

Valentine Lake (62-0071) Rice Creek Watershed District

Valentine Lake is located within the City of Arden Hills in Ramsey County. The lake has a surface area of 60-acres and a maximum and mean depth of 4.0 m (13.1 feet) and 1.5 m (4.9 feet), respectively. Because of the shallowness of the lake, its entire surface area is considered littoral, the shallow (0-15 foot depth) area dominated by aquatic vegetation, and it does not maintain a thermocline (a density gradient owed to changing water temperatures throughout the lake's water column). The mean depth and surface area of the lake translates to an approximate volume of 300 ac-ft. The result of comparing the lake's surface area to its 2,237-acre drainage area (watershed) is a rather large 37:1 watershed-to-lake size ratio (the greater the ratio, the greater the potential stress on the lake from surface runoff).

This was the sixth year that Valentine Lake has been involved in CAMP (2001-2005 being the others). In fact, the 2001-2005 CAMP data were the only data found through STORET nationwide water quality database search. Therefore 2001-2006 represents the only water quality data readily available for the lake.

The lake was monitored 10 times between mid-April and early-October, 2006. On each sampling day the lake was monitored for TP, CLA, TKN, and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability.

2006 summer (May-September) data summary

| <i>Parameter</i> | <i>Mean</i> | <i>Minimum</i> | <i>Maximum</i> | <i>Grade</i> |
|-------------------|-------------|----------------|----------------------|--------------|
| TP (µg/l) | 60.9 | 42.0 | 79.0 | C |
| CLA (µg/l) | 12.6 | 5.1 | 34.0 | B |
| Secchi (m) | 1.8 | 1.0 | 2.6 | C |
| TKN (mg/l) | 1.10 | 0.82 | 1.40 | |
| | | | Overall Grade | C |

The resulting overall water quality grade for 2006 (C) is identical to those of 2001-2005. The lake's 2006 nutrient concentrations and Secchi transparencies are graphed on the following page.

Because of the limitedness of the lake's water quality database, the determination of any long- or short-term trends is not possible. It is reported on the MPCA website, however, that a recently conducted trend analysis on the lake's Secchi transparency data revealed a statistically significant improvement in recent water clarity. To better understand the lake's water quality and what direction it may be heading, more years of data collection are needed.

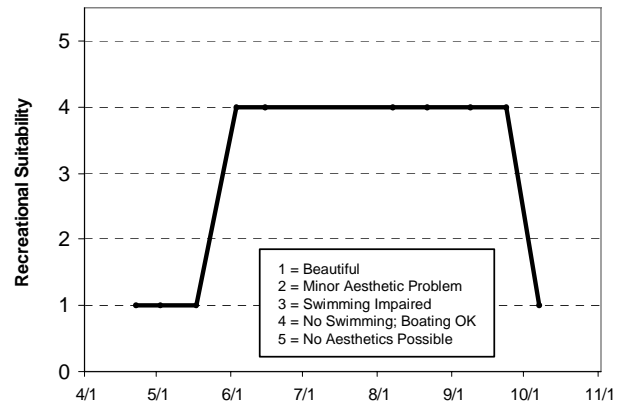
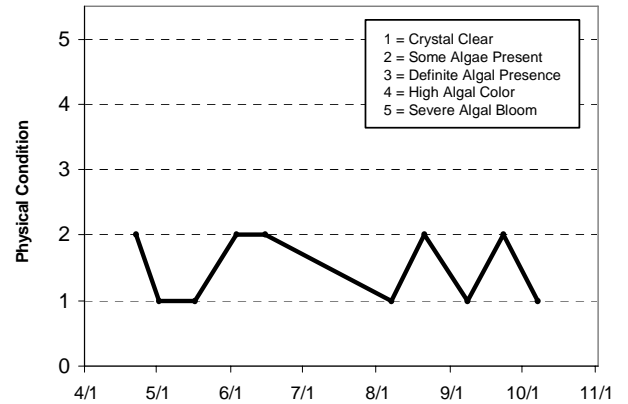
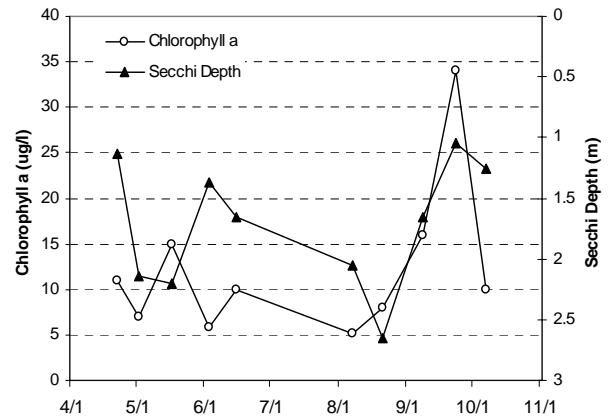
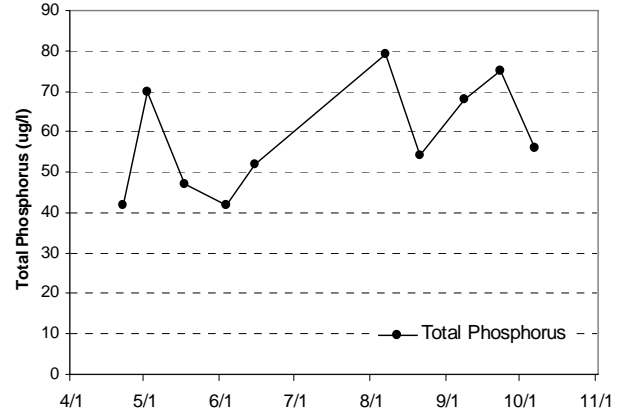
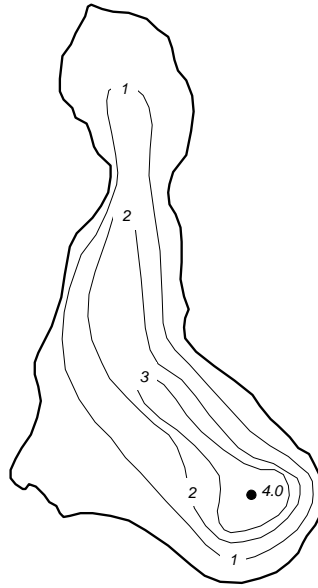
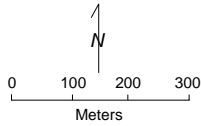
The perceived physical and recreational conditions of the lake, recorded by the volunteers, were ranked on a 1-to-5 scale. The rankings are shown in both tabular and graphical form on the lake's associated information sheet. The mean physical condition ranking was 1.5 (between 1- "crystal clear" and 2- "some algae present"), while the mean recreational suitability ranking was 2.8 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Kent Johnson of the Metropolitan Council at (651) 602-8117 or kent.johnson@metc.state.mn.us.

