Eagle Spring Lake at Eagleville, WI
Water-Quality Data Summary

This summary covers the period October 1991 to September 2001, which is the period of water-quality monitoring of Eagle Spring Lake by the U.S. Geological Survey (USGS). Emphasis in this summary is on data collected during 1997 – 2001, or the period during which ONR Lake planning Grant LPL-425 provided part of funding. All data collected during 1997 - 2001 is included. Data from previous years is discussed and is included in graphs to illustrate changes or trends.

In reviewing the data, it may be helpful to refer to the methods and explanations of physical and chemical characteristics sections in the USGS annual lake data report "Water-Quality and Lake-Stage Data for Wisconsin Lakes, Water Year 1999" and to Shaw and others (1994) "Understanding Lake Data."

Lake description and **sampling** locations:

Eagle Sprtng Lake is classified as a drainage lake. The lake has one main inlet and 2 outlets. The average depth of the lake is 1.2 meters **and** the surface area is 311 acres (0.486 square miles). The water-quality sampling site is located at the deepest point in the lake at a depth of about 2.5 meters. Lake stage was monitored near one of the outlet structures, which is located along the northeastern shore of the lake. The locations of the monitoring sites are shown in Figure 1.

Lake Data:

The following summarizes some highlights of data given in the tables and shown in the figures:

Lake-stage fluctuations:

Lake stages were measured by the USGS on most sampling dates. The range of observed stages was small over the 1991 – 2001 period. Stages ranged from 9.36 feet on Mar. 1, 1994 to 9.71 feet on Feb. 11, 1997. This small range of fluctuation is common for drained lakes, which are fed largely by ground water and by little overland runoff. Stage values are shown figure 2 and listed in the table on the top half of Figures 3a-e.

Lake-depth profiles:

Vertical profiles of water temperature, dissolved oxygen, pH, and specific conductance are typical of those for shallow lakes and show little variation from year to year. Data from these profiles, which were measured over the deepest point in the lake, are listed in Table 2 and graphed in Figures 3a-e. During the February through August sampling period, complete water-column mixing was observed on most sampling dates (typical for very shallow lakes). The lake did not become thermally stratified through the summer. No anoxic (devoid of oxygen) regions were observed at any depth. The pH, which ranged between 7.8 and 8.3, is common for southeastern Wisconsin lakes and poses problems for aquatic life.

Chemical constituents:

Water samples collected in April were analyzed for selected chemical constituents for chemical characterization of the lake. These data for the 1997 – 2001 period are given in Figures 3a-e. The constituent values for color, chlorophyll a, chloride, calcium, magnesium, pH, alkalinity, total nitrogen, and total phosphorus are within regional values for this area as described by Lillie and Mason in "Limnological Characteristics of Wisconsin Lakes," 1983, Technical Bulletin No. 138, Department of Natural Resources. Chloride and sodium, two constituents that commonly exhibit increasing concentrations in southeastern Wisconsin lakes, show an increasing trend over the 11-year period (fig. 4). This trend is generally attributed to the effects of road salting in winter. Dissolved solids, a measure of dissolved constituents, showed annual variability, but no perceptible increasing or decreasing trend (fig. 4).

The ratio of dissolved nitrogen to dissolved phosphorus averaged 87:1, based on the April 1997 - 2001 surface concentrations. This ratio suggests the lake is phosphorus limited, which means algal growth is dependent on the amount of phosphorus available rather than the amount of nitrogen available.

Three common measures of water quality used as indices are concentrations of near-surface total-phosphorus and chlorophyll a, and Secchi depth. Near-surface total phosphorus concentrations ranged from 0.006 mg/L on April 17, 1992 to 0.038 mg/L on **Aug.** 4, 1999; chlorophyll a ranged from 1.1 µg/L on June 6, 2000 to 36 µg/L on **Aug.** 16, 2000; and Secchi depths ranged from 0.9 m on July 6, 1995 to greater than 2.5 m (measurement was limited by the maximum depth of the lake) on June 6, 2000.
Surface total phosphorus shows a significant trend of increasing concentration over the 1991 – 2001 period (fig. 5). Although there is year-to-year variability in chlorophyll a concentration and Secchi depth, there is not a significant increasing or decreasing trend for these parameters (fig. 5).

Total phosphorus concentrations near the lake bottom generally were very similar to near-surface concentrations, owing to the shallow and continuously mixed water in the lake.

Lake condition:

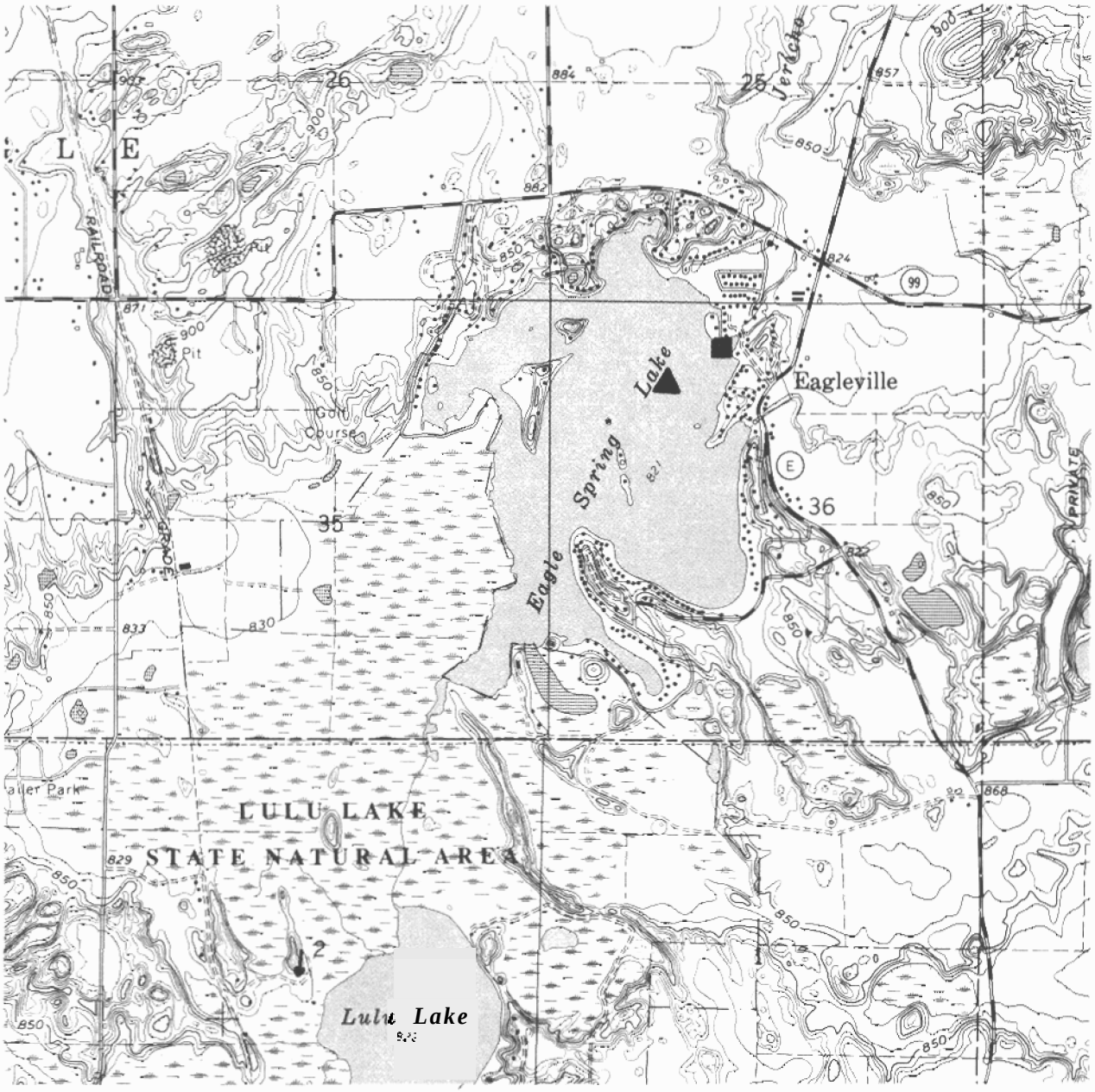
Water-quality index:

Lillie and Mason (1983) classified all Wisconsin lakes using a random data set collected in the summer (July and August). The index, shown on page 14 of "Water-Quality and Lake-Stage data for Wisconsin Lakes, Water Year 2000," is based on surface total-phosphorus and chlorophyll a concentrations, and Secchi depths. According to the index, surface total phosphorus and chlorophyll a concentrations in Eagle Spring Lake indicate "good" water quality, and Secchi depths indicate "fair" water quality for the 1997 – 2001 period.

Lillie and Mason 11983) also provided a **means** of comparing the condition of Eagle Spring Lake with other lakes in southeastern Wisconsin. The comparison in Table 2 shows the percentage distribution of southeastern Wisconsin lakes within each condition group and the relative position of Eagle Spring Lake.

Trophic status:

Another means of assessing the nutrient. or trophic, status of a lake is to use Carlson's Trophic State Index (TSI). The summer TSI data for 1991 -12001 is listed in Table 3. Figure 6 is a graphical illustration of the variation in TSI for Eagle Spring Lake during the I I-year monitoring period. The phosphorus index shows the lake to be mesotrophic to eutrophic, or a lake with moderate to high nutrient levels. Chlorophyll a index indicates generally mesotrophic conditions. The Secchi depth index suggests much more eutrophic conditions than indicated by either the phosphorus or chlorophyll a indices.



