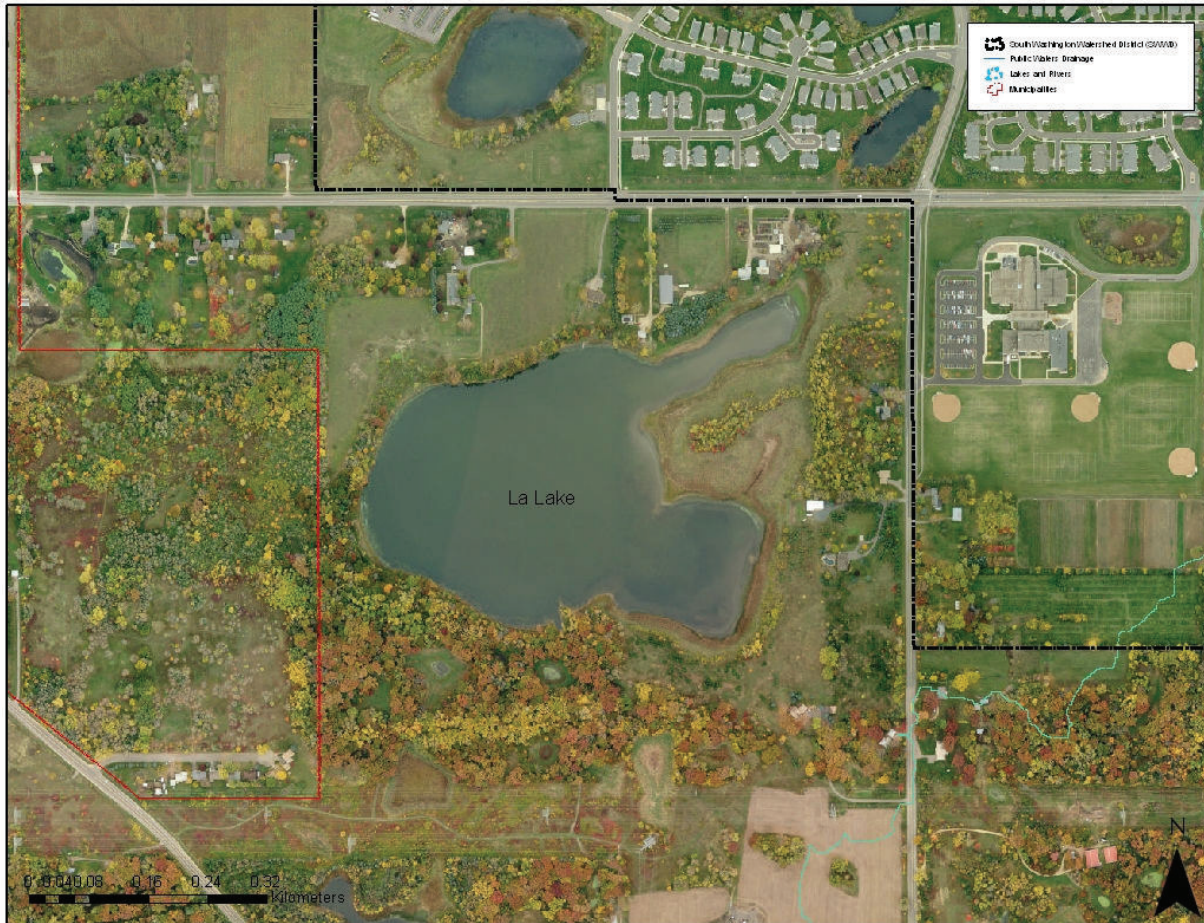


La Lake

DNR ID #82-0097 Municipality: Woodbury
Surface Area: 45 Acres Watershed Area: 81 Acres
Mean Depth: 6 feet Maximum Depth: 10 feet
SWWD Maximum Allowable Phosphorus Load: 1.65 lbs/ac/yr
SWWD Trophic State Index (TSI) Goal: 60-65