Valentine Lake
Arden Hills, Ramsey Co.

Lake ID: 620071
WD: Rice Creek
Volunteer: Bob Kistler

● Sampling site
Contours in meters



2006 Data

| Date | Surf. Temp C | Bot. Temp C | Surf. DO mg/L | Bot. DO mg/L | CLA ug/L | Surf. TP ug/L | Bot. TP ug/L | Secchi M | PC 1 thru 5 | RS 1 thru 5 |
|---------|-----------------|----------------|------------------|-----------------|-------------|------------------|-----------------|-------------|----------------|----------------|
| 4/22/06 | 14.9 | | | | 11 | 42 | | 1.13 | 2 | 1 |
| 5/2/06 | 15.9 | | | | 7 | 70 | | 2.14 | 1 | 1 |
| 5/17/06 | 16.7 | | | | 15 | 47 | | 2.2 | 1 | 1 |
| 6/3/06 | 26.4 | | | | 5.8 | 42 | | 1.37 | 2 | 4 |
| 6/15/06 | 22.4 | | | | 10 | 52 | | 1.66 | 2 | 4 |
| 8/7/06 | 25.9 | | | | 5.1 | 79 | | 2.05 | 1 | 4 |
| 8/21/06 | 24.3 | | | | 8 | 54 | | 2.65 | 2 | 4 |
| 9/8/06 | 21.3 | | | | 16 | 68 | | 1.65 | 1 | 4 |
| 9/23/06 | 14.6 | | | | 34 | 75 | | 1.04 | 2 | 4 |
| 10/7/06 | 15.1 | | | | 10 | 56 | | 1.26 | 1 | 1 |

Lake Water Quality Grades Based on Summertime Averages

| Year | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 |
|------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Total Phosphorus | | | | | | | | | | | | | |
| Chlorophyll a | | | | | | | | | | | | | |
| Secchi Depth | | | | | | | | | | | | | |
| Overall | | | | | | | | | | | | | |

| Year | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Total Phosphorus | | | | | | | | | C | C | C | C | C | C |
| Chlorophyll a | | | | | | | | | B | B | C | C | C | B |
| Secchi Depth | | | | | | | | | C | C | D | C | C | C |
| Overall | | | | | | | | | C | C | C | C | C | C |

Source: Metropolitan Council and STORET data