EXPLANATION

▲ **Water-quality monitoring site**

■ **Lake-stage monitoring *site***

Figure 1. Locations of water-quality and lake-stage monitoring sites on **Eagle Spring Lake** *at* Eagleville, Wisconsin.

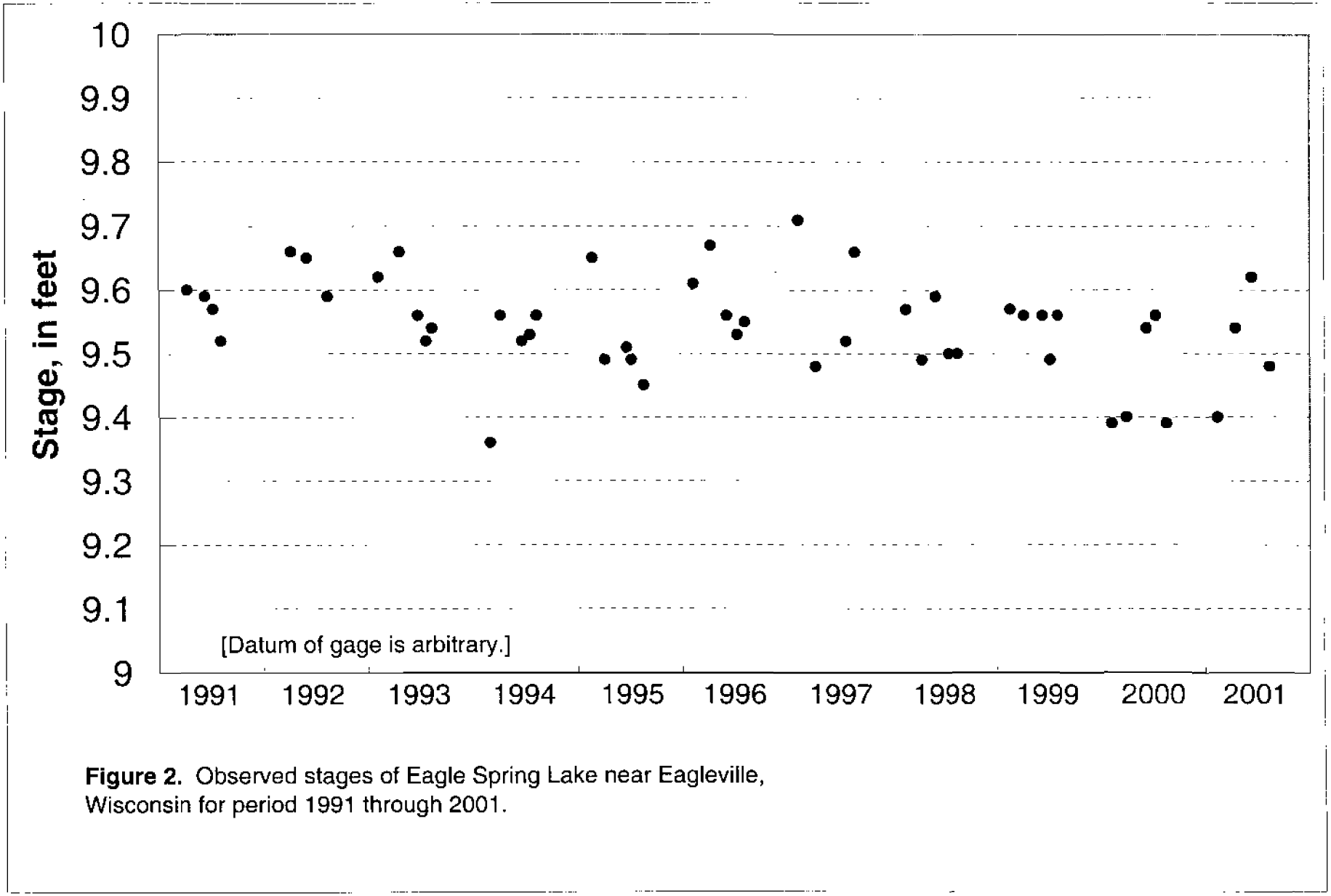


Figure 2. Observed stages of Eagle Spring Lake near Eagleville, Wisconsin for period 1991 through 2001.

425103088261500 EAGLE SPRING LAKE A T EAGLEVILLE, WI

LOCATION--Lat 42'5 1'03", long 88°26'15", in SE 1/4 NW 114 sec 36, T.5 N, R 17 E., Waukcsha County. Hydrologic Unrt 07120006, at Eagleville.

DRAINAGE AREA.--33 2 mi^2.

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

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

WATEK-QUALITY DATA, FEBRUARY 11 TO AUGUST 25. 1997

(Milligrams per liter unless otherwise indicated)

	Feb. 11		Apr. 10		June 10		July 24		Aug. 25	
Lake stage (ft)	9 :I		9 48		---		4.52		9.66	
Secchi-depth (meters)	---		1.8		2.3		1.5		1.7	
Chlorophyll a, phytoplankton (µg/L)	---		5 2		4.0		5.4		4 2	
Depth of sample (m)	0 5	2.5	0 5	2.0	0 5	2.0	0.5	2.0	0.5	2 0
Water temperature (°C)	2.5	5.5	7 0	6.5	22 3	20.0	26 0	25.0	21.5	21.5
Specific conductance (µS/cm)	598	712	455	454	479	504	494	513	479	497
pH (units)	7.7	7 4	8.5	8.5	8.1	8.0	7 9	7.9	8 1	8.1
Dissolved oxygen	12.3	7.9	13.0	12.7	1 0 0	9 7	7.1	8.3	9.6	9.5
Phosphorus, total (as P)	0.007	<0.008	0.012	0 1 4	0.012	0 012	0.031	0 C31	0.017	0.019
Phosphorus, ortho, dissolved (as P)	---	---	<0 002	<0.002	---		---	---	---	--
Nitrogen, NO2 + NO3, diss (as N)	---	---	0 84	0.88	---	---	---	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	0 02	0.02	---	---	---		---	---
Nitrogen, amm. + org, total (as HI	---	---	0.40	0.40	---	---	---	---	---	---
Nitrogen, total [as N)	---	---	1.2	1.3	---	---	---	---	---	---
Color (Pt-Co. scale)	--	--	15	10	---	---	---	---	---	---
Turbidity (NTU)	---	---	2.7	2.7	---	---	---	---	---	---
Hardness, as CaCO3	---	---	230	240	---	---	---	---	---	---
Calcium, dissolved (Ca)	---	---	49	50	---	---	---	---	---	---
Magnesium, dissolved (Mg)	---	---	27	27	---		---	---	---	---
Sodium, dissolved (Na)	---	---	6 2	6.2	---	---	---	---	---	---
Potassium, dissolved (K)	---	---	1	1	---	---	---	---		---
Alkalinity, as CaCO3	---	---	210	210	---	---	---	---	---	---
Sulfare, dissolved (504)	---	---	16	I7	---	---	---	---	---	--
Chloride, dissolved (Cl)	---	---	15	15	---	---	---	---	---	---
Silica, dissolved (SiO2)	---	---	4 9	4.9	---		---	---	---	---
Solids, dissolved, at 180°C	---	---	258	264	---	---	---	---	--	---
Iron, dissolved (Fe) µg/L	---	---	10	<10	---	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	r0.4	<0.4	---	---	---	---	---	---
	2-11-97	4-10-97	6-10-97		7-24-97		8-25-97			

