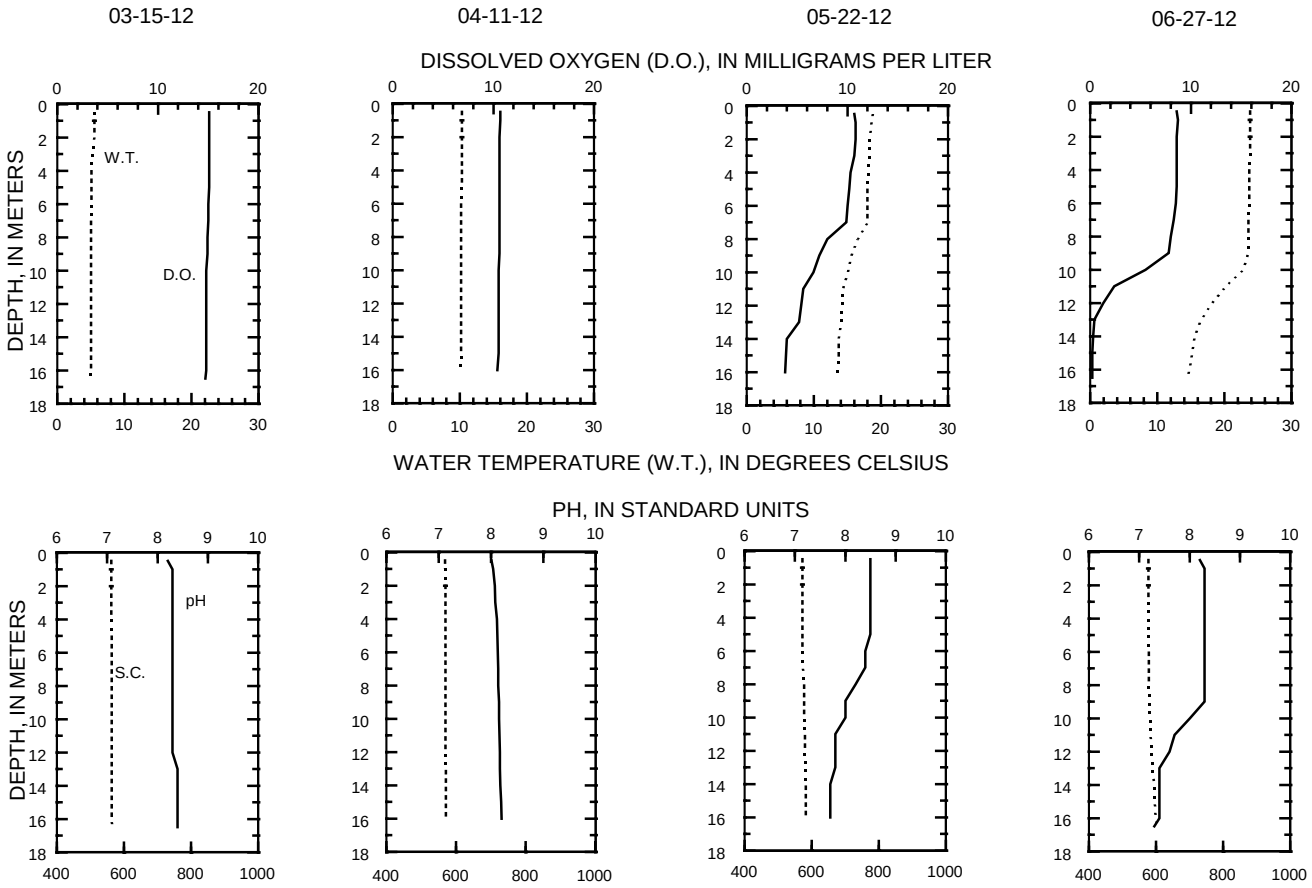
(Milligrams per liter unless otherwise indicated)

Date	Nitrate + nitrite water, fltrd, mg/L as N (00631)	Turbdty white light, det ang 90+/-30 degrees NTU (63675)	Appar-ent color, water, unfltrd Pt-Co units (00081)	Hard-ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Sodium, water, fltrd, mg/L (00930)	Potas-sium, water, fltrd, mg/L (00935)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor-ide, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Silica, water, fltrd, mg/L as SiO2 (00955)	Iron, water, fltrd, ug/L (01046)
JUL													
24...	--	--	--	--	--	--	--	--	--	--	--	--	--
24...	<.019	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--	--	--
AUG													
22...	--	--	--	--	--	--	--	--	--	--	--	--	--
22...	<.019	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--	--	--
SEP													
26...	--	--	--	--	--	--	--	--	--	--	--	--	--
26...	.033	--	--	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--	--	--	--

Date	Manga-nese, water, fltrd, ug/L (01056)	Dis-solved solids dried @ 180degC wat flt mg/L (70300)
MAR 2012		
15...	--	--
15...	--	--
15...	--	--
APR		
11...	--	--
11...	<1.0	314
11...	--	--

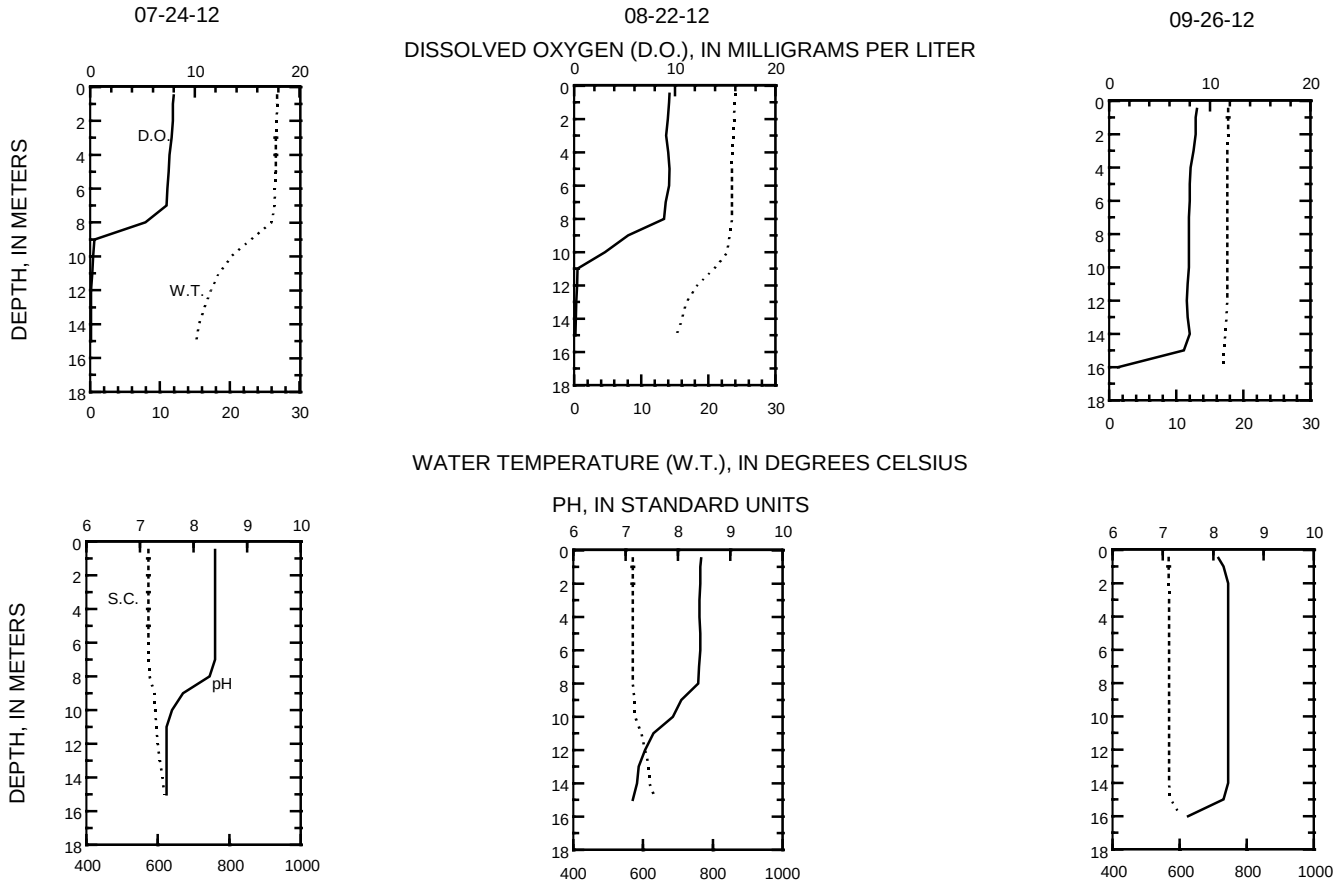
423556088365001 DELAVAN LAKE AT CENTER NEAR DELAVAN LAKE, WI

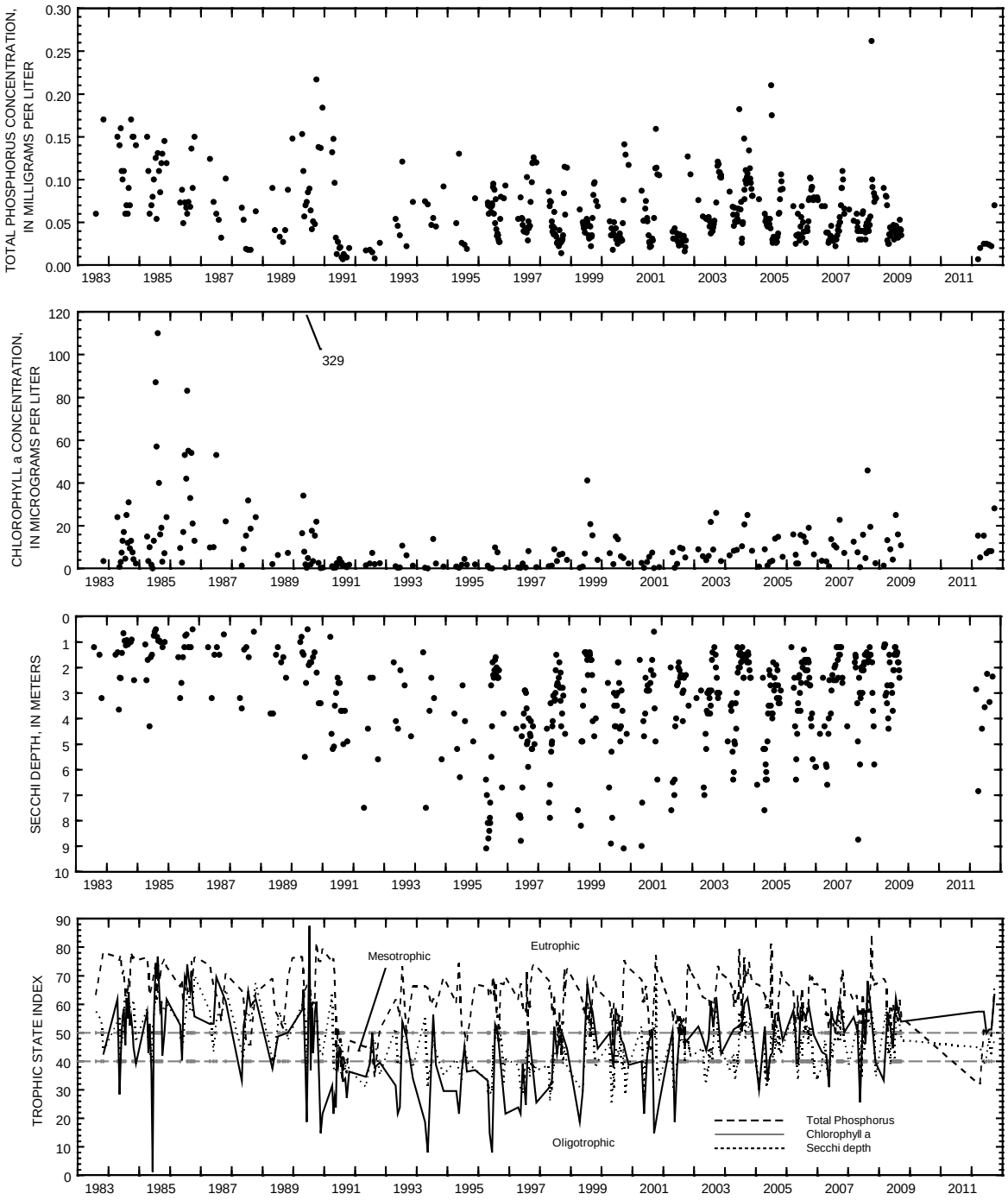
LAKE-DEPTH PROFILES, MARCH 15 TO JUNE 27, 2012



423556088365001 DELAVAN LAKE AT CENTER NEAR DELAVAN LAKE, WI

LAKE-DEPTH PROFILES, JULY 24 TO SEPTEMBER 26, 2012





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

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

LOCATION.--Lat 42°36'59", long 88°35'44", in NW ¼ SW ¼ sec.22, T.2 N., R.16 E., Walworth County, Hydrologic Unit 07090001, 2.6 mi southeast of Delavan.

SURFACE AREA--3.24 mi^2.

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

PERIOD OF RECORD.--October 1983 to August 2009, March to September 2012.

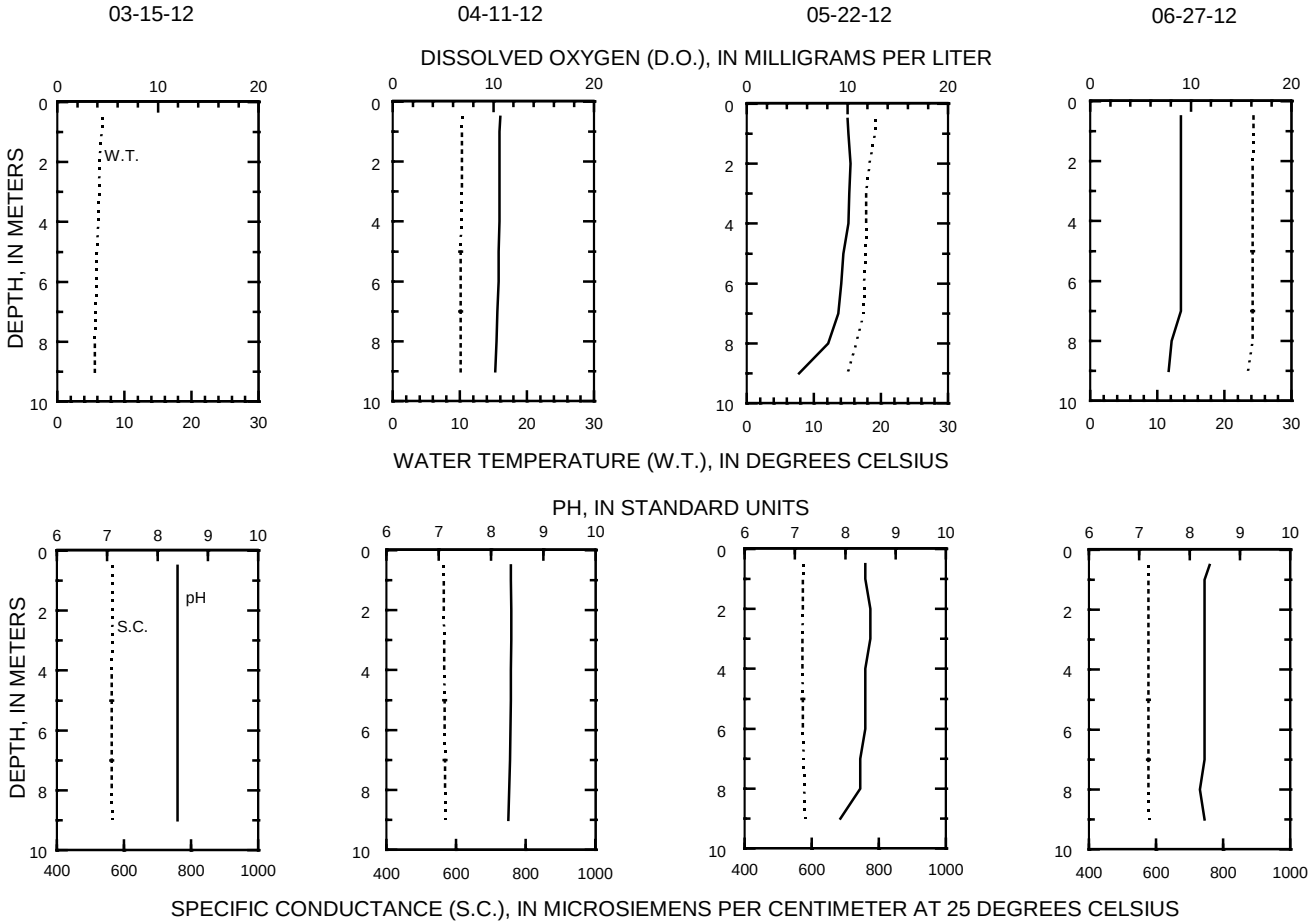
WATER-QUALITY DATA, MARCH 15 TO SEPTEMBER 26, 2012

(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro -matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)
MAR 2012								
15...	2.55	--	--	--	--	--	--	--
15...	--	.50	6.8	566	8.4	--	--	.021
APR								
11...	6.25	--	--	--	--	--	--	--
11...	--	.50	10.4	564	8.4	10.7	--	.020
MAY								
22...	4.55	--	--	--	--	--	--	--
22...	--	.50	19.2	576	8.4	10.0	15.3	.026
JUN								
27...	3.50	--	--	--	--	--	--	--
27...	--	.50	24.3	576	8.4	9.0	11.5	.026
JUL								
24...	2.45	--	--	--	--	--	--	--
24...	--	.50	27.1	573	8.4	8.4	12.7	.028
AUG								
22...	3.35	--	--	--	--	--	--	--
22...	--	.50	24.2	569	8.5	9.7	7.73	.022
SEP								
26...	2.05	--	--	--	--	--	--	--
26...	--	.50	18.1	563	8.3	10.6	40.8	.062

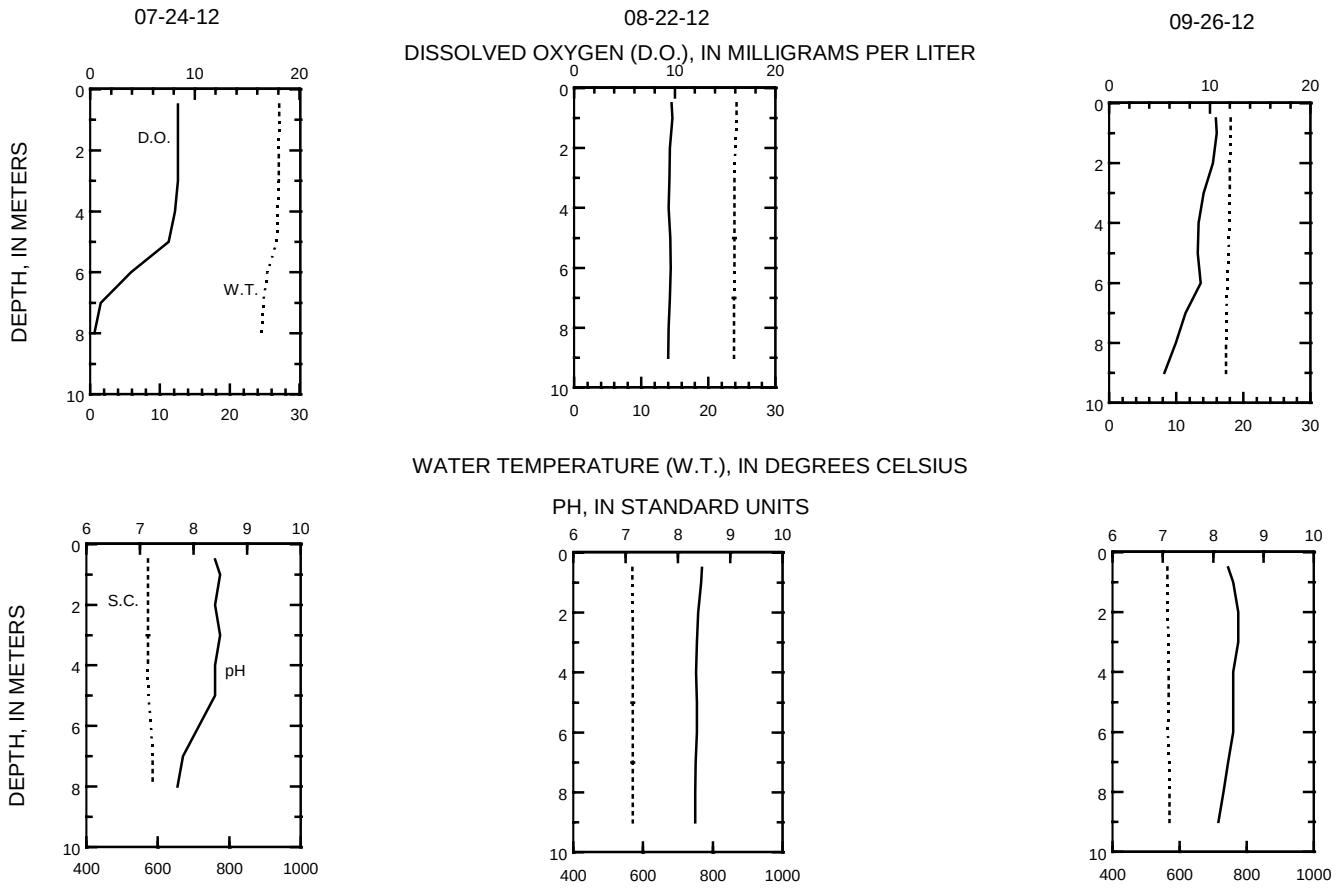
423659088354401 DELAVAN LAKE, AT NORTH END, NEAR LAKE LAWN, WI

LAKE-DEPTH PROFILES, MARCH 15 TO JUNE 27, 2012



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

LAKE-DEPTH PROFILES, JULY 24 TO SEPTEMBER 26, 2012



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

LOCATION.--Lat 42°35'26", long 88°38'01", in SE ¼ NW ¼ sec.32, T.2 N., R.16 E., Walworth County, Hydrologic Unit 07090001, 2.6 mi southeast of Delavan.

SURFACE AREA--3.24 mi^2.

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

PERIOD OF RECORD.-- October 1983 to August 2009, March to September 2012.

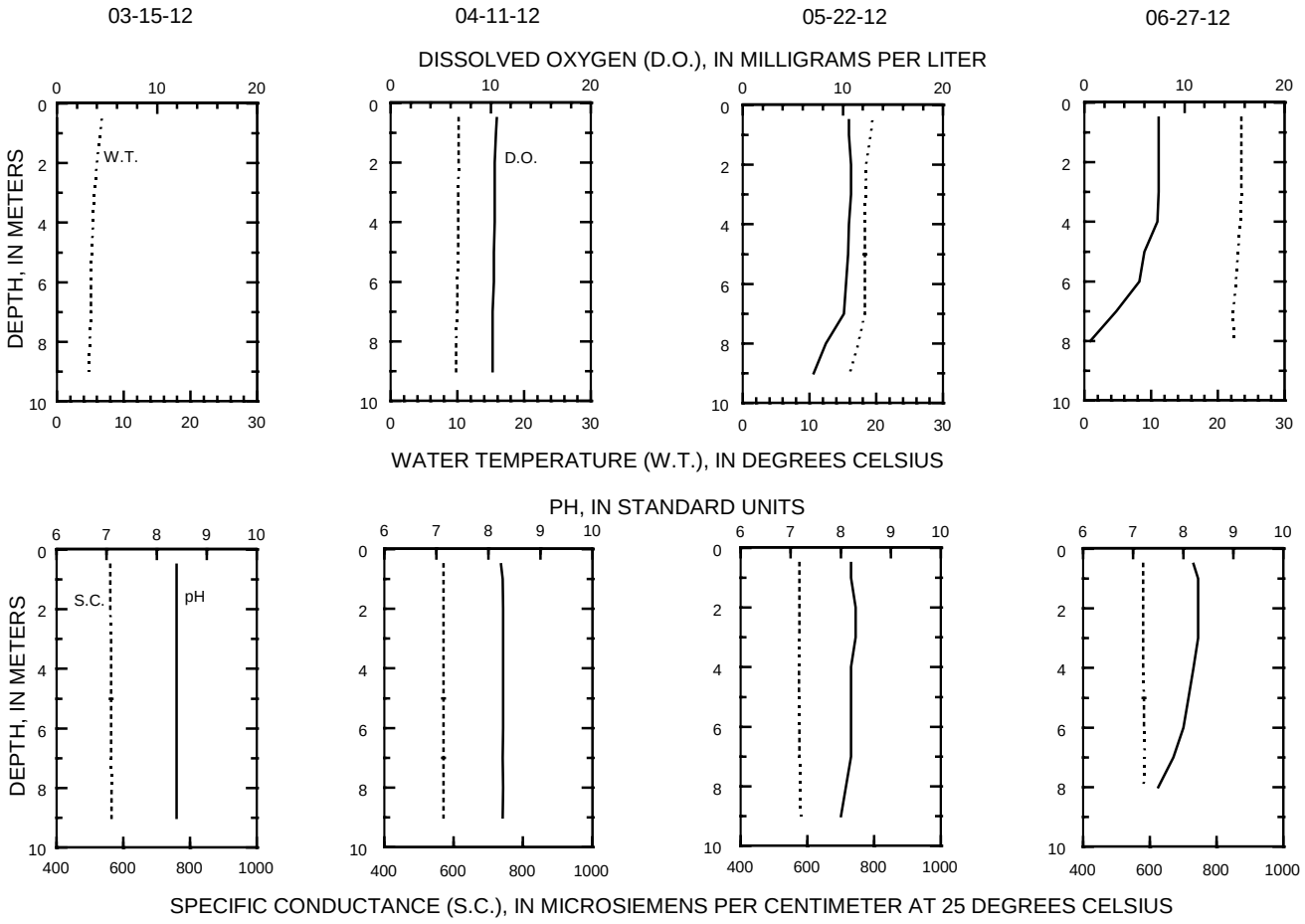
WATER-QUALITY DATA, MARCH 15 TO SEPTEMBER 26, 2012

(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro -matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)
MAR 2012								
15...	2.75	--	--	--	--	--	--	--
15...	--	.50	6.7	561	8.4	--	--	.024
APR								
11...	7.50	--	--	--	--	--	--	--
11...	--	.50	10.2	571	8.2	10.6	--	.021
MAY								
22...	4.55	--	--	--	--	--	--	--
22...	--	.50	19.4	576	8.2	10.6	14.3	.036
JUN								
27...	3.55	--	--	--	--	--	--	--
27...	--	.50	23.5	580	8.2	7.4	7.09	.028
JUL								
24...	2.48	--	--	--	--	--	--	--
24...	--	.50	26.5	574	8.4	7.4	9.60	.025
AUG								
22...	3.25	--	--	--	--	--	--	--
22...	--	.50	23.8	571	8.3	8.5	7.90	.024
SEP								
26...	2.35	--	--	--	--	--	--	--
26...	--	.50	17.8	567	8.3	8.7	34.2	.069

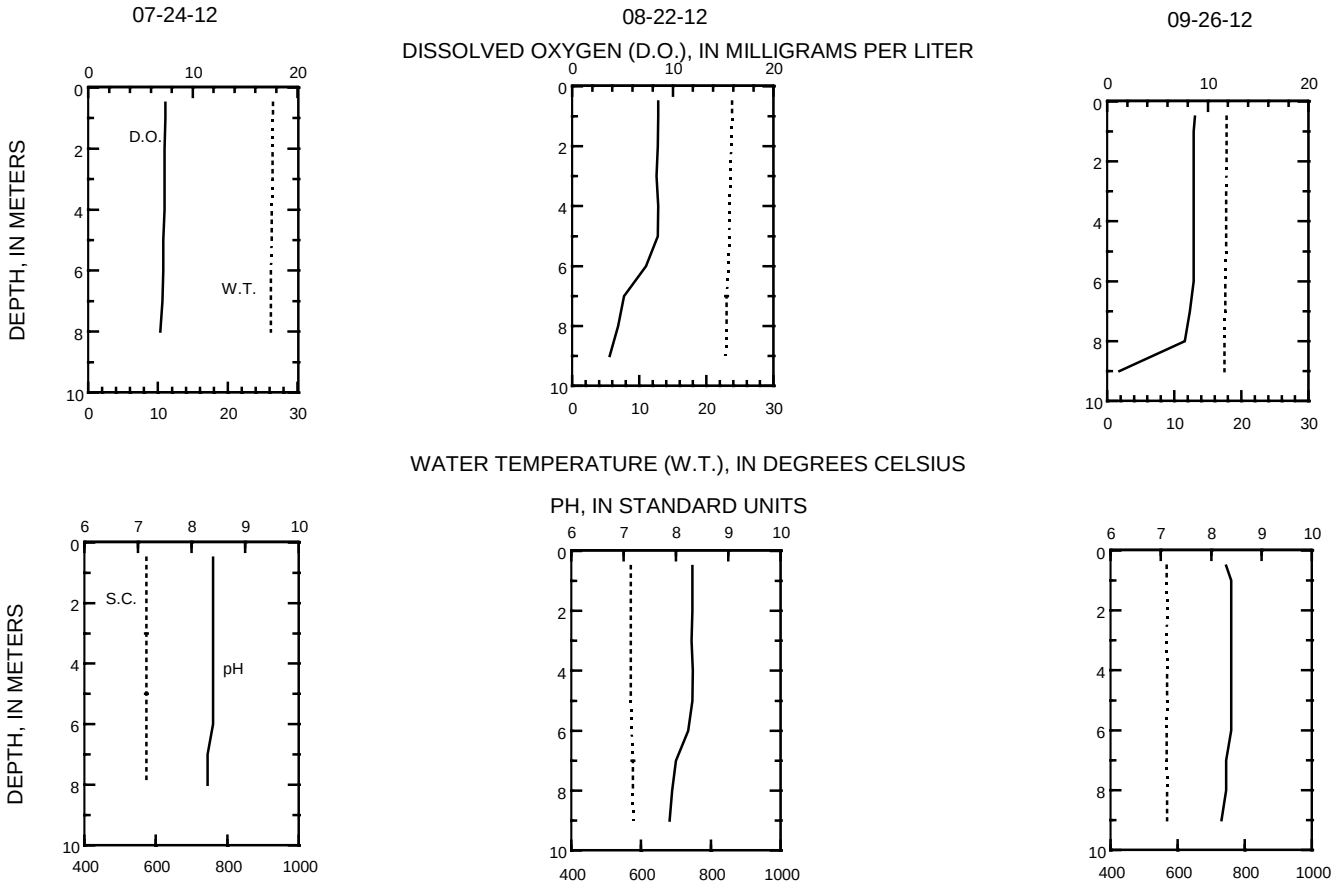
423526088380101 DELAVAN LAKE, AT SW END, NEAR DELAVAN LAKE, WI

LAKE-DEPTH PROFILES, MARCH 15 TO JUNE 27, 2012



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

LAKE-DEPTH PROFILES, JULY 24 TO SEPTEMBER 26, 2012



05404500 DEVILS LAKE NEAR BARABOO, WI

LOCATION.--Lat 43°25′35″, long 89°43′40″ referenced to North American Datum of 1927, in SW ¼ SE ¼ sec.13, T.11 N., R.6 E., Sauk County, WI, Hydrologic Unit 07070004, in Devils Lake State Park, 3.5 mi south of Baraboo.

SURFACE AREA.--0.56 mi^2.

DRAINAGE AREA.--4.79 mi^2.

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 954.88 ft, above NAVD of 1988.

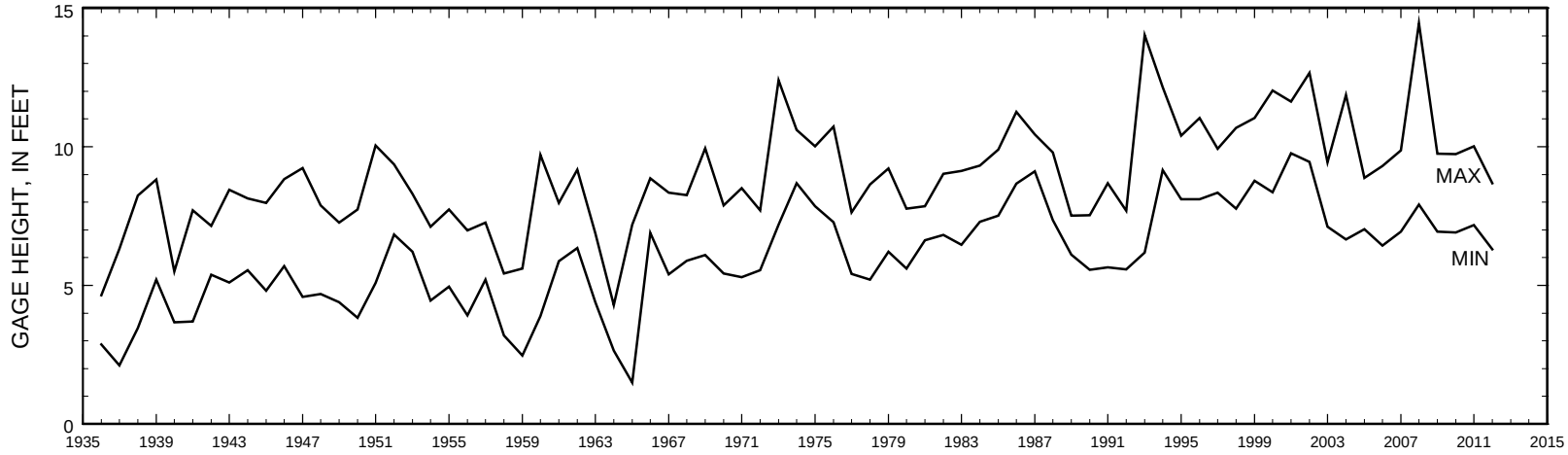
REMARKS.--Lake has no surface outlet. Water removed from lake by bottom withdrawal pipe, October 1-7, and 10-23.

EXTREMES FOR PERIOD OF RECORD.--Maximum observed, 14.83 ft, June 12, 2008; minimum observed, 1.49 ft, Feb. 8, 1965.

EXTREMES FOR CURRENT YEAR.--Maximum observed, 8.68 ft, May 5 and 8; minimum observed, 6.30 ft, Sept. 30.

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	7.50	6.97	7.19	7.30	7.34	7.37	8.10	8.48	8.29	7.62	7.25	6.76
2	7.48	6.99	7.18	7.29	7.34	7.38	8.11	8.51	8.26	7.61	7.24	6.74
3	7.46	7.05	7.21	7.28	7.34	7.40	8.11	8.55	8.24	7.60	7.23	6.73
4	7.45	7.04	7.28	7.28	7.33	7.41	8.11	8.56	8.22	7.58	7.21	6.73
5	7.44	7.04	7.29	7.27	7.33	7.41	8.11	8.58	8.20	7.57	7.18	6.77
6	7.41	7.02	7.29	7.29	7.33	7.41	8.11	8.62	8.18	7.55	7.16	6.75
7	7.40	7.01	7.28	7.29	7.33	7.45	8.10	8.65	8.16	7.53	7.13	6.73
8	7.38	7.06	7.28	7.29	7.32	7.56	8.09	8.65	8.14	7.50	7.11	6.71
9	7.37	7.22	7.27	7.28	7.32	7.60	8.08	8.65	8.12	7.47	7.10	6.71
10	7.35	7.28	7.26	7.28	7.32	7.61	8.07	8.65	8.10	7.44	7.08	6.69
11	7.33	7.28	7.26	7.28	7.31	7.63	8.05	8.64	8.09	7.41	7.05	6.67
12	7.32	7.28	7.26	7.29	7.31	7.69	8.05	8.63	8.06	7.38	7.03	6.64
13	7.36	7.28	7.25	7.31	7.31	7.73	8.04	8.62	8.03	7.39	7.02	6.61
14	7.33	7.28	7.29	7.31	7.31	7.75	8.03	8.61	8.00	7.44	7.00	6.60
15	7.29	7.28	7.31	7.31	7.31	7.77	8.10	8.60	7.98	7.42	6.99	6.58
16	7.26	7.26	7.31	7.30	7.31	7.78	8.11	8.58	7.96	7.40	7.00	6.56
17	7.23	7.25	7.31	7.31	7.31	7.81	8.11	8.56	7.94	7.37	6.98	6.54
18	7.20	7.24	7.32	7.32	7.31	7.82	8.10	8.53	7.93	7.37	6.96	6.51
19	7.17	7.23	7.31	7.32	7.30	7.85	8.12	8.51	7.91	7.39	6.94	6.49
20	7.12	7.22	7.31	7.32	7.30	7.88	8.30	8.49	7.89	7.36	6.92	6.48
21	7.09	7.22	7.31	7.33	7.30	7.88	8.34	8.46	7.86	7.34	6.90	6.46
22	7.07	7.21	7.32	7.33	7.30	7.89	8.35	8.45	7.83	7.33	6.88	6.44
23	7.05	7.20	7.32	7.34	7.29	7.91	8.35	8.42	7.81	7.31	6.86	6.42
24	7.05	7.21	7.31	7.34	7.30	7.93	8.36	8.40	7.79	7.33	6.85	6.40
25	7.04	7.20	7.31	7.34	7.30	7.94	8.38	8.37	7.76	7.33	6.83	6.38
26	7.03	7.22	7.31	7.33	7.30	7.94	8.39	8.40	7.73	7.36	6.85	6.36
27	7.01	7.22	7.30	7.33	7.29	7.94	8.38	8.40	7.70	7.35	6.86	6.34
28	7.00	7.21	7.29	7.34	7.29	7.92	8.38	8.39	7.68	7.33	6.84	6.33
29	6.99	7.20	7.29	7.34	7.35	7.92	8.39	8.36	7.66	7.31	6.83	6.32
30	6.99	7.20	7.29	7.34	---	8.03	8.46	8.32	7.64	7.29	6.81	6.31
31	6.98	---	7.30	7.34	---	8.08	---	8.31	---	7.27	6.78	---
Mean	7.23	7.18	7.28	7.31	7.31	7.73	8.19	8.51	7.97	7.42	7.00	6.56
Max	7.50	7.28	7.32	7.34	7.35	8.08	8.46	8.65	8.29	7.62	7.25	6.77
Min	6.98	6.97	7.18	7.27	7.29	7.37	8.03	8.31	7.64	7.27	6.78	6.31



Annual minimum and maximum water levels for Devils Lake, 1936-2012.

423525088260400 GENEVA LAKE AT LAKE GENEVA, WI

LOCATION.--Lat 42°35′25″, long 88°26′04″ referenced to North American Datum of 1927, in SE ¼ NW ¼ sec.36, T.2 N., R.17 E., Walworth County, WI, Hydrologic Unit 07120006, at Geneva Lake dam at Center Street at Lake Geneva.

SURFACE AREA.--8.22 mi^2.

DRAINAGE AREA.--28.7 mi^2.

PERIOD OF RECORD.--October 1997 to August 2002, December 2002 to current year.

GAGE.--Water-stage recorder. Datum of gage is 861.86 ft above NAVD of 1988 or 862.08 ft above NGVD of 1929. Intermittent staff-gage readings during winter months.

REMARKS.—Records good except for estimated days, which are poor. Gage-height telemeter at station.

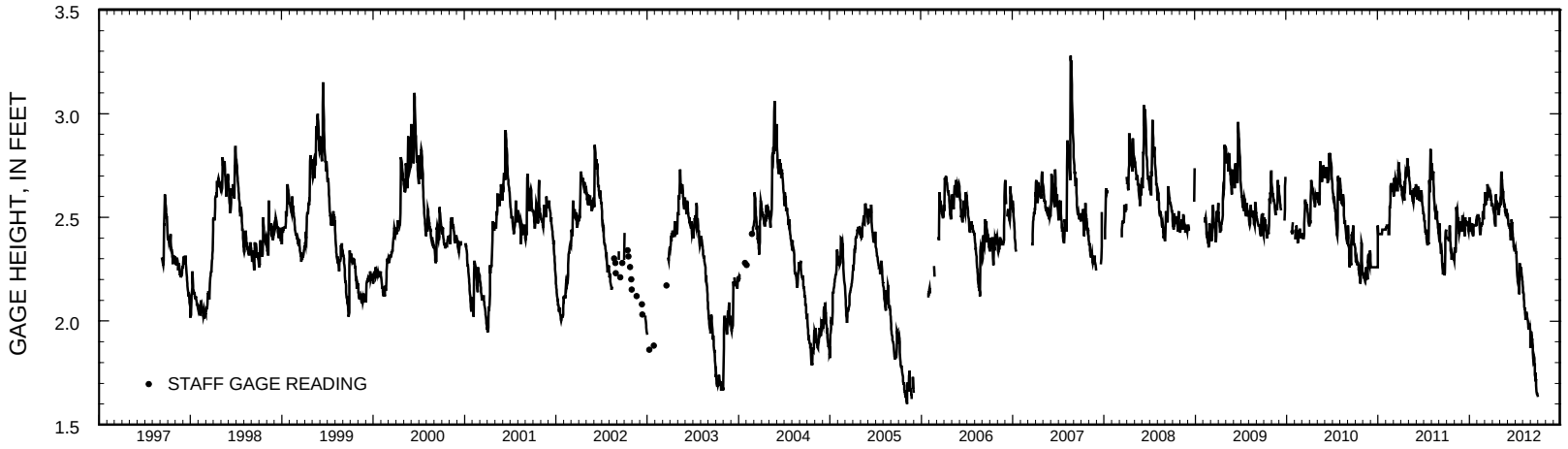
EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 3.35 ft, Aug. 20, 2007; minimum gage height, 1.44 ft, Nov. 5, 2005 (affected by wind).

EXTREMES FOR CURRENT YEAR.--Maximum gage height observed, 2.92 ft (affected by wind), May 6; minimum gage height, 1.58 ft (affected by wind), Sept. 27.

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012
DAILY MEAN VALUES

[e, estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	2.40	2.29	2.44	2.50	2.50	2.56	2.57	2.55	2.52	2.34	2.18	1.89
2	2.40	2.29	2.43	2.48	2.50	2.57	2.56	2.57	2.51	2.34	2.16	1.87
3	2.40	2.34	2.47	e2.45	2.50	2.62	2.56	2.58	2.50	2.35	2.14	1.89
4	2.40	2.35	2.51	e2.43	2.50	2.60	2.55	2.58	2.48	2.35	2.14	1.90
5	2.40	2.35	2.49	e2.44	2.51	2.56	2.54	2.56	2.47	2.33	2.13	1.95
6	2.40	2.35	2.48	2.46	2.51	2.57	2.53	2.63	2.46	2.33	2.11	1.93
7	2.40	2.33	2.49	2.45	2.50	2.59	2.53	2.72	2.46	2.31	2.09	1.93
8	2.40	2.37	2.47	2.45	2.49	2.62	2.52	2.71	2.47	2.27	2.07	1.91
9	2.39	2.49	2.46	2.47	2.50	2.60	2.51	2.69	2.46	2.26	2.06	1.91
10	2.39	2.55	2.45	2.45	2.49	2.60	2.49	2.68	2.45	2.22	2.06	1.90
11	2.39	2.53	2.44	2.45	e2.46	2.58	2.47	2.67	2.45	2.20	2.04	1.88
12	2.39	2.53	2.42	2.47	e2.45	2.63	2.47	2.64	2.43	2.19	2.02	1.85
13	2.43	2.54	2.41	e2.46	e2.42	2.66	2.46	2.63	2.41	2.18	2.01	1.82
14	2.46	2.51	2.46	e2.46	e2.42	2.65	2.46	2.62	2.40	2.18	2.01	1.83
15	2.42	2.51	2.50	e2.45	e2.42	2.64	2.54	2.62	2.39	2.17	2.01	1.82
16	2.39	e2.49	2.48	2.41	2.44	2.64	2.61	2.59	2.41	2.17	2.04	1.83
17	2.37	e2.48	2.48	e2.43	2.47	2.63	2.56	2.57	2.47	2.16	2.04	1.82
18	2.34	e2.50	2.48	e2.45	2.46	2.63	2.55	2.56	2.49	2.13	2.02	1.79
19	2.33	e2.43	2.47	e2.46	2.46	2.62	2.55	2.55	2.47	2.28	2.02	1.79
20	2.32	e2.45	2.46	e2.46	2.46	2.63	2.58	2.56	2.47	2.26	2.01	1.74
21	2.30	e2.42	2.48	e2.46	2.47	2.62	2.57	2.55	2.44	2.26	2.01	1.73
22	2.30	2.42	2.47	e2.46	2.47	2.61	2.55	2.53	2.42	2.25	2.00	1.75
23	2.30	2.43	2.47	e2.46	2.47	2.62	2.55	2.52	2.41	2.24	1.98	1.71
24	2.32	2.45	2.47	e2.46	2.53	2.62	2.54	2.53	2.40	2.24	1.97	1.72
25	2.31	2.44	2.46	e2.46	2.51	2.61	2.54	2.51	2.37	2.26	1.96	1.69
26	2.30	2.45	2.46	e2.46	2.51	2.58	2.54	2.51	2.36	2.25	1.97	1.66
27	2.30	2.48	2.44	e2.46	2.52	2.59	2.52	2.52	2.36	2.24	1.99	1.65
28	2.30	2.46	2.43	e2.47	2.49	2.58	2.51	2.54	2.35	2.22	1.97	1.65
29	2.30	2.45	2.43	e2.48	2.56	2.56	2.54	2.54	2.34	2.21	1.96	1.65
30	2.30	2.45	2.46	e2.46	---	2.56	2.57	2.50	2.34	2.20	1.97	1.64
31	2.30	---	2.48	2.49	---	2.56	---	2.50	---	2.19	1.95	---
Mean	2.36	2.44	2.46	2.46	2.48	2.60	2.53	2.58	2.43	2.24	2.04	1.80
Max	2.46	2.55	2.51	2.50	2.56	2.66	2.61	2.72	2.52	2.35	2.18	1.95
Min	2.30	2.29	2.41	2.41	2.42	2.56	2.46	2.50	2.34	2.13	1.95	1.64



Stage hydrograph for Geneva Lake, 1997-2012.

423329088323300 GENEVA LAKE AT WEST END NEAR WILLIAMS BAY, WI

LOCATION.--Lat 42°33'29", long 88°32'33", in NE ¼ SE ¼ sec.12, T.1 N., R.16 E., Walworth County, Hydrologic Unit 07120006, 1.3 mi south of Williams Bay.

SURFACE AREA.--8.22 mi^2.

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. Lake ice-covered during February sampling. Water-quality analyses done by Wisconsin State Laboratory of Hygiene. Samples for determination of chlorophyll *a* concentration are collected from the top 0.5 m of the lake.

WATER-QUALITY DATA, NOVEMBER 23, 2011 TO SEPTEMBER 25, 2012
(Milligrams per liter unless otherwise indicated)

Date	Transparency Secchi disc, meters (00078)	Sampling depth, meters (00098)	Temperature, water, deg C (00010)	Specific conductance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dissolved oxygen, mg/L (00300)	Chlorophyll a trichromatic method, uncorr, ug/L (32210)	Phosphorus, water, unfltrd mg/L as P (00665)	Orthophosphate, water, fltrd, mg/L as P (00671)	Total nitrogen, water, unfltrd mg/L (00600)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia + org-N, water, fltrd, mg/L as N (00623)	Ammonia + org-N, water, unfltrd mg/L as N (00625)
NOV 2011													
23...	9.75	--	--	--	--	--	--	--	--	--	--	--	--
23...	--	.50	8.9	533	8.2	9.3	1.57	.016	--	--	--	--	--
23...	--	42.0	8.6	536	8.0	7.2	--	.022	--	--	--	--	--
APR 2012													
11...	7.85	--	--	--	--	--	--	--	--	--	--	--	--
11...	--	.50	7.7	525	8.2	12.2	2.08	.006	<.002	.65	<.015	--	.57
JUN													
27...	5.20	--	--	--	--	--	--	--	--	--	--	--	--
27...	--	.50	23.2	526	8.5	8.9	2.38	.012	.002	<.62	<.015	--	.60
27...	--	9.0	22.5	527	8.5	8.7	--	.015	--	--	--	--	--
27...	--	16.0	11.4	528	7.9	7.9	--	.012	--	--	--	--	--
27...	--	32.0	8.9	530	7.8	7.1	--	.011	--	--	--	--	--
27...	--	37.0	8.6	530	7.8	6.8	--	.013	--	--	--	--	--
27...	--	42.0	8.3	536	7.5	2.0	--	.016	--	--	--	--	--
JUL													
24...	4.35	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	.50	26.5	528	8.5	8.2	3.10	.013	<.002	.40	<.015	--	--
24...	--	9.0	25.8	531	8.5	7.6	--	.013	--	--	--	--	--
24...	--	16.0	11.5	533	8.7	6.3	--	.013	--	--	--	--	--
24...	--	33.0	8.6	535	8.2	7.8	--	.010	--	--	--	--	--
24...	--	38.0	8.4	537	8.0	2.6	--	.012	--	--	--	--	--
AUG													
22...	4.15	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	.50	23.7	524	8.4	9.0	4.00	.010	<.002	.48	<.015	--	--
22...	--	10.0	23.4	526	8.4	7.7	--	.013	--	--	--	--	--
22...	--	16.0	12.0	534	7.6	3.5	--	.007	--	--	--	--	--
22...	--	33.0	8.6	536	7.4	2.8	--	.012	--	--	--	--	--
22...	--	38.0	8.4	539	7.3	.5	--	.021	--	--	--	--	--
22...	--	42.0	8.2	543	7.3	.1	--	.080	--	--	--	--	--

423329088323300 GENEVA LAKE AT WEST END NEAR WILLIAMS BAY, WI

WATER-QUALITY DATA, , NOVEMBER 23, 2011 TO SEPTEMBER 25, 2012
(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro -matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Total nitro-gen, water, unfltrd mg/L (00600)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia + org-N, water, fltrd, mg/L as N (00623)	Ammonia + org-N, water, unfltrd mg/L as N (00625)
SEP													
25...	4.35	--	--	--	--	--	--	--	--	--	--	--	--
25...	--	.50	17.9	525	8.4	8.3	4.70	.013	<.002	<.49	<.015	.41	.47
25...	--	14.0	17.7	524	8.4	8.1	--	.013	<.002	<.52	<.015	<.14	.50
25...	--	16.0	12.8	535	7.7	.8	--	.010	<.002	.41	<.015	.22	.37
25...	--	33.0	8.8	536	7.4	1.4	--	.023	.015	.65	<.015	.26	.40
25...	--	38.0	8.5	539	7.4	.2	--	.049	.038	.59	.144	.53	.53
25...	--	42.0	8.3	542	7.4	.1	--	.073	.060	<.78	.293	.52	.76

Date	Nitrate + nitrite water, fltrd, mg/L as N (00631)	Turbdty white light, det ang 90+/-30 degrees NTU (63675)	Appar-ent color, water, unfltrd Pt-Co units (00081)	Hard-ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Sodium, water, fltrd, mg/L (00930)	Potas-sium, water, fltrd, mg/L (00935)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor-ide, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Silica, water, fltrd, mg/L as SiO2 (00955)	Iron, water, fltrd, ug/L (01046)
NOV 2011													
23...	--	--	--	--	--	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--	--	--	--	--	--
APR 2012													
11...	--	--	--	--	--	--	--	--	--	--	--	--	--
11...	.076	<1.0	5	233	35.7	34.9	21.6	1.90	189	43.4	29.6	3.00	<100
JUN													
27...	--	--	--	--	--	--	--	--	--	--	--	--	--
27...	<.019	--	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUL													
24...	--	--	--	--	--	--	--	--	--	--	--	--	--
24...	<.019	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--	--	--

423329088323300 GENEVA LAKE AT WEST END NEAR WILLIAMS BAY, WI

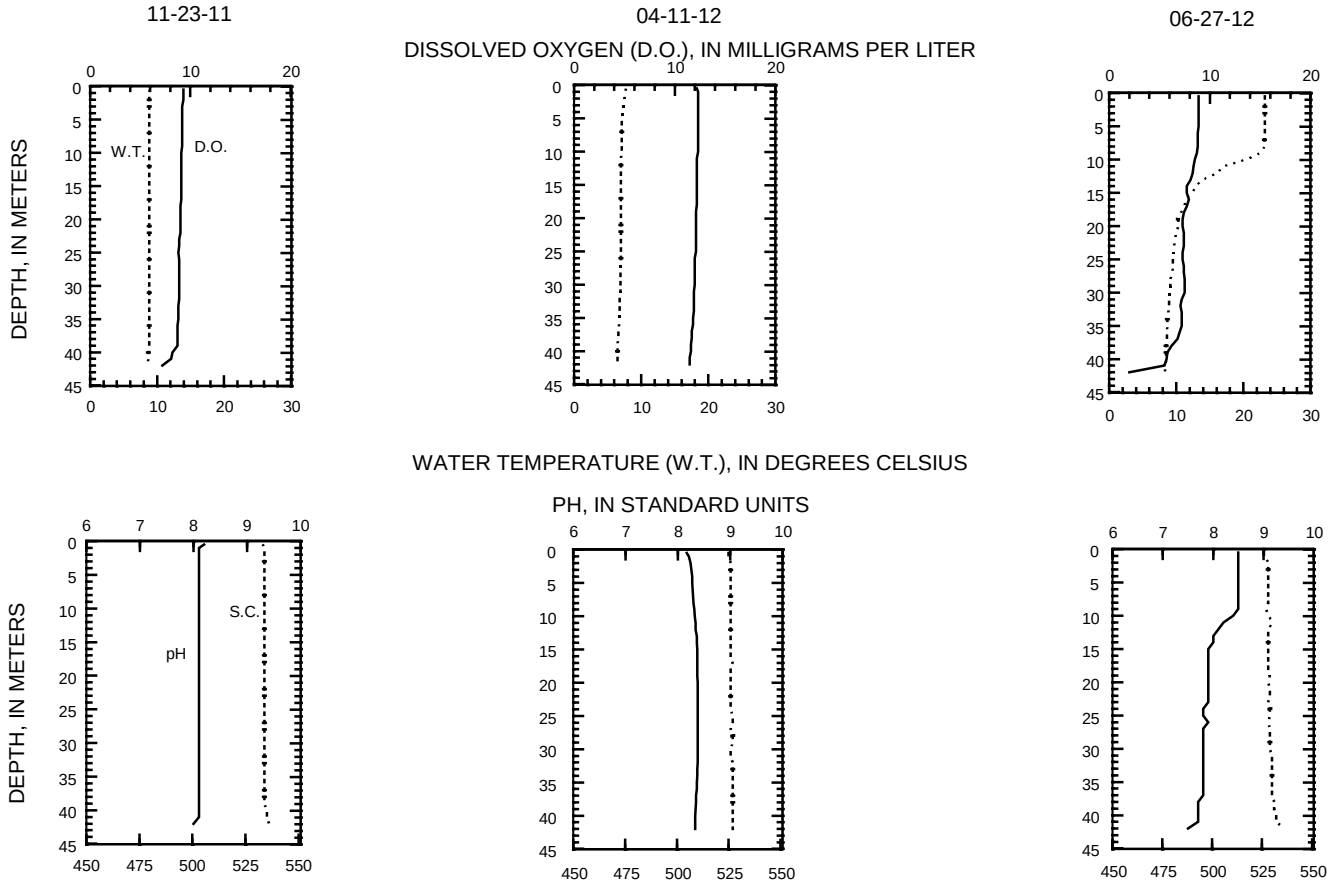
WATER-QUALITY DATA, , NOVEMBER 23, 2011 TO SEPTEMBER 25, 2012
(Milligrams per liter unless otherwise indicated)

Date	Nitrate + nitrite water, fltrd, mg/L as N (00631)	Turbdty white light, det ang 90+/-30 degrees NTU (63675)	Appar-ent color, water, unfltrd Pt-Co units (00081)	Hard-ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Sodium, water, fltrd, mg/L (00930)	Potas-sium, water, fltrd, mg/L (00935)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor-ide, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Silica, water, fltrd, mg/L as SiO2 (00955)	Iron, water, fltrd, ug/L (01046)
AUG													
22...	--	--	--	--	--	--	--	--	--	--	--	--	--
22...	<.019	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--	--	--
SEP													
25...	--	--	--	--	--	--	--	--	--	--	--	--	--
25...	<.019	--	--	--	--	--	--	--	--	--	--	--	--
25...	<.019	--	--	--	--	--	--	--	--	--	--	--	--
25...	.041	--	--	--	--	--	--	--	--	--	--	--	--
25...	.246	--	--	--	--	--	--	--	--	--	--	--	--
25...	.061	--	--	--	--	--	--	--	--	--	--	--	--
25...	<.019	--	--	--	--	--	--	--	--	--	--	--	--

Date	Manga-nese, water, fltrd, ug/L (01056)	Dis-solved solids dried @ 180degC wat flt mg/L (70300)
NOV 2011		
23...	--	--
23...	--	--
23...	--	--
APR 2012		
11...	--	--
11...	<1.0	294

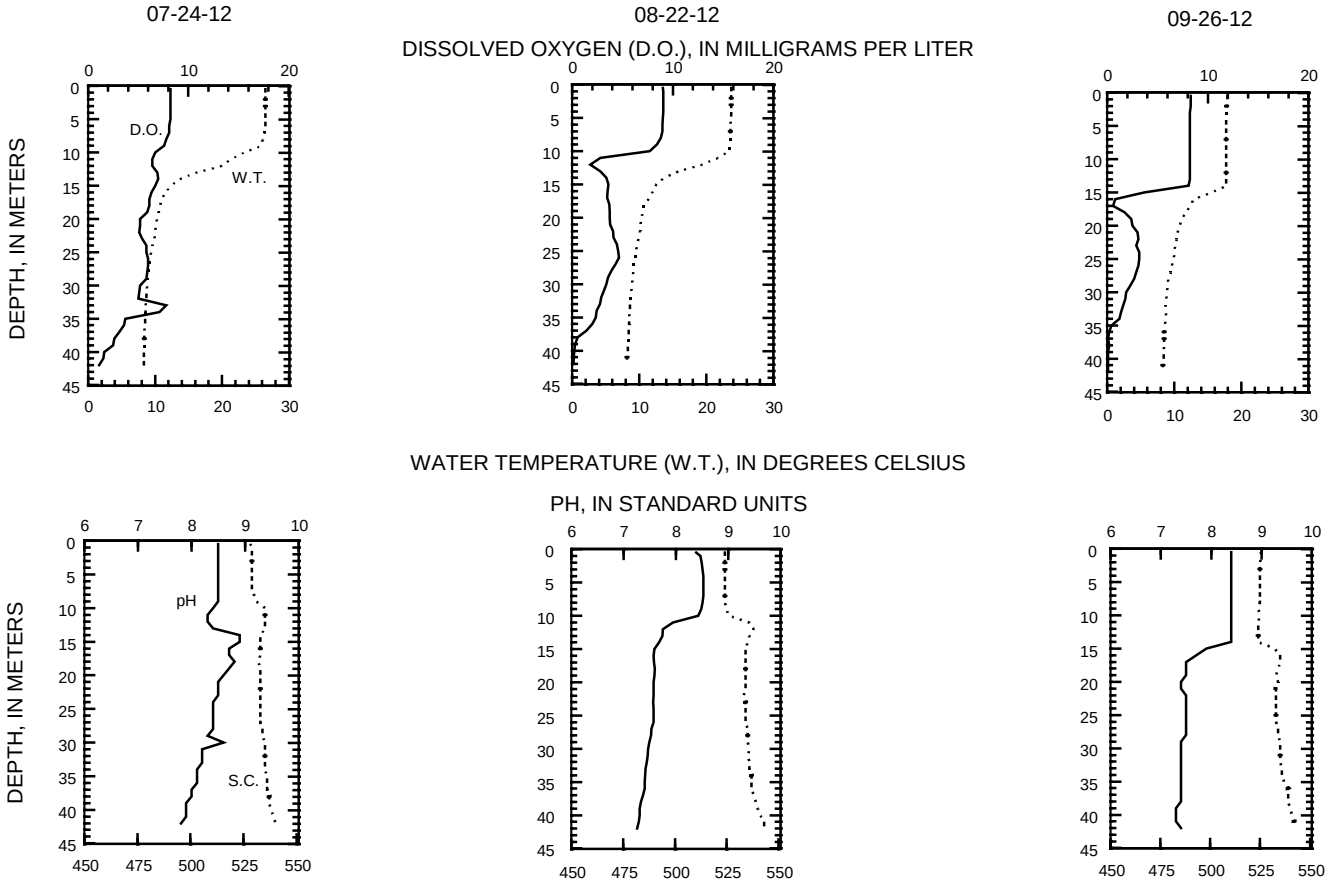
423329088323300 GENEVA LAKE AT WEST END NEAR WILLIAMS BAY, WI

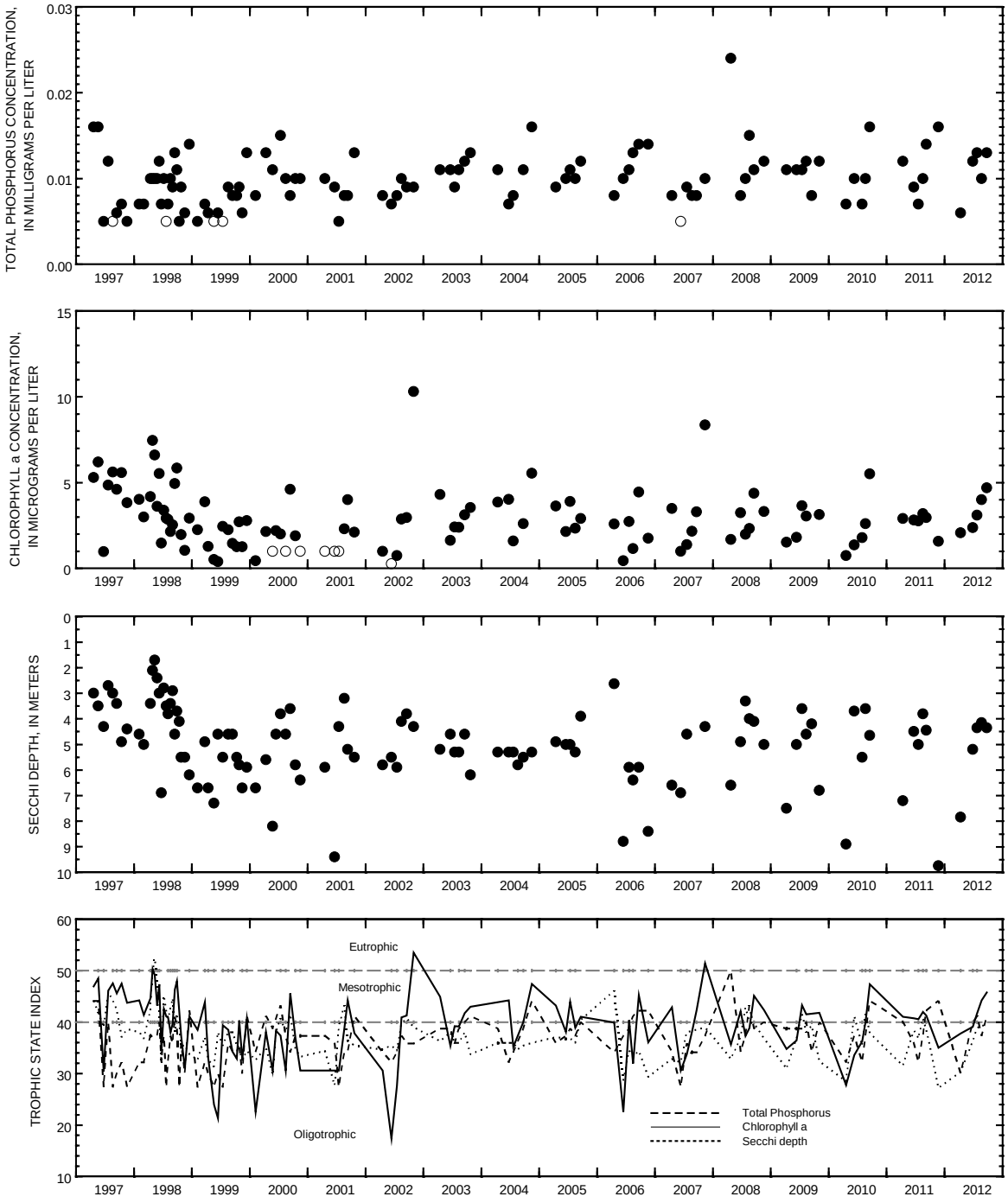
LAKE-DEPTH PROFILES, NOVEMBER 23, 2011 TO JUNE 27, 2012



423329088323300 GENEVA LAKE AT WEST END NEAR WILLIAMS BAY, WI

LAKE-DEPTH PROFILES, JULY 24 TO SEPTEMBER 26, 2012





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

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

432504088152201 GILBERT LAKE DEEP HOLE NEAR WEST BEND, WI

LOCATION.--Lat 43°25'04", long 88°15'22", in NW ¼ SW ¼ sec.17, T.11 N., R.19 E., Washington County, Hydrologic Unit 04040003.

SURFACE AREA.—0.07 mi^2.

PERIOD OF RECORD.—April 2012 to July 2012.

WATER-QUALITY DATA, APRIL 26 TO JULY 31, 2012
(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro -matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Total nitro-gen, water, unfltrd mg/L (00600)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrate + nitrite water, fltrd, mg/L as N (00631)
APR 2012													
26...	2.50	--	--	--	--	--	--	--	--	--	--	--	--
26...	--	.50	12.5	716	8.4	12.6	5.51	.021	<.002	1.2	.031	.70	.504
JUL													
31...	1.55	--	--	--	--	--	--	--	--	--	--	--	--
31...	--	.50	26.6	682	8.4	11.3	9.05	.027	--	--	--	--	--

Date	Turbdty white light, det ang 90+/-30 degrees NTU (63675)	Appar-ent color, water, unfltrd Pt-Co units (00081)	Hard-ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Sodium, water, fltrd, mg/L (00930)	Potas-sium, water, fltrd, mg/L (00935)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor-ide, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Iron, water, fltrd, ug/L (01046)	Manga-nese, water, fltrd, ug/L (01056)	Dis-solved solids dried @ 180degC wat flt mg/L (70300)
APR 2012													
26...	--	--	--	--	--	--	--	--	--	--	--	--	--
26...	<1.0	10	301	58.5	37.5	30.4	1.50	243	73.1	26.1	<100	<1.0	410
JUL													
31...	--	--	--	--	--	--	--	--	--	--	--	--	--
31...	<1.0	--	277	40.2	42.8	--	--	--	--	--	--	--	--

04086418 GILBERT LAKE TRIBUTARY NEAR WEST BEND, WI

LOCATION.--Lat 43°25'13", long 88°15'18", in NW ¼ NE ¼ SW ¼ sec.17, T.11 N., R.19 E., Washington County, Hydrologic Unit 04040003.

PERIOD OF RECORD.—April 2012 to July 2012.

WATER-QUALITY DATA, APRIL 26 TO JULY 31, 2012
(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro -matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Total nitro-gen, water, unfltrd mg/L (00600)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrate + nitrite water, fltrd, mg/L as N (00631)
APR 2012													
26...	--	.50	10.5	781	7.9	15.1	27.8	.025	.002	1.3	<.015	.32	.949
26...	.45	--	--	--	--	--	--	--	--	--	--	--	--
JUL													
31...	>.20	--	--	--	--	--	--	--	--	--	--	--	--
31...	--	.20	16.2	844	7.5	8.1	2.23	.041	--	--	--	--	--

Date	Turbdty white light, det ang 90+/-30 degrees NTU (63675)	Appar-ent color, water, unfltrd Pt-Co units (00081)	Hard-ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Sodium, water, fltrd, mg/L (00930)	Potas-sium, water, fltrd, mg/L (00935)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor-ide, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Iron, water, fltrd, ug/L (01046)	Manga-nese, water, fltrd, ug/L (01056)	Dis-solved solids dried @ 180degC wat flt mg/L (70300)
APR 2012													
26...	1.2	5	338	71.8	38.5	28.7	1.90	270	70.4	27.6	<100	<1.0	438
26...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUL													
31...	--	--	--	--	--	--	--	--	--	--	--	--	--
31...	<1.0	--	373	79.7	42.3	--	--	--	--	--	--	--	--

432514088151601 GILBERT LAKE SPRING #1 NEAR WEST BEND, WI

LOCATION.--Lat 43°25'14", long 88°15'16", in SE ¼ NW ¼ sec.17, T.11 N., R.19 E., Washington County, Hydrologic Unit 04040003.

PERIOD OF RECORD.—April 2012 to July 2012.

WATER-QUALITY DATA, APRIL 26 TO JULY 31, 2012
(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro -matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Total nitro-gen, water, unfltrd mg/L (00600)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrate + nitrite water, fltrd, mg/L as N (00631)
APR 2012													
26...	1.50	--	--	--	--	--	--	--	--	--	--	--	--
26...	--	.50	9.5	815	7.7	2.5	1.84	.009	.004	1.9	<.015	.32	1.57
JUL													
31...	2.00	--	--	--	--	--	--	--	--	--	--	--	--
31...	--	1.5	9.9	814	7.7	2.1	<.260	.009	--	--	--	--	--

Date	Turbdty white light, det ang 90+/-30 degrees NTU (63675)	Appar-ent color, water, unfltrd Pt-Co units (00081)	Hard-ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Sodium, water, fltrd, mg/L (00930)	Potas-sium, water, fltrd, mg/L (00935)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor-ide, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Iron, water, fltrd, ug/L (01046)	Manga-nese, water, fltrd, ug/L (01056)	Dis-solved solids dried @ 180degC wat flt mg/L (70300)
APR 2012													
26...	--	--	--	--	--	--	--	--	--	--	--	--	--
26...	<1.0	<5	358	76.4	40.7	27.0	1.70	276	70.9	32.3	<100	<1.0	470
JUL													
31...	--	--	--	--	--	--	--	--	--	--	--	--	--
31...	<1.0	--	357	75.3	41.0	--	--	--	--	--	--	--	--

432511088151801 GILBERT LAKE SPRING #2 NEAR WEST BEND, WI

LOCATION.--Lat 43°25'11", long 88°15'18", in NE ¼ SW ¼ sec.17, T.11 N., R.19 E., Washington County, Hydrologic Unit 04040003.

PERIOD OF RECORD.—April 2012 to July 2012.

WATER-QUALITY DATA, APRIL 26 TO JULY 31, 2012
(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro -matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Total nitro-gen, water, unfltrd mg/L (00600)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrate + nitrite water, fltrd, mg/L as N (00631)
APR 2012													
26...	1.50	--	--	--	--	--	--	--	--	--	--	--	--
26...	--	.50	10.6	900	7.8	5.7	.720	.009	.003	5.3	<.015	.15	5.19
JUL													
31...	1.50	--	--	--	--	--	--	--	--	--	--	--	--
31...	--	1.0	9.7	947	7.9	4.9	.320	.011	--	--	--	--	--

Date	Turbdty white light, det ang 90+/-30 degrees NTU (63675)	Appar-ent color, water, unfltrd Pt-Co units (00081)	Hard-ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Sodium, water, fltrd, mg/L (00930)	Potas-sium, water, fltrd, mg/L (00935)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor-ide, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Iron, water, fltrd, ug/L (01046)	Manga-nese, water, fltrd, ug/L (01056)	Dis-solved solids dried @ 180degC wat flt mg/L (70300)
APR 2012													
26...	--	--	--	--	--	--	--	--	--	--	--	--	--
26...	<1.0	5	400	87.1	44.2	32.1	1.70	307	75.7	34.7	<100	<1.0	512
JUL													
31...	--	--	--	--	--	--	--	--	--	--	--	--	--
31...	<1.0	--	369	77.9	42.3	--	--	--	--	--	--	--	--

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

LOCATION.--Lat 43°49′28″, long 88°55′36″ referenced to North American Datum of 1927, in NE ¼ SE ¼ SE ¼ sec.27, T.16 N., R.13 E., Green Lake County, WI, Hydrologic Unit 04030201, on left bank at downstream side of County Trunk Highway A, 2.3 mi southeast of Green Lake.

SURFACE AREA.--11.48 mi^2.

DRAINAGE AREA.--103 mi^2; including surface area of Green Lake.

PERIOD OF RECORD.--October 1993 to May 2012 (discontinued).

GAGE.--Water-stage recorder. Datum of gage is 789.91 ft above NAVD of 1988.

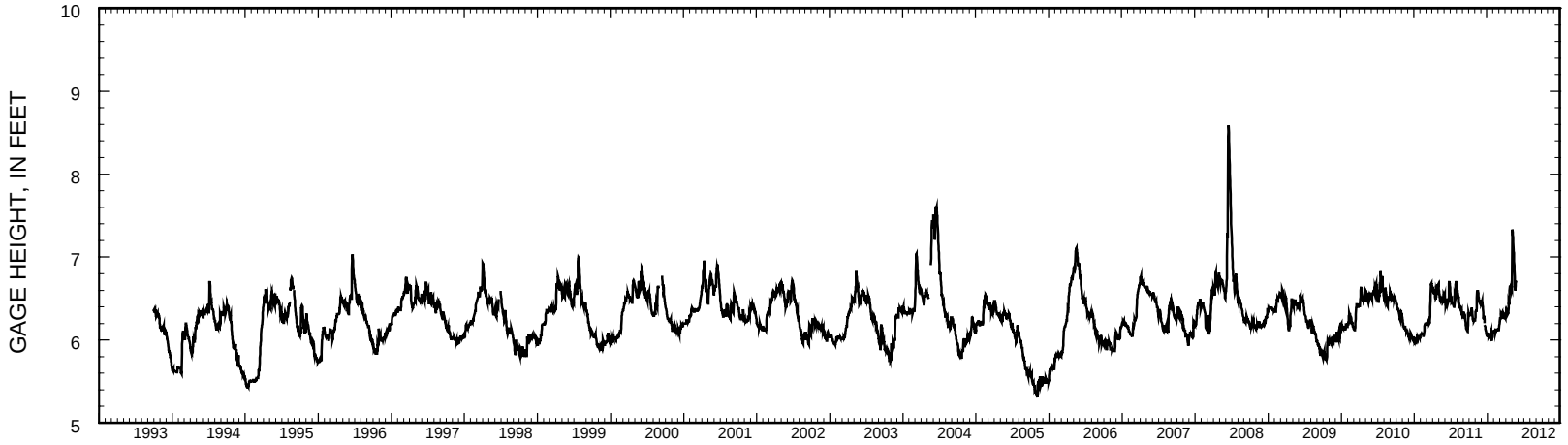
REMARKS.--Lake level regulated by dam at outlet at Green Lake. Gage-height telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum recorded gage height, 8.67 ft, June 15, 2008; minimum recorded, 5.27 ft, Nov. 5, 2005.

EXTREMES FOR CURRENT YEAR.--Maximum recorded gage height, 7.58 ft, May 3; minimum recorded gage height, 5.93 ft, January 2.

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	6.30	6.25	6.43	6.09	6.09	6.20	6.33	6.63	---	---	---	---
2	6.30	6.27	6.44	6.06	6.10	6.22	6.33	6.64	---	---	---	---
3	6.30	6.34	6.45	6.06	6.10	6.26	6.34	7.24	---	---	---	---
4	6.30	6.35	6.47	6.05	6.11	6.26	6.35	7.33	---	---	---	---
5	6.30	6.35	6.46	6.05	6.11	6.26	6.34	7.30	---	---	---	---
6	6.30	6.35	6.44	6.05	6.11	6.25	6.34	7.27	---	---	---	---
7	6.30	6.34	6.43	6.04	6.11	6.26	6.35	7.24	---	---	---	---
8	6.31	6.38	6.40	6.05	6.11	6.32	6.36	7.18	---	---	---	---
9	6.30	6.51	6.38	6.05	6.11	6.31	6.35	7.09	---	---	---	---
10	6.30	6.60	6.33	6.04	6.11	6.31	6.32	7.07	---	---	---	---
11	6.30	6.59	6.27	6.05	6.14	6.31	6.32	7.05	---	---	---	---
12	6.31	6.59	6.27	6.05	6.09	6.32	6.31	6.95	---	---	---	---
13	6.35	6.59	6.26	6.07	6.11	6.33	6.32	6.90	---	---	---	---
14	6.39	6.59	6.26	6.07	6.12	6.32	6.32	6.85	---	---	---	---
15	6.37	6.58	6.29	6.07	6.12	6.32	6.38	6.76	---	---	---	---
16	6.34	6.57	6.25	6.06	6.12	6.31	6.45	6.69	---	---	---	---
17	6.32	6.53	6.22	6.06	6.12	6.31	6.43	6.64	---	---	---	---
18	6.27	6.51	---	6.08	6.12	6.30	6.43	6.61	---	---	---	---
19	6.25	6.49	6.17	6.10	6.12	6.29	6.44	6.60	---	---	---	---
20	6.24	6.48	6.16	6.06	6.12	6.28	6.60	6.65	---	---	---	---
21	6.24	6.47	6.15	6.01	6.13	6.27	6.64	6.68	---	---	---	---
22	6.24	6.45	6.13	6.00	6.13	6.25	6.64	6.70	---	---	---	---
23	6.24	6.45	6.12	6.00	6.13	6.29	6.64	---	---	---	---	---
24	6.26	6.44	6.11	6.00	6.13	6.30	6.64	---	---	---	---	---
25	6.23	6.44	6.10	6.06	6.13	6.29	6.65	---	---	---	---	---
26	6.24	6.45	6.08	6.09	6.12	6.27	6.63	---	---	---	---	---
27	6.24	6.47	6.06	6.08	6.12	6.27	6.62	---	---	---	---	---
28	6.24	6.47	6.06	6.10	6.12	6.27	6.60	---	---	---	---	---
29	6.24	6.45	6.05	6.10	6.18	6.26	6.60	---	---	---	---	---
30	6.24	6.44	6.05	6.09	---	6.31	6.65	---	---	---	---	---
31	6.25	---	6.05	6.09	---	6.33	---	---	---	---	---	---
Mean	6.28	6.46	---	6.06	6.12	6.29	6.46	---	---	---	---	---
Max	6.39	6.60	---	6.10	6.18	6.33	6.65	---	---	---	---	---
Min	6.23	6.25	---	6.00	6.09	6.20	6.31	---	---	---	---	---



Stage hydrograph for Green Lake, 1993-2012.

434756089020500 GREEN LAKE AT DEEP HOLE NEAR GREEN LAKE, WI

LOCATION.--Lat 43°47'56", long 89°02'05", in NW ¼ SE ¼ sec.2, T.15 N., R.12 E., Green Lake County, Hydrologic Unit 04030201, about 5 miles southwest of the City of Green Lake.

SURFACE AREA.--11.48 mi^2.

PERIOD OF RECORD.--May 2004 to current year. Lake sampled by Wisconsin Department of Natural Resources prior to 2004.

REMARKS.--Water-quality analyses done by Wisconsin State Laboratory of Hygiene. A "*" indicates data that were collected by Mary Jane Bumby, Citizen Lake Monitoring Volunteer.

