Lake Monitoring Program

CAMP Monitoring Program

The Citizen Assisted Monitoring Program (CAMP) was initiated by the Metropolitan Council to supplement the water quality monitoring performed by Met Council staff and to increase our knowledge of water quality of area lakes. Volunteers in the program monitor the lakes semi-monthly from mid-April to mid-October. They measure surface water temperature and Secchi depth, and collect surface water samples that are analyzed for total phosphorous (TP), total Kjeldahl nitrogen (TKN), and chlorophyll-a (CLA). The volunteers also judge the appearance of the lake, its odor and its suitability for recreation. In 2007, Cowley, Henry and Rice lakes were monitoring through CAMP.

Cowley Lake

Cowley Lake is a small lake located within Hassan Township. There is little morphological information available for Cowley Lake. Because of its shallowness, the entire area is considered littoral zone (the 0-15 foot depth area of the lake dominated by aquatic vegetation) and it does not maintain a thermocline (a density gradient owing to changing water temperatures throughout the lake's water column).

This is the third year that Cowley Lake has been involved in CAMP. The lake was monitored one time during the 2007 monitoring season. The lake's 2007 overall grade is F.

The perceived physical and recreational conditions (ranked on a 1-to-5 scale) were 2.0 for physical condition (some algae present) and 4.0 for recreational suitability (no swimming, boating ok).

Cowley Lake had the distinction of having the highest surface water total phosphorus concentration of all the lakes monitored in the 2007 CAMP. Due to the lack of water quality data for previous years, it is not possible to determine any trends in Cowley Lake.

Cowley Lake 2007 Summer (May-September) Data Summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	3830.0	3830.0	3830.0	F
CLA (µg/l)	150.0	150.0	150.0	F
Secchi (m)	2.0	2.0	2.0	C
TKN (mg/l)	18.00	18.00	18.00	
			Overall Grade	D

Henry Lake

Henry Lake is a 77-acre lake located in Hassan Township. Because the maximum depth of the lake is only 1.5 m (5 feet), the entire lake area is considered littoral zone. Additionally, because of the lake's shallowness it does not maintain a thermocline.

This marks the fourth year that Henry Lake has been involved in CAMP. Other than the 1995 and 2005-2007 CAMP data, a search through the STORET nationwide water quality database yielded no additional information. The lake was monitored six times between early-May and mid-October, 2006.

The lake's 2007 grade was a D, similar to previous year's grates. Because so little water quality data is available for Henry Lake it is not possible to determine any long-term or short-term trends. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

The average user perception rankings were 3.4 for physical condition (between 3 - definite algal color and 4 - high algal color), and 4.8 for recreational suitability (between 4 - no swimming, boating ok and 5 - no aesthetics possible).

Henry Lake 2007 Summer (May-September) Data Summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	168.8	75.0	244.0	F
CLA (µg/l)	32.9	6.7	61.0	C
Secchi (m)	0.9	0.5	1.1	D
TKN (mg/l)	1.82	1.40	2.30	
			Overall Grade	D

Rice Lake

Rice Lake lies within the City of Maple Grove. The lake has a surface area of 252 acres and an average depth of 1.9m (6.2 ft). The maximum depth is 3.4 m (11 ft). Because of the shallowness of the lake, the entire area is considered littoral zone and it does not maintain a thermocline. Eurasian water milfoil was documented to be present in the lake in 1996. There is a carry-in public access to the lake.

This was the first year that Rice Lake has been involved in CAMP. A search through the STORET nationwide water quality database for historic data on the lake showed that Secchi transparency measurements were collected along with user perception rankings for the years 1991, 1993 and 2002-2007. Dissolved oxygen measurements were collected in 1993. However, the CAMP 2007 data is the first year of known data collected for nutrients and chlorophyll-a.

The lake was monitored 10 times between late-June and mid-October 2007.

The lake received a grade of F for 2007. As mentioned earlier, there are no nutrient data available for the lake other than the 2007 CAMP data. Therefore, there are not sufficient data to determine long-term or short-term trends. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

The average perceived physical and recreational conditions (ranked on a 1-to-5 scale) were 3.9 for physical condition (4—high algal color) and 4.0 for recreational suitability (4—no swimming, boating ok).

The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on Rice Lake. Information of the survey can be obtained through the MDNR Fisheries Section by calling 651.297.4916 or by visiting the website at http://www.dnr.state.mn.us/lakefind.