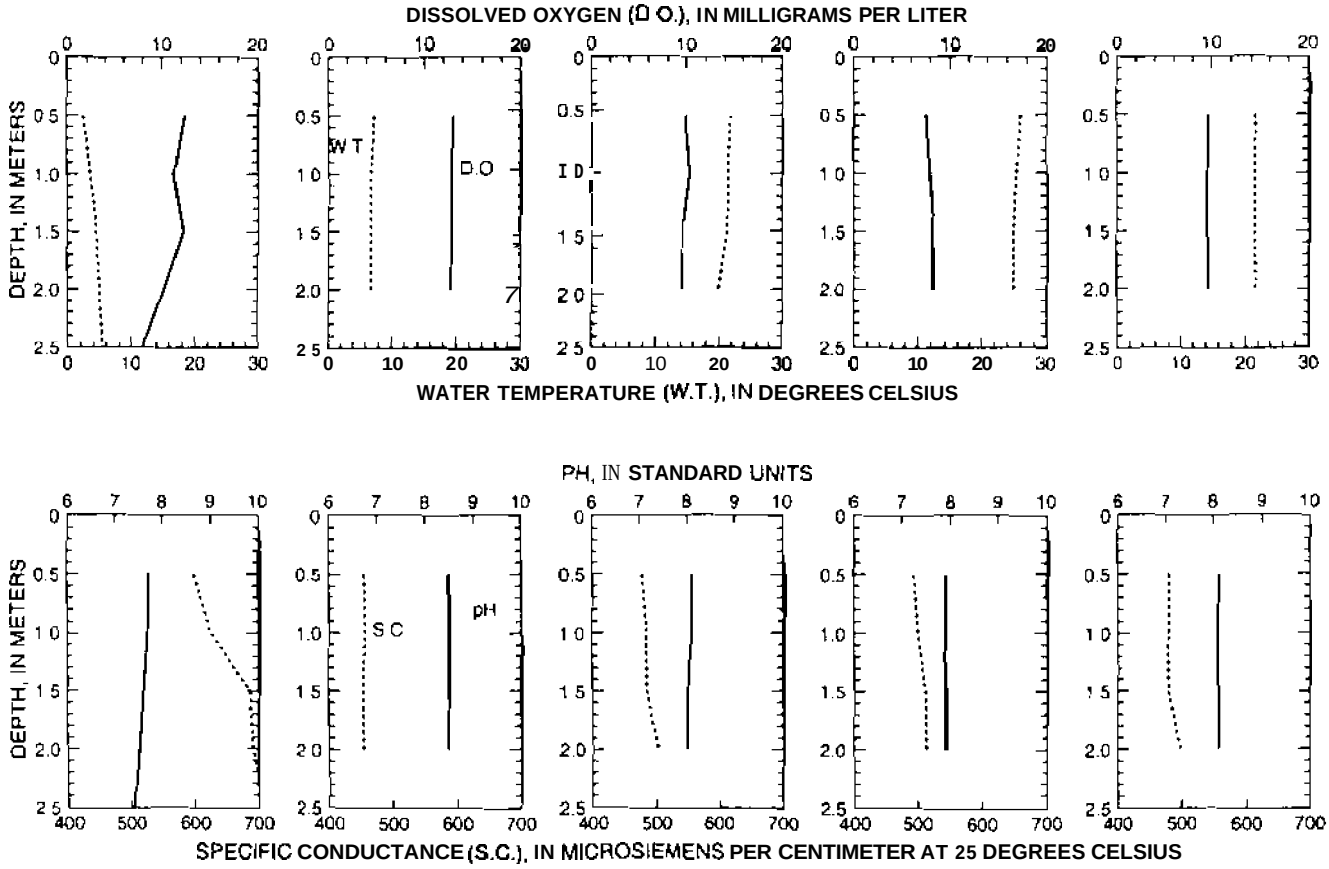


Figure 3a. Water-quality data and **depth profiles** for Eagle Spring Lake near Eagleville, Wisconsin, 1997.

425103088261500 EAGLE SPRING LAKE AT EAGLEVILLE, WI

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

DRAINAGE AREA.--33.2mi^2.

PERIOD OF RECORD.--April 1991 to current year

REMARKS.--Lake sampled near southeast end at a lake depth of about 3 m. Water-quality analyses done by Wisconsin State Laboratory of Hygiene. Lake-stage readings from 1991 to 1993 (except 2/4/93 and 4/19193) were previously reported 1 A too high.

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

	Feb 17		Apr 14		June 01		July 17		Aug 19	
Lake stage (ft)	9.57		9.49		9.59		9.50		9.50	
Secchi-depth (meters)	---		1.7		1.3		1.2		1.5	
Chlorophyll a, phytoplankton (µg/L)	---		4.48		5.08		7.21		5.32	
nepth of sample (m)	0.5	2.0	0.5	2.0	0.5	2.0	0.5	2.0	0.5	2.0
Water temperature (°C)	5.9	6.2	13.6	13.1	23.1	22.9	27.9	27.8	21.5	23.7
Specific conductance (µS/cm)	560	571	450	452	450	451	462	475	491	491
pH (units)	7.9	8.0	8.2	8.2	8.0	8.0	8.0	8.0	8.0	8.0
Dissolved oxygen	20.1	20.3	10.0	10.0	8.9	8.4	8.6	8.1	8.6	8.8
Phosphorus, total (as P)	0.019	---	0.021	0.022	0.020	0.021	0.021	0.023	0.020	0.020
Phosphorus, ortho, dissolved (as P)	---	---	<0.002	<0.002	---	---	---	---	---	---
Nitrogen, NO2 + NO3, diss. (as N)	---	---	0.490	0.521	---	---	---	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	0.039	0.035	---	---	---	---	---	---
Nitrogen, amm + org, total (as N)	---	---	0.42	0.44	---	---	---	---	---	---
Nitrogen, total (as N)	---	---	0.91	0.96	---	---	---	---	---	---
Color (Pt-Co. scale)	---	---	15	45	---	---	---	---	---	---
Turbidity (NTU)	---	---	4.5	4.7	---	---	---	---	---	---
Hardness, as CaCO3	---	---	230	230	---	---	---	---	---	---
Calcium, dissolved (Ca)	---	---	47	47	---	---	---	---	---	---
Magnesium, dissolved (Mg)	---	---	27	27	---	---	---	---	---	---
Sodium, dissolved (Na)	---	---	5.9	5.9	---	---	---	---	---	---
Potassium, dissolved (K)	---	---	1.1	1.0	---	---	---	---	---	---
Alkalinity, as CaCO3	---	---	209	208	---	---	---	---	---	---
Sulfate, dissolved (SO4)	---	---	12	12	---	---	---	---	---	---
Chloride, dissolved (Cl)	---	---	15	15	---	---	---	---	---	---
Silica, dissolved (SiO2)	---	---	4.4	4.5	---	---	---	---	---	---
Solids, dissolved, at 180°C	---	---	256	254	---	---	---	---	---	---
Iron, dissolved (Fe) µg/L	---	---	<10	<10	---	---	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	<0.40	<0.40	---	---	---	---	---	---

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

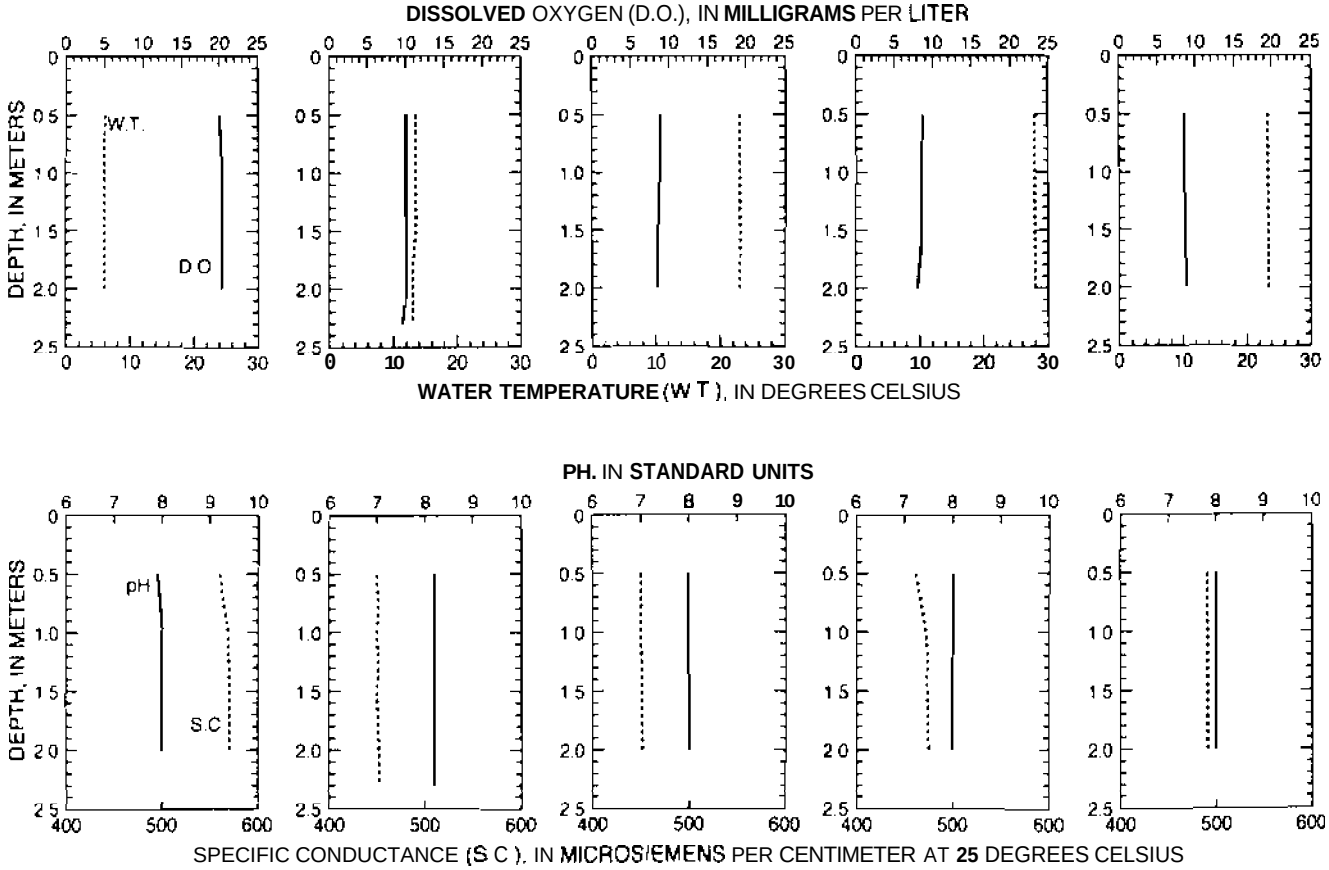


Figure 3b. Water-quality data and depth profiles for Eagle Spring Lake near Eagleville, Wisconsin, 1998.