Map 14: La Lake



La Lake (Map 14) is a landlocked shallow basin within the East Mississippi subwatershed (Map 4.8). The less than 2-to-1 ratio of drainage area to lake surface area implies that inputs to the lake will be relatively straightforward to manage. The lake's drainage area is predominantly undeveloped with a mix of natural habitat areas and some agricultural land use. The watershed is privately owned and a portion of it is being considered for development. Currently, however, no storm sewer outfalls discharge to the lake and previous existence of septic systems for the few residences around the lake is likely of little concern to the lake. This lake is classified as a wetland by the Minnesota DNR, and has been used in the past by MnDNR Fisheries as a walleye rearing pond.

SWWD sets a TSI goal of 60-65 for La Lake, corresponding to an allowable watershed TP loading rate of 1.65 lbs/ac/yr. SWWD's goal encompasses MnPCA water quality standards for shallow lakes in the region.

Results

Lake level has been recorded at La Lake since 2004. While, lake level was monitored all season in 2010, the surface elevation was consistently below the existing lake gauge. Subsequently, only one reading was taken in 2010—at the end of the season when the surface elevation was surveyed. La Lake surface elevation readings since 2004 are shown in Figure 18.

Lake water quality was monitored once in April and twice in each of May through October. Water Quality results are below in Table 18.

Annual growing season averages of total phosphorus, chlorophyll a, and secchi transparency are shown graphically in Figures 19-21. La Lake's 2010 trophic status and historical lake grades are presented in Table 19.