If you notice any errors in the lake data or physical information for Cowley, Henry or Rice Lakes, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at 651.602.8743 or brian.johnson@metc.state.mn.us.

Rice Lake 2007 Summer (May-September) Data Summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	222.1	144.0	327.0	F
CLA (µg/l)	97.7	9.2	150.0	F
Secchi (m)	0.6	0.4	0.9	F
TKN (mg/l)	3.80	2.80	5.20	
			Overall Grade	F

Three Rivers Park Lake Monitoring

Fish, Weaver and Diamond Lakes were monitored by Three Rivers Park District (TRPD) in 2007. The lakes were sampled bi-weekly from spring (prior to lake-stratification) through the fall (after fall lake turn-over) to determine seasonal changes in water quality. Samples were collected at the deepest location within each lake. At each sampling location, a water quality profile was measured at each meter with a YSI 600 XL water quality probe. Water quality parameters collected included temperature, dissolved oxygen, specific conductivity, and pH. Water clarity was also measured at each sampling site with a 20-cm black and white secchi disk. Surface samples were collected using a 2-m composite technique. Water samples were also collected at the thermocline and 1-m from the bottom with a Kemmerer bottle sampler. Samples were placed on ice and transported to the laboratory for nutrient analysis.

Standard Methods for the Examination of Water and Wastewater (1995) was used to determine nutrient concentrations of the water samples. Surface samples were analyzed in the laboratory for total phosphorus (TP), soluble reactive phosphorus (SRP), total nitrogen (TN), and chlorophyll-*a*. The thermocline and bottom samples were additionally analyzed for TP and SRP. Sample analysis was prioritized by analyte holding time to ensure that analyses are completed within the required time interval. Samples were stored at 4°C until all analysis was completed. A quality assurance and quality control protocol was followed to ensure the precision and accuracy of laboratory data analysis.

Diamond Lake

Diamond Lake has impaired water quality conditions that inhibit recreational use. The lake is extremely eutrophic with phosphorus concentrations consistently above 100 micrograms per liter (µg/L). The average phosphorus concentration in 2007 during the growing season was 154 µg/L with values ranging between 60 and 211 µg/L. The excessive amount of phosphorus in the lake is conducive for severe algae blooms.

The average chlorophyll-a concentration was 46 µg/L in 2007. Seasonal variation in chlorophyll-a concentrations ranged between 7 and 75 µg/L. Consequently, water clarity conditions were extremely poor in which Secchi depth measurements ranged between 0.3 to 1.19 m.

Although the water quality in Diamond Lake is extremely poor, 2007 had the best water quality overall compared to previous years, especially compared to 2006. Average chlorophyll-a concentrations decreased from 86 µg/L in 2006 to 46 µg/L in 2007. Secchi disk transparency increased from a yearly average of 0.34 m in 2006 to 0.56 m in 2007.

The severe algae blooms provides a shading effect that inhibits the development of aquatic macrophytes. The poor water quality conditions are partially due to large amounts of watershed nutrient loading from surrounding agricultural areas.

In addition, the shallow morphology of the lake is extremely conducive for internal loading of nutrients that are re-suspended from the sediments. The lake is frequently vulnerable to winter and summer fish kills due to the extreme eutrophic conditions.

Elm Creek Watershed Management Commission
2007 Lake Water Quality Summary

Sample Id	Sample Date	Secchi m	Temp °C	DO mg/L	DO %	Sp. Cond µS/cm	pH	TP µg/L	SRP µg/L	TN mg/L	Chl-*a* µg/L	Cloride mg/L
FISH	24-Apr-07	1.38	12.6	17.1	161	438	7.78	74.8		<.93	53.8	
FISH	7-May-07	1.60	14.4	11.7	114	366	8.59	79.5		<.62	23.5	
FISH	21-May-07	3.00	17.6	10.9	114	447	8.32	36.7		<.35	6.0	
FISH	4-Jun-07	1.60	21.3	9.7	109	423	8.64	61.9		<.24	16.2	
FISH	18-Jun-07	1.40	25.3	5.4	66	457	8.47	52.6		<.36	19.4	
FISH	2-Jul-07	1.10	24.5	8.9	107	465	8.64	41.9		<.43	30.3	
FISH	16-Ju -07	0.88	25.3	12.1	148	440	8.24	41.6		<.35	36.6	
FISH	30-Ju -07	0.60	27.5	10.4	132	380	8.07	42.5		<.71	39.8	
FISH	13-Aug-07	0.70	Profile Data Absent					49.5		<.88	42.2	
FISH	28-Aug-07	0.70	22.3	8.8	119	450	8.15	49.0		<.57	46.6	
FISH	11-Sep-07	0.80	21.0	7.7	103	444	7.78	53.6		2.11	38.1	
FISH	24-Sep-07	1.10	19.3	10.8	117	441	7.26	46.3		<.85	38.3	
FISH	15-Oct-07	1.15	14.1	3.7	36	360	6.78	75.6		<.95	14.4	
	Mean	1.23	20.4	9.8	110	426	8.06	54.3		1.64	31.2	
	Std.Dev.	0.63	4.9	3.4	33.4	36.3	0.58	14.3		0.28	14.18	
	Summer Mean (May-Sept)	1.23	21.8	9.6	113	431	8.22	50.5		<.59	30.65	