425103088261500 EAGLE SPRING LAKE AT EAGLEVILLE, WI

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

DRAINAGE AREA.--33.2 mi^2

PERIOD OF RECORD --April 1991 to current year.

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

WATER-QUALITY DATA, FEBRUARY 19 TO AUGUST 03, 1999
(Milligrams per liter unless otherwise indicated)

	Feb-19		Apr 7		Jun 11	Jul 7	Aug-4
Lake stage (ft)	9.57		9.56		9.56	9.49	
Secchi depth (m)	---		>2.0		2.3	1.5	1.7
Chlorophyll a, phytoplankton (ug/L)	---		17.9		2.09	2.95	3.21
Depth of sample (m)	0.5	2.0	0.5	1.5	0.5	0.5	0.5
Water temperature (°C)	5.0	6.6	11.5	11.5	26.8	28.6	28.0
Specific conductance (µS/cm)	546	565	468	469	457	451	445
pH (units)	7.8	7.6	8.3	9.3	7.9	8.2	8.1
Dissolved oxygen (mg/L)	19.2	19.2	11.5	11.3	8.2	9.3	9.8
Phosphorus, total (as P)	0.01	0.014	0.012	0.012	0.021	0.017	0.038
Phosphorus, ortho, dissolved (as P)	---	---	0.004	---	---	---	
Nitrogen, NO2 + NO3, diss (as N)	---	---	0.669	---			---
Nitrogen, ammonia, **dissolved** (as N)	---	---	0.017	---			---
Nitrogen, amm. + org., total (as N)	---	---	0.57	---	---	---	
Nitrogen, total (as N)	---	---	1.2	---			---
Color (Pt-Co. scale)	---	---	5	---			---
Turbidity (NTU)	---	---	1.0	---	---	---	---
Hardness, (as $CaCO_3$)	---	---	230	---			---
Calcium, dissolved (Ca)	---	---	46	---			---
Magnesium, dissolved (Mg)	---	---	28	---			---
Sodium, **dissolved** (Na)	---	---	6.5	---			---
Potassium, dissolved (K)	---	---	1.3	---			---
Alkalinity, (as $CaCO_3$)	---	---	212	---	---	---	---
Sulfate, dissolved (SO_4)	---	---	12	---	---	---	---
Chloride, dissolved (Cl)	---	---	17.0	---	---	---	---
Silica, dissolved (SiO_2)	---	---	2.0	---			---
Solids, dissolved, at 180°C	---	---	268	---			---
Iron, **dissolved** (Fe) µg/L	---	---	<10	---			---
Manganese, dissolved (Mn) µg/L	---	---	1.3	---	---	---	

2-19-99 4-07-99 6-11-99 7-07-99 8-04-99

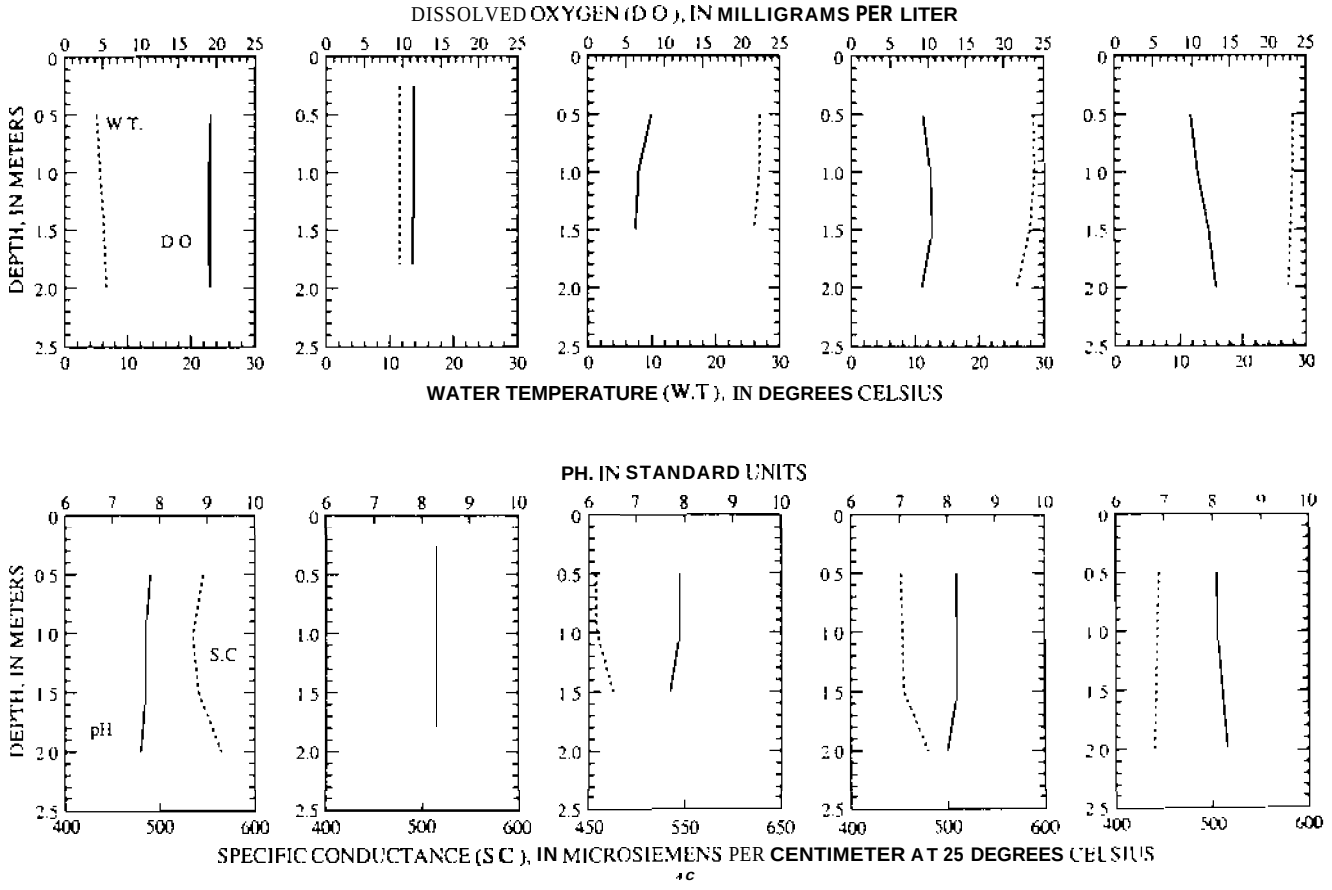


Figure 3c. Water-quality data and depth **profiles** for Eagle Spring Lake near Eagleville, Wisconsin, 1999.

425103088261500 EAGLE SPRING LAKE AT EAGLEVILLE, WI

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

DRAINAGE AREA.--33.2 mi^2

PERIOD OF RECORD.--April 1991 to current year

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

WATER-QUALITY DATA, FEBRUARY 09 TO AUGUST 16,2000
(Milligrams per liter unless otherwise indicated)

	Feb-9		Mar-19		Jun-8	Jul-11	Aug-16
Lake stage (ft)	9.39		3.40		3.54	9.56	9.39
Secchi-depth (m)	---		2.0		>2.5	2.5	1.5
Chlorophyll a, phytoplankton (µg/L)	---		6		1.5	2	36
Depth of sample (m)	0.5	2.P	0.5	2.0	0.5	0.5	0.5
Water temperature (°C)	1.7	4.7	9.0	8.2	21.0	27.2	26.2
Specific conductance (µS/cm)	572	667	483	474	410	475	479
pH (units)	7.8	7.3	8.2	6.2	8.1	7.9	8.0
Dissolved oxygen (mg/L)	14.9	6.6	12.1	12.4	10.2	5.2	9.7
Phosphorus, total (as P)	0.016	0.016	0.914	0.914	0.013	0.313	0.022
Phosphorus, ortho, dissolved (as P)	---	---	<0.002	---	---	---	---
Nitrogen, NO2 + NO3, diss (as N)	---	---	0.756	---	---	---	---
Nitrogen, ammonia, dissolved (as N)	---	---	0.026	---	---	---	---
Nitrogen, amm. + org., total (as N)	---	---	0.58	---	---	---	---
Nitrogen, total (as El		---	1.3	---	---	---	---
:~lor (Pc-Cu. scale)	---	---	15	---	---	---	---
Turbidity (NTU)	---	---	0.5	---	---	---	---
Hardness, (as $CaCO_3$)	---	---	240	---	---	---	---
Calcium, dissolved (Ca)	---	---	50	---	---	---	---
Magnesium, dissolved (Mg)	---	---	29	---	---	---	---
Sodium, dissolved (Na)	---	---	7.2	---	---	---	---
Potassium, dissolved (K)	---	---	1.1	---	---	---	---
Alkalinity, (as $CaCO_3$)	---	---	214	---	---	---	---
Sulfate, dissolved (SO_4)	---	---	20.4	---	---	---	---
Chloride, dissolved (Cl)		---	17.9	---	---	---	---
Silica, dissolved (SiO_2)	---	---	4.2	---	---	---	---
Solids, dissolved, at 180°C	---	---	272	---	---	---	---
Iron, dissolved (Fe) µg/L	---	---	<10	---	---	---	---
Manganese, dissolved (Mn) µg/L	---	---	1.0	---	---	---	---