WATER-QUALITY DATA, APRIL 12 TO SEPTEMBER 27, 2012

(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro -matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Total nitro-gen, water, unfltrd mg/L (00600)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrate + nitrite water, fltrd, mg/L as N (00631)
APR 2012													
12...	3.95	--	--	--	--	--	--	--	--	--	--	--	--
12...	--	.50	7.5	501	8.4	13.6	11.3	.036	.017	.84	<.015	.59	.255
12...	--	67.0	4.6	516	8.0	10.2	--	.046	--	--	--	--	--
MAY													
*13...	1.30	.10	14.4	--	--	--	--	--	--	--	--	--	--
*19...	1.80	.10	18.9	--	--	--	--	--	--	--	--	--	--
JUN													
*04...	8.50	.10	20.0	--	--	--	--	--	--	--	--	--	--
*07...	11.6	.10	23.3	--	--	--	--	--	--	--	--	--	--
*19...	9.00	.10	25.0	--	--	--	--	--	--	--	--	--	--
26...	9.10	--	--	--	--	--	--	--	--	--	--	--	--
26...	--	.50	23.0	497	8.7	9.5	3.64	.018	--	--	--	--	--
26...	--	67.0	5.8	519	7.5	3.9	--	.128	--	--	--	--	--
*28...	6.60	.10	26.7	--	--	--	--	--	--	--	--	--	--
JUL													
*08...	4.70	.10	27.2	--	--	--	--	--	--	--	--	--	--
11...	5.53	--	--	--	--	--	--	--	--	--	--	--	--
11...	--	.50	27.7	490	8.7	9.2	1.19	.011	--	--	--	--	--
11...	--	67.0	5.7	524	7.4	.2	--	.171	--	--	--	--	--
*12...	4.10	.10	25.0	--	--	--	--	--	--	--	--	--	--
*27...	4.10	.10	25.6	--	--	--	--	--	--	--	--	--	--
AUG													
*01...	4.30	.10	23.9	--	--	--	--	--	--	--	--	--	--
*14...	4.00	.10	22.2	--	--	--	--	--	--	--	--	--	--
*19...	4.00	.10	17.8	--	--	--	--	--	--	--	--	--	--
21...	4.55	--	--	--	--	--	--	--	--	--	--	--	--
21...	--	.50	22.8	486	8.7	8.5	4.59	.009	<.002	.46	<.015	--	<.019
21...	--	67.0	5.8	533	7.5	.2	--	.213	--	--	--	--	--
*25...	4.30	.10	17.2	--	--	--	--	--	--	--	--	--	--

434756089020500 GREEN LAKE AT DEEP HOLE NEAR GREEN LAKE, WI

WATER-QUALITY DATA, APRIL 12 TO SEPTEMBER 27, 2012
(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro -matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Total nitro-gen, water, unfltrd mg/L (00600)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia + org-N, water, fltrd, mg/L as N (00623)	Ammonia + org-N, water, unfltrd mg/L as N (00625)
SEP													
*03...	5.50	.10	17.2	--	--	--	--	--	--	--	--	--	--
*12...	4.00	.10	17.2	--	--	--	--	--	--	--	--	--	--
27...	4.65	--	--	--	--	--	--	--	--	--	--	--	--
27...	--	.50	17.0	493	8.6	9.0	3.24	.012	--	--	--	--	--
27...	--	20.0	8.5	516	8.2	4.7	--	.010	--	--	--	--	--
27...	--	50.0	6.1	519	7.7	6.2	--	.072	--	--	--	--	--
27...	--	63.0	5.9	524	7.5	1.5	--	.142	--	--	--	--	--
27...	--	66.0	5.7	539	7.2	.3	--	.236	--	--	--	--	--
27...	--	67.0	5.7	542	7.3	.3	--	.331	--	--	--	--	--
*27...	4.80	.10	17.2	--	--	--	--	--	--	--	--	--	--

Date	Turbdty white light, det ang 90+/-30 degrees NTU (63675)	Appar-ent color, water, unfltrd Pt-Co units (00081)	Hard-ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Sodium, water, fltrd, mg/L (00930)	Potas-sium, water, fltrd, mg/L (00935)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor-ide, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Silica, water, fltrd, mg/L as SiO2 (00955)	Iron, water, fltrd, ug/L (01046)	Manga-nese, water, fltrd, ug/L (01056)
APR 2012													
12...	--	--	--	--	--	--	--	--	--	--	--	--	--
12...	1.8	5	225	33.9	34.2	18.8	3.30	187	38.2	30.0	.915	<100	<1.0
12...	--	--	--	--	--	--	--	--	--	--	--	--	--

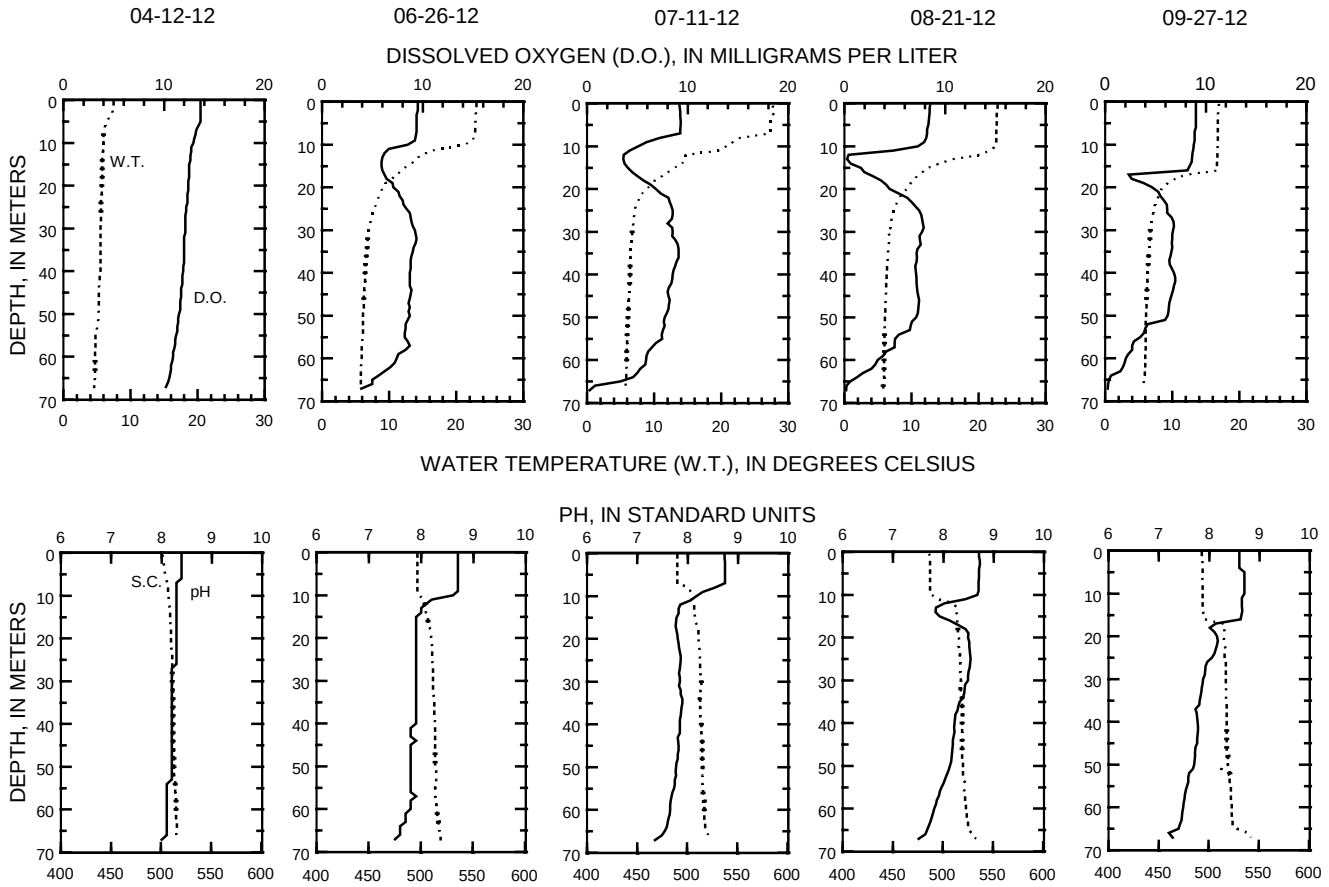
434756089020500 GREEN LAKE AT DEEP HOLE NEAR GREEN LAKE, WI

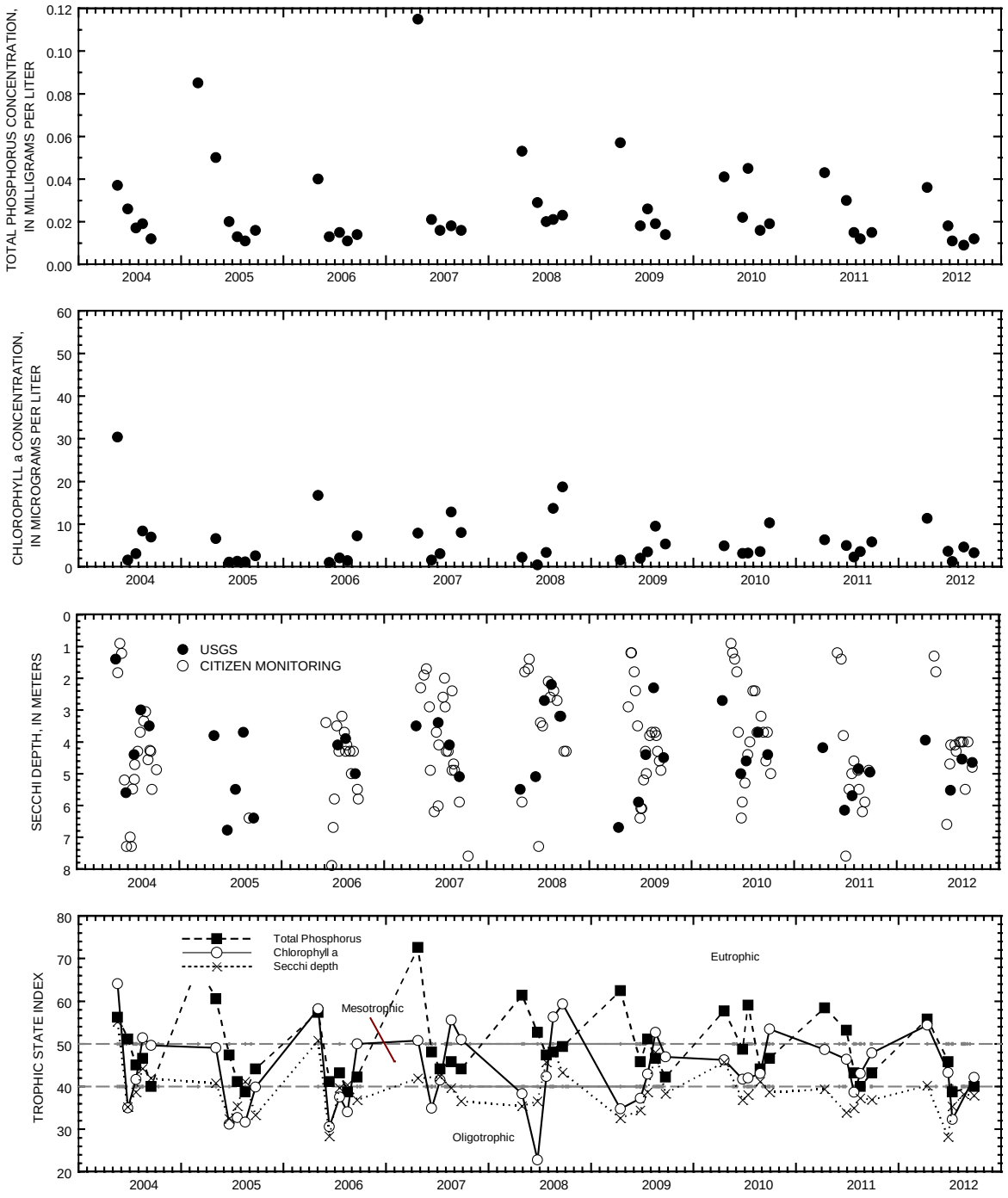
WATER-QUALITY DATA, APRIL 12 TO SEPTEMBER 27, 2012
(Milligrams per liter unless otherwise indicated)

Date	Dis-solved solids dried @ 180degC wat flt mg/L (70300)
APR 2012	
12...	--
12...	280
12...	--

434756089020500 GREEN LAKE AT DEEP HOLE NEAR GREEN LAKE, WI

LAKE-DEPTH PROFILES, APRIL 12 TO SEPTEMBER 27, 2012





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

434928088570000 GREEN LAKE AT EAST END NEAR GREEN LAKE, WI

LOCATION.--Lat 43°49'28", long 88°57'00", in SE ¼ SE ¼ sec.28, T.16 N., R.13 E., Green Lake County, Hydrologic Unit 04030201, about one mile southeast of the City of Green Lake.

SURFACE AREA.--11.48 mi^2.

PERIOD OF RECORD.--May 2004 current year. Lake sampled by Wisconsin Department of Natural Resources prior to 2004.

REMARKS.--Water-quality analyses done by Wisconsin State Laboratory of Hygiene. A "*" indicates data that were collected by Mary Jane Bumby, Citizen Lake Monitoring Volunteer.

WATER-QUALITY DATA, APRIL 12 TO SEPTEMBER 27, 2012
(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro -matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)
APR 2012								
12...	3.55	--	--	--	--	--	--	--
12...	--	.50	6.9	507	8.4	13.8	12.9	.036
12...	--	33.0	5.3	513	8.2	11.6	--	.037
MAY								
*13...	1.20	.10	13.3	--	--	--	--	--
*19...	1.20	.10	18.9	--	--	--	--	--
JUN								
*04...	6.40	.10	20.0	--	--	--	--	--
*07...	9.80	.10	24.4	--	--	--	--	--
*19...	7.20	.10	24.4	--	--	--	--	--
26...	6.50	--	--	--	--	--	--	--
26...	--	.50	22.7	498	8.7	9.7	1.91	.016
26...	--	33.0	6.4	515	7.7	7.6	--	.056
*28...	4.90	.10	27.8	--	--	--	--	--
JUL								
*08...	5.00	.10	28.9	--	--	--	--	--
11...	4.65	--	--	--	--	--	--	--
11...	--	.50	27.4	488	8.8	10.4	1.30	.012
11...	--	31.0	6.7	516	7.7	7.0	--	.056
*12...	3.80	.10	25.0	--	--	--	--	--
*27...	3.70	.10	26.7	--	--	--	--	--

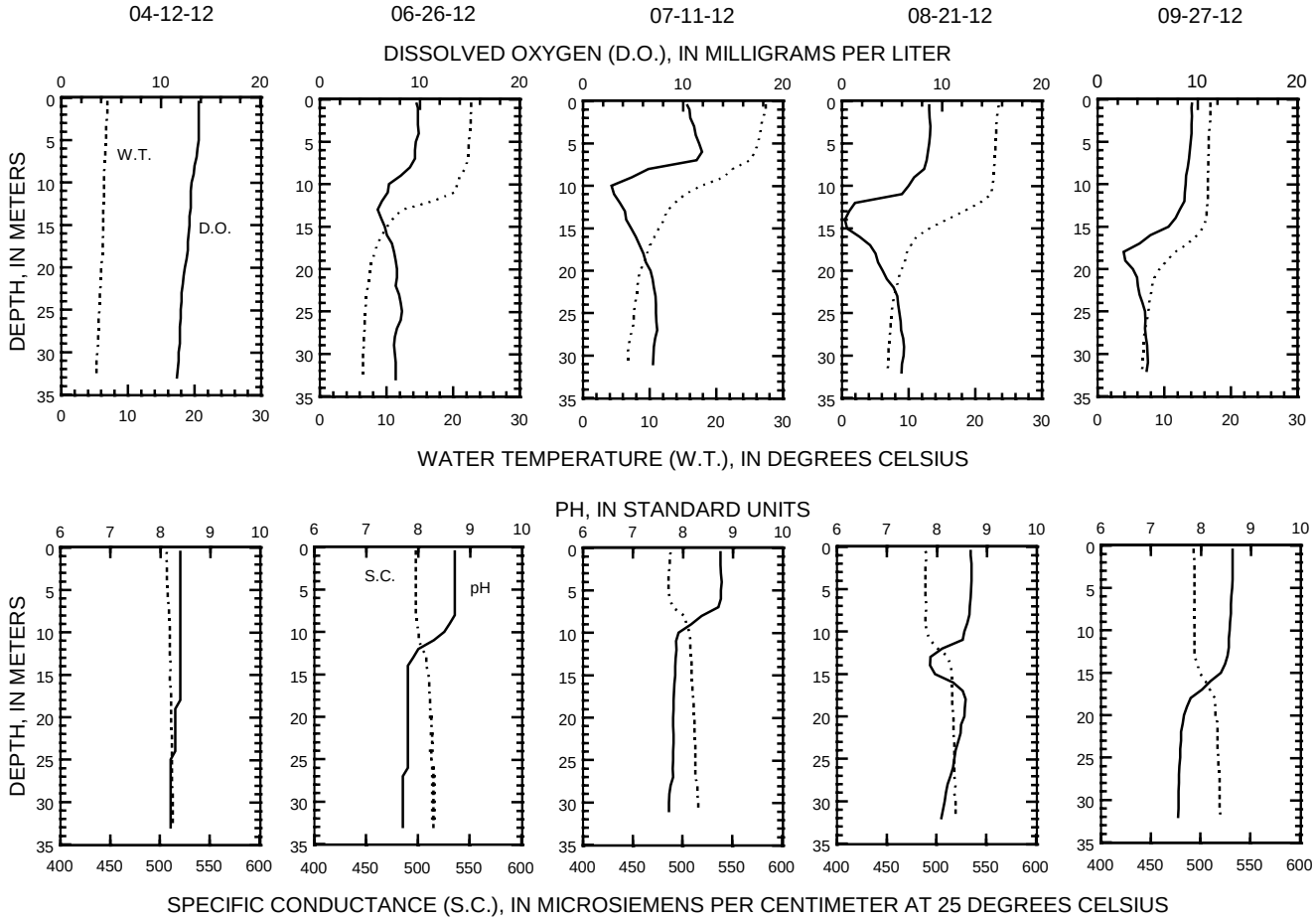
434928088570000 GREEN LAKE AT EAST END NEAR GREEN LAKE, WI

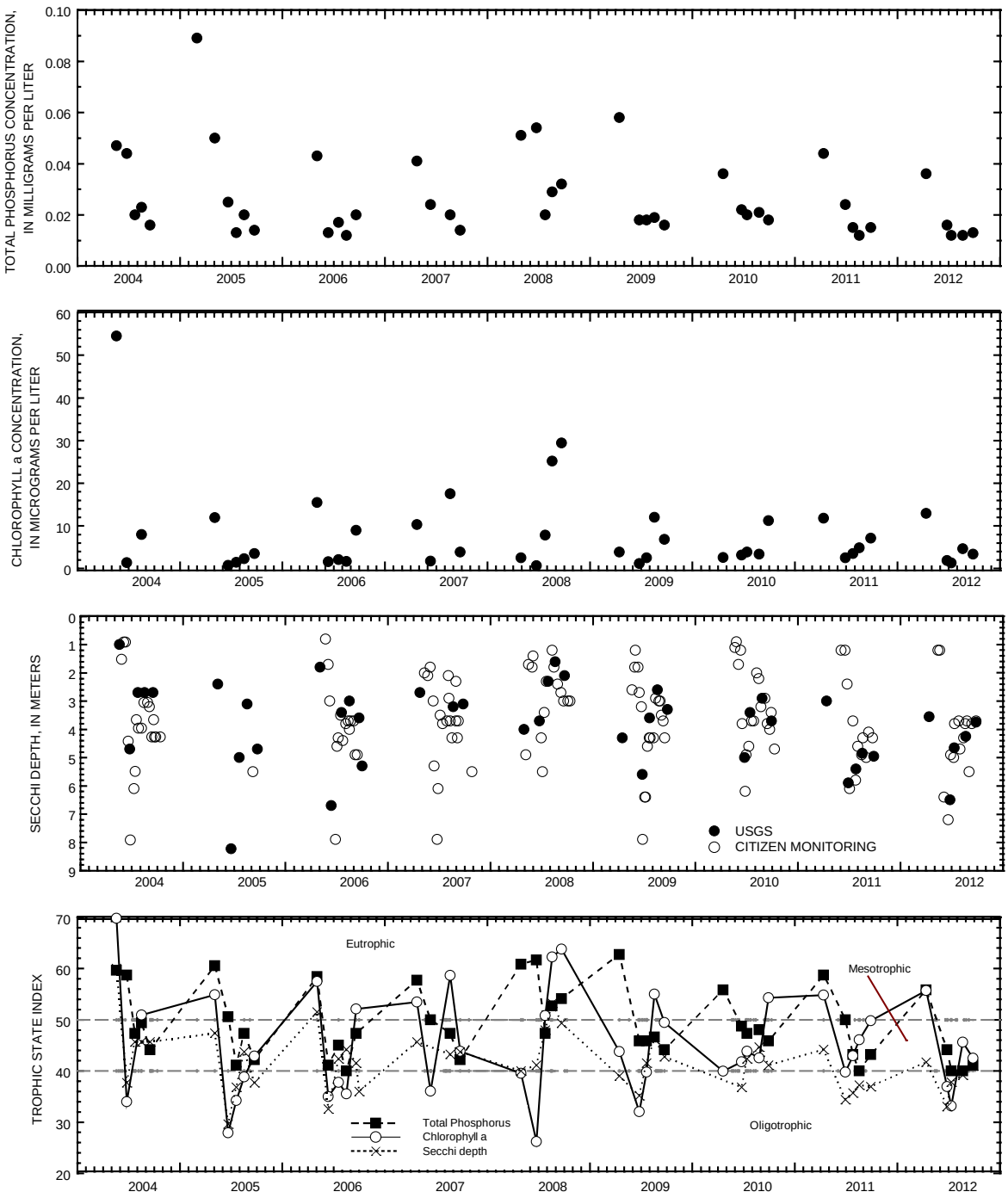
WATER-QUALITY DATA, APRIL 12 TO SEPTEMBER 27, 2012
(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro-matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)
AUG								
*01...	4.70	.10	24.4	--	--	--	--	--
*14...	4.30	.10	22.8	--	--	--	--	--
*19...	3.80	.10	17.8	--	--	--	--	--
21...	4.25	--	--	--	--	--	--	--
21...	--	.50	23.5	489	8.7	8.7	4.61	.012
21...	--	32.0	6.8	519	8.1	5.9	--	.056
*25...	3.70	.10	17.2	--	--	--	--	--
SEP								
*03...	5.50	.10	17.2	--	--	--	--	--
*12...	3.80	.10	17.2	--	--	--	--	--
*27...	3.70	.10	17.2	--	--	--	--	--
27...	3.75	--	--	--	--	--	--	--
27...	--	.50	16.9	493	8.6	9.4	3.36	.013
27...	--	32.0	6.7	520	7.5	4.9	--	.062

434928088570000 GREEN LAKE AT EAST END NEAR GREEN LAKE, WI

LAKE-DEPTH PROFILES, APRIL 12 TO SEPTEMBER 27, 2012





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

435009088550100 GREEN LAKE INLET, SITE 1, NEAR GREEN LAKE, WI

LOCATION.--Lat 43°50'09", long 88°55'01", in NE ¼ NW ¼ sec.26, T.16 N., R.13 E., Green Lake County, Hydrologic Unit 04030201.

PERIOD OF RECORD.--May 2006 to current year.

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

WATER-QUALITY DATA, APRIL 12 TO SEPTEMBER 27, 2012
(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Phos-phorus, water, unfltrd mg/L as P (00665)
APR 2012							
12...	.80	--	--	--	--	--	--
JUN							
26...	.50	--	--	--	--	--	--
26...	--	.10	25.0	730	8.7	13.2	.079
JUL							
11...	.50	--	--	--	--	--	--
11...	--	.10	28.4	814	8.9	10.8	.139
AUG							
21...	1.00	--	--	--	--	--	--
21...	--	.50	22.3	914	8.6	9.6	.076
SEP							
27...	1.00	--	--	--	--	--	--
27...	--	.50	15.1	1100	8.7	11.1	.044

434948088552200 GREEN LAKE INLET, SITE 2, NEAR GREEN LAKE, WI

LOCATION.--Lat 43°49'48", long 88°55'22", in SW ¼ NW ¼ sec.26, T.16 N., R.13 E., Green Lake County, Hydrologic Unit 04030201, about one mile southeast of the City of Green Lake.

PERIOD OF RECORD.--May 2006 to current year.

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

WATER-QUALITY DATA APRIL 12 TO SEPTEMBER 27, 2012
(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Phos-phorus, water, unfltrd mg/L as P (00665)
APR 2012							
12...	.70	--	--	--	--	--	--
12...	--	.50	11.4	700	8.8	21.1	.039
JUN							
26...	1.00	--	--	--	--	--	--
26...	--	.10	25.1	758	8.6	11.6	.086
JUL							
11...	1.00	--	--	--	--	--	--
11...	--	.10	28.6	812	9.0	11.1	.156
AUG							
21...	1.00	--	--	--	--	--	--
21...	--	.50	22.6	898	8.7	9.9	.081
SEP							
27...	1.00	--	--	--	--	--	--
27...	--	.50	14.9	1050	8.8	11.8	.042

425715089164700 LAKE KEGONSA AT BARBER DRIVE NEAR STOUGHTON, WI

LOCATION.--Lat 42°57′15″, long 89°16′47″ referenced to North American Datum of 1927, in SW ¼ NE ¼ NE ¼ sec.26, T.6 N., R.10 E., Dane County, WI, Hydrologic Unit 07090001, on downstream side of bridge on Barber Drive, 3.5 mi northwest of Stoughton.

SURFACE AREA.--1.05 mi^2.

DRAINAGE AREA.--386 mi^2.

PERIOD OF RECORD.--October 2003 to current year.

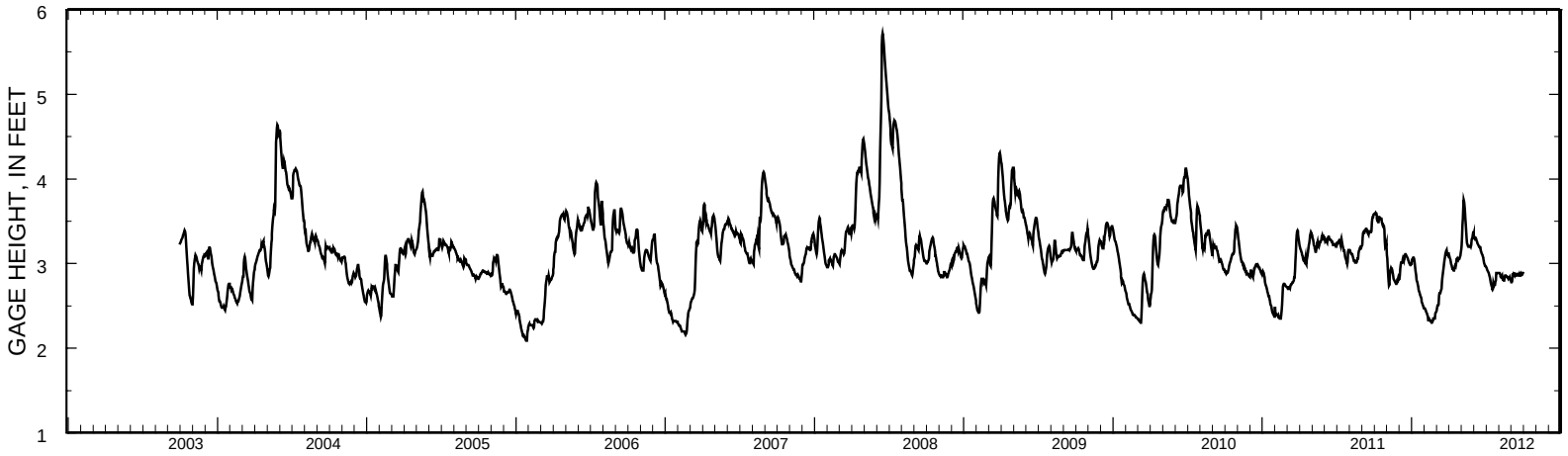
GAGE.--Water-stage recorder. Datum of gage is 840.00 ft above sea level (levels from Wisconsin Department of Transportation benchmark).

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 5.73 ft, June 16, 2008; minimum observed, 2.07 ft, Jan.27, 2006.

EXTREMES FOR CURRENT YEAR.--Maximum gage height observed, 3.75 ft, May 7; minimum observed, 2.30 ft, Feb. 20, 21.

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	3.59	3.22	2.82	2.98	2.47	2.44	3.11	3.16	3.34	2.96	2.89	2.80
2	3.59	3.10	2.82	3.04	2.47	2.47	3.10	3.21	3.31	2.95	2.89	2.78
3	3.59	3.06	2.86	3.04	2.47	2.50	3.08	3.31	3.30	2.93	2.89	2.78
4	3.60	2.96	2.94	3.06	2.46	2.51	3.06	3.45	3.31	2.92	2.88	2.79
5	3.59	2.88	2.98	3.07	2.45	2.51	3.05	3.53	3.31	2.91	2.87	2.87
6	3.59	2.80	3.01	3.07	2.43	2.52	3.02	3.66	3.29	2.90	2.85	2.87
7	3.56	2.74	3.01	3.06	2.42	2.53	2.99	3.75	3.29	2.89	2.84	2.88
8	3.53	2.75	3.01	3.03	2.41	2.62	2.98	3.73	3.27	2.87	2.84	2.87
9	3.51	2.86	3.01	2.99	2.39	2.65	2.96	3.68	3.26	2.85	2.85	2.88
10	3.51	2.91	3.05	2.94	2.38	2.65	2.94	3.62	3.24	2.83	2.86	2.88
11	3.49	2.93	3.07	2.90	2.33	2.65	2.94	3.53	3.23	2.80	2.82	2.86
12	3.49	2.95	3.06	2.87	2.33	2.67	2.93	3.46	3.22	2.77	2.81	2.87
13	3.55	2.94	3.04	2.81	2.33	2.69	2.92	3.38	3.21	2.75	2.81	2.86
14	3.55	2.94	3.07	2.79	2.34	2.70	2.92	3.30	3.20	2.73	2.80	2.86
15	3.54	2.92	3.09	2.78	2.33	2.79	2.95	3.24	3.20	2.72	2.80	2.87
16	3.54	2.89	3.11	2.75	2.33	2.84	2.97	3.23	3.19	2.70	2.85	2.87
17	3.53	2.86	3.11	2.73	2.32	2.88	2.98	3.21	3.19	2.69	2.86	2.88
18	3.53	2.82	3.10	2.69	2.32	2.92	2.97	3.20	3.15	2.70	2.86	2.88
19	3.53	2.81	3.09	2.67	2.31	2.96	3.00	3.20	3.14	2.77	2.86	2.86
20	3.49	2.80	3.08	2.66	2.30	3.00	3.05	3.20	3.12	2.75	2.85	2.86
21	3.47	2.79	3.07	2.64	2.30	3.04	3.05	3.20	3.11	2.74	2.85	2.86
22	3.45	2.78	3.06	2.62	2.31	3.07	3.06	3.20	3.10	2.75	2.84	2.88
23	3.44	2.77	3.04	2.61	2.32	3.11	3.05	3.21	3.08	2.75	2.84	2.87
24	3.45	2.76	3.03	2.60	2.35	3.13	3.04	3.20	3.07	2.79	2.83	2.86
25	3.44	2.76	3.01	2.58	2.35	3.15	3.05	3.22	3.06	2.80	2.82	2.86
26	3.40	2.77	3.00	2.56	2.35	3.16	3.06	3.28	3.03	2.89	2.83	2.88
27	3.27	2.81	2.99	2.54	2.35	3.11	3.06	3.30	3.00	2.89	2.83	2.87
28	3.20	2.81	2.98	2.53	2.35	3.11	3.08	3.31	2.99	2.89	2.84	2.87
29	3.21	2.83	2.98	2.51	2.41	3.10	3.09	3.34	2.97	2.89	2.82	2.88
30	3.22	2.81	2.99	2.50	---	3.12	3.13	3.33	2.97	2.89	2.81	2.89
31	3.24	---	2.99	2.48	---	3.12	---	3.35	---	2.89	2.80	---
Mean	3.47	2.87	3.02	2.78	2.37	2.83	3.02	3.35	3.17	2.82	2.84	2.86
Max	3.60	3.22	3.11	3.07	2.47	3.16	3.13	3.75	3.34	2.96	2.89	2.89
Min	3.20	2.74	2.82	2.48	2.30	2.44	2.92	3.16	2.97	2.69	2.80	2.78



Stage hydrograph for Lake Kegonsa, 1993-2012.

05427235 LAKE KOSHKONONG NEAR NEWVILLE, WI

LOCATION.--Lat 42°51′27″, long 88°56′27″ referenced to North American Datum of 1927, in NW ¼ NE ¼ sec.34, T.5 N., R.13 E., Jefferson County, WI, Hydrologic Unit 07090001, 80 ft east of Pottawatomi Trail Bridge at Bingham Point Estates, and 4.5 mi northeast of Newville.

SURFACE AREA.—16.34 $mi^{2.}$

DRAINAGE AREA.--2,560 mi^2.

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

GAGE.--Water-stage recorder. Datum of gage is 769.77 ft above NAVD of 1988 (Wisconsin Department of Transportation bench mark).

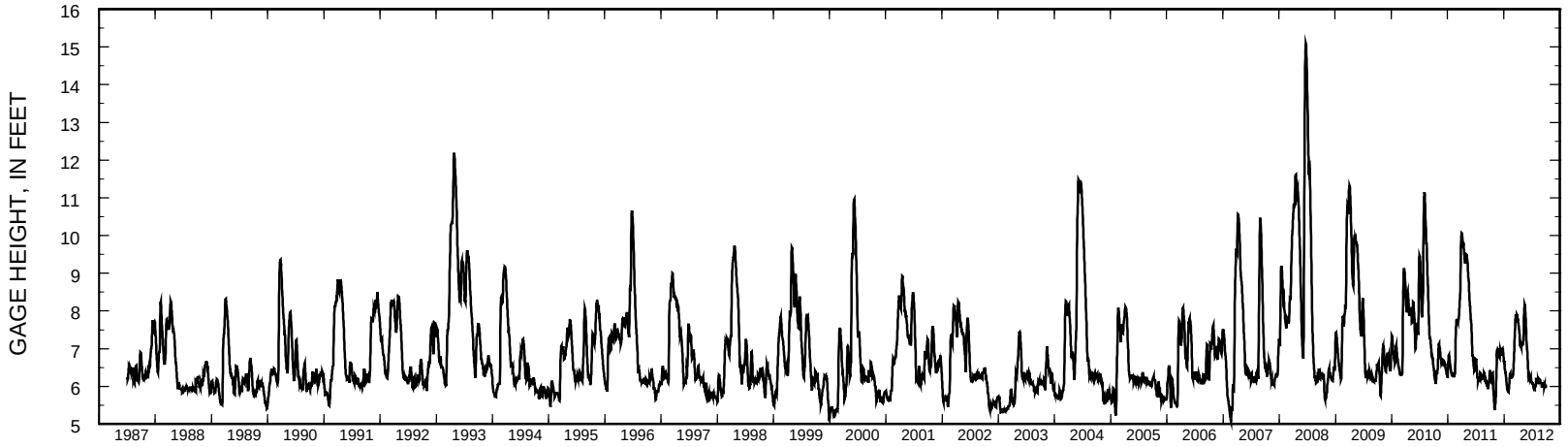
REMARKS.--Lake level regulated by dam at Indianford. Gage-height telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum recorded gage height, 15.13 ft, June 21, 22, 2008; minimum recorded, 5.06 ft, Feb. 22, 2007.

EXTREMES FOR CURRENT YEAR.--Maximum recorded gage height, 8.19 ft, May 12, 13; minimum recorded gage height, 5.33 ft, Nov. 2.

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	6.35	5.37	6.78	6.68	5.89	6.46	7.69	7.14	6.75	6.09	6.18	6.03
2	6.30	5.41	6.76	6.62	5.95	6.58	7.67	7.17	6.66	6.08	6.17	6.00
3	6.25	5.51	6.77	6.55	6.03	6.73	7.66	7.19	6.58	6.08	6.16	6.00
4	6.20	5.53	6.85	6.50	6.09	6.82	7.63	7.23	6.50	6.08	6.17	6.00
5	6.16	5.56	6.88	6.48	6.16	6.88	7.59	7.28	6.42	6.07	6.23	6.06
6	6.12	5.60	6.89	6.45	6.22	6.94	7.53	7.41	6.34	6.06	6.19	6.06
7	6.11	5.68	6.93	6.42	6.27	7.01	7.48	7.65	6.26	6.05	6.16	6.06
8	6.14	5.75	6.95	6.39	6.29	7.18	7.46	7.82	6.19	6.00	6.14	6.07
9	6.16	5.94	6.96	6.38	6.32	7.32	7.43	7.96	6.17	5.98	6.14	6.07
10	6.17	6.09	6.92	6.37	6.34	7.43	7.36	8.07	6.18	5.96	6.16	6.05
11	6.18	6.23	6.87	6.37	6.29	7.57	7.26	8.13	6.23	5.94	6.12	6.04
12	6.19	6.41	6.84	6.35	6.26	7.68	7.20	8.18	6.26	5.92	6.10	6.05
13	6.27	6.59	6.82	6.29	6.24	7.77	7.12	8.18	6.23	5.92	6.09	6.05
14	6.33	6.73	6.86	6.21	6.23	7.82	7.08	8.15	6.23	5.94	6.08	6.04
15	6.34	6.84	6.94	6.15	6.23	7.86	7.06	8.11	6.23	5.94	6.07	6.03
16	6.33	6.94	6.94	6.10	6.23	7.88	7.13	8.04	6.24	5.93	6.16	6.03
17	6.34	6.97	6.97	6.07	6.25	7.88	7.11	7.95	6.26	5.92	6.19	6.04
18	6.33	6.96	6.99	6.04	6.26	7.89	7.08	7.86	6.23	5.92	6.18	6.04
19	6.32	7.00	7.00	6.00	6.26	7.90	7.06	7.78	6.24	6.00	6.18	5.98
20	6.24	7.00	7.01	5.98	6.26	7.90	7.09	7.70	6.22	5.99	6.18	6.02
21	6.11	6.97	7.01	5.95	6.26	7.90	7.05	7.61	6.25	5.99	6.17	6.01
22	5.96	6.94	7.00	5.91	6.26	7.89	7.06	7.49	6.22	6.00	6.16	6.05
23	5.85	6.91	6.98	5.90	6.26	7.91	7.08	7.38	6.20	6.01	6.14	6.03
24	5.80	6.88	6.93	5.89	6.28	7.89	7.08	7.23	6.19	6.04	6.13	6.01
25	5.72	6.87	6.88	5.88	6.29	7.88	7.10	7.18	6.15	6.05	6.12	6.01
26	5.67	6.87	6.84	5.88	6.29	7.83	7.13	7.11	6.13	6.16	6.11	6.01
27	5.60	6.90	6.82	5.87	6.30	7.77	7.11	7.03	6.10	6.17	6.12	6.00
28	5.54	6.84	6.74	5.86	6.31	7.80	7.11	6.98	6.12	6.16	6.10	6.00
29	5.50	6.85	6.69	5.86	6.38	7.73	7.11	7.00	6.11	6.16	6.08	6.00
30	5.42	6.79	6.67	5.85	---	7.73	7.14	6.90	6.10	6.18	6.06	5.99
31	5.41	---	6.65	5.86	---	7.70	---	6.81	---	6.19	6.06	---
Mean	6.05	6.43	6.88	6.16	6.23	7.53	7.26	7.54	6.27	6.03	6.14	6.03
Max	6.35	7.00	7.01	6.68	6.38	7.91	7.69	8.18	6.75	6.19	6.23	6.07
Min	5.41	5.37	6.65	5.85	5.89	6.46	7.05	6.81	6.10	5.92	6.06	5.98



Stage hydrograph for Lake Koshkonong, 1987-2012.

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

LOCATION.--Lat 43°22'55", long 88°13'47", in NW ¼ NE ¼ sec.33, T.11 N., R.19 E., Washington County, Hydrologic Unit 04040003, 2.6 mi southwest of West Bend.

SURFACE AREA.--0.38 mi^2.

PERIOD OF RECORD.--February 1997 to August 1999, February 2003 to current year.

REMARKS.--Lake sampled at center of northern basin at deep hole. The lake was not sampled during winter ice cover because of unsafe winter conditions. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

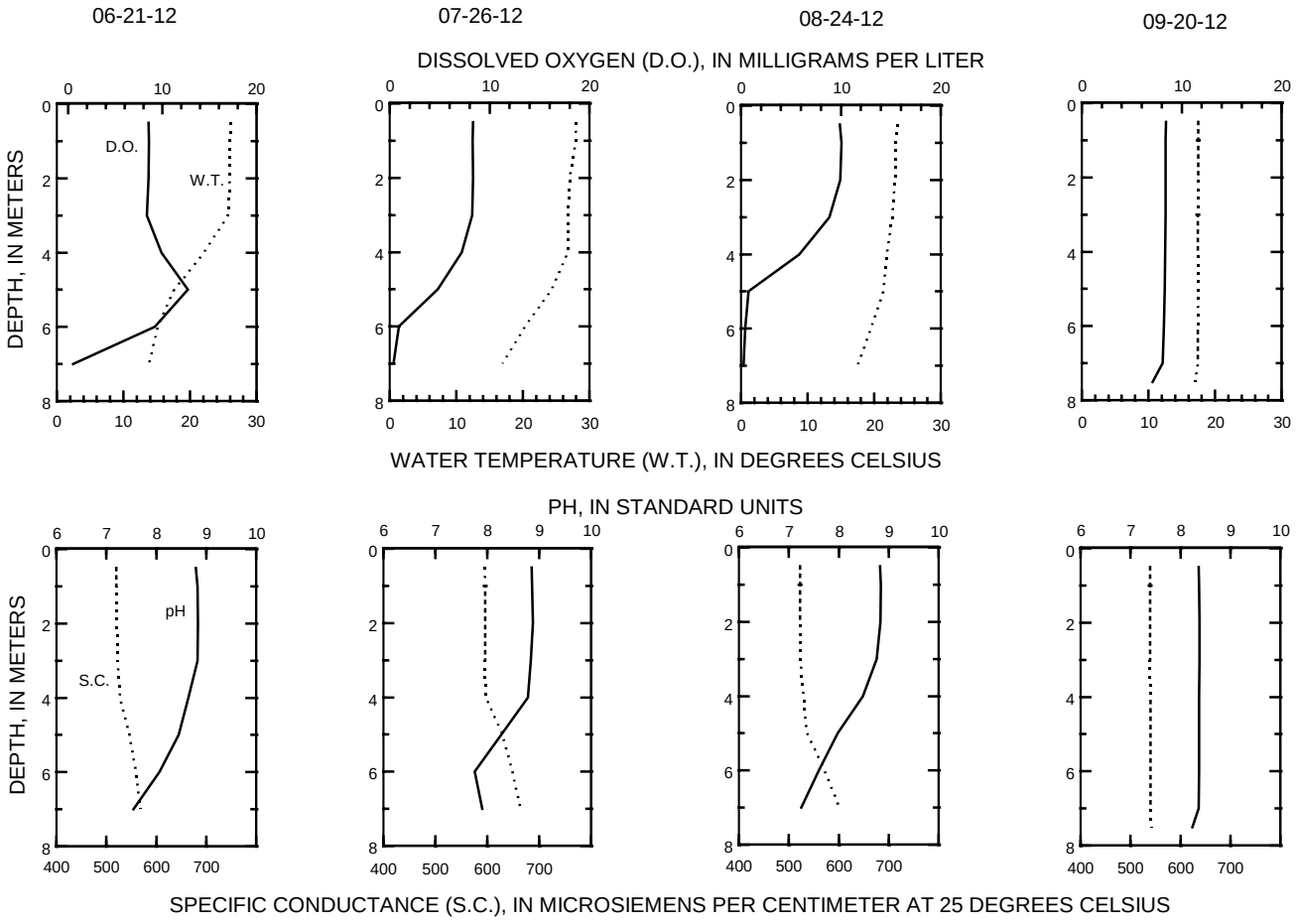
WATER-QUALITY DATA, JUNE 21 TO SEPTEMBER 20, 2012

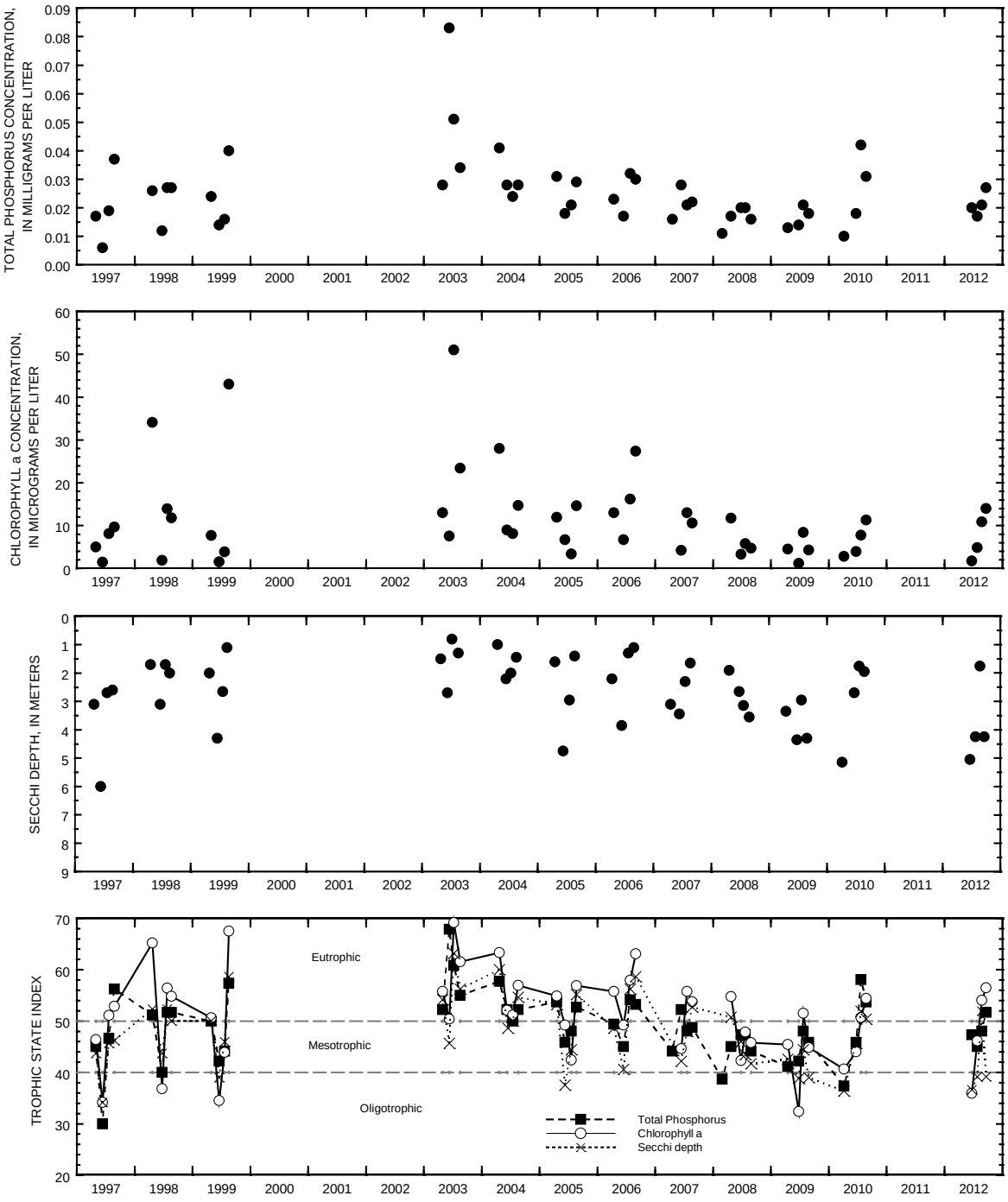
(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro -matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)
JUN 2012								
21...	5.05	--	--	--	--	--	--	--
21...	--	.50	26.2	520	8.8	8.5	1.72	.020
21...	--	7.0	13.8	568	7.5	.5	--	.040
JUL								
26...	4.25	--	--	--	--	--	--	--
26...	--	.50	28.0	595	8.8	8.3	4.88	.017
26...	--	7.0	16.9	664	7.9	.4	--	.082
AUG								
24...	1.75	--	--	--	--	--	--	--
24...	--	.50	23.5	522	8.8	9.9	10.9	.021
24...	--	7.0	17.5	601	7.2	.3	--	.089
SEP								
20...	4.25	--	--	--	--	--	--	--
20...	--	.50	17.5	539	8.4	8.4	14.0	.027
20...	--	7.5	17.0	542	8.2	7.1	--	.031

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

LAKE-DEPTH PROFILES, JUNE 21 TO SEPTEMBER 20, 2012





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 ¼ SE ¼ sec.33, T.11 N., R.19 E., Washington County, Hydrologic Unit 04040003, 2.8 mi southwest of West Bend.

SURFACE AREA.--0.38 mi^2.

PERIOD OF RECORD.--February 1997 to August 1999, February 2003 to current year.

REMARKS.--Lake sampled in southern basin at deep hole. The lake was not sampled during winter ice cover because of unsafe winter conditions. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, MAY 4 TO SEPTEMBER 20, 2012

(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro -matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Total nitro-gen, water, unfltrd mg/L (00600)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrate + nitrite water, fltrd, mg/L as N (00631)
MAY 2012													
04...	5.65	--	--	--	--	--	--	--	--	--	--	--	--
04...	--	.50	15.0	527	8.0	10.6	1.51	.051	<.002	.84	.033	.80	.036
JUN													
21...	4.65	--	--	--	--	--	--	--	--	--	--	--	--
21...	--	.50	25.1	534	8.6	8.6	1.70	.016	--	--	--	--	--
21...	--	15.0	7.3	577	7.3	.6	--	.035	--	--	--	--	--
JUL													
26...	7.55	--	--	--	--	--	--	--	--	--	--	--	--
26...	--	.50	27.3	615	8.6	8.3	1.84	.012	.004	.49	--	--	--
26...	--	14.5	8.6	661	8.6	.1	--	.110	--	--	--	--	--
AUG													
24...	4.15	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	.50	23.5	529	8.6	8.8	2.40	.013	--	--	--	--	--
24...	--	15.5	8.4	588	7.5	.1	--	.170	--	--	--	--	--
SEP													
20...	4.35	--	--	--	--	--	--	--	--	--	--	--	--
20...	--	.50	18.4	534	8.5	8.2	3.15	.014	--	--	--	--	--
20...	--	15.5	8.7	588	7.1	.2	--	.180	--	--	--	--	--

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

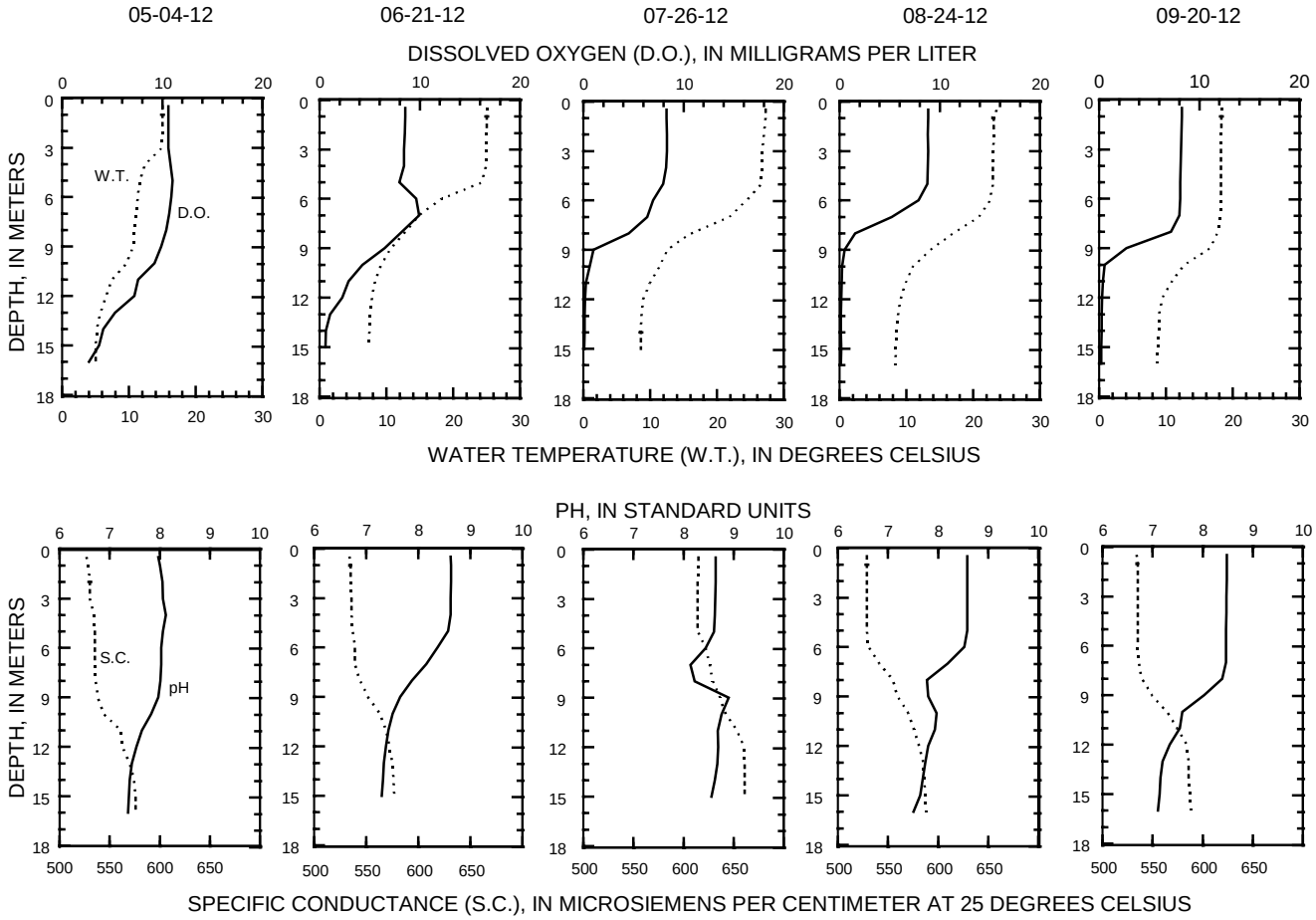
WATER-QUALITY DATA, MAY 4 TO SEPTEMBER 20, 2012
(Milligrams per liter unless otherwise indicated)

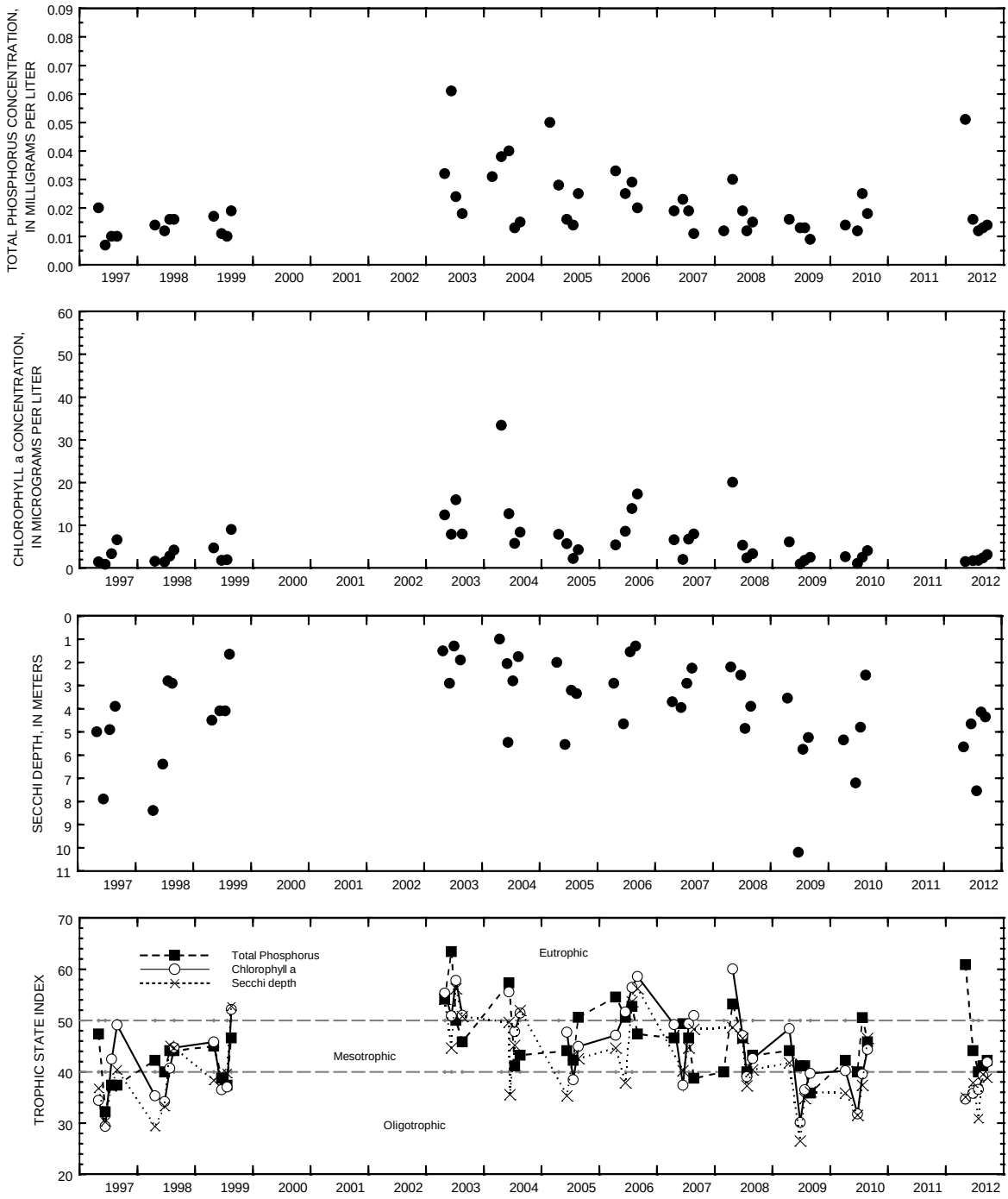
Date	Turbdty white light, det ang 90+/-30 degrees NTU (63675)	Appar-ent color, water, unfltrd Pt-Co units (00081)	Hard-ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Sodium, water, fltrd, mg/L (00930)	Potas-sium, water, fltrd, mg/L (00935)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor-ide, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Silica, water, fltrd, mg/L as SiO2 (00955)	Iron, water, fltrd, ug/L (01046)	Manga-nese, water, fltrd, ug/L (01056)
MAY 2012													
04...	--	--	--	--	--	--	--	--	--	--	--	--	--
04...	1.1	10	222	34.2	33.1	24.7	1.70	182	52.3	18.8	1.41	<100	<1.0
JUN													
21...	--	--	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUL													
26...	--	--	--	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--	--	--	--
AUG													
24...	--	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--	--	--
SEP													
20...	--	--	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--	--	--

Date	Dis-solved solids dried @ 180degC wat flt mg/L (70300)
MAY 2012	
04...	--
04...	282

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

LAKE-DEPTH PROFILES, MAY 4 TO SEPTEMBER 20, 2012





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

05428000 LAKE MENDOTA AT MADISON, WI

LOCATION.--Lat 43°05′42″, long 89°22′12″ referenced to North American Datum of 1927, in NW ¼ SE ¼ sec.12, T.7 N., R.9 E., Dane County, WI, Hydrologic Unit 07090001, in county boat house at dam at outlet, in Madison.

SURFACE AREA.—15.2 mi^2.

DRAINAGE AREA.--233 mi^2 of which 36.6 mi^2 probably is noncontributing.

PERIOD OF RECORD.--January 1916 to January 1985 (incomplete), February 1985 to current year.

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

GAGE.--Water-stage recorder. Datum of gage is 840.00 ft above NGVD of 1929, or 5.60 ft below City of Madison datum. Prior to Oct. 1, 1979, gage datum was 847.82 ft; prior to Nov. 15, 1971, nonrecording gage at same site at the higher datum.

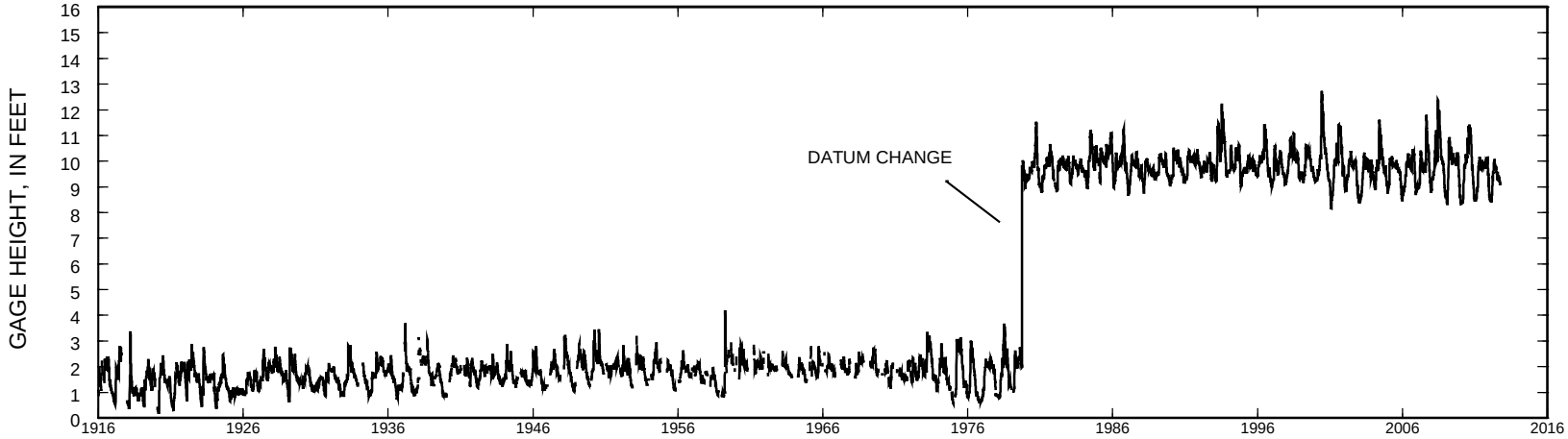
REMARKS.--Lake level regulated by concrete dam with two 12-foot gates and 20-foot lock at outlet. Gage-height telemeter at station.

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

EXTREMES FOR CURRENT YEAR.--Maximum recorded gage height, 10.30 ft, Nov. 13; minimum recorded, 8.53 ft, Feb. 11, 12, 13.

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	9.92	9.87	9.50	8.73	8.43	8.55	9.51	9.92	9.79	9.57	9.49	---
2	9.92	9.89	9.44	8.70	8.43	8.61	9.52	9.96	9.78	9.56	9.48	---
3	9.92	9.93	9.43	8.57	8.44	8.64	9.55	9.99	9.76	9.55	9.47	---
4	9.92	9.92	9.51	8.61	8.45	8.66	9.56	9.99	9.75	9.54	9.47	---
5	9.93	9.89	9.50	8.60	8.45	8.67	9.56	9.97	9.74	9.52	9.47	9.37
6	9.93	9.88	9.47	8.60	8.45	8.68	9.56	10.02	9.74	9.51	9.44	9.37
7	9.92	9.87	9.44	8.59	8.45	8.71	9.56	10.08	9.74	9.49	9.42	9.36
8	9.93	9.92	9.40	8.58	8.45	8.81	9.57	10.08	9.74	9.45	9.41	9.35
9	9.93	10.08	9.36	8.56	8.44	8.85	9.58	10.07	9.73	9.43	9.43	9.34
10	9.93	10.15	9.29	8.55	8.45	8.87	9.56	10.05	9.71	9.40	9.44	9.31
11	9.94	10.16	9.24	8.55	8.44	8.89	9.54	10.03	9.73	9.38	9.41	9.29
12	9.95	10.16	9.20	8.56	8.43	8.95	9.54	10.02	9.73	9.35	9.40	9.29
13	10.05	10.16	9.16	8.56	8.43	8.99	9.53	10.00	9.70	9.33	9.39	9.29
14	10.08	10.15	9.17	8.54	8.44	9.01	9.54	9.97	9.68	9.32	9.39	9.27
15	10.06	10.14	9.20	8.52	8.43	9.03	9.61	9.95	9.68	9.30	9.38	9.26
16	10.05	10.11	9.15	8.51	8.43	9.05	9.66	9.92	9.69	9.29	9.42	9.25
17	10.03	10.05	9.11	8.51	8.43	9.07	9.66	9.87	9.70	9.28	9.42	9.25
18	10.02	9.98	9.08	8.51	8.44	9.09	9.65	9.84	9.68	9.32	9.40	9.23
19	10.02	9.95	9.05	8.49	8.43	9.13	9.67	9.81	9.68	9.42	9.40	9.19
20	10.01	9.92	9.01	8.50	8.43	9.16	9.77	9.80	9.67	9.40	9.42	9.19
21	9.98	9.87	8.98	8.50	8.43	9.18	9.79	9.78	9.69	9.39	9.41	9.17
22	9.98	9.84	8.96	8.49	8.43	9.21	9.80	9.76	9.67	9.38	9.39	9.18
23	9.99	9.79	8.91	8.50	8.44	9.28	9.81	9.73	9.64	9.37	9.36	9.15
24	10.00	9.75	8.87	8.49	8.46	9.31	9.81	9.70	9.64	9.41	9.35	9.13
25	10.02	9.71	8.83	8.48	8.46	9.34	9.82	9.71	9.62	---	9.35	9.11
26	9.99	9.70	8.78	8.47	8.45	9.33	9.85	9.74	9.60	9.54	---	9.11
27	9.97	9.69	8.76	8.46	8.45	9.33	9.83	9.76	9.58	9.54	---	9.11
28	9.96	9.63	8.70	8.45	8.45	9.37	9.83	9.77	9.59	9.53	---	9.10
29	9.95	9.60	8.67	8.45	8.52	9.37	9.85	9.82	9.59	9.52	---	9.10
30	9.92	9.54	8.67	8.43	---	9.44	9.91	9.79	9.58	9.52	---	9.10
31	9.91	---	8.66	8.43	---	9.49	---	9.79	---	9.51	---	---
Mean	9.97	9.91	9.11	8.53	8.44	9.03	9.67	9.89	9.69	---	---	---
Max	10.08	10.16	9.51	8.73	8.52	9.49	9.91	10.08	9.79	---	---	---
Min	9.91	9.54	8.66	8.43	8.43	8.55	9.51	9.70	9.58	---	---	---



Stage hydrograph for Lake Mendota, 1916-2012.

430251088284700 MIDDLE GENESEE LAKE, AT GENESEE LAKE ROAD, NEAR OCONOMOWOC, WI

LOCATION.--Lat 43°02'51", long 88°28'47", in SW ¼ SW ¼ SW ¼ sec.22, T. 7 N., R.17 E., Waukesha County, Hydrologic Unit 07090001, at the southwest side of the lake about 2 miles south of Oconomowoc.

SURFACE AREA.--0.17 mi^2.

DRAINAGE AREA.--Unknown.

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

GAGE.--Staff gage. Local observer, Tom Schubring provided most readings of gage. Datum of gage is about 0.0 ft above NGVD of 1929.

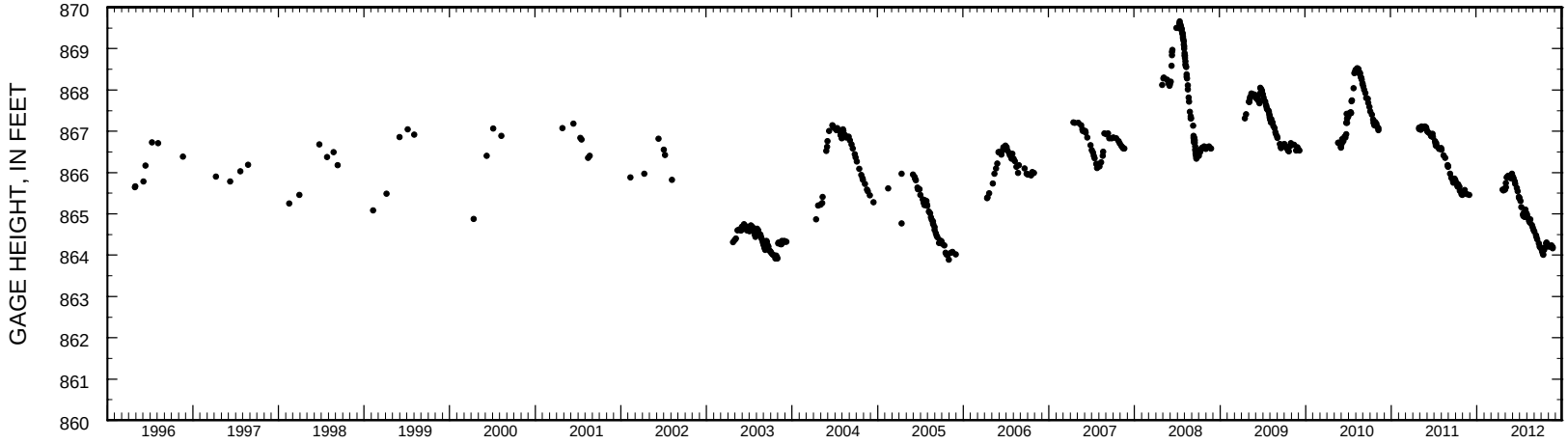
EXTREMES FOR THE PERIOD OF RECORD.--Maximum observed gage height, 869.65 ft, July 12, 2008; minimum observed, 863.88 ft, Oct. 31, 2005.

EXTREMES FOR CURRENT YEAR.--Maximum observed gage height, 865.96 ft, May 29; minimum observed, 864.18 ft, Sept. 30.

GAGE HEIGHT, FT

WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012

Date	Gage Height, ft	Date	Gage Height, ft	Date	Gage Height, ft
October 2	865.81	May 10	865.90	July 23	864.92
5	865.75	14	865.92	26	865.10
10	865.67	25	865.86	27	865.10
11	865.65	27	865.88	30	865.02
13	865.71	29	865.96	August 2	864.98
18	865.65	30	865.92	7	864.90
20	865.55	June 2	865.90	12	864.82
28	865.47	7	865.86	15	864.78
31	865.45	11	865.78	16	864.86
November 4	865.49	14	865.72	23	864.72
11	865.57	20	865.62	27	864.66
20	865.47	23	865.54	31	864.60
30	865.45	28	865.40	September 3	864.56
April 21	865.58	30	865.38	10	864.48
24	865.56	July 1	865.37	12	864.44
30	865.58	5	865.30	16	864.38
May 2	865.62	8	865.16	23	864.28
3	865.64	16	864.98	27	864.20
4	865.74	18	864.94	30	864.18
7	865.88	19	865.02		



Stage hydrograph for Middle Genesee Lake, 1996-2012.

05429000 LAKE MONONA AT MADISON, WI

LOCATION.--Lat 43°03′48″, long 89°23′49″ referenced to North American Datum of 1927, in SE ¼ SW ¼ sec.23, T.7 N., R.9 E., Dane County, WI, Hydrologic Unit 07090001, in Brittingham Park, in Madison.

SURFACE AREA.--5.3 mi^2.

DRAINAGE AREA.--279 mi^2 of which 36.6 mi^2 probably is noncontributing.

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 NGVD of 1929, or 5.60 ft below City of Madison datum. Prior to Oct. 1, 1979, datum 843.61 ft; prior to Nov. 15, 1971, nonrecording gage at same site.

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

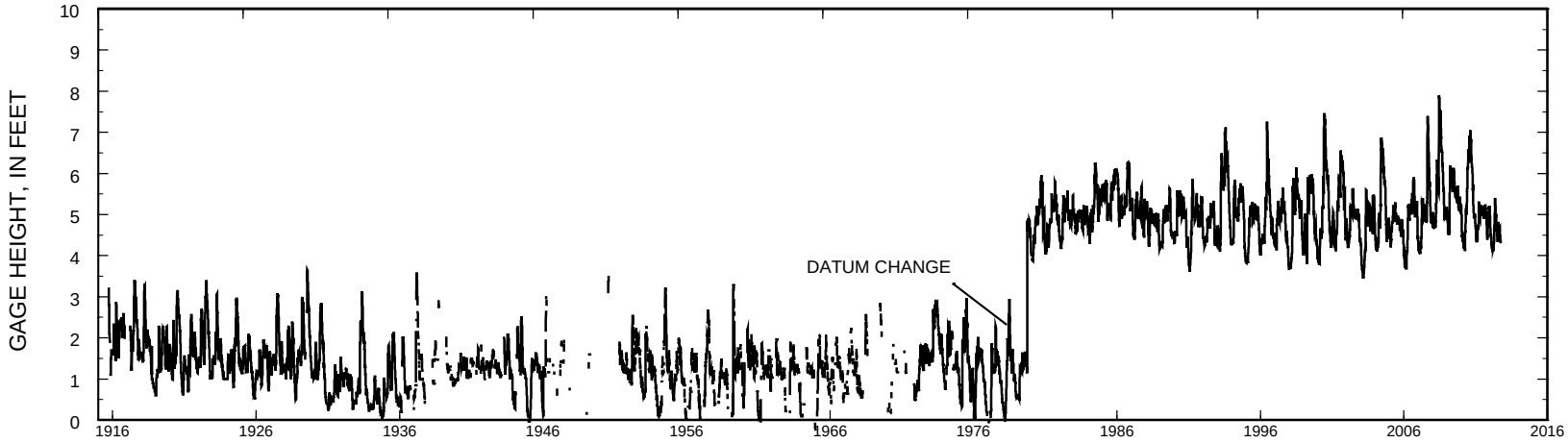
EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 7.92 ft, June 15, 2008; minimum observed, 3.22 ft, Jan. 20, 1965, current datum.

EXTREMES FOR CURRENT YEAR.--Maximum recorded gage height, 5.40 ft, May 7; minimum recorded, 4.10 ft, March 28, current datum.

05429000 LAKE MONONA AT MADISON, WI

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	4.95	4.50	5.05	4.96	4.45	4.26	4.27	4.94	4.96	4.51	4.78	4.64
2	4.93	4.55	5.04	4.90	4.44	4.24	4.30	5.00	4.93	4.51	4.77	4.62
3	4.91	4.63	5.09	4.90	4.41	4.23	4.30	5.08	4.93	4.50	4.77	4.61
4	4.89	4.65	5.19	4.89	4.39	4.21	4.30	5.18	4.94	4.49	4.76	4.61
5	4.88	4.66	5.20	4.87	4.36	4.19	4.31	5.20	4.94	4.49	4.74	4.64
6	4.86	4.68	5.20	4.84	4.35	4.17	4.30	5.30	4.91	4.48	4.72	4.63
7	4.85	4.68	5.18	4.79	4.33	4.18	4.31	5.40	4.89	4.48	4.70	4.63
8	4.83	4.74	5.17	4.76	4.31	4.21	4.32	5.39	4.86	4.45	4.70	4.60
9	4.81	4.90	5.15	4.73	4.29	4.20	4.30	5.37	4.84	4.44	4.73	4.60
10	4.78	5.00	5.15	4.69	4.28	4.20	4.28	5.34	4.83	4.42	4.72	4.59
11	4.76	5.03	5.15	4.67	4.26	4.19	4.30	5.30	4.81	4.40	4.69	4.58
12	4.74	5.03	5.15	4.65	4.25	4.21	4.33	5.27	4.76	4.38	4.68	4.56
13	4.80	5.03	5.14	4.63	4.24	4.21	4.35	5.23	4.73	4.37	4.68	4.54
14	4.76	5.02	5.21	4.61	4.25	4.20	4.37	5.21	4.71	4.36	4.67	4.52
15	4.69	5.00	5.21	4.59	4.24	4.20	4.47	5.20	4.69	4.35	4.66	4.51
16	4.65	4.99	5.21	4.58	4.22	4.18	4.50	5.20	4.67	4.34	4.71	4.50
17	4.60	4.97	5.21	4.57	4.21	4.17	4.50	5.19	4.66	4.33	4.72	4.48
18	4.57	4.99	5.20	4.55	4.20	4.15	4.51	5.18	4.65	4.49	4.72	4.45
19	4.53	5.00	5.19	4.53	4.19	4.16	4.56	5.18	4.65	4.70	4.72	4.42
20	4.45	4.99	5.18	4.52	4.19	4.15	4.67	5.15	4.64	4.67	4.73	4.41
21	4.43	4.99	5.18	4.52	4.19	4.14	4.71	5.09	4.65	4.65	4.72	4.40
22	4.42	4.99	5.17	4.51	4.18	4.14	4.73	5.05	4.61	4.64	4.70	4.39
23	4.39	4.99	5.15	4.53	4.17	4.17	4.72	5.03	4.60	4.63	4.69	4.37
24	4.42	5.00	5.14	4.52	4.18	4.16	4.74	5.00	4.59	4.70	4.68	4.35
25	4.43	5.04	5.12	4.51	4.17	4.15	4.78	4.97	4.58	4.72	4.68	4.35
26	4.43	5.07	5.10	4.50	4.17	4.14	4.79	5.02	4.54	4.82	4.69	4.35
27	4.43	5.08	5.10	4.48	4.15	4.13	4.80	5.01	4.53	4.82	4.68	4.34
28	4.43	5.07	5.08	4.47	4.15	4.10	4.83	5.00	4.52	4.82	4.67	4.33
29	4.44	5.05	5.08	4.45	4.24	4.11	4.84	4.98	4.51	4.80	4.67	4.33
30	4.47	5.04	5.08	4.44	---	4.20	4.91	4.95	4.51	4.79	4.65	4.33
31	4.48	---	5.03	4.44	---	4.25	---	5.00	---	4.79	4.65	---
Mean	4.65	4.91	5.15	4.63	4.26	4.18	4.51	5.14	4.72	4.56	4.70	4.49
Max	4.95	5.08	5.21	4.96	4.45	4.26	4.91	5.40	4.96	4.82	4.78	4.64
Min	4.39	4.50	5.03	4.44	4.15	4.10	4.27	4.94	4.51	4.33	4.65	4.33



Stage hydrograph for Lake Monona, 1915-2012.

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

LOCATION.--Lat 43°05'51", long 88°27'35", in NW ¼ SE ¼ sec.2, T.7 N., R.17 E., Waukesha County, Hydrologic Unit 07090001, at Oconomowoc.

SURFACE AREA.--1.20 mi^2.