Figure 18: La Lake Surface Elevation 2004-2010

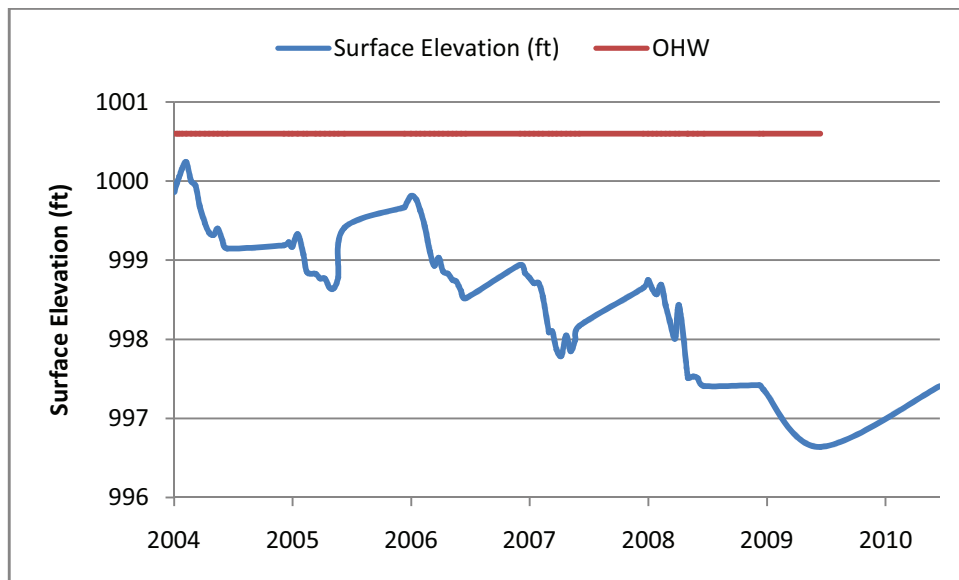


Figure 19: La Lake Historical Mean Growing Season Total Phosphorus Concentration

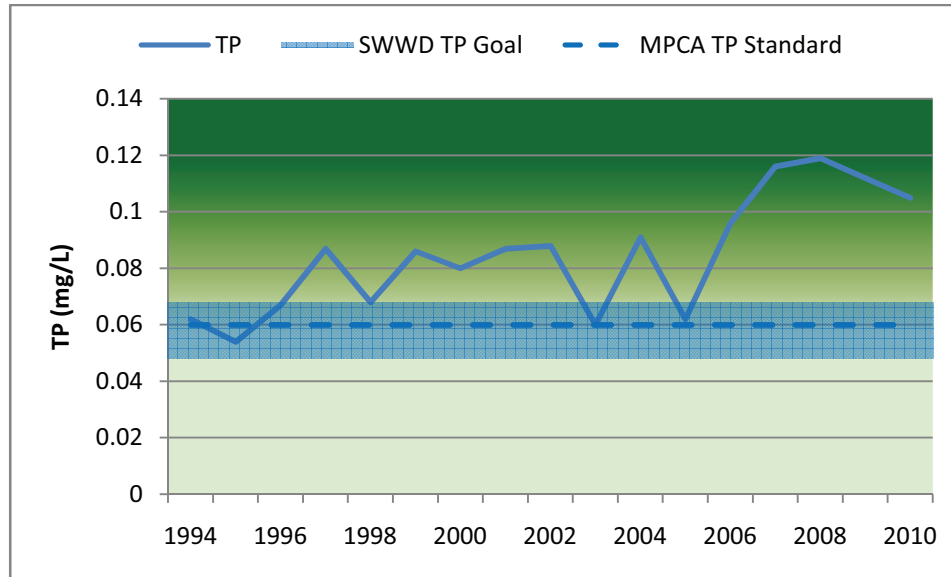
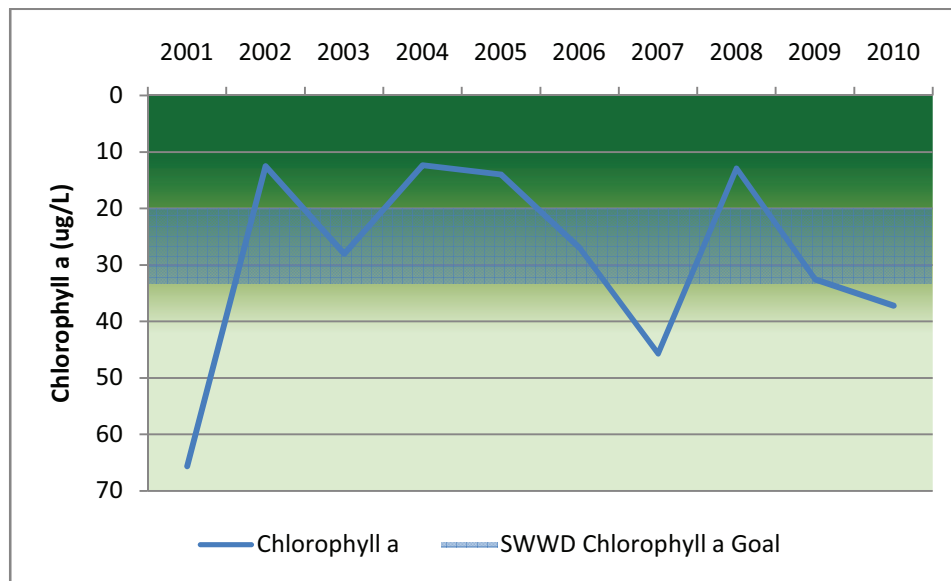
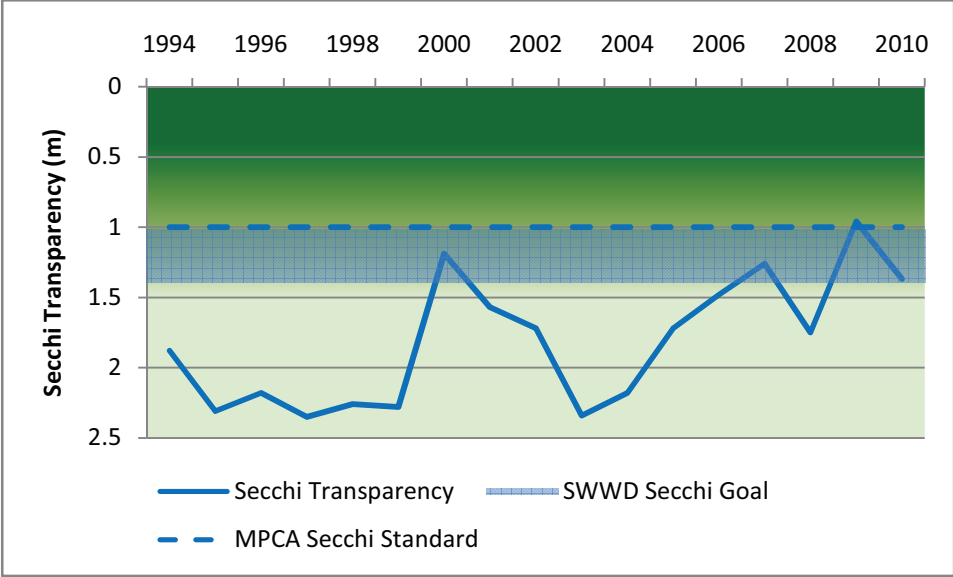