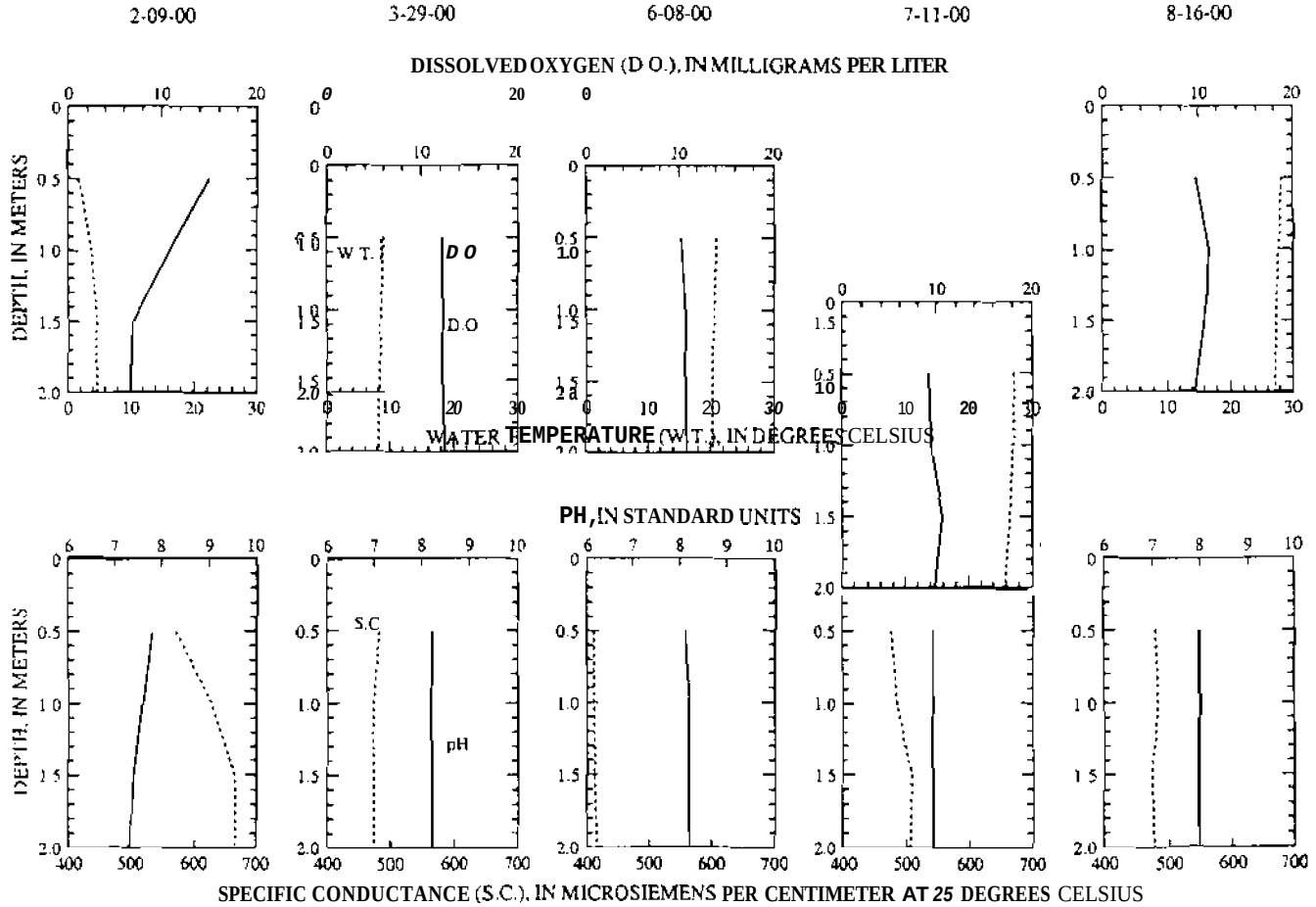


Figure 3d. Water-quality data and depth profiles for Eagle Spring *Lake* near Eagleville, Wisconsin, **2000.**

DRAINAGE AREA.--33 2 mi²

PERIOD OF RECORD --April 1991 to current year

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

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

	Feb-12		Apr-17		Jun-13		Jul 16		Aug-14
Lake stage (ft)	9.30		9.54		9.52		9.55		4.48
Secchi-depth (m)			1.4		2.3		1.0		0.95
Chlorophyll a, phytoplankton (µg/L)					3.2		6		5
Depth of sample (m)	0	2.0	0.5	2.0	0.5	2.0	0.5	2.0	3.5
Water temperature (°C)	2.7	4.2	9.0	8.7	24.8	28.5	27.9	24.6	25.1
Specific conductance (µS/cm)	615	701	434	435	471	544	*533*	*595*	*557*
pH (units)	7.4	7.4	8.1	8.1	7.8	7.4	7.9	7.6	7.3
Dissolved oxygen (mg/L)	10.4	10.3	11.9	12.3	9.7	14.1	9.7	10.2	8.0
Phosphorus, total (as P)	0.010	0.010	0.011	0.011	0.014	0.035	0.023	0.025	0.025
Phosphorus, ortho, dissolved (as P)	---	---	0.002	---	---	---		---	---
Nitrogen, NO2 + NO3, diss (as N)	---	---	0.715	---	---	---		---	---
Nitrogen, ammonia, dissolved (as N)	---	---	0.022	---	---	---		---	---
Nitrogen, amm. + org., total (as N)	---	---	*0.33*	---	---	---		---	---
Nitrogen, total (as N)	---	---	1.0	---	---	---		---	---
Color (Pt Co. scale)	---	---	15	---	---	---		---	---
Turbidity (NTU)	---	---	6.5	---	---	---		---	---
Hardness, (as $CaCO_3$)		---	212	---	---	---			---
Calcium, dissolved (Ca)			47	---	---	---			
Magnesium, dissolved (Mg)			23	---		---			
Sodium, dissolved (Na)	---		5.6						
Potassium, dissolved (K)	---		0.6					---	
Alkalinity, (as $CaCO_3$)	---		192					---	---
Sulfate, dissolved (SO_4)	---	---	12.4	---	---	---		---	---
Chloride, dissolved (Cl)	---	---	13.5	---	---	---		---	---
Silica, dissolved (SiO_2)	---	---	6.3	---	---	---		---	---
Solids, dissolved, at 180°C	---	---	246	---	---	---		---	---
Iron, dissolved (Fe) µg/L		---	10	---	---	---		---	---
Manganese, dissolved (Mn) µg/L		---	<0.4	---	---	---			---

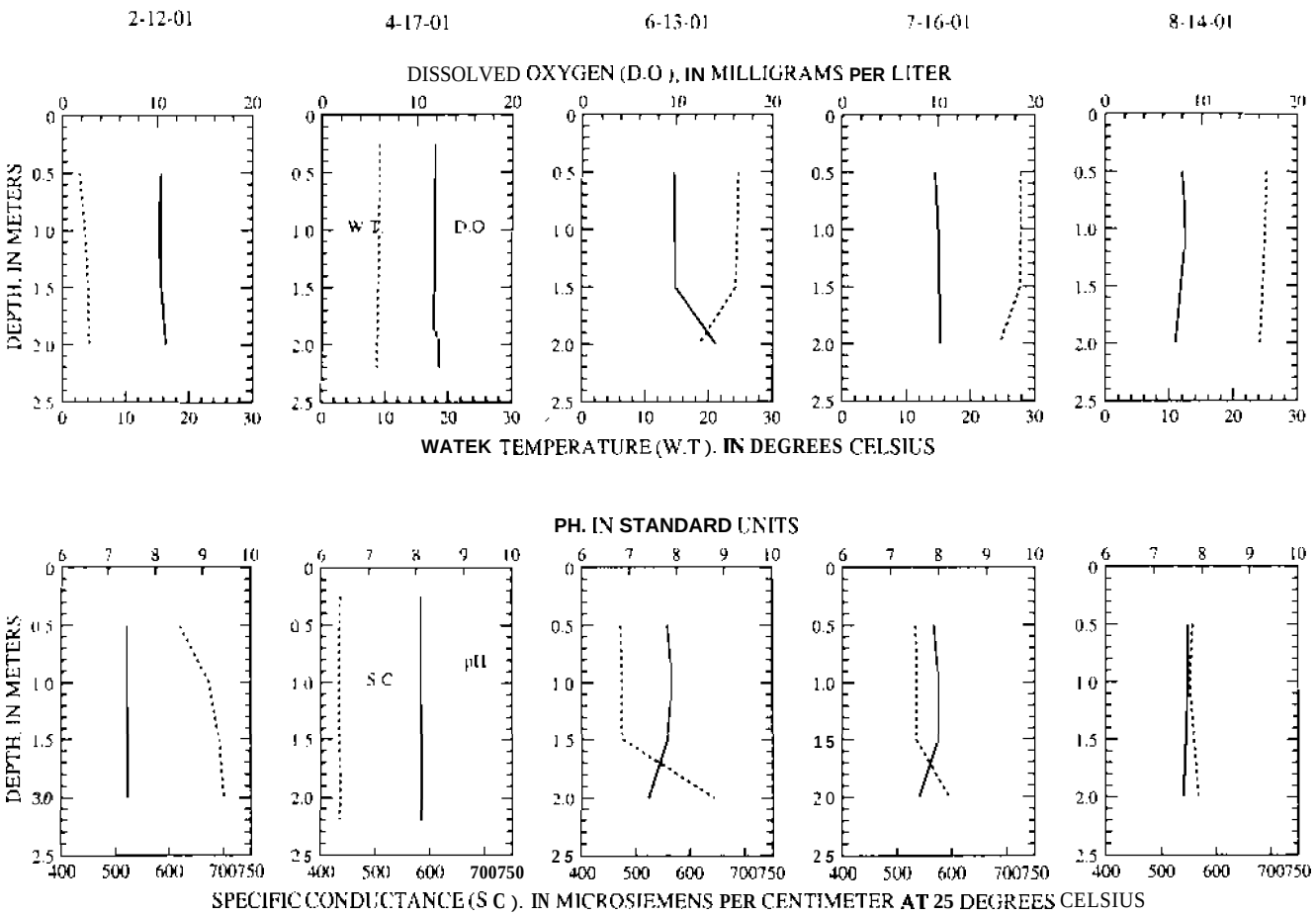


Figure 3e. Water-quality data and depth profiles for Eagle Spring Lake near Eagleville, Wisconsin, 2001.