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

REMARKS.--Lake sampled near center at the deep hole. The lake was not sampled during winter ice cover because of unsafe winter conditions. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, APRIL 3 TO SEPTEMBER 19, 2012

(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro-matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Total nitro-gen, water, unfltrd mg/L (00600)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrate + nitrite water, fltrd, mg/L as N (00631)
APR 2012													
03...	5.95	--	--	--	--	--	--	--	--	--	--	--	--
03...	--	.50	9.9	568	8.2	11.5	2.93	.010	.003	.63	.017	.53	.104
JUN													
19...	5.75	--	--	--	--	--	--	--	--	--	--	--	--
19...	--	.50	24.8	552	8.2	9.2	1.26	.011	--	--	--	--	--
19...	--	17.0	7.9	596	7.4	1.6	--	.024	--	--	--	--	--
JUL													
25...	5.45	--	--	--	--	--	--	--	--	--	--	--	--
25...	--	.50	26.7	541	8.5	8.1	2.12	.008	--	--	--	--	--
25...	--	17.0	7.9	604	7.6	.1	--	.018	--	--	--	--	--
AUG													
17...	4.25	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	.50	23.2	538	8.5	8.6	2.08	.006	--	--	--	--	--
17...	--	18.0	7.9	616	8.2	.1	--	.050	--	--	--	--	--
SEP													
19...	5.05	--	--	--	--	--	--	--	--	--	--	--	--
19...	--	.50	19.3	544	8.5	8.4	3.07	.011	--	--	--	--	--
19...	--	18.0	8.3	604	7.3	.2	--	.026	--	--	--	--	--

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

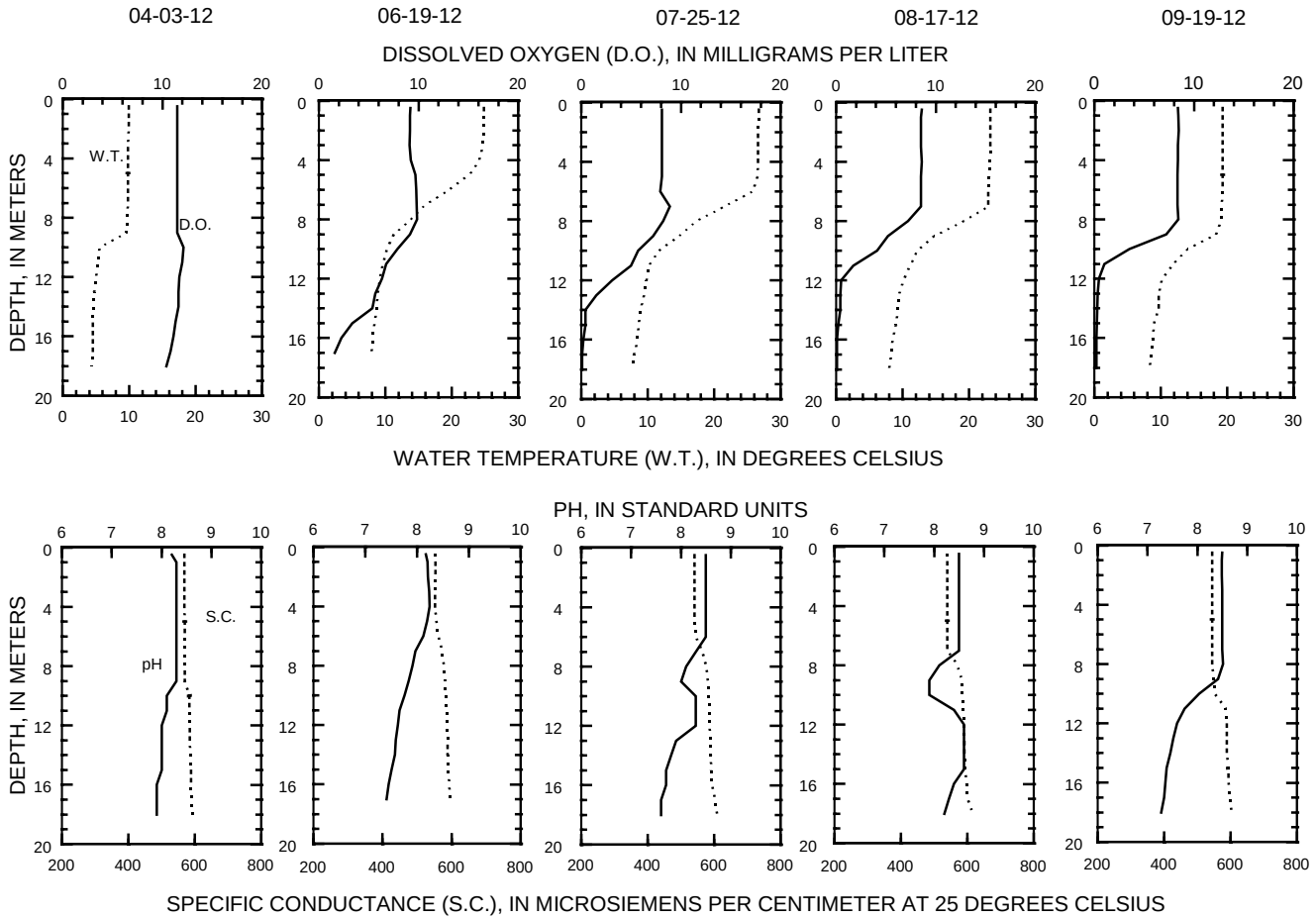
WATER-QUALITY DATA, APRIL 3 TO SEPTEMBER 19, 2012
(Milligrams per liter unless otherwise indicated)

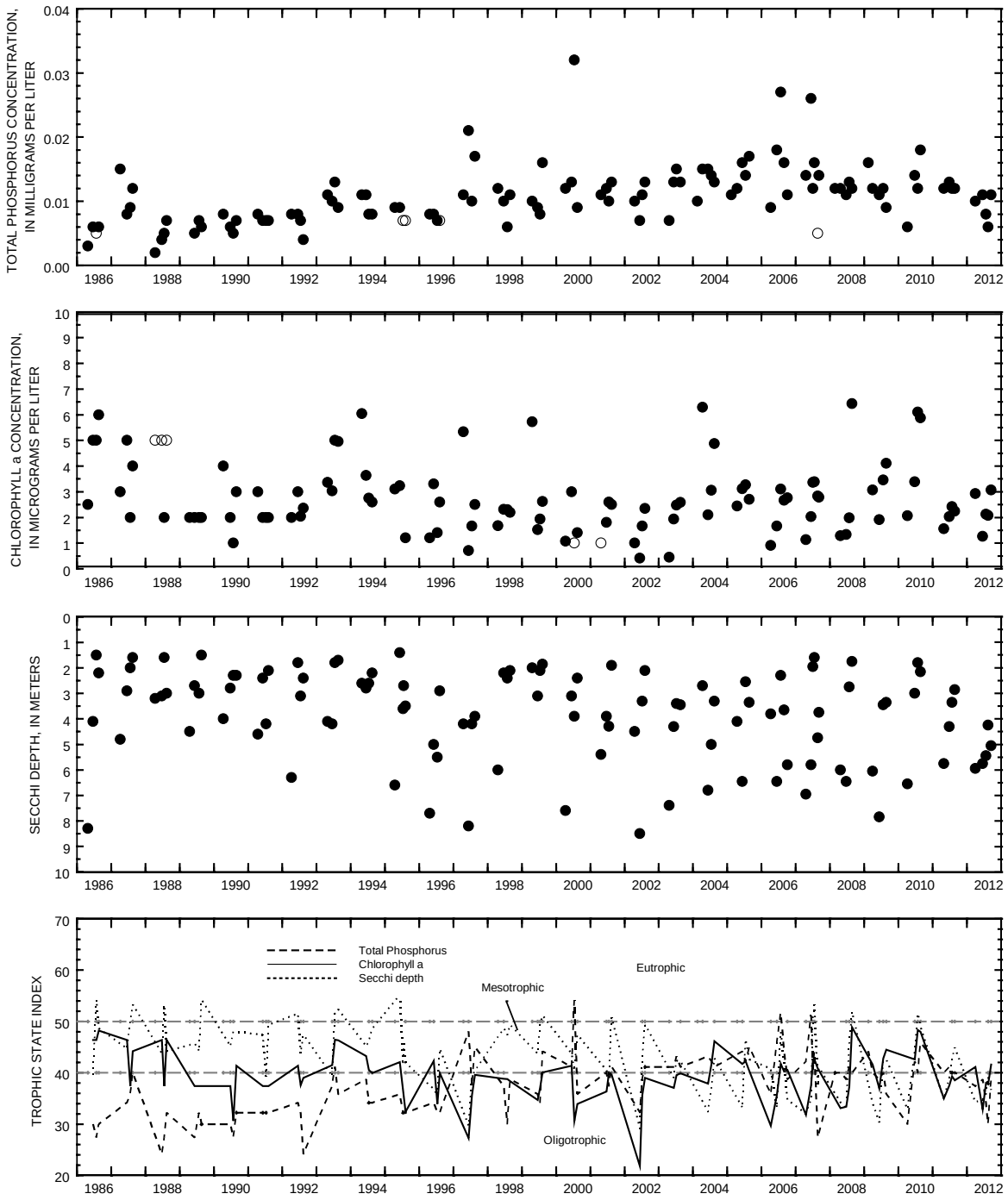
Date	Turbdty white light, det ang 90+/-30 degrees NTU (63675)	Appar-ent color, water, unfltrd Pt-Co units (00081)	Hard-ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Sodium, water, fltrd, mg/L (00930)	Potas-sium, water, fltrd, mg/L (00935)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor-ide, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Silica, water, fltrd, mg/L as SiO2 (00955)	Iron, water, fltrd, ug/L (01046)	Manga-nese, water, fltrd, ug/L (01056)
APR 2012													
03...	--	--	--	--	--	--	--	--	--	--	--	--	--
03...	.8	5	245	44.9	32.3	22.3	2.00	209	50.4	23.7	5.90	<100	<1.0
JUN													
19...	--	--	--	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUL													
25...	--	--	--	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--	--	--	--
AUG													
17...	--	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--	--	--
SEP													
19...	--	--	--	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--	--	--	--

Date	Dis-solved solids dried @ 180degC wat flt mg/L (70300)
APR 2012	
03...	--
03...	318

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

LAKE-DEPTH PROFILES, APRIL 3 TO SEPTEMBER 19, 2012





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

(Open circles on the first two 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 ¼ NW ¼ sec.1, T.7 N., R.17 E., Waukesha County, Hydrologic Unit 07090001, at Oconomowoc.

SURFACE AREA.—1.20 mi^2.

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

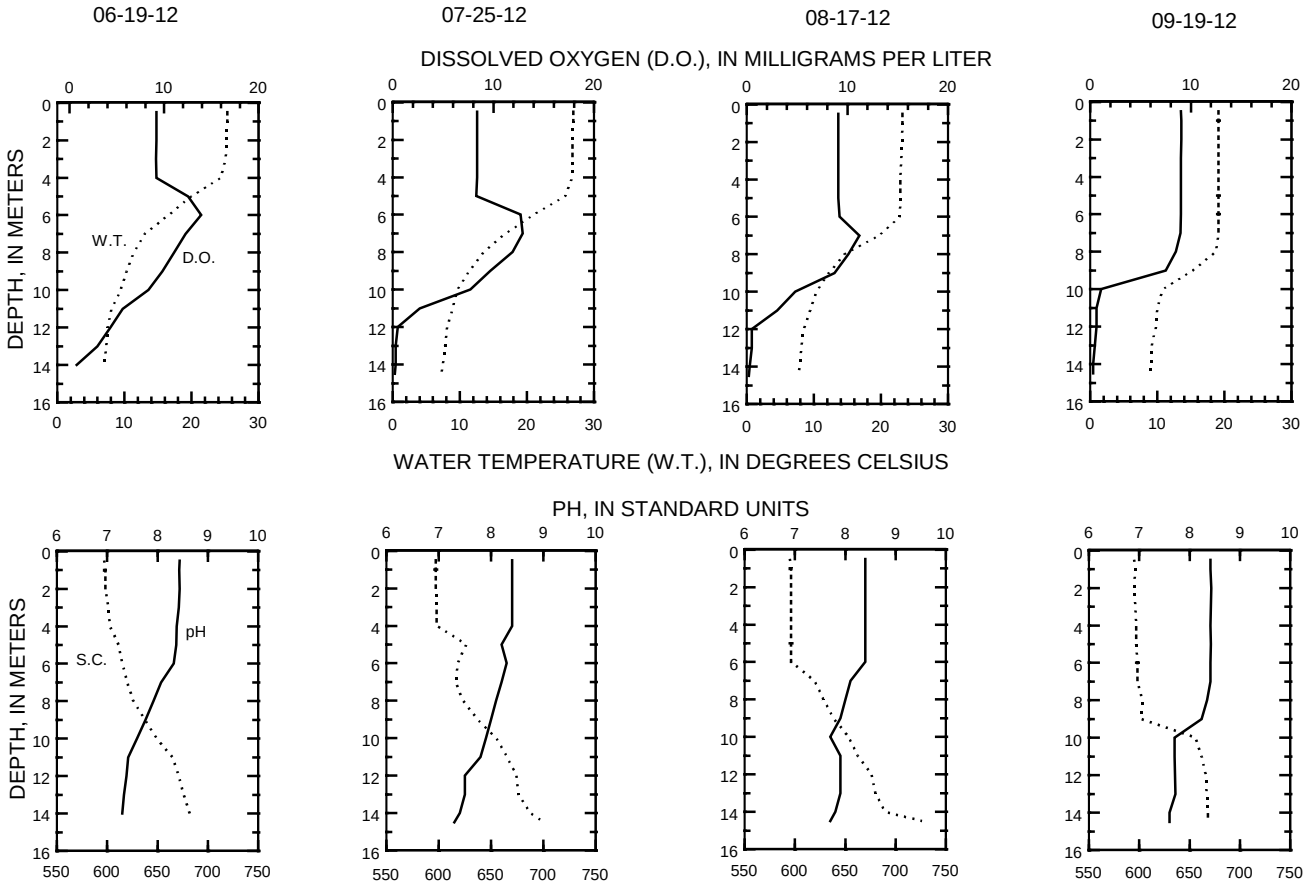
REMARKS.--Lake sampled at the deepest point in northeast bay near Hewitt Point. The lake was not sampled during winter ice cover because of unsafe winter conditions. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

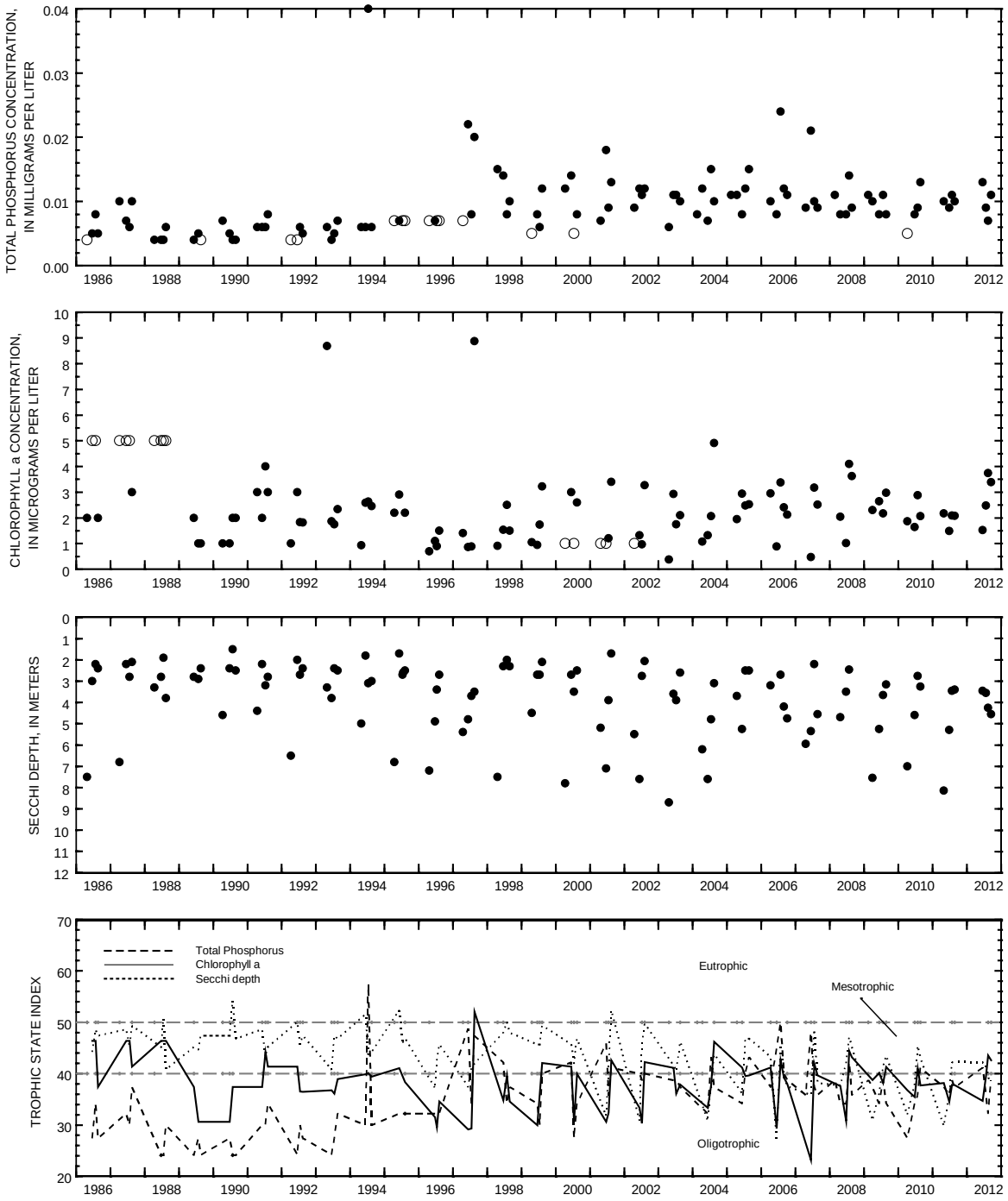
WATER-QUALITY DATA, JUNE 19 TO SEPTEMBER 19, 2012
(Milligrams per liter unless otherwise indicated)

Date	Transparency Secchi disc, meters (00078)	Sampling depth, meters (00098)	Temperature, water, deg C (00010)	Specific conductance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dissolved oxygen, mg/L (00300)	Chlorophyll a trichromatic method, uncorr, ug/L (32210)	Phosphorus, water, unfltrd mg/L as P (00665)
JUN 2012								
19...	3.45	--	--	--	--	--	--	--
19...	--	.50	25.3	597	8.4	9.2	1.52	.013
19...	--	14.0	7.0	682	7.3	.7	--	.035
JUL								
25...	3.55	--	--	--	--	--	--	--
25...	--	.50	26.9	597	8.4	8.4	2.48	.009
25...	--	14.0	7.5	687	7.4	.3	--	.039
AUG								
17...	4.25	--	--	--	--	--	--	--
17...	--	.50	23.2	595	8.4	9.1	3.74	.007
17...	--	14.5	7.5	726	7.7	.2	--	.028
SEP								
19...	4.55	--	--	--	--	--	--	--
19...	--	.50	19.1	595	8.4	9.0	3.39	.011
19...	--	14.5	9.0	668	7.6	.3	--	.039

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

LAKE-DEPTH PROFILES, JUNE 19 TO SEPTEMBER 19, 2012





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

(Open circles on the first two 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 ¼ SE ¼ 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 September 2006, April to August 2008, April to August 2010, April to August 2012.

REMARKS.--Lake sampled near center at the deep hole. The lake was not sampled during winter ice cover because of unsafe winter conditions. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, APRIL 2 TO SEPTEMBER 19, 2012
(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro-matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Total nitro-gen, water, unfltrd mg/L (00600)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrate + nitrite water, fltrd, mg/L as N (00631)
APR 2012													
02...	4.65	--	--	--	--	--	--	--	--	--	--	--	--
02...	--	.50	10.0	577	7.9	11.6	3.53	.015	<.002	.91	<.015	.64	.265
JUN													
19...	2.75	--	--	--	--	--	--	--	--	--	--	--	--
19...	--	.50	24.7	547	8.2	9.1	3.91	.016	--	--	--	--	--
19...	--	27.0	4.6	607	7.4	.2	--	.025	--	--	--	--	--
JUL													
25...	2.65	--	--	--	--	--	--	--	--	--	--	--	--
25...	--	.50	26.4	523	8.6	8.4	4.75	.014	--	--	--	--	--
25...	--	27.0	4.9	603	7.4	.1	--	.020	--	--	--	--	--
AUG													
17...	2.95	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	.50	22.8	517	8.6	8.5	5.03	.011	--	--	--	--	--
17...	--	28.0	4.9	616	7.8	.1	--	.023	--	--	--	--	--
SEP													
19...	3.55	--	--	--	--	--	--	--	--	--	--	--	--
19...	--	.50	19.2	522	8.6	8.6	5.47	.015	--	--	--	--	--
19...	--	28.0	5.0	618	7.1	.1	--	.039	--	--	--	--	--

430723088252100 OKAUCHEE LAKE AT OKAUCHEE, WI

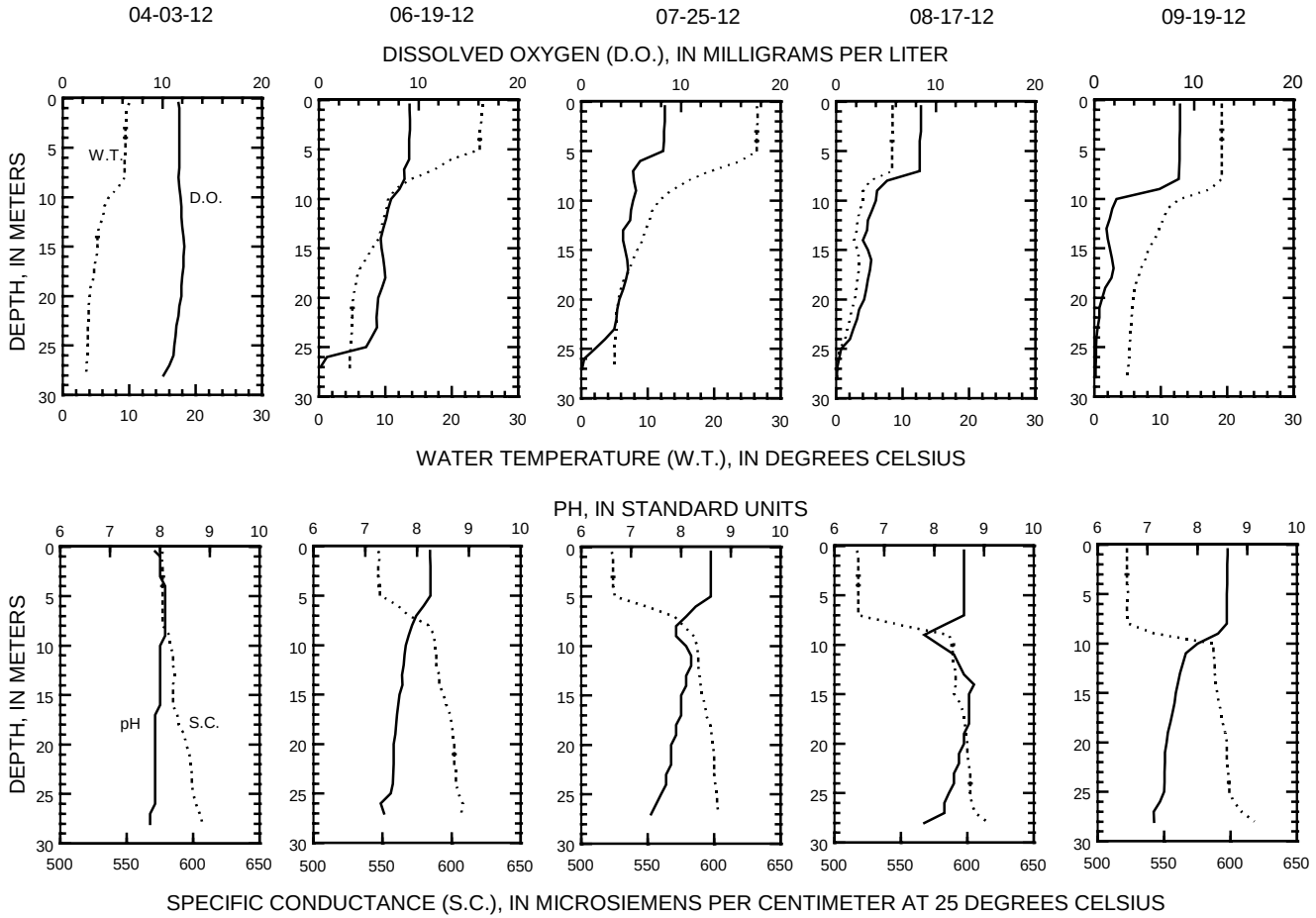
WATER-QUALITY DATA, APRIL 2 TO SEPTEMBER 19, 2012
(Milligrams per liter unless otherwise indicated)

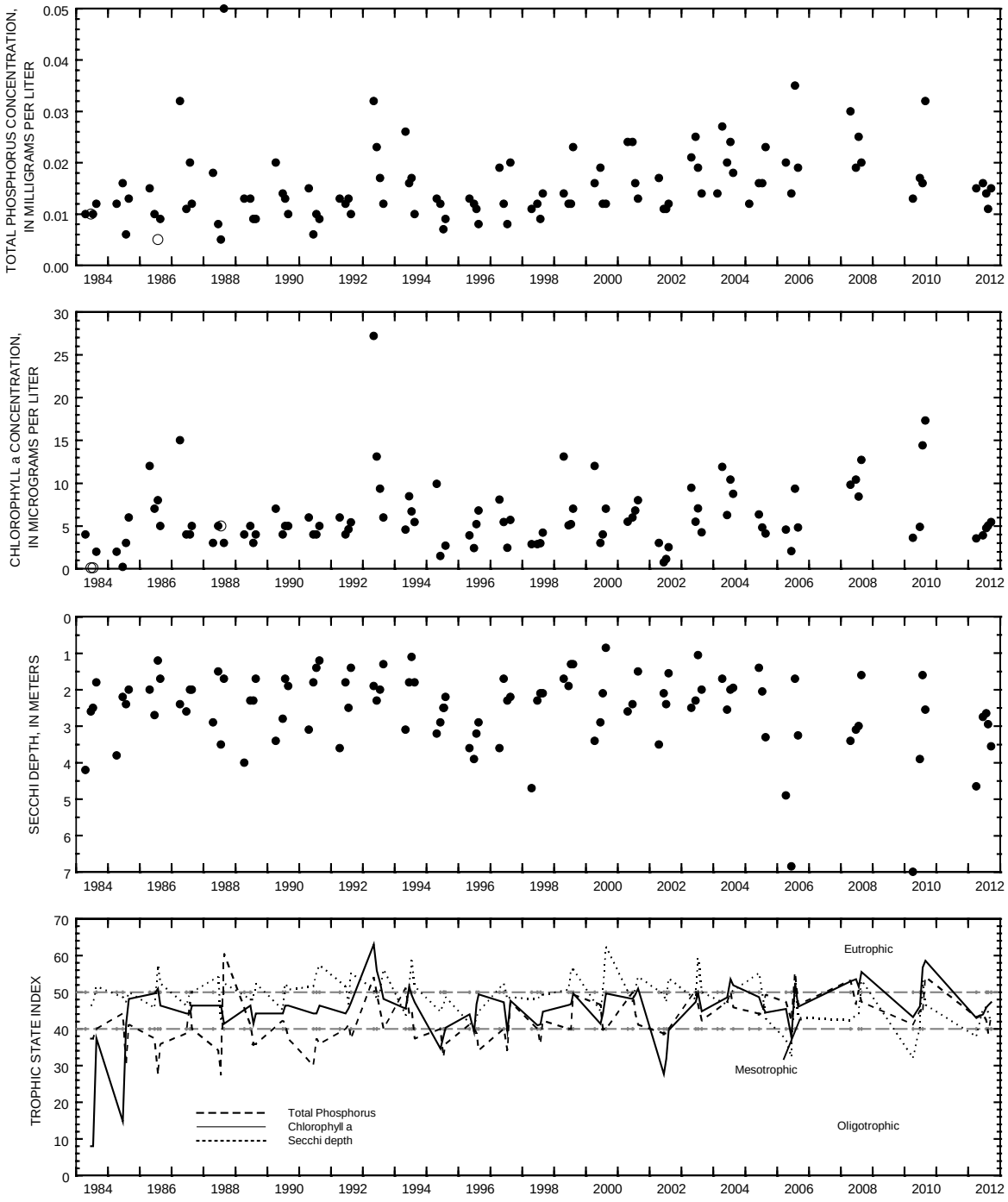
Date	Turbdty white light, det ang 90+/-30 degrees NTU (63675)	Appar-ent color, water, unfltrd Pt-Co units (00081)	Hard-ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Sodium, water, fltrd, mg/L (00930)	Potas-sium, water, fltrd, mg/L (00935)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor-ide, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Silica, water, fltrd, mg/L as SiO2 (00955)	Iron, water, fltrd, ug/L (01046)	Manga-nese, water, fltrd, ug/L (01056)
APR 2012													
02...	--	--	--	--	--	--	--	--	--	--	--	--	--
02...	<1.0	10	261	51.1	32.5	18.8	2.00	226	43.9	23.9	5.20	<100	<1.0
JUN													
19...	--	--	--	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUL													
25...	--	--	--	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--	--	--	--
AUG													
17...	--	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--	--	--
SEP													
19...	--	--	--	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--	--	--	--

Date	Dis-solved solids dried @ 180degC wat flt mg/L (70300)
APR 2012	
02...	--
02...	334

430723088252100 OKAUCHEE LAKE AT OKAUCHEE, WI

LAKE-DEPTH PROFILES, APRIL 3 TO SEPTEMBER 19, 2012





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

(Open circles on the first two 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 ¼ NW ¼ sec.30, T.8 N., R.18 E., Waukesha County, Hydrologic Unit 07090001, near Okauchee.

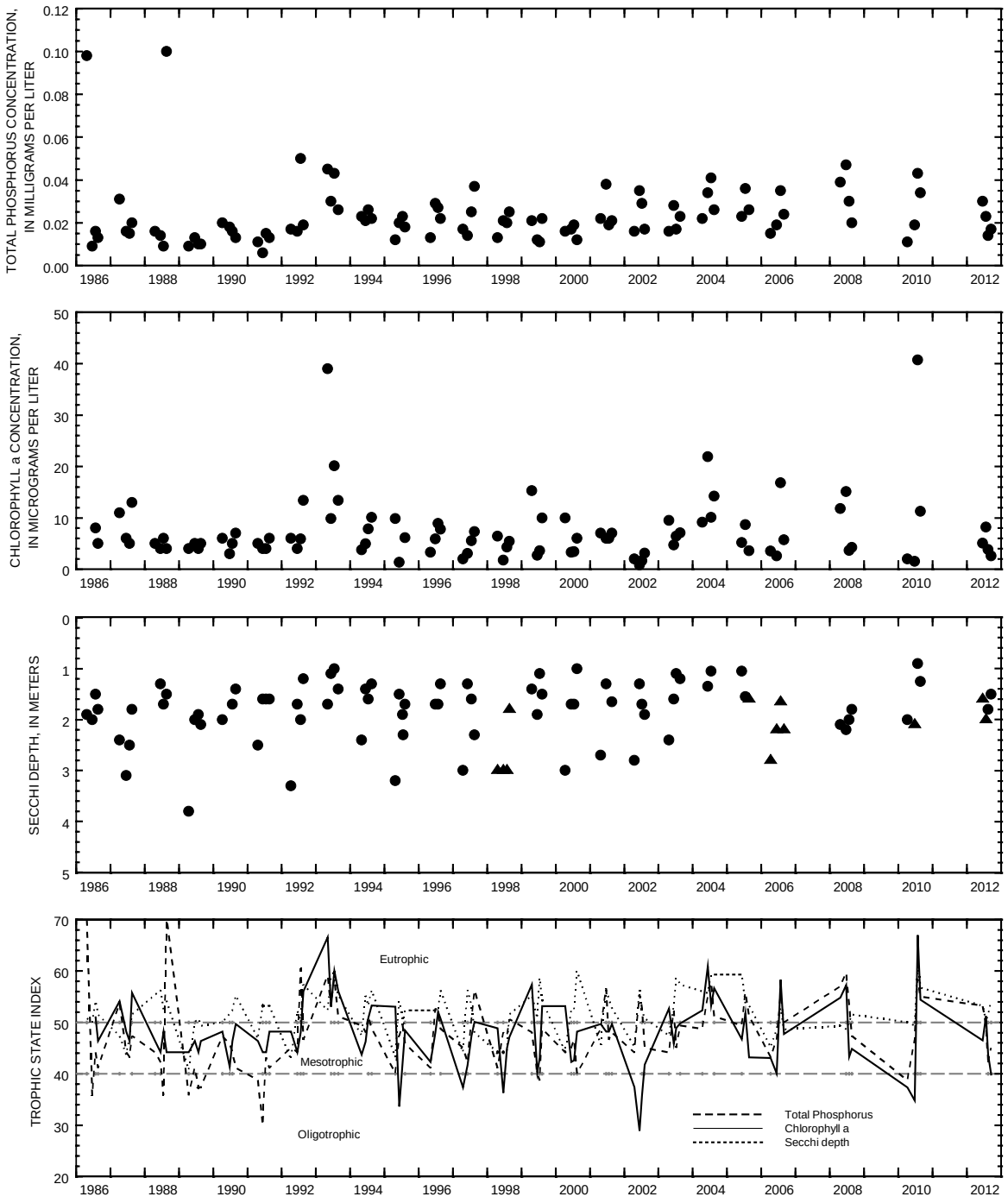
PERIOD OF RECORD.--April 1986 to September 2006, April to August 2008, April to August 2010, April to August 2012.

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, JUNE 19 TO SEPTEMBER 19, 2012

(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro -matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)
JUN 2012								
19...	>1.60	--	--	--	--	--	--	--
19...	--	.50	26.5	590	8.3	7.6	5.07	.030
JUL								
25...	>2.00	--	--	--	--	--	--	--
25...	--	.50	26.4	527	8.4	8.3	8.20	.023
AUG								
17...	1.80	--	--	--	--	--	--	--
17...	--	.50	22.2	517	8.5	8.2	3.84	.014
SEP								
19...	1.50	--	--	--	--	--	--	--
19...	--	.50	16.8	523	8.7	9.7	2.58	.017



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

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

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

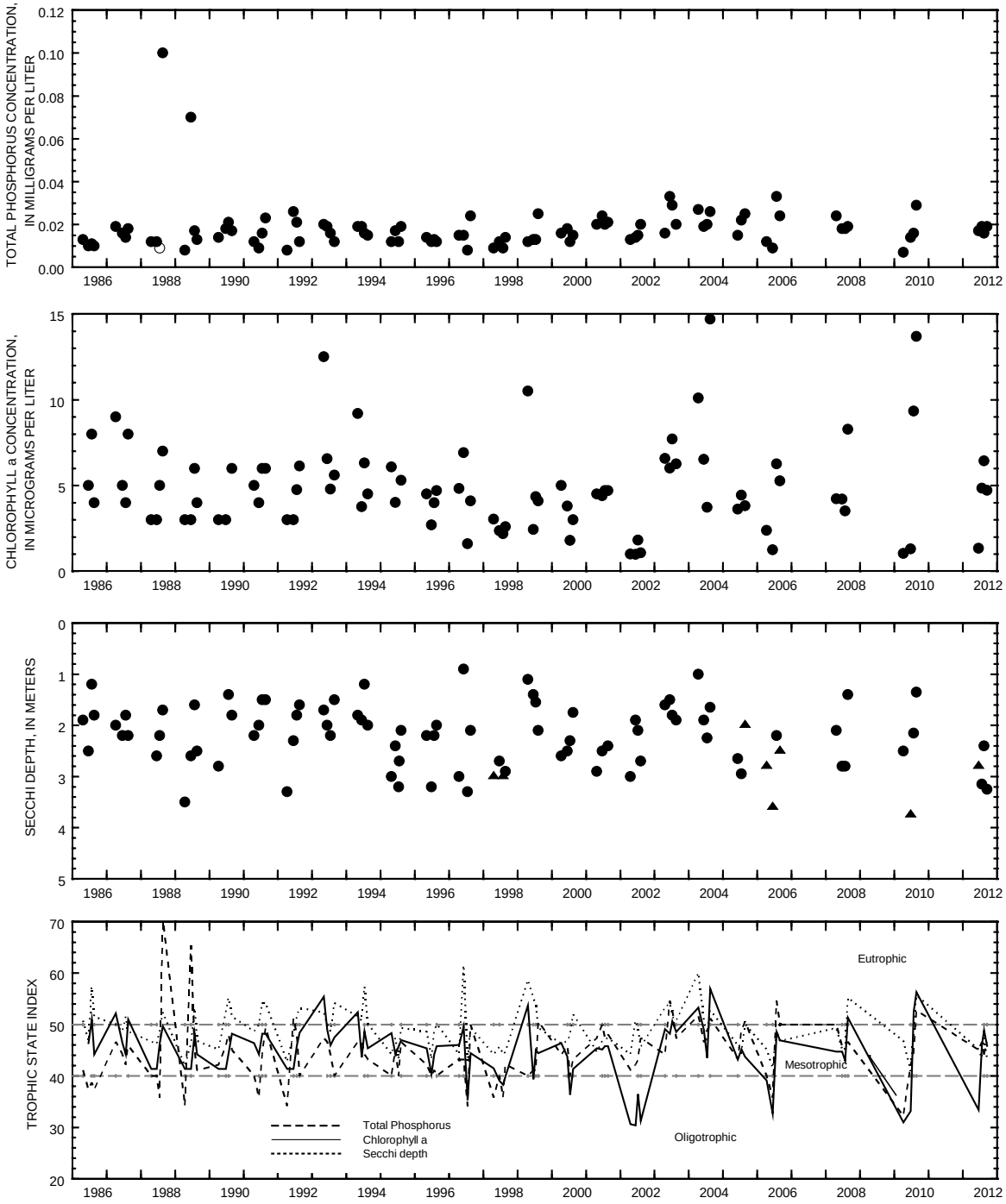
LOCATION.--Lat 43°06'45", long 88°26'45", in SE ¼ NE ¼ sec.35, T.8 N., R.17 E., Waukesha County, Hydrologic Unit 07090001, at Okauchee.

PERIOD OF RECORD.--April 1986 to September 2006, April to August 2008, April to August 2010, April to August 2012

REMARKS.--Lake sampled in Lower Okauchee Lake, at an approximate depth of 3 m. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, WATER-QUALITY DATA, JUNE 19 TO SEPTEMBER 19, 2012
(Milligrams per liter unless otherwise indicated)

Date	Transparency Secchi disc, meters (00078)	Sampling depth, meters (00098)	Temperature, water, deg C (00010)	Specific conductance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dissolved oxygen, mg/L (00300)	Chlorophyll a trichromatic method, uncorr, ug/L (32210)	Phosphorus, water, unfltrd mg/L as P (00665)
JUN 2012								
19...	>2.80	--	--	--	--	--	--	--
19...	--	.50	27.2	493	8.5	9.1	1.33	.017
JUL								
25...	3.15	--	--	--	--	--	--	--
25...	--	.50	27.3	502	8.7	7.3	4.84	.019
AUG								
17...	2.40	--	--	--	--	--	--	--
17...	--	.50	23.1	505	8.4	7.7	6.44	.016
SEP								
19...	3.25	--	--	--	--	--	--	--
19...	--	.50	18.4	509	8.6	8.5	4.72	.019



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

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

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

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

LOCATION.--Lat 43°06'42", long 88°25'24", in NE ¼ SE ¼ sec.36, T.8 N., R.17 E., Waukesha County, Hydrologic Unit 07090001, at Okauchee.

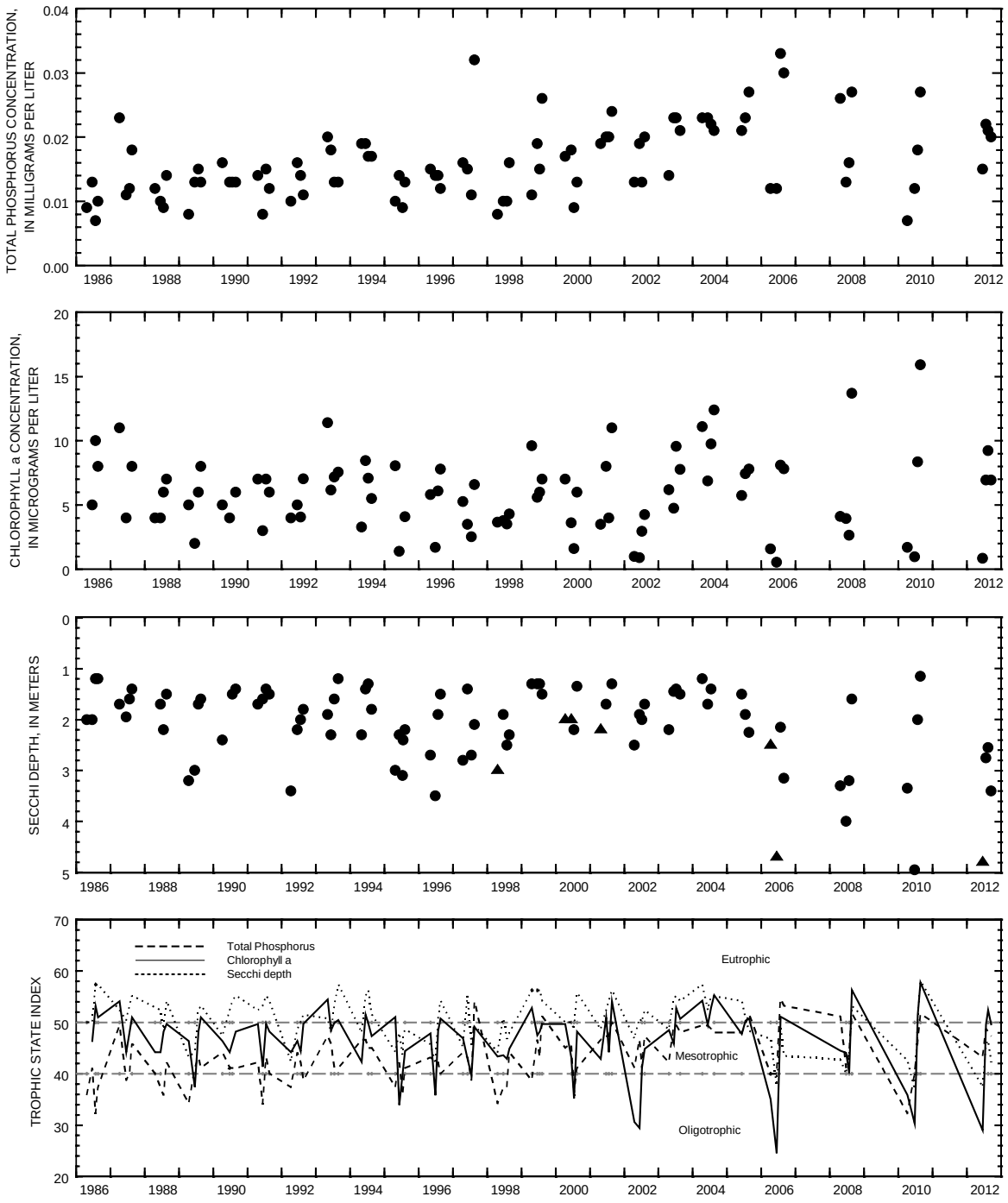
PERIOD OF RECORD.--April 1986 to September 2006, April to August 2008, April to August 2010, April to August 2012.

REMARKS.--Lake sampled in Ice House Bay, in the southern part of the lake, at an approximate depth of 5 m. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, JUNE 19 TO SEPTEMBER 19, 2012

(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro -matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)
JUN 2012								
19...	>4.80	--	--	--	--	--	--	--
19...	--	.50	25.2	530	8.1	9.3	.850	.015
JUL								
25...	2.75	--	--	--	--	--	--	--
25...	--	.50	26.9	527	8.5	7.7	6.93	.022
AUG								
17...	2.55	--	--	--	--	--	--	--
17...	--	.50	22.6	516	8.5	8.1	9.22	.021
SEP								
19...	3.40	--	--	--	--	--	--	--
19...	--	.50	17.7	515	8.6	9.0	6.94	.020



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

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

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

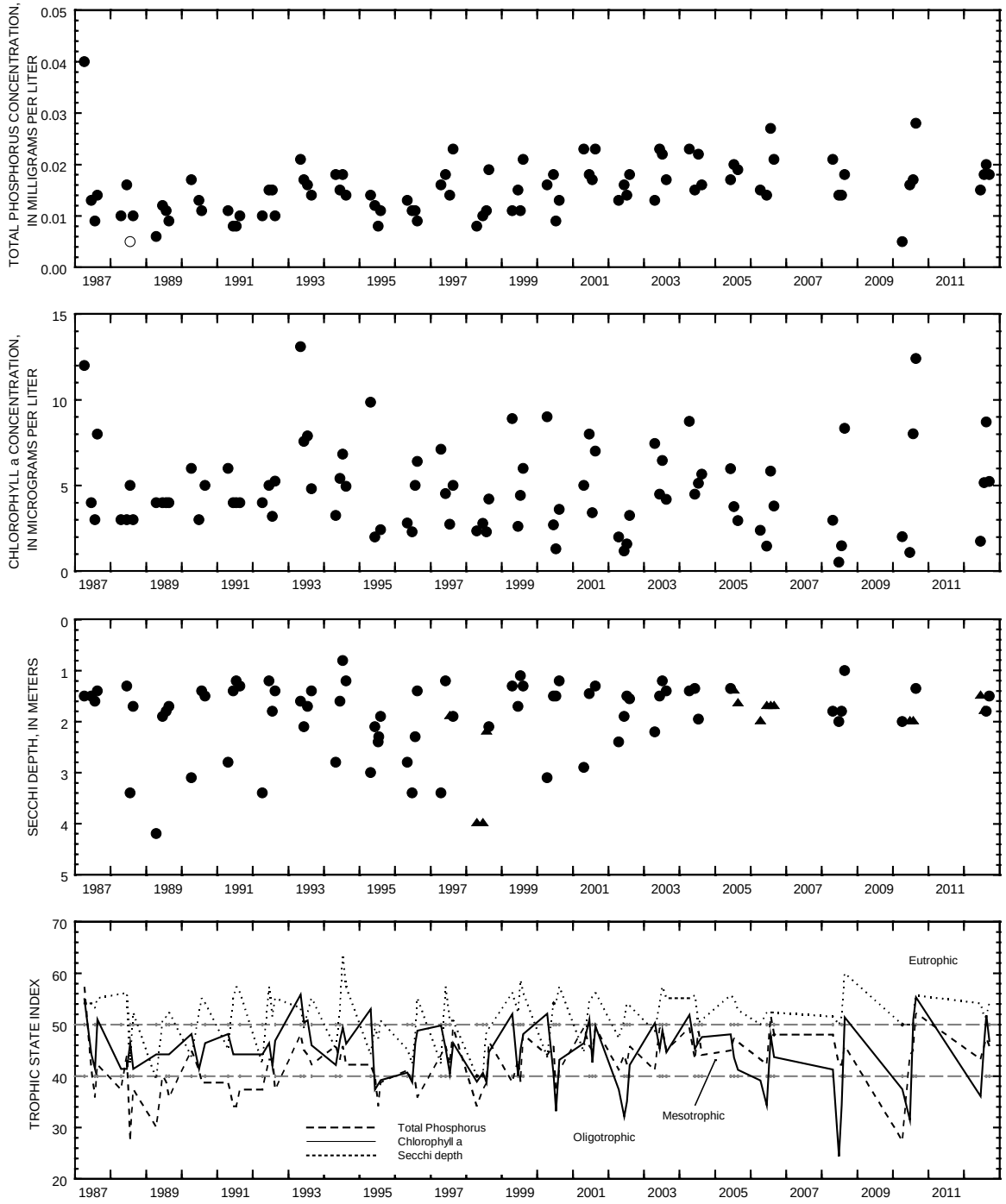
LOCATION.--Lat 43°07'57", long 88°26'17", in NW ¼ NW ¼ sec.25, T.8 N., R.17 E., Waukesha County, Hydrologic Unit 07090001, at Okauchee.

PERIOD OF RECORD.--June 1986 to September 2006, April to August 2008, April to August 2010.

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, JUNE 19 TO SEPTEMBER 19, 2012
(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro -matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)
JUN 2012								
19...	>1.50	--	--	--	--	--	--	--
19...	--	.50	26.1	523	8.4	10.4	1.75	.015
JUL								
25...	>1.80	--	--	--	--	--	--	--
25...	--	.50	26.3	518	8.5	7.9	5.16	.018
AUG								
17...	1.80	--	--	--	--	--	--	--
17...	--	.50	21.9	512	8.5	8.0	8.71	.020
SEP								
19...	1.50	--	--	--	--	--	--	--
19...	--	.50	17.0	520	8.5	8.7	5.23	.018



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

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

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

423246088175800 POWERS LAKE AT POWERS LAKE, WI

LOCATION.--Lat 42°32'46", long 88°17'58", in NW ¼ SE ¼ sec.13, T.1 N., R.18 E., Walworth County, Hydrologic Unit 07120006, at Powers Lake.

SURFACE AREA.—0.72 mi^2.

DRAINAGE AREA.--3.42 mi^2.

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

REMARKS.--Lake sampled near center at the deep hole. The lake was not sampled during winter ice cover because of unsafe winter conditions. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, APRIL 2 TO SEPTEMBER 18, 2012
(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro-matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Total nitro-gen, water, unfltrd mg/L (00600)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia + org-N, water, fltrd, mg/L as N (00623)	Ammonia + org-N, water, unfltrd mg/L as N (00625)
APR 2012													
02...	4.15	--	--	--	--	--	--	--	--	--	--	--	--
02...	--	.50	11.5	488	8.2	10.7	3.67	.016	<.002	<.54	<.015	--	.52
JUN													
22...	5.15	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	.50	25.5	503	8.4	8.3	1.66	.014	--	--	--	--	--
22...	--	9.5	16.0	523	7.2	.7	--	.024	--	--	--	--	--
JUL													
28...	3.35	--	--	--	--	--	--	--	--	--	--	--	--
28...	--	.50	27.7	503	8.5	8.3	4.30	.016	<.002	<.28	--	.56	.26
28...	--	9.5	17.7	524	7.5	.2	--	.037	--	--	--	--	--
AUG													
30...	3.25	--	--	--	--	--	--	--	--	--	--	--	--
30...	--	.50	25.3	510	8.3	9.0	4.71	.015	--	--	--	--	--
30...	--	10.0	19.3	567	7.1	.2	--	.054	--	--	--	--	--
SEP													
18...	2.75	--	--	--	--	--	--	--	--	--	--	--	--
18...	--	.50	20.9	518	8.3	7.4	9.09	.021	--	--	--	--	--
18...	--	9.5	20.9	518	8.3	7.7	--	.021	--	--	--	--	--

423246088175800 POWERS LAKE AT POWERS LAKE, WI

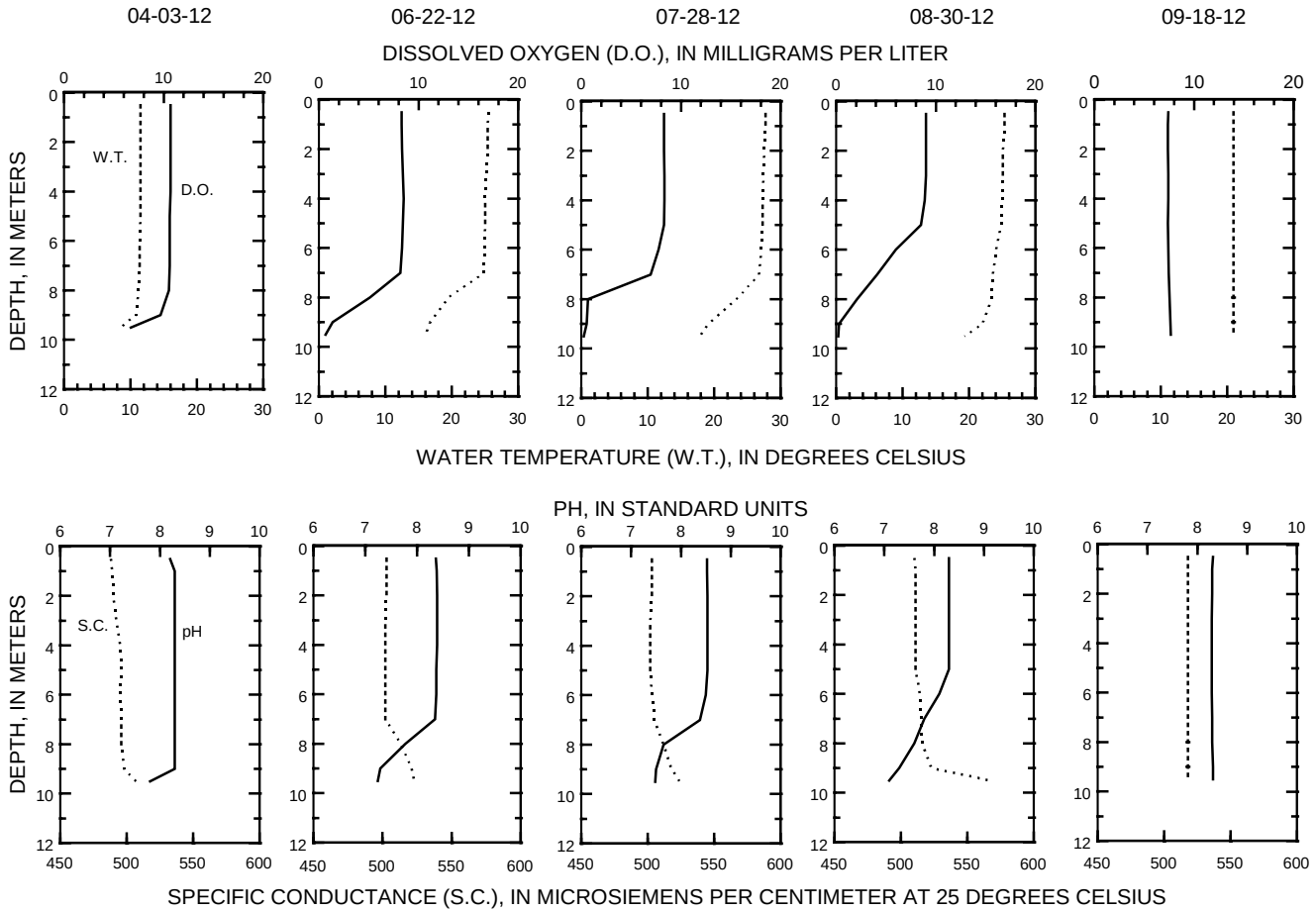
WATER-QUALITY DATA, , APRIL 2 TO SEPTEMBER 18, 2012
(Milligrams per liter unless otherwise indicated)

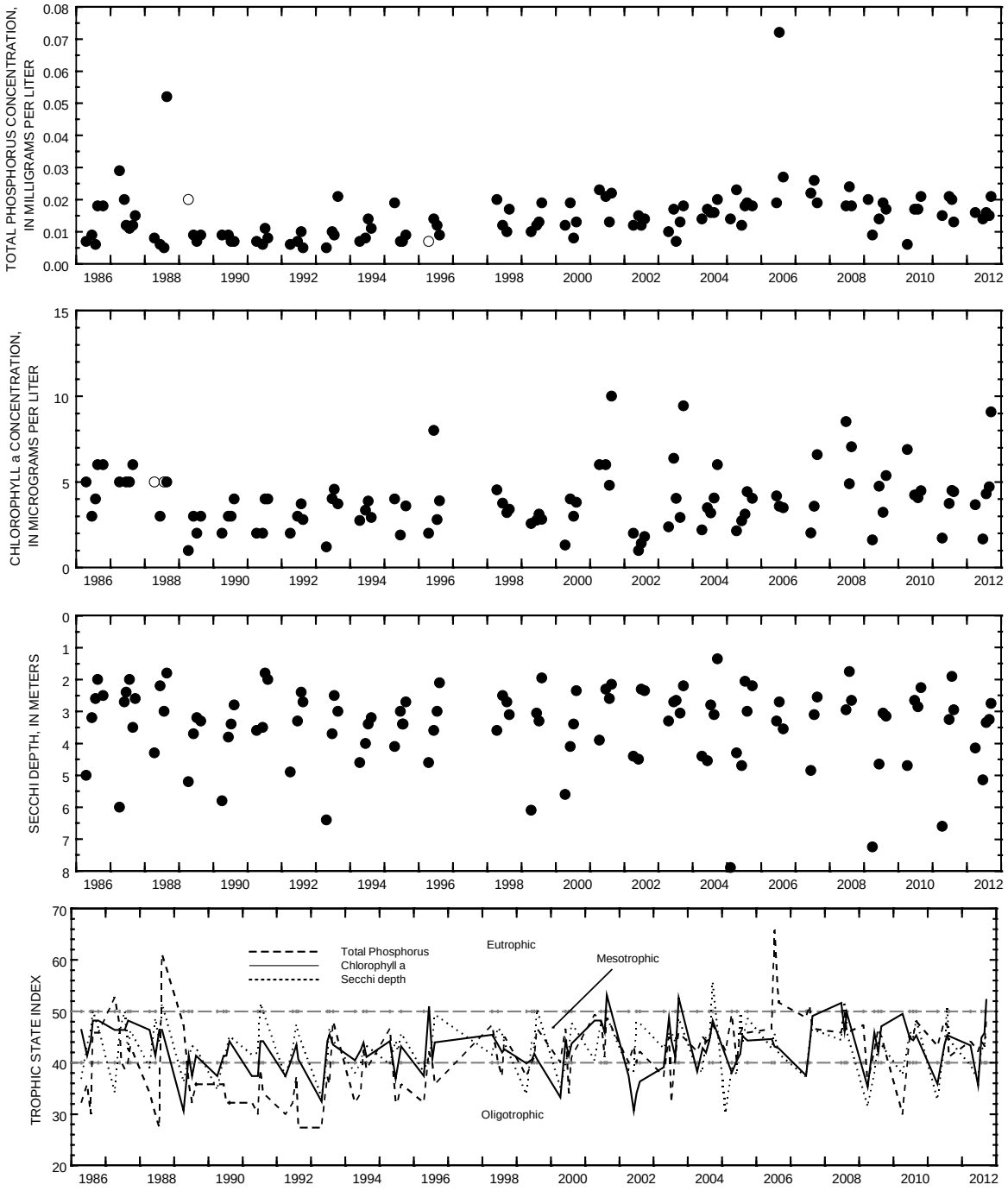
Date	Nitrate + nitrite water, fltrd, mg/L as N (00631)	Turbdty white light, det ang 90+/-30 degrees NTU (63675)	Appar-ent color, water, unfltrd Pt-Co units (00081)	Hard-ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Sodium, water, fltrd, mg/L (00930)	Potas-sium, water, fltrd, mg/L (00935)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor-ide, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Silica, water, fltrd, mg/L as SiO2 (00955)	Iron, water, fltrd, ug/L (01046)
APR 2012													
02...	--	--	--	--	--	--	--	--	--	--	--	--	--
02...	<.019	<1.0	15	209	33.4	30.5	20.7	2.10	169	43.4	30.5	6.03	<100
JUN													
22...	--	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUL													
28...	--	--	--	--	--	--	--	--	--	--	--	--	--
28...	<.019	--	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--	--	--
AUG													
30...	--	--	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--	--	--
SEP													
18...	--	--	--	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--	--	--	--

Date	Manga-nese, water, fltrd, ug/L (01056)	Dis-solved solids dried @ 180degC wat flt mg/L (70300)
APR 2012		
02...	--	--
02...	<1.0	270

423246088175800 POWERS LAKE AT POWERS LAKE, WI

LAKE-DEPTH PROFILES, APRIL 3 TO SEPTEMBER 18, 2012





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

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

05429485 LAKE WAUBESA AT MCFARLAND, WI

LOCATION.--Lat 43°00′32″, long 89°18′19″ referenced to North American Datum of 1927, in SW ¼ SW ¼ sec.3, T.6 N., R.10 E., Dane County, WI, Hydrologic Unit 07090001, on left bank just upstream from bridge on U.S. Highway 51, downstream of dam at outlet of Lake Waubesa and 1.0 mi southwest of McFarland.

SURFACE AREA.--3.25 mi^2.

DRAINAGE AREA.--327 mi^2 of which 36.6 mi^2 probably is noncontributing.

PERIOD OF RECORD.--October 2003 to current year.

REVISED RECORDS.--WSP 805, WDR WI-73-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 840.00 ft above NGVD of 1929 (levels by Wisconsin Department of Natural Resources).

REMARKS.--Lake level regulated by dams at outlets of Lake Mendota and Lake Waubesa. Gage-height telemeter at station.

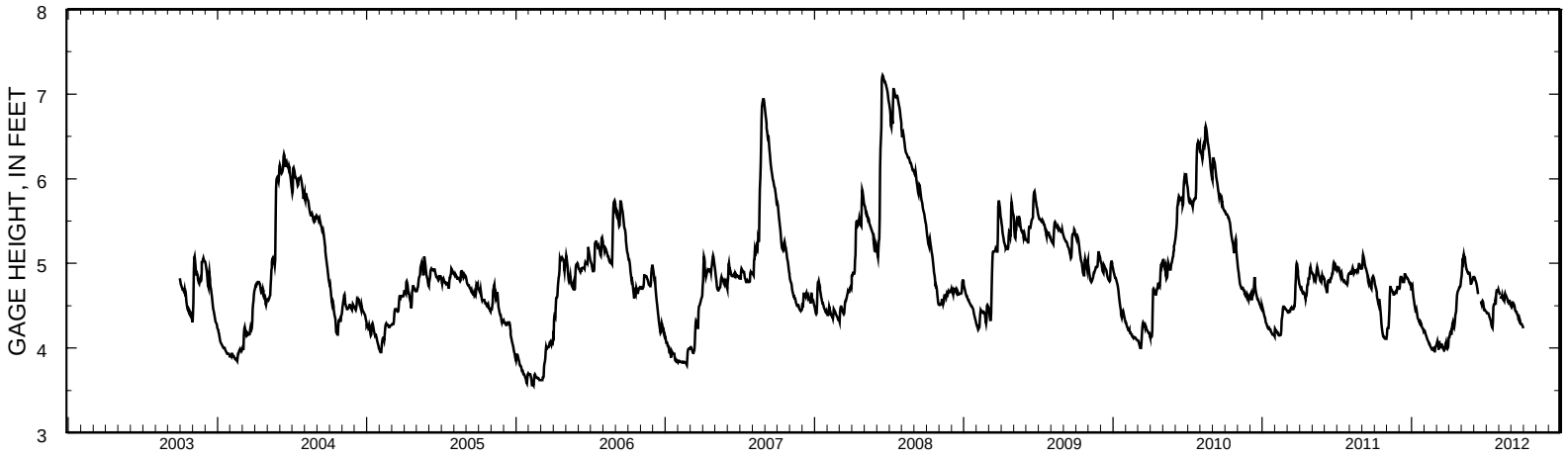
EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 7.22 ft, June 15-17, 2008; minimum observed, 3.50 ft, Feb.14, 2006, current datum.

EXTREMES FOR CURRENT YEAR.--Maximum recorded gage height, 5.20 ft, May 7; minimum recorded, 3.96 ft, Feb. 26-28.

05429485 LAKE WAUBESA AT MCFARLAND, WI

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	4.80	4.12	4.70	4.68	4.21	4.04	4.12	4.82	4.84	4.43	4.67	4.50
2	4.76	4.15	4.70	4.73	4.20	4.06	4.13	4.85	4.84	4.42	4.66	4.49
3	4.74	4.23	4.72	4.74	4.20	4.08	4.13	4.92	4.82	4.41	4.64	4.48
4	4.72	4.24	4.82	4.68	4.18	4.05	4.16	5.01	4.82	4.41	---	4.49
5	4.70	4.24	4.84	4.63	4.16	4.02	4.19	5.00	4.80	4.41	---	4.54
6	4.68	4.24	4.84	4.59	4.15	3.98	4.20	5.07	4.79	4.41	---	4.54
7	4.65	4.34	4.84	4.56	4.13	3.98	4.17	5.10	4.77	4.40	4.60	4.53
8	4.62	4.45	4.83	4.52	4.12	4.07	4.17	5.06	4.75	4.38	4.60	4.52
9	4.59	4.62	4.82	4.49	4.10	4.07	4.24	5.08	4.72	4.36	4.60	4.51
10	4.57	4.72	4.78	4.46	4.09	4.02	4.28	5.07	4.69	4.35	4.62	4.49
11	4.54	4.72	4.78	4.43	4.08	4.01	4.30	5.01	4.65	4.33	4.59	4.45
12	4.52	4.70	4.78	4.43	4.07	4.01	4.27	4.98	---	4.32	4.58	4.44
13	4.57	4.69	4.78	4.45	4.05	4.04	4.25	4.95	---	4.28	4.57	4.43
14	4.57	4.68	4.82	4.42	4.05	4.04	4.24	4.93	---	4.26	4.57	4.43
15	4.53	4.67	4.87	4.38	4.04	4.04	4.27	4.92	---	4.26	4.56	4.42
16	4.48	4.66	4.87	4.35	4.03	4.02	4.32	4.90	---	4.25	4.62	4.40
17	4.42	4.66	4.86	4.34	4.02	4.00	4.39	4.89	---	4.24	4.64	4.39
18	4.36	4.63	4.85	4.33	4.01	3.99	4.41	4.88	---	4.31	4.62	4.39
19	4.28	4.63	4.84	4.31	4.00	3.98	4.44	4.88	4.54	4.48	4.62	4.34
20	4.24	4.64	4.83	4.30	3.99	3.99	4.54	4.89	4.52	4.51	4.61	4.33
21	4.20	4.64	4.82	4.31	3.98	3.98	4.62	4.89	4.55	4.52	4.60	4.32
22	4.17	4.65	4.82	4.29	3.98	3.99	4.65	4.86	4.56	4.52	4.59	4.34
23	4.14	4.66	4.81	4.30	3.98	4.03	4.67	4.82	4.55	4.53	4.57	4.32
24	4.14	4.65	4.80	4.29	4.00	4.05	4.68	4.76	4.53	4.57	4.55	4.29
25	4.13	4.65	4.78	4.27	4.00	4.07	4.69	4.76	4.52	4.56	4.54	4.28
26	4.12	4.68	4.77	4.26	3.97	4.04	4.71	4.77	4.49	4.65	4.56	4.28
27	4.12	4.72	4.77	4.25	3.96	4.00	4.72	4.80	4.45	4.68	4.56	4.28
28	4.11	4.72	4.75	4.24	3.96	3.99	4.72	4.80	4.45	4.68	4.56	4.27
29	4.11	4.72	4.74	4.23	4.01	4.00	4.73	4.82	4.45	4.67	4.54	4.26
30	4.11	4.72	4.75	4.22	---	4.02	4.77	4.83	4.44	4.67	4.52	4.25
31	4.11	---	4.74	4.20	---	4.11	---	4.83	---	4.69	4.51	---
Mean	4.41	4.56	4.80	4.41	4.06	4.02	4.41	4.91	---	4.45	---	4.40
Max	4.80	4.72	4.87	4.74	4.21	4.11	4.77	5.10	---	4.69	---	4.54
Min	4.11	4.12	4.70	4.20	3.96	3.98	4.12	4.76	---	4.24	---	4.25



Stage hydrograph for Lake Waubesa, 2003-2012.

424848088083100 WIND LAKE, HEADWATER, AT OUTLET AT WIND LAKE, WI

LOCATION.--Lat 42°48′48″, long 88°08′31″ referenced to North American Datum of 1927, in NE ¼ NW ¼ sec.16, T.4 N., R.20 E., Racine County, WI, Hydrologic Unit 07120006, at Wind Lake.

SURFACE AREA.--1.46 mi^2.

DRAINAGE AREA.--39.6 mi^2.

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

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

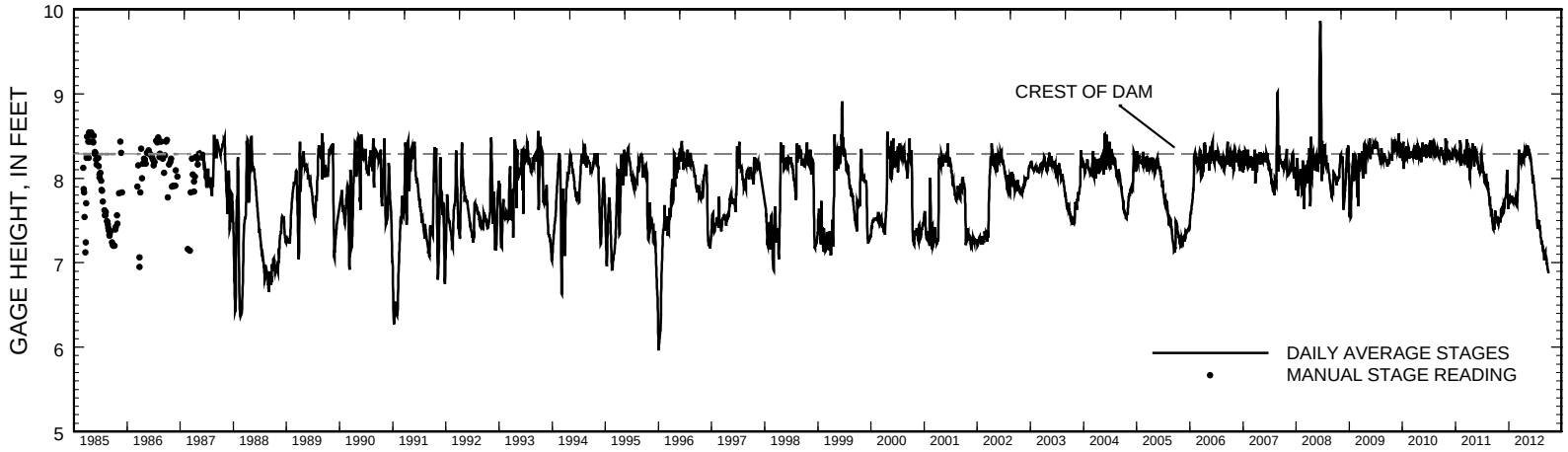
REMARKS.--Lake level regulated by dam with two 10-foot gates at outlet. Lake ice-covered Dec. 3 to Mar. 14. Prior to October 1987, published as Wind Lake at Wind Lake, Wis. Gage-height telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 9.88 ft, June 14, 15, 2008; minimum recorded, 5.95 ft, Jan. 2, 1996.

EXTREMES FOR CURRENT YEAR.—Headwater: Maximum recorded gage height, 8.42 ft, May 10; minimum recorded, 6.88 ft, Sept. 30. Tailwater: Maximum recorded gage height, 6.01 ft, Mar. 13; minimum recorded,2.44 ft, July 4.

HEADWATER
GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	7.58	7.49	7.65	7.74	7.73	7.79	8.21	8.31	8.22	7.76	7.42	7.06
2	7.57	7.49	7.65	7.77	7.76	7.83	8.20	8.30	8.20	7.74	7.40	7.05
3	7.56	7.54	7.67	7.76	7.76	7.88	8.20	8.28	8.19	7.72	7.39	7.03
4	7.56	7.53	7.71	7.77	7.75	7.90	8.22	8.29	8.17	7.71	7.38	7.11
5	7.55	7.52	7.74	7.76	7.75	7.93	8.24	8.30	8.16	7.69	7.37	7.14
6	7.54	7.52	7.76	7.76	7.75	7.95	8.23	8.32	8.14	7.67	7.33	7.13
7	7.54	7.52	7.76	7.74	7.74	7.97	8.22	8.36	8.12	7.65	7.31	7.13
8	7.53	7.56	7.76	7.73	7.74	8.09	8.23	8.35	8.10	7.61	7.30	7.13
9	7.53	7.63	7.77	7.73	7.73	8.22	8.21	8.39	8.08	7.59	7.30	7.14
10	7.52	7.64	7.77	7.73	7.74	8.28	8.21	8.39	8.06	7.56	7.30	7.12
11	7.51	7.63	7.78	7.74	7.75	8.29	8.20	8.30	8.04	7.53	7.27	7.10
12	7.51	7.63	7.79	7.76	7.74	8.34	8.20	8.27	8.03	7.51	7.25	7.08
13	7.53	7.62	7.79	7.79	7.74	8.34	8.19	8.31	8.00	7.49	7.24	7.08
14	7.54	7.63	7.84	7.78	7.75	8.26	8.20	8.32	7.98	7.47	7.23	7.08
15	7.51	7.63	7.90	7.76	7.75	8.23	8.26	8.34	7.96	7.46	7.22	7.07
16	7.49	7.63	7.92	7.75	7.74	8.20	8.30	8.34	7.94	7.43	7.25	7.05
17	7.47	7.61	7.96	7.76	7.72	8.16	8.30	8.34	8.04	7.42	7.25	7.05
18	7.46	7.60	7.99	7.75	7.70	8.16	8.24	8.33	8.01	7.40	7.23	7.04
19	7.49	7.60	8.03	7.74	7.69	8.21	8.26	8.33	7.99	7.51	7.22	7.00
20	7.50	7.60	8.07	7.74	7.69	8.20	8.32	8.32	7.97	7.49	7.21	6.99
21	7.47	7.60	8.10	7.75	7.70	8.22	8.29	8.32	7.96	7.47	7.20	6.99
22	7.47	7.60	8.09	7.76	7.71	8.24	8.26	8.30	7.94	7.45	7.18	7.00
23	7.47	7.59	8.01	7.78	7.72	8.30	8.27	8.28	7.92	7.44	7.17	6.97
24	7.51	7.58	7.90	7.78	7.77	8.27	8.27	8.25	7.90	7.47	7.15	6.95
25	7.51	7.59	7.84	7.77	7.75	8.21	8.30	8.24	7.88	7.47	7.14	6.94
26	7.51	7.60	7.77	7.76	7.74	8.22	8.34	8.26	7.84	7.49	7.14	6.93
27	7.50	7.66	7.73	7.74	7.73	8.18	8.33	8.27	7.82	7.49	7.15	6.92
28	7.49	7.65	7.67	7.72	7.71	8.21	8.35	8.25	7.80	7.47	7.13	6.91
29	7.49	7.67	7.64	7.72	7.76	8.23	8.37	8.24	7.79	7.45	7.12	6.90
30	7.48	7.65	7.67	7.71	---	8.24	8.37	8.22	7.77	7.43	7.10	6.89
31	7.50	---	7.71	7.71	---	8.22	---	8.22	---	7.44	7.08	---
Mean	7.51	7.59	7.82	7.75	7.73	8.15	8.26	8.30	8.00	7.53	7.24	7.03
Max	7.58	7.67	8.10	7.79	7.77	8.34	8.37	8.39	8.22	7.76	7.42	7.14
Min	7.46	7.49	7.64	7.71	7.69	7.79	8.19	8.22	7.77	7.40	7.08	6.89



Stage hydrograph for Wind Lake, headwater, 1985-2012.

424915088083900 WIND LAKE AT WIND LAKE, WI

LOCATION.--Lat 42°49'15", long 88°08'39", in NW ¼ SW ¼ sec.9, T.4 N., R.20 E., Racine County, Hydrologic Unit 07120006, at Wind Lake.

SURFACE AREA.--1.46 mi^2.

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

REMARKS.--Lake sampled near center at the deep hole. The lake was not sampled during winter ice cover because of unsafe winter conditions. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, APRIL 3 TO SEPTEMBER 18, 2012
(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro -matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Total nitro-gen, water, unfltrd mg/L (00600)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia + org-N, water, fltrd, mg/L as N (00623)	Ammonia + org-N, water, unfltrd mg/L as N (00625)
APR 2012													
03...	3.15	--	--	--	--	--	--	--	--	--	--	--	--
03...	--	.50	11.0	719	8.0	9.9	2.03	.025	.004	1.1	.069	--	1.0
JUN													
22...	3.95	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	.50	25.6	740	8.3	8.3	2.77	.019	--	--	--	--	--
22...	--	14.5	11.6	749	7.3	.1	--	.102	--	--	--	--	--
JUL													
28...	3.05	--	--	--	--	--	--	--	--	--	--	--	--
28...	--	.50	27.1	748	8.4	7.6	5.07	.016	<.002	<.47	--	.94	.45
28...	--	13.0	12.3	748	7.9	.1	--	.093	--	--	--	--	--
AUG													
30...	3.45	--	--	--	--	--	--	--	--	--	--	--	--
30...	--	.50	24.3	757	8.3	8.5	3.76	.014	--	--	--	--	--
30...	--	6.0	23.5	761	8.0	5.8	--	.017	--	--	--	--	--
30...	--	9.0	14.9	749	7.3	.3	--	.054	--	--	--	--	--
30...	--	11.0	13.1	750	7.3	.1	--	.077	--	--	--	--	--
30...	--	13.0	12.5	758	7.2	.1	--	.096	--	--	--	--	--
SEP													
18...	2.35	--	--	--	--	--	--	--	--	--	--	--	--
18...	--	.50	19.8	758	8.3	7.7	5.73	.017	--	--	--	--	--
18...	--	13.0	12.7	762	7.1	.1	--	.107	--	--	--	--	--

424915088083900 WIND LAKE AT WIND LAKE, WI

WATER-QUALITY DATA, APRIL 3 TO SEPTEMBER 18, 2012

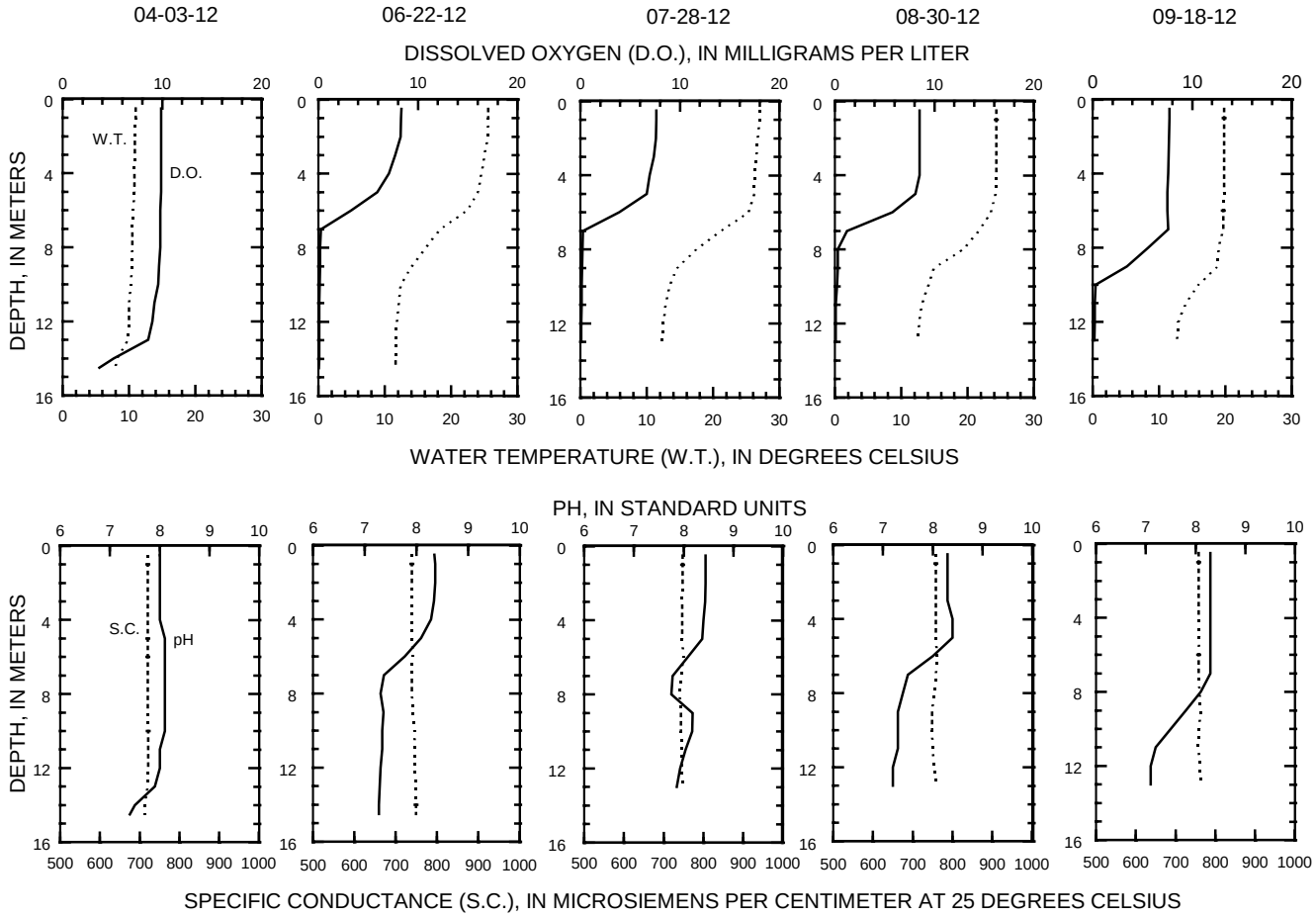
(Milligrams per liter unless otherwise indicated)

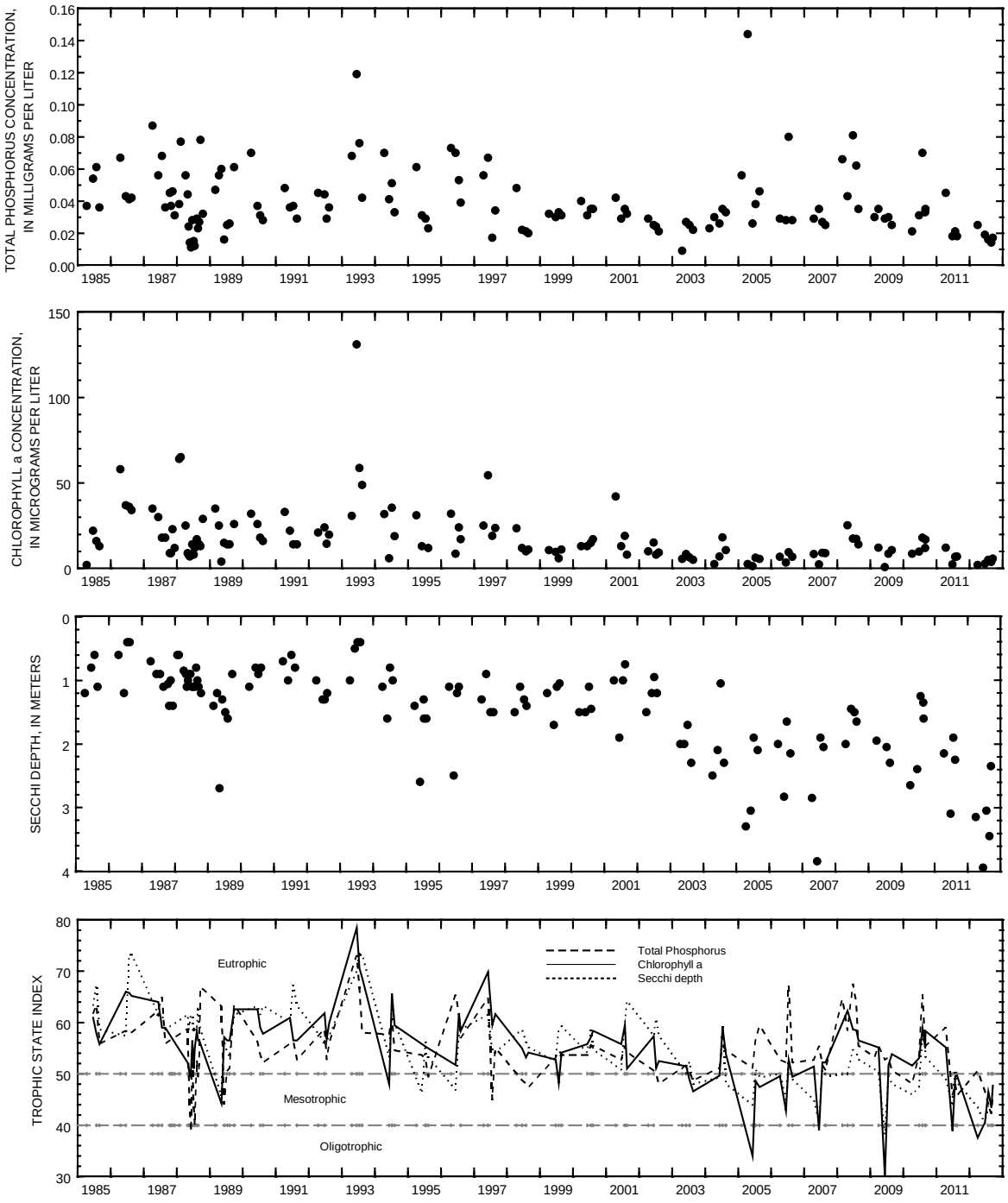
Date	Nitrate + nitrite water, fltrd, mg/L as N (00631)	Turbdty white light, det ang 90+/-30 degrees NTU (63675)	Appar-ent color, water, unfltrd Pt-Co units (00081)	Hard-ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Sodium, water, fltrd, mg/L (00930)	Potas-sium, water, fltrd, mg/L (00935)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor-ide, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Silica, water, fltrd, mg/L as SiO2 (00955)	Iron, water, fltrd, ug/L (01046)
APR 2012													
03...	--	--	--	--	--	--	--	--	--	--	--	--	--
03...	.069	<1.0	15	217	43.8	26.2	57.8	2.50	153	111	45.0	.476	<100
JUN													
22...	--	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUL													
28...	--	--	--	--	--	--	--	--	--	--	--	--	--
28...	<.019	--	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--	--	--
AUG													
30...	--	--	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--	--	--

Date	Manga-nese, water, fltrd, ug/L (01056)	Dis-solved solids dried @ 180degC wat flt mg/L (70300)
APR 2012		
03...	--	--
03...	<1.0	408

424915088083900 WIND LAKE AT WIND LAKE, WI

LAKE-DEPTH PROFILES, APRIL 3 TO SEPTEMBER 18, 2012





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

04082500 LAKE WINNEBAGO AT OSHKOSH, WI

LOCATION.--Lat 44°00′35″, long 88°31′38″ referenced to North American Datum of 1927, in NE ¼ NE ¼ sec.25, T.18 N., R.16 E., Winnebago County, WI, Hydrologic Unit 04030203, 800 ft east of mouth of the upper Fox River.