Figure 20: La Lake Historical Mean Growing Season Chlorophyll a¹ Concentration



¹Uncorrected trichromatic chlorophyll a concentrations are displayed in this figure and are the basis of the Met Council lake grading system. MnPCA standards apply to Pheophytin a corrected chlorophyll a concentrations.

Figure 21: La Lake Historical Mean Growing Season Secchi Transparency



Date	Secchi Depth (m)	Water Temperature (°C)	Pheophytin a Corrected Chlorophyll a (ug/L)	Trichromatic Uncorrected Chlorophyll a (ug/L)	TKN (mg/L)	TP (mg/L)
04/28/10	2.5	15.9	1	1.8	0.88	0.062
05/16/10	2.5	20	13	14	0.87	0.035
05/30/10	2.5	27.2	1	1.6	0.95	0.107
06/16/10	2.5	26.4	4.9	5.7	0.89	0.129
06/27/10	0.8	28.5	140	140	1.9	0.164
07/30/10	0.5	28.3	70	71	2.4	0.146
08/22/10	0.5	28.7	57	58	1.1	0.077
09/19/10	0.5	17.4	28	32	1.4	0.105
10/03/10	0.7	19.5	33	38	1.3	0.114
10/17/10	0.7	14	6.4	10	1.1	0.115

Table 18: La Lake 2010 Lake Water Quality Results

Parameter	Trophic Status	Lake Grades																
		94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10
Total Phosphorus	71;Hyper-eutrophic	C	C	C	D	D	D	D	D	D	C	D	C	D	D	D	D	D
Chlorophyll a	66; Eutrophic								D	B	C	B	B	C	C	B	C	C
Secchi Transparency	55; Eutrophic	C	B	C	B	B	B	D	C	C	B	C	C	C	C	C	C	C
Overall	Eutrophic	C	B	C	C	C	C	D	D	C	C	C	C	C	C	C	C	C

Table 19: La Lake 2010 Trophic Status and Historical Lake Grades

Discussion

La Lake displays surface elevation trends typical for land locked basins. With no outlet, the surface elevation rises during years of high precipitation and slowly falls during years with less precipitation. La Lake’s surface elevation has been steadily dropping since monitoring began in the years following high precipitation year of 2002. Accompanying the decreasing surface elevation in recent years has been a spike in total phosphorus concentration and rapid decrease in secchi transparency. Given the small size of the lake’s watershed and absence of development activity, the drastic changes in TP and transparency are likely due to lake dynamics and decreased lake volume.

In 2010, mean growing season total phosphorus concentration exceeded both SWWD goals and MnPCA shallow lake water quality standards. Chlorophyll a and secchi transparency both met SWWD goals. Historically, and in 2010, total phosphorus was higher than expected based on chlorophyll a and secchi transparency measurements. That dynamic is indicative of a system where algae dominate light attenuation but are nevertheless limited by some factor other than TP (i.e. nitrogen or grazing).