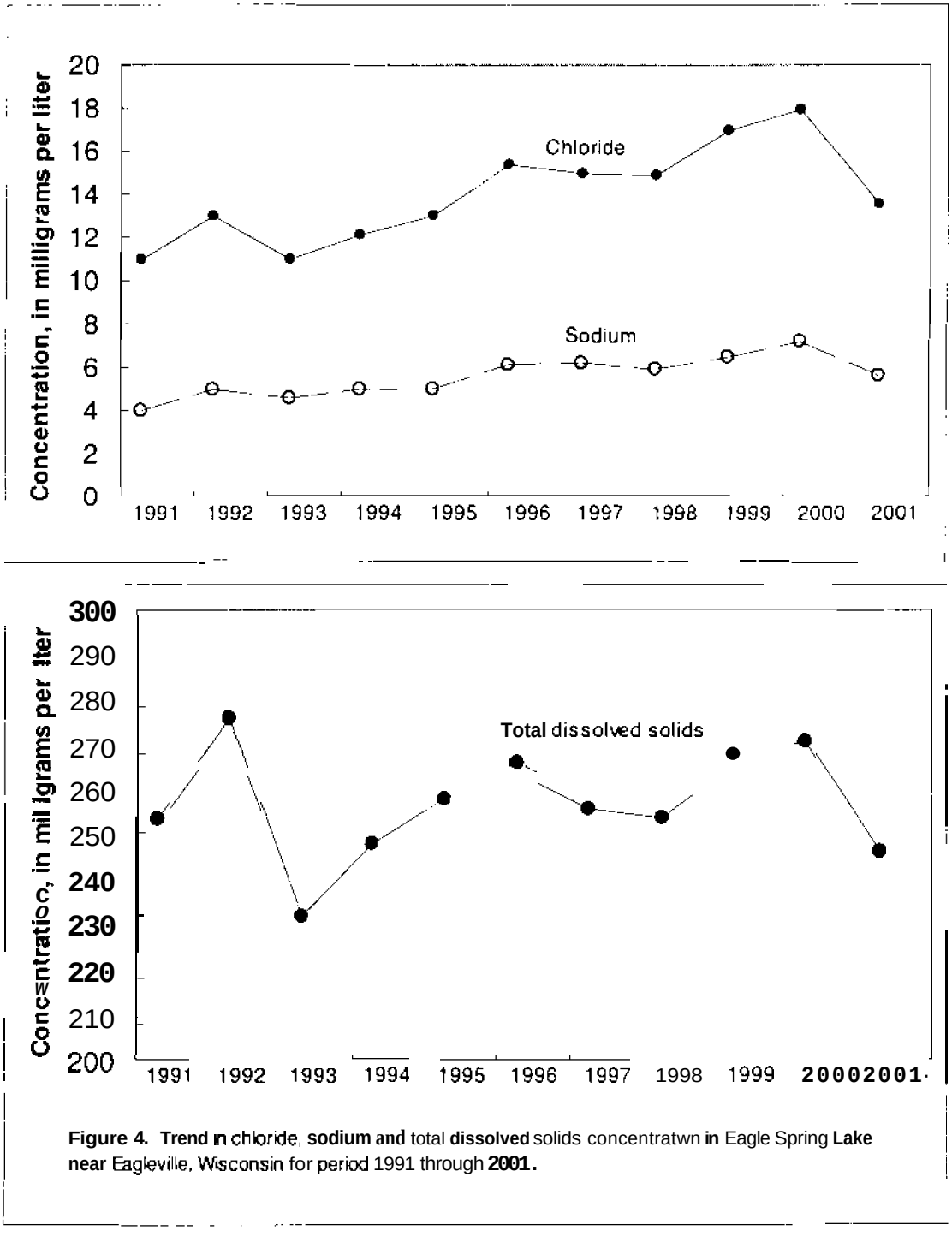


Figure 4. Trend in chloride, sodium and total dissolved solids concentratwn in Eagle Spring Lake near Eagleville, Wisconsin for period 1991 through 2001.

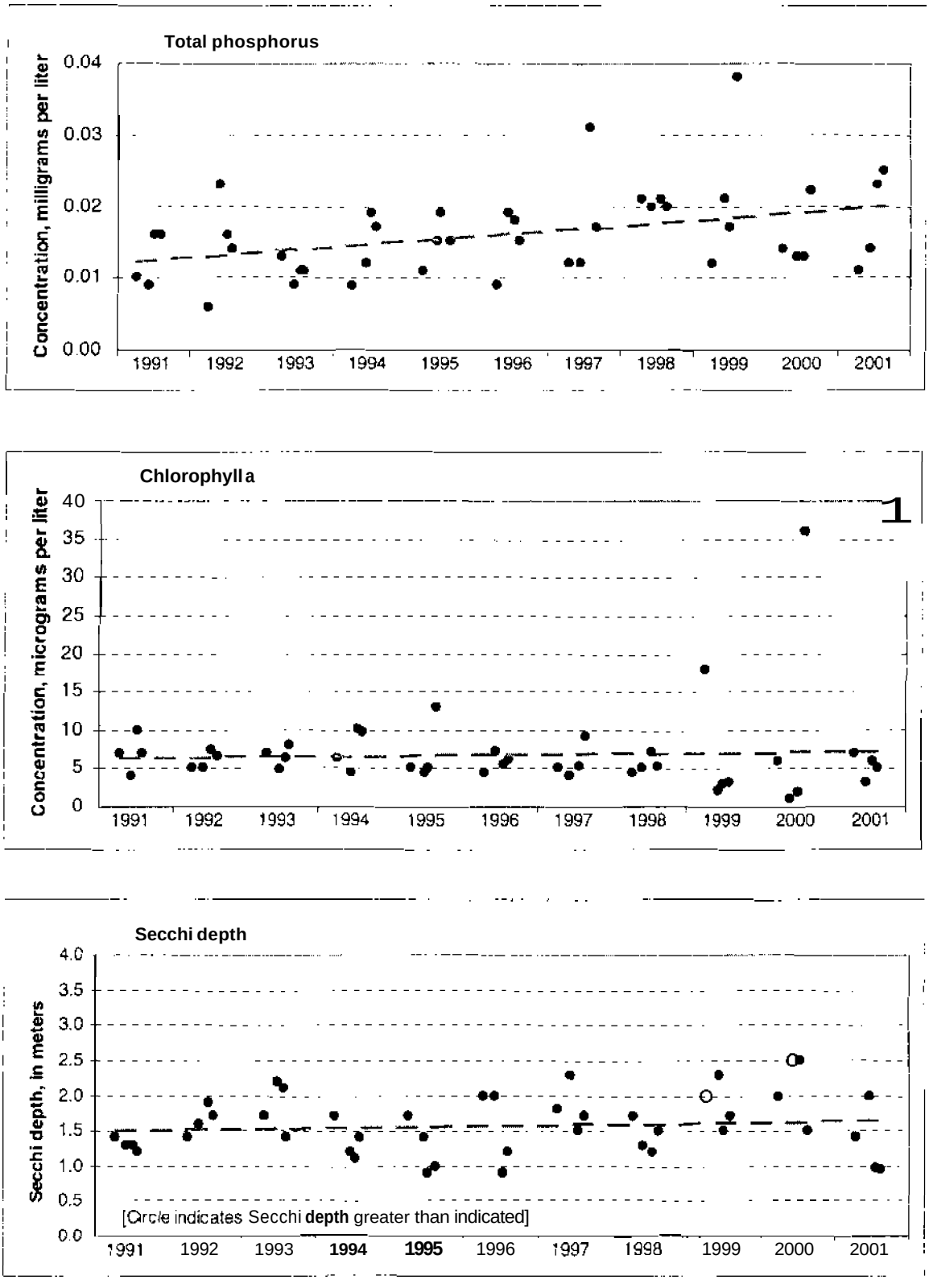


Figure 5. Surface total phosphorus and chlorophyll a concentrations and Secchi depths *for* Eagle Spring Lake at Eagleville, Wisconsin, 1991 – 2001. Dashed line is a best-fit trendline.