SURFACE AREA.--215 mi^2.

DRAINAGE AREA.--5,880 mi^2.

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

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

GAGE.--Water-stage recorder. Nonrecording gage read once daily October 1938 to October 1978. Datum of gage is 743.91 ft above NAVD of 1988 (Wisconsin Department of Transportation benchmark). From July 1992 to March 20, 2007 datum was 743.97 ft above NAVD of 1988. Prior to 2012 datum of gage was published as 745.05 ft above mean tide at New York City.

REMARKS.--Lake elevations controlled by dams at Menasha and Neenah. Data-collection platform and gage-height telemeter at station.

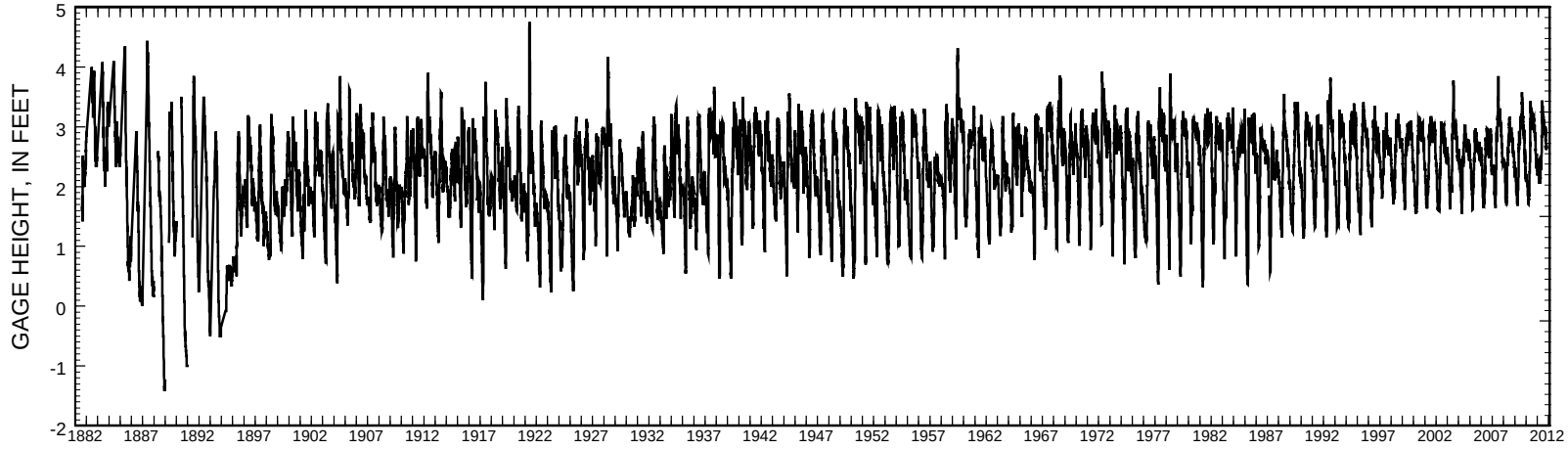
EXTREMES FOR PERIOD OF RECORD.-- Water year 1938-1992; maximum gage height observed, 4.32 ft Mar. 9, 1982, datum unknown; minimum observed, 0.33 ft May 17, 1960, datum unknown. Water year 1993-current year; maximum daily mean gage height, 3.85 ft June 14, 2008; minimum recorded, 1.16 ft, March 2-5, 1993.

EXTREMES FOR CURRENT YEAR.--Maximum daily mean gage height, 3.44 ft, May 10; Minimum recorded, 2.05 ft, Feb. 7-9, 14-21, 27.

04082500 LAKE WINNEBAGO AT OSHKOSH, WI

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	2.83	2.31	2.30	2.35	2.11	2.10	2.39	2.85	3.16	3.08	2.95	2.89
2	2.80	2.35	2.28	2.38	2.09	2.13	2.42	2.86	3.10	3.06	2.97	2.87
3	2.78	2.43	2.25	2.40	2.08	2.15	2.37	3.14	3.11	3.11	2.99	2.85
4	2.76	2.41	2.29	2.38	2.08	2.15	2.36	3.27	3.12	3.12	2.96	2.85
5	2.74	2.39	2.32	2.37	2.06	2.12	2.38	3.28	3.10	3.11	2.95	2.83
6	2.72	2.37	2.30	2.37	2.06	2.09	2.34	3.33	3.10	3.11	2.94	2.80
7	2.70	2.37	2.23	2.36	2.05	2.08	2.32	3.36	3.11	3.10	2.92	2.79
8	2.67	2.46	2.20	2.36	2.05	2.10	2.27	3.39	3.11	3.07	2.92	2.76
9	2.66	2.49	2.19	2.36	2.05	2.14	2.27	3.42	3.11	3.07	2.98	2.79
10	2.64	2.55	2.20	2.36	2.06	2.15	2.31	3.44	3.12	3.04	3.01	2.76
11	2.60	2.55	2.20	2.36	2.06	2.13	2.34	3.40	3.10	3.01	2.97	2.72
12	2.63	2.53	2.19	2.35	2.07	2.16	2.33	3.40	3.09	2.99	2.96	2.72
13	2.58	2.51	2.19	2.37	2.06	2.19	2.34	3.40	3.12	2.96	2.95	2.72
14	2.52	2.50	2.22	2.36	2.05	2.22	2.33	3.37	3.07	2.94	2.95	2.71
15	2.50	2.49	2.18	2.34	2.05	2.23	2.43	3.34	3.03	2.95	2.95	2.71
16	2.48	2.44	2.27	2.32	2.05	2.25	2.35	3.35	3.05	2.92	2.93	2.69
17	2.43	2.47	2.28	2.30	2.05	2.27	2.52	3.30	3.05	2.95	2.97	2.69
18	2.44	2.45	2.29	2.29	2.05	2.30	2.49	3.21	3.12	2.97	2.96	2.68
19	2.42	2.44	2.31	2.26	2.05	2.32	2.58	3.21	3.18	2.95	2.96	2.64
20	2.35	2.46	2.34	2.25	2.05	2.34	2.75	3.16	3.16	2.93	2.96	2.64
21	2.35	2.45	2.34	2.24	2.05	2.35	2.75	3.15	3.15	2.89	2.94	2.66
22	2.34	2.45	2.35	2.21	2.06	2.37	2.77	3.15	3.17	2.89	2.92	2.66
23	2.34	2.40	2.36	2.21	2.06	2.41	2.78	3.12	3.14	2.88	2.91	2.66
24	2.32	2.39	2.37	2.21	2.06	2.47	2.80	3.11	3.11	2.90	2.90	2.61
25	2.39	2.36	2.35	2.20	2.07	2.48	2.84	3.05	3.11	2.86	2.90	2.65
26	2.34	2.35	2.38	2.18	2.07	2.51	2.83	3.15	3.09	2.95	2.91	2.66
27	2.34	2.36	2.36	2.17	2.05	2.41	2.86	3.21	3.05	3.00	2.92	2.65
28	2.34	2.36	2.39	2.16	2.07	2.30	2.85	3.18	3.07	2.97	2.94	2.65
29	2.33	2.35	2.38	2.15	2.09	2.42	2.82	3.16	3.08	2.94	2.90	2.66
30	2.32	2.31	2.39	2.13	---	2.44	2.85	3.21	3.08	2.96	2.87	2.67
31	2.30	---	2.39	2.12	---	2.41	---	3.19	---	2.99	2.89	---
Mean	2.51	2.42	2.29	2.29	2.06	2.26	2.53	3.23	3.11	2.99	2.94	2.72
Max	2.83	2.55	2.39	2.40	2.11	2.51	2.86	3.44	3.18	3.12	3.01	2.89
Min	2.30	2.31	2.18	2.12	2.05	2.08	2.27	2.85	3.03	2.86	2.87	2.61



Stage hydrograph for Lake Winnebago at Oshkosh, WI, 1882-2012.

04084255 LAKE WINNEBAGO NEAR STOCKBRIDGE, WI

LOCATION.--Lat 44°04′14″, long 88°19′44″ referenced to North American Datum of 1983, Calumet County, WI, Hydrologic Unit 04030203, Stockbridge Indian Reservation, on east shore of Lake Winnebago, 300 ft south of County Highway E and 1.6 mi west of Stockbridge.

SURFACE AREA.--215 mi^2.

DRAINAGE AREA.--5,880 mi^2.

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

GAGE.--Water-stage recorder. Datum of gage from July 1992 to current year is 744.00 ft above NAVD of 1988 (RTK-GPS survey). Prior to 2012 pbulished as 745.05 ft above mean tide of New York City.

REMARKS.--Lake elevations controlled by dams at Menasha and Neenah. Data-collection platform and gage-height telemeter at station.

EXTREMES FOR PERIOD OF RECORD.-- Water year 1982-1992; maximum daily mean gage height, 3.53 ft, May 31, 1989, datum unknown; minimum recorded, 0.30 ft, Mar. 1, 1986, datum unknown. Water year 1993 to current year; maximum daily mean gage height, 3.85 ft, July 9, 11, 1993, June 14, 2008; minimum recorded 1.10 ft March 2, 1993, March 11, 1996.

EXTREMES FOR CURRENT YEAR.--Maximum daily mean gage height, 3.36 ft, May 10; minimum recorded, 1.90 ft, Feb. 21, 26, 28, 29.

04084255 LAKE WINNEBAGO NEAR STOCKBRIDGE, WI

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	2.69	2.22	2.18	2.35	2.00	2.03	2.29	2.76	3.03	2.96	2.86	2.70
2	2.69	2.20	2.18	2.37	1.99	2.05	2.24	2.76	3.10	2.95	2.89	2.70
3	2.66	2.26	2.18	2.30	1.98	2.08	2.24	3.06	3.07	3.01	2.85	2.73
4	2.65	2.30	2.21	2.28	1.97	2.04	2.23	3.14	3.00	3.01	2.85	2.73
5	2.63	2.28	2.17	2.27	1.97	2.00	2.16	3.15	2.98	2.99	2.90	2.70
6	2.61	2.31	2.17	2.26	1.96	1.97	2.19	3.19	3.01	2.99	2.86	2.68
7	2.60	2.31	2.22	2.27	1.95	1.96	2.21	3.29	3.03	2.94	2.81	2.64
8	2.58	2.29	2.20	2.26	1.95	2.05	2.28	3.35	3.06	2.95	2.76	2.69
9	2.55	2.37	2.17	2.26	1.96	2.08	2.27	3.34	3.07	2.93	2.78	2.66
10	2.52	2.56	2.12	2.26	1.96	2.05	2.27	3.36	3.05	2.90	2.81	2.66
11	2.49	2.50	2.09	2.25	1.98	2.05	2.23	3.36	3.06	2.89	2.84	2.66
12	2.51	2.45	2.08	2.27	1.97	2.08	2.21	3.32	3.08	2.87	2.85	2.62
13	2.49	2.44	2.09	2.29	1.95	2.12	2.22	3.31	2.99	2.86	2.85	2.61
14	2.62	2.44	2.12	2.25	1.96	2.14	2.26	3.30	2.94	2.86	2.84	2.60
15	2.66	2.44	2.19	2.22	1.95	2.15	2.37	3.28	2.96	2.84	2.83	2.59
16	2.53	2.51	2.20	2.20	1.96	2.17	2.51	3.23	2.96	2.86	2.91	2.62
17	2.53	2.48	2.20	2.21	1.95	2.19	2.42	3.19	3.01	2.83	2.89	2.57
18	2.31	2.43	2.22	2.19	1.96	2.21	2.43	3.14	3.06	2.80	2.84	2.58
19	2.14	2.37	2.22	2.18	1.95	2.23	2.40	3.12	3.10	2.77	2.84	2.60
20	2.19	2.33	2.23	2.15	1.95	2.25	2.51	3.13	3.11	2.79	2.84	2.59
21	2.26	2.33	2.25	2.13	1.95	2.27	2.64	3.07	3.11	2.82	2.85	2.57
22	2.22	2.31	2.27	2.11	1.97	2.28	2.64	3.03	3.05	2.80	2.83	2.58
23	2.23	2.33	2.29	2.13	1.96	2.31	2.68	3.01	3.02	2.81	2.81	2.58
24	2.28	2.34	2.29	2.12	1.98	2.35	2.72	3.00	2.99	2.76	2.80	2.62
25	2.14	2.28	2.29	2.09	1.99	2.36	2.70	3.04	2.94	2.77	2.79	2.52
26	2.18	2.25	2.31	2.07	1.95	2.28	2.69	3.06	2.96	2.83	2.81	2.50
27	2.23	2.26	2.27	2.06	1.98	2.30	2.73	3.06	2.97	2.82	2.83	2.51
28	2.23	2.26	2.29	2.06	1.96	2.33	2.65	3.13	2.98	2.83	2.80	2.53
29	2.23	2.13	2.29	2.04	1.97	2.26	2.69	3.22	2.99	2.84	2.80	2.53
30	2.21	2.23	2.29	2.02	---	2.25	2.75	3.12	2.98	2.87	2.83	2.52
31	2.23	---	2.30	2.00	---	2.30	---	3.05	---	2.86	2.77	---
Mean	2.42	2.34	2.21	2.19	1.96	2.17	2.43	3.15	3.02	2.87	2.83	2.61
Max	2.69	2.56	2.31	2.37	2.00	2.36	2.75	3.36	3.11	3.01	2.91	2.73
Min	2.14	2.13	2.08	2.00	1.95	1.96	2.16	2.76	2.94	2.76	2.76	2.50

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APPENDIX

Wisconsin Lakes Team
Quality-Assurance Plan

Most lake studies and monitoring programs that are conducted by the USGS Wisconsin Water Science Center entail water sampling and analysis to determine water quality and biological productivity. Because all sampling and analysis is subject to error and random variablility, a certain proportion of the sampling effort should include quality-assurance samples. Sampling by the USGS was done by the Lake Studies Team of the USGS Wisconsin Water Science Center. This team implements a quality-assurance plan each year that involves collecting three types of samples from a subset of the lakes studied each year, which include blanks, replicates, and spikes (U.S. Geological Survey, Wisconsin Water Science Center Lake Studies Team). These samples are collected and/or prepared solely for the purpose of assessing the magnitude of error and random variability so that the accuracy and precision of all data can be evaluated. The plan for this quality-assurance sampling is described below.

Three types of QA/QC samples are collected:

blanks
Provide information about accuracy and errors due to treatment or reagents
replicates
provide information about precision (variability)
standard additions (spikes)
provide information about accuracy and matrix interferences

Blank Sampling
B1. A **preservation blank** consists of deionized water or inorganic blank water, to which is added any reagents or preservatives that are normally added to natural water samples. The blank is not taken to the field, but is shipped to the laboratory for analysis along with the natural water samples.

This blank sample is analyzed for the Nutrient Group[1] and chlorophyll-a.

B2. A **field blank** consists of deionized water or inorganic blank water treated exactly the same as regular samples. During winter, the field blank is analyzed for total phosphorus (TP) only; during summer, it is analyzed for TP and chlorophyll-a, and in the spring it is analyzed for the Nutrient Group and chlorophyll-a.

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[1]Nutrient Group = all phosphorus and nitrogen species that are commonly determined in lakes (total phosphorus, nitrate + nitrite, ammonia, total Kjeldahl nitrogen, total nitrogen)

Replicate Sampling

Triplicate samples are taken near water surface in summer for analysis of total phosphorus and chlorophyll-a. For a portion of the sites where surface triplicates are collected, a set of triplicate samples is also taken from near-bottom water, for analysis of total phosphorus.

Triplicate samples collected in the spring are taken near the water surface for analysis of the Nutrient Group.

Standard Addition Testing

Replicate samples are collected for **a standard addition (spike) test,** which consists of an addition of a prepared phosphorus solution (standard) of known volume and concentration, such that the expected result of analysis is the natural water TP concentration plus the known addition. One sample from each set will receive no spike (the mean of these gives the natural water TP concentration).

Data and results of replicate sampling and field blank testing for the past five years are shown in Table A1.

Table A1. Analyses of replicate samples from Wisconsin lakes in water years 2008-2012. See text for procedures used. Phosphorus data in milligrams per liter; chlorophyll data in micrograms per liter. Symbol "<" indicates less than given detection limit (DL); mean and standard deviation not calculated for datasets containing values less than DL.

Parameter	Lake	Date	Replicate Data			Mean	Standard Deviation	Percent Standard Deviation
Total Phosphorus	Beulah	3/4/08	0.010	0.011		**0.011**	**0.001**	**6.7**
	Beulah	8/26/08	0.011	0.012		**0.012**	**0.001**	**6.1**
	Beulah	2/23/09	0.013	0.013		**0.013**	**0.000**	**0.0**
	Beulah	8/24/09	0.017	0.017		**0.017**	**0.000**	**0.0**
	Delavan	9/15/09	0.035	0.031	0.031	**0.032**	**0.002**	**7.1**
	Beulah	8/19/10	0.015	0.016		**0.016**	**0.001**	**4.6**
	Big Cedar, South	8/24/10	0.015	0.014		**0.015**	**0.001**	**4.9**
	Powers	8/30/10	0.021	0.022		**0.022**	**0.001**	**3.3**
	Beulah	8/10/11	0.140	0.170		**0.155**	**0.021**	**13.7**
	Oconomowoc	7/25/11	0.013	0.010	0.012	**0.012**	**0.002**	**13.1**
	Powers	7/25/11	0.017	0.018	0.020	**0.018**	**0.002**	**8.3**
	Wind	7/25/11	0.018	0.019	0.021	**0.019**	**0.002**	**7.9**
	Anvil	7/17/12	0.024	0.035	0.028	**0.029**	**0.006**	**19.2**
	Beulah	8/29/12	0.014	0.015	0.016	**0.015**	**0.001**	**6.7**
	Big Cedar, South	8/24/12	0.011	0.011	0.011	**0.011**	**0.000**	**0.0**
	Little Cedar, South	8/24/12	0.012	0.013		**0.013**	**0.001**	**5.7**
	Powers	8/30/12	0.015	0.015	0.016	**0.015**	**0.001**	**3.8**
Total Phosphorus, near bottom	Big Cedar, South	8/24/10	0.081	0.067		**0.074**	**0.010**	**13.4**
	Powers	8/30/10	0.036	0.038		**0.037**	**0.001**	**3.8**
	Anvil	7/17/12	0.028	0.025	0.031	**0.028**	**0.003**	**10.7**
	Big Cedar, South	8/24/12	0.025	0.025	0.028	**0.025**	**0.000**	**0.0**
	Little Cedar, South	8/24/12	0.168	0.170		**0.169**	**0.001**	**0.8**
Dissolved Phosphorus	Beulah	3/4/08	0.001	0.003		**0.002**	**0.001**	**70.7**
	Beulah	8/26/08	<0.002	<0.002		**NA**	**NA**	**NA**
	Beulah	2/23/09	<0.002	<0.002		**NA**	**NA**	**NA**
	Beulah	8/24/09	<0.002	<0.002		**NA**	**NA**	**NA**
	Beulah	8/19/10	<0.002	<0.002		**NA**	**NA**	**NA**
	Beulah	8/10/11	<0.002	<0.002		**NA**	**NA**	**NA**
	Anvil	7/17/12	0.007	<0.002	0.003	**NA**	**NA**	**NA**
	Beulah	8/29/12	<0.002	<0.002	<0.002	**NA**	**NA**	**NA**
Dissolved Ammonia	Beulah	3/4/08	0.083	0.046		**0.065**	**0.026**	**40.6**
	Beulah	8/26/08	<0.015	<0.015		**NA**	**NA**	**NA**
	Beulah	2/23/09	0.211	0.204		**0.208**	**0.005**	**2.4**
	Beulah	8/24/09	0.032	0.035		**0.034**	**0.002**	**6.3**
	Beulah	8/19/10	<0.015	0.030		**NA**	**NA**	**NA**
	Beulah	8/10/11	0.032	0.029		**0.031**	**0.002**	**7.0**
	Anvil	7/17/12	<0.015	0.019	0.018	**NA**	**NA**	**NA**
	Beulah	8/29/12	<0.015	<0.015	<0.015	**NA**	**NA**	**NA**
Total Kjeldahl Nitrogen	Beulah	3/4/08	0.570	0.450		**0.510**	**0.085**	**16.6**
	Beulah	8/26/08	0.530	0.580		**0.555**	**0.035**	**6.4**
	Beulah	2/23/09	0.660	0.690		**0.675**	**0.021**	**3.1**
	Beulah	8/24/09	0.160	0.530		**0.345**	**0.262**	**75.8**
	Beulah	8/19/10	0.580	0.680		**0.63**	**0.071**	**11.2**
	Beulah	8/10/11	0.560	0.460		**0.510**	**0.071**	**13.9**
	Anvil	7/17/12	0.280	0.390	0.410	**0.360**	**0.070**	**19.4**
	Beulah	8/29/12	0.800	0.500	0.460	**0.587**	**0.186**	**31.7**

Table A1. -- continued

Parameter	Lake	Date	Replicate Data			Mean	Standard Deviation	Percent Standard Deviation
Dissolved Nitrate plus Nitrite	Beulah	3/4/08	0.675	0.670		**0.673**	**0.004**	**0.5**
	Beulah	8/26/08	<0.019	<0.019		**NA**	**NA**	**NA**
	Beulah	2/23/09	0.673	0.721		**0.697**	**0.034**	**4.9**
	Beulah	8/24/09	0.074	0.073		**0.074**	**0.001**	**1.0**
	Beulah	8/19/10	0.022	0.022		**0.022**	**0.000**	**0.0**
	Beulah	8/10/11	0.067	0.066		**0.067**	**0.001**	**1.1**
	Anvil	7/17/12	<0.019	<0.019	<0.019	**NA**	**NA**	**NA**
	Beulah	8/29/12	<0.019	<0.019	<0.019	**NA**	**NA**	**NA**
Chlorophyll-a (micrograms per liter)	Beulah	8/26/08	6.97	7.45		**7.21**	**0.34**	**4.71**
	Beulah	2/23/09	0.55	0.55		**0.55**	**0.00**	**0.0**
	Beulah	8/24/09	2.66	2.90		**2.78**	**0.17**	**6.1**
	Delavan	9/15/09	10.80	10.10	9.8	**10.23**	**0.51**	**5.0**
	Beulah	8/19/10	5.35	5.56		**5.46**	**0.15**	**2.72**
	Big Cedar, South	8/24/10	3.93	3.9		**3.92**	**0.02**	**0.54**
	Beulah	8/10/11	4.45	5.24		**4.85**	**0.56**	**11.53**
	Anvil	7/17/12	5.10	3.95	3.74	**4.26**	**0.73**	**17.17**
	Beulah	8/29/12	5.36	4.68	6.11	**5.38**	**0.72**	**13.29**
	Big Cedar, South	8/24/12	3.72	3.55	3.53	**3.60**	**0.10**	**2.90**
Turbidity, NTU	Beulah	3/4/08	<1.0	<1.0		**NA**	**NA**	**NA**
	Beulah	8/26/08	<1.0	<1.0		**NA**	**NA**	**NA**
	Beulah	2/23/09	<1.0	<1.0		**NA**	**NA**	**NA**
	Beulah	8/24/09	<1.0	<1.0		**NA**	**NA**	**NA**
	Beulah	8/19/10	<1.0	<1.0		**NA**	**NA**	**NA**
	Beulah	8/10/11	<1.0	<1.0		**NA**	**NA**	**NA**
	Beulah	8/29/12	<1.0	<1.0	<1.0	**NA**	**NA**	**NA**
Dissolved Calcium	Beulah	3/4/08	62.8	62.5		**62.65**	**0.212**	**0.3**
	Beulah	8/26/08	47.9	47.6		**47.75**	**0.212**	**0.4**
	Beulah	2/23/09	63	63.8		**63.4**	**0.566**	**0.9**
	Beulah	8/24/09	41.7	41.9		**41.8**	**0.141**	**0.3**
	Beulah	8/19/10	47	47.3		**47.15**	**0.212**	**0.4**
	Beulah	8/10/11	37.4	38		**37.7**	**0.424**	**1.1**
	Beulah	8/29/12	35.9	36.5	36.6	**36.3**	**0.379**	**1.0**
Diss. Magnesium	Beulah	3/4/08	35.6	35.5		**35.55**	**0.071**	**0.2**
	Beulah	8/26/08	32.8	32.5		**32.65**	**0.212**	**0.6**
	Beulah	2/23/09	34.7	35.1		**34.9**	**0.283**	**0.8**
	Beulah	8/24/09	31.2	31.3		**31.25**	**0.071**	**0.2**
	Beulah	8/19/10	34.1	33.8		**33.95**	**0.212**	**0.6**
	Beulah	8/10/11	36.7	37.1		**36.90**	**0.283**	**0.8**
	Beulah	8/29/12	37.4	38.1	38.1	**37.87**	**0.404**	**1.1**
Diss. Potassium	Beulah	3/4/08	1.8	1.9		**1.85**	**0.071**	**3.8**
	Beulah	8/26/08	1.4	1.4		**1.4**	**0.000**	**0.0**
	Beulah	2/23/09	1.7	1.7		**1.7**	**0.000**	**0.0**
	Beulah	8/24/09	1.4	1.4		**1.4**	**0.000**	**0.0**
	Beulah	8/19/10	1.4	1.5		**1.45**	**0.071**	**4.9**
	Beulah	8/10/11	1.5	1.6		**1.55**	**0.071**	**4.6**
	Beulah	8/29/11	1.7	1.8	1.8	**1.77**	**0.058**	**3.3**
Dissolved Sodium	Beulah	3/4/08	9.9	10		**9.95**	**0.071**	**0.7**
	Beulah	8/26/08	9	8.9		**8.95**	**0.071**	**0.8**
	Beulah	2/23/09	9.7	9.8		**9.75**	**0.071**	**0.7**
	Beulah	8/24/09	8.6	8.7		**8.65**	**0.071**	**0.8**
	Beulah	8/19/10	10.4	11.4		**10.9**	**0.707**	**6.5**
	Beulah	8/10/11	10.4	10.7		**10.55**	**0.212**	**2.0**
	Beulah	8/29/12	11.4	11.5	12.1	**11.67**	**0.379**	**3.2**

Table A1. -- continued

Parameter	Lake	Date	Replicate Data			Mean	Standard Deviation	Percent Standard Deviation
ANC as CaCO3	Beulah	3/4/08	245	244		**244.5**	**0.707**	**0.3**
	Beulah	8/26/08	219	218		**218.5**	**0.707**	**0.3**
	Beulah	2/23/09	258	256		**257**	**1.414**	**0.6**
	Beulah	8/24/09	209	209		**209**	**0.000**	**0.0**
	Beulah	8/19/10	208	207		**207.5**	**0.707**	**0.3**
	Beulah	8/10/11	194	194		**194**	**0.000**	**0.0**
	Beulah	8/29/12	206	205	205	**205.3**	**0.577**	**0.3**
Diss. Chloride	Beulah	3/4/08	23.5	23.7		**23.6**	**0.141**	**0.6**
	Beulah	8/26/08	21	20.9		**20.95**	**0.071**	**0.3**
	Beulah	2/23/09	23	22.9		**22.95**	**0.071**	**0.3**
	Beulah	8/24/09	21.6	21.4		**21.5**	**0.141**	**0.7**
	Beulah	8/19/10	21.6	21.5		**21.55**	**0.071**	**0.3**
	Beulah	8/10/11	24.7	24.5		**24.6**	**0.141**	**0.6**
	Beulah	8/29/12	26.9	27.1	27.1	**27.03**	**0.115**	**0.4**
Dissolved Silica	Beulah	3/4/08	15.3	15.2		**15.25**	**0.071**	**0.5**
	Beulah	8/26/08	10.3	10.3		**10.3**	**0.000**	**0.0**
	Beulah	2/23/09	14.8	15		**14.9**	**0.141**	**0.9**
	Beulah	8/24/09	11.3	11.3		**11.3**	**0.000**	**0.0**
	Beulah	8/19/10	18.1	18.1		**18.1**	**0.000**	**0.0**
	Beulah	8/10/11	12.7	12.7		**12.7**	**0.00**	**0.0**
	Beulah	8/29/12	14.6	14.5	14.5	**14.5**	**0.06**	**0.4**
Dissolved Sulfate	Beulah	3/4/08	29.5	29.5		**29.5**	**0.000**	**0.0**
	Beulah	8/26/08	26.3	26.3		**26.3**	**0.000**	**0.0**
	Beulah	2/23/09	30.5	30.8		**30.65**	**0.212**	**0.7**
	Beulah	8/24/09	27.7	27.8		**27.75**	**0.071**	**0.3**
	Beulah	8/19/10	25.9	25.8		**25.85**	**0.071**	**0.3**
	Beulah	8/10/11	29.3	29.2		**29.25**	**0.071**	**0.2**
	Beulah	8/29/12	32.5	32.8	32.5	**32.6**	**0.173**	**0.5**
Dissolved Iron	Beulah	3/4/08	<100	<100		**NA**	**NA**	**NA**
	Beulah	8/26/08	<100	<100		**NA**	**NA**	**NA**
	Beulah	2/23/09	<100	<100		**NA**	**NA**	**NA**
	Beulah	8/24/09	<100	<100		**NA**	**NA**	**NA**
	Beulah	8/19/10	<100	<100		**NA**	**NA**	**NA**
	Beulah	8/10/11	<100	<100		**NA**	**NA**	**NA**
	Beulah	8/29/12	<100	<100	<100	**NA**	**NA**	**NA**
Diss. Manganese	Beulah	8/26/08	<0.5	<0.5		**NA**	**NA**	**NA**
	Beulah	2/23/09	<1.0	<1.0		**NA**	**NA**	**NA**
	Beulah	8/24/09	<1.0	<1.0		**NA**	**NA**	**NA**
	Beulah	8/10/11	<1.0	<1.0		**NA**	**NA**	**NA**
	Beulah	8/29/12	<1.0	<1.0	<1.0	**NA**	**NA**	**NA**
Dissolved Solids	Beulah	8/26/08	302	298		**300**	**2.83**	**0.9**
	Beulah	2/23/09	350	346		**348**	**2.83**	**0.8**
	Beulah	8/24/09	312	312		**312**	**0.00**	**0.0**
	Beulah	8/19/10	284	286		**285**	**1.41**	**0.5**
	Beulah	8/10/11	270	272		**271**	**1.41**	**0.5**
	Beulah	8/29/12	282	276	278	**279**	**3.06**	**1.1**

Table A2. Data from tests of blanks, 2007-2012. All data in milligrams per liter, unless otherwise indicated.
< = less than given detection limit; E = estimated value.

Delavan Lake. Analyses at USGS National Water Quality Laboratory, Lakewood, CO.

Parameter	4/7/06	6/13/06	8/14/06	4/16/07	9/14/09
Total Phosphorus	< 0.004	E 0.002	< 0.004	<0.004	<0.008
Dissolved orthophosphate	<0.006	<0.006	E0.003	<0.006	<0.008
Chlorophyll a	< 0.0260	---	< 0.0260	<0.260	---

Lake Beulah at Deep Hole near East Troy, WI. Analysis at Wisconsin State Laboratory of Hygiene, Madison, WI

Parameter	8/29/07	2/27/08	8/26/08	2/22/09	8/20/09	8/19/10	8/10/11
Total Phosphorus	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dissolved orthophosphate	0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Kjeldahl	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
Dissolved Ammonia	<0.15	<0.015	<0.015	<0.015	<0.015	0.015	<0.015
Dissolved Nitrate plus Nitrite	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019
Chlorophyll a (µg/L)	<0.260	---	<0.260	<0.260	<0.260	<0.260	<0.260
Dissolved Calcium	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Dissolved Magnesium	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Dissolved Potassium	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Dissolved Sodium	0.200	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
ANC as CaCO3	<2	3	<2	<2	<2	<2	3
Dissolved Chloride	<1.0	1.2	<1.0	<1.0	<1.0	<1.0	<1.0
Dissolved Silica	<0.22	<0.022	<0.022	<0.022	<0.022	<0.022	<0.022
Dissolved Sulfate	<4.5	<4.5	<4.5	<4.5	<4.5	<4.5	<4.5
Dissolved Iron	<100	<100	<100	<100	<100	<100	<100
Dissolved Manganese	<0.5	<0.5	<100	<1.0	<1.0	<1.0	<1.0
Dissolved Solids	---	---	<50	<50	<50	<50	<50
Turbidity, NTU	---	<1.0	<1.0	---	<1.0	<1.0	<1.0

Mercer Lake at Main Deep Hole at Mercer, WI, WI. Analysis at Wisconsin State Laboratory of Hygiene, Madison, WI

Parameter	8/27/10
Total Phosphorus	< 0.005

Rolling Stone Lake near Pickerel, WI. Analysis at Wisconsin State Laboratory of Hygiene, Madison, WI

Parameter	8/29/07
Total Phosphorus	<0.005
Chlorophyll a (ug/L)	<0.260
ANC as CaCO3	2
Dissolved Silica	<0.022

Wind Lake at Wind Lake, WI. Analyses at Wisconsin State Laboratory of Hygiene, Madison, WI

Parameter	6/13/06	8/30/10
Total Phosphorus	< 0.005	< 0.005
Chlorophyll a (ug/L)	<0.260	---

Silver Lake near West Bend, WI. Analyses at Wisconsin State Laboratory of Hygiene, Madison, WI

Parameter	8/31/09
Total Phosphorus	< 0.005
Chlorophyll a (ug/L)	<0.260

Water-Quality and Lake-Stage Data for Wisconsin Lakes, Water Year 2013

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FIGURE

TABLES

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

Multiply	By	To Obtain
mile (mi)	1.609	kilometer
pound (lb)	453.6	gram
acre	0.4048	hectare
foot (ft)	0.3048	meter
meter (m)	3.281	foot
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 either 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– or the North American Vertical Datum of 1988 (NAVD 88).

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 (mmho/cm) at 25 degrees Celsius, formerly used by the U.S. Geological Survey.

WATER-QUALITY AND LAKE-STAGE DATA FOR WISCONSIN LAKES, WATER YEAR 2013
By Wisconsin Water Science Center Lake-Studies Team

INTRODUCTION

The U.S. Geological Survey (USGS), in cooperation with local and other agencies, collects data at selected lakes throughout Wisconsin. These data, accumulated over many years, provide a data base for developing an improved understanding of the water quality of lakes. To make these data available to interested parties outside the USGS, the data are published annually in this report series. The locations of water-quality and lake-stage stations in Wisconsin for water year 2013 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, 2012 through September 30, 2013 is called "water year 2013."

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

Water-resources data, including stage and discharge data at most streamflow-gaging stations, are available through the World Wide Web on the Internet. The Wisconsin Water Science Center's home page is at http://wi.water.usgs.gov/. Information on the Wisconsin Water Science Center's Lakes Program is found at http://wi.water.usgs.gov/lakes/index.html and http://wi.water.usgs.gov/projects/index.html. The Wisconsin Water Science Center Lake-Studies Team includes S.B. Manteufel, D.M. Robertson, B.J. Siebers, and E.D. Dantoin.

Figure 1. Location of USGS lake water-quality, lake-stage, and lake-level network stations in Wisconsin.

The USGS has done cooperative lake monitoring with local and other agencies since 1983. Cooperators in 2013 included:

Big Cedar Lake Protection and Rehabilitation District

Dane County

Geneva Lake Environmental Agency

Green Lake Sanitary District

Lake Beulah Management District

Middle Genesee Lake District

Powers Lake District

Rock County Public Works Department

Town of Delavan

Town of Washington

U.S. Army Corps of Engineers

U.S. Environmental Protection Agency

Village of Oconomowoc Lake

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 2013 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: B.W. Olson (Rhinelander), and S.A. March (Middleton). The data were collected and processed by D.D. Baumann, E.D. Dantoin, D.E. Housner, D.L. Olson, Z.T. Scott, B.J. Siebers and C. Utzig. S.B. Manteufel assembled, edited, and formatted the report. Additional assistance in preparation of the report was provided by M.M. Greenwood, and D.L. Olson.

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
Balsam Lake near Birchwood	453907091345800	Mar. 1993–Aug. 1994, Mar. 1996–Aug. 1997, Mar.–Sept. 2001
Bass Lake near Shawano	445215088300300	Feb. 1990–Aug. 1992
Bear Lake at Deep Hole near Haugen	453754091490900	Mar. 1992–Aug. 1993
Beaver Dam Lake, South end, at Beaver Dam	432814088515000	June–Oct. 1991
North end, near Beaver Dam	433122088545700	June–Oct. 1991
Benedict Lake near Powers Lake	423201088180800	May 1998–Aug. 2000
Big Blacksmith Lake near Keshena	445401088334500	Feb. 1990–Aug. 1992
Big Hills (Hills) Lake near Wild Rose	440912089092000	June 1983–Aug. 1984, Feb.–Aug. 1987, Feb.–Aug. 1990, Feb.–Aug. 1993, Feb.–Aug. 1996, Feb.–Aug. 1999
Big Muskego Lake, at North Site, near Muskego	425301088061300	Feb.–Aug. 1988
Research Base, near Muskego	425235088075300	May–June 1994
Big Round Lake near Milltown	453142092180100	Feb.–Sept. 2001
Big St. Germain Lake, near St. Germain	455557089311000	Feb. 1992–Aug. 1996
near Lake Tomahawk	05390750	1991–2001
Big Sand Lake, Deep Hole, near Hertel	454910092134000	Feb.–Sept. 2001
East Site, near Hertel	454921092124300	Feb.–Sept. 2001
Big Sissabagama Lake, near Stone Lake	454724091303600	Apr. 1986–Sept. 1996, Oct. 1997–Sept. 2002
North Site, near Stone Lake	454800091312900	Mar. 1998–Sept. 2001
Booth Lake near East Troy	424800088254800	Feb. 1992–Aug. 1994, Feb. 2001–Aug. 2003
Buffalo Lake, Center Site, at Packwaukee	434558089260600	May 1998–Sept. 2001
East End, at Montello	434720089201600	May 1998–Sept. 2001
West End, near Endeavor	434414089282400	May 1998–Sept. 2001

Table 1. Discontinued lake stations--continued

Station name	Site identification number	Period of record
Butternut Lake, near Park Falls	455854090310300	Oct. 2002–Oct. 2004
Deep Hole, near Park Falls	455803090310800	Mar. 2003–Sept. 2004
North Site, near Butternut	455904090303400	Mar. 2003–Sept. 2004
Far South Site, near Park Falls	455651090312700	Mar. 2003–Sept. 2004
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
Eagle Spring Lake at Eagleville	425103088261500	Apr. 1991–Sept. 2001
Elizabeth Lake near Twin Lakes	423051088155300	Feb. 1995–Sept. 1997
Fish Lake near Sauk City	05406050	Nov. 1966–Sept. 1981, Apr. 1985–May 1987, May 1988, Apr. 1989–Oct. 1990, Oct. 1990–Nov. 1996, Nov. 1996–Sept. 2004
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
Gilbert Lake Deep Hole near West Bend	432504088152201	Apr. –July 2012
Gilbert Lake Tributary near West Bend	04086418	Apr. –July 2012
Gilbert Lake Spring #1 near West Bend	432514088151601	Apr. –July 2012
Gilbert Lake Spring #2 near West Bend	432511088151801	Apr. –July 2012
Geneva Lake, Geneva Bay, at Lake Geneva	423455088263800	Apr. 1997–Feb. 1999
Williams Bay, at Williams Bay	423420088320500	Apr. 1997–Feb. 1999
Center, near Lake Geneva	423402088301400	Apr. 1997–Mar. 1999
East End, near Lake Geneva	423421088272300	Apr. 1997–May 2000
Hemlock Lake near Mikana	453421091333700	Mar. 1993–Aug. 1994, Mar. 1996–Aug. 1997, Mar.–Sept. 2001
Hooker Lake at Salem	423335088060300	Feb. 1992–Aug. 1993
Kawaguesaga, Deep Hole, near Minocqua	455208089435800	May–Sept. 2003
South Site, near Minocqua	455145089442600	May–Sept. 2003

Table 1. Discontinued lake stations--continued

Station name	Site identification number	Period of record
Kirby Lake near Cumberland	453554092042101	Nov. 1995–Oct. 1996
(Site 1) near Cumberland	453608092035801	Nov. 1995–Nov. 1996
(Site 2) near Cumberland	453601092035301	Nov. 1995–Nov. 1996
(Site 3) near Cumberland	453612092034901	Nov. 1995–Nov. 1996
(Site 4) near Cumberland	453603092035701	Nov. 1995–Nov. 1996
(Site 5) near Cumberland	453608092041201	Nov. 1995–Nov. 1996
(Site 6) near Cumberland	453555092040901	Nov. 1995–Nov. 1996
Lac La Belle at Oconomowoc	430733088305900	Feb. 1984–Aug. 1985, Apr. –Aug. 1991, Feb. 2001–Aug. 2003
NW, at Oconomowoc	430809088313900	Feb. 1984–Aug. 1985
SE, at Oconomowoc	430707088301400	Feb. 1984–Aug. 1985
Lake Bastine, Deep Hole, near Mercer	460511090153800	Apr. 2009–Mar. 2010
Lake Blass at Lake Delton	433545089482400	Mar. 1989–Aug. 1990
Lake Desair near Rice Lake	453446091465100	Aug. 2004
Lake Keesus,		
East Bay, near Merton	430957088183400	Apr. 1991–Aug. 1995
North Bay, near Merton	431006088191000	Apr. 1991–Aug. 1995
Lake Morris at Mount Morris	440654089120500	Jun. 1983–Sept. 1989
Lake Nebagamon, Northeast Bay, at Lake Nebagamon	463050091412300	May 1992–Aug. 1995
Southeast Bay, at Lake Nebagamon	462928091413500	Mar. 1992–Sept. 1995
West Bay, at Lake Nebagamon	463034091425300	May 1992–Aug. 1995
Lake Noquebay near Crivitz	451511087550900	Feb. 1987–Aug. 1988, Apr. 1991–Aug. 1994
East End, near Crivitz	451540087525700	Apr. 1991–Aug. 1994
Lamotte Lake near Shawano	445305088361200	Feb. 1990–Aug. 1992
Lauderdale Lakes at Lauderdale	424554088332700	Oct. 1993–Oct. 1994
Mill, at Lauderdale	424555088335700	Nov. 1993–Nov. 1994, Aug. 2002
Green, Auxiliary, Number 1, near Lauderdale	424640088341900	June 1999–Sept. 2000
Green, near Lauderdale	424652088341500	Nov. 1993–Nov. 1994, Aug. 2002
Legend Lake (site 1) near Shawano	445342088312700	Feb. 1990–Feb. 1992
Little Arbor Vitae near Woodruff	455446089370300	Feb. 1991–Sept. 2002
Little Cedar Lake, North Site, near West Bend	432255088134700	Feb. 1997–Aug. 1999, Feb. 2003–Sept. 2012
Little Cedar Lake, South Site, near West Bend	432249088134500	Feb. 1997–Aug. 1999, Feb. 2003–Sept. 2012
Little Green Lake, at Center, near Markesan	434412088590700	Feb. 1991–Aug. 2003
Little Muskego Lake at Muskego	425425088083500	Oct. 1986–Aug. 2002

Table 1. Discontinued lake stations--continued

Station name	Site identification number	Period of record
Little Rock Lake near Woodruff	455946089415702	Oct. 1983–Sept. 1996
Little St. Germain Lake, near Eagle River	05390700	(a)
Upper East Bay, at St. Germain	455532089253900	Dec. 1996–Mar. 97, Mar. 1999, Mar. 2000–Aug. 2003
Northeast Bay, near St. Germain	455545089262500	Apr. 1991–Aug. 1994, Aug. 1996–Aug. 1997, Mar. 1999–Aug. 2003
South Bay, near St. Germain	455437089270800	Apr. 1991–Aug. 1994, Aug. 1996–Aug. 1997, Mar. 1999–Aug. 2003
West Bay, at St. Germain	455428089282400	Apr. 1991–Aug. 1994, Aug. 1996–Aug. 1997, Mar. 1999–Aug. 2003
Little Sand Lake - Site No. 2 - near Mole Lake	452826088544101	May1996–Sept. 2003
Long (Kee Nong Go-Mong) Lake at Wind Lake	424937088103400	Feb. 1988–Aug. 1989, Feb. 1991–Aug. 1996
Loon Lake near Shawano	445009088303700	Feb. 1991–Aug. 1993
Lost Lake near Beaver Dam	432640088580500	June–Oct. 1991
McKenzie Lakes		
McKenzie (Big McKenzie)		
Deep Hole, near Spooner	455507092013500	Feb. 1987–Aug. 1998
Northern Site, near Spooner	455540092022000	June 1997–Aug. 1998
South Site, near Spooner	455437092022300	June 1997–Aug. 1998
Lower McKenzie, near Webb Lake	455902092011900	June 1997–Aug. 1998
Middle McKenzie, near Spooner	455635092021800	June 1997–Aug. 1998
Mary (Marie) Lake at Twin Lakes	423128088151200	Feb. 1995–Aug. 1997
Max Lake near Woodruff	460128089423501	Mar. 1988–Dec. 1996
Mead Lake, East Bay near Willard	444720090445000	Apr. 1991–Aug. 1995
West Bay near Willard	444733090460100	Feb. 1991–Sept. 1995
Mercer Lake, Deep Hole, at Mercer	460937090033100	Mar. 2008–Sept. 2009
West basin, at Mercer	460945090040600	Mar. 2008–Sept. 2009
Minocqua Lake		
Deep Hole, at Minocqua	455214089412800	May–Sept. 2003
North Bay, at Minocqua	455232089424100	May–Sept. 2003
South Bay, at Minocqua	455206089425200	May–Sept. 2003
Montello Lake at Montello	434748089195800	Feb. 1995–Aug. 1998
Moon Lake near St. Germain	455504089260500	Feb. 1992–Aug. 1996
Morgan Lake near Fence	454622088324801	Oct. 1987–Sept. 1998.

Table 1. Discontinued lake stations--continued

Station name	Site identification number	Period of record
Moshawquit Lake near Shawano	445352088295800	Feb. 1990–Aug. 1992
Muskego (Big Muskego)		
Auxiliary Number 1, near Muskego	425329088054000	June 1996–Aug. 2000
Bass Bay, near Muskego	425344008807010	Feb. 1988–Aug. 2002
near Wind Lake	425109088075000	Oct. 1987–Sept. 1989, Jan. 1991–Sept. 2002
South Site, near Muskego	425212088072800	Feb. 1988–Aug. 2002
Muskellunge Lake near Eagle River	455700089224900	June 2000–Aug. 2001
Muskellunge Lake, near Lake Outlet near Eagle River	455706089232400	Nov. 2000–Oct. 2001
Nagawicka Lake, at Deep Hole, at Delafield	430417088230300	Feb. 2003–Sept. 2004
Namekagon Lakes		
Garden, near Cable	461224091033200	Mar. 1998–Aug. 1999
Jackson, near Cable	461457091065900	Mar. 1998–Aug. 1999
Namekagon		
Deep Hole, near Cable	461308091065100	Mar. 1998–Aug. 1999
East Basin, near Cable	461228091044300	Mar. 1998–Aug. 1999
Northeast Basin, near Cable	461410091050700	Mar. 1998–Aug. 1999
Park Lake (site 1) at Pardeeville	433239089175800	Feb. 1986–Aug. 1987, May–Nov. 1993
(site 2) at Pardeeville	433226089175500	May–Nov. 1993
(site 3) at Pardeeville	433245089173000	May–Nov. 1993
(site 4) at Pardeeville	433257089165100	May–Nov. 1993
Pike Lake near Hartford	431916088200501	Dec. 1998–Dec. 2000
Pike Lake-QW Site-near Hartford	431835088200600	Feb.–Aug. 2000
Potter Lake near Mukwonago	424905088204000	Feb. 1993–Sept. 2007
Pretty Lake, at Deep Hole, near Dousman	425722088295000	Feb. 1993–Aug. 1997
Puckaway Lake, West Basin, near Marquette	434515089124000	Apr. 2005–Sept. 2007
East Basin, near Marquette	43454208907300	Apr. 2005–Sept. 2007
River site, near Marquette	434824089083200	Apr. 2005–Sept. 2007
Red Cedar Lake, at Mikana	453522091360600	Mar. 1993–Aug. 1994, Mar. 1996–Aug. 1997, Oct. 2000–Sept. 2001
Deep Hole, near Mikana	453725091345100	Mar. 1993–Aug. 1994, Mar. 1996–Aug. 1997, Mar. –Sept. 2001
South End, at Mikana	453519091352500	Mar. 1993–Aug. 1994, Mar. 1996–Aug. 1997, Mar. –Sept. 2001
Rice Lake at Deep Hole near Whitewater	424629088415700	Apr.–Nov. 1991

Table 1. Discontinued lake stations--continued

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
Shell Lake at Shell Lake	05334000	Aug. 1936–Sept. 1999
Silver Lake near Oconomowoc	430436088293300	Apr. 1992–Aug. 1996
Silver Lake near West Bend	432322088125000	Feb. 1996–Aug. 1997 Feb. 2009–Aug. 2009
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
Spooner Lake, Deep Hole, near Spooner	455034091493300	June 2002–Aug. 2004
Southeast Site, near Spooner	454945091483900	June 2002–Aug. 2004
Stewart Lake at Mt. Horeb	430117089442701	May 1992–Sept. 1993
Tichigan Lake near Waterford	424854088123300	Mar. 1994–Aug. 1996, Apr. 2003–Aug. 2004
Tombeau Lake near Powers Lake	423153088184800	May 1998–Aug. 2000
Townline Lake near Mercer	460409090084100	Apr. 2009–Mar. 2010
Trude Lake, Deep Hole, near Mercer	460646090091900	Apr. 2009–Mar. 2010
Turtle-Flambeau Flowage, Deep Hole, near Mercer	460458090102700	Apr. 2009–Mar. 2010
SW Basin, near Mercer	460344090124800	Apr. 2009–Mar. 2010
Lake Bastine, Deep Hole, near Mercer	460511090153800	Apr. 2009–Mar. 2010
Townline Lake, near Mercer	460409090084100	Apr. 2009–Mar. 2010
Trude Lake, Deep Hole, near Mercer	460646090091900	Apr. 2009–Mar. 2010
Twin Lake, East Twin, near Westfield	435430089350700	June 2002–Aug. 2004
West Twin, near Westfield	435438089352300	June 2002–Aug. 2004
Winnebago, Buoy Site, near Oshkosh	440128088271201	May 2011–Sept. 2011

(a) Wisconsin Valley Improvement Co. currently collects stage data for this site.

In most lakes, water samples were collected at two depths - near the surface and near the bottom. Chemical analyses of water samples were performed using standard analytical methods by either the USGS National Water Quality Laboratory (Wershaw and others, 1987; Fishman and Friedman, 1989; Fishman, 1993) or the Wisconsin State Laboratory of Hygiene (Wisconsin State Laboratory of Hygiene, 1993). Analyses for dissolved constituents were

performed on samples that were filtered in the field through a 0.45-µm (micrometer) pore-size filter. Total or total recoverable constituents were determined by analyzing unfiltered water samples. Preservation and shipment of samples followed standard protocols established by the laboratories. Water-quality data were archived in the Water Quality Data Base (QWDATA) of the National Water Information System (NWIS). Additional descriptive information about water-quality data is available in the data report: "Water Resources Data – Wisconsin, 2013". NWIS parameter codes and minimum laboratory reporting levels for chemical constituents are given in table 2. The parameter code for turbidity has changed from 00076 to 63675 or 63676 because the method of testing has changed.

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).

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

				(NWQL)				(WSLH)	
				Standard Analysis		Low-Level Analysis			
Parameter Name	Units	CAS Number[1]	Parameter Code[2]	LRL	Lab Code	LRL	Lab Code	LRL	Test Code
Calcium, diss. (Ca)	mg/L	7440-70-2	00915	0.022	659	--	--	0.100	E200.7
Magnesium, diss. (Mg)	mg/L	7439-95-4	00925	0.011	663	--	--	0.100	E200.7
Sodium, diss. (Na)	mg/L	7440-23-5	00930	0.06	675	--	--	0.100	E200.7
Potassium, diss. (K)	mg/L	7440-09-7	00935	0.03	2773	0.004	2774	0.100	E200.7
Sulfate, diss. (SO4)	mg/L	14808-79-8	00945	0.02	1572	0.02	1263	4.70	EPA 375.2
Chloride, diss. (Cl)	mg/L	16887-00-6	00940	0.02	1571	0.02	1259	1.00	SM4500-CL-E
Fluoride, diss. (F)	mg/L	16984-48-8	00950	0.01	651	0.01	1260	--	--
Iron, diss. (Fe)		7439-89-6	01046	4.0	645	--	--	0.100	E200.7
Manganese, diss. (Mn)		7439-96-5	01056	0.2	648	0.40	1793	1.00	E200.7
Silica, diss. (SiO2)	mg/L	7631-86-9	00955	0.06	3121	0.018	667	0.022	USGS I-2700-85
Nitrogen, NO2+NO3, diss.	mg/L	--	00631	0.04	3156	--	--	0.019	EPA 353.2
Nitrogen, ammonia, diss.	mg/L	7664-41-7	00608	0.02	1991	--	--	0.015	EPA 350.1
Nitrogen, organic, total [3]	mg/L	--	--	--	--	--	--	--	--
Nitrogen, amm.+org., total [4]	mg/L	17778-88-0	00625	0.07	1986	--	--	0.14	EPA 351.2
Nitrogen, amm.+org.,diss.	mg/L	17778-88-0	00623	0.07	1985	--	--	--	--
Phosphorus, total	mg/L	7723-14-0	00665	0.004	1984	0.004	2333	0.005	EPA 365.1
Phosphorus, ortho, diss.	mg/L	14265-44-2	00671	0.004	3118	--	--	0.002	SM4500-PE
Chlorophyll a, phytoplankton	µg/L	479-61-8	70953	0.1	3152	--	--	--	--
Chlorophyll a, phytoplankton	µg/L	479-61-8	32210	--	--	--	--	0.26	EPA 445

Footnotes:

1: CAS (Chemical Abstracting Services) number = unique identification for each constituent

2: Parameter Code - unique number for storage of data in database

3: Calculated as difference between total ammonia + organic nitrogen and ammonia nitrogen

4: Also known as Total Kjeldahl Nitrogen (TKN)

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).

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 a 20-cm.-diameter disc with alternating black-and-white quadrants, is lowered to a depth at which it is no longer visible. This depth is referred to as the Secchi depth. Clarity can be reduced by algae, zooplankton, water color, and suspended sediment. Algae are often the most dominant influence on clarity in lakes and, therefore, Secchi depth is usually correlated with the algal abundance. Secchi depths are generally the least during summer when algal populations are largest.

pH

The pH is a measure of the acidity of the water. It is defined as the negative logarithm of hydrogen-ion concentration and varies over a 14-unit log scale, with a pH of 7 being neutral. Values less than 7 indicate acidic conditions; the lower the value, the stronger the acidity. Values greater than 7 indicate alkaline conditions. The pH of water is influenced in part by photosynthesis and respiration of planktonic algae and aquatic plants. It is important because it

affects the solubility of many chemical constituents, and because aquatic organisms have limited pH tolerances. Planktonic algae and aquatic plants produce oxygen and consume carbon dioxide as they photosynthesize during daytime; they consume oxygen and produce carbon dioxide when they respire at night. Carbon dioxide combines with the water molecule to form carbonic acid; therefore respiration causes a decrease in pH at night and photosynthesis during the day causes an increase in pH. The result is a daily cycle in pH. Because phytoplankton are usually concentrated in the near-surface water, changes in pH in the epilimnion are more extreme than in the hypolimnion, where less photosynthesis usually occurs.

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

Dissolved Oxygen

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

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

Anoxia in the hypolimnion is common in stratified eutrophic (nutrient-rich) lakes in Wisconsin. Complete anoxia, however, is often not detected because of meter constraints.

During anoxic conditions, many aquatic organisms cannot survive, but many other species (primarily bacteria) actually function only in such conditions. Therefore, a shift from oxic to anoxic conditions produces a rapid and dramatic change in the biological community and chemical environment. Anoxia also can cause release of phosphorus from the bottom sediments. This phosphorus then mixes throughout the water column during spring and fall turnover.

Phosphorus

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

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

Nitrogen

Nitrogen, like phosphorus, is an essential nutrient for plant and algal growth. Usually in Wisconsin lakes, nitrogen is in abundant supply from the atmosphere and other sources. If phosphorus is abundant relative to algal needs, nitrogen can become the limiting nutrient. In that case, algal blooms are more likely to be triggered by increases in nitrogen than by

increases in phosphorus. Some bluegreen algal species can fix nitrogen from the atmosphere (Wetzel, 1983). Therefore, in situations where other types of algae are excluded because of a shortage of nitrogen, the nitrogen-fixing bluegreen algae have a competitive advantage and may be present in abundance.

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

Chlorophyll *a*

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

CLASSIFICATION OF LAKES

Two methods are commonly used to classify and evaluate Wisconsin lakes according to their water quality or trophic state: Lillie and Mason's (1983) water-quality index and Carlson's (1977) trophic state index (TSI). In previous USGS data reports, a modification of Carlson's trophic state index for Wisconsin lakes by Lillie and others (1993) had been used; however, this approach did not properly classify oligotrophic and highly euthrophic lakes and, therefore, was discontinued.

Lillie and Mason's (1983) water quality indices for Wisconsin lakes were developed based on summer measurements of total phosphorus and chlorophyll *a* concentrations, and Secchi depth from a random set of lakes in Wisconsin. These data were used to classify the lakes's 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

Carlson's (1977) 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.

Carlson's (1977) TSI values are also based on near-surface total phosphorus and chlorophyll *a* concentrations, and Secchi depths. The indices were developed to place these three characteristics on similar scales to allow comparison of different lakes. TSI values based on phosphorus concentrations (TSI_P), Secchi depths (TSI_{SD}), and chlorophyll *a* concentrations (TSI_C) typically are computed only for measurements collected during the open-water period.

TSI values for a lake can be calculated using the following equations (Carlson, 1977):

$TSI_P = 4.15 + 14.42 \times (\ln [\text{total phosphorus concentration} \times 1{,}000])$

$TSI_{SD} = 60.0 - 14.41 \times (\ln \text{Secchi depth})$

$TSI_C = 30.6 + 9.81 \times (\ln \text{chlorophyll } a \text{ concentration})$

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

The three main trophic conditions (Carlson, 1977) 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----------	-------0.024--------	---------2.0---------	---------7.2---------
Mesotrophic				
----------	---------40----------	-------0.012--------	---------4.0---------	---------2.6---------
Oligotrophic				

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LAKE DATA

Remarks codes and symbols used in the following tables:

[<, less than; >, greater than; --, not available; E, estimated]

05390500 ANVIL LAKE NEAR EAGLE RIVER, WI

LOCATION.--Lat 45°57'00.5", long 89°03'15.3", referenced to North American Datum of 1983, in NW ¼ NE ¼ sec.13, T.40 N., R.11 E., Vilas County, Hydrologic Unit 07070001.

DRAINAGE AREA.—4.11 mi^2.

PERIOD OF RECORD.--June 2010 to current year.

GAGE.--Water-stage recorder and rain gage.

REMARKS.--Anvil Lake is a seepage lake. Gage height telemeter at station. Records are considered good.

EXTREMES FOR PERIOD OF RECORD.--Maximum, 97.20 ft, many days during May and June 1943; Minimum, 89.27 ft, Oct. 7 to 17, 2012.

EXTREMES FOR CURRENT YEAR.--Maximum, 90.32 ft, May 30; Minimum, 89.27 ft, Oct. 7 to 17, 2012.

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	89.38	89.46	89.47	89.50	89.59	89.65	89.76	90.22	90.26	90.08	89.84	89.86
2	89.37	89.45	89.47	89.50	89.59	89.65	89.76	90.23	90.24	90.06	89.83	89.84
3	89.36	89.44	89.47	89.50	89.59	89.65	89.76	90.25	90.22	90.04	89.81	89.82
4	89.36	89.44	89.47	89.49	89.59	89.65	89.75	90.26	90.20	90.03	89.79	89.80
5	89.33	89.43	89.47	89.49	89.60	89.64	89.75	90.26	90.21	90.01	89.81	89.78
6	89.31	89.43	89.47	89.49	89.60	89.64	89.76	90.26	90.22	89.99	89.83	89.77
7	89.30	89.44	89.46	89.49	89.60	89.64	89.78	90.25	90.21	90.01	89.85	89.75
8	89.29	89.44	89.46	89.49	89.60	89.63	89.80	90.25	90.21	90.06	89.83	89.74
9	89.29	89.43	89.46	89.48	89.60	89.64	89.82	90.25	90.19	90.07	89.82	89.73
10	89.30	89.44	89.47	89.48	89.61	89.66	89.81	90.27	90.19	90.10	89.81	89.73
11	89.29	89.47	89.47	89.49	89.63	89.71	89.81	90.27	90.18	90.07	89.80	89.72
12	89.28	89.51	89.46	89.50	89.63	89.72	89.83	90.26	90.17	90.06	89.78	89.70
13	89.28	89.50	89.46	89.50	89.63	89.72	89.84	90.26	90.15	90.03	89.77	89.68
14	89.28	89.49	89.46	89.50	89.64	89.72	89.85	90.25	90.14	90.01	89.75	89.66
15	89.28	89.49	89.46	89.49	89.64	89.71	89.90	90.24	90.14	89.99	89.73	89.66
16	89.28	89.48	89.47	89.49	89.64	89.72	89.90	90.23	90.15	89.98	89.72	89.64
17	89.28	89.48	89.47	89.49	89.64	89.72	89.90	90.22	90.15	89.96	89.71	89.63
18	89.36	89.48	89.47	89.49	89.63	89.72	89.92	90.21	90.14	89.96	89.70	89.61
19	89.37	89.47	89.47	89.48	89.65	89.74	89.97	90.21	90.12	89.93	89.68	89.62
20	89.37	89.47	89.49	89.49	89.65	89.73	89.97	90.21	90.12	89.90	89.67	89.66
21	89.36	89.47	89.51	89.49	89.65	89.73	89.97	90.24	90.17	89.87	89.67	89.67
22	89.36	89.47	89.51	89.49	89.65	89.73	89.99	90.28	90.17	89.85	89.69	89.65
23	89.36	89.47	89.51	89.49	89.66	89.73	90.05	90.26	90.17	89.85	89.67	89.64
24	89.36	89.47	89.51	89.48	89.66	89.72	90.05	90.25	90.16	89.83	89.65	89.62
25	89.47	89.48	89.50	89.49	89.66	89.72	90.06	90.24	90.15	89.81	89.64	89.61
26	89.52	89.47	89.50	89.49	89.66	89.72	90.07	90.22	90.14	89.88	89.68	89.61
27	89.51	89.47	89.50	89.49	89.66	89.71	90.08	90.20	90.14	89.89	89.87	89.59
28	89.50	89.47	89.50	89.52	89.66	89.71	90.09	90.19	90.14	89.89	89.89	89.59
29	89.49	89.47	89.50	89.55	---	89.71	90.13	90.19	90.13	89.87	89.89	89.59
30	89.48	89.47	89.50	89.57	---	89.74	90.15	90.23	90.10	89.86	89.89	89.58
31	89.47	---	89.50	89.59	---	89.76	---	90.24	---	89.86	89.87	---
Mean	89.36	89.47	89.48	89.50	89.63	89.70	89.91	90.24	90.17	89.96	89.77	89.69
Max	89.52	89.51	89.51	89.59	89.66	89.76	90.15	90.28	90.26	90.10	89.89	89.86
Min	89.28	89.43	89.46	89.48	89.59	89.63	89.75	90.19	90.10	89.81	89.64	89.58

455638089034501 ANVIL LAKE, DEEP HOLE, NEAR EAGLE RIVER, WI

LOCATION.--Lat 45°56'38", long 89°03'45", in SW ¼ sec.13, T.40 N., R.11 E., Vilas County, Hydrologic Unit 07070001, near Eagle River.

SURFACE AREA.—0.62 mi^2.

PERIOD OF RECORD.—May 2012 to September 2013.

REMARKS.--Lake sampled at the deep hole at a depth of 8-9 m. Water-quality analyses by Wisconsin State Laboratory of Hygiene. A "*" indicates data that were collected by a Citizen Lake Monitoring Volunteer.

WATER-QUALITY DATA, OCTOBER 2, 2012 TO SEPTEMBER 23, 2013

(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro -matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)	Phos-phorus, water, fltrd, mg/L as P (00666)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Total nitro-gen, water, unfltrd mg/L (00600)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia + org-N, water, fltrd, mg/L as N (00623)
OCT 2012													
*02...	1.88	.50	--	--	--	--	3.04	.022	--	--	--	--	--
16...	2.90	.50	--	--	--	--	10.7	.018	--	--	--	--	--
16...	--	7.5	8.7	40	8.2	9.3	--	.018	--	--	--	--	--
JAN 2013													
10...	2.50	--	--	--	--	--	--	--	--	--	--	--	--
10...	--	.50	1.5	43	7.8	14.2	22.2	.017	--	--	--	--	--
10...	--	8.0	4.0	51	7.0	1.4	--	.017	--	--	--	--	--
MAR													
26...	7.00	--	--	--	--	--	--	--	--	--	--	--	--
26...	--	1.0	1.6	45	7.6	11.9	5.24	.013	--	--	--	--	--
26...	--	7.0	4.4	51	6.5	.5	--	.014	--	--	--	--	--
MAY													
*14...	3.00	.50	--	--	--	--	--	.019	--	--	--	--	--
24...	3.20	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	.50	13.6	39	7.6	10.6	2.41	.019	--	<.006	.53	<.048	--
24...	--	8.0	8.1	37	6.8	3.4	--	.016	--	--	--	--	--
*24...	--	.50	--	--	--	--	--	.016	--	--	--	--	--
*31...	4.60	.50	--	--	--	--	4.27	.018	--	--	--	--	--
JUN													
*12...	--	--	--	--	--	--	1.82	.020	--	--	--	--	--
*12...	4.70	.50	--	--	--	--	1.82	.020	--	--	--	--	--
12...	4.08	--	--	--	--	--	--	--	--	--	--	--	--
12...	--	.50	19.5	40	8.1	10.2	3.20	.017	--	--	--	--	--
12...	--	8.0	10.0	42	7.2	3.8	--	.036	--	--	--	--	--
*24...	3.70	.50	--	--	--	--	3.46	.011	--	--	--	--	--

455638089034501 ANVIL LAKE, DEEP HOLE, NEAR EAGLE RIVER, WI

WATER-QUALITY DATA, OCTOBER 2, 2012 TO SEPTEMBER 23, 2013

(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro-matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)	Phos-phorus, water, fltrd, mg/L as P (00666)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Total nitro-gen, water, unfltrd mg/L (00600)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia + org-N, water, fltrd, mg/L as N (00623)
JUL													
11...	3.18	--	--	--	--	--	--	--	--	--	--	--	--
11...	--	.50	24.0	42	8.6	8.7	4.78	.011	<.005	<.002	<.47	<.015	.44
11...	--	1.0	23.6	42	8.6	8.8	5.54	.009	<.005	<.002	<.42	<.015	.40
11...	--	2.0	23.5	42	8.7	8.8	4.84	.009	<.005	<.002	<.51	<.015	.49
11...	--	8.0	12.5	50	6.9	.4	--	.019	--	--	--	<.015	--
*11...	3.40	.50	--	--	--	--	5.07	.009	--	--	--	--	--
*22...	3.00	.50	--	--	--	--	6.11	.008	--	--	--	--	--
22...	2.15	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	.50	24.5	41	9.0	8.8	8.23	.009	--	--	--	--	--
22...	--	8.0	12.8	51	7.2	.3	--	.025	--	--	--	--	--
*22...	--	--	--	--	--	--	7.60	.008	--	--	--	--	--
AUG													
*04...	2.40	.50	--	--	--	--	7.52	.016	--	--	--	--	--
14...	2.10	--	--	--	--	--	--	--	--	--	--	--	--
14...	--	.50	20.0	43	8.5	9.1	7.95	.015	.007	<.002	<.54	<.015	--
14...	--	6.0	19.5	42	8.4	8.8	--	.025	--	--	--	--	--
14...	--	7.0	16.9	49	7.3	.7	--	.017	--	--	--	--	--
14...	--	8.0	14.5	63	6.9	.2	--	.038	--	--	--	--	--
*18...	--	.50	--	--	--	--	5.79	.018	--	--	--	--	--
*19...	2.50	--	--	--	--	--	--	--	--	--	--	--	--
*25...	2.80	.50	--	--	--	--	4.59	.019	--	--	--	--	--
SEP													
*11...	3.30	.50	--	--	--	--	5.44	.019	--	--	--	--	--
18...	2.25	--	--	--	--	--	--	--	--	--	--	--	--
18...	--	.50	18.3	42	7.0	8.3	8.95	.019	--	--	--	--	--
18...	--	8.0	17.9	44	6.9	6.4	--	.019	--	--	--	--	--
*23...	2.50	.50	--	--	--	--	8.79	.019	--	--	--	--	--

455638089034501 ANVIL LAKE, DEEP HOLE, NEAR EAGLE RIVER, WI

WATER-QUALITY DATA, OCTOBER 2, 2012 TO SEPTEMBER 23, 2013

(Milligrams per liter unless otherwise indicated)

Date	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrate + nitrite water, fltrd, mg/L as N (00631)	Turbdty white light, det ang 90+/-30 degrees NTU (63675)	Appar-ent color, water, unfltrd Pt-Co units (00081)	Hard-ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Sodium, water, fltrd, mg/L (00930)	Potas-sium, water, fltrd, mg/L (00935)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor-ide, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Silica, water, fltrd, mg/L as SiO2 (00955)
MAY													
24...	--	--	--	--	--	--	--	--	--	--	--	--	--
24...	.43	.101	1.9	5	16.8	3.87	1.73	1.36	.34	17	1.1	<15.0	.634
24...	--	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUL													
11...	--	--	--	--	--	--	--	--	--	--	--	--	--
11...	.45	<.019	--	--	--	--	--	--	--	--	--	--	--
11...	.40	<.019	--	--	--	--	--	--	--	--	--	--	--
11...	.49	<.019	--	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--	--	--	--
AUG													
14...	--	--	--	--	--	--	--	--	--	--	--	--	--
14...	.52	<.019	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--	--	--
SEP													
18...	--	--	--	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	17.1	3.98	1.75	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--	--	--	--

455638089034501 ANVIL LAKE, DEEP HOLE, NEAR EAGLE RIVER, WI

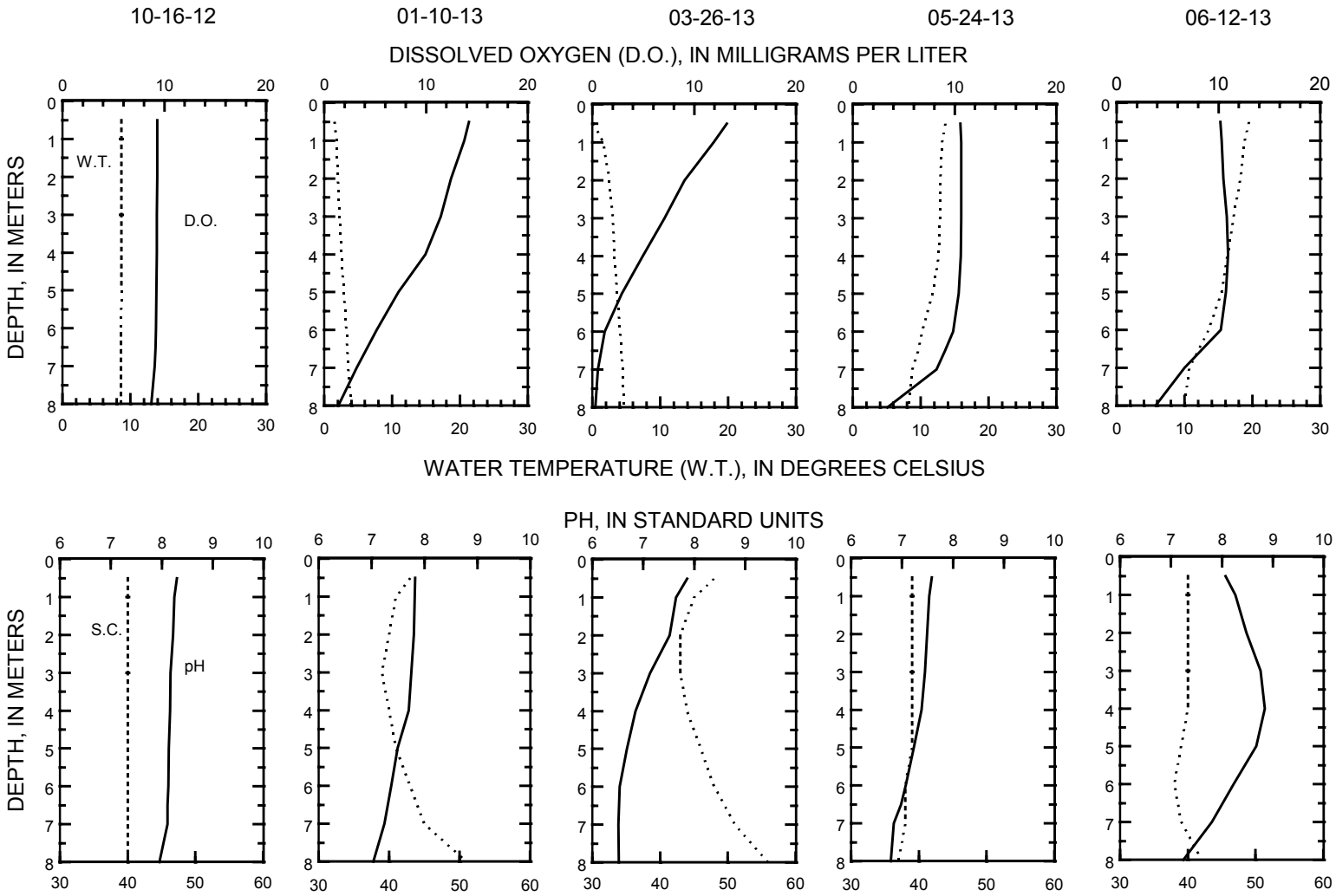
WATER-QUALITY DATA, OCTOBER 2, 2012 TO SEPTEMBER 23, 2013

(Milligrams per liter unless otherwise indicated)

Date	Iron, water, fltrd, ug/L (01046)	Manganese, water, fltrd, ug/L (01056)	Dissolved solids dried @ 180degC wat flt mg/L (70300)
OCT 2012			
02...	--	--	--
16...	--	--	--
16...	--	--	--
JAN 2013			
10...	--	--	--
10...	--	--	--
10...	--	--	--
MAR			
26...	--	--	--
26...	--	--	--
26...	--	--	--
MAY			
14...	--	--	--
24...	--	--	--
24...	<.3	<1.0	<50
24...	--	--	--
24...	--	--	--
31...	--	--	--

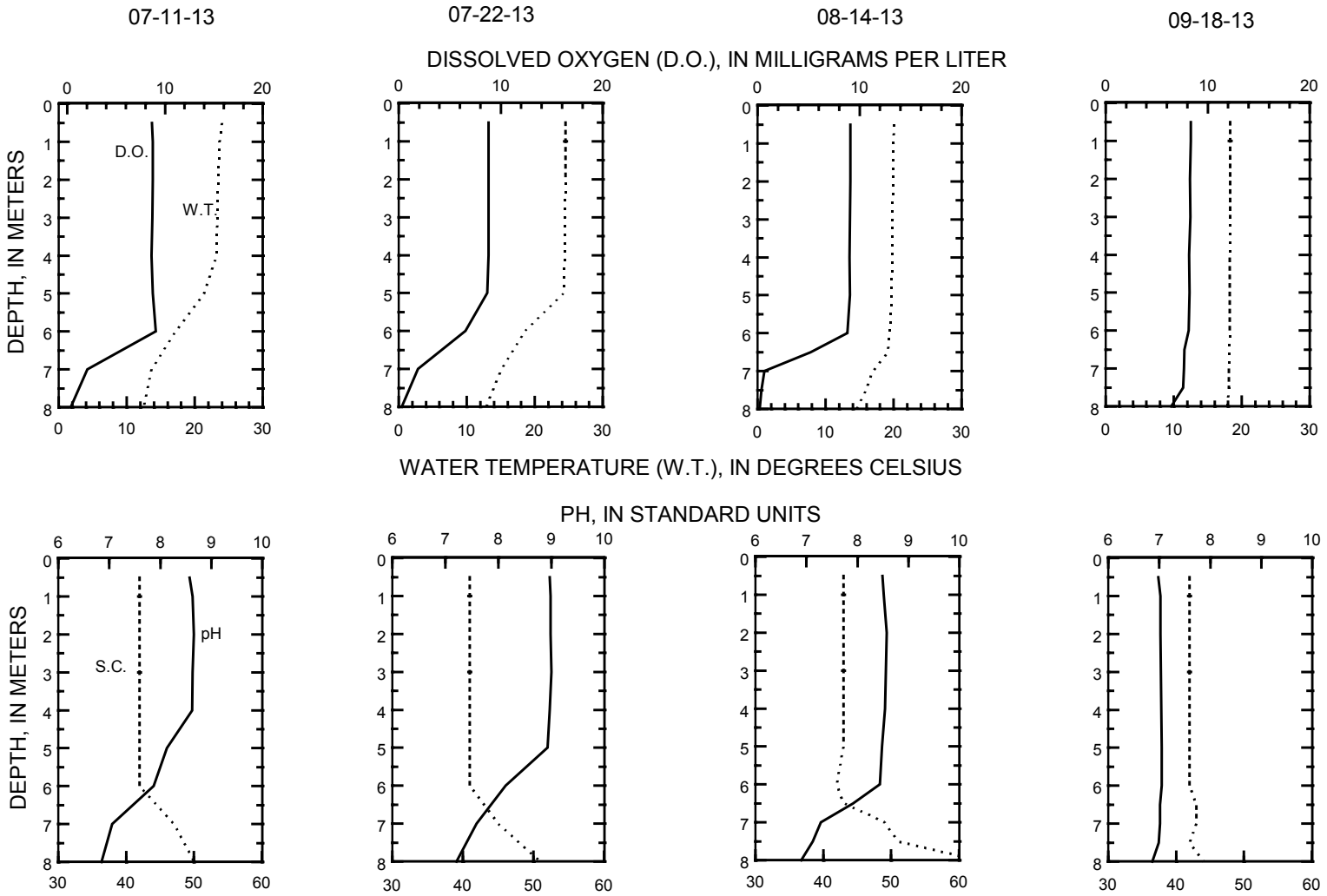
455638089034501 ANVIL LAKE, DEEP HOLE, NEAR EAGLE RIVER, WI

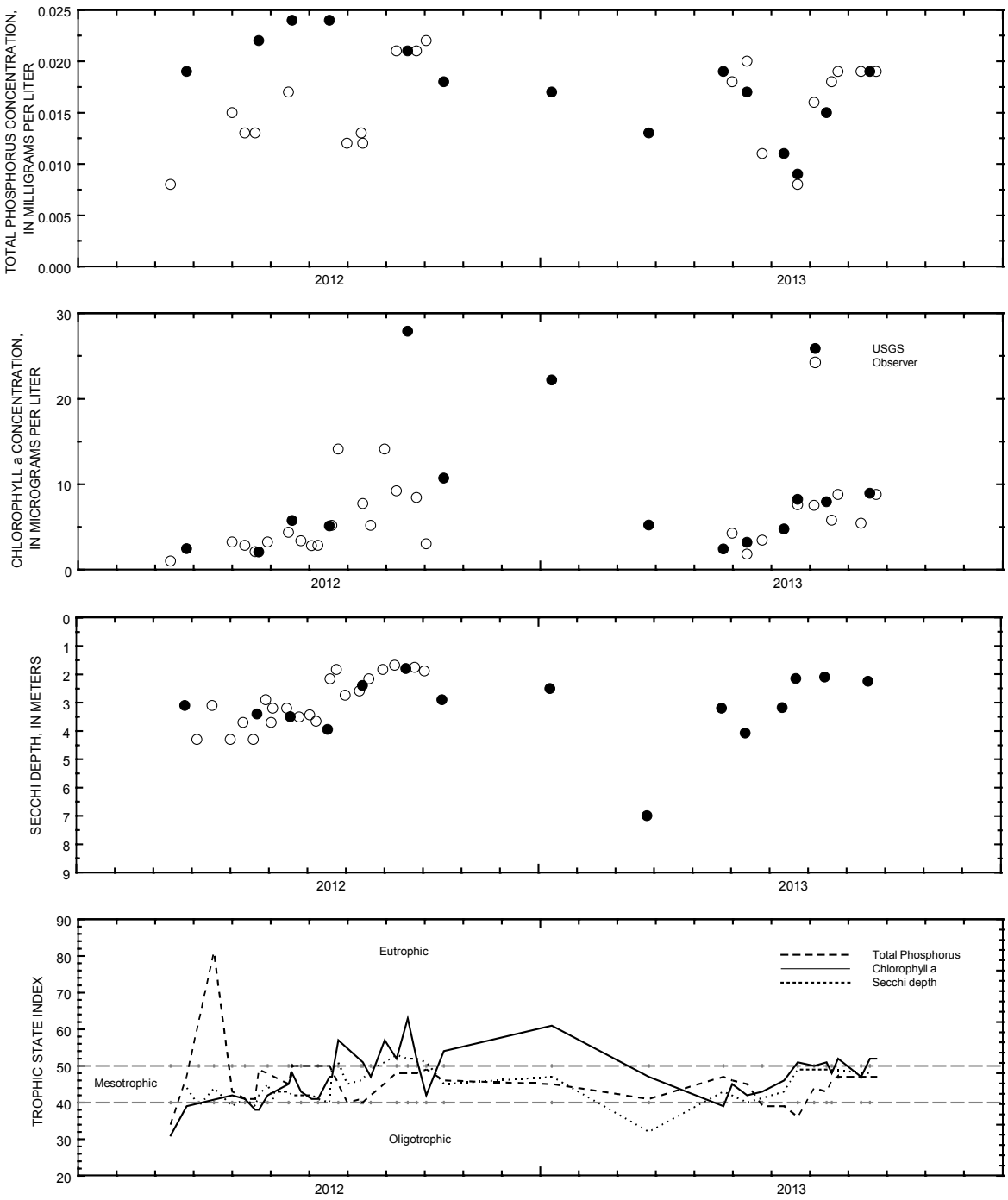
LAKE-DEPTH PROFILES, OCTOBER 16, 2012 TO JUNE 12, 2013



455638089034501 ANVIL LAKE, DEEP HOLE, NEAR EAGLE RIVER, WI

LAKE-DEPTH PROFILES, JULY 11 TO SEPTEMBER 18, 2013





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

424840088241600 LAKE BEULAH AT DEEP HOLE NEAR EAST TROY, WI

LOCATION.--Lat 42°48'40", long 88°24'16", in SW ¼ NW ¼ NW ¼ sec.17, T.4 N., R.18 E., Walworth County, Hydrologic Unit 07120006, near East Troy.