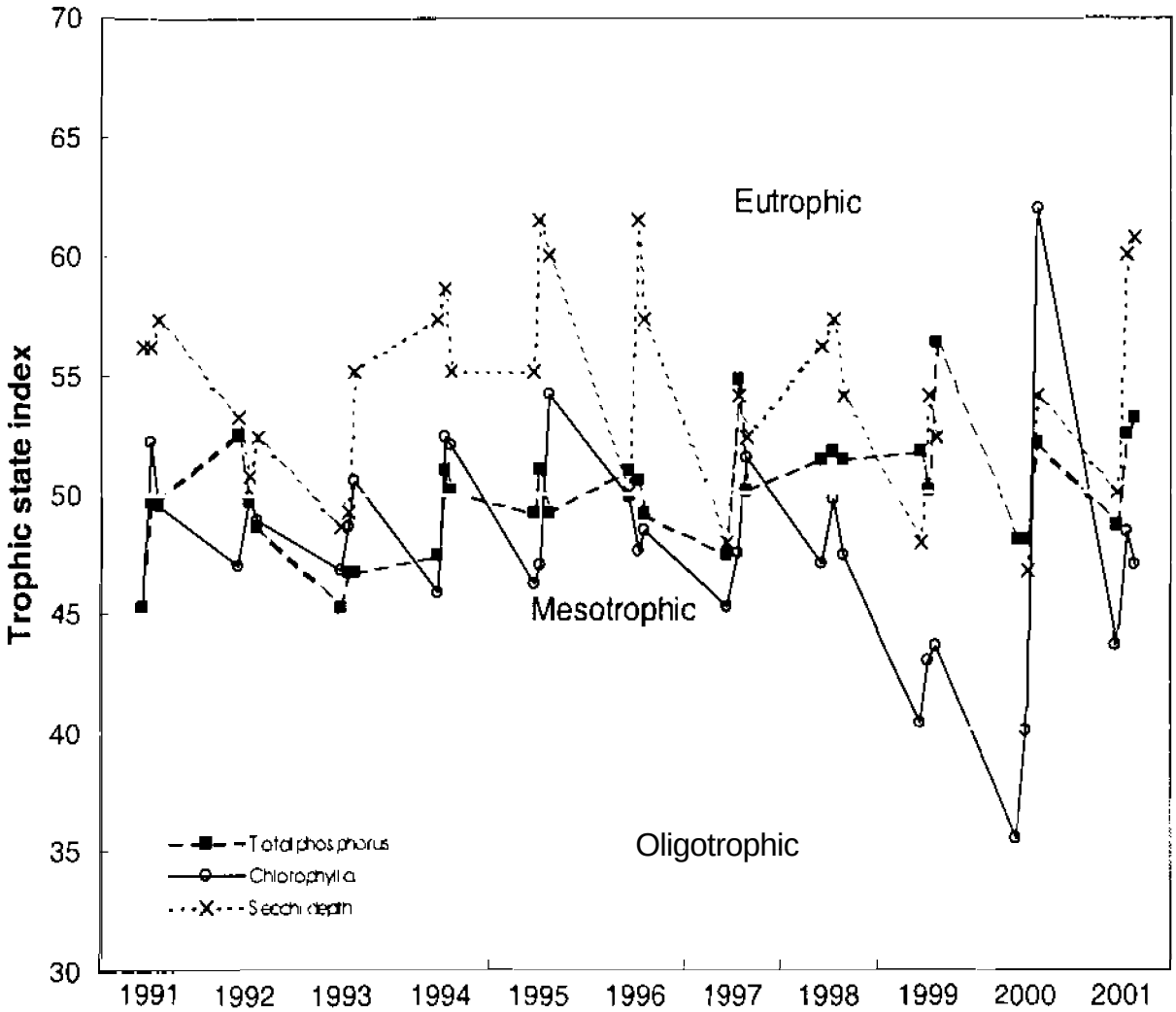


Figure *6*. Trophic state index for Eagle Spring Lake at Eagleville, Wisconsin, 1991 - 2001

Table 1. Lake depth profiles of field-measured parameters for Eagle Spring Lake near Eagleville, Wisconsin, 1997 through 2001

[°C, degrees Celsius; µS/cm, microsiemans per centimeter; mg/L, milligrams per liter]

Date Time	Depth (feet)	Depth (meters)	Temper-ature (°C)	Specific conductance (µS/cm)	pH	Dissolved oxygen (mg/L)
2/11/97 14:04	1.6	0.5	2.4	598	7.7	12.3
2/11197 14:05	3.3	1	3.4	625	7.7	11.2
2/11197 14:06	4.9	1.5	4.4	687	7.6	12.2
2/11/97 14:07	6.6	2	5	692	7.5	10.1
2/11/97 14:08	8.2	2.5	5.4	712	7.4	7.9
4/10/97 12:35	*1.6*	0.5	6.8	455	8.5	13
4/10/97 12:36	*3.3*	1	6.7	457	8.5	12.9
4/10/97 12:37	*4.9*	1.5	6.6	454	8.5	12.8
4/10/97 12:38	*6.6*	2	6.6	454	8.5	12.7
6/10/97 11:00	*1.6*	0.5	22.1	479	8.1	10
6/10/97 11:01	*3.3*	1	21.6	485	8.1	10.4
6/10/97 11:02	*4.9*	1.5	21.3	485	8	9.6
6/10/97 11:03	*6.6*	2	20.2	504	8	9.7
7/24/97 12:00	*1.6*	0.5	25.9	494	7.9	7.7
7/24/97 12:01	*3.3*	1	25.7	500	7.9	8
7/24/97 12:02	*4.9*	1.5	25.1	513	7.9	8.4
7/24/97 12:03	*6.6*	2	25	513	7.9	8.3
8/25/97 11:50	*1.6*	0.5	21.5	479	8.1	9.6
8/25/97 11:51	*3.3*	1	21.5	478	8.1	9.6
8/25/97 11:52	*4.9*	1.5	21.6	479	8.1	9.6
8/25/97 11:53	*6.6*	2	21.5	497	8.1	9.5

Table 1. Lake depth profiles of field-measuredparameters for Eagle Spring Lake near Eagleville, Wisconsin, 1997 through 2001--continued

[°C, **degrees** Celsius; µS/cm, microsiemansper centimeter; mg/L, milligrams per liter]

2/17/98 13:10	*1.6*	0.5	5.9	560	7.9	20.1
2/17/98 13:11	*3.3*	1	6.1	570	8	20.5
2/17/98 13:12	*4.9*	1.5	6.2	571	8	20.5
2/17/98 13:13	*6.6*	2	6.2	571	8	20.3
4/14/98 13:15	*1.6*	0.5	13.6	450	8.2	10
4/14/98 13:16	*2.5*	0.75	13.5	451	8.2	10
4/14/98 13:17	*3.3*	1	13.4	450	8.2	10
4/14/98 13:18	*3.9*	1.2	13.3	451	8.2	10.1
4/14/98 13:19	*4.9*	1.5	13.3	450	8.2	10
4/14/98 13:20	*5.9*	1.8	13.2	451	8.2	10
4/14/98 13:21	*6.6*	2	13.1	452	8.2	10
4/14/98 13:22	*7.2*	2.2	13.1	452	8.2	9.5
6/1/98 11:30	*1.6*	0.5	23.1	450	8	8.9
6/1/98 11:31	*3.3*	1	23.1	450	8	8.8
6/1/98 11:32	*4.9*	1.5	23	451	8	8.5
6/1/98 11:33	*6.6*	2	22.9	451	8	8.4
7/17/98 9:00	*1.6*	0.5	27.9	462	8	8.6
7/17/98 9:01	*3.3*	1	28	472	8	8.7
7/17/98 9:02	*4.9*	1.5	28	474	8	8.7
7/17/98 9:03	*6.6*	2	27.8	475	8	8.1
8/19/98 10:15	*1.6*	0.5	23.5	491	8	8.6
8/19/98 10:16	*3.3*	1	23.7	491	8	8.6
8/19/98 10:17	*4.9*	1.5	23.7	491	8	8.7
8/19/98 10:18	*6.6*	2	23.7	491	8	8.8

Table 1. Lake depth profiles of field-measured parameters for Eagle Spring Lake near Eagleville, Wisconsin, 1997 through 2001--continued

[°C, degrees Celsius; µS/cm, microsiemans per centimeter; mg/L, milligrams per liter]

2/19/99 14:45	*1.6*	0.5	5	546	7.8	19.2
2/19/99 14:46	*3.3*	1	5.6	535	7.7	19
2/19/99 14:47	*4.9*	1.5	6.2	541	7.7	18.8
2/19/99 14:48	*6.6*	2	6.6	565	7.6	19.2
4/7/99 12:45	*0.8*	0.25	11.5	467	8.3	11.5
4/7/99 12:46	*1.6*	0.5	11.5	468	8.3	11.5
4/7/99 12:47	*2.5*	0.75	11.5	469	8.3	11.4
4/7/99 12:48	*3.3*	1	11.5	469	8.3	11.4
4/7/99 12:49	*3.9*	1.2	11.5	469	8.3	11.4
4/7/99 12:50	*4.9*	1.5	11.5	469	8.3	11.3
4/7/99 12:51	*5.9*	1.8	11.5	470	8.3	11.3
6/11/99 9:40	*1.6*	0.5	26.8	457	7.9	8.2
6/11/99 9:41	*3.3*	1	26.7	458	7.9	6.6
6/11/99 9:42	*4.9*	1.5	25.9	475	7.7	6.2
6/11/99 9:43	*6.6*	2	20.8	620	7.6	14.9
7/7/99 18:00	*1.6*	0.5	28.6	451	8.2	9.3
7/7/99 18:01	*3.3*	1	28.6	453	8.2	10.3
7/7/99 18:02	*4.9*	1.5	27.9	454	8.2	10.6
7/7/99 18:03	*6.6*	2	25.9	480	8	9.2
8/4/99 15:30	*1.6*	0.5	28	445	8.1	9.8
8/4/99 15:31	*3.3*	1	27.9	443	8.1	10.7
8/4/99 15:32	*4.9*	1.5	27.6	442	8.2	12.2
8/4/99 15:33	*6.6*	2	27.2	440	8.3	13.2