SURFACE AREA.--1.30 mi^2.

PERIOD OF RECORD.--August 2007 to August 2013.

REMARKS.--Lake sampled at the deep hole at a depth of 19 m. Water-quality analyses by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, MAY 8 TO AUGUST 14, 2013

(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro-matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Total nitro-gen, water, unfltrd mg/L (00600)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrate + nitrite water, fltrd, mg/L as N (00631)
MAY 2013													
08...	3.25	--	--	--	--	--	--	--	--	--	--	--	--
08...	--	.50	17.1	537	8.4	13.2	12.4	.015	<.002	1.9	<.015	1.4	.593
AUG													
14...	2.55	--	--	--	--	--	--	--	--	--	--	--	--
14...	--	2.0	23.3	499	8.4	9.3	4.81	.017	<.002	<.64	<.015	.62	<.019
14...	--	4.0	22.8	513	8.3	7.7	--	.018	<.002	<.76	<.015	.74	<.019
14...	--	10.0	7.9	549	7.8	4.0	--	.012	<.002	1.1	.071	.37	.754
14...	--	17.0	6.1	556	7.7	.4	--	.008	<.002	1.3	.054	.51	.807
14...	--	18.0	5.9	570	7.6	.2	--	.022	<.002	1.1	.790	1.0	.136

424840088241600 LAKE BEULAH AT DEEP HOLE NEAR EAST TROY, WI

WATER-QUALITY DATA, MAY 8 TO AUGUST 14, 2013

(Milligrams per liter unless otherwise indicated)

Date	Turbdty white light, det ang 90+/-30 degrees NTU (63675)	Appar-ent color, water, unfltrd Pt-Co units (00081)	Hard-ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Sodium, water, fltrd, mg/L (00930)	Potas-sium, water, fltrd, mg/L (00935)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor-ide, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Silica, water, fltrd, mg/L as SiO2 (00955)	Iron, water, fltrd, ug/L (01046)	Manga-nese, water, fltrd, ug/L (01056)
MAY 2013													
08...	--	--	--	--	--	--	--	--	--	--	--	--	--
08...	1.9	15	271	53.8	33.2	11.1	1.92	233	24	28.6	8.93	<.100	<1.00
AUG													
14...	--	--	--	--	--	--	--	--	--	--	--	--	--
14...	2.5	20	--	46	34	11	1.5	221	23	25.3	8.87	<.100	<1.00
14...	2.2	20	253	45.3	33.9	10.9	1.51	231	22	25.6	9.14	<.100	<1.00
14...	.9	20	--	56	36	11	1.8	243	24	29.3	12.1	<.100	<1.00
14...	1.2	15	277	54.3	34.3	11.1	1.85	246	24	28.7	14.5	<.100	40
14...	3.5	20	--	57	36	11	1.9	251	24	25.8	18.3	<.100	760

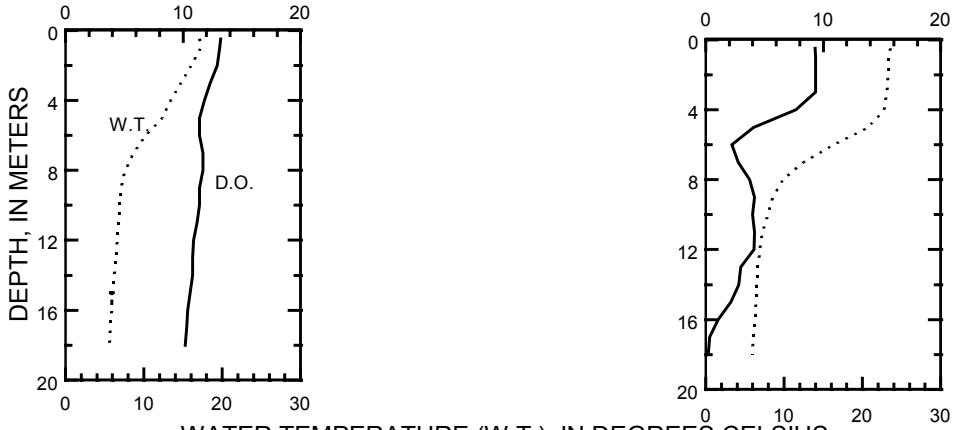
Date	Dis-solved solids dried @ 180degC wat flt mg/L (70300)
MAY 2013	
08...	--
08...	290
AUG	
14...	--
14...	318
14...	326
14...	352
14...	364
14...	370

424840088241600 LAKE BEULAH AT DEEP HOLE NEAR EAST TROY, WI

LAKE-DEPTH PROFILES, MAY 8 TO AUGUST 14, 2013

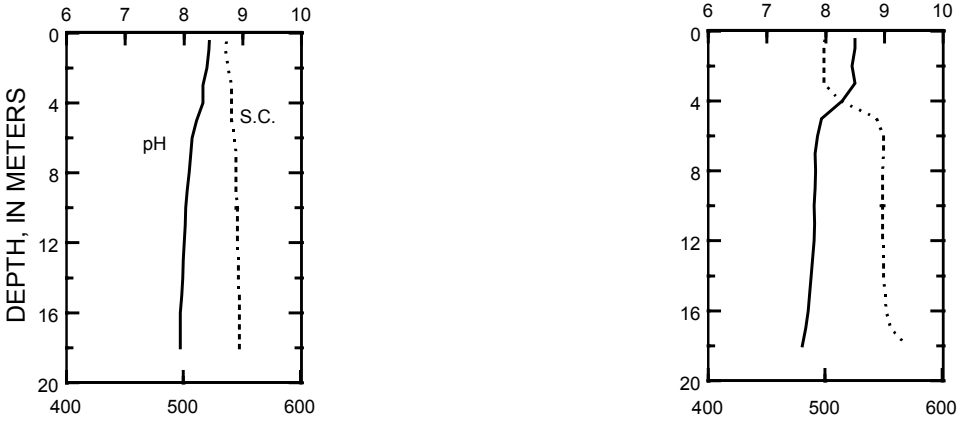
05-08-13 08-14-13

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

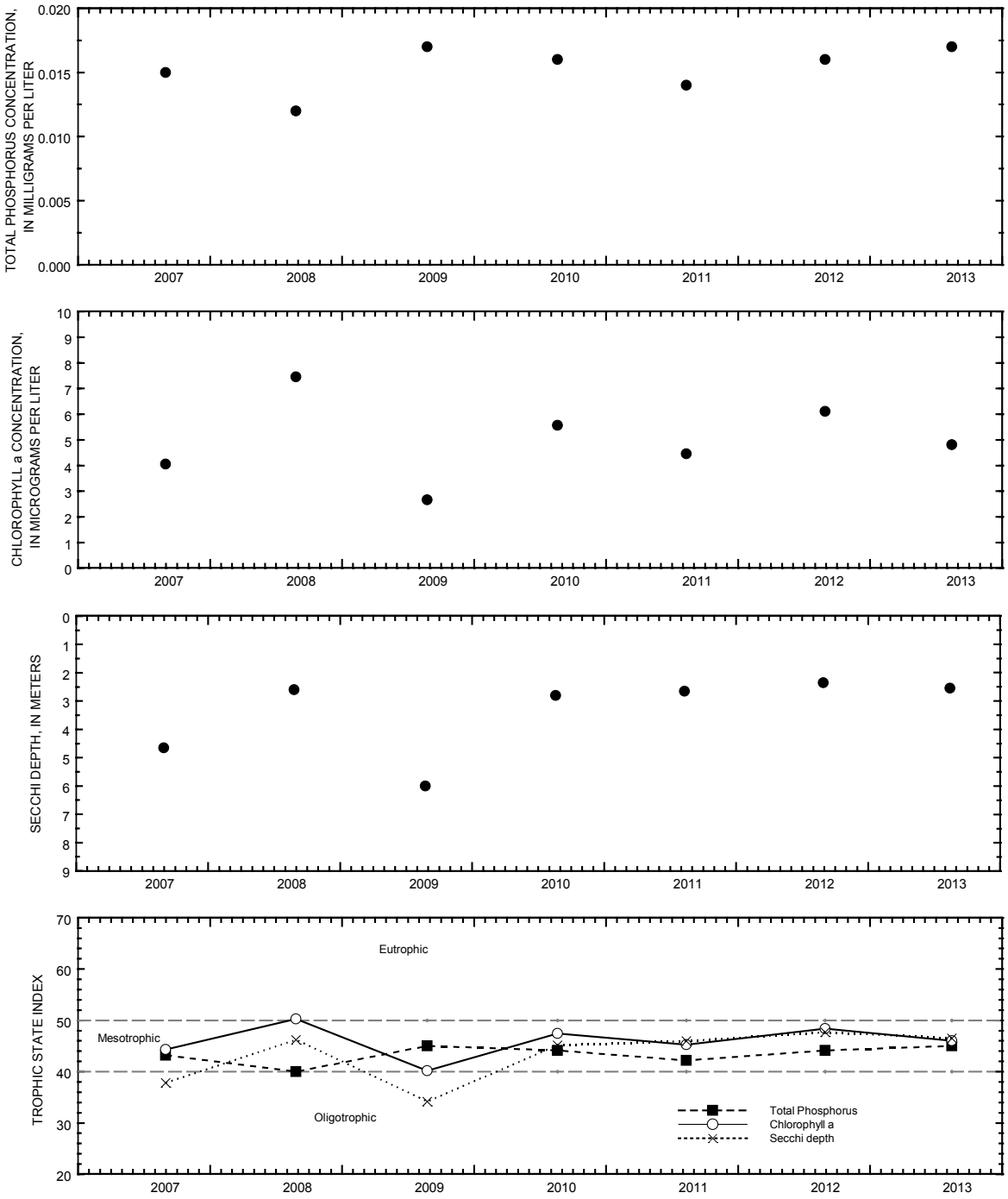


WATER TEMPERATURE (W.T.), IN DEGREES CELSIUS

PH, IN STANDARD UNITS



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



August surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Lake Beulah, Deep Hole, near East Troy, Wisconsin.

424929088231300 LAKE BEULAH STATION 2 NEAR EAST TROY, WI

LOCATION.--Lat 42°49'29", long 88°23'13", in SE ¼ NE ¼ NE ¼ sec.8, T.4 N., R.18 E., Walworth County, Hydrologic Unit 07120006, near East Troy.

SURFACE AREA.--1.30 mi^2.

PERIOD OF RECORD.--August 2007 to August 2013.

REMARKS.--Lake sampled at a depth of 15 m. Water-quality analyses by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, MAY 8 TO AUGUST 14, 2013

(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro-matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Total nitro-gen, water, unfltrd mg/L (00600)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrate + nitrite water, fltrd, mg/L as N (00631)
MAY 2013													
08...	4.95	--	--	--	--	--	--	--	--	--	--	--	--
08...	--	.50	18.3	484	8.5	11.6	4.65	.017	<.002	1.4	<.015	1.3	.120
AUG													
14...	2.55	--	--	--	--	--	--	--	--	--	--	--	--
14...	--	2.0	23.7	460	8.7	9.6	3.64	.017	<.002	<.73	<.015	.71	<.019
14...	--	5.0	23.0	462	8.6	8.7	--	.013	--	--	--	--	--
14...	--	10.0	8.4	488	8.0	6.3	--	.012	--	--	--	--	--
14...	--	14.0	6.7	497	7.7	.2	--	.031	--	--	--	--	--
14...	--	15.0	6.5	501	7.7	.2	--	.041	<.002	<1.5	.699	1.5	<.019

424929088231300 LAKE BEULAH STATION 2 NEAR EAST TROY, WI

WATER-QUALITY DATA, MAY 8 TO AUGUST 14, 2013

(Milligrams per liter unless otherwise indicated)

Date	Turbdty white light, det ang 90+/-30 degrees NTU (63675)	Appar-ent color, water, unfltrd Pt-Co units (00081)	Hard-ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Sodium, water, fltrd, mg/L (00930)	Potas-sium, water, fltrd, mg/L (00935)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor-ide, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Silica, water, fltrd, mg/L as SiO2 (00955)	Iron, water, fltrd, ug/L (01046)	Manga-nese, water, fltrd, ug/L (01056)
MAY 2013													
08...	--	--	--	--	--	--	--	--	--	--	--	--	--
08...	2.1	15	245	41.8	34.1	12.9	2.10	200	26	27.1	7.57	<.100	<1.00
AUG													
14...	--	--	--	--	--	--	--	--	--	--	--	--	--
14...	1.9	20	223	34.2	33.5	12.9	1.76	191	27	25.0	9.58	<.100	<1.00
14...	--	--	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--	--	--
14...	7.7	30	241	41.3	33.6	12.1	1.96	217	26	24.1	14.8	<.100	300

Date	Dis-solved solids dried @ 180degC wat flt mg/L (70300)
MAY 2013	
08...	--
08...	266
AUG	
14...	--
14...	286
14...	--
14...	--
14...	--
14...	322

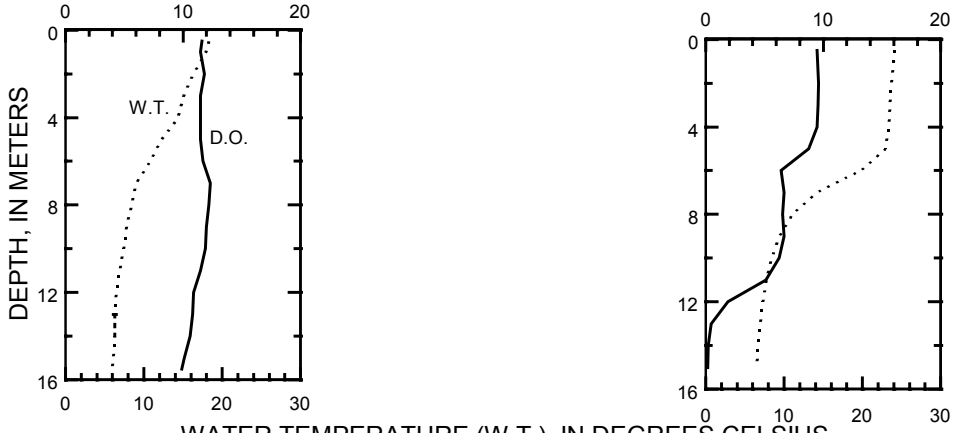
424929088231300 LAKE BEULAH STATION 2 NEAR EAST TROY, WI

LAKE-DEPTH PROFILES, MAY 8 TO AUGUST 14, 2013

05-08-13

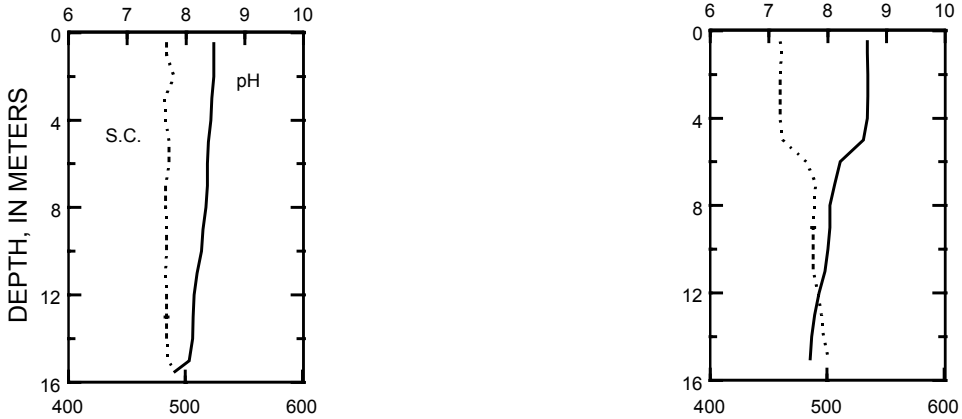
08-14-13

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

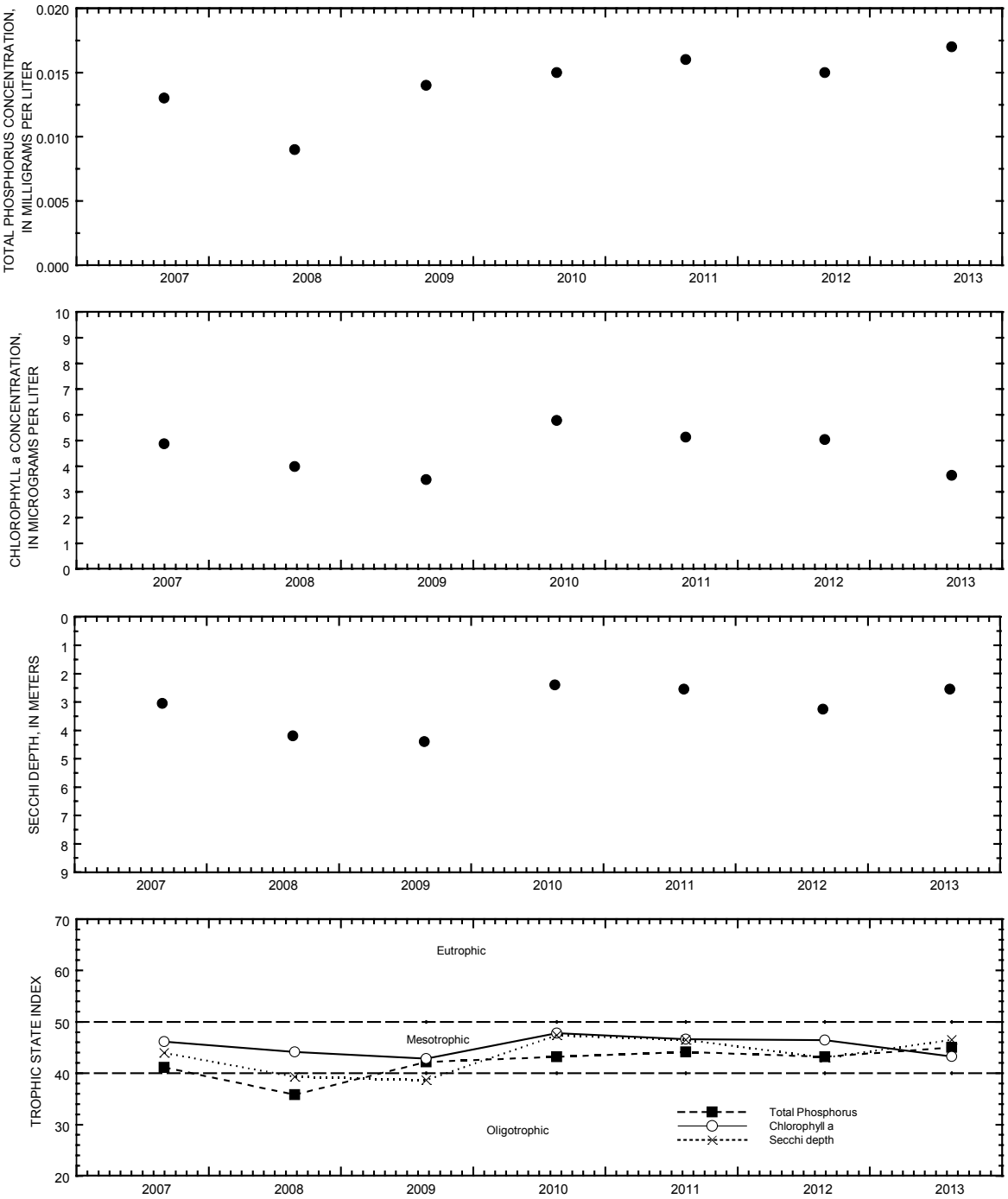


WATER TEMPERATURE (W.T.), IN DEGREES CELSIUS

PH, IN STANDARD UNITS



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



August surface total phosphorus, chlorophyll a concentrations, Secchi depths, and TSI data for Lake Beulah, Station 2, near East Troy, Wisconsin.

05544099 LAKE BEULAH INLET NEAR EAST TROY, WI

LOCATION.--Lat 42°48'39", long 88°24'56", in SE ¼ NE ¼ NW ¼ sec.18, T.4 N., R.18 E., Walworth County, Hydrologic Unit 07120006, near East Troy.

PERIOD OF RECORD.--August 2008 to August 2013.

REMARKS.--Lake sampled at a depth of 15 m. Water-quality analyses by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, MAY 8 TO AUGUST 14, 2013

(Milligrams per liter unless otherwise indicated)

Date	Transparency Secchi disc, meters (00078)	Sampling depth, meters (00098)	Temperature, water, deg C (00010)	Specific conductance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dissolved oxygen, mg/L (00300)	Chlorophyll a trichro-matic method, uncorr, ug/L (32210)	Phosphorus, water, unfltrd mg/L as P (00665)	Orthophosphate, water, fltrd, mg/L as P (00671)	Total nitrogen, water, unfltrd mg/L (00600)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrate + nitrite water, fltrd, mg/L as N (00631)
MAY 2013													
08...	1.00	--	--	--	--	--	--	--	--	--	--	--	--
08...	--	.50	18.6	592	7.8	8.2	4.45	.020	<.002	2.1	.054	1.3	.769
AUG													
14...	1.00	--	--	--	--	--	--	--	--	--	--	--	--
14...	--	.50	19.9	600	7.7	4.6	1.56	.020	.005	.69	.036	.53	.159

Date	Turbdty white light, det ang 90+/-30 degrees NTU (63675)	Apparent color, water, unfltrd Pt-Co units (00081)	Hardness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Sodium, water, fltrd, mg/L (00930)	Potassium, water, fltrd, mg/L (00935)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chloride, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Silica, water, fltrd, mg/L as SiO2 (00955)	Iron, water, fltrd, ug/L (01046)	Manganese, water, fltrd, ug/L (01056)
MAY 2013													
08...	--	--	--	--	--	--	--	--	--	--	--	--	--
08...	2.2	20	313	68.8	34.4	9.72	2.33	268	20	26.9	7.91	<.100	70
AUG													
14...	--	--	--	--	--	--	--	--	--	--	--	--	--
14...	1.8	30	305	63.4	35.6	9.48	1.38	283	22	24.2	16.6	<.100	30

05544099 LAKE BEULAH INLET NEAR EAST TROY, WI

WATER-QUALITY DATA, MAY 8 TO AUGUST 14, 2013

(Milligrams per liter unless otherwise indicated)

Date	Dis-solved solids dried @ 180degC wat flt mg/L (70300)
MAY 2013	
08...	--
08...	316
AUG	
14...	--
14...	384

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

LOCATION.--Lat 43°24'09", long 88°15'16", in NE ¼ SW ¼ sec. 20, T.11 N., R.19 E., Washington County, Hydrologic Unit 04040003, near West Bend.

SURFACE AREA.--1.46 mi^2.

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

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

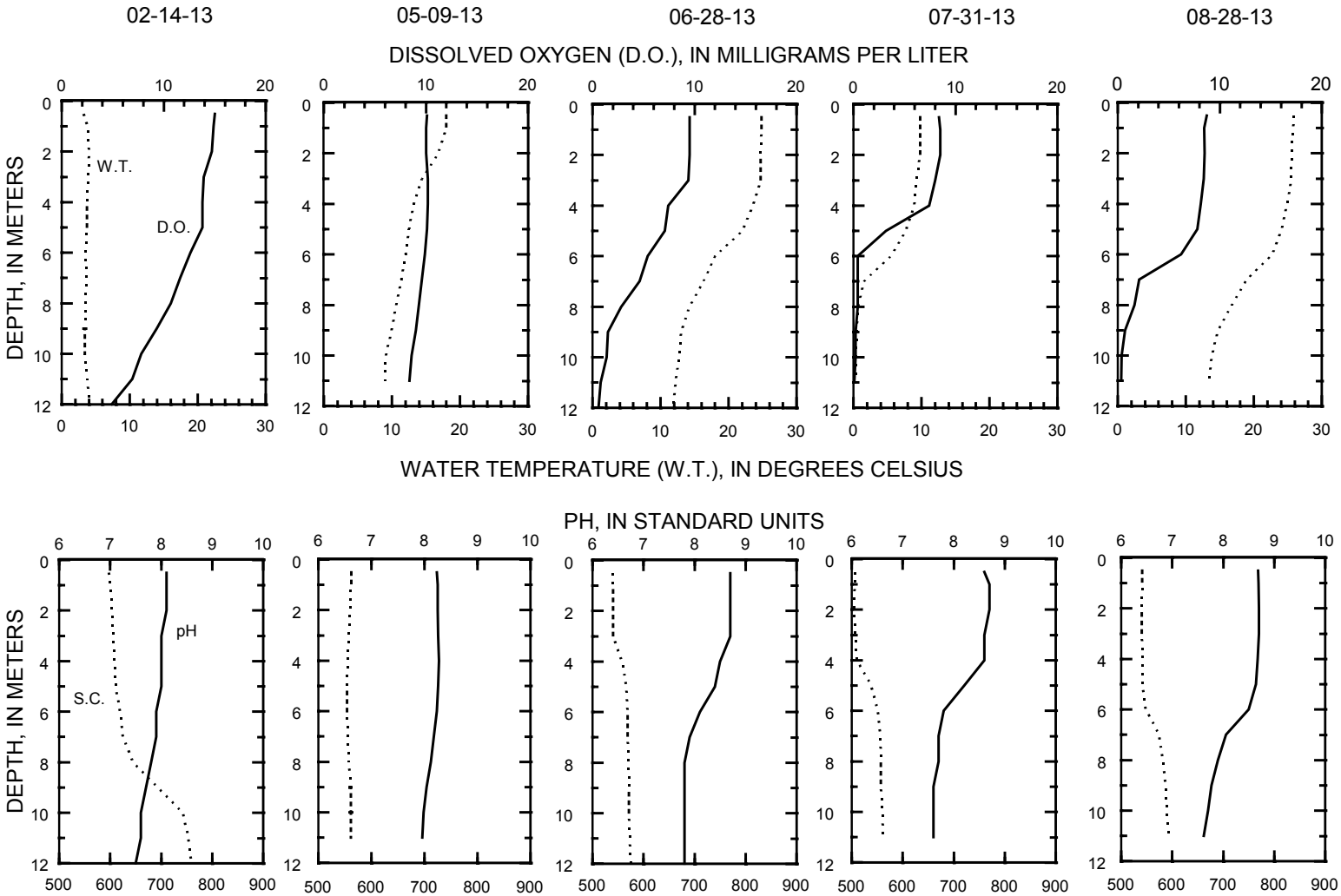
WATER-QUALITY DATA, FEBRUARY 14 TO AUGUST 28, 2013

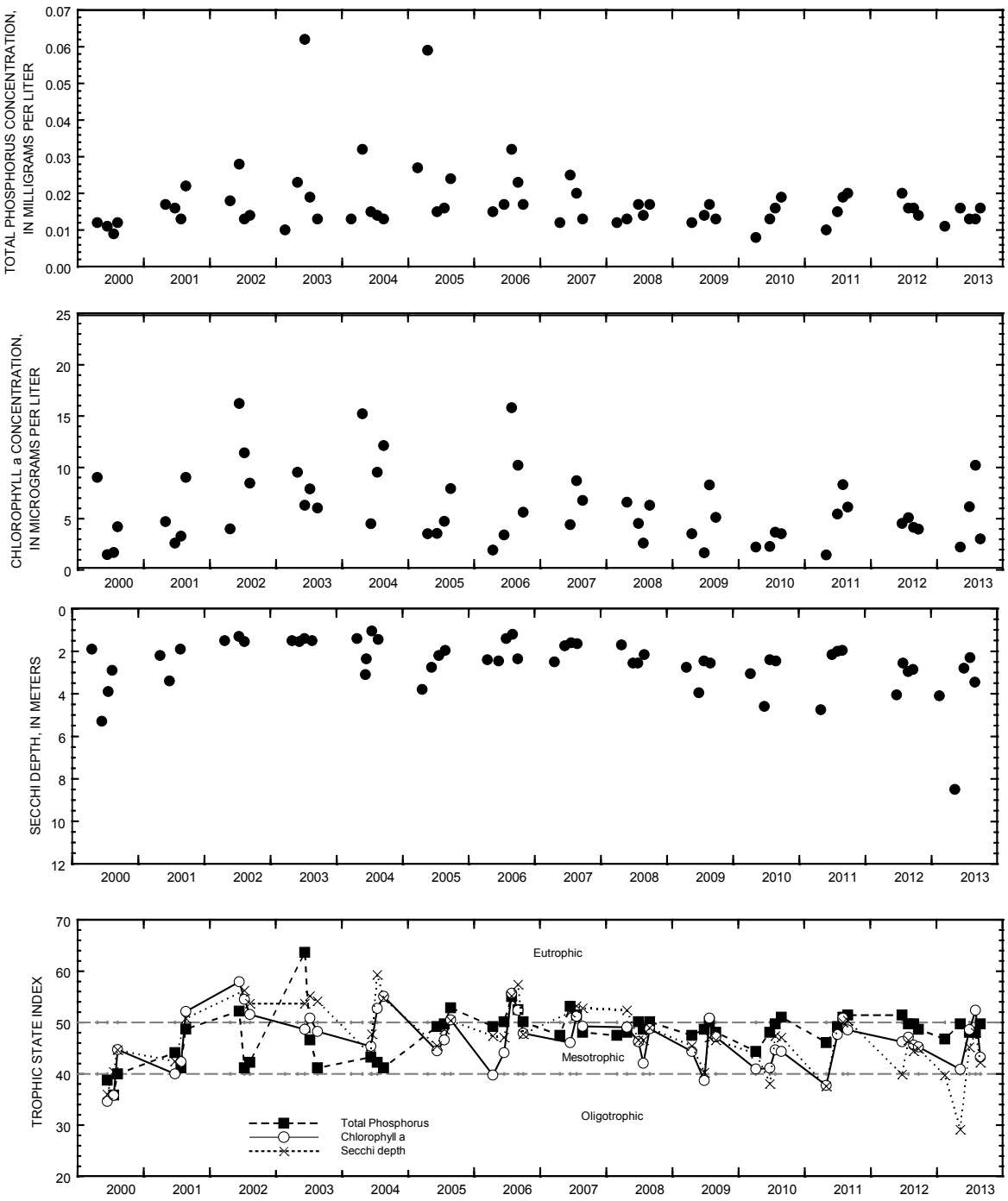
(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro -matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)	Ammonia + org-N, water, unfltrd mg/L as N (00625)
FEB 2013									
14...	4.10	--	--	--	--	--	--	--	--
14...	--	.50	3.2	597	8.1	15.0	--	.011	--
14...	--	11.5	4.0	759	7.5	4.9	--	.026	--
MAY									
09...	8.50	--	--	--	--	--	--	--	--
09...	--	.50	18.0	562	8.2	10.1	2.22	.016	.48
JUN									
28...	2.80	--	--	--	--	--	--	--	--
28...	--	.50	24.8	539	8.7	9.5	6.16	.013	--
28...	--	12.0	11.9	575	7.8	.6	--	.047	--
JUL									
31...	2.30	--	--	--	--	--	--	--	--
31...	--	.50	22.4	531	8.7	9.8	10.2	.013	--
31...	--	10.5	12.7	581	7.7	.3	--	.031	--
AUG									
28...	3.45	--	--	--	--	--	--	--	--
28...	--	.50	25.9	541	8.7	8.7	3.03	.016	--
28...	--	10.5	13.4	594	7.6	.3	--	.049	--

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

LAKE-DEPTH PROFILES, FEBRUARY 14 TO AUGUST 28, 2013





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

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

LOCATION.--Lat 43°22'24", long 88°15'49", in NE ¼ SE ¼ sec.31, T.11 N., R.19 E., Washington County, Hydrologic Unit 04040003, near West Bend.

SURFACE AREA.--1.46 mi^2.

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

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

WATER-QUALITY DATA, FEBRUARY 14 TO AUGUST 28, 2013
(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro-matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Total nitro-gen, water, unfltrd mg/L (00600)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia + org-N, water, fltrd, mg/L as N (00623)	Ammonia + org-N, water, unfltrd mg/L as N (00625)
FEB 2013													
14...	4.20	--	--	--	--	--	--	--	--	--	--	--	--
14...	--	.50	1.7	555	7.7	13.7	--	.011	--	--	--	--	--
14...	--	21.0	3.4	595	7.6	3.1	--	.080	--	--	--	--	--
MAY													
09...	9.05	--	--	--	--	--	--	--	--	--	--	--	--
09...	--	.50	15.9	555	8.4	11.3	2.92	.016	<.006	.58	<.048	--	.33
JUN													
28...	3.30	--	--	--	--	--	--	--	--	--	--	--	--
28...	--	.50	24.2	537	8.8	9.9	5.88	.011	--	--	--	--	--
28...	--	30.5	5.4	573	7.6	.2	--	.106	--	--	--	--	--
JUL													
31...	5.30	--	--	--	--	--	--	--	--	--	--	--	--
31...	--	.50	22.3	525	8.7	9.4	5.96	.009	<.002	<.62	<.015	.47	.60
31...	--	30.0	5.5	579	7.5	.3	--	.026	--	--	--	--	--
AUG													
28...	3.95	--	--	--	--	--	--	--	--	--	--	--	--
28...	--	.50	28.9	533	8.6	8.8	4.36	.014	--	--	--	--	--
28...	--	30.0	5.5	602	7.4	.3	--	.102	--	--	--	--	--

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

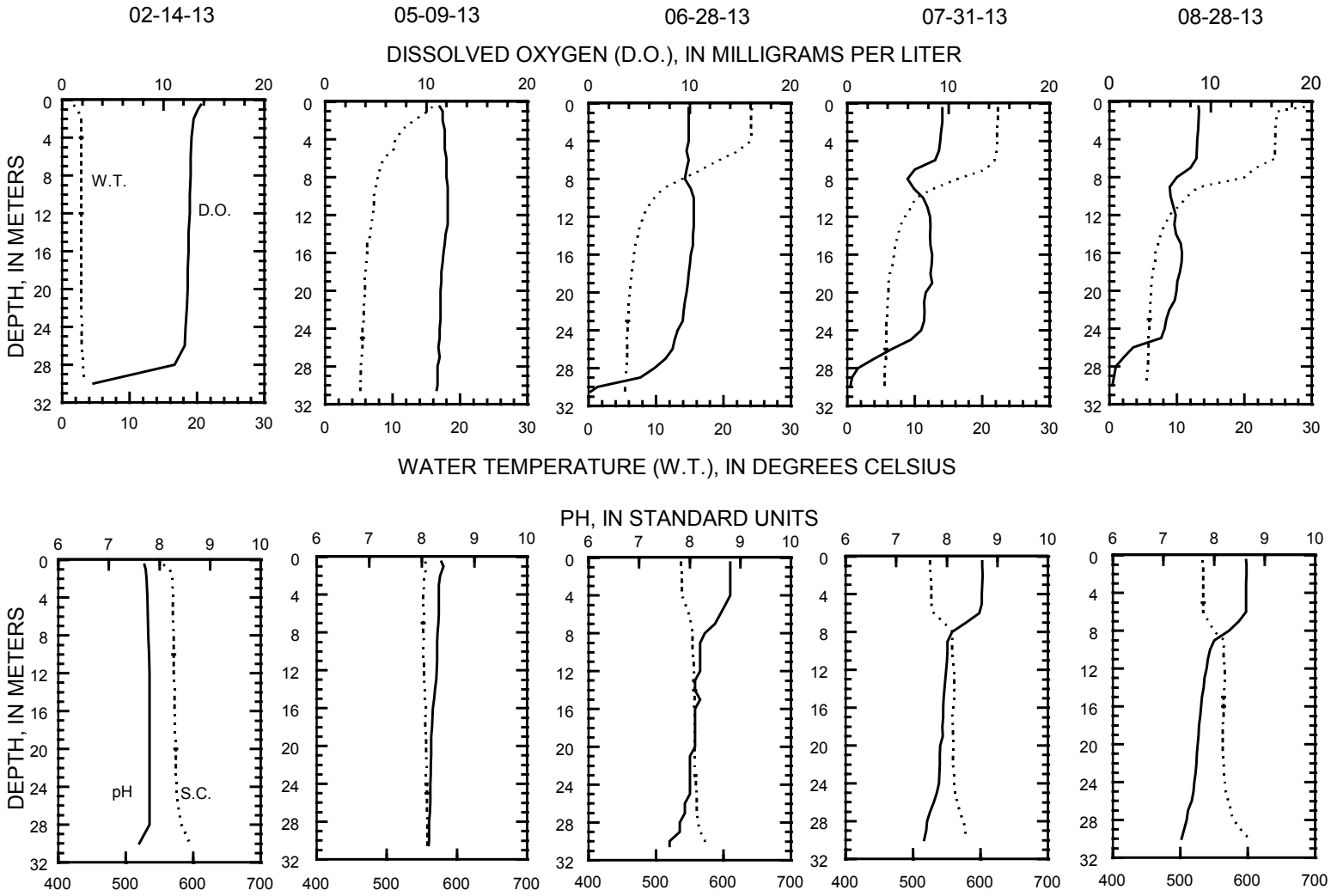
WATER-QUALITY DATA, FEBRUARY 14 TO AUGUST 28, 2013
(Milligrams per liter unless otherwise indicated)

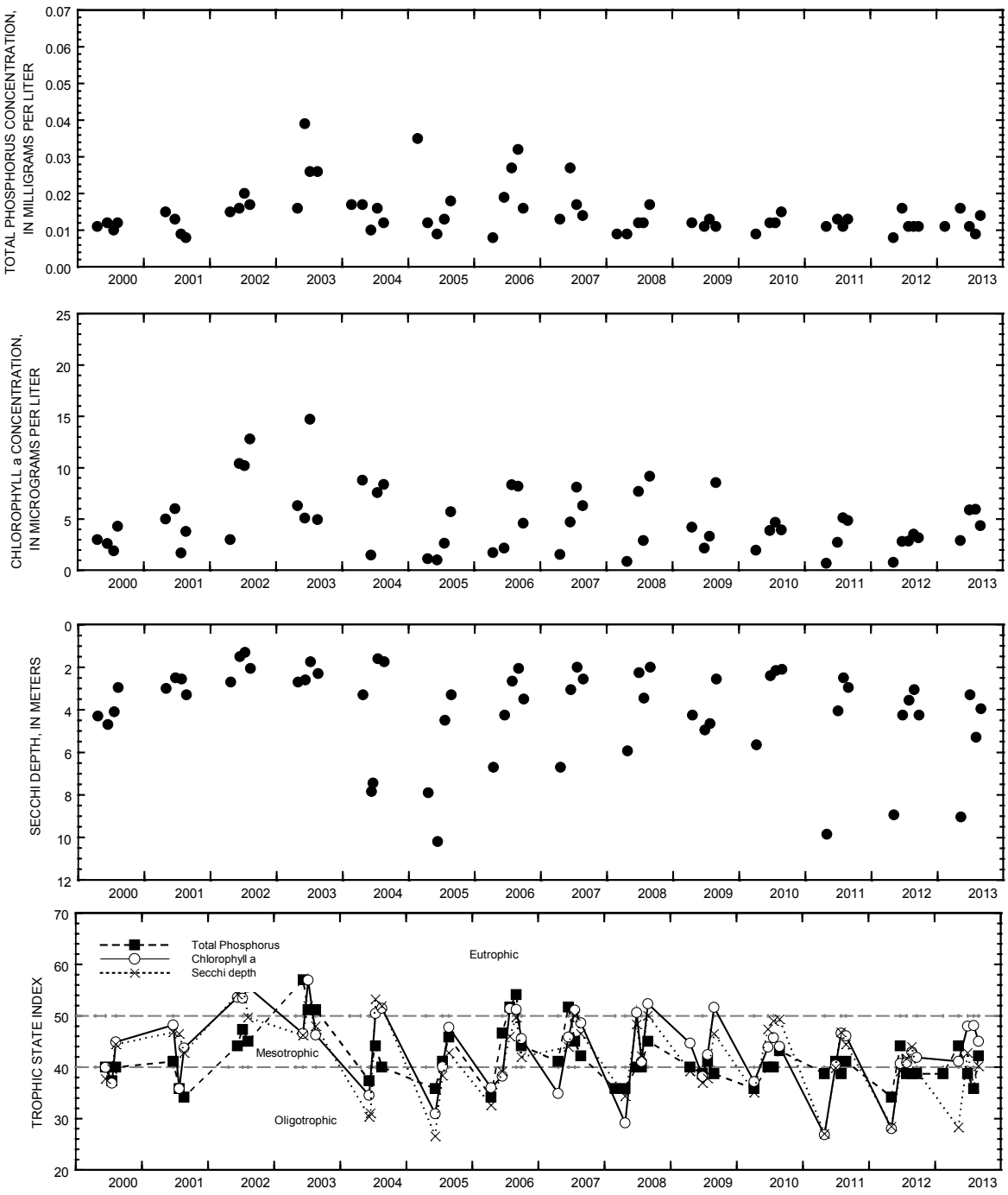
Date	Nitrate + nitrite water, fltrd, mg/L as N (00631)	Turbdty white light, det ang 90+/-30 degrees NTU (63675)	Appar-ent color, water, unfltrd Pt-Co units (00081)	Hard-ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Sodium, water, fltrd, mg/L (00930)	Potas-sium, water, fltrd, mg/L (00935)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor-ide, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Silica, water, fltrd, mg/L as SiO2 (00955)	Iron, water, fltrd, ug/L (01046)
FEB 2013													
14...	--	--	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--	--	--
MAY													
09...	--	--	--	--	--	--	--	--	--	--	--	--	--
09...	.246	.5	10	240	37.4	35.6	25.8	1.76	198	53.6	20.3	3.30	<.3
JUN													
28...	--	--	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUL													
31...	--	--	--	--	--	--	--	--	--	--	--	--	--
31...	<.019	--	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--	--	--
AUG													
28...	--	--	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--	--	--

Date	Manga-nese, water, fltrd, ug/L (01056)	Dis-solved solids dried @ 180degC wat flt mg/L (70300)
FEB 2013		
14...	--	--
14...	--	--
14...	--	--
MAY		
09...	--	--
09...	<3	294

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

LAKE-DEPTH PROFILES, FEBRUARY 14 TO AUGUST 28, 2013





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

423556088365001 DELAVAN LAKE AT CENTER NEAR DELAVAN LAKE, WI

LOCATION.--Lat 42°35'56", long 88°36'50", in SE ¼ SW ¼ sec.28, T.2 N., R.16 E., Walworth County, Hydrologic Unit 07090001, 2.6 mi southeast of Delavan.

SURFACE AREA.--3.24 mi^2.

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

PERIOD OF RECORD.--October 1983 to September 2009, October 2011 to September 2013.

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

WATER-QUALITY DATA, NOVEMBER 20, 2012 TO JUNE 18, 2013

(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro -matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Total nitro-gen, water, unfltrd mg/L (00600)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia + org-N, water, fltrd, mg/L as N (00623)
NOV 2012												
20...	7.25	--	--	--	--	--	--	--	--	--	--	--
20...	--	.50	8.1	569	8.1	10.4	5.91	.034	.018	.73	.060	.54
20...	--	16.0	7.8	570	8.2	10.2	--	.032	--	--	--	--
FEB 2013												
13...	13.1	--	--	--	--	--	--	--	--	--	--	--
13...	--	.50	1.1	568	7.3	14.2	.860	.028	.018	.66	.097	--
13...	--	15.0	2.8	682	--	9.4	--	.104	.087	--	--	--
APR												
30...	2.40	--	--	--	--	--	--	--	--	--	--	--
30...	--	.50	8.6	560	8.5	12.6	8.26	.023	.005	.91	.016	--
30...	--	16.5	7.2	562	8.4	12.0	--	.026	--	--	--	--
MAY												
29...	7.45	--	--	--	--	--	--	--	--	--	--	--
29...	--	.50	16.4	563	8.5	9.3	2.27	.022	.003	.98	.047	.36
29...	--	8.0	16.0	564	8.5	9.1	--	.017	--	--	--	--
29...	--	9.0	15.0	568	8.3	8.4	--	.021	--	--	--	--
29...	--	10.0	12.5	572	8.1	7.0	--	.038	.019	--	--	--
29...	--	16.0	10.5	576	7.7	3.1	--	.114	.096	--	--	--
JUN												
18...	2.60	--	--	--	--	--	--	--	--	--	--	--
18...	--	.50	22.4	555	8.9	11.4	35.6	.026	.010	.98	.017	.25
18...	--	6.0	22.0	556	8.9	11.1	--	.028	.002	--	--	--
18...	--	12.0	12.4	574	7.7	2.0	--	.091	.074	--	--	--
18...	--	16.0	11.3	578	7.6	.2	--	.203	.171	--	--	--

423556088365001 DELAVAN LAKE AT CENTER NEAR DELAVAN LAKE, WI

WATER-QUALITY DATA, JULY 30 TO SEPTEMBER 30, 2013

(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro-matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Total nitro-gen, water, unfltrd mg/L (00600)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia + org-N, water, fltrd, mg/L as N (00623)
JUL												
30...	1.80	--	--	--	--	--	--	--	--	--	--	--
30...	--	.50	22.7	526	8.6	8.6	51.3	.033	<.002	<.32	.018	.54
30...	--	7.0	22.3	532	8.3	5.4	--	.025	<.002	--	--	--
30...	--	12.0	14.0	585	7.7	.2	--	.190	.175	--	--	--
30...	--	16.0	12.3	598	7.5	.1	--	.441	.405	--	--	--
AUG												
15...	1.30	--	--	--	--	--	--	--	--	--	--	--
15...	--	.50	23.5	523	8.8	10.4	22.8	.006	<.002	<.72	<.015	.54
15...	--	7.0	22.8	524	8.8	9.5	--	.014	<.002	--	--	--
15...	--	10.0	17.8	575	7.8	.2	--	.040	--	--	--	--
15...	--	12.0	13.9	590	7.6	.2	--	.138	.646	--	--	--
15...	--	13.0	13.2	595	7.7	.1	--	.254	--	--	--	--
15...	--	14.0	12.8	601	7.5	.1	--	.026	--	--	--	--
15...	--	15.0	12.4	605	7.5	.1	--	.388	--	--	--	--
15...	--	16.0	12.2	610	7.5	.1	--	.445	.081	--	--	--
SEP												
30...	1.62	--	--	--	--	--	--	--	--	--	--	--
30...	--	.50	19.6	526	8.6	10.8	42.2	.044	.003	<.87	<.015	.43
30...	--	11.0	18.6	539	8.3	4.0	--	.037	.021	--	--	--
30...	--	13.0	13.8	617	7.6	.3	--	.473	.443	--	--	--
30...	--	16.0	12.6	646	7.4	.2	--	.636	.606	--	--	--

Date	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrate + nitrite water, fltrd, mg/L as N (00631)	Turbdty white light, det ang 90+/-30 degrees NTU (63675)	Appar-ent color, water, unfltrd Pt-Co units (00081)	Hard-ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Sodium, water, fltrd, mg/L (00930)	Potas-sium, water, fltrd, mg/L (00935)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor-ide, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Silica, water, fltrd, mg/L as SiO2 (00955)
NOV 2012													
20...	--	--	--	--	--	--	--	--	--	--	--	--	--
20...	.66	.067	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--	--	--
FEB 2013													
13...	--	--	--	--	--	--	--	--	--	--	--	--	--
13...	.52	.141	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--	--	--

423556088365001 DELAVAN LAKE AT CENTER NEAR DELAVAN LAKE, WI

WATER-QUALITY DATA, APRIL 30 TO SEPTEMBER 30, 2013

(Milligrams per liter unless otherwise indicated)

Date	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrate + nitrite water, fltrd, mg/L as N (00631)	Turbdty white light, det ang 90+/-30 degrees NTU (63675)	Appar-ent color, water, unfltrd Pt-Co units (00081)	Hard-ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Sodium, water, fltrd, mg/L (00930)	Potas-sium, water, fltrd, mg/L (00935)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor-ide, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Silica, water, fltrd, mg/L as SiO2 (00955)
APR													
30...	--	--	--	--	--	--	--	--	--	--	--	--	--
30...	.27	.639	2.6	10	222	38.9	30.4	32.6	2.61	176	62	24.3	.119
30...	--	--	--	--	--	--	--	--	--	--	--	--	--
MAY													
29...	--	--	--	--	--	--	--	--	--	--	--	--	--
29...	.56	.415	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUN													
18...	--	--	--	--	--	--	--	--	--	--	--	--	--
18...	.95	.035	--	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUL													
30...	--	--	--	--	--	--	--	--	--	--	--	--	--
30...	.30	<.019	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--	--	--
AUG													
15...	--	--	--	--	--	--	--	--	--	--	--	--	--
15...	.70	<.019	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--	--	--
SEP													
30...	--	--	--	--	--	--	--	--	--	--	--	--	--
30...	.85	<.019	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--	--	--

423556088365001 DELAVAN LAKE AT CENTER NEAR DELAVAN LAKE, WI

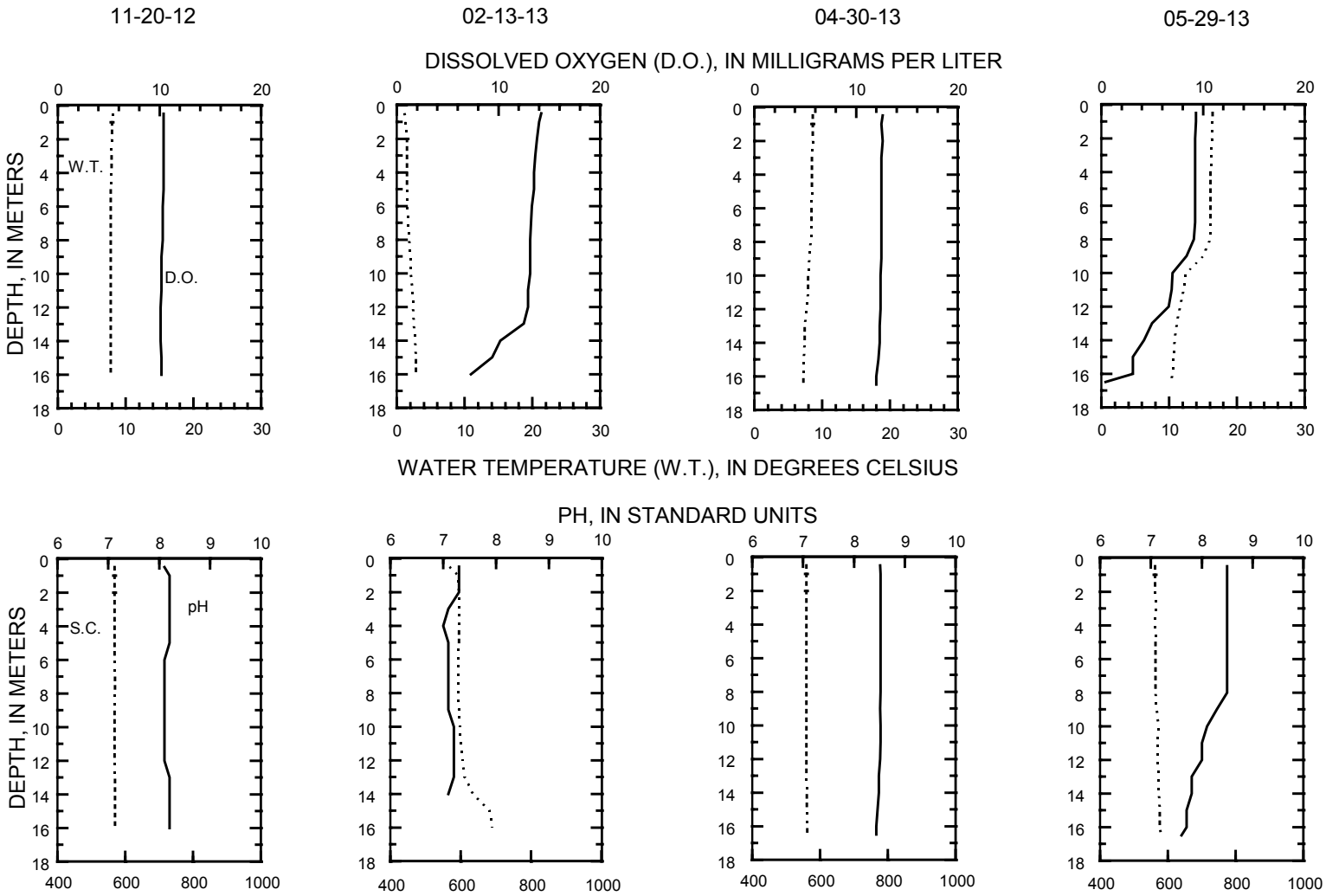
WATER-QUALITY DATA, NOVEMBER 20, 2012 TO APRIL 30, 2013

(Milligrams per liter unless otherwise indicated)

Date	Iron, water, fltrd, ug/L (01046)	Manganese, water, fltrd, ug/L (01056)	Dissolved solids dried @ 180degC wat flt mg/L (70300)
NOV 2012			
20...	--	--	--
20...	--	--	--
20...	--	--	--
FEB 2013			
13...	--	--	--
13...	--	--	--
13...	--	--	--
APR			
30...	--	--	--
30...	<.100	<1.00	308
30...	--	--	--

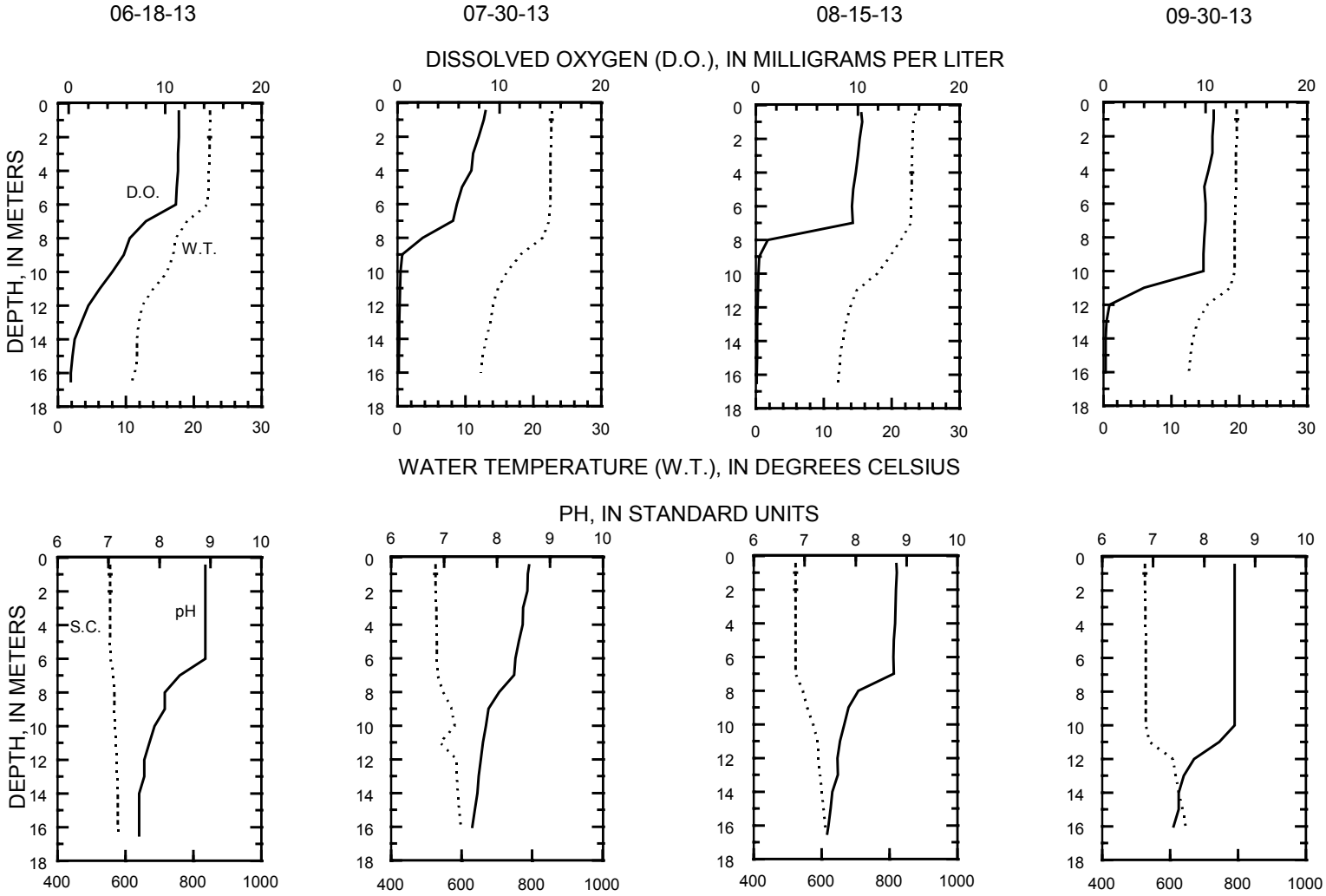
423556088365001 DELAVAN LAKE AT CENTER NEAR DELAVAN LAKE, WI

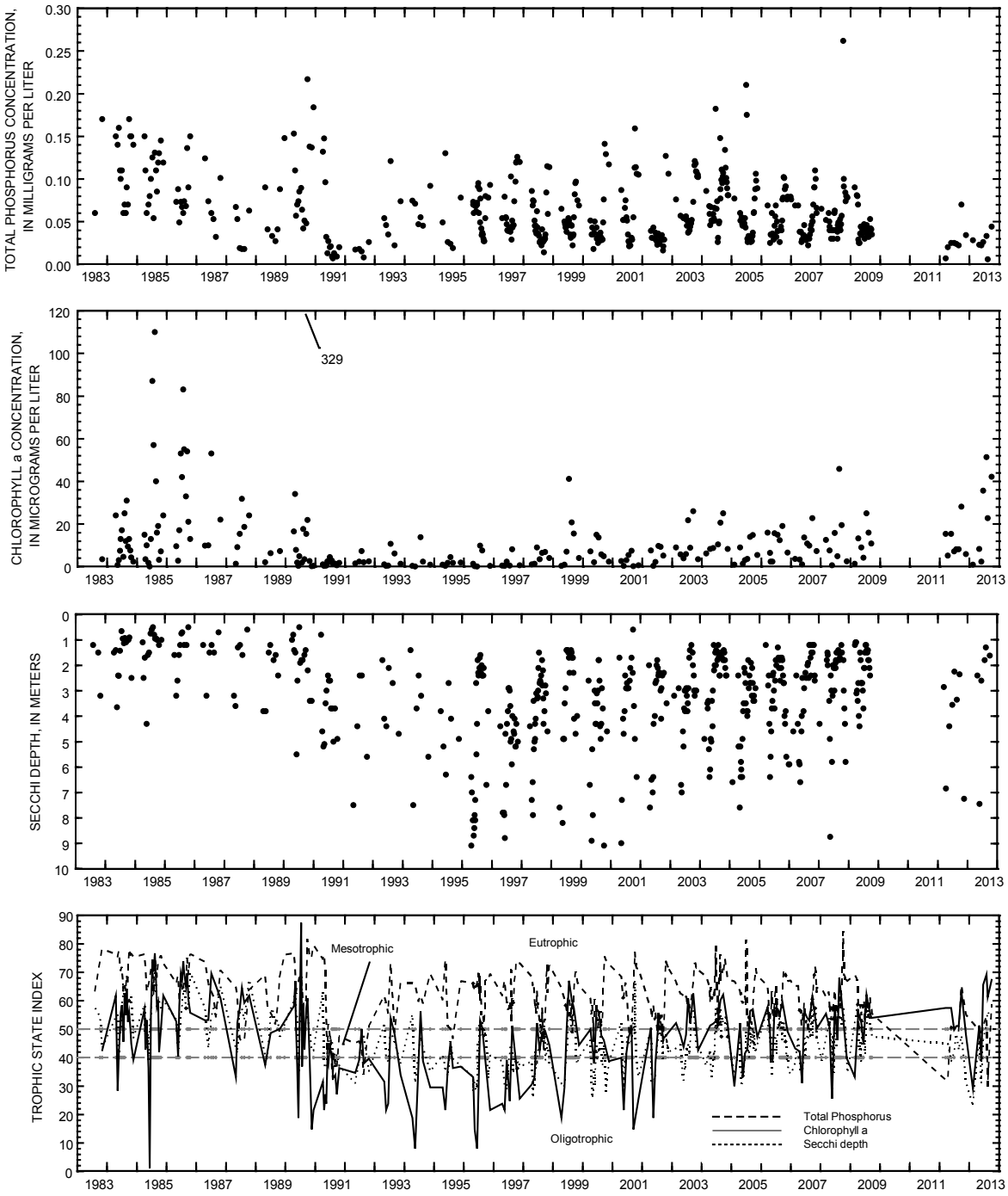
LAKE-DEPTH PROFILES, NOVEMBER 20, 2012 TO MAY 29, 2013



423556088365001 DELAVAN LAKE AT CENTER NEAR DELAVAN LAKE, WI

LAKE-DEPTH PROFILES, JUNE 18 TO SEPTEMBER 30, 2013





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

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

LOCATION.--Lat 42°36'59", long 88°35'44", in NW ¼ SW ¼ sec.22, T.2 N., R.16 E., Walworth County, Hydrologic Unit 07090001, 2.6 mi southeast of Delavan.

SURFACE AREA--3.24 mi^2.

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

PERIOD OF RECORD.--October 1983 to August 2009, March 2012 to September 2013.

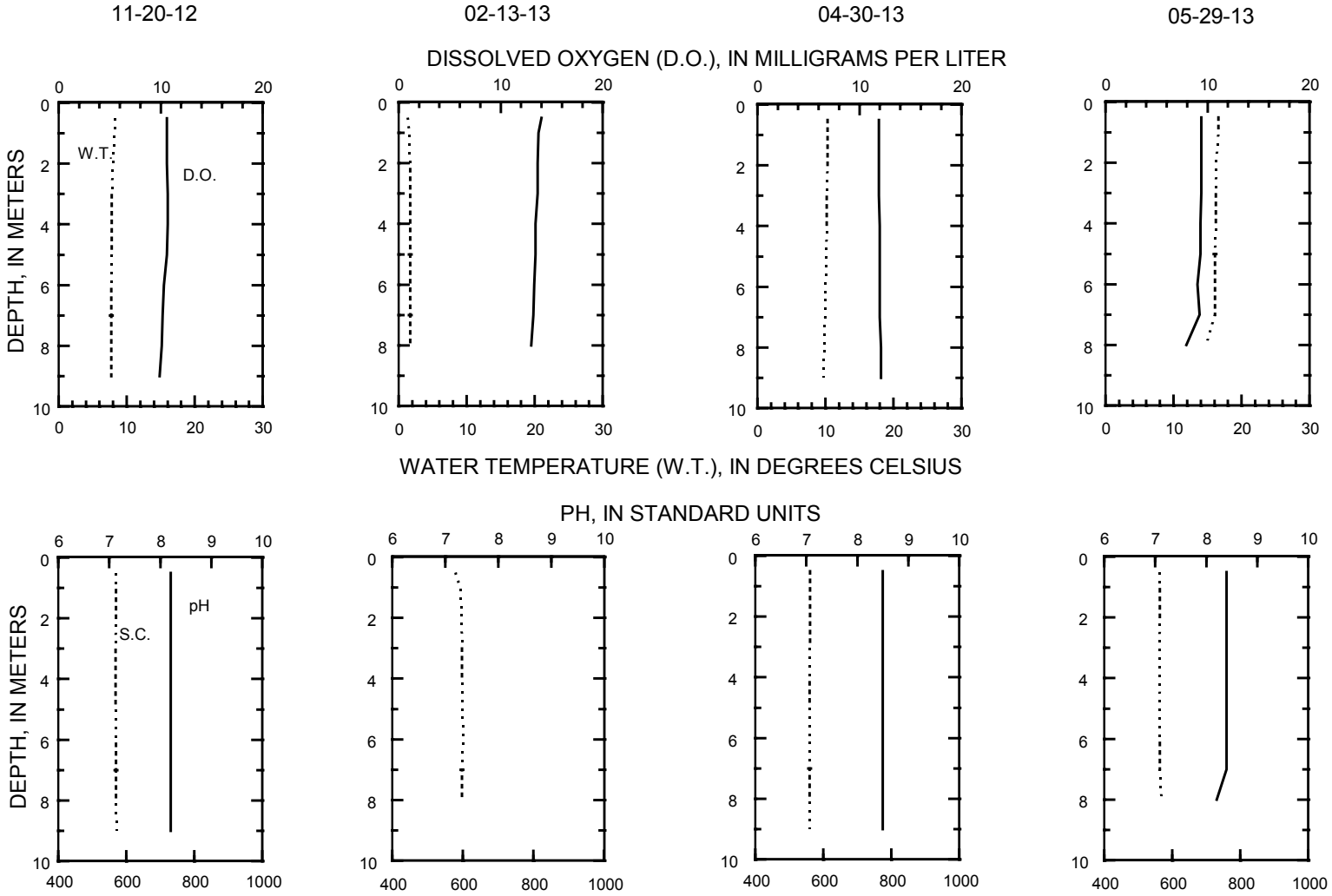
WATER-QUALITY DATA, NOVEMBER 20, 2012 TO SEPTEMBER 30, 2013

(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro -matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)
NOV 2012								
20...	5.15	--	--	--	--	--	--	--
20...	--	.50	8.3	569	8.2	10.6	4.47	.031
FEB 2013								
13...	8.00	--	--	--	--	--	--	--
13...	--	.50	1.3	579	--	14.0	--	.029
APR								
30...	4.00	--	--	--	--	--	--	--
30...	--	.50	10.3	561	8.5	11.9	3.88	.027
MAY								
29...	6.50	--	--	--	--	--	--	--
29...	--	.50	16.6	563	8.4	9.4	2.34	.020
JUN								
18...	2.50	--	--	--	--	--	--	--
18...	--	.50	20.6	560	8.7	10.0	33.8	.021
JUL								
30...	1.50	--	--	--	--	--	--	--
30...	--	.50	23.0	522	8.7	10.4	58.0	.037
AUG								
15...	1.38	--	--	--	--	--	--	--
15...	--	.50	23.4	524	8.8	9.9	25.1	.023
SEP								
30...	1.60	--	--	--	--	--	--	--
30...	--	.50	19.6	523	8.7	10.8	39.0	.044

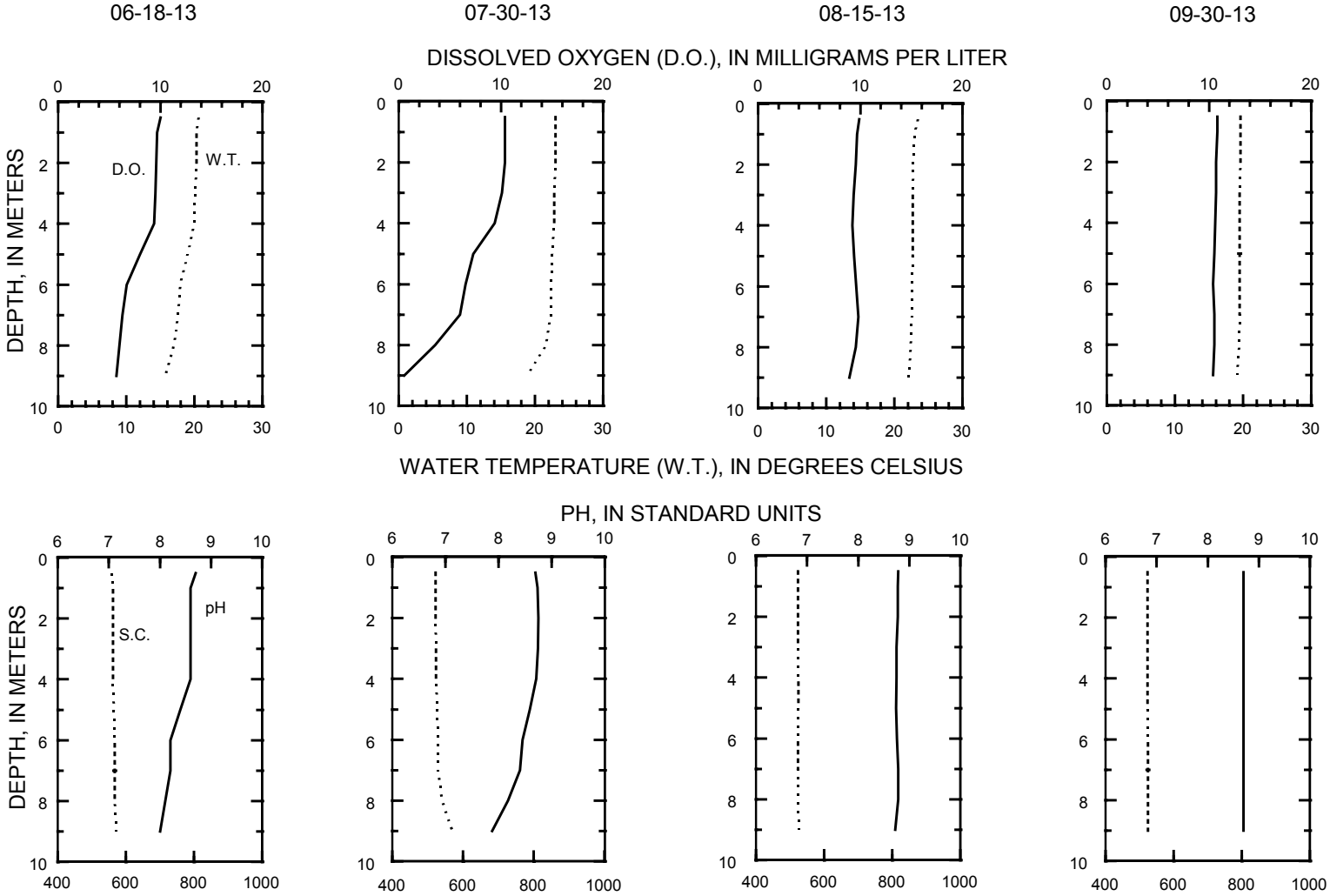
423659088354401 DELAVAN LAKE, AT NORTH END, NEAR LAKE LAWN, WI

LAKE-DEPTH PROFILES, NOVEMBER 20, 2012 TO MAY 29, 2013



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

LAKE-DEPTH PROFILES, JUNE 18 TO SEPTEMBER 30, 2013



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

LOCATION.--Lat 42°35'26", long 88°38'01", in SE ¼ NW ¼ sec.32, T.2 N., R.16 E., Walworth County, Hydrologic Unit 07090001, 2.6 mi southeast of Delavan.

SURFACE AREA--3.24 mi^2.

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

PERIOD OF RECORD.-- October 1983 to August 2009, March 2012 to September 2013.

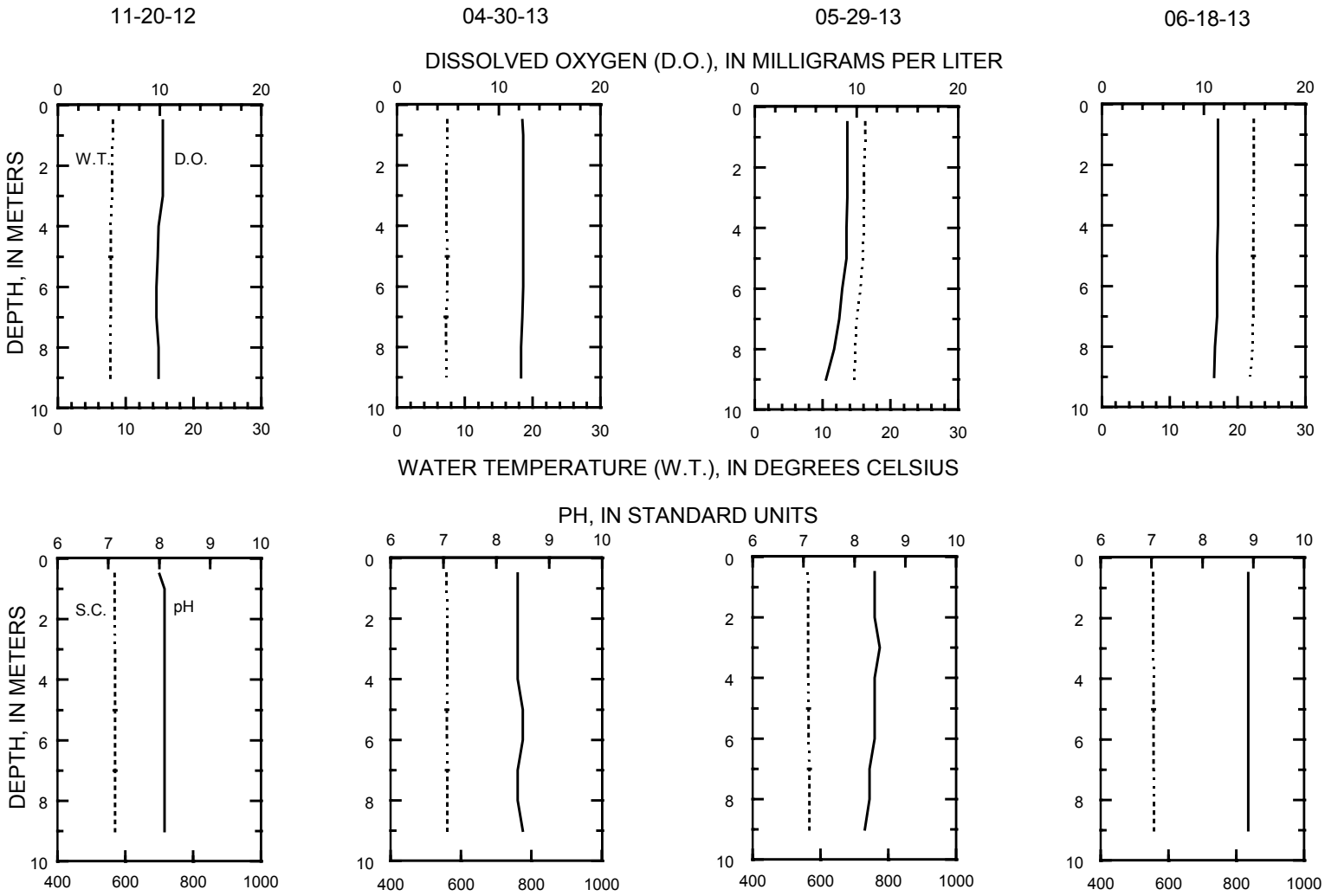
WATER-QUALITY DATA, NOVEMBER 20, 2012 TO SEPTEMBER 30, 2013

(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro -matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)
NOV 2012								
20...	6.95	--	--	--	--	--	--	--
20...	--	.50	8.1	569	8.0	10.3	7.15	.034
APR 2013								
30...	2.10	--	--	--	--	--	--	--
30...	--	.50	7.4	559	8.4	12.3	11.5	.026
MAY								
29...	8.65	--	--	--	--	--	--	--
29...	--	.50	16.3	563	8.4	9.1	1.31	.017
JUN								
18...	2.65	--	--	--	--	--	--	--
18...	--	.50	22.4	555	8.9	11.4	31.3	.025
JUL								
30...	1.40	--	--	--	--	--	--	--
30...	--	.50	23.3	525	8.7	9.8	41.1	.032
AUG								
15...	1.35	--	--	--	--	--	--	--
15...	--	.50	23.7	522	8.8	11.2	24.3	.024
SEP								
30...	1.50	--	--	--	--	--	--	--
30...	--	.50	20.0	523	8.7	11.6	32.2	.041

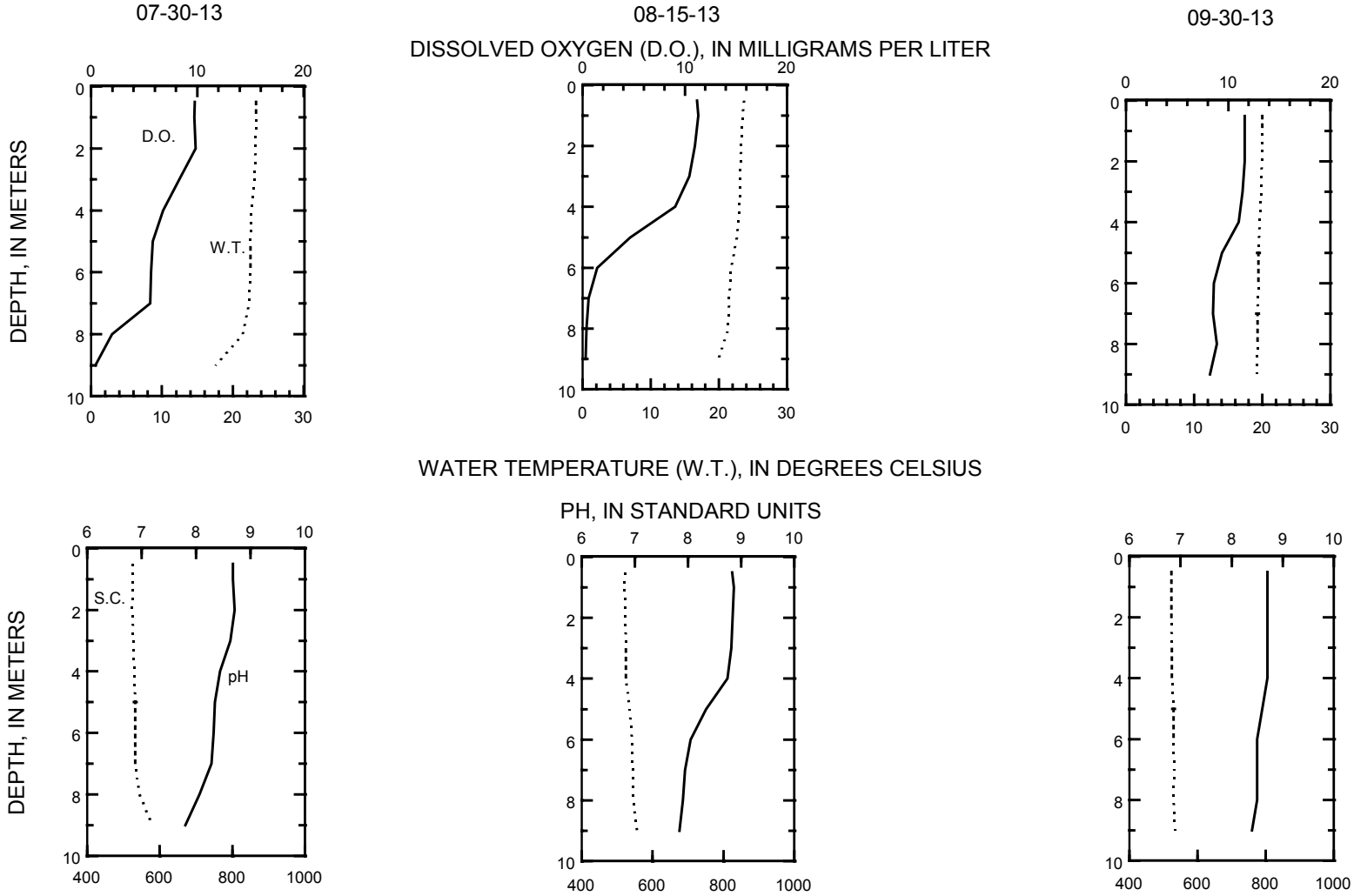
423526088380101 DELAVAN LAKE, AT SW END, NEAR DELAVAN LAKE, WI

LAKE-DEPTH PROFILES, NOVEMBER 20, 2012 TO JUNE 18, 2013



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

LAKE-DEPTH PROFILES, JULY 30 TO SEPTEMBER 30, 2013



05404500 DEVILS LAKE NEAR BARABOO, WI

LOCATION.--Lat 43°25′35″, long 89°43′40″ referenced to North American Datum of 1927, in SW ¼ SE ¼ sec.13, T.11 N., R.6 E., Sauk County, WI, Hydrologic Unit 07070004, in Devils Lake State Park, 3.5 mi south of Baraboo.

SURFACE AREA.--0.56 mi^2.

DRAINAGE AREA.--4.79 mi^2.

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 954.88 ft, above NAVD of 1988.

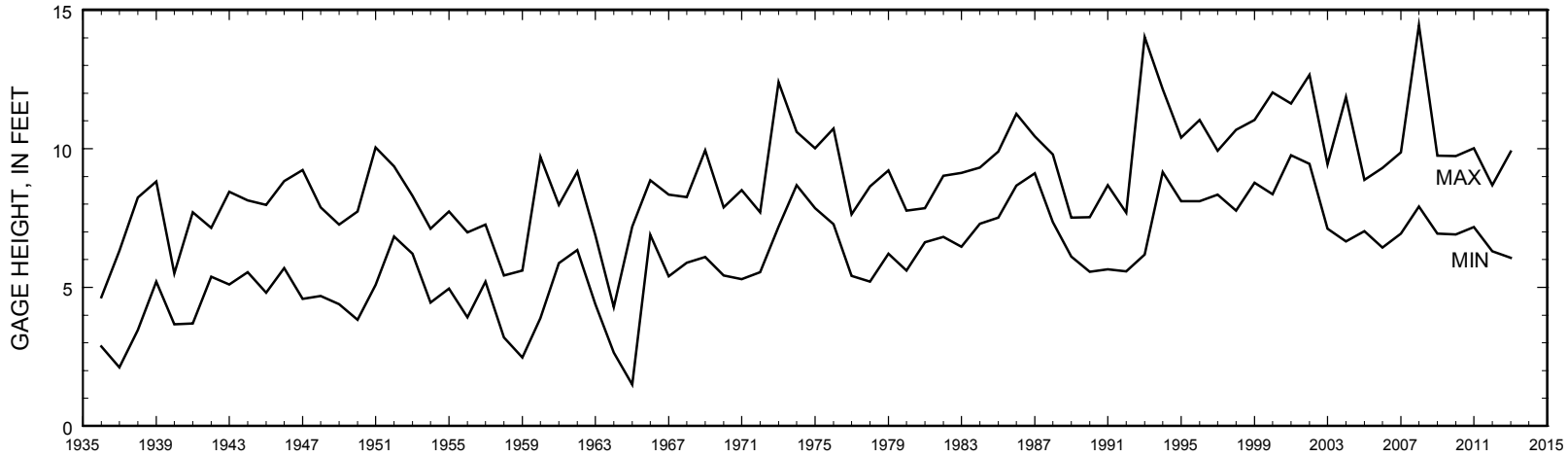
REMARKS.--Lake has no surface outlet. Water removed from lake by bottom withdrawal pipe, May 13-27 and June 24 to July 30.

EXTREMES FOR PERIOD OF RECORD.--Maximum observed, 14.83 ft, June 12, 2008; minimum observed, 1.49 ft, Feb. 8, 1965.

EXTREMES FOR CURRENT YEAR.--Maximum observed, 9.89 ft, June 26; minimum observed, 6.07 ft, Dec. 9, 13-15.

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	6.30	6.29	6.14	6.24	6.41	6.58	7.04	8.90	9.04	9.75	8.33	7.76
2	6.28	6.28	6.14	6.23	6.42	6.58	7.06	8.89	9.00	9.70	8.30	7.72
3	6.28	6.26	6.14	6.23	6.42	6.58	7.08	8.92	8.98	9.65	8.27	7.70
4	6.27	6.26	6.13	6.23	6.42	6.58	7.11	8.96	8.96	9.61	8.25	7.67
5	6.24	6.25	6.13	6.22	6.43	6.60	7.15	8.96	8.98	9.56	8.23	7.65
6	6.21	6.25	6.12	6.22	6.44	6.62	7.20	8.96	8.99	9.51	8.21	7.63
7	6.19	6.25	6.11	6.22	6.46	6.62	7.27	8.95	8.97	9.46	8.19	7.60
8	6.18	6.24	6.10	6.21	6.48	6.62	7.36	8.94	8.96	9.43	8.16	7.58
9	6.16	6.23	6.11	6.21	6.47	6.63	7.52	8.96	8.94	9.41	8.14	7.56
10	6.15	6.24	6.12	6.22	6.49	6.70	7.90	9.21	8.97	9.37	8.11	7.54
11	6.13	6.27	6.12	6.25	6.51	6.79	8.13	9.27	8.96	9.31	8.10	7.58
12	6.11	6.31	6.11	6.26	6.51	6.82	8.29	9.29	8.97	9.26	8.11	7.56
13	6.15	6.30	6.10	6.25	6.51	6.84	8.36	9.29	9.06	9.20	8.09	7.53
14	6.27	6.29	6.09	6.25	6.52	6.84	8.40	9.27	9.06	9.14	8.06	7.50
15	6.34	6.27	6.11	6.25	6.52	6.86	8.46	9.25	9.06	9.10	8.04	7.52
16	6.33	6.26	6.13	6.25	6.52	6.88	8.50	9.23	9.05	9.05	8.01	7.50
17	6.34	6.26	6.12	6.24	6.52	6.88	8.55	9.24	9.03	9.02	7.99	7.48
18	6.36	6.25	6.13	6.24	6.51	6.89	8.72	9.25	9.00	8.98	7.97	7.47
19	6.37	6.24	6.14	6.23	6.51	6.91	8.82	9.23	8.98	8.93	7.94	7.50
20	6.36	6.24	6.24	6.23	6.52	6.91	8.85	9.23	8.95	8.87	7.92	7.61
21	6.36	6.24	6.27	6.22	6.52	6.91	8.87	9.21	9.03	8.83	7.90	7.58
22	6.35	6.24	6.27	6.22	6.54	6.92	8.88	9.17	9.16	8.80	7.94	7.56
23	6.36	6.21	6.26	6.22	6.54	6.92	8.89	9.14	9.69	8.74	7.96	7.55
24	6.36	6.20	6.25	6.21	6.54	6.92	8.89	9.10	9.78	8.68	7.93	7.52
25	6.38	6.18	6.25	6.22	6.54	6.92	8.89	9.06	9.84	8.63	7.91	7.50
26	6.39	6.17	6.24	6.21	6.54	6.92	8.89	9.02	9.86	8.59	7.89	7.49
27	6.37	6.16	6.24	6.22	6.57	6.92	8.88	9.00	9.85	8.53	7.87	7.47
28	6.35	6.15	6.24	6.23	6.58	6.92	8.87	9.01	9.82	8.47	7.85	7.46
29	6.34	6.15	6.25	6.30	---	6.93	8.88	9.01	9.84	8.42	7.83	7.46
30	6.32	6.14	6.25	6.39	---	6.95	8.91	9.06	9.80	8.38	7.81	7.45
31	6.30	---	6.24	6.41	---	7.00	---	9.06	---	8.35	7.78	---
Mean	6.29	6.24	6.17	6.24	6.50	6.81	8.22	9.10	9.22	9.06	8.04	7.56
Max	6.39	6.31	6.27	6.41	6.58	7.00	8.91	9.29	9.86	9.75	8.33	7.76
Min	6.11	6.14	6.09	6.21	6.41	6.58	7.04	8.89	8.94	8.35	7.78	7.45



Annual minimum and maximum water levels for Devils Lake, 1936-2013.

424207088072400 EAGLE LAKE, AT DEEP HOLE, NEAR KANSASVILLE, WI

LOCATION.--Lat 42°42'07", long 88°07'24", in SE ¼ SW ¼ sec. 22, T.3 N., R.20 E., Racine County, Hydrologic Unit 07120006, 1.5 mi northwest of Kansasville.

SURFACE AREA.--0.80 mi^2.

PERIOD OF RECORD.--June to September 2013.

REMARKS.--Lake sampled near the center at a depth of approximately 3.6 m. Water-quality analyses by Wisconsin State Laboratory of Hygiene.

WATER-QUALITY DATA, JUNE 29 TO AUGUST 29, 2013

(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro -matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)
JUN 2013								
29...	1.10	--	--	--	--	--	--	--
29...	--	.50	24.5	424	8.8	8.2	29.4	.053
29...	--	2.0	24.5	424	8.8	8.2	--	.053
29...	--	3.0	24.5	424	8.8	8.1	--	.054
JUL								
17...	1.05	--	--	--	--	--	--	--
17...	--	.50	29.6	386	9.2	10.0	12.0	.036
17...	--	1.5	29.1	385	9.2	10.1	--	.028
17...	--	3.0	26.2	406	8.3	.9	--	.097
30...	1.40	--	--	--	--	--	--	--
30...	--	.50	22.4	392	9.1	10.0	18.7	.043
30...	--	1.5	21.7	391	9.1	9.9	--	.048
30...	--	3.0	21.2	395	9.0	7.7	--	.054
AUG								
15...	.85	--	--	--	--	--	--	--
15...	--	.50	22.4	387	9.2	7.7	34.1	.054
15...	--	1.5	22.3	387	9.3	7.4	--	.051
15...	--	3.0	22.2	388	9.3	6.8	--	.051
29...	.85	--	--	--	--	--	--	--
29...	--	.50	26.9	378	9.4	9.4	27.9	.048
29...	--	1.5	26.4	378	9.3	8.4	--	.055
29...	--	2.5	26.3	379	9.3	7.4	--	.055

424207088072400 EAGLE LAKE, AT DEEP HOLE, NEAR KANSASVILLE, WI

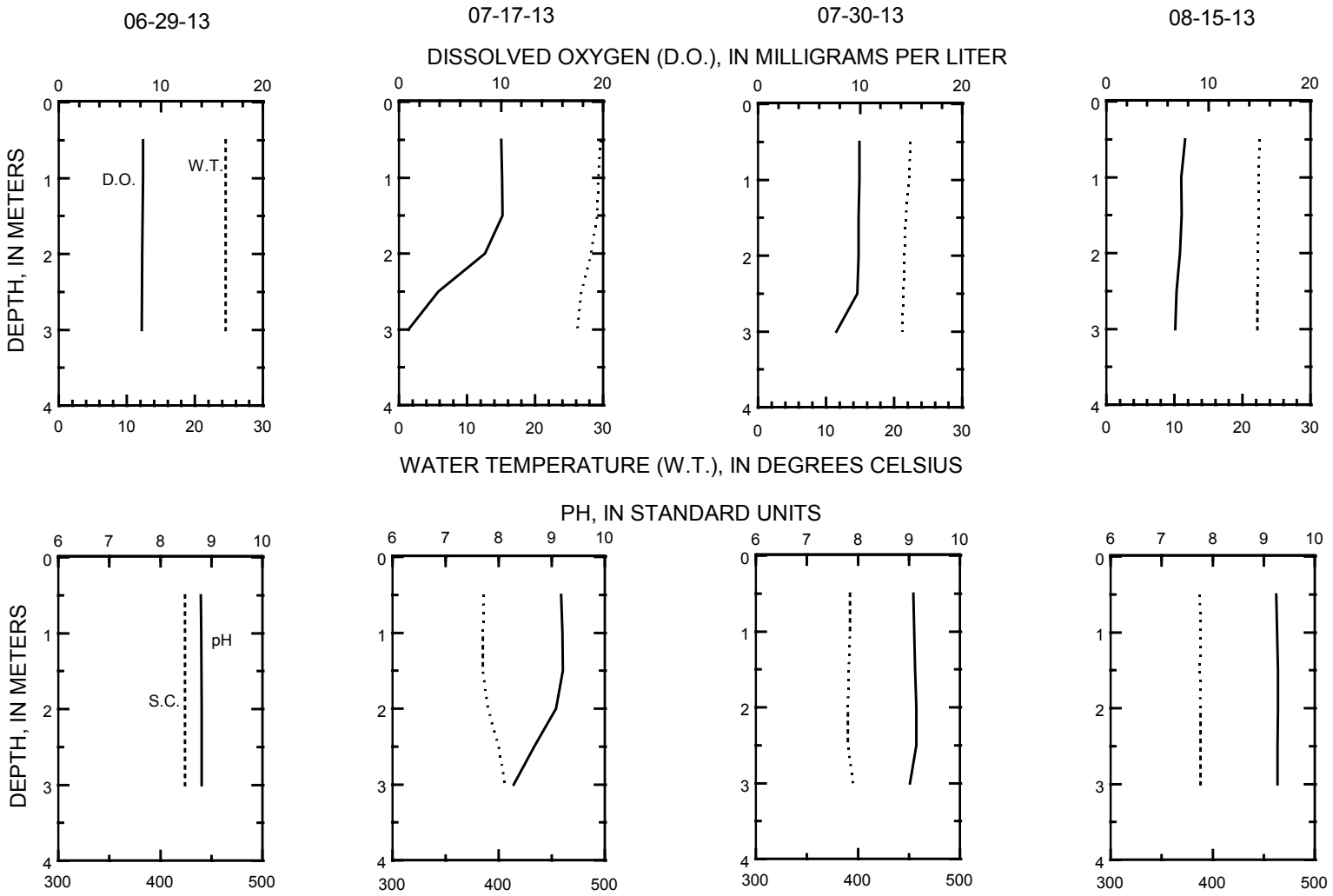
WATER-QUALITY DATA, SEPTEMBER 11 TO SEPTEMBER 26, 2013

(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro -matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)
SEP								
11...	.85	--	--	--	--	--	--	--
11...	--	.50	24.6	385	9.2	9.5	50.9	.066
11...	--	2.0	24.3	387	9.1	7.7	--	.065
11...	--	3.0	24.3	388	9.0	6.7	--	.068
26...	.85	--	--	--	--	--	--	--
26...	--	.50	19.2	392	9.2	10.8	27.4	.055
26...	--	1.5	18.5	392	9.2	10.7	--	.064
26...	--	2.5	18.1	392	9.2	10.4	--	.060

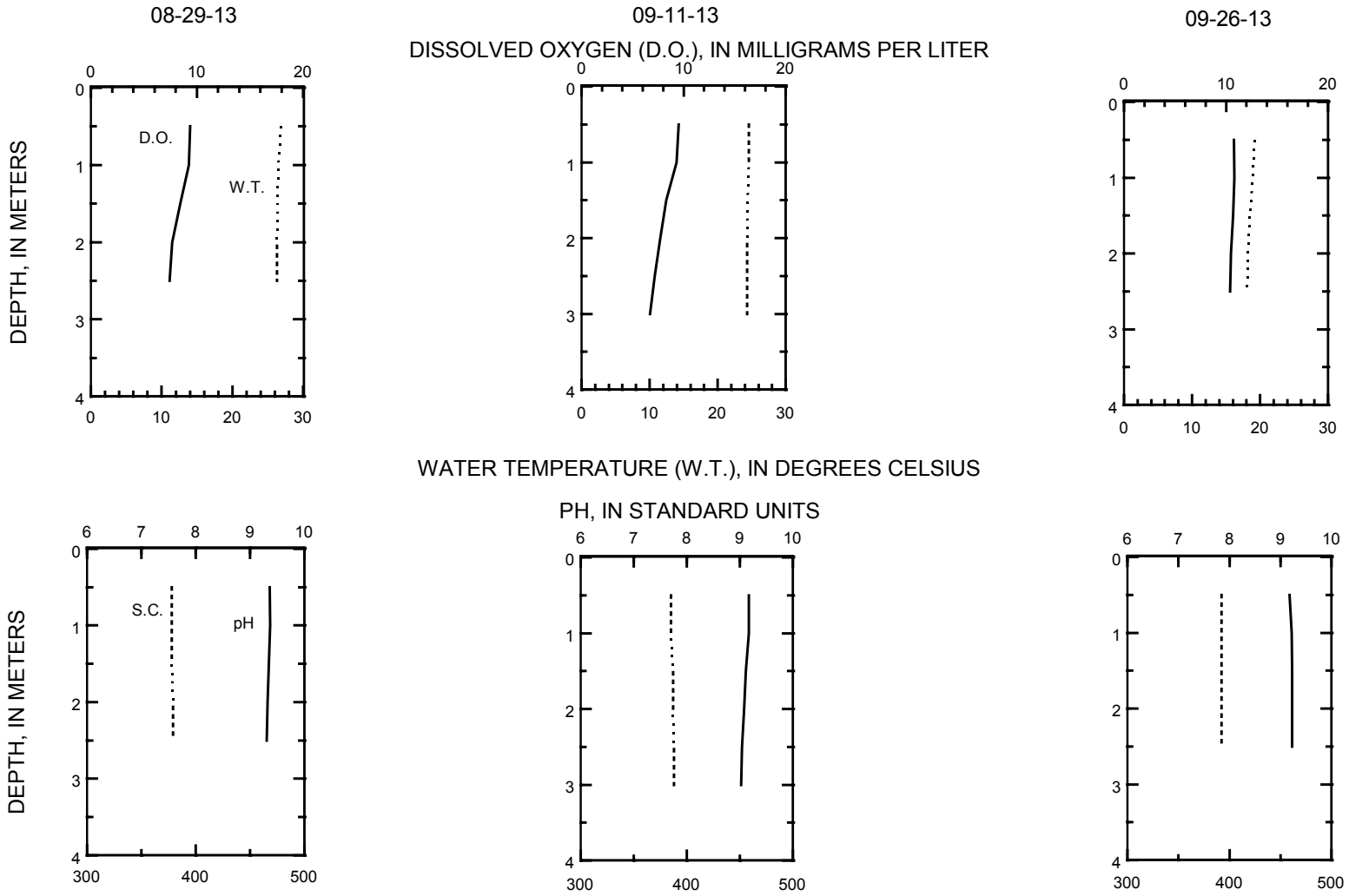
424207088072400 EAGLE LAKE, AT DEEP HOLE, NEAR KANSASVILLE, WI

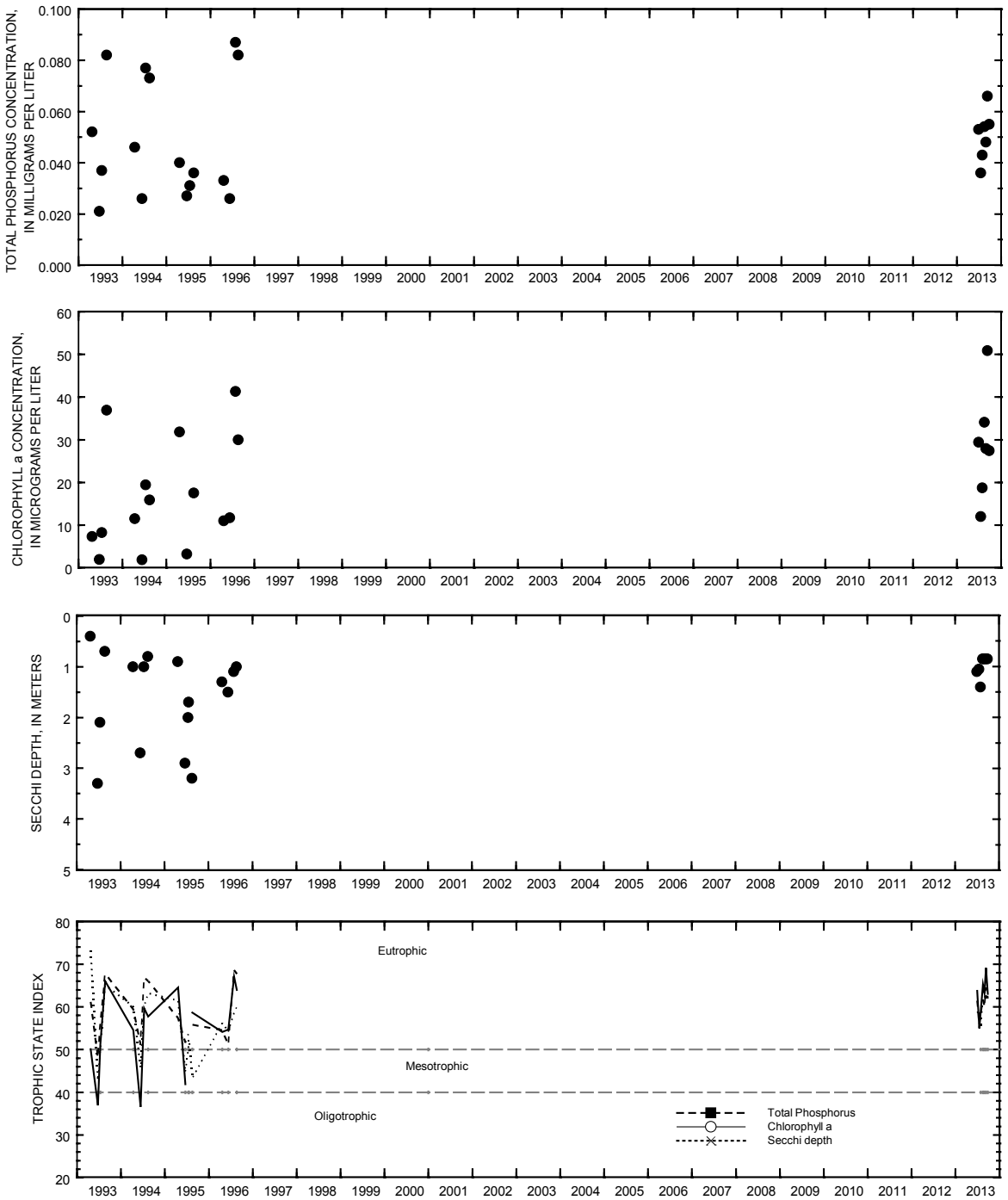
LAKE-DEPTH PROFILES, JUNE 29 TO AUGUST 15, 2013



424207088072400 EAGLE LAKE, AT DEEP HOLE, NEAR KANSASVILLE, WI

LAKE-DEPTH PROFILES, AUGUST 29 TO AUGUST 26, 2013





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

423525088260400 GENEVA LAKE AT LAKE GENEVA, WI

LOCATION.--Lat 42°35′25″, long 88°26′04″ referenced to North American Datum of 1927, in SE ¼ NW ¼ sec.36, T.2 N., R.17 E., Walworth County, WI, Hydrologic Unit 07120006, at Geneva Lake dam at Center Street at Lake Geneva.

SURFACE AREA.--8.22 mi^2.

DRAINAGE AREA.--28.7 mi^2.

PERIOD OF RECORD.--October 1997 to August 2002, December 2002 to current year.

GAGE.--Water-stage recorder. Datum of gage is 861.86 ft above NAVD of 1988 or 862.08 ft above NGVD of 1929. Intermittent staff-gage readings during winter months.

REMARKS.—Records good except for estimated days, which are poor. Gage-height telemeter at station.

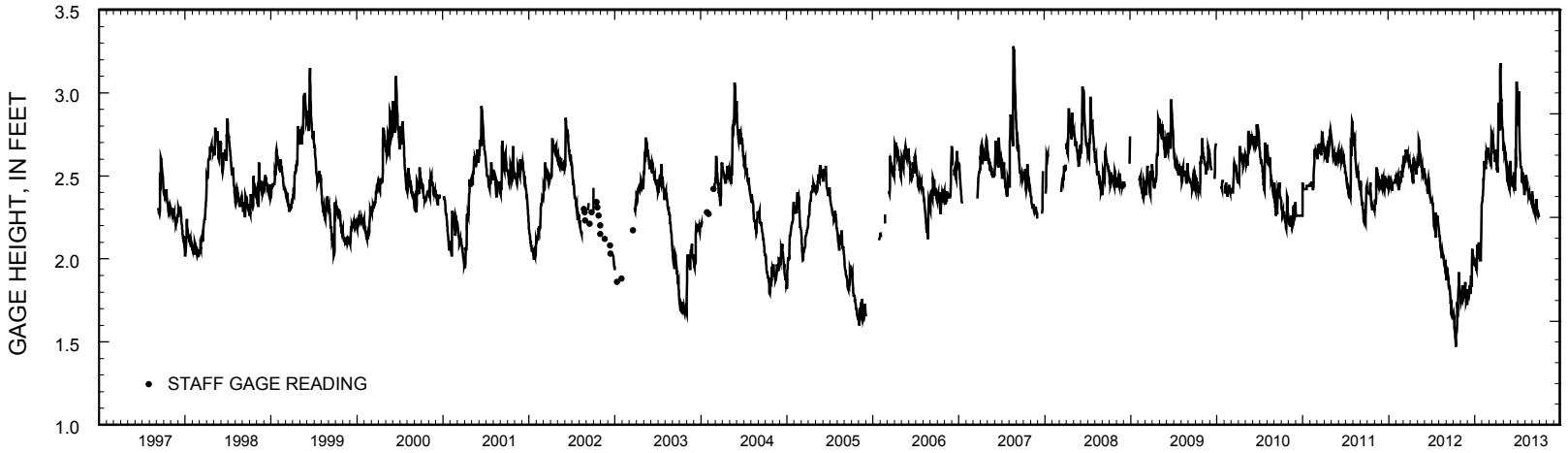
EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 3.47 ft, Apr. 17, 2013; minimum gage height, 1.38 ft, Oct. 13, 2012 (affected by wind).

EXTREMES FOR CURRENT YEAR.--Maximum gage height observed, 3.47 ft (affected by wind), Apr. 17; minimum gage height, 1.38 ft (affected by wind), Oct. 12.

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013
DAILY MEAN VALUES

[e, estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	1.64	1.77	1.76	1.97	2.33	2.63	2.61	2.69	2.56	e2.89	2.42	2.40
2	1.64	1.75	1.78	1.97	2.34	2.61	2.58	2.65	2.53	2.80	2.48	2.40
3	1.64	1.74	1.81	1.97	2.35	2.60	2.56	2.70	2.50	2.81	2.48	2.39
4	1.66	1.75	1.81	1.97	2.37	2.59	2.57	2.69	2.48	2.83	2.47	2.38
5	1.64	1.74	1.79	1.96	2.38	2.61	2.53	2.67	2.46	2.84	2.46	2.35
6	1.59	1.75	1.79	1.96	2.39	2.63	2.55	2.65	2.48	3.01	2.50	2.35
7	1.57	1.75	1.78	1.95	2.43	2.61	2.52	2.63	2.47	e2.90	2.50	2.34
8	1.57	1.75	1.78	1.94	2.48	2.60	2.57	2.64	2.46	e2.79	2.48	2.31
9	1.55	1.74	1.80	1.95	2.48	2.59	2.69	2.61	2.44	2.67	2.48	2.32
10	1.53	1.79	1.83	1.93	2.54	2.65	2.83	2.64	2.44	2.66	2.46	2.33
11	1.51	1.83	1.84	2.08	2.59	2.74	2.92	2.63	2.45	e2.63	2.46	2.31
12	1.47	1.84	1.81	2.08	2.57	2.76	2.94	2.59	2.44	e2.60	2.46	2.30
13	1.51	1.80	1.81	2.08	2.57	2.75	2.90	2.56	2.50	2.58	2.43	2.27
14	1.59	1.79	1.79	2.06	2.57	2.73	2.83	2.58	2.48	2.56	2.42	2.26
15	1.56	1.78	1.85	2.05	2.56	2.73	2.83	2.54	2.50	2.55	2.41	2.27
16	1.56	1.77	1.90	2.08	2.56	2.74	2.78	2.51	2.52	2.55	2.39	2.28
17	1.61	1.78	1.88	2.04	2.54	2.71	2.78	2.48	2.49	2.55	2.39	2.27
18	1.74	1.78	1.86	2.06	2.56	2.75	3.14	2.47	2.44	2.54	2.38	2.27
19	1.71	1.78	1.83	2.10	2.65	2.71	3.18	2.48	2.42	2.54	2.39	2.32
20	1.71	1.80	1.96	2.03	2.63	2.68	3.06	2.51	2.41	2.48	2.38	2.36
21	1.70	1.81	2.06	2.03	2.62	2.67	3.00	2.55	2.46	2.46	2.38	2.32
22	1.74	1.86	2.04	2.00	2.65	2.65	2.95	2.54	2.59	2.52	2.38	2.30
23	1.81	1.81	2.02	1.99	2.64	2.63	2.96	2.50	2.61	2.49	2.37	2.29
24	1.85	1.77	2.02	1.99	2.63	2.65	2.92	2.47	2.60	2.46	2.37	2.28
25	1.92	1.76	2.02	1.99	2.61	2.63	2.86	2.45	2.76	2.45	2.37	2.27
26	1.88	1.74	2.00	1.99	2.63	2.59	2.82	2.43	2.99	2.45	2.36	2.27
27	1.86	1.75	1.99	1.99	2.67	2.59	2.80	2.42	3.06	2.44	2.37	2.26
28	1.83	1.74	2.00	2.03	2.64	2.59	2.79	2.45	3.06	2.41	2.35	2.27
29	1.83	1.73	2.00	2.16	---	2.60	2.77	2.50	e3.00	2.39	2.34	2.27
30	1.81	1.73	2.00	2.33	---	2.63	2.75	2.53	e2.94	2.39	2.37	2.26
31	1.79	---	1.99	2.33	---	2.66	---	2.59	---	2.40	2.40	---
Mean	1.68	1.77	1.89	2.03	2.54	2.66	2.80	2.56	2.58	2.60	2.42	2.31
Max	1.92	1.86	2.06	2.33	2.67	2.76	3.18	2.70	3.06	3.01	2.50	2.40
Min	1.47	1.73	1.76	1.93	2.33	2.59	2.52	2.42	2.41	2.39	2.34	2.26



Stage hydrograph for Geneva Lake, 1997-2013.

423329088323300 GENEVA LAKE AT WEST END NEAR WILLIAMS BAY, WI

LOCATION.--Lat 42°33'29", long 88°32'33", in NE ¼ SE ¼ sec.12, T.1 N., R.16 E., Walworth County, Hydrologic Unit 07120006, 1.3 mi south of Williams Bay.

SURFACE AREA.--8.22 mi^2.

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 0.5 m of the lake.

WATER-QUALITY DATA, NOVEMBER 20, 2012 TO SEPTEMBER 27, 2013
(Milligrams per liter unless otherwise indicated)

Date	Transparency Secchi disc, meters (00078)	Sampling depth, meters (00098)	Temperature, water, deg C (00010)	Specific conductance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dissolved oxygen, mg/L (00300)	Chlorophyll a trichromatic method, uncorr, ug/L (32210)	Phosphorus, water, unfltrd mg/L as P (00665)	Orthophosphate, water, fltrd, mg/L as P (00671)	Total nitrogen, water, unfltrd mg/L (00600)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia + org-N, water, fltrd, mg/L as N (00623)	Ammonia + org-N, water, unfltrd mg/L as N (00625)
NOV 2012													
20...	6.15	--	--	--	--	--	--	--	--	--	--	--	--
20...	--	.50	9.5	529	8.3	9.3	3.48	.019	.007	.42	.022	--	.39
20...	--	43.0	8.7	541	7.6	.2	--	.079	--	<.74	.295	--	.72
APR 2013													
30...	5.80	--	--	--	--	--	--	--	--	--	--	--	--
30...	--	.50	4.9	528	8.5	13.0	4.31	.040	<.002	<.18	.028	--	<.14
JUN													
18...	6.65	--	--	--	--	--	--	--	--	--	--	--	--
18...	--	.50	20.7	525	8.6	9.4	2.10	.010	<.006	<.45	<.048	.37	.39
18...	--	8.0	20.1	525	8.6	9.5	--	.012	--	--	--	--	--
18...	--	14.0	9.0	526	8.7	11.1	--	.013	--	--	--	--	--
18...	--	32.0	5.9	530	8.4	10.2	--	.010	--	--	--	--	--
18...	--	37.0	5.5	531	8.3	9.6	--	.010	--	--	--	--	--
18...	--	43.0	5.5	533	8.1	8.0	--	.015	--	--	--	--	--
JUL													
11...	5.10	--	--	--	--	--	--	--	--	--	--	--	--
11...	--	.50	24.5	527	8.7	9.0	2.61	.007	<.002	<.46	<.015	.46	.44
11...	--	6.0	24.0	527	8.7	9.2	--	.012	--	--	--	--	--
11...	--	14.0	10.0	530	9.0	10.2	--	.009	--	--	--	--	--
11...	--	33.0	5.9	533	8.5	9.3	--	.007	--	--	--	--	--
11...	--	37.0	5.6	535	8.3	8.1	--	.008	--	--	--	--	--
11...	--	43.0	5.5	538	7.9	5.1	--	.015	.007	.75	.115	.59	.62

423329088323300 GENEVA LAKE AT WEST END NEAR WILLIAMS BAY, WI

WATER-QUALITY DATA, NOVEMBER 20, 2012 TO SEPTEMBER 27, 2013
(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro -matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Total nitro-gen, water, unfltrd mg/L (00600)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia + org-N, water, fltrd, mg/L as N (00623)	Ammonia + org-N, water, unfltrd mg/L as N (00625)
AUG													
14...	4.25	--	--	--	--	--	--	--	--	--	--	--	--
14...	--	.50	23.2	528	8.7	8.9	3.28	<.005	<.002	<.22	<.015	.51	.20
14...	--	9.0	23.1	529	8.7	8.7	--	.009	--	--	--	--	--
14...	--	15.0	9.5	532	8.2	8.2	--	.011	--	--	--	--	--
14...	--	33.0	6.0	535	8.0	6.8	--	.007	--	--	--	--	--
14...	--	38.0	5.7	537	7.9	4.6	--	.009	--	--	--	--	--
14...	--	43.0	5.6	541	7.8	1.8	--	.044	--	--	--	--	--
SEP													
27...	6.80	--	--	--	--	--	--	--	--	--	--	--	--
27...	--	.50	20.0	524	8.4	9.0	1.84	.012	<.002	<.40	<.015	.51	.38
27...	--	11.0	19.8	525	8.6	8.9	--	.014	<.002	<.25	<.015	<.14	.23
27...	--	15.0	9.8	536	8.0	4.9	--	.013	<.002	.51	<.015	.44	.47
27...	--	33.0	6.1	539	7.7	4.6	--	.015	.002	.77	<.015	.76	.54
27...	--	38.0	5.8	542	7.6	2.4	--	.031	.019	.75	.024	.71	.46
27...	--	43.0	5.7	549	7.5	.2	--	.078	.058	.62	.167	.75	.50

Date	Nitrate + nitrite water, fltrd, mg/L as N (00631)	Turbdty white light, det ang 90+/-30 degrees NTU (63675)	Appar-ent color, water, unfltrd Pt-Co units (00081)	Hard-ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Sodium, water, fltrd, mg/L (00930)	Potas-sium, water, fltrd, mg/L (00935)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor-ide, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Silica, water, fltrd, mg/L as SiO2 (00955)	Iron, water, fltrd, ug/L (01046)
NOV 2012													
20...	--	--	--	--	--	--	--	--	--	--	--	--	--
20...	.031	--	--	--	--	--	--	--	--	--	--	--	--
20...	<.019	--	--	--	--	--	--	--	--	--	--	--	--
APR 2013													
30...	--	--	--	--	--	--	--	--	--	--	--	--	--
30...	.042	1.4	5	232	34.7	35.2	22.0	1.91	194	44	26.3	3.10	<.100
JUN													
18...	--	--	--	--	--	--	--	--	--	--	--	--	--
18...	<.061	--	--	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--	--	--	--

423329088323300 GENEVA LAKE AT WEST END NEAR WILLIAMS BAY, WI

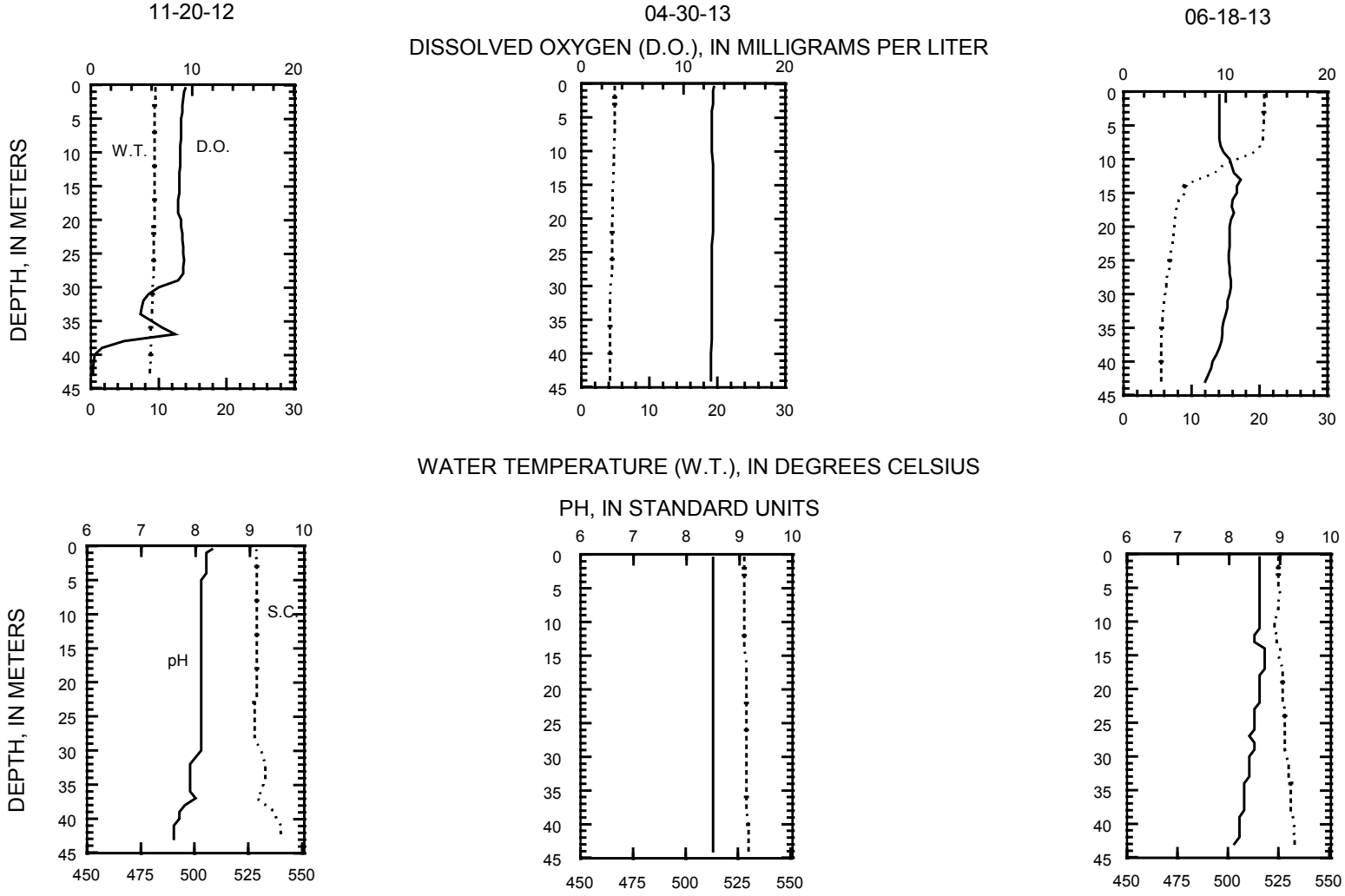
WATER-QUALITY DATA, , NOVEMBER 20, 2012 TO SEPTEMBER 27, 2013
(Milligrams per liter unless otherwise indicated)

Date	Nitrate + nitrite water, fltrd, mg/L as N (00631)	Turbdty white light, det ang 90+/-30 degrees NTU (63675)	Appar-ent color, water, unfltrd Pt-Co units (00081)	Hard-ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Sodium, water, fltrd, mg/L (00930)	Potas-sium, water, fltrd, mg/L (00935)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor-ide, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Silica, water, fltrd, mg/L as SiO2 (00955)	Iron, water, fltrd, ug/L (01046)
JUL													
11...	--	--	--	--	--	--	--	--	--	--	--	--	--
11...	<.019	--	--	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--	--	--	--
11...	.127	--	--	--	--	--	--	--	--	--	--	--	--
AUG													
14...	--	--	--	--	--	--	--	--	--	--	--	--	--
14...	<.019	--	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--	--	--
SEP													
27...	--	--	--	--	--	--	--	--	--	--	--	--	--
27...	<.019	--	--	--	--	--	--	--	--	--	--	--	--
27...	<.019	--	--	--	--	--	--	--	--	--	--	--	--
27...	.041	--	--	--	--	--	--	--	--	--	--	--	--
27...	.235	--	--	--	--	--	--	--	--	--	--	--	--
27...	.292	--	--	--	--	--	--	--	--	--	--	--	--
27...	.130	--	--	--	--	--	--	--	--	--	--	--	--

Date	Manga-nese, water, fltrd, ug/L (01056)	Dis-solved solids dried @ 180degC wat flt mg/L (70300)
NOV 2012		
20...	--	--
20...	--	--
20...	--	--
APR 2013		
30...	--	--
30...	<1.00	294

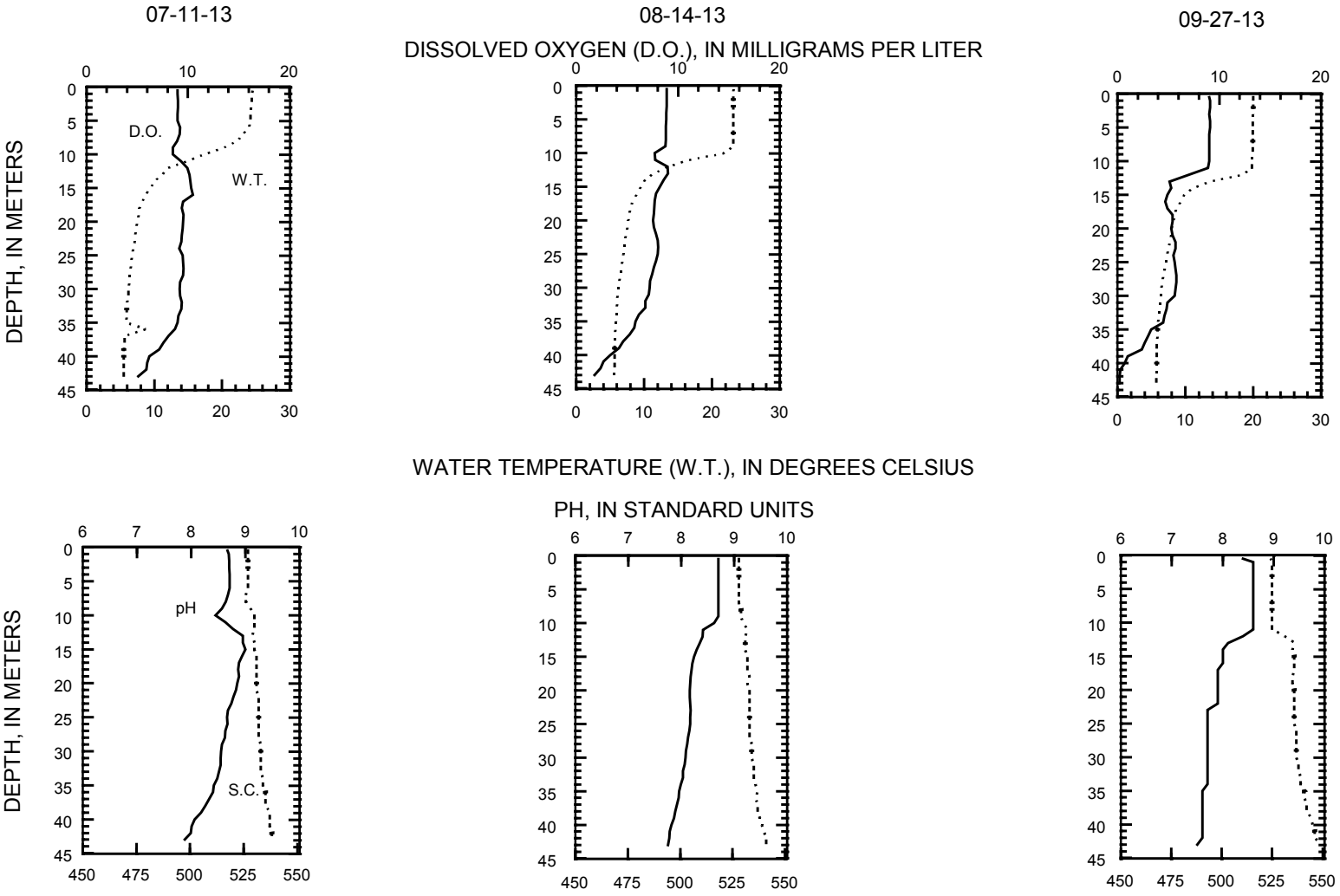
423329088323300 GENEVA LAKE AT WEST END NEAR WILLIAMS BAY, WI

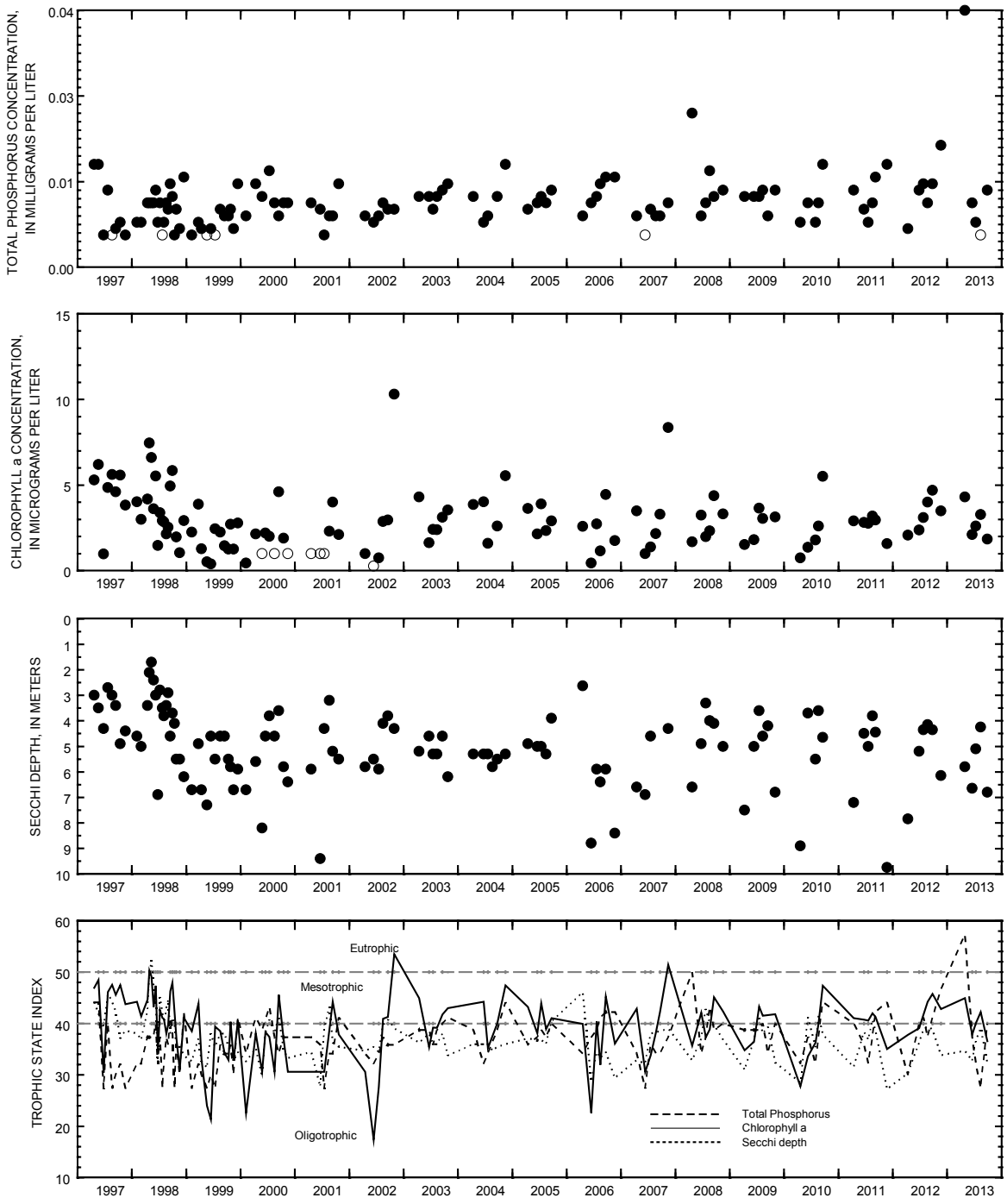
LAKE-DEPTH PROFILES, NOVEMBER 20, 2012 TO JUNE 18, 2013



423329088323300 GENEVA LAKE AT WEST END NEAR WILLIAMS BAY, WI

LAKE-DEPTH PROFILES, JULY 11 TO SEPTEMBER 27, 2013





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

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

434840089000001 GREEN LAKE AT GREEN LAKE, WI

LOCATION.--Lat 43°48′40″, long 89°00′00″ referenced to North American Datum of 1983, in SE ¼ SW ¼ sec.31, T.16 N., R.13 E., Green Lake County, WI, Hydrologic Unit 04030201, on left bank at upstream side of County Highway K, 11.6 mi southwest of Green Lake.

SURFACE AREA.--11.48 mi^2.

DRAINAGE AREA.--103 mi^2; including surface area of Green Lake.

PERIOD OF RECORD.--October 1993 to May 2012, October 2012 to September 2013. Data from October 1993 to May 2012 previously available as 434928088553601 Green Lake at County Trunk HWY A near Green Lake, WI.

GAGE.--Water-stage recorder. Datum of gage is 790.132 ft above NAVD of 1988 (from Wisconsin Department of Transportation Benchmark).

COOPERATION.--Operated in cooperation with Green Lake Sanitary District.

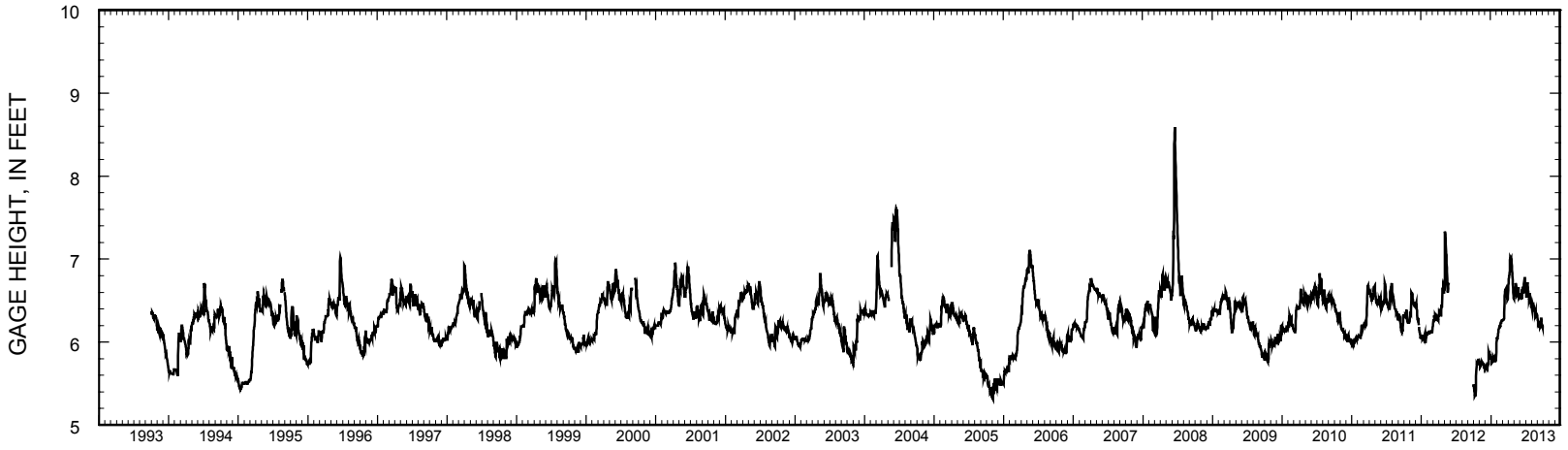
REMARKS.--Lake level regulated by dam at outlet at Green Lake. Gage-height telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum recorded gage height, 8.67 ft, June 15, 2008; minimum recorded, 5.27 ft, Nov. 5, 2005.

EXTREMES FOR CURRENT YEAR.--Maximum recorded gage height, 7.32 ft, Apr. 10; minimum recorded gage height, 5.29 ft, Oct. 13.

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	5.48	5.74	5.68	5.81	6.02	6.26	6.68	6.54	6.58	6.64	6.42	6.30
2	5.48	5.73	5.69	5.81	6.04	6.26	6.71	6.56	6.57	6.61	6.42	6.30
3	5.48	5.73	5.69	5.80	6.04	6.26	6.74	6.59	6.53	6.58	6.41	6.27
4	5.46	5.72	5.70	5.79	6.05	6.26	6.76	6.61	6.53	6.57	6.40	6.26
5	5.42	5.72	5.70	5.79	6.05	6.27	6.78	6.61	6.54	6.55	6.37	6.25
6	5.41	5.71	5.69	5.79	6.06	6.27	6.80	6.60	6.56	6.55	6.37	6.23
7	5.39	5.72	5.70	5.77	6.08	6.27	6.81	6.60	6.55	6.54	6.44	6.24
8	5.35	5.71	5.70	5.78	6.10	6.27	6.83	6.59	6.54	6.62	6.45	6.25
9	5.36	5.72	5.71	5.77	6.10	6.28	6.86	6.61	6.54	6.68	6.43	6.23
10	5.37	5.72	5.72	5.78	6.12	6.36	6.99	6.71	6.53	6.72	6.43	6.22
11	5.36	5.73	5.70	5.81	6.15	6.47	7.01	6.68	6.52	6.69	6.43	6.23
12	5.35	5.76	5.70	5.82	6.16	6.53	7.02	6.66	6.56	6.66	6.44	6.24
13	5.43	5.76	5.69	5.83	6.16	6.56	7.01	6.63	6.63	6.63	6.44	6.21
14	5.59	5.75	5.70	5.82	6.18	6.59	7.00	6.61	6.61	6.61	6.41	6.18
15	5.67	5.75	5.71	5.81	6.18	6.61	7.01	6.59	6.63	6.60	6.40	6.21
16	5.67	5.76	5.73	5.81	6.18	6.63	6.99	6.57	6.65	6.58	6.40	6.21
17	5.67	5.75	5.74	5.81	6.19	6.63	6.97	6.58	6.65	6.55	6.39	6.18
18	5.72	5.74	5.74	5.80	6.19	6.64	6.99	6.59	6.65	6.54	6.38	6.19
19	5.74	5.74	5.74	5.81	6.20	6.63	6.96	6.57	6.62	6.51	6.37	6.22
20	5.73	5.75	5.88	5.80	6.20	6.61	6.92	6.57	6.59	6.51	6.36	6.27
21	5.73	5.74	5.86	5.79	6.21	6.60	6.87	6.56	6.64	6.53	6.35	6.28
22	5.74	5.74	5.84	5.77	6.23	6.58	6.83	6.58	6.70	6.56	6.37	6.28
23	5.74	5.74	5.85	5.77	6.24	6.57	6.80	6.66	6.73	6.59	6.36	6.23
24	5.75	5.72	5.84	5.77	6.24	6.55	6.75	6.61	6.73	6.55	6.34	6.22
25	5.76	5.71	5.84	5.77	6.24	6.54	6.70	6.58	6.77	6.52	6.32	6.22
26	5.80	5.71	5.84	5.77	6.25	6.52	6.64	6.56	6.77	6.51	6.32	6.21
27	5.79	5.69	5.83	5.78	6.26	6.51	6.60	6.54	6.77	6.49	6.33	6.20
28	5.79	5.68	5.84	5.80	6.26	6.51	6.56	6.55	6.73	6.46	6.34	6.18
29	5.78	5.69	5.84	5.88	---	6.52	6.53	6.55	6.73	6.45	6.33	6.20
30	5.79	5.70	5.83	5.99	---	6.56	6.52	6.59	6.69	6.43	6.33	6.18
31	5.75	---	5.83	6.02	---	6.62	---	6.59	---	6.43	6.32	---
Mean	5.60	5.73	5.76	5.81	6.16	6.48	6.82	6.59	6.63	6.56	6.38	6.23
Max	5.80	5.76	5.88	6.02	6.26	6.64	7.02	6.71	6.77	6.72	6.45	6.30
Min	5.35	5.68	5.68	5.77	6.02	6.26	6.52	6.54	6.52	6.43	6.32	6.18



Stage hydrograph for Green Lake, 1993-2013.

434756089020500 GREEN LAKE AT DEEP HOLE NEAR GREEN LAKE, WI

LOCATION.--Lat 43°47'56", long 89°02'05", in NW ¼ SE ¼ sec.2, T.15 N., R.12 E., Green Lake County, Hydrologic Unit 04030201, about 5 miles southwest of the City of Green Lake.

SURFACE AREA.--11.48 mi^2.

PERIOD OF RECORD.--May 2004 to current year. Lake sampled by Wisconsin Department of Natural Resources prior to 2004.

REMARKS.--Water-quality analyses done by Wisconsin State Laboratory of Hygiene. A "*" indicates data that were collected by Mary Jane Bumby, Citizen Lake Monitoring Volunteer.

WATER-QUALITY DATA, MAY 7 TO SEPTEMBER 25, 2013

(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro -matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Total nitro-gen, water, unfltrd mg/L (00600)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia + org-N, water, fltrd, mg/L as N (00623)	Ammonia + org-N, water, unfltrd mg/L as N (00625)
MAY 2013													
07...	7.25	--	--	--	--	--	--	--	--	--	--	--	--
07...	--	.50	7.7	513	8.3	13.1	2.92	.036	.020	1.3	<.015	--	1.0
07...	--	68.0	3.8	517	8.2	12.1	--	.048	--	--	--	--	--
JUN													
*11...	4.57	.10	20.0	--	--	--	--	--	--	--	--	--	--
*17...	5.79	.10	20.0	--	--	--	--	--	--	--	--	--	--
*19...	6.25	.10	20.0	--	--	--	--	--	--	--	--	--	--
27...	8.60	--	--	--	--	--	--	--	--	--	--	--	--
27...	--	.50	22.3	499	8.7	9.3	2.43	.011	--	--	--	--	--
27...	--	68.0	4.4	521	7.6	3.2	--	.148	--	--	--	--	--
*27...	6.10	.10	22.2	--	--	--	--	--	--	--	--	--	--
JUL													
*07...	7.47	.10	23.9	--	--	--	--	--	--	--	--	--	--
*11...	8.84	.10	25.0	--	--	--	--	--	--	--	--	--	--
*20...	4.72	.10	27.8	--	--	--	--	--	--	--	--	--	--
25...	5.30	--	--	--	--	--	--	--	--	--	--	--	--
25...	--	.50	25.2	490	8.8	8.8	4.13	.010	--	--	--	--	--
25...	--	68.0	4.5	521	7.6	1.8	--	.273	--	--	--	--	--
*31...	4.88	.10	22.8	--	--	--	--	--	--	--	--	--	--

434756089020500 GREEN LAKE AT DEEP HOLE NEAR GREEN LAKE, WI

WATER-QUALITY DATA, MAY 7 TO SEPTEMBER 25, 2013

(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro -matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Total nitro-gen, water, unfltrd mg/L (00600)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia + org-N, water, fltrd, mg/L as N (00623)	Ammonia + org-N, water, unfltrd mg/L as N (00625)
AUG													
*03...	5.79	.10	23.3	--	--	--	--	--	--	--	--	--	--
*08...	4.88	.10	22.8	--	--	--	--	--	--	--	--	--	--
13...	5.65	--	--	--	--	--	--	--	--	--	--	--	--
13...	--	.50	22.6	492	8.7	9.1	5.37	.009	<.002	<.61	<.015	.22	.59
13...	--	67.0	4.5	548	7.4	.2	--	.205	--	--	--	--	--
*14...	5.49	.10	22.8	--	--	--	--	--	--	--	--	--	--
*17...	4.72	.10	25.6	--	--	--	--	--	--	--	--	--	--
*31...	3.20	.10	24.4	--	--	--	--	--	--	--	--	--	--
SEP													
*06...	3.81	.10	23.9	--	--	--	--	--	--	--	--	--	--
*22...	5.03	.10	20.0	--	--	--	--	--	--	--	--	--	--
25...	5.10	--	--	--	--	--	--	--	--	--	--	--	--
25...	--	.50	19.2	493	8.6	9.3	3.67	.013	--	--	--	--	--
25...	--	17.0	8.5	519	8.0	5.7	--	.011	--	--	--	--	--
25...	--	50.0	4.6	521	7.9	7.6	--	.084	--	--	--	--	--
25...	--	63.0	4.6	527	7.7	2.3	--	.154	--	--	--	--	--
25...	--	66.0	4.6	537	7.6	.2	--	.244	--	--	--	--	--
25...	--	67.0	4.5	550	7.4	.1	--	.270	--	--	--	--	--

Date	Nitrate + nitrite water, fltrd, mg/L as N (00631)	Turbdty white light, det ang 90+/-30 degrees NTU (63675)	Appar-ent color, water, unfltrd Pt-Co units (00081)	Hard-ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Sodium, water, fltrd, mg/L (00930)	Potas-sium, water, fltrd, mg/L (00935)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor-ide, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Silica, water, fltrd, mg/L as SiO2 (00955)	Iron, water, fltrd, ug/L (01046)
MAY 2013													
07...	--	--	--	--	--	--	--	--	--	--	--	--	--
07...	.278	1.9	10	231	34.7	35.1	19.7	3.53	192	38	28.2	.900	<.100
07...	--	--	--	--	--	--	--	--	--	--	--	--	--
AUG													
13...	<.019	--	--	--	--	--	--	--	--	--	--	--	--

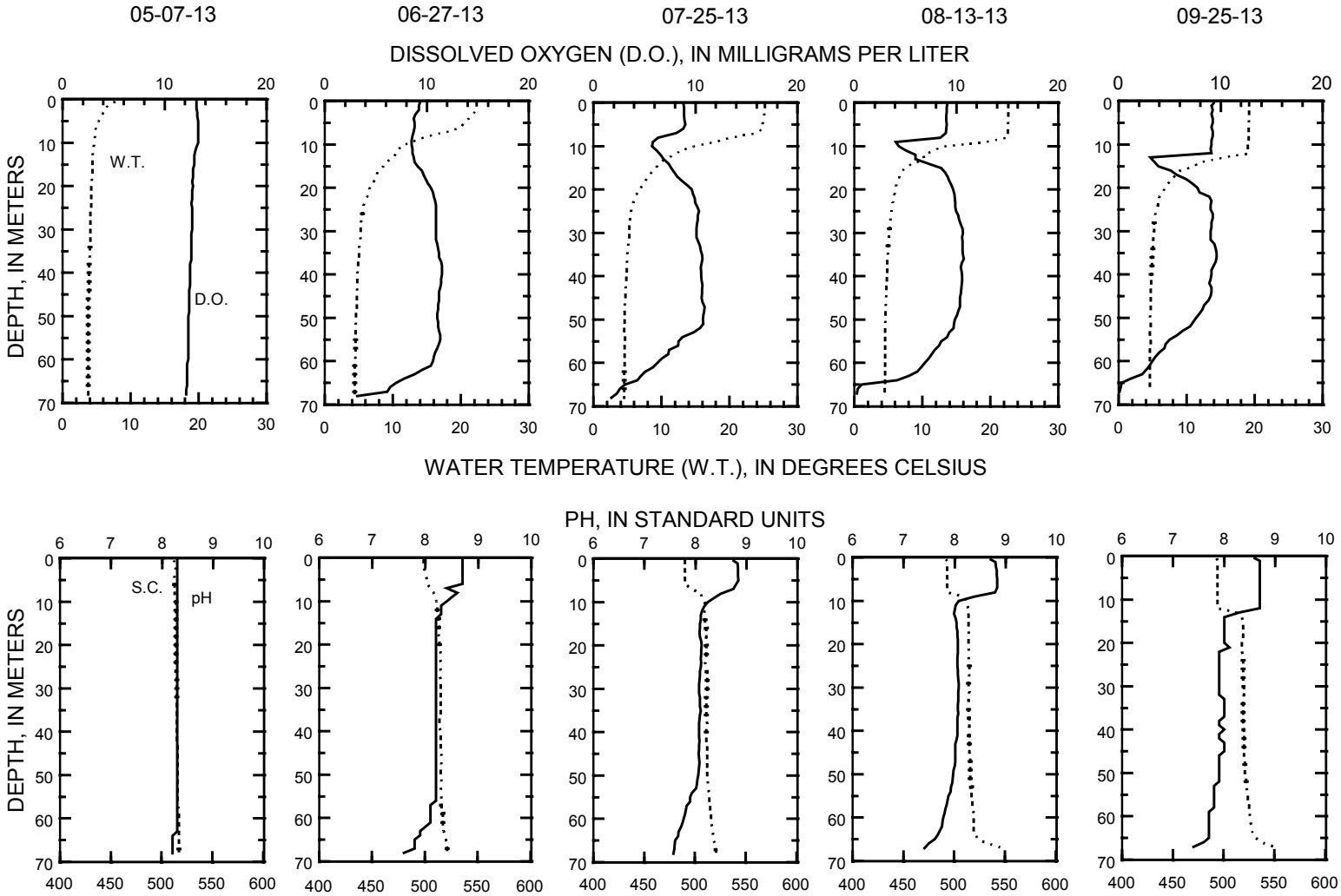
434756089020500 GREEN LAKE AT DEEP HOLE NEAR GREEN LAKE, WI

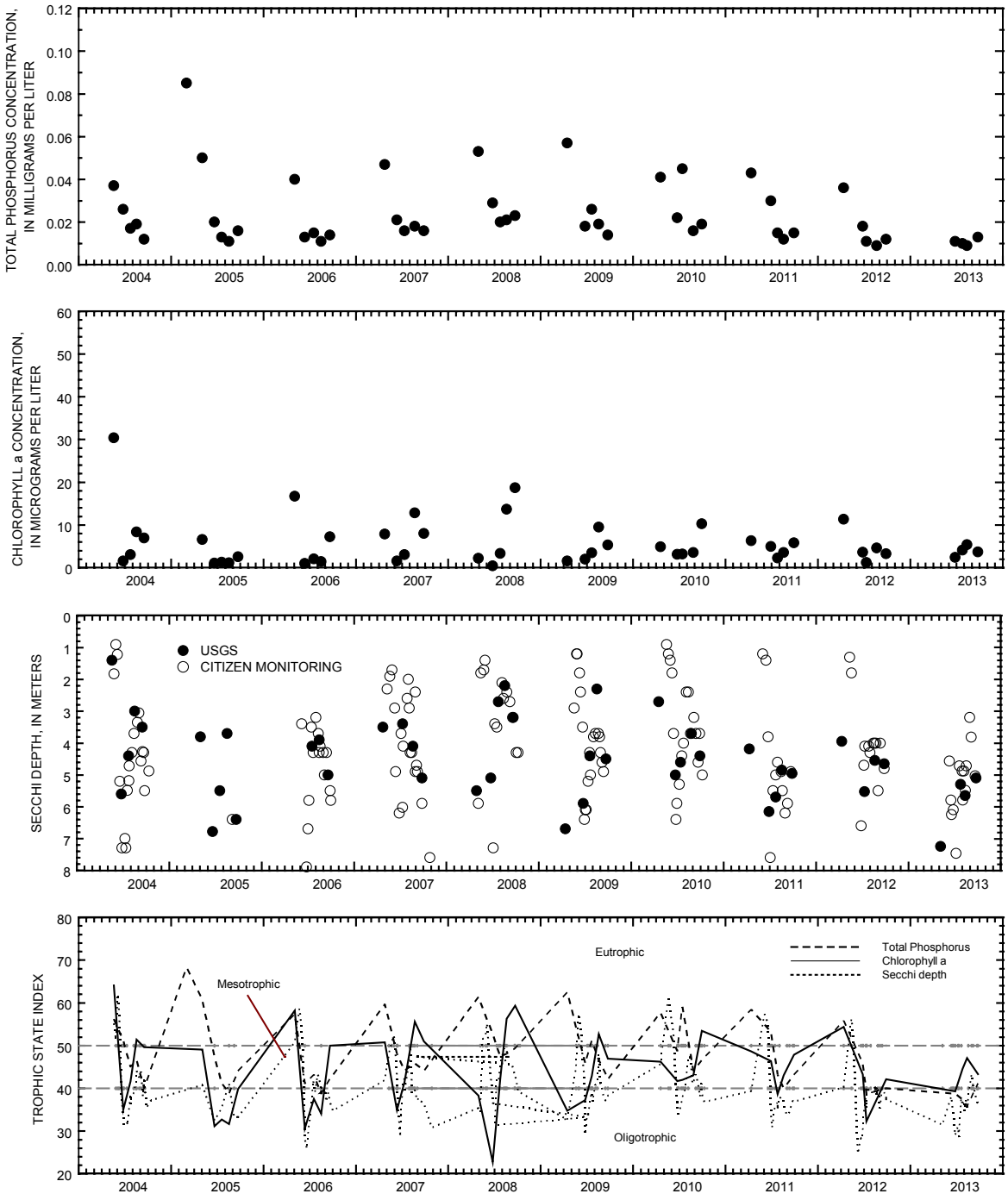
WATER-QUALITY DATA, MAY 7 TO SEPTEMBER 25, 2013
(Milligrams per liter unless otherwise indicated)

Date	Manganese, water, fltrd, ug/L (01056)	Dissolved solids dried @ 180degC wat flt mg/L (70300)
MAY 2013		
07...	--	--
07...	<1.00	266
07...	--	--

434756089020500 GREEN LAKE AT DEEP HOLE NEAR GREEN LAKE, WI

LAKE-DEPTH PROFILES, MAY 7 TO SEPTEMBER 25, 2013





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

434928088570000 GREEN LAKE AT EAST END NEAR GREEN LAKE, WI

LOCATION.--Lat 43°49'28", long 88°57'00", in SE ¼ SE ¼ sec.28, T.16 N., R.13 E., Green Lake County, Hydrologic Unit 04030201, about one mile southeast of the City of Green Lake.

SURFACE AREA.--11.48 mi^2.

PERIOD OF RECORD.--May 2004 current year. Lake sampled by Wisconsin Department of Natural Resources prior to 2004.

REMARKS.--Water-quality analyses done by Wisconsin State Laboratory of Hygiene. A "*" indicates data that were collected by Mary Jane Bumby, Citizen Lake Monitoring Volunteer.