Table 1. Lake depth profiles of field-measured parameters for Eagle Spring Lake near Eagleville, Wisconsin, 1997 through 2001--continued

[°C, **degrees Celsius;** µS/cm, microsiemans per centimeter; mg/L, milligrams per liter]

2/9/00 11:30	*1.6*	0.5	1.2	605	8	11.8
2/9/00 11:35	*26.2*	8	4	652	7.4	2.4
2/9/00 16:15	*1.6*	0.5	1.7	572	7.8	14.9
2/9/00 16:16	*3.3*	1	3.7	628	7.6	10.7
2/9/00 16:17	*4.9*	1.5	4.6	665	7.4	7
2/9/00 16:18	*6.6*	2	4.7	667	7.3	6.6
3/29/00 14:15	*1.6*	0.5	9	483	8.2	12.1
3/29/00 14:16	*3.3*	1	8.6	473	8.2	12.1
3/29/00 14:17	*4.9*	1.5	8.4	474	8.2	12.2
3/29/00 14:18	*6.6*	2	8.2	474	8.2	12.4
6/8/00 10:30	*1.6*	0.5	21	410	8.1	10.2
6/8/00 10:31	*3.3*	1	20.6	410	8.2	10.6
6/8/00 10:32	*4.9*	1.5	20.4	412	8.2	10.7
6/8/00 10:33	*6.6*	2	20.3	416	8.2	10.8
7/11/00 16:00	*1.6*	0.5	27.2	475	7.9	9.2
7/11/00 16:01	*3.3*	1	27.1	484	7.9	9.4
7/11/00 16:02	*4.9*	1.5	26.6	509	7.9	10.6
7/11/00 16:03	*6.6*	2	25.7	506	7.9	9.8
8/16/00 16:25	*1.6*	0.5	28.2	479	8	9.7
8/16/00 16:26	*3.3*	1	27.8	482	8	11.1
8/16/00 16:27	*4.9*	1.5	27.4	474	8	10.7
8/16/00 16:28	*6.6*	2	27.2	477	8	9.6

Table 1. Lake depth profiles of field-measured parameters for Eagle Spring Lake near Eagleville, Wisconsin, 1997 through 2001--continued

[°C, degrees Celsius; µS/cm, microsiemans per centimeter; mg/L, milligrams per liter]

2/12/01 14:38	*1.6*	0.5	2.7	619	7.4	10.4
2/12/01 14:39	*3.3*	1	3.5	674	7.4	10.1
2/12/01 14:40	*4.9*	1.5	4	693	7.4	10.4
2/12/01 14:41	*6.6*	2	4.2	701	7.4	10.9
4/17/01 10:05	*0.8*	0.25	9	435	8.1	11.9
4/17/01 10:06	*1.6*	0.5	9	434	8.1	11.9
4/17/01 10:07	*2.5*	0.75	9	434	8.1	11.7
4/17/01 10:08	*3.3*	1	8.8	434	8.1	11.8
4/17/01 10:09	*3.9*	1.2	8.9	434	8.1	11.9
4/17/01 10:10	*4.9*	1.5	8.8	433	8.1	12
4/17/01 10:11	*5.9*	1.8	8.7	435	8.1	11.8
4/17/01 10:12	*6.6*	2	8.7	435	8.1	12.3
4/17/01 10:13	*7.2*	2.2	8.7	435	8.1	12.4
6/13/01 11:00	*1.6*	0.5	24.8	471	7.8	9.7
6/13/01 11:01	*3.3*	1	24.6	474	7.9	9.9
6/13/01 11:02	*4.9*	1.5	24.3	474	7.8	9.8
6/13/01 11:03	*6.6*	2	18.5	644	7.4	14.1
7/16/01 17:00	*1.6*	0.5	27.9	533	7.9	9.7
7/16/01 17:01	*3.3*	1	27.9	535	7.9	10
7/16/01 17:02	*4.9*	1.5	27.8	534	8	10.1
7/16/01 17:03	*6.6*	2	24.6	595	7.6	10.2
8/14/01 10:30	*1.6*	0.5	25.1	557	7.7	8
8/14/01 10:31	*3.3*	1	25	552	7.7	8.4
8/14/01 10:32	*6.6*	2	24.2	567	7.6	7.3
8/14/01 10:35	*1.6*	0.5	25.1	557	7.7	8

Table 2. Late summer condition of Eagle Spring Lake relative to other southeastern Wisconsin Lakes

[Average July and August values for 1991-1995 and for 1997-2001]
[mg/L; Milligrams per liter] [µg/L; Micrograms per liter]

	Parameter (late Summer values)	Percentage distribution of lakes in southeastern Wisconsin within parameter ranges [1]	
	Total Phosphorus (mg/L)		
	<0.010	best condition	7
Eagle Spring Lake (1991-95)	0.010-0.020		21
Eagle Spring Lake (1996-2001)	.020-0.030		15
	0.030-0.050		18
	0.050-0.100		39
	0.100-0.150		
	>0.150	worst condition	
	Chlorophyll a (µg/L)		
	0 - 5	best condition	22
Eagle Spring Lake (1991-95) and (1996-2001)	**5 - 10**		**30**
	10 - 15		14
	15 - **30**		10
	>30	worst condition	24
	Secchi depth (meters)		
	>6	best condition	0
	3 - 6		9
	2 - 3		26
Eagle Spring Lake (1991-95) and (1996-2001)	1 - 2		32
	0 - 1	worst condition	33

[1] Data in this table are from Lillie, R.A. and Mason, J.W., **1983,** *Limnological characteristics of Wisconsin* Lakes: Wisconsin Department of Natural Resources Tech. Bull. 138, 116 p.

Table 3. Summary of summer, near-surface trophic state index (TSI) parameters and TSI values for 1991 -12001 period.

[mg/L, milligrams per liter; µg/L, microgams per liter]

Date	Total-phosphorus concentration (mg/L)	Chloro-phyll *a* concentration (µg/L)	Secchi depth (meters)	Trophic State Index (TSI)		
				Total-phosphorus	Chloro-phyll *a*	Secchi depth
6/11/91	0.009	4	1.3	45.2	45.3	56.2
7/9/91	0.016	10	1.3	49.7	52.2	56.2
8/6/91	0.016	7	1.2	49.7	49.5	57.4
6/1/92	0.023	5	1.6	52.5	47.0	53.2
7/14/92	0.016	7.35	1.9	49.7	49.9	50.7
8/11/92	0.014	6.46	1.7	48.7	48.9	52.3
6/22/93	0.009	4.92	2.2	45.2	46.9	48.6
7/21/93	0.011	6.25	2.1	46.8	48.7	49.3
8/10/93	0.011	7.99	**1.4**	46.8	50.5	55.1
6/20/94	0.012	4.34	1.2	47.5	45.9	57.4
7/18/94	0.019	10.2	1.1	51.0	52.4	58.6
8/10/94	0.017	9.74	1.4	50.2	52.0	55.1
6/19/95	0.015	4.5	1.4	49.2	46.2	55.1
7/6/95	0.019	5	0.9	51.0	47.0	61.5
8/17/95	0.015	13	1	49.2	54.2	60.0
6/4/96	0.019	7.3	2	51.0	49.9	50.0
7/10/96	0.018	5.4	**0.9**	50.6	47.6	61.5
8/5/96	0.015	6.1	1.2	49.2	48.5	57.4
6/10/97	0.012	4	**2.3**	47.5	45.3	48.0
7/24/97	0.031	5.36	1.5	54.8	47.5	54.2
8/25/97	0.017	9.15	1.7	50.2	51.6	52.3
6/1/98	0.02	5.08	1.3	51.4	47.1	56.2
7/17/98	0.021	7.21	1.2	51.8	49.8	57.4
8/19/98	0.02	5.32	1.5	51.4	47.5	54.2
6/11/99	0.021	2.09	2.3	51.8	40.4	48.0
7/7/99	0.017	2.95	1.5	50.2	43.0	54.2
8/4/99	0.038	3.21	1.7	56.4	43.6	52.3
6/8/00	0.013	1.1	**> 2.5**	48.1	35.5	< 46.8
7/11/00	0.013	2	2.5	48.1	40.1	46.8
8/16/00	0.022	36	1.5	52.1	61.9	54.2
6/13/01	0.014	3.2	2	48.7	43.6	50.0
7/16/01	0.023	6	1	52.5	48.4	60.0
8/14/01	0.025	5	0.95	53.1	47.0	60.7