WATER-QUALITY DATA, MAY 7 TO SEPTEMBER 25, 2013

(Milligrams per liter unless otherwise indicated)

Date	Transparency Secchi disc, meters (00078)	Sampling depth, meters (00098)	Temperature, water, deg C (00010)	Specific conductance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dissolved oxygen, mg/L (00300)	Chlorophyll a trichro -matic method, uncorr, ug/L (32210)	Phosphorus, water, unfltrd mg/L as P (00665)
MAY 2013								
07...	5.60	--	--	--	--	--	--	--
07...	--	.50	8.7	514	8.4	13.8	3.03	.030
07...	--	31.5	4.1	516	8.3	12.0	--	.044
JUN								
*11...	3.20	.10	20.0	--	--	--	--	--
*17...	10.7	.10	20.0	--	--	--	--	--
*19...	10.4	.10	19.4	--	--	--	--	--
27...	8.00	--	--	--	--	--	--	--
27...	--	.50	22.8	503	8.7	8.7	2.34	.011
27...	--	32.0	5.2	515	7.9	9.4	--	.054
*27...	10.7	.10	24.4	--	--	--	--	--
JUL								
*07...	6.10	.10	30.0	--	--	--	--	--
*11...	5.03	.10	26.7	--	--	--	--	--
*20...	4.88	.10	28.9	--	--	--	--	--
25...	4.80	--	--	--	--	--	--	--
25...	--	.50	24.9	494	8.8	9.3	8.46	.014
25...	--	30.0	5.2	513	8.0	9.1	--	.060
*31...	4.88	.10	23.9	--	--	--	--	--

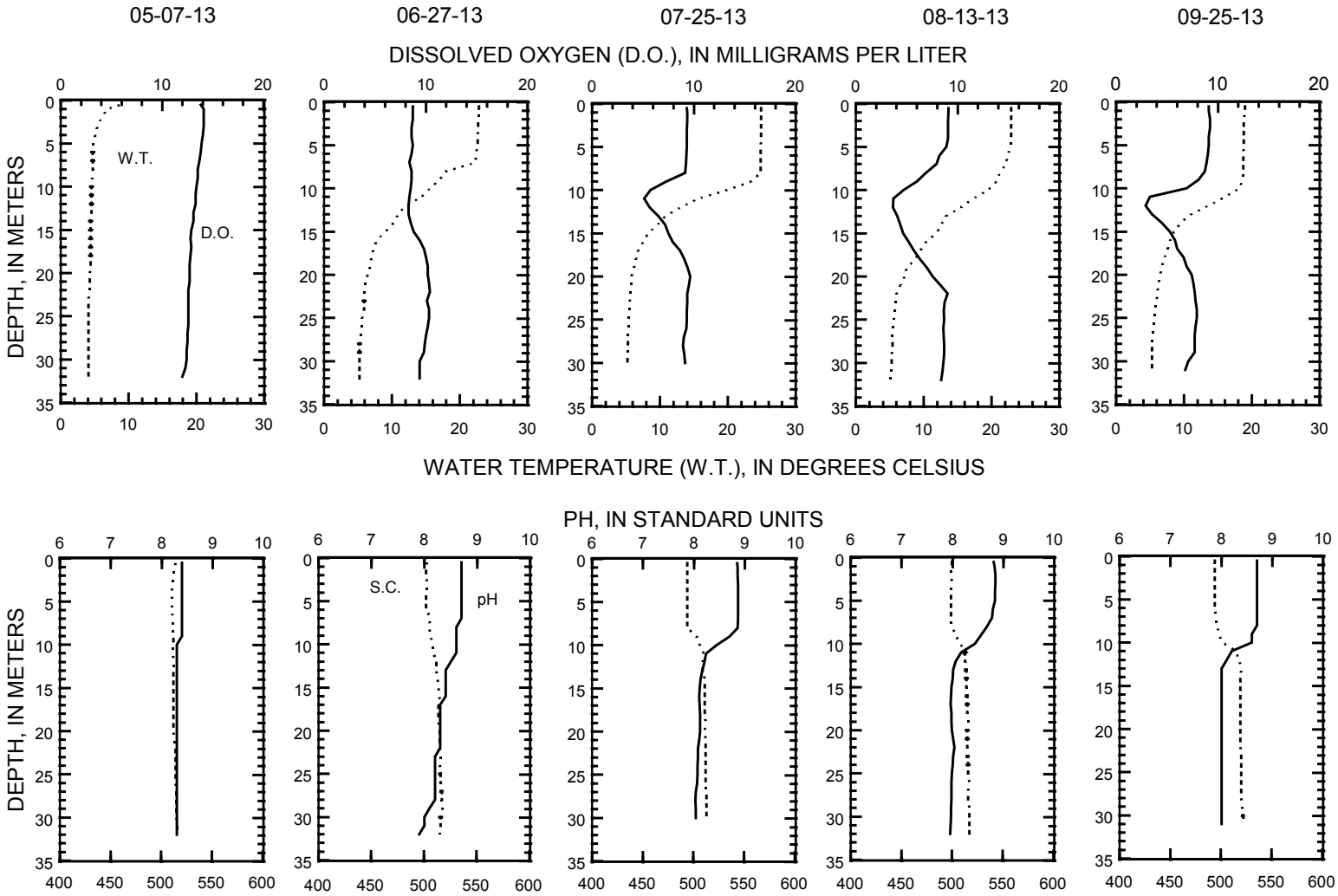
434928088570000 GREEN LAKE AT EAST END NEAR GREEN LAKE, WI

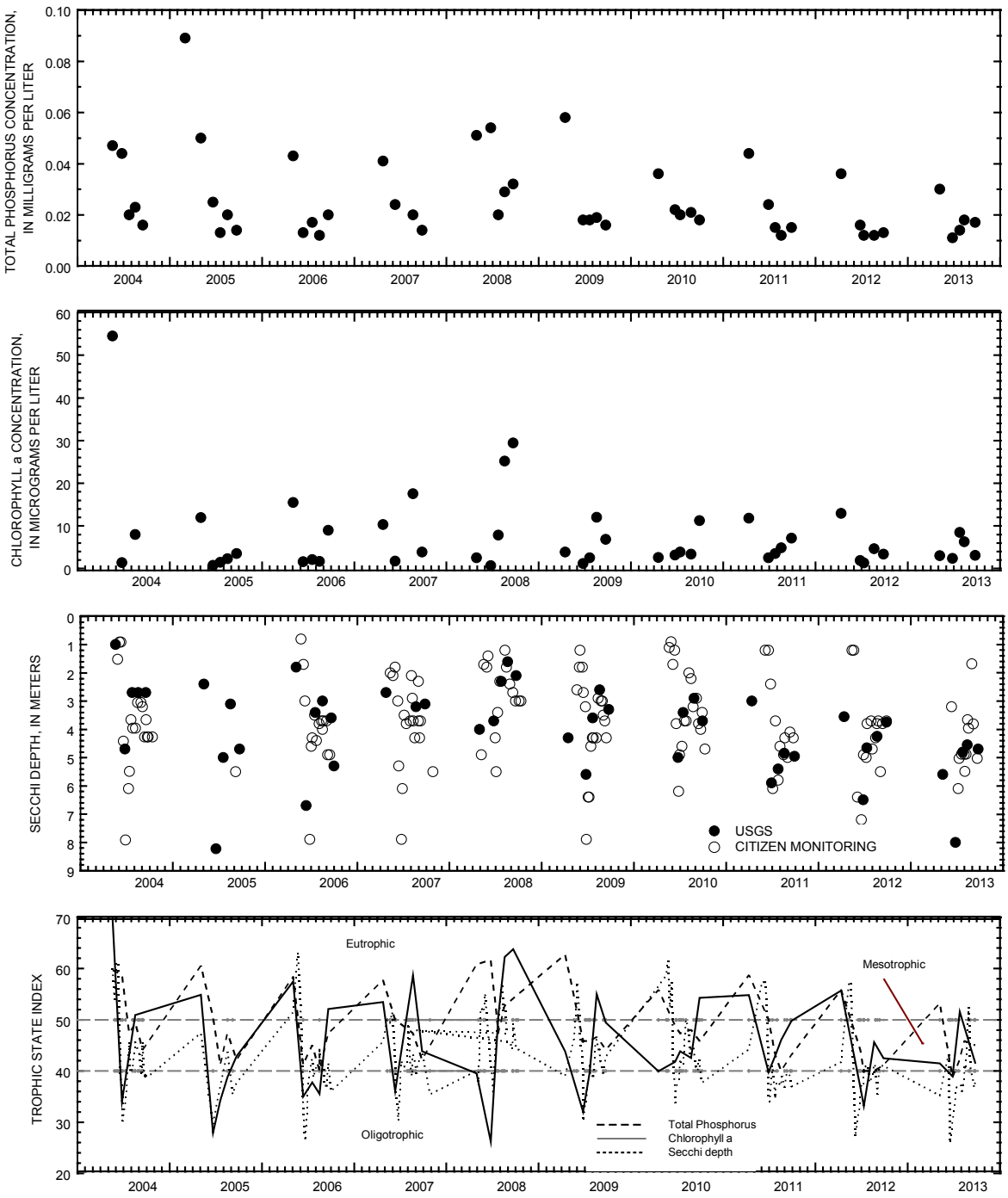
WATER-QUALITY DATA, MAY 7 TO SEPTEMBER 25, 2013
(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro-matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)
AUG								
*03...	5.49	.10	23.3	--	--	--	--	--
*08...	4.88	.10	23.3	--	--	--	--	--
13...	4.55	--	--	--	--	--	--	--
13...	--	.50	22.9	500	8.8	9.1	6.28	.018
13...	--	32.0	5.2	517	8.0	8.4	--	.070
*14...	3.66	.10	23.9	--	--	--	--	--
*17...	3.96	.10	30.0	--	--	--	--	--
*31...	1.68	.10	25.0	--	--	--	--	--
SEP								
*06...	3.81	.10	25.6	--	--	--	--	--
*22...	5.03	.10	18.9	--	--	--	--	--
25...	4.70	--	--	--	--	--	--	--
25...	--	.50	19.0	494	8.7	9.1	3.06	.017
25...	--	31.0	5.3	522	8.0	6.8	--	.061

434928088570000 GREEN LAKE AT EAST END NEAR GREEN LAKE, WI

LAKE-DEPTH PROFILES, MAY 7 TO SEPTEMBER 25, 2013





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

05401063 LAKE HURON NEAR PLAINFIELD, WI

LOCATION.--Lat 44°11'44.3", long 89°25'02.9" referenced to North American Datum of 1983, in NW ¼ SE ¼ NW ¼ sec.22, T.20 N., R.9 E., Waushara County, WI, Hydrologic Unit 07070003.

DRAINAGE AREA.--8.34 mi².

PERIOD OF RECORD.--May 2010 to current year. Working records from May 1978 to April 2010 in USGS database.

GAGE.--Water-stage recorder installed November 15, 2012. Local datum used. Prior to November 15, 2012 staff gage was read periodically by observer.

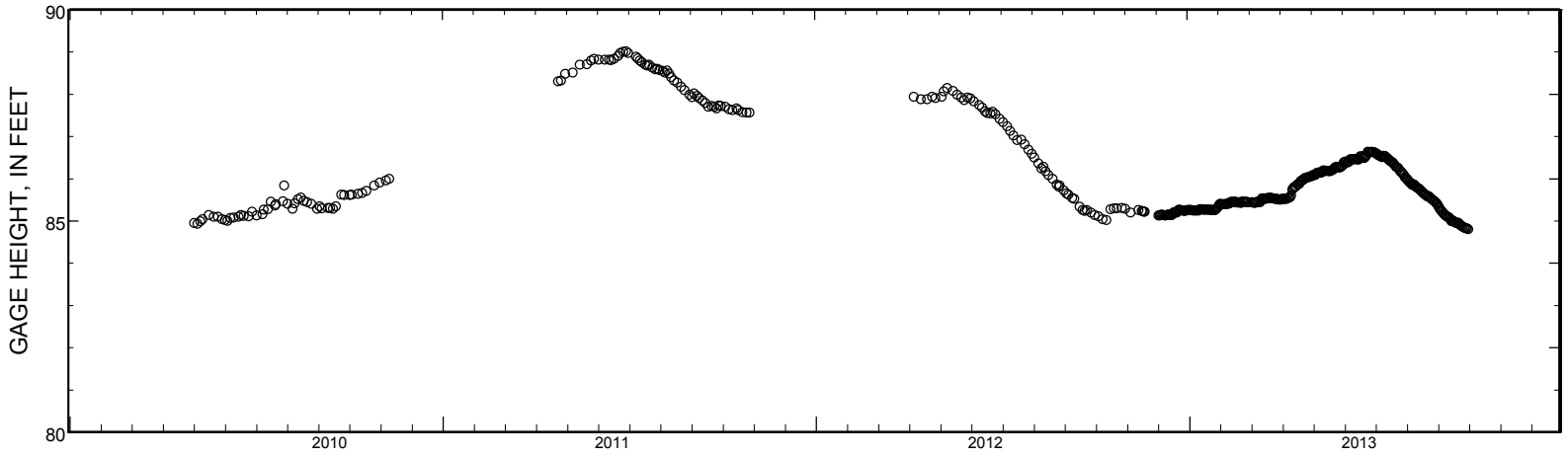
COOPERATION.--Wisconsin Department of Natural Resources.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height, 89.01 ft., June 28, 2011; miminum daily gage height, 84.80 ft., Sept. 30, 2013.

EXTREMES FOR CURRENT YEAR.--Maximum daily gage height, 86.64 ft., Jun. 23, 2013; miminum daily gage height, 84.80 ft., Sept. 30, 2013.

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	---	---	85.13	85.26	85.39	85.44	85.52	86.08	86.40	86.60	85.98	85.34
2	---	---	85.13	85.26	85.39	85.43	85.52	86.08	86.39	86.58	85.95	85.31
3	85.11	---	85.14	85.26	85.39	85.43	85.52	86.11	86.38	86.56	85.93	85.27
4	---	85.20	85.15	85.25	85.39	85.42	85.52	86.13	86.39	86.55	85.90	85.24
5	---	---	85.14	85.25	85.39	85.43	85.52	86.14	86.41	86.53	85.88	85.21
6	---	---	85.14	85.25	85.39	85.45	85.54	86.14	86.46	86.52	85.85	85.18
7	85.04	---	85.13	85.25	85.40	85.44	85.55	86.14	86.46	86.51	85.87	85.15
8	---	---	85.13	85.25	85.41	85.44	85.56	86.14	86.46	86.54	85.85	85.13
9	---	---	85.14	85.25	85.40	85.44	85.60	86.15	86.46	86.54	85.82	85.11
10	---	---	85.15	85.25	85.42	85.48	85.74	86.19	86.46	86.53	85.80	85.09
11	85.02	---	85.15	85.28	85.45	85.53	85.77	86.19	86.46	86.50	85.78	85.09
12	---	85.26	85.15	85.28	85.44	85.53	85.80	86.18	86.46	86.48	85.77	85.06
13	---	---	85.14	85.28	85.44	85.53	85.81	86.18	86.46	86.46	85.75	85.02
14	---	---	85.14	85.27	85.45	85.52	85.82	86.18	86.45	86.43	85.72	84.99
15	85.28	85.24	85.17	85.27	85.45	85.52	85.86	86.18	86.49	86.41	85.70	85.01
16	---	85.23	85.21	85.27	85.44	85.54	85.87	86.17	86.53	86.40	85.67	84.99
17	---	85.22	85.20	85.27	85.43	85.53	85.88	86.18	86.53	86.38	85.65	84.97
18	85.30	85.22	85.20	85.27	85.43	85.54	85.93	86.19	86.51	86.35	85.63	84.95
19	---	---	85.20	85.27	85.44	85.55	85.96	86.20	86.50	86.33	85.61	84.95
20	---	---	85.25	85.27	85.43	85.54	85.96	86.22	86.49	86.29	85.58	84.96
21	85.30	---	85.27	85.27	85.42	85.53	85.98	86.25	86.53	86.27	85.59	84.94
22	---	---	85.26	85.26	85.45	85.53	86.01	86.27	86.56	86.26	85.58	84.91
23	---	---	85.26	85.26	85.46	85.52	86.02	86.28	86.64	86.23	85.56	84.89
24	---	---	85.25	85.26	85.45	85.52	86.03	86.27	86.63	86.19	85.53	84.87
25	---	---	85.25	85.26	85.45	85.52	86.03	86.27	86.63	86.16	85.51	84.86
26	85.31	---	85.24	85.26	85.44	85.51	86.04	86.26	86.63	86.14	85.49	84.84
27	---	---	85.24	85.28	85.44	85.51	86.05	86.27	86.64	86.11	85.47	84.83
28	---	---	85.25	85.31	85.44	85.50	86.06	86.30	86.63	86.08	85.45	84.82
29	85.29	---	85.26	85.34	---	85.50	86.06	86.31	86.63	86.04	85.42	84.82
30	---	---	85.26	85.38	---	85.51	86.08	86.38	86.62	86.02	85.40	84.80
31	---	---	85.26	85.40	---	85.52	---	86.40	---	86.00	85.37	---
Mean	---	---	85.19	85.28	85.43	85.50	85.82	86.21	86.51	86.35	85.68	85.02
Max	---	---	85.27	85.40	85.46	85.55	86.08	86.40	86.64	86.60	85.98	85.34
Min	---	---	85.13	85.25	85.39	85.42	85.52	86.08	86.38	86.00	85.37	84.80



Stage hydrograph for Lake Huron near Plainfield, 2010-2013.

425715089164700 LAKE KEGONSA AT BARBER DRIVE NEAR STOUGHTON, WI

LOCATION.--Lat 42°57′15″, long 89°16′47″ referenced to North American Datum of 1927, in SW ¼ NE ¼ NE ¼ sec.26, T.6 N., R.10 E., Dane County, WI, Hydrologic Unit 07090001, on downstream side of bridge on Barber Drive, 3.5 mi northwest of Stoughton.

SURFACE AREA.--1.05 mi^2.

DRAINAGE AREA.--386 mi^2.

PERIOD OF RECORD.--October 2003 to current year.

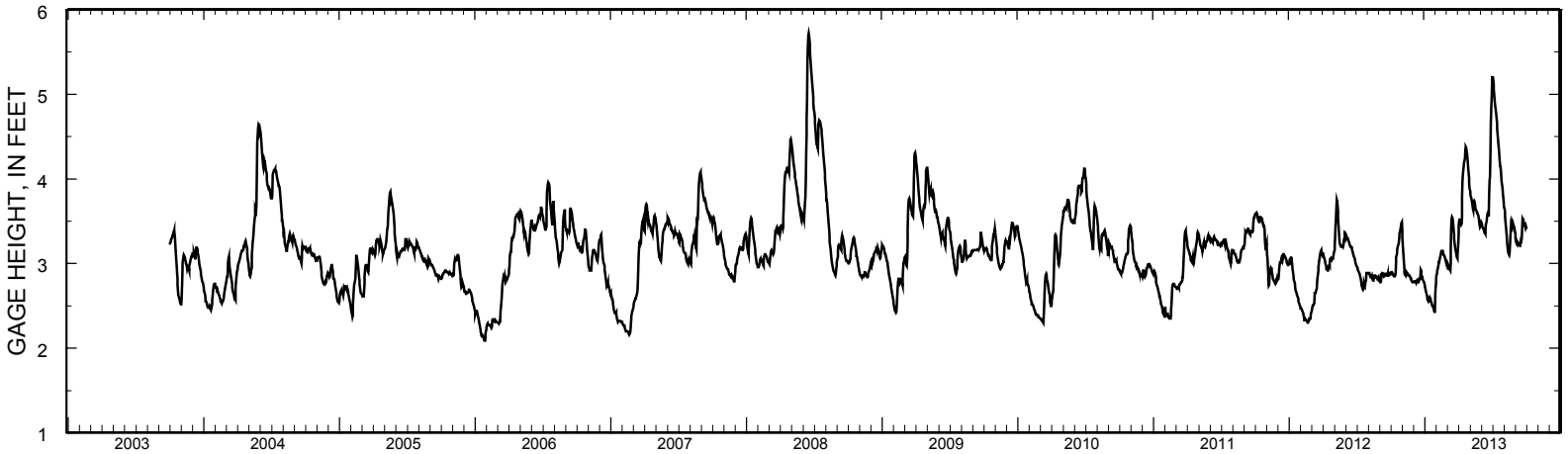
GAGE.--Water-stage recorder. Datum of gage is 840.00 ft above sea level (levels from Wisconsin Department of Transportation benchmark).

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 5.73 ft, June 16, 2008; minimum observed, 2.07 ft, Jan.27, 2006.

EXTREMES FOR CURRENT YEAR.--Maximum gage height observed, 5.20 ft, June 30 and July 1; minimum observed, 2.43 ft, Jan. 27 and 28.

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	2.89	3.31	2.78	2.72	2.83	3.01	3.44	3.85	3.48	5.20	3.66	3.30
2	2.90	3.23	2.79	2.71	2.87	2.99	3.50	3.81	3.46	5.16	3.65	3.27
3	2.90	3.15	2.79	2.68	2.88	2.97	3.52	3.79	3.44	5.11	3.61	3.25
4	2.89	3.08	2.79	2.66	2.93	2.94	3.52	3.78	3.43	5.06	3.56	3.24
5	2.88	3.00	2.79	2.64	2.94	2.94	3.51	3.75	3.42	5.00	3.50	3.25
6	2.87	2.94	2.78	2.62	2.97	2.95	3.48	3.72	3.41	4.94	3.44	3.23
7	2.87	2.89	2.78	2.60	2.99	2.93	3.46	3.69	3.40	4.88	3.39	3.23
8	2.86	2.87	2.77	2.58	3.03	2.92	3.47	3.65	3.38	4.84	3.33	3.24
9	2.85	2.87	2.79	2.57	3.02	3.00	3.54	3.63	3.36	4.80	3.25	3.22
10	2.85	2.86	2.80	2.56	3.03	3.18	3.78	3.73	3.36	4.76	3.20	3.22
11	2.85	2.88	2.79	2.58	3.07	3.42	3.97	3.73	3.35	4.71	3.15	3.23
12	2.86	2.90	2.78	2.59	3.08	3.52	4.05	3.74	3.36	4.66	3.13	3.23
13	2.89	2.89	2.78	2.60	3.11	3.55	4.10	3.73	3.46	4.60	3.13	3.22
14	3.01	2.88	2.78	2.58	3.14	3.54	4.15	3.70	3.48	4.54	3.11	3.20
15	3.08	2.88	2.80	2.59	3.15	3.51	4.20	3.66	3.50	4.48	3.10	3.25
16	3.09	2.87	2.82	2.58	3.15	3.46	4.22	3.64	3.55	4.42	3.13	3.28
17	3.11	2.86	2.82	2.57	3.15	3.39	4.24	3.63	3.59	4.37	3.23	3.27
18	3.18	2.86	2.82	2.55	3.14	3.34	4.35	3.62	3.60	4.31	3.33	3.29
19	3.20	2.86	2.82	2.54	3.14	3.30	4.36	3.61	3.58	4.23	3.42	3.40
20	3.22	2.86	2.93	2.51	3.11	3.25	4.38	3.60	3.57	4.17	3.39	3.53
21	3.23	2.85	2.92	2.50	3.10	3.21	4.37	3.59	3.56	4.14	3.39	3.52
22	3.27	2.84	2.86	2.50	3.10	3.17	4.33	3.58	3.83	4.15	3.46	3.52
23	3.32	2.82	2.84	2.49	3.09	3.15	4.30	3.57	3.98	4.10	3.51	3.50
24	3.35	2.82	2.84	2.47	3.07	3.12	4.25	3.54	4.03	4.03	3.50	3.49
25	3.37	2.81	2.83	2.45	3.05	3.09	4.18	3.50	4.27	3.96	3.47	3.47
26	3.39	2.80	2.81	2.44	3.03	3.07	4.11	3.46	4.66	3.93	3.46	3.46
27	3.42	2.79	2.80	2.43	3.04	3.06	4.06	3.43	4.83	3.89	3.44	3.44
28	3.45	2.78	2.79	2.43	3.04	3.09	4.01	3.44	4.95	3.82	3.43	3.42
29	3.48	2.78	2.78	2.65	---	3.15	3.95	3.46	5.12	3.77	3.40	3.44
30	3.49	2.78	2.76	2.73	---	3.24	3.89	3.47	5.20	3.72	3.37	3.42
31	3.39	---	2.74	2.78	---	3.35	---	3.49	---	3.69	3.34	---
Mean	3.11	2.90	2.81	2.58	3.04	3.19	3.96	3.63	3.79	4.43	3.37	3.33
Max	3.49	3.31	2.93	2.78	3.15	3.55	4.38	3.85	5.20	5.20	3.66	3.53
Min	2.85	2.78	2.74	2.43	2.83	2.92	3.44	3.43	3.35	3.69	3.10	3.20



Stage hydrograph for Lake Kegonsa, 1993-2013.

05427235 LAKE KOSHKONONG NEAR NEWVILLE, WI

LOCATION.--Lat 42°51′27″, long 88°56′27″ referenced to North American Datum of 1927, in NW ¼ NE ¼ sec.34, T.5 N., R.13 E., Jefferson County, WI, Hydrologic Unit 07090001, 80 ft east of Pottawatomi Trail Bridge at Bingham Point Estates, and 4.5 mi northeast of Newville.

SURFACE AREA.—16.34 $mi^{2.}$

DRAINAGE AREA.--2,560 mi^2.

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

GAGE.--Water-stage recorder. Datum of gage is 769.77 ft above NAVD of 1988 (Wisconsin Department of Transportation bench mark).

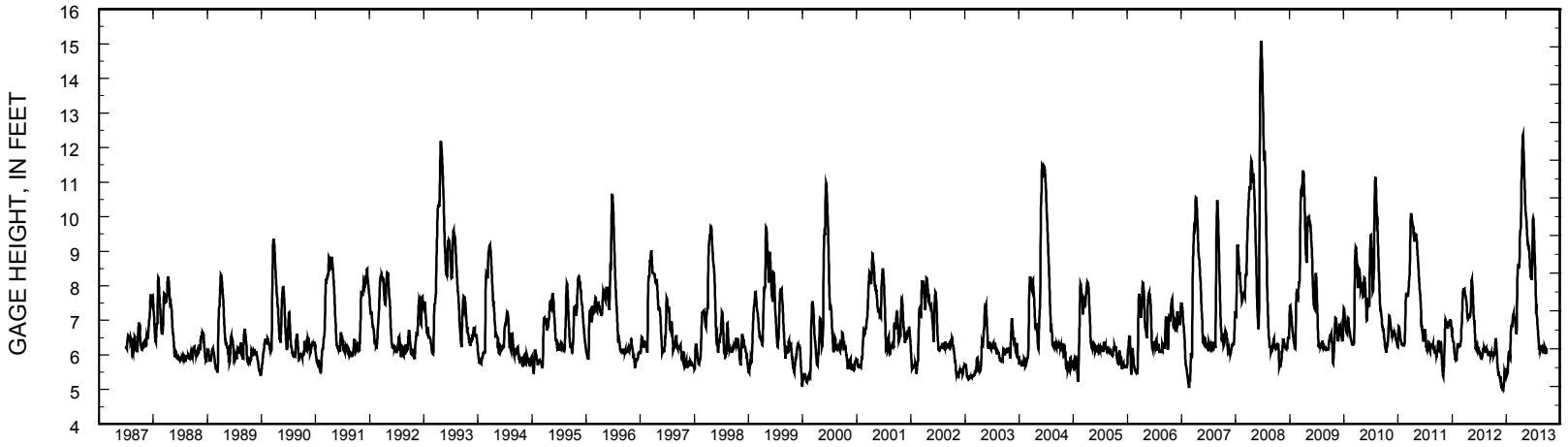
REMARKS.--Lake level regulated by dam at Indianford. Gage-height telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum recorded gage height, 15.13 ft, June 21, 22, 2008; minimum recorded, 4.98 ft, Dec. 6 and 9, 2012.

EXTREMES FOR CURRENT YEAR.--Maximum recorded gage height, 12.38 ft, Apr. 23; minimum recorded gage height, 4.98 ft, Dec. 6 and 9, 2012.

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	5.99	5.84	5.05	5.58	6.56	6.96	9.21	11.34	9.16	9.96	6.75	6.20
2	5.99	5.78	5.06	5.57	6.67	6.91	9.38	11.17	9.14	9.91	6.70	6.18
3	5.99	5.72	5.05	5.56	6.74	6.87	9.50	11.01	9.08	9.84	6.65	6.15
4	6.00	5.68	5.08	5.55	6.80	6.82	9.57	10.85	9.03	9.75	6.57	6.14
5	6.01	5.63	5.04	5.53	6.83	6.79	9.62	10.71	8.96	9.63	6.50	6.12
6	6.00	5.59	5.02	5.52	6.84	6.76	9.63	10.56	8.90	9.51	6.45	6.10
7	5.99	5.57	5.04	5.50	6.85	6.70	9.64	10.42	8.83	9.37	6.41	6.09
8	5.96	5.52	5.03	5.48	6.86	6.65	9.69	10.27	8.74	9.25	6.33	6.06
9	6.00	5.49	5.04	5.46	6.83	6.60	9.78	10.15	8.64	9.13	6.27	6.05
10	6.03	5.42	5.09	5.45	6.81	6.63	9.98	10.15	8.56	9.02	6.22	6.08
11	6.02	5.42	5.07	5.49	6.86	6.78	10.31	10.11	8.46	8.85	6.24	6.12
12	6.01	5.51	5.06	5.55	6.90	7.06	10.67	10.09	8.39	8.69	6.28	6.16
13	6.04	5.44	5.08	5.67	6.95	7.39	10.97	10.04	8.42	8.53	6.23	6.14
14	6.15	5.41	5.11	5.77	7.00	7.73	11.19	9.99	8.34	8.38	6.17	6.14
15	6.18	5.41	5.13	5.87	7.06	8.01	11.38	9.94	8.30	8.24	6.13	6.20
16	6.17	5.41	5.20	5.94	7.10	8.20	11.53	9.86	8.31	8.09	6.15	6.23
17	6.22	5.39	5.22	6.01	7.13	8.33	11.63	9.78	8.30	7.94	6.16	6.24
18	6.29	5.36	5.24	6.06	7.15	8.44	11.88	9.71	8.27	7.76	6.16	6.25
19	6.35	5.35	5.27	6.10	7.19	8.52	12.08	9.62	8.23	7.59	6.16	6.21
20	6.38	5.32	5.49	6.12	7.19	8.56	12.24	9.55	8.19	7.44	6.15	6.24
21	6.39	5.29	5.51	6.11	7.18	8.57	12.31	9.46	8.16	7.33	6.14	6.20
22	6.45	5.27	5.47	6.10	7.17	8.56	12.35	9.40	8.31	7.35	6.19	6.15
23	6.49	5.38	5.49	6.07	7.15	8.55	12.35	9.37	8.37	7.27	6.23	6.12
24	6.40	5.22	5.51	6.03	7.12	8.54	12.30	9.30	8.42	7.20	6.23	6.10
25	6.34	5.20	5.53	5.99	7.09	8.52	12.21	9.25	8.67	7.13	6.24	6.09
26	6.29	5.18	5.55	5.94	7.05	8.51	12.09	9.20	9.11	7.09	6.24	6.07
27	6.21	5.14	5.57	5.90	7.04	8.54	11.98	9.15	9.53	7.07	6.25	6.05
28	6.12	5.11	5.58	5.88	7.00	8.59	11.84	9.17	9.76	6.99	6.24	6.04
29	6.05	5.09	5.59	6.02	---	8.68	11.68	9.18	9.90	6.91	6.23	6.12
30	6.03	5.07	5.59	6.24	---	8.83	11.50	9.15	9.97	6.82	6.22	6.16
31	5.93	---	5.59	6.42	---	9.01	---	9.17	---	6.79	6.20	---
Mean	6.14	5.41	5.27	5.82	6.97	7.79	11.02	9.91	8.75	8.22	6.29	6.14
Max	6.49	5.84	5.59	6.42	7.19	9.01	12.35	11.34	9.97	9.96	6.75	6.25



Stage hydrograph for Lake Koshkonong, 1987-2013.

441257089071500 LONG LAKE NEAR SAXEVILLE, WI

LOCATION.--Lat 44°12'56.6", long 89°07'14.6" referenced to North American Datum of 1983, in SE ¼ SW ¼ sec.7, T.20 N., R.12 E., Waushara County, WI, Hydrologic Unit 04030202.

DRAINAGE AREA.--

PERIOD OF RECORD.--April 2010 to current year.

GAGE.--A staff gage is periodically read by an observer, and reported in local datum.

COOPERATION.--Wisconsin Department of Natural Resources.

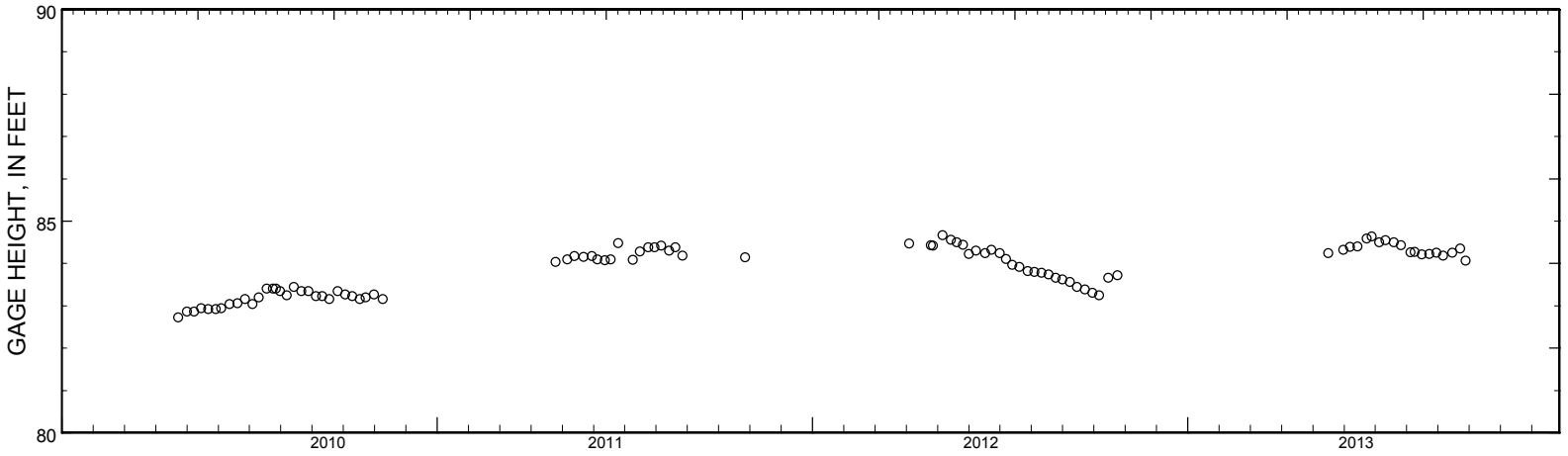
REMARKS.--Lake has no outlet.

EXTREMES FOR PERIOD OF RECORD.--Maximum observed gage height, 84.66 ft May 6, 2012; miminum observed gage height, 82.72 ft Apr. 23, 2010.

EXTREMES FOR CURRENT YEAR.--Maximum observed gage height, 84.64 ft Jun 28, 2013; miminum observed gage height, 83.24 ft Oct. 6, 2012.

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	---	---	---	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---	84.50	84.26	---
6	83.24	---	---	---	---	---	---	---	---	---	---	84.18
7	---	---	---	---	---	---	---	---	84.39	---	---	---
8	---	---	---	---	---	---	---	---	---	---	---	---
9	---	---	---	---	---	---	---	---	---	---	84.27	---
10	---	---	---	---	---	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---	---	---	84.55	---	---
12	---	---	---	---	---	---	---	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---	---	84.40	---	---	---
15	83.66	---	---	---	---	---	---	---	---	---	---	84.25
16	---	---	---	---	---	---	---	84.24	---	---	84.21	---
17	---	---	---	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---	---	---	84.50	---	---
20	---	---	---	---	---	---	---	---	---	---	---	---
21	---	---	---	---	---	---	---	---	---	---	---	---
22	---	---	---	---	---	---	---	---	---	---	---	---
23	---	---	---	---	---	---	---	---	84.59	---	84.22	84.35
24	83.72	---	---	---	---	---	---	---	---	---	---	---
25	---	---	---	---	---	---	---	---	---	---	---	---
26	---	---	---	---	---	---	---	---	---	84.43	---	---
27	---	---	---	---	---	---	---	---	---	---	---	---
28	---	---	---	---	---	---	---	---	84.64	---	---	84.06
29	---	---	---	---	---	---	---	---	---	---	---	---
30	---	---	---	---	---	---	---	---	---	---	84.25	---
31	---	---	---	---	---	---	---	84.32	---	---	---	---
Mean	---	---	---	---	---	---	---	---	---	---	---	---
Max	---	---	---	---	---	---	---	---	---	---	---	---
Min	---	---	---	---	---	---	---	---	---	---	---	---



Stage hydrograph for Long Lake, 2010-2013.

05428000 LAKE MENDOTA AT MADISON, WI

LOCATION.--Lat 43°05′42″, long 89°22′12″ referenced to North American Datum of 1927, in NW ¼ SE ¼ sec.12, T.7 N., R.9 E., Dane County, WI, Hydrologic Unit 07090001, in county boat house at dam at outlet, in Madison.

SURFACE AREA.—15.2 mi^2.

DRAINAGE AREA.--233 mi² of which 36.6 mi² probably is noncontributing.

PERIOD OF RECORD.--January 1916 to January 1985 (incomplete), February 1985 to current year.

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

GAGE.--Water-stage recorder. Datum of gage is 840.00 ft above NGVD of 1929, or 5.60 ft below City of Madison datum. Prior to Oct. 1, 1979, gage datum was 847.82 ft; prior to Nov. 15, 1971, nonrecording gage at same site at the higher datum.

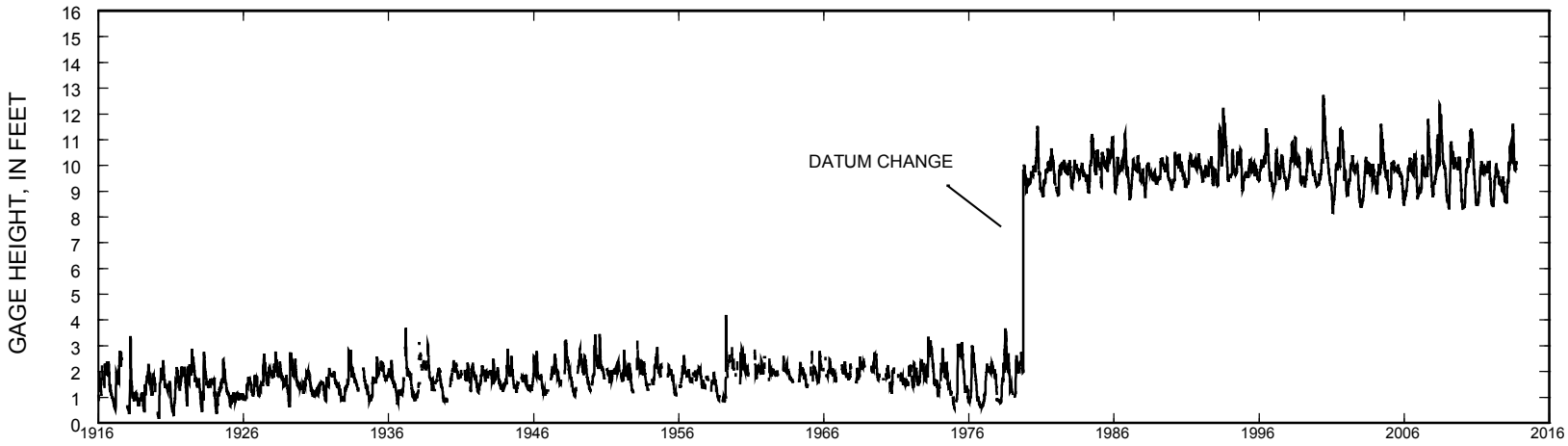
REMARKS.--Lake level regulated by concrete dam with two 12-foot gates and 20-foot lock at outlet. Gage-height telemeter at station.

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

EXTREMES FOR CURRENT YEAR.--Maximum recorded gage height, 11.60 ft, June 29; minimum recorded, 8.50 ft, Jan. 27.

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	9.10	9.48	8.81	8.64	9.06	9.38	10.09	10.37	10.34	11.56	10.16	9.94
2	9.10	9.45	8.79	8.62	9.09	9.38	10.11	10.33	10.34	11.53	10.12	9.93
3	9.10	9.43	8.77	8.62	9.10	9.37	10.11	10.32	10.30	11.51	10.09	9.92
4	9.10	9.41	8.76	8.61	9.12	9.37	10.09	10.32	10.27	11.48	10.06	9.91
5	9.08	9.39	8.72	8.59	9.12	9.39	10.07	10.29	10.27	11.44	10.02	9.89
6	9.06	9.37	8.69	8.59	9.12	9.40	10.04	10.26	10.28	11.41	10.00	9.88
7	9.03	9.37	8.67	8.58	9.14	9.39	10.01	10.22	10.27	11.37	9.98	9.88
8	9.00	9.34	8.64	8.57	9.17	9.39	10.03	10.18	10.24	11.36	9.94	9.87
9	9.00	9.33	8.63	8.56	9.17	9.39	10.11	10.16	10.21	11.35	9.91	9.87
10	9.01	9.31	8.64	8.56	9.19	9.50	10.29	10.27	10.23	11.35	9.89	9.88
11	8.98	9.33	8.61	8.58	9.25	9.72	10.43	10.30	10.22	11.31	9.87	9.89
12	8.96	9.38	8.58	8.60	9.28	9.93	10.51	10.28	10.22	11.26	9.89	9.89
13	9.01	9.34	8.57	8.61	9.31	10.05	10.51	10.24	10.33	11.20	9.87	9.85
14	9.17	9.30	8.57	8.61	9.33	10.11	10.51	10.21	10.32	11.15	9.84	9.83
15	9.27	9.27	8.58	8.60	9.34	10.14	10.54	10.20	10.32	11.10	9.83	9.86
16	9.27	9.25	8.62	8.60	9.34	10.14	10.54	10.16	10.33	11.06	9.83	9.88
17	9.30	9.22	8.61	8.59	9.33	10.12	10.55	10.17	10.31	11.02	9.82	9.86
18	9.35	9.19	8.61	8.59	9.34	10.10	10.71	10.19	10.27	10.96	9.81	9.86
19	9.38	9.17	8.61	8.58	9.35	10.08	10.77	10.18	10.24	10.89	9.81	9.98
20	9.40	9.15	8.75	8.57	9.34	10.04	10.76	10.23	10.20	10.82	9.80	10.15
21	9.40	9.11	8.80	8.56	9.34	10.01	10.72	10.24	10.20	10.77	9.80	10.16
22	9.43	9.09	8.74	8.55	9.35	9.98	10.70	10.23	10.27	10.78	9.88	10.15
23	9.49	9.11	8.73	8.55	9.35	9.94	10.68	10.24	10.47	10.74	9.94	10.13
24	9.51	9.01	8.72	8.54	9.34	9.91	10.64	10.21	10.58	10.66	9.94	10.12
25	9.55	8.98	8.70	8.53	9.34	9.87	10.60	10.18	10.79	10.59	9.94	10.12
26	9.58	8.95	8.69	8.52	9.34	9.83	10.55	10.14	11.12	10.54	9.94	10.11
27	9.56	8.91	8.68	8.52	9.38	9.80	10.51	10.12	11.45	10.49	9.95	10.10
28	9.54	8.88	8.67	8.53	9.39	9.81	10.48	10.18	11.54	10.41	9.95	10.09
29	9.53	8.85	8.68	8.69	---	9.85	10.44	10.21	11.58	10.33	9.95	10.11
30	9.53	8.83	8.66	8.91	---	9.93	10.40	10.27	11.58	10.26	9.95	10.09
31	9.50	---	8.65	9.02	---	10.02	---	10.33	---	10.22	9.94	---
Mean	9.27	9.21	8.68	8.61	9.26	9.79	10.42	10.23	10.50	11.00	9.93	9.97
Max	9.58	9.48	8.81	9.02	9.39	10.14	10.77	10.37	11.58	11.56	10.16	10.16
Min	8.96	8.83	8.57	8.52	9.06	9.37	10.01	10.12	10.20	10.22	9.80	9.83



Stage hydrograph for Lake Mendota, 1916-2013.

430251088284700 MIDDLE GENESEE LAKE, AT GENESEE LAKE ROAD, NEAR OCONOMOWOC, WI

LOCATION.--Lat 43°02'51", long 88°28'47", in SW ¼ SW ¼ SW ¼ sec.22, T. 7 N., R.17 E., Waukesha County, Hydrologic Unit 07090001, at the southwest side of the lake about 2 miles south of Oconomowoc.

SURFACE AREA.--0.17 mi^2.

DRAINAGE AREA.--Unknown.

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

GAGE.--Staff gage. Local observer, Tom Schubring provided most readings of gage. Datum of gage is about 0.0 ft above NGVD of 1929.

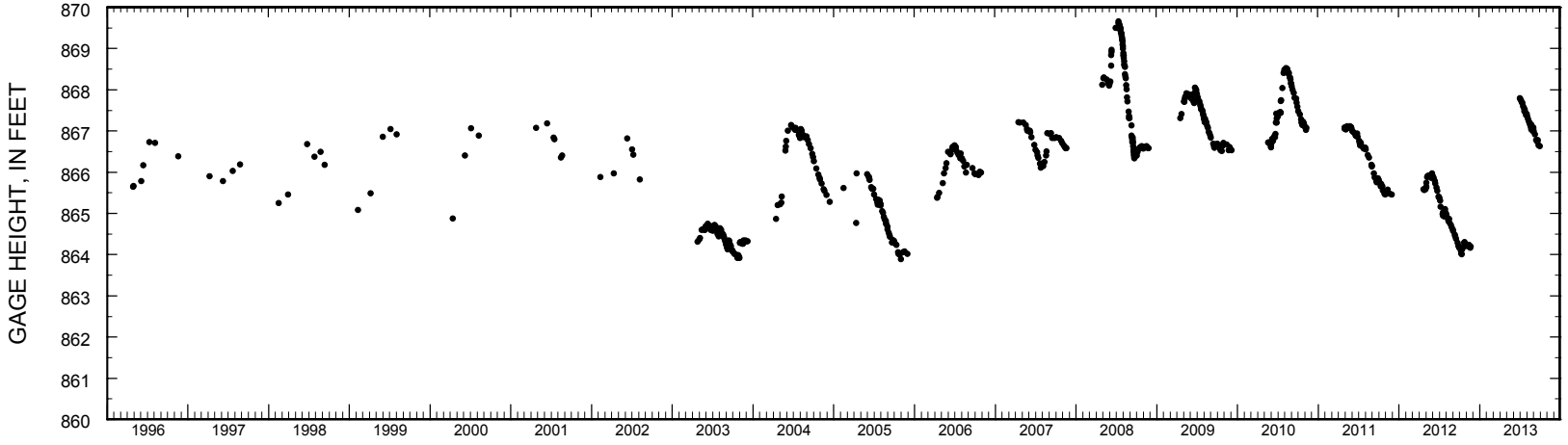
EXTREMES FOR THE PERIOD OF RECORD.--Maximum observed gage height, 869.65 ft, July 12, 2008; minimum observed, 863.88 ft, Oct. 31, 2005.

EXTREMES FOR CURRENT YEAR.--Maximum observed gage height, 867.79 ft, July 1; minimum observed, 864.00 ft, Oct. 12.

GAGE HEIGHT, FT

WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013

Date	Gage Height, ft	Date	Gage Height, ft	Date	Gage Height, ft
October 1	864.16	July 1	867.79	August 16	867.15
7	864.08	3	867.77	19	867.09
10	864.02	6	867.73	21	867.03
12	864.00	9	867.69	22	867.15
14	864.12	12	867.67	26	867.07
15	864.16	16	867.59	29	866.99
18	864.18	19	867.55	31	867.08
23	864.28	21	867.47	September 1	867.05
25	864.30	22	867.51	3	866.99
31	864.24	24	867.45	7	866.91
November 1	864.22	29	867.39	14	866.77
6	864.20	31	867.41	18	866.73
12	864.22	August 3	867.35	20	866.77
15	864.23	7	867.29	25	866.65
20	864.16	10	867.23	30	866.63
21	864.19	14	867.19		



Stage hydrograph for Middle Genesee Lake, 1996-2013.

05429000 LAKE MONONA AT MADISON, WI

LOCATION.--Lat 43°03′48″, long 89°23′49″ referenced to North American Datum of 1927, in SE ¼ SW ¼ sec.23, T.7 N., R.9 E., Dane County, WI, Hydrologic Unit 07090001, in Brittingham Park, in Madison.

SURFACE AREA.--5.3 mi^2.

DRAINAGE AREA.--279 mi² of which 36.6 mi² probably is noncontributing.

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 NGVD of 1929, or 5.60 ft below City of Madison datum. Prior to Oct. 1, 1979, datum 843.61 ft; prior to Nov. 15, 1971, nonrecording gage at same site.

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

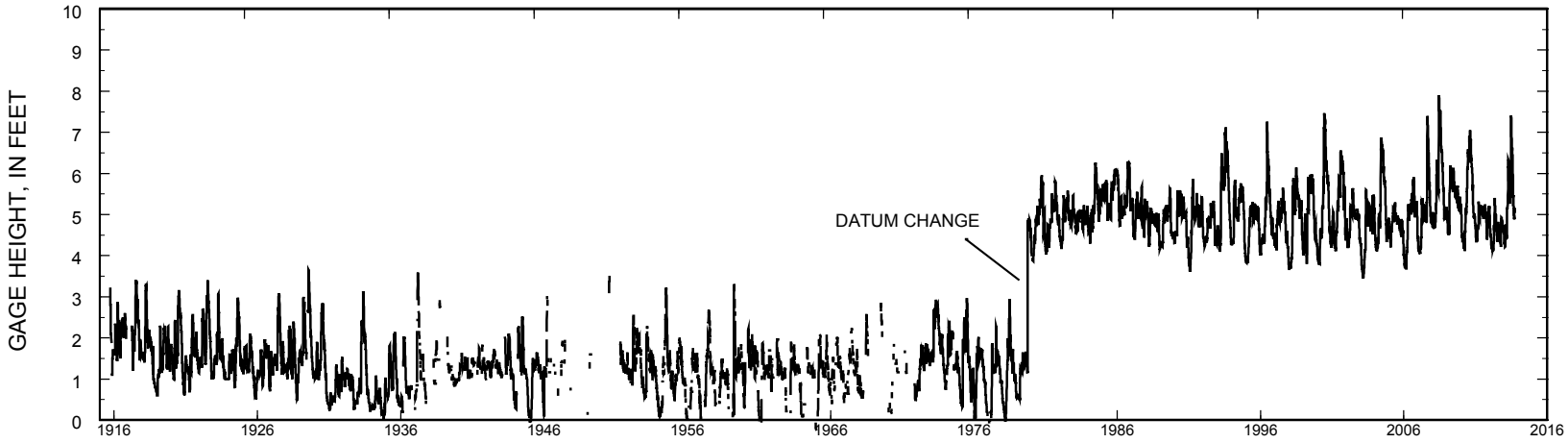
EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 7.92 ft, June 15, 2008; minimum observed, 3.22 ft, Jan. 20, 1965, current datum.

EXTREMES FOR CURRENT YEAR.--Maximum recorded gage height, 7.41 ft, June 29; minimum recorded, 4.21 ft, Oct. 11, 12, 2012 and Jan. 26, 27, 2013.

05429000 LAKE MONONA AT MADISON, WI

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	4.33	4.77	4.70	4.42	4.75	4.49	5.35	5.75	5.53	7.35	6.45	5.22
2	4.33	4.77	4.70	4.40	4.74	4.46	5.37	5.70	5.48	7.29	6.42	5.19
3	4.33	4.78	4.70	4.39	4.71	4.45	5.37	5.73	5.45	7.22	6.35	5.16
4	4.32	4.79	4.69	4.37	4.69	4.43	5.38	5.74	5.44	7.16	6.29	5.12
5	4.29	4.79	4.68	4.35	4.67	4.45	5.39	5.71	5.43	7.09	6.24	5.12
6	4.26	4.80	4.69	4.34	4.64	4.45	5.41	5.68	5.42	7.03	6.20	5.09
7	4.25	4.81	4.68	4.32	4.64	4.44	5.41	5.65	5.40	6.97	6.16	5.06
8	4.24	4.80	4.68	4.30	4.64	4.42	5.46	5.62	5.39	6.95	6.12	5.04
9	4.24	4.79	4.70	4.28	4.62	4.43	5.62	5.60	5.40	6.92	6.07	5.01
10	4.23	4.77	4.71	4.27	4.64	4.60	5.92	5.74	5.43	6.89	6.01	4.99
11	4.21	4.79	4.69	4.30	4.75	4.85	6.11	5.71	5.43	6.84	5.96	4.98
12	4.21	4.80	4.66	4.33	4.75	4.96	6.16	5.65	5.48	6.80	5.93	4.96
13	4.30	4.78	4.63	4.33	4.74	5.01	6.14	5.61	5.66	6.75	5.86	4.92
14	4.51	4.79	4.60	4.32	4.73	5.04	6.14	5.57	5.70	6.71	5.79	4.88
15	4.66	4.79	4.61	4.32	4.70	5.07	6.16	5.52	5.72	6.68	5.73	4.92
16	4.68	4.79	4.61	4.31	4.67	5.11	6.13	5.48	5.74	6.65	5.67	4.92
17	4.70	4.79	4.59	4.29	4.64	5.12	6.15	5.51	5.77	6.62	5.62	4.90
18	4.77	4.79	4.58	4.28	4.63	5.15	6.34	5.48	5.79	6.59	5.56	4.90
19	4.80	4.79	4.56	4.27	4.62	5.16	6.34	5.45	5.79	6.56	5.50	5.00
20	4.79	4.79	4.64	4.26	4.59	5.15	6.31	5.49	5.79	6.55	5.46	5.17
21	4.79	4.79	4.63	4.25	4.57	5.14	6.26	5.45	5.86	6.57	5.41	5.16
22	4.82	4.78	4.64	4.23	4.57	5.14	6.21	5.41	5.99	6.63	5.45	5.14
23	4.89	4.73	4.65	4.23	4.55	5.14	6.14	5.39	6.18	6.62	5.47	5.13
24	4.90	4.72	4.63	4.22	4.52	5.14	6.06	5.34	6.22	6.59	5.43	5.12
25	4.93	4.72	4.60	4.22	4.50	5.14	6.00	5.31	6.53	6.57	5.39	5.11
26	4.93	4.70	4.56	4.21	4.49	5.13	5.95	5.29	6.99	6.57	5.37	5.10
27	4.92	4.69	4.54	4.21	4.51	5.14	5.91	5.27	7.26	6.53	5.33	5.09
28	4.91	4.69	4.52	4.22	4.50	5.15	5.86	5.33	7.35	6.50	5.32	5.08
29	4.88	4.69	4.49	4.44	---	5.19	5.82	5.38	7.41	6.48	5.29	5.09
30	4.83	4.70	4.46	4.70	---	5.25	5.78	5.47	7.40	6.48	5.27	5.07
31	4.79	---	4.45	4.74	---	5.31	---	5.54	---	6.47	5.25	---
Mean	4.58	4.77	4.62	4.33	4.63	4.91	5.89	5.53	5.95	6.76	5.75	5.05
Max	4.93	4.81	4.71	4.74	4.75	5.31	6.34	5.75	7.41	7.35	6.45	5.22
Min	4.21	4.69	4.45	4.21	4.49	4.42	5.35	5.27	5.39	6.47	5.25	4.88



Stage hydrograph for Lake Monona, 1915-2013.

05545000 NORTH LAKE NEAR ELKHORN, WI

LOCATION.--Lat 42°44′38″, long 88°37′45″ referenced to North American Datum of 1927, Walworth County, WI, Hydrologic Unit 07120006.

DRAINAGE AREA.--10.80 mi² of which 10.79 mi² probably is noncontributing.

PERIOD OF RECORD.--May 1937 to current year.

GAGE.--A staff gage is periodically read by an observer, and reported in local datum.

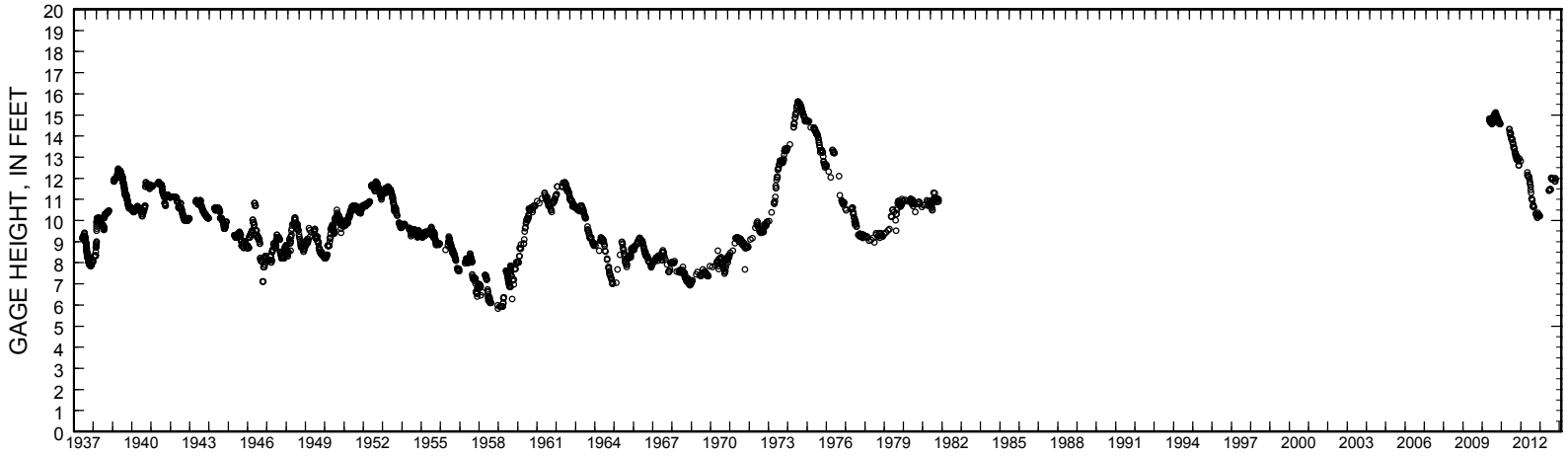
COOPERATION.--Wisconsin Department of Natural Resources.

EXTREMES FOR PERIOD OF RECORD.--Maximum observed gage height, 15.62 ft June 22, 1974; miminum observed gage height, 5.81 ft Dec. 1, 1958.

EXTREMES FOR CURRENT YEAR.--Maximum observed gage height, 12.01 ft Jul. 9, 2013; miminum observed gage height, 10.12 ft Oct. 12, 2012.

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	---	---	---	---	---	---	---	---	---	---	---	---
2	---	10.28	---	---	---	---	---	---	---	11.99	---	---
3	10.17	---	---	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---	---	---	---
6	---	---	---	---	---	---	---	---	---	---	11.97	---
7	---	---	---	---	---	---	---	---	11.46	---	---	---
8	---	---	---	---	---	---	---	---	---	---	---	---
9	---	---	---	---	---	---	---	---	---	12.01	---	---
10	---	---	---	---	---	---	---	---	---	---	---	---
11	---	10.25	---	---	---	---	---	---	11.43	---	---	---
12	10.12	---	---	---	---	---	---	---	---	---	---	11.86
13	---	---	---	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---	---	---	---	---	11.83
15	10.23	---	---	---	---	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---	---	---	11.93	---	---
17	---	---	---	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	---	11.47	---	---	---
19	10.28	---	---	---	---	---	---	---	---	---	---	---
20	---	---	---	---	---	---	---	---	---	---	---	12.00
21	---	10.23	---	---	---	---	---	11.42	---	---	---	---
22	---	---	---	---	---	---	---	11.41	---	---	---	---
23	---	---	---	---	---	---	---	---	---	---	---	---
24	10.36	---	---	---	---	---	---	---	---	11.97	---	---
25	---	---	---	---	---	---	---	---	11.45	---	---	11.96
26	---	---	---	---	---	---	---	---	---	---	---	---
27	---	10.19	---	---	---	---	---	---	---	---	---	---
28	---	---	---	---	---	---	---	11.43	---	---	---	---
29	---	---	---	---	---	---	---	---	---	---	---	---
30	---	---	---	---	---	---	---	---	---	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---
Mean	---	---	---	---	---	---	---	---	---	---	---	---
Max	---	---	---	---	---	---	---	---	---	---	---	---
Min	---	---	---	---	---	---	---	---	---	---	---	---



Stage hydrograph for North Lake, 1937-2013.

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

LOCATION.--Lat 43°05'51", long 88°27'35", in NW ¼ SE ¼ sec.2, T.7 N., R.17 E., Waukesha County, Hydrologic Unit 07090001, at Oconomowoc.

SURFACE AREA.--1.20 mi^2.

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 21 TO AUGUST 28, 2013
(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro-matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Total nitro-gen, water, unfltrd mg/L (00600)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrate + nitrite water, fltrd, mg/L as N (00631)
FEB 2013													
21...	5.4	--	--	--	--	--	--	--	--	--	--	--	--
21...	--	.50	2.2	610	7.8	13.3	--	.011	--	--	--	--	--
21...	--	17.0	2.7	606	7.8	12.2	--	.010	--	--	--	--	--
MAY													
14...	12.0	--	--	--	--	--	--	--	--	--	--	--	--
14...	--	.50	14.5	579	8.3	10.2	.446	.013	<.006	.61	.044	.41	.196
JUN													
28...	6.00	--	--	--	--	--	--	--	--	--	--	--	--
28...	--	.50	24.9	564	8.4	8.4	2.47	.013	--	--	--	--	--
28...	--	18.0	6.5	588	7.8	3.9	--	.036	--	--	--	--	--
JUL													
30...	2.35	--	--	--	--	--	--	--	--	--	--	--	--
30...	--	.50	23.1	562	8.5	9.1	4.81	.010	--	--	--	--	--
30...	--	17.0	6.9	587	7.7	.9	--	.012	--	--	--	--	--
AUG													
28...	1.95	--	--	--	--	--	--	--	--	--	--	--	--
28...	--	.50	26.9	567	8.5	9.1	2.33	.013	--	--	--	--	--
28...	--	18.0	6.8	610	7.5	.2	--	.051	--	--	--	--	--

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

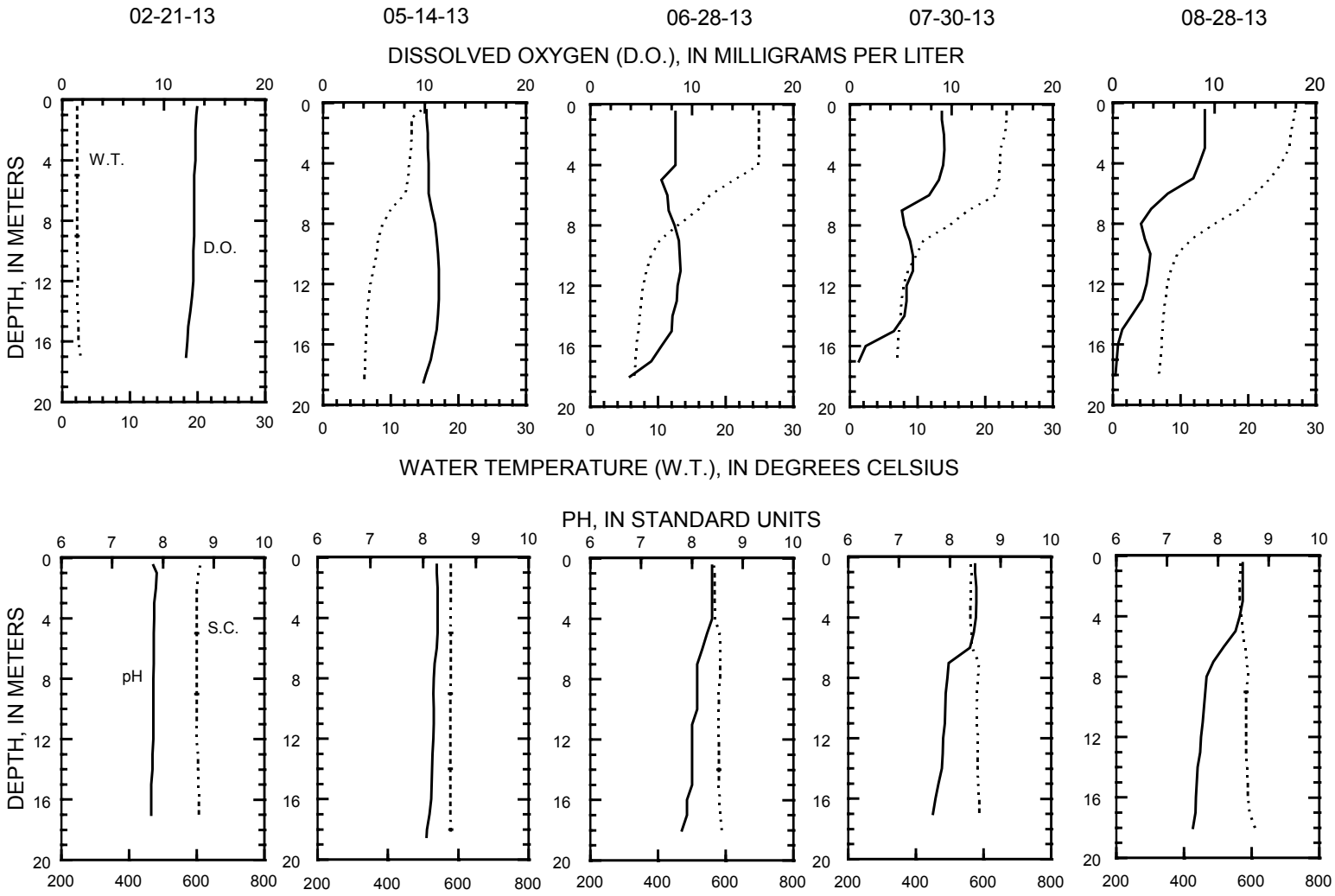
WATER-QUALITY DATA, FEBRUARY 21 TO AUGUST 28, 2013
(Milligrams per liter unless otherwise indicated)

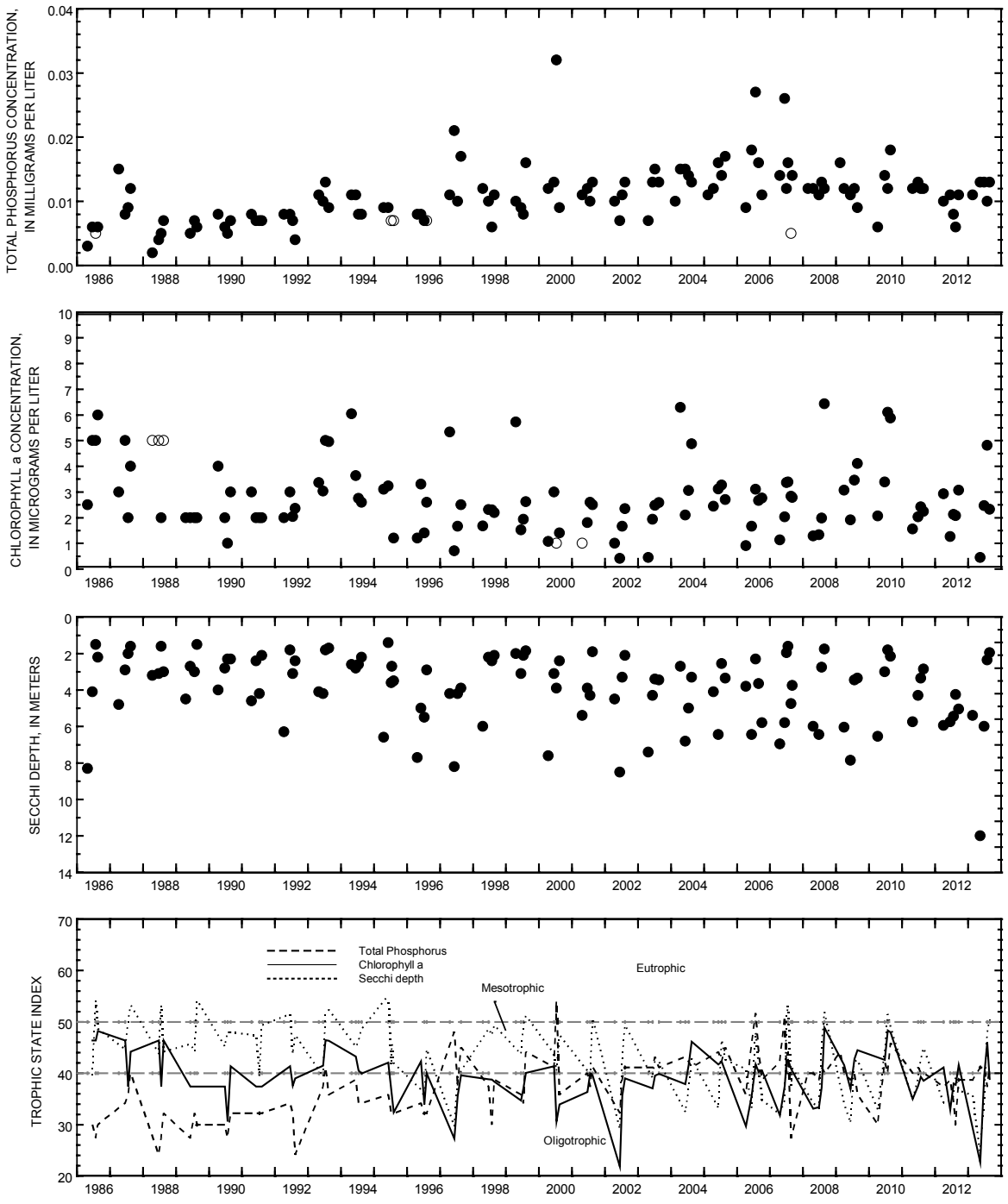
Date	Turbdty white light, det ang 90+/-30 degrees NTU (63675)	Appar-ent color, water, unfltrd Pt-Co units (00081)	Hard-ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Sodium, water, fltrd, mg/L (00930)	Potas-sium, water, fltrd, mg/L (00935)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor-ide, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Silica, water, fltrd, mg/L as SiO2 (00955)	Iron, water, fltrd, ug/L (01046)	Manga-nese, water, fltrd, ug/L (01056)
FEB 2013													
14...	--	--	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--	--	--
MAY													
14...	--	--	--	--	--	--	--	--	--	--	--	--	--
14...	.6	15	263	48.2	34.6	23.2	2.23	216	49.6	23.9	4.22	<.3	<1.00
JUN													
28...	--	--	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUL													
30...	--	--	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--	--	--
AUG													
28...	--	--	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--	--	--

Date	Dis-solved solids dried @ 180degC wat flt mg/L (70300)
MAY	
14...	316

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

LAKE-DEPTH PROFILES, FEBRUARY 21 TO AUGUST 28, 2013





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

(Open circles on the first two 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 ¼ NW ¼ sec.1, T.7 N., R.17 E., Waukesha County, Hydrologic Unit 07090001, at Oconomowoc.

SURFACE AREA.—1.20 mi^2.

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

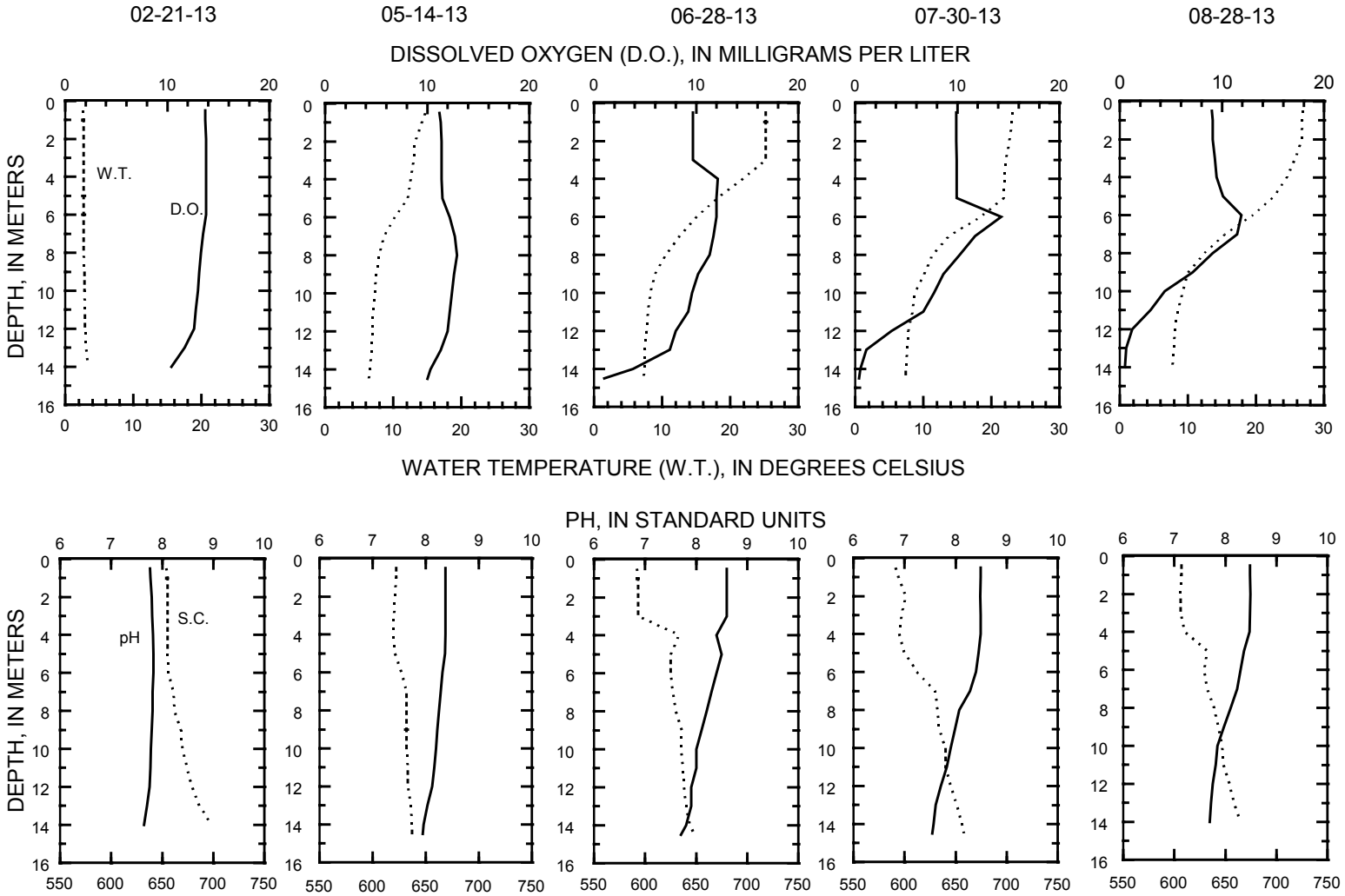
REMARKS.--Lake sampled at the deepest point in northeast bay near Hewitt Point. Water-quality analyses done by Wisconsin State Laboratory of Hygiene.

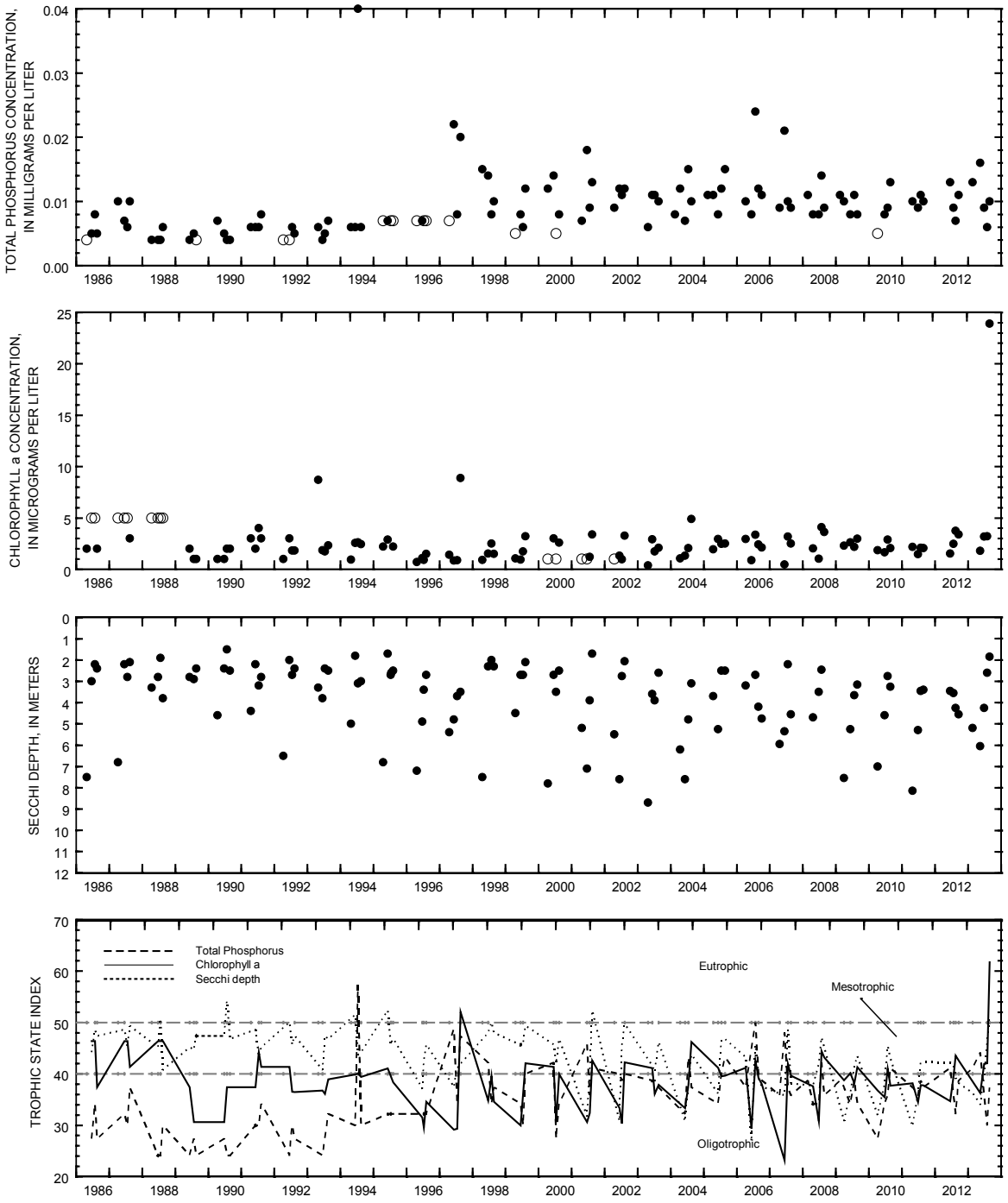
WATER-QUALITY DATA, FEBRUARY 21 TO AUGUST 28, 2013
(Milligrams per liter unless otherwise indicated)

Date	Transparency Secchi disc, meters (00078)	Sampling depth, meters (00098)	Temperature, water, deg C (00010)	Specific conductance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dissolved oxygen, mg/L (00300)	Chlorophyll a trichro -matic method, uncorr, ug/L (32210)	Phosphorus, water, unfltrd mg/L as P (00665)
FEB 2013								
21...	5.2	--	--	--	--	--	--	--
21...	--	.50	2.6	654	7.8	13.7	--	.013
21...	--	14.0	3.3	698	7.6	10.4	--	.013
MAY								
14...	6.05	--	--	--	--	--	--	--
14...	--	.50	14.7	622	8.4	11.2	1.79	.016
JUN								
28...	4.25	--	--	--	--	--	--	--
28...	--	.50	25.2	592	8.6	9.7	3.18	.009
28...	--	14.5	7.2	648	7.7	1.0	--	.014
JUL								
30...	2.60	--	--	--	--	--	--	--
30...	--	.50	23.1	591	8.5	9.9	3.23	.006
30...	--	14.5	7.4	658	7.5	.4	--	.038
AUG								
28...	1.85	--	--	--	--	--	--	--
28...	--	.50	26.9	607	8.5	9.0	23.9	.010
28...	--	14.0	7.7	665	7.7	.5	--	.040

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

LAKE-DEPTH PROFILES, FEBRUARY 21 TO AUGUST 28, 2013





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

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

423246088175800 POWERS LAKE AT POWERS LAKE, WI

LOCATION.--Lat 42°32'46", long 88°17'58", in NW ¼ SE ¼ sec.13, T.1 N., R.18 E., Walworth County, Hydrologic Unit 07120006, at Powers Lake.

SURFACE AREA.—0.72 mi^2.

DRAINAGE AREA.--3.42 mi^2.

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

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

WATER-QUALITY DATA, FEBRUARY 21 TO AUGUST 29, 2013
(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro -matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Total nitro-gen, water, unfltrd mg/L (00600)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia + org-N, water, fltrd, mg/L as N (00623)	Ammonia + org-N, water, unfltrd mg/L as N (00625)
FEB 2013													
21...	4.90	--	--	--	--	--	--	--	--	--	--	--	--
21...	--	.50	3.1	553	8.3	14.2	--	.016	--	--	--	--	--
21...	--	9.0	3.7	569	8.2	11.2	--	.013	--	--	--	--	--
MAY													
08...	8.55	--	--	--	--	--	--	--	--	--	--	--	--
08...	--	.50	17.8	517	8.3	10.3	1.29	.012	<.006	1.5	.032	--	1.5
JUN													
29...	3.40	--	--	--	--	--	--	--	--	--	--	--	--
29...	--	.50	24.5	503	8.5	8.4	7.52	.020	--	--	--	--	--
29...	--	9.0	14.6	530	7.6	.4	--	.018	--	--	--	--	--
JUL													
17...	2.75	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	.50	29.8	509	8.6	9.2	4.93	.015	<.002	<.93	<.015	.53	.91
17...	--	9.5	14.1	543	9.2	.2	--	.022	--	--	--	--	--
AUG													
29...	2.85	--	--	--	--	--	--	--	--	--	--	--	--
29...	--	.50	27.3	516	8.6	8.5	3.93	.021	--	--	--	--	--
29...	--	9.5	15.3	559	7.6	.4	--	.049	--	--	--	--	--

423246088175800 POWERS LAKE AT POWERS LAKE, WI

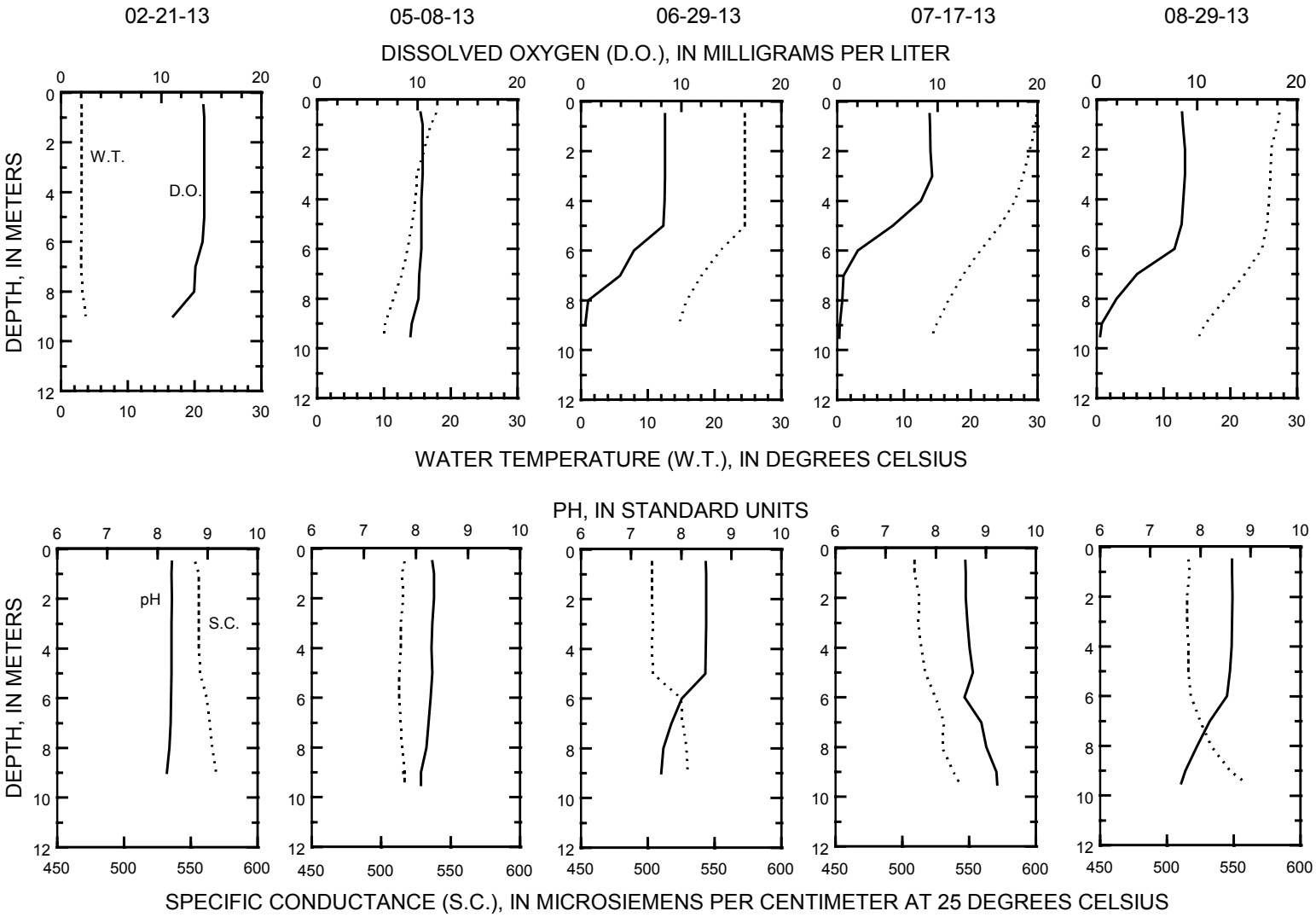
WATER-QUALITY DATA, FEBRUARY 21 TO AUGUST 29, 2013
(Milligrams per liter unless otherwise indicated)

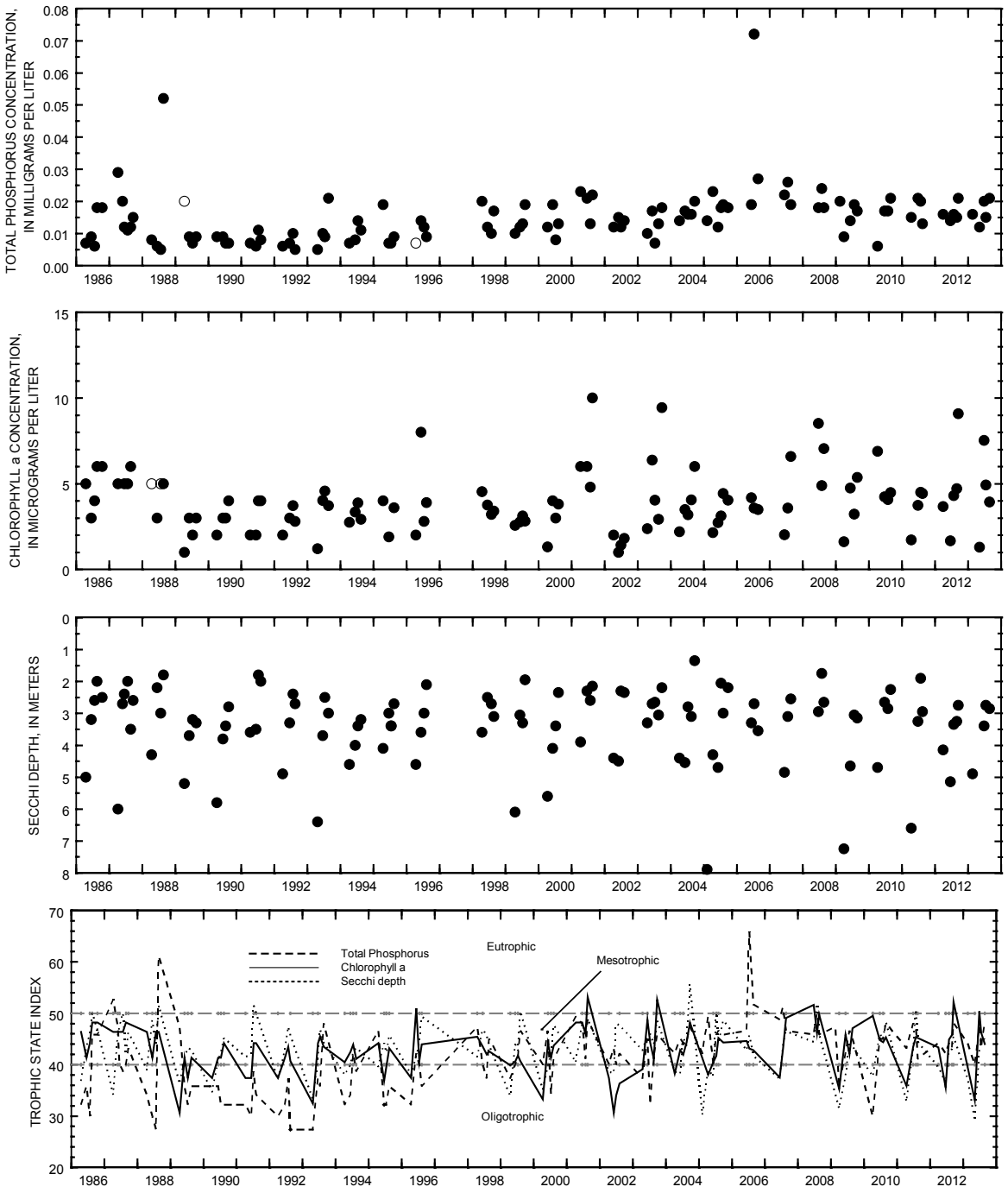
Date	Nitrate + nitrite water, fltrd, mg/L as N (00631)	Turbdty white light, det ang 90+/-30 degrees NTU (63675)	Appar-ent color, water, unfltrd Pt-Co units (00081)	Hard-ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Sodium, water, fltrd, mg/L (00930)	Potas-sium, water, fltrd, mg/L (00935)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor-ide, water, fltrd, mg/L (00940)	Silica, water, fltrd, mg/L as SiO2 (00955)	Iron, water, fltrd, ug/L (01046)	Manga-nese, water, fltrd, ug/L (01056)
FEB 2013													
21...	--	--	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--	--	--
MAY													
08...	--	--	--	--	--	--	--	--	--	--	--	--	--
08...	.043	1.0	10	218	35.5	31.5	22.2	2.47	179	44.1	6.55	<.3	<1.0
JUN													
29...	--	--	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUL													
17...	--	--	--	--	--	--	--	--	--	--	--	--	--
17...	<.019	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--	--	--
AUG													
29...	--	--	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--	--	--

Date	Dis-solved solids dried @ 180degC wat flt mg/L (70300)
FEB 2013	
21...	--
21...	--
21...	--
MAY	
08...	--
08...	280

423246088175800 POWERS LAKE AT POWERS LAKE, WI

LAKE-DEPTH PROFILES, FEBRUARY 21 TO AUGUST 29, 2013





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

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

453420091551600 SILVER LAKE NEAR CUMBERLAND, WI

LOCATION.--Lat 45°34′20″, long 91°55′16″ referenced to North American Datum of 1927, in SE ¼ NE ¼ SW ¼ sec.25, T.36 N., R.13 W., Barron County, WI, Hydrologic Unit 07050007.

DRAINAGE AREA.--1,800 acres; 2.81 mi²

PERIOD OF RECORD.--October 2011 to current year. Archived data October 2004 to September 2011.

GAGE.--Non-recording gage. Staff gage mounted on wood board and 1.5" steel pipe. The staff is installed/removed seasonally to coincide with measuring stage during the open water period.

COOPERATION.--Wisconsin Department of Natural Resources.

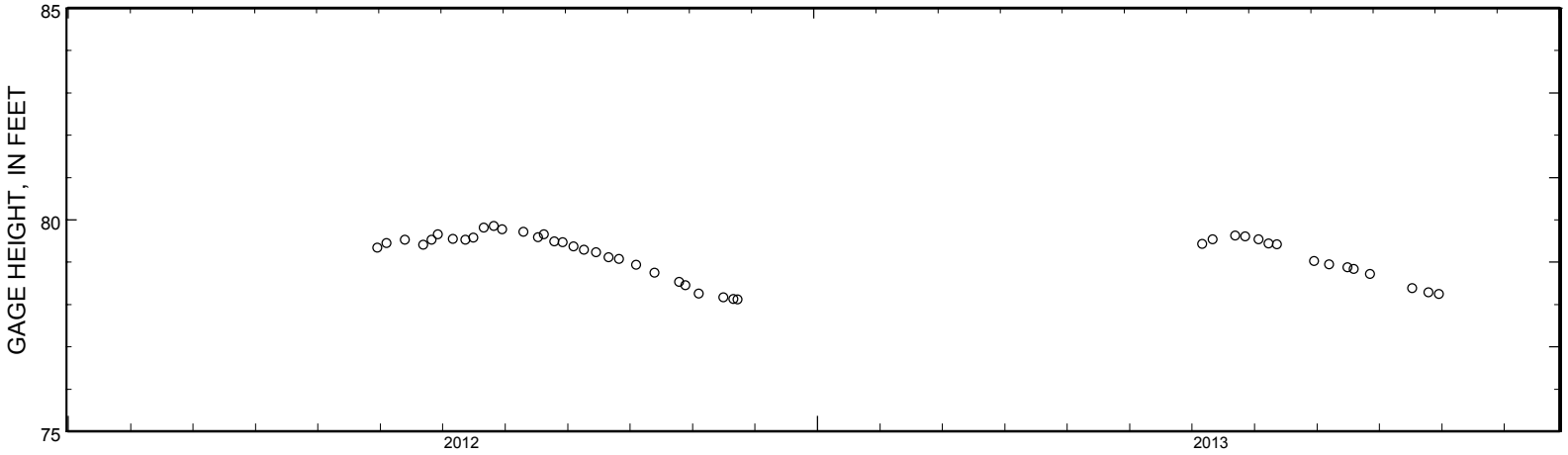
REMARKS.--Water surface elevation collected by land owner (observer).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height, 79.85 ft, June 25, 2012; Minimum daily gage height, 78.12 ft, Oct. 22, 2012.

EXTREMES FOR CURRENT YEAR.--Maximum daily gage height, 79.63 ft, June 21, 2013; Minimum daily gage height, 78.12 ft, Oct. 22, 2012.

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	---	---	---	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---	79.54	---	---
3	78.25	---	---	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	79.43	---	---	---
6	---	---	---	---	---	---	---	---	---	---	78.94	---
7	---	---	---	---	---	---	---	---	---	79.44	---	---
8	---	---	---	---	---	---	---	---	---	---	---	---
9	---	---	---	---	---	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---	---	79.54	---	---	---
11	---	---	---	---	---	---	---	---	---	79.42	---	---
12	---	---	---	---	---	---	---	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---	---	---	---	---	---
15	78.17	---	---	---	---	---	---	---	---	---	78.88	---
16	---	---	---	---	---	---	---	---	---	---	---	78.38
17	---	---	---	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---	---	78.84	---
19	---	---	---	---	---	---	---	---	---	---	---	---
20	78.13	---	---	---	---	---	---	---	---	---	---	---
21	---	---	---	---	---	---	---	---	79.63	---	---	---
22	78.12	---	---	---	---	---	---	---	---	---	---	---
23	---	---	---	---	---	---	---	---	---	---	---	---
24	---	---	---	---	---	---	---	---	---	---	---	78.28
25	---	---	---	---	---	---	---	---	---	---	---	---
26	---	---	---	---	---	---	---	---	79.61	---	78.72	---
27	---	---	---	---	---	---	---	---	---	---	---	---
28	---	---	---	---	---	---	---	---	---	---	---	---
29	---	---	---	---	---	---	---	---	---	79.02	---	78.24
30	---	---	---	---	---	---	---	---	---	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---
Mean	---	---	---	---	---	---	---	---	---	---	---	---
Max	---	---	---	---	---	---	---	---	---	---	---	---
Min	---	---	---	---	---	---	---	---	---	---	---	---



Stage hydrograph for Silver Lake near Cumberland, 2011-2013.

04072500 SILVER LAKE AT PORTAGE, WI

LOCATION.--Lat 43°33′10″, long 89°28′22.9″ referenced to North American Datum of 1983, Columbia County, WI, Hydrologic Unit 04030201, previously published at Lat 43°33′10″, long 89°07′58″referenced to North American Datum of 1927

DRAINAGE AREA.--1.00 mi².

PERIOD OF RECORD.--May 2010 to current year. Work records from August 1936 to February 2010 in USGS database.

GAGE.--A staff gage is periodically read by an observer, and reported in local datum.

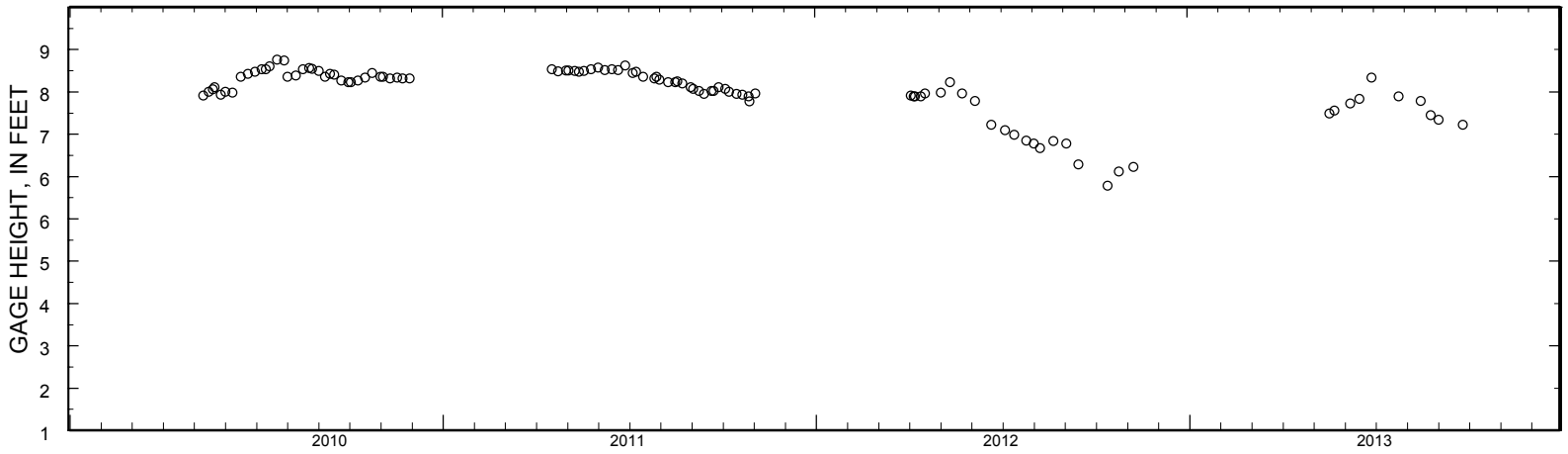
COOPERATION.--Wisconsin Department of Natural Resources.

EXTREMES FOR PERIOD OF RECORD.--Maximum observed gage height, 8.88 ft July 21, 2010; miminum observed gage height, 6.20 ft, Oct. 12, 2012.

EXTREMES FOR CURRENT YEAR.--Maximum observed gage height, 8.50 ft Jun 27; miminum observed gage height, 6.20 ft, Oct. 12.

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	---	---	---	---	---	---	---	---	---	---	---	7.60
2	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---	---	---	---
6	---	---	---	---	---	---	---	---	7.95	---	---	---
7	---	6.60	---	---	---	---	---	---	---	---	---	---
8	---	---	---	---	---	---	---	---	---	---	---	---
9	---	---	---	---	---	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---	---	---	---	---	---
12	6.20	---	---	---	---	---	---	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---	---	---	---	8.00	---
15	---	---	---	---	---	---	---	---	8.05	---	---	---
16	---	---	---	---	---	---	---	7.74	---	---	---	---
17	---	---	---	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---	---	---	---	---	---
20	---	---	---	---	---	---	---	---	---	---	---	---
21	---	---	---	---	---	---	---	7.80	---	---	---	---
22	---	---	---	---	---	---	---	---	---	---	---	---
23	6.50	---	---	---	---	---	---	---	---	8.10	---	---
24	---	---	---	---	---	---	---	---	---	---	7.70	---
25	---	---	---	---	---	---	---	---	---	---	---	7.50
26	---	---	---	---	---	---	---	---	---	---	---	---
27	---	---	---	---	---	---	---	---	8.50	---	---	---
28	---	---	---	---	---	---	---	---	---	---	---	---
29	---	---	---	---	---	---	---	---	---	---	---	---
30	---	---	---	---	---	---	---	---	---	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---
Mean	---	---	---	---	---	---	---	---	---	---	---	---
Max	---	---	---	---	---	---	---	---	---	---	---	---
Min	---	---	---	---	---	---	---	---	---	---	---	---



Stage hydrograph for Silver Lake at Portage, 2010-2013.

05429485 LAKE WAUBESA AT MCFARLAND, WI

LOCATION.--Lat 43°00′32″, long 89°18′19″ referenced to North American Datum of 1927, in SW ¼ SW ¼ sec.3, T.6 N., R.10 E., Dane County, WI, Hydrologic Unit 07090001, on left bank just upstream from bridge on U.S. Highway 51, downstream of dam at outlet of Lake Waubesa and 1.0 mi southwest of McFarland.

SURFACE AREA.--3.25 mi^2.

DRAINAGE AREA.--327 mi² of which 36.6 mi² probably is noncontributing.

PERIOD OF RECORD.--October 2003 to current year.

REVISED RECORDS.--WSP 805, WDR WI-73-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 840.00 ft above NGVD of 1929 (levels by Wisconsin Department of Natural Resources).

REMARKS.--Lake level regulated by dams at outlets of Lake Mendota and Lake Waubesa. Gage-height telemeter at station.

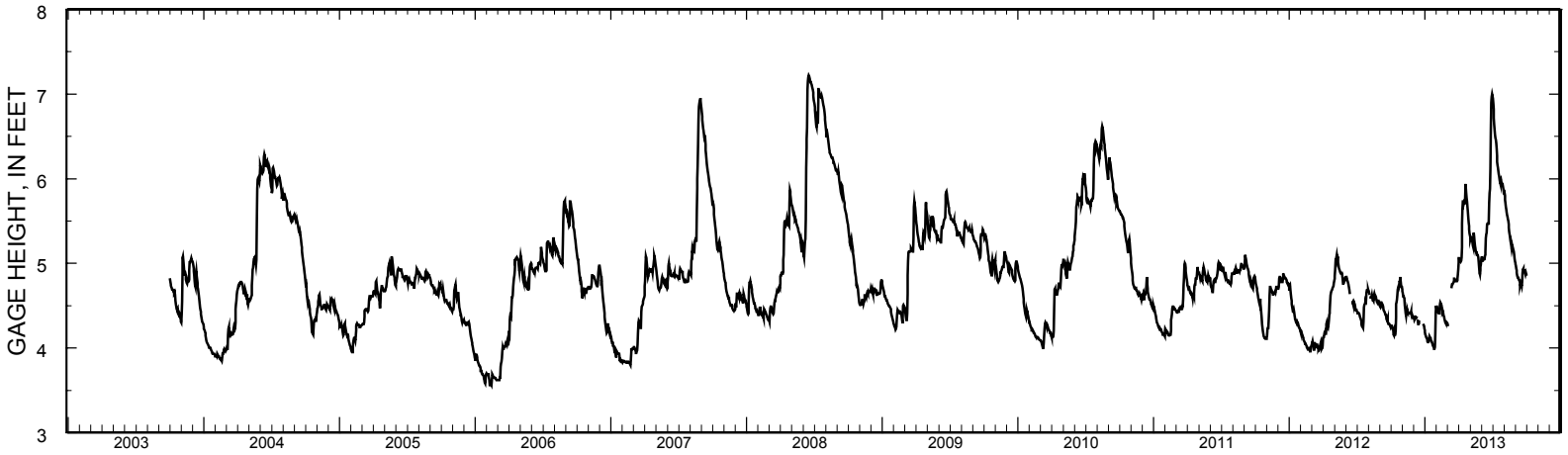
EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 7.22 ft, June 15-17, 2008; minimum observed, 3.50 ft, Feb.14, 2006, current datum.

EXTREMES FOR CURRENT YEAR.--Maximum recorded gage height, 7.03 ft, June 29; minimum recorded, 3.97 ft, Jan. 27.

05429485 LAKE WAUBESA AT MCFARLAND, WI

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	4.26	4.67	4.36	4.19	4.49	4.29	5.06	5.31	5.07	6.95	5.82	4.99
2	4.26	4.65	4.36	4.16	4.49	4.27	5.06	5.29	5.07	6.89	5.83	4.97
3	4.26	4.61	4.33	4.15	4.49	---	5.04	5.31	5.06	6.82	5.80	4.94
4	4.25	4.61	4.34	4.13	4.47	---	5.03	5.31	5.03	6.72	5.75	4.92
5	4.24	4.60	4.37	4.12	4.45	---	5.03	5.30	5.03	6.64	5.71	4.89
6	4.23	4.59	---	4.11	4.42	---	5.02	5.27	5.04	6.58	5.67	4.86
7	4.23	4.58	4.35	4.10	4.42	---	5.03	5.25	5.05	6.52	5.64	4.84
8	4.16	4.50	4.35	4.08	4.43	---	5.07	5.21	5.05	6.48	5.60	4.83
9	4.15	4.46	4.36	4.07	4.41	4.20	5.19	5.19	5.05	6.46	5.57	4.83
10	4.19	4.41	---	4.07	4.41	---	5.47	5.33	5.09	6.42	5.55	4.81
11	4.16	4.38	---	4.09	4.51	---	5.65	5.36	5.10	6.36	5.52	4.80
12	4.16	4.43	4.32	4.11	4.54	4.72	5.73	5.32	5.14	6.27	5.50	4.80
13	4.20	4.45	4.28	4.14	4.53	4.75	5.73	5.26	5.30	6.20	5.46	4.76
14	4.36	4.43	4.28	4.13	4.52	4.75	5.70	5.21	5.34	6.16	5.42	4.73
15	4.52	4.42	4.29	4.11	4.50	4.76	5.72	5.18	5.36	6.13	5.37	4.75
16	4.54	4.43	4.31	4.11	4.47	4.77	5.71	5.14	5.46	6.09	5.34	4.76
17	4.57	4.41	---	4.09	4.44	4.78	5.71	5.13	5.47	6.05	5.31	4.75
18	4.62	4.41	---	4.08	4.42	4.80	5.86	5.13	5.47	6.03	5.27	4.73
19	4.69	4.41	---	4.08	4.43	4.82	5.94	5.09	5.47	5.99	5.24	4.78
20	4.71	---	4.37	4.07	4.41	4.82	5.90	5.10	5.47	5.96	5.21	4.89
21	4.70	---	---	4.05	4.38	4.81	5.83	5.10	5.50	5.94	5.17	4.93
22	4.72	---	---	4.03	4.37	4.80	5.77	5.09	5.71	5.99	5.20	4.94
23	4.78	4.41	---	4.02	4.34	4.79	5.73	5.07	5.83	6.00	5.22	4.93
24	4.78	4.43	---	4.01	4.32	4.79	5.67	5.01	5.88	5.97	5.20	4.92
25	4.78	4.41	---	4.00	4.30	4.79	5.61	4.95	6.12	5.94	5.18	4.92
26	4.84	4.39	---	3.99	4.29	4.79	5.54	4.89	6.58	5.94	5.16	4.91
27	4.79	4.37	---	3.99	4.31	4.80	5.48	4.87	6.90	5.94	5.14	4.89
28	4.74	4.38	4.27	4.01	4.31	4.82	5.44	4.92	6.97	5.91	5.10	4.87
29	4.72	4.36	4.26	4.17	---	4.87	5.40	4.96	7.00	5.88	5.05	4.89
30	4.72	4.36	4.23	4.42	---	4.93	5.35	4.98	7.00	5.84	5.02	4.87
31	4.69	---	4.21	4.50	---	5.01	---	5.04	---	5.83	5.00	---
Mean	4.48	---	---	4.11	4.42	---	5.48	5.15	5.59	6.22	5.39	4.86
Max	4.84	---	---	4.50	4.54	---	5.94	5.36	7.00	6.95	5.83	4.99
Min	4.15	---	---	3.99	4.29	---	5.02	4.87	5.03	5.83	5.00	4.73



Stage hydrograph for Lake Waubesa, 2003-2013.

461231091524900 WHITEFISH (BARDON) LAKE NEAR GORDON, WI

LOCATION.--Lat 46°12′31″, long 91°52′49″ referenced to North American Datum of 1927, in SW ¼ SW ¼ NW ¼ sec.16, T.43 N., R.12 W., Douglas County, WI, Hydrologic Unit 07030002.

DRAINAGE AREA.--0.81 mi²

PERIOD OF RECORD.--October 2011 to present. Archived data from 2004 to September 2011.

GAGE.--Non-recording gage. Steel rod pounded into lake bed. The rod is installed/removed seasonally to coincide with measuring stage during the open water period.

COOPERATION.--Wisconsin Department of Natural Resources.

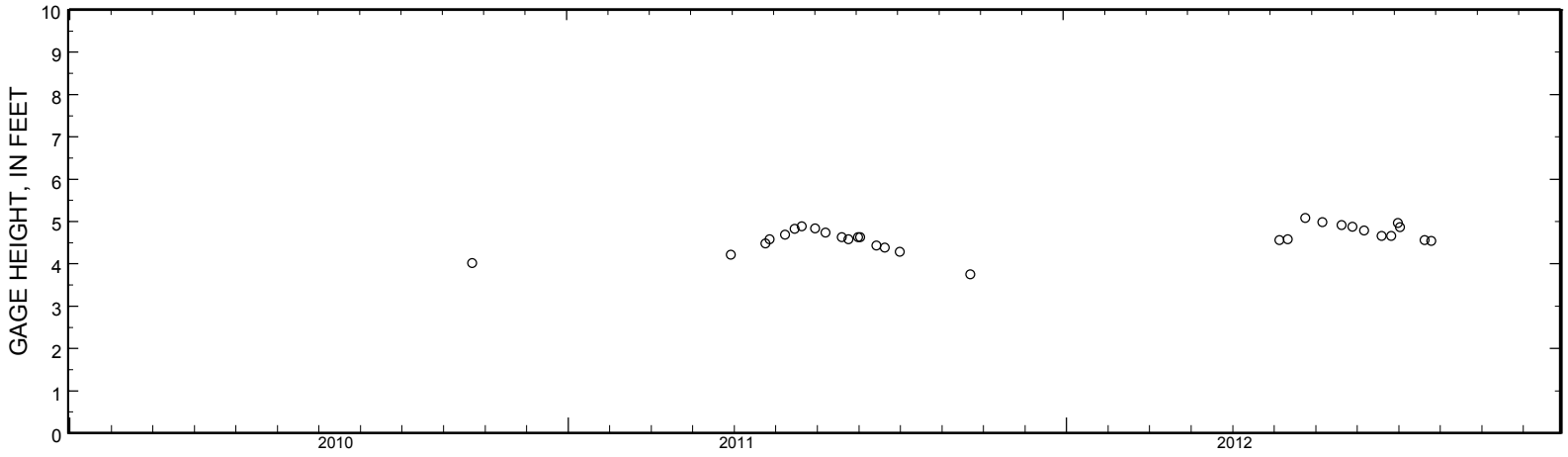
REMARKS.--Water surface elevation collected by land owner (observer).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height, 5.08ft, June 24, 2013; Minimum daily gage height, 3.75 ft, October 22, 2012.

EXTREMES FOR CURRENT YEAR.--Maximum daily gage height, 5.08ft, June 24, 2013; Minimum daily gage height, 3.75 ft, October 22, 2012.

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	---	---	---	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---	---	---	4.86
3	---	---	---	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	4.56	---	---	---
6	---	---	---	---	---	---	---	---	---	4.98	4.78	---
7	---	---	---	---	---	---	---	---	---	---	---	---
8	---	---	---	---	---	---	---	---	---	---	---	---
9	---	---	---	---	---	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---	---	4.58	---	---	---
12	---	---	---	---	---	---	---	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---	---	---	---	---	---
15	---	---	---	---	---	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---	---	---	---	---	---
17	---	---	---	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---	---	---	---	4.66	---
20	---	---	---	---	---	---	---	---	---	4.91	---	4.56
21	---	---	---	---	---	---	---	---	---	---	---	---
22	3.75	---	---	---	---	---	---	---	---	---	---	---
23	---	---	---	---	---	---	---	---	---	---	---	---
24	---	---	---	---	---	---	---	---	5.08	---	---	---
25	---	---	---	---	---	---	---	---	---	---	---	4.54
26	---	---	---	---	---	---	---	---	---	---	4.66	---
27	---	---	---	---	---	---	---	---	---	---	---	---
28	---	---	---	---	---	---	---	---	---	4.87	---	---
29	---	---	---	---	---	---	---	---	---	---	---	---
30	---	---	---	---	---	---	---	---	---	---	---	---
31	---	---	---	---	---	---	---	---	---	---	4.96	---
Mean	---	---	---	---	---	---	---	---	---	---	---	---
Max	---	---	---	---	---	---	---	---	---	---	---	---
Min	---	---	---	---	---	---	---	---	---	---	---	---



Stage hydrograph for Whitefish (Bardon) Lake near Gordon, 2011-2013.

424848088083100 WIND LAKE, HEADWATER, AT OUTLET AT WIND LAKE, WI

LOCATION.--Lat 42°48′48″, long 88°08′31″ referenced to North American Datum of 1927, in NE ¼ NW ¼ sec.16, T.4 N., R.20 E., Racine County, WI, Hydrologic Unit 07120006, at Wind Lake.

SURFACE AREA.--1.46 mi^2.

DRAINAGE AREA.--39.6 mi².

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

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

REMARKS.--Lake level regulated by dam with two 10-foot gates at outlet. Lake ice-covered Jan. 14 to Mar. 8. Prior to October 1987, published as Wind Lake at Wind Lake, Wis. Gage-height telemeter at station.

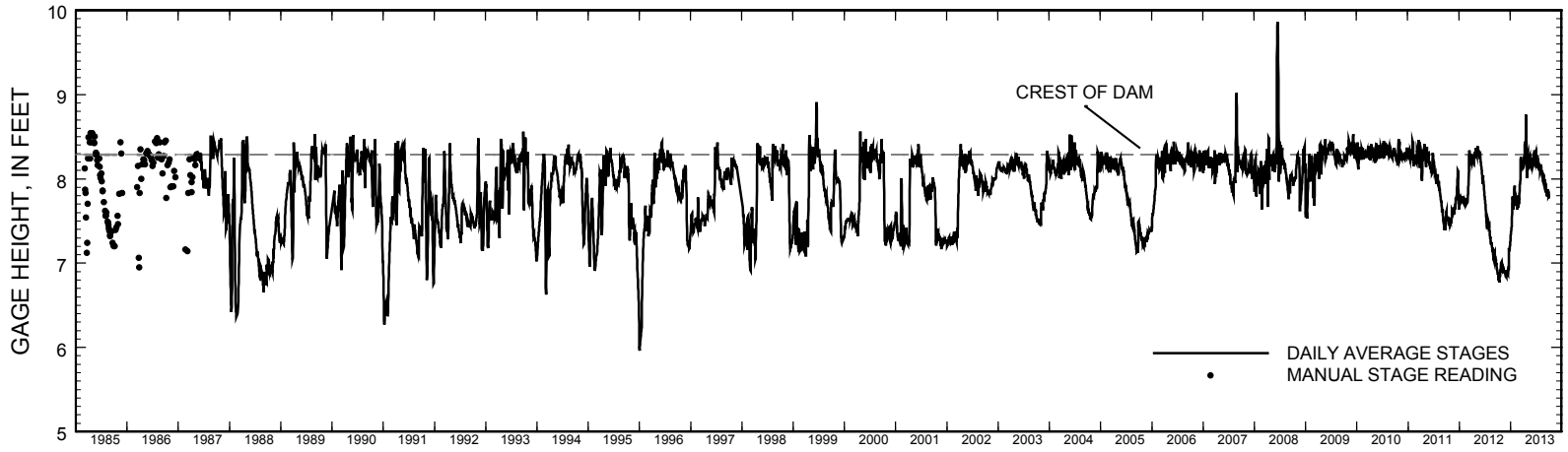
EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 9.88 ft, June 14, 15, 2008; minimum recorded, 5.95 ft, Jan. 2, 1996.

EXTREMES FOR CURRENT YEAR.—Headwater: Maximum recorded gage height, 8.80 ft, Apr. 19; minimum recorded, 6.75 ft, Oct. 12-13. Tailwater: Maximum recorded gage height, 8.71 ft, Apr. 19; minimum recorded, 3.01 ft, Sept. 18-19.

HEADWATER
GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013
DAILY MEAN VALUES

[e, estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	6.88	6.94	6.84	7.31	7.73	7.75	8.22	8.19	8.13	8.22	8.14	7.98
2	6.88	6.93	6.85	7.33	7.68	7.78	8.17	8.28	8.16	8.19	8.16	7.99
3	6.87	6.92	6.86	7.34	7.68	7.82	8.14	8.30	8.16	8.19	8.16	7.96
4	6.87	6.91	6.90	7.36	7.72	7.85	8.15	8.21	8.21	8.13	8.15	7.94
5	6.86	6.90	6.88	7.37	7.74	7.89	8.19	8.16	8.24	8.13	8.13	7.91
6	6.84	6.90	6.87	7.39	7.73	7.93	8.23	8.16	8.25	8.16	8.13	7.89
7	6.82	6.91	6.88	7.40	7.73	7.94	8.27	8.18	8.23	8.18	8.12	7.89
8	6.80	6.90	6.88	7.42	7.76	7.94	8.25	8.18	8.21	8.20	8.10	7.90
9	6.79	6.90	6.89	7.43	7.74	7.96	8.18	8.18	8.18	8.27	8.09	7.89
10	6.80	6.90	6.91	7.45	7.73	8.00	8.27	8.19	8.16	8.27	8.08	7.87
11	6.78	6.90	6.89	7.54	7.74	8.09	8.40	8.16	8.18	8.18	8.06	7.86
12	6.77	6.93	6.88	7.59	7.73	8.23	8.44	8.18	8.21	8.15	8.09	7.86
13	6.79	6.91	6.87	7.66	7.73	8.26	8.39	8.21	8.28	8.15	8.08	7.84
14	6.86	6.91	6.88	7.71	7.72	8.20	8.31	8.22	8.29	8.15	8.06	7.81
15	6.87	6.90	6.89	7.76	7.71	8.17	8.23	8.24	8.31	8.16	8.04	7.82
16	6.85	6.90	6.92	7.79	7.69	8.16	8.22	8.23	8.29	8.15	8.03	7.82
17	6.85	6.90	6.92	7.76	7.65	8.18	8.29	8.22	8.20	8.15	8.02	7.80
18	6.90	6.90	6.92	7.73	7.64	8.19	8.58	8.20	8.23	8.13	8.01	7.79
19	6.91	6.90	6.93	7.70	7.75	8.18	8.76	8.18	8.23	8.11	7.99	7.81
20	6.91	6.90	7.07	7.67	7.79	8.15	8.74	8.15	8.21	8.10	7.98	7.88
21	6.90	6.90	7.18	7.64	7.79	8.15	8.67	8.14	8.23	8.10	7.96	7.88
22	6.92	6.89	7.14	7.66	7.80	8.15	8.56	8.16	8.34	8.17	8.02	7.86
23	6.99	6.92	7.15	7.69	7.74	8.15	8.46	8.21	8.29	8.17	8.05	7.84
24	6.99	6.88	7.17	7.71	7.68	8.16	8.35	8.20	8.22	8.15	8.04	7.84
25	7.00	6.87	7.18	7.74	7.66	8.16	8.17	8.20	8.28	8.13	8.02	e7.82
26	7.01	6.87	7.20	7.77	7.70	8.15	8.01	8.19	8.30	8.13	8.01	e7.81
27	7.00	6.85	7.21	7.79	7.78	8.15	8.06	8.19	8.27	8.14	8.00	7.80
28	6.99	6.85	7.23	7.82	7.77	8.12	8.14	8.21	8.25	8.12	7.99	7.79
29	6.98	6.85	7.25	7.85	---	8.16	8.17	8.19	8.27	8.10	7.98	7.80
30	6.99	6.85	7.27	7.92	---	8.21	8.11	8.15	8.26	8.09	7.98	7.78
31	6.96	---	7.29	7.84	---	8.22	---	8.14	---	8.11	7.99	---
Mean	6.89	6.90	7.01	7.62	7.73	8.08	8.30	8.19	8.24	8.15	8.05	7.86
Max	7.01	6.94	7.29	7.92	7.80	8.26	8.76	8.30	8.34	8.27	8.16	7.99
Min	6.77	6.85	6.84	7.31	7.64	7.75	8.01	8.14	8.13	8.09	7.96	7.78



Stage hydrograph for Wind Lake, headwater, 1985-2013.

424915088083900 WIND LAKE AT WIND LAKE, WI

LOCATION.--Lat 42°49'15", long 88°08'39", in NW ¼ SW ¼ sec.9, T.4 N., R.20 E., Racine County, Hydrologic Unit 07120006, at Wind Lake.

SURFACE AREA.--1.46 mi^2.

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 21 TO AUGUST 29, 2013

(Milligrams per liter unless otherwise indicated)

Date	Trans-parency Secchi disc, meters (00078)	Sam-pling depth, meters (00098)	Temper-ature, water, deg C (00010)	Specif-ic conduc-tance, wat unf uS/cm @ 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Dis-solved oxygen, mg/L (00300)	Chloro-phyll a trichro-matic method, uncorr, ug/L (32210)	Phos-phorus, water, unfltrd mg/L as P (00665)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Total nitro-gen, water, unfltrd mg/L (00600)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia + org-N, water, fltrd, mg/L as N (00623)	Ammonia + org-N, water, unfltrd mg/L as N (00625)
FEB 2013													
21...	4.10	--	--	--	--	--	--	--	--	--	--	--	--
21...	--	.50	3.4	849	8.0	15.4	--	.021	--	--	--	--	--
21...	--	13.0	2.5	1080	7.6	8.8	--	.035	--	--	--	--	--
MAY													
14...	4.05	--	--	--	--	--	--	--	--	--	--	--	--
14...	--	.50	13.9	662	8.0	9.0	2.74	.027	.003	1.1	.087	--	.91
JUN													
29...	3.40	--	--	--	--	--	--	--	--	--	--	--	--
29...	--	.50	23.9	667	8.4	7.3	5.01	.018	--	--	--	--	--
29...	--	13.0	11.6	692	7.4	.1	--	.117	--	--	--	--	--
JUL													
17...	3.75	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	.50	28.9	690	8.6	8.7	6.44	.016	<.002	<1.2	<.015	.93	1.2
17...	--	14.5	11.3	704	8.8	.1	--	.156	--	--	--	--	--
AUG													
29...	3.25	--	--	--	--	--	--	--	--	--	--	--	--
29...	--	.50	26.2	700	8.4	8.1	5.09	.019	--	--	--	--	--
29...	--	4.0	25.2	699	8.4	7.9	--	.021	--	--	--	--	--
29...	--	10.0	12.9	706	7.4	.1	--	.130	--	--	--	--	--
29...	--	13.0	11.9	710	7.2	.1	--	.176	--	--	--	--	--
29...	--	14.5	11.8	710	7.2	.1	--	.195	--	--	--	--	--

424915088083900 WIND LAKE AT WIND LAKE, WI

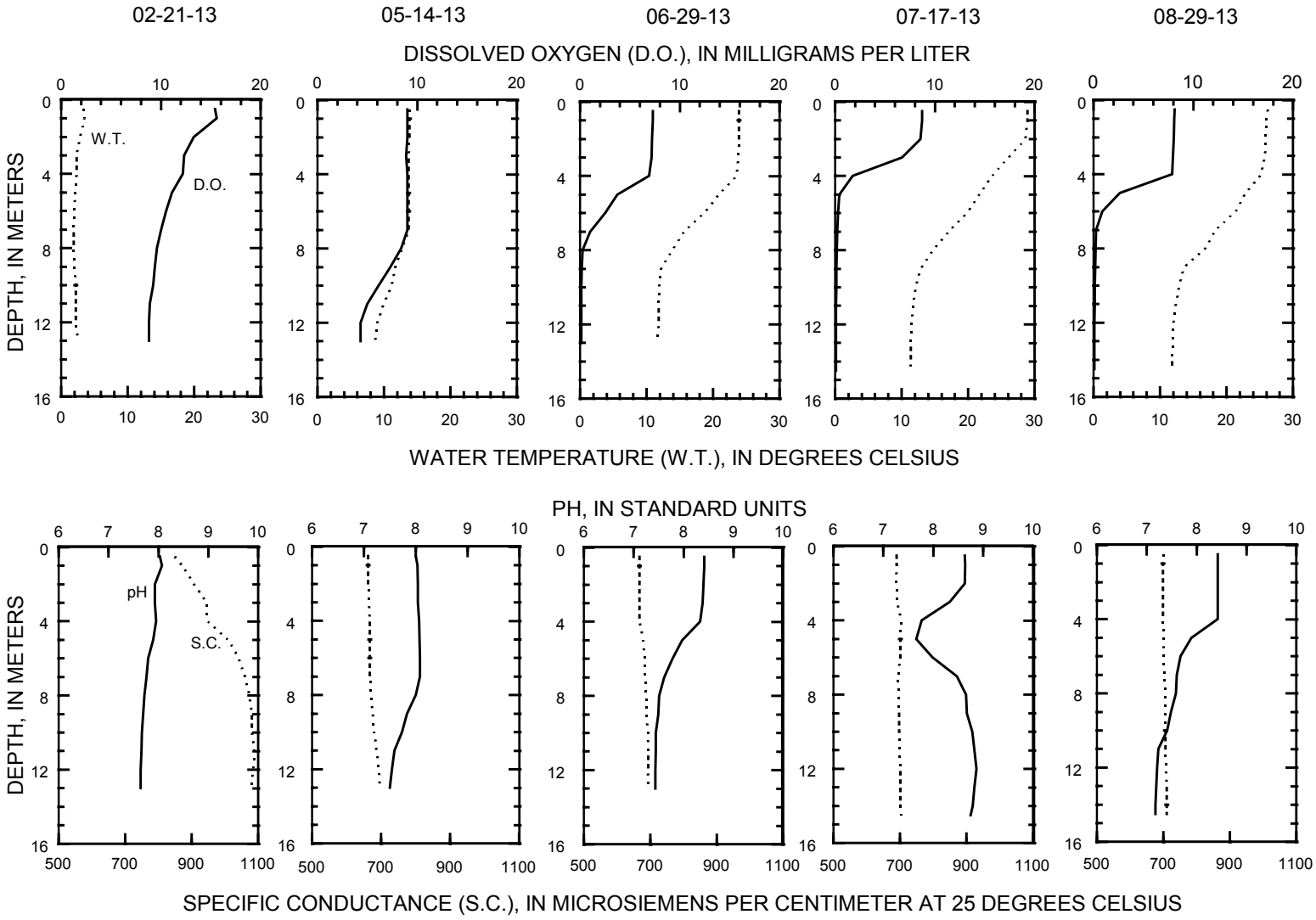
WATER-QUALITY DATA, FEBRUARY 21 TO AUGUST 29, 2013
(Milligrams per liter unless otherwise indicated)

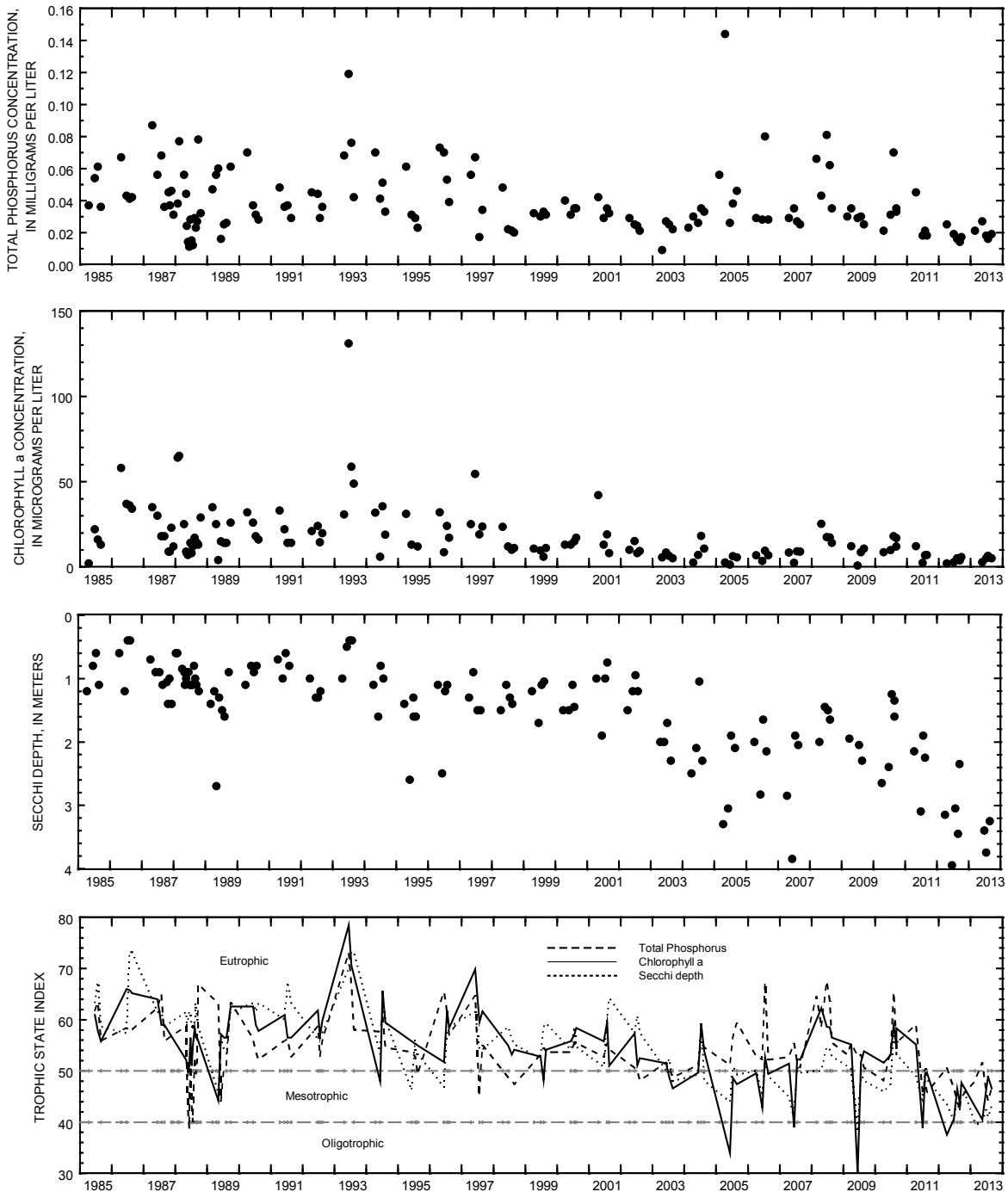
Date	Nitrate + nitrite water, fltrd, mg/L as N (00631)	Turbdty white light, det ang 90+/-30 degrees NTU (63675)	Appar-ent color, water, unfltrd Pt-Co units (00081)	Hard-ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Sodium, water, fltrd, mg/L (00930)	Potas-sium, water, fltrd, mg/L (00935)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor-ide, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Silica, water, fltrd, mg/L as SiO2 (00955)	Iron, water, fltrd, ug/L (01046)
FEB 2013													
21...	--	--	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--	--	--
MAY													
14...	--	--	--	--	--	--	--	--	--	--	--	--	--
14...	.189	1.5	40	210	44.7	24.0	57.8	3.01	143	105	39.4	.271	<.3
JUN													
29...	--	--	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUL													
17...	--	--	--	--	--	--	--	--	--	--	--	--	--
17...	<.019	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--	--	--
AUG													
29...	--	--	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--	--	--

Date	Manga-nese, water, fltrd, ug/L (01056)	Dis-solved solids dried @ 180degC wat flt mg/L (70300)
MAY		
14...	--	--
14...	10	382

424915088083900 WIND LAKE AT WIND LAKE, WI

LAKE-DEPTH PROFILES, FEBRUARY 21 TO AUGUST 29, 2013





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

04082500 LAKE WINNEBAGO AT OSHKOSH, WI

LOCATION.--Lat 44°00′35″, long 88°31′38″ referenced to North American Datum of 1927, in NE ¼ NE ¼ sec.25, T.18 N., R.16 E., Winnebago County, WI, Hydrologic Unit 04030203, 800 ft east of mouth of the upper Fox River.

SURFACE AREA.--215 mi^2.

DRAINAGE AREA.--5,880 mi^2.

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

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

GAGE.--Water-stage recorder. Nonrecording gage read once daily October 1938 to October 1978. Datum of gage is 743.91 ft above NAVD of 1988 (Wisconsin Department of Transportation benchmark). From July 1992 to March 20, 2007 datum was 743.97 ft above NAVD of 1988. Prior to 2012 datum of gage was published as 745.05 ft above mean tide at New York City.

REMARKS.--Lake elevations controlled by dams at Menasha and Neenah. Data-collection platform and gage-height telemeter at station.

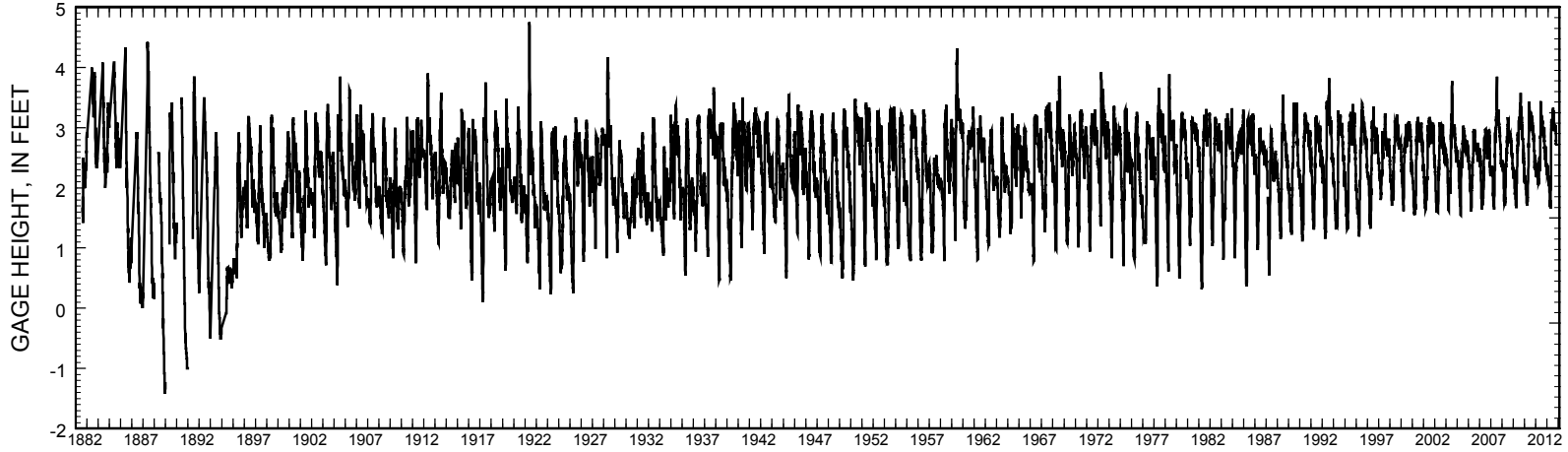
EXTREMES FOR PERIOD OF RECORD.-- Water year 1938-1992; maximum gage height observed, 4.32 ft Mar. 9, 1982, datum unknown; minimum observed, 0.33 ft May 17, 1960, datum unknown. Water year 1993-current year; maximum daily mean gage height, 3.85 ft June 14, 2008; minimum recorded, 1.16 ft, March 2-5, 1993.

EXTREMES FOR CURRENT YEAR.--Maximum daily mean gage height, 3.33 ft, June 17; Minimum recorded, 1.64 ft, March 24.

04082500 LAKE WINNEBAGO AT OSHKOSH, WI

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	2.67	2.40	2.26	2.26	2.20	1.83	1.87	3.02	3.13	3.12	2.99	2.99
2	2.68	2.40	2.25	2.24	2.19	1.80	1.91	3.05	3.14	3.11	3.00	3.00
3	2.67	2.41	2.25	2.23	2.17	1.78	1.94	3.12	3.16	3.09	3.00	2.99
4	2.63	2.39	2.22	2.22	2.15	1.75	1.97	3.08	3.16	3.10	3.02	2.97
5	2.58	2.39	2.26	2.21	2.14	1.74	2.00	3.05	3.16	3.11	2.99	2.97
6	2.61	2.36	2.22	2.19	2.12	1.72	2.04	3.03	3.16	3.12	2.98	2.93
7	2.57	2.36	2.24	2.19	2.12	1.71	2.09	3.01	3.16	3.13	3.04	2.97
8	2.49	2.36	2.25	2.17	2.12	1.69	2.15	2.99	3.17	3.23	3.05	3.04
9	2.46	2.36	2.26	2.16	2.12	1.68	2.25	2.99	3.18	3.28	3.03	3.00
10	2.49	2.36	2.24	2.15	2.10	1.71	2.50	3.08	3.16	3.24	3.03	2.99
11	2.47	2.35	2.23	2.17	2.11	1.77	2.60	2.98	3.17	3.22	3.03	3.00
12	2.48	2.35	2.24	2.19	2.10	1.80	2.65	3.01	3.22	3.17	3.04	2.98
13	2.51	2.41	2.22	2.19	2.08	1.80	2.70	3.04	3.22	3.14	3.05	2.94
14	2.62	2.37	2.24	2.18	2.06	1.78	2.80	2.98	3.23	3.12	3.03	2.86
15	2.69	2.35	2.25	2.18	2.06	1.76	2.86	2.96	3.20	3.11	3.01	2.85
16	2.66	2.38	2.23	2.17	2.04	1.75	2.90	2.98	3.29	3.09	3.01	2.85
17	2.60	2.37	2.26	2.17	2.02	1.74	3.01	2.99	3.33	3.09	3.00	2.81
18	2.59	2.37	2.26	2.16	1.99	1.71	3.05	2.99	3.30	3.08	2.99	2.77
19	2.55	2.37	2.26	2.15	1.99	1.71	2.96	2.98	3.21	3.05	2.98	2.79
20	2.51	2.38	2.36	2.14	1.98	1.69	3.10	2.98	3.16	3.05	2.97	2.80
21	2.50	2.38	2.31	2.13	1.95	1.66	3.14	2.96	3.14	3.03	2.96	2.80
22	2.47	2.34	2.38	2.11	1.94	1.65	3.09	3.02	3.15	3.00	2.99	2.80
23	2.47	2.24	2.34	2.09	1.93	1.65	3.08	3.14	3.12	3.01	2.98	2.76
24	2.45	2.38	2.32	2.08	1.91	1.65	3.09	3.10	3.09	3.01	2.96	2.73
25	2.40	2.32	2.30	2.07	1.89	1.65	3.08	3.07	3.06	2.99	2.93	2.74
26	2.44	2.32	2.29	2.05	1.87	1.65	3.10	3.06	3.06	3.00	2.95	2.73
27	2.47	2.30	2.28	2.04	1.86	1.67	3.08	3.06	3.07	3.00	2.97	2.71
28	2.46	2.27	2.27	2.05	1.85	1.69	3.06	3.02	3.08	2.99	3.04	2.70
29	2.45	2.29	2.28	2.08	---	1.71	3.05	3.05	3.15	3.00	3.02	2.71
30	2.41	2.30	2.28	2.16	---	1.74	3.03	3.10	3.14	2.98	3.00	2.71
31	2.41	---	2.27	2.20	---	1.80	---	3.11	---	2.98	3.02	---
Mean	2.53	2.35	2.27	2.15	2.04	1.72	2.67	3.03	3.17	3.09	3.00	2.86
Max	2.69	2.41	2.38	2.26	2.20	1.83	3.14	3.14	3.33	3.28	3.05	3.04
Min	2.40	2.24	2.22	2.04	1.85	1.65	1.87	2.96	3.06	2.98	2.93	2.70



Stage hydrograph for Lake Winnebago at Oshkosh, WI, 1882-2013.

04084255 LAKE WINNEBAGO NEAR STOCKBRIDGE, WI

LOCATION.--Lat 44°04′14″, long 88°19′44″ referenced to North American Datum of 1983, Calumet County, WI, Hydrologic Unit 04030203, Stockbridge Indian Reservation, on east shore of Lake Winnebago, 300 ft south of County Highway E and 1.6 mi west of Stockbridge.

SURFACE AREA.--215 mi^2.

DRAINAGE AREA.--5,880 mi².

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

GAGE.--Water-stage recorder. Datum of gage from July 1992 to current year is 744.00 ft above NAVD of 1988 (RTK-GPS survey). Prior to 2012 pbulished as 745.05 ft above mean tide of New York City.

REMARKS.--Lake elevations controlled by dams at Menasha and Neenah. Data-collection platform and gage-height telemeter at station.

EXTREMES FOR PERIOD OF RECORD.-- Water year 1982-1992; maximum daily mean gage height, 3.53 ft, May 31, 1989, datum unknown; minimum recorded, 0.30 ft, Mar. 1, 1986, datum unknown. Water year 1993 to current year; maximum daily mean gage height, 3.85 ft, July 9, 11, 1993, June 14, 2008; minimum recorded 1.10 ft March 2, 1993, March 11, 1996.

EXTREMES FOR CURRENT YEAR.--Maximum daily mean gage height, 3.23 ft, June 16; minimum recorded, 1.49 ft, Mar. 9.

04084255 LAKE WINNEBAGO NEAR STOCKBRIDGE, WI

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	2.54	2.29	2.12	2.13	2.08	1.70	1.79	2.91	3.05	2.97	2.94	2.91
2	2.53	2.26	2.13	2.11	2.06	1.68	1.83	2.86	3.07	2.96	2.92	2.90
3	2.54	2.23	2.12	2.10	2.04	1.66	1.85	2.92	3.08	2.98	2.91	2.89
4	2.59	2.23	2.16	2.08	2.03	1.63	1.87	2.95	3.03	3.03	2.89	2.87
5	2.64	2.22	2.13	2.07	2.01	1.61	1.92	2.93	3.00	3.06	2.90	2.81
6	2.55	2.24	2.11	2.06	2.00	1.60	1.95	2.92	3.02	3.06	2.90	2.84
7	2.48	2.23	2.10	2.04	2.01	1.58	2.02	2.90	3.06	3.08	2.95	2.87
8	2.51	2.24	2.09	2.03	2.02	1.55	2.08	2.87	3.08	3.17	2.94	2.85
9	2.45	2.21	2.06	2.03	2.00	1.54	2.17	2.82	3.05	3.20	2.95	2.89
10	2.47	2.21	2.11	2.01	1.99	1.59	2.40	2.83	3.06	3.18	2.94	2.91
11	2.42	2.25	2.19	2.03	2.01	1.66	2.48	2.94	3.10	3.12	2.94	2.92
12	2.34	2.43	2.15	2.04	1.98	1.70	2.57	2.97	3.09	3.06	2.93	2.83
13	2.37	2.33	2.14	2.06	1.95	1.69	2.66	2.92	3.10	3.04	2.90	2.76
14	2.47	2.27	2.10	2.05	1.95	1.65	2.69	2.87	3.11	3.01	2.92	2.76
15	2.59	2.25	2.08	2.04	1.94	1.63	2.79	2.89	3.11	3.00	2.92	2.71
16	2.51	2.22	2.13	2.03	1.91	1.63	2.85	2.87	3.23	3.00	2.91	2.67
17	2.47	2.24	2.16	2.04	1.89	1.61	2.85	2.84	3.20	3.02	2.90	2.67
18	2.51	2.23	2.13	2.02	1.87	1.60	2.94	2.87	3.13	3.04	2.89	2.67
19	2.40	2.24	2.14	2.03	1.90	1.60	3.10	2.87	3.11	3.05	2.90	2.70
20	2.39	2.24	2.08	2.04	1.86	1.57	3.05	2.87	3.06	2.95	2.89	2.75
21	2.36	2.26	2.29	2.02	1.84	1.54	3.02	2.88	3.05	2.87	2.90	2.72
22	2.32	2.29	2.25	2.00	1.82	1.53	3.00	2.88	3.03	2.91	2.88	2.64
23	2.32	2.41	2.20	1.97	1.81	1.54	3.01	2.91	3.05	2.89	2.86	2.61
24	2.31	2.30	2.18	1.96	1.78	1.54	3.03	2.95	3.01	2.90	2.86	2.59
25	2.35	2.24	2.17	1.94	1.76	1.55	3.05	2.94	2.99	2.94	2.89	2.59
26	2.40	2.23	2.16	1.92	1.74	1.56	3.03	2.92	2.97	2.93	2.88	2.60
27	2.34	2.23	2.14	1.91	1.74	1.57	2.98	2.88	2.98	2.94	2.86	2.59
28	2.29	2.19	2.14	1.94	1.73	1.58	2.96	2.90	3.01	2.95	2.90	2.59
29	2.27	2.13	2.16	1.98	---	1.60	2.95	2.97	2.97	2.90	2.92	2.62
30	2.20	2.10	2.14	2.07	---	1.63	2.95	3.01	2.96	2.88	2.91	2.61
31	2.32	---	2.13	2.11	---	1.71	---	3.04	---	2.91	2.89	---
Mean	2.43	2.25	2.14	2.03	1.92	1.61	2.59	2.91	3.06	3.00	2.91	2.74
Max	2.64	2.43	2.29	2.13	2.08	1.71	3.10	3.04	3.23	3.20	2.95	2.92
Min	2.20	2.10	2.06	1.91	1.73	1.53	1.79	2.82	2.96	2.87	2.86	2.59

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APPENDIX

Wisconsin Lakes Team
Quality-Assurance Plan

Most lake studies and monitoring programs that are conducted by the USGS Wisconsin Water Science Center entail water sampling and analysis to determine water quality and biological productivity. Because all sampling and analysis is subject to error and random variablility, a certain proportion of the sampling effort should include quality-assurance samples. Sampling by the USGS was done by the Lake Studies Team of the USGS Wisconsin Water Science Center. This team implements a quality-assurance plan each year that involves collecting three types of samples from a subset of the lakes studied each year, which include blanks, replicates, and spikes (U.S. Geological Survey, Wisconsin Water Science Center Lake Studies Team). These samples are collected and/or prepared solely for the purpose of assessing the magnitude of error and random variability so that the accuracy and precision of all data can be evaluated. The plan for this quality-assurance sampling is described below.

Three types of QA/QC samples are collected:

blanks
Provide information about accuracy and errors due to treatment or reagents
replicates
provide information about precision (variability)
standard additions (spikes)
provide information about accuracy and matrix interferences

Blank Sampling
B1. A **preservation blank** consists of deionized water or inorganic blank water, to which is added any reagents or preservatives that are normally added to natural water samples. The blank is not taken to the field, but is shipped to the laboratory for analysis along with the natural water samples.

This blank sample is analyzed for the Nutrient Group[1] and chlorophyll-a.

B2. A **field blank** consists of deionized water or inorganic blank water treated exactly the same as regular samples. During winter, the field blank is analyzed for total phosphorus (TP) only; during summer, it is analyzed for TP and chlorophyll-a, and in the spring it is analyzed for the Nutrient Group and chlorophyll-a.

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[1]Nutrient Group = all phosphorus and nitrogen species that are commonly determined in lakes (total phosphorus, nitrate + nitrite, ammonia, total Kjeldahl nitrogen, total nitrogen)

Replicate Sampling

Triplicate samples are taken near water surface in summer for analysis of total phosphorus and chlorophyll-a. For a portion of the sites where surface triplicates are collected, a set of triplicate samples is also taken from near-bottom water, for analysis of total phosphorus.

Triplicate samples collected in the spring are taken near the water surface for analysis of the Nutrient Group.

Standard Addition Testing

Replicate samples are collected for **a standard addition (spike) test,** which consists of an addition of a prepared phosphorus solution (standard) of known volume and concentration, such that the expected result of analysis is the natural water TP concentration plus the known addition. One sample from each set will receive no spike (the mean of these gives the natural water TP concentration).

Data and results of replicate sampling and field blank testing for the past five years are shown in Table A1.

Table A1. Analyses of replicate samples from Wisconsin lakes in water years 2009-2013. See text for procedures used. Phosphorus data in milligrams per liter; chlorophyll data in micrograms per liter. Symbol "<" indicates less than given detection limit (DL); mean and standard deviation not calculated for datasets containing values less than DL.

Parameter	Lake	Date	Replicate Data			Mean	Standard Deviation	Percent Standard Deviation
Total Phosphorus	Beulah	2/23/09	0.013	0.013		**0.013**	**0.000**	**0.0**
	Beulah	8/24/09	0.017	0.017		**0.017**	**0.000**	**0.0**
	Delavan	9/15/09	0.035	0.031	0.031	**0.032**	**0.002**	**7.1**
	Beulah	8/19/10	0.015	0.016		**0.016**	**0.001**	**4.6**
	Big Cedar, South	8/24/10	0.015	0.014		**0.015**	**0.001**	**4.9**
	Powers	8/30/10	0.021	0.022		**0.022**	**0.001**	**3.3**
	Beulah	8/10/11	0.140	0.170		**0.155**	**0.021**	**13.7**
	Oconomowoc	7/25/11	0.013	0.010	0.012	**0.012**	**0.002**	**13.1**
	Powers	7/25/11	0.017	0.018	0.020	**0.018**	**0.002**	**8.3**
	Wind	7/25/11	0.018	0.019	0.021	**0.019**	**0.002**	**7.9**
	Anvil	7/17/12	0.024	0.035	0.028	**0.029**	**0.006**	**19.2**
	Beulah	8/29/12	0.014	0.015	0.016	**0.015**	**0.001**	**6.7**
	Big Cedar, South	8/24/12	0.011	0.011	0.011	**0.011**	**0.000**	**0.0**
	Little Cedar, S.	8/24/12	0.012	0.013		**0.013**	**0.001**	**5.7**
	Powers	8/30/12	0.015	0.015	0.016	**0.015**	**0.001**	**3.8**
	Anvil	10/16/12	0.180	0.180		**0.180**	**0.000**	**0.0**
	Beulah	8/14/13	0.170	0.170	0.170	**0.170**	**0.000**	**0.0**
Total Phosphorus, near bottom	Big Cedar, South	8/24/10	0.081	0.067		**0.074**	**0.010**	**13.4**
	Powers	8/30/10	0.036	0.038		**0.037**	**0.001**	**3.8**
	Anvil	7/17/12	0.028	0.025	0.031	**0.028**	**0.003**	**10.7**
	Big Cedar, South	8/24/12	0.025	0.025	0.028	**0.026**	**0.002**	**6.7**
	Little Cedar, S.	8/24/12	0.168	0.170		**0.169**	**0.001**	**0.8**
Dissolved Phosphorus	Beulah	2/23/09	<0.002	<0.002		**NA**	**NA**	**NA**
	Beulah	8/24/09	<0.002	<0.002		**NA**	**NA**	**NA**
	Beulah	8/19/10	<0.002	<0.002		**NA**	**NA**	**NA**
	Beulah	8/10/11	<0.002	<0.002		**NA**	**NA**	**NA**
	Anvil	7/17/12	0.007	<0.002	0.003	**NA**	**NA**	**NA**
	Beulah	8/29/12	<0.002	<0.002	<0.002	**NA**	**NA**	**NA**
	Beulah	8/14/13	<0.002	<0.002	<0.002	**NA**	**NA**	**NA**
Dissolved Ammonia	Beulah	2/23/09	0.211	0.204		**0.208**	**0.005**	**2.4**
	Beulah	8/24/09	0.032	0.035		**0.034**	**0.002**	**6.3**
	Beulah	8/19/10	<0.015	0.030		**NA**	**NA**	**NA**
	Beulah	8/10/11	0.032	0.029		**0.031**	**0.002**	**7.0**
	Anvil	7/17/12	<0.015	0.019	0.018	**NA**	**NA**	**NA**
	Beulah	8/29/12	<0.015	<0.015	<0.015	**NA**	**NA**	**NA**
	Beulah	8/14/13	<0.015	<0.015	<0.015	**NA**	**NA**	**NA**
Total Kjeldahl Nitrogen	Beulah	2/23/09	0.660	0.690		**0.675**	**0.021**	**3.1**
	Beulah	8/24/09	0.160	0.530		**0.345**	**0.262**	**75.8**
	Beulah	8/19/10	0.580	0.680		**0.63**	**0.071**	**11.2**
	Beulah	8/10/11	0.560	0.460		**0.510**	**0.071**	**13.9**
	Anvil	7/17/12	0.280	0.390	0.410	**0.360**	**0.070**	**19.4**
	Beulah	8/29/12	0.800	0.500	0.460	**0.587**	**0.186**	**31.7**
	Beulah	8/14/13	0.420	0.640		**0.530**	**0.156**	**29.4**

Table A1. -- continued

Parameter	Lake	Date	Replicate Data			Mean	Standard Deviation	Percent Standard Deviation
Dissolved Nitrate plus Nitrite	Beulah	2/23/09	0.673	0.721		**0.697**	**0.034**	**4.9**
	Beulah	8/24/09	0.074	0.073		**0.074**	**0.001**	**1.0**
	Beulah	8/19/10	0.022	0.022		**0.022**	**0.000**	**0.0**
	Beulah	8/10/11	0.067	0.066		**0.067**	**0.001**	**1.1**
	Anvil	7/17/12	<0.019	<0.019	<0.019	**NA**	**NA**	**NA**
	Beulah	8/29/12	<0.019	<0.019	<0.019	**NA**	**NA**	**NA**
	Beulah	8/14/13	<0.019	<0.019	<0.019	**NA**	**NA**	**NA**
Chlorophyll-a (micrograms per liter)	Beulah	2/23/09	0.55	0.55		**0.55**	**0.00**	**0.0**
	Beulah	8/24/09	2.66	2.90		**2.78**	**0.17**	**6.1**
	Delavan	9/15/09	10.80	10.10	9.8	**10.23**	**0.51**	**5.0**
	Beulah	8/19/10	5.35	5.56		**5.46**	**0.15**	**2.72**
	Big Cedar, South	8/24/10	3.93	3.9		**3.92**	**0.02**	**0.54**
	Beulah	8/10/11	4.45	5.24		**4.85**	**0.56**	**11.53**
	Anvil	7/17/12	5.10	3.95	3.74	**4.26**	**0.73**	**17.17**
	Beulah	8/29/12	5.36	4.68	6.11	**5.38**	**0.72**	**13.29**
	Big Cedar, South	8/24/12	3.72	3.55	3.53	**3.60**	**0.10**	**2.90**
	Beulah	8/14/13	5.68	5.56	4.81	**5.35**	**0.47**	**8.81**
Turbidity, NTU	Beulah	2/23/09	<1.0	<1.0		**NA**	**NA**	**NA**
	Beulah	8/24/09	<1.0	<1.0		**NA**	**NA**	**NA**
	Beulah	8/19/10	<1.0	<1.0		**NA**	**NA**	**NA**
	Beulah	8/10/11	<1.0	<1.0		**NA**	**NA**	**NA**
	Beulah	8/29/12	<1.0	<1.0	<1.0	**NA**	**NA**	**NA**
	Beulah	8/14/13	3.2	4.3	2.5	**3.3**	**0.907**	**27.2**
Dissolved Calcium	Beulah	3/4/08	62.8	62.5		**62.65**	**0.212**	**0.3**
	Beulah	8/26/08	47.9	47.6		**47.75**	**0.212**	**0.4**
	Beulah	2/23/09	63	63.8		**63.4**	**0.566**	**0.9**
	Beulah	8/24/09	41.7	41.9		**41.8**	**0.141**	**0.3**
	Beulah	8/19/10	47	47.3		**47.15**	**0.212**	**0.4**
	Beulah	8/10/11	37.4	38		**37.7**	**0.424**	**1.1**
	Beulah	8/29/12	35.9	36.5	36.6	**36.3**	**0.379**	**1.0**
Diss. Magnesium	Beulah	3/4/08	35.6	35.5		**35.55**	**0.071**	**0.2**
	Beulah	8/26/08	32.8	32.5		**32.65**	**0.212**	**0.6**
	Beulah	2/23/09	34.7	35.1		**34.9**	**0.283**	**0.8**
	Beulah	8/24/09	31.2	31.3		**31.25**	**0.071**	**0.2**
	Beulah	8/19/10	34.1	33.8		**33.95**	**0.212**	**0.6**
	Beulah	8/10/11	36.7	37.1		**36.90**	**0.283**	**0.8**
	Beulah	8/29/12	37.4	38.1	38.1	**37.87**	**0.404**	**1.1**
Diss. Potassium	Beulah	3/4/08	1.8	1.9		**1.85**	**0.071**	**3.8**
	Beulah	8/26/08	1.4	1.4		**1.4**	**0.000**	**0.0**
	Beulah	2/23/09	1.7	1.7		**1.7**	**0.000**	**0.0**
	Beulah	8/24/09	1.4	1.4		**1.4**	**0.000**	**0.0**
	Beulah	8/19/10	1.4	1.5		**1.45**	**0.071**	**4.9**
	Beulah	8/10/11	1.5	1.6		**1.55**	**0.071**	**4.6**
	Beulah	8/29/11	1.7	1.8	1.8	**1.77**	**0.058**	**3.3**
Dissolved Sodium	Beulah	3/4/08	9.9	10		**9.95**	**0.071**	**0.7**
	Beulah	8/26/08	9	8.9		**8.95**	**0.071**	**0.8**
	Beulah	2/23/09	9.7	9.8		**9.75**	**0.071**	**0.7**
	Beulah	8/24/09	8.6	8.7		**8.65**	**0.071**	**0.8**
	Beulah	8/19/10	10.4	11.4		**10.9**	**0.707**	**6.5**
	Beulah	8/10/11	10.4	10.7		**10.55**	**0.212**	**2.0**
	Beulah	8/29/12	11.4	11.5	12.1	**11.67**	**0.379**	**3.2**

Table A1. -- continued

Parameter	Lake	Date	Replicate Data			Mean	Standard Deviation	Percent Standard Deviation
ANC as CaCO3	Beulah	2/23/09	258	256		**257**	**1.414**	**0.6**
	Beulah	8/24/09	209	209		**209**	**0.000**	**0.0**
	Beulah	8/19/10	208	207		**207.5**	**0.707**	**0.3**
	Beulah	8/10/11	194	194		**194**	**0.000**	**0.0**
	Beulah	8/29/12	206	205	205	**205.3**	**0.577**	**0.3**
	Beulah	8/14/13	221	222	221	**221.3**	**0.577**	**0.3**
Diss. Chloride	Beulah	3/4/08	23.5	23.7		**23.6**	**0.141**	**0.6**
	Beulah	8/26/08	21	20.9		**20.95**	**0.071**	**0.3**
	Beulah	2/23/09	23	22.9		**22.95**	**0.071**	**0.3**
	Beulah	8/24/09	21.6	21.4		**21.5**	**0.141**	**0.7**
	Beulah	8/19/10	21.6	21.5		**21.55**	**0.071**	**0.3**
	Beulah	8/10/11	24.7	24.5		**24.6**	**0.141**	**0.6**
	Beulah	8/29/12	26.9	27.1	27.1	**27.03**	**0.115**	**0.4**
Dissolved Silica	Beulah	2/23/09	14.8	15		**14.9**	**0.141**	**0.9**
	Beulah	8/24/09	11.3	11.3		**11.3**	**0.000**	**0.0**
	Beulah	8/19/10	18.1	18.1		**18.1**	**0.000**	**0.0**
	Beulah	8/10/11	12.7	12.7		**12.7**	**0.00**	**0.0**
	Beulah	8/29/12	14.6	14.5	14.5	**14.5**	**0.06**	**0.4**
	Beulah	8/14/13	8.92	9.1	8.87	**9.0**	**0.12**	**1.3**
Dissolved Sulfate	Beulah	2/23/09	30.5	30.8		**30.65**	**0.212**	**0.7**
	Beulah	8/24/09	27.7	27.8		**27.75**	**0.071**	**0.3**
	Beulah	8/19/10	25.9	25.8		**25.85**	**0.071**	**0.3**
	Beulah	8/10/11	29.3	29.2		**29.25**	**0.071**	**0.2**
	Beulah	8/29/12	32.5	32.8	32.5	**32.6**	**0.173**	**0.5**
	Beulah	8/14/13	25	25.3	25.3	**25.2**	**0.173**	**0.7**
Dissolved Iron	Beulah	3/4/08	<100	<100		**NA**	**NA**	**NA**
	Beulah	8/26/08	<100	<100		**NA**	**NA**	**NA**
	Beulah	2/23/09	<100	<100		**NA**	**NA**	**NA**
	Beulah	8/24/09	<100	<100		**NA**	**NA**	**NA**
	Beulah	8/19/10	<100	<100		**NA**	**NA**	**NA**
	Beulah	8/10/11	<100	<100		**NA**	**NA**	**NA**
	Beulah	8/29/12	<100	<100	<100	**NA**	**NA**	**NA**
Diss. Manganese	Beulah	8/26/08	<0.5	<0.5		**NA**	**NA**	**NA**
	Beulah	2/23/09	<1.0	<1.0		**NA**	**NA**	**NA**
	Beulah	8/24/09	<1.0	<1.0		**NA**	**NA**	**NA**
	Beulah	8/10/11	<1.0	<1.0		**NA**	**NA**	**NA**
	Beulah	8/29/12	<1.0	<1.0	<1.0	**NA**	**NA**	**NA**
Dissolved Solids	Beulah	2/23/09	350	346		**348**	**2.83**	**0.8**
	Beulah	8/24/09	312	312		**312**	**0.00**	**0.0**
	Beulah	8/19/10	284	286		**285**	**1.41**	**0.5**
	Beulah	8/10/11	270	272		**271**	**1.41**	**0.5**
	Beulah	8/29/12	282	276	278	**279**	**3.06**	**1.1**
	Beulah	8/14/13	312	298	318	**309**	**10.3**	**3.3**

Table A2. Data from tests of blanks, 2009-2013. All data in milligrams per liter, unless otherwise indicated.
< = less than given detection limit; E = estimated value.

Delavan Lake. Analyses at USGS National Water Quality Laboratory, Lakewood, CO.

Parameter	9/14/09
Total Phosphorus	<0.008
Dissolved orthophosphate	<0.008
Chlorophyll a	---

Lake Beulah at Deep Hole near East Troy, WI. Analysis at Wisconsin State Laboratory of Hygiene, Madison, WI

Parameter	2/22/09	8/20/09	8/19/10	8/10/11
Total Phosphorus	<0.005	<0.005	<0.005	<0.005
Dissolved orthophosphate	<0.002	<0.002	<0.002	<0.002
Total Kjeldahl	<0.14	<0.14	<0.14	<0.14
Dissolved Ammonia	<0.015	<0.015	0.015	<0.015
Dissolved Nitrate plus Nitrite	<0.019	<0.019	<0.019	<0.019
Chlorophyll a (μg/L)	<0.260	<0.260	<0.260	<0.260
Dissolved Calcium	<0.10	<0.10	<0.10	<0.10
Dissolved Magnesium	<0.10	<0.10	<0.10	<0.10
Dissolved Potassium	<0.10	<0.10	<0.10	<0.10
Dissolved Sodium	<0.10	<0.10	<0.10	<0.10
ANC as CaCO3	<2	<2	<2	3
Dissolved Chloride	<1.0	<1.0	<1.0	<1.0
Dissolved Silica	<0.022	<0.022	<0.022	<0.022
Dissolved Sulfate	<4.5	<4.5	<4.5	<4.5
Dissolved Iron	<100	<100	<100	<100
Dissolved Manganese	<1.0	<1.0	<1.0	<1.0
Dissolved Solids	<50	<50	<50	<50
Turbidity, NTU	---	<1.0	<1.0	<1.0

Mercer Lake at Main Deep Hole at Mercer, WI, WI. Analysis at Wisconsin State Laboratory of Hygiene, Madison, WI

Parameter	8/27/10
Total Phosphorus	< 0.005

Wind Lake at Wind Lake, WI. Analyses at Wisconsin State Laboratory of Hygiene, Madison, WI

Parameter	8/30/10
Total Phosphorus	< 0.005
Chlorophyll a (ug/L)	---

Silver Lake near West Bend, WI. Analyses at Wisconsin State Laboratory of Hygiene, Madison, WI

Parameter	8/31/09
Total Phosphorus	< 0.005
Chlorophyll a (ug/L)	<0.260

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