Sample Id	Sample Date	Secchi m	Temp °C	DO mg/L	DO %	Sp. Cond µS/cm	pH	TP µg/L	SRP µg/L	TN mg/L	Chl-*a* µg/L	Cloride mg/L
WEAVER	24-Apr-07	3.21	12.5	12.7	119	422	7.72	29.5	0.12	0.95	7.07	72.0
WEAVER	7-May-07	6.45	14.5	11.1	109	358	8.58	32.3	7.18	0.99	2.01	
WEAVER	21-May-07	3.50	17.4	12.3	128	427	8.66	27.9	1.55	0.79	4.67	72.0
WEAVER	4-Jun-07	3.00	21.0	10.8	121	404	8.84	27.0	3.54	0.77	8.30	
WEAVER	18-Jun-07	2.05	25.6	5.1	62	421	8.8	40.5	11.3	0.90	6.88	74.0
WEAVER	3-Jul-07	2.15	Profile Data Absent					72.0	19.4	<.14	7.49	
WEAVER	16-Ju -07	2.70	24.4	9.4	113	429	8.14	38.2	13.2	0.81	6.30	68.0
WEAVER	30-Ju -07	1.70	28.1	9.9	127	386	7.95	32.0	13.5	0.85	6.50	
WEAVER	13-Aug-07	2.00	Profile Data Absent					31.7	4.25	<.17	7.33	70.0
WEAVER	28-Aug-07	2.43	22.4	8.6	118	442	8.13	29.5	3.77	0.81	10.68	
WEAVER	11-Sep-07	2.15	20.6	8.9	116	430	7.96	28.2	3.81	1	7.72	58.0
WEAVER	24-Sep-07	1.80	19.3	11.9	130	425	7.28	25.8	3.59	0.73	10.15	
WEAVER	15-Oct-07	2.50	13.3	4.6	44	350	6.86	35.0	6.61	0.92	7.39	68.0
	Mean	2.74	19.9	9.6	108	409	8.10	34.6	7.1	0.91	7.1	68.8
	Std.Dev.	1.24	5.1	2.7	28.1	30.7	0.65	12.0	5.65	0.14	2.18	5.3
	Summer Mean (May-Sept)	2.81	21.8	9.5	112	412	8.41	35.9	8.2	0.92	6.8	68.4

Sample Id	Sample Date	Secchi m	Temp °C	DO mg/L	DO %	Sp. Cond µS/cm	pH	TP µg/L	SRP µg/L	TN mg/L	Chl-*a* µg/L	Cloride mg/L
DIAMOND	24-Apr-07	1.80	15.0	9.3	92	371	7.51	60		<.84	5.3	
DIAMOND	7-May-07	1.19	14.9	9.8	97	324	8.00	87		2.33	14.0	
DIAMOND	21-May-07	1.13	18.1	10.7	113	405	8.09	60		2.27	7.3	
DIAMOND	4-Jun-07	0.90	21.1	8.4	94	409	8.04	102		2.63	16.4	
DIAMOND	19-Jun-07	0.39	23.5	9.5	112	412	8.39	204		3.26	51.0	
DIAMOND	3-Jul-07	0.40	Profile Data Absent					187		3.42	71.9	
DIAMOND	16-Ju -07	0.30	24.7	12.7	154	363	8.40	175		2.55	58.5	
DIAMOND	30-Ju -07	0.35	29.4	11.3	148	350	8.02	176		2.95	41.4	
DIAMOND	13-Aug-07	0.40	Profile Data Absent					149		2.47	49.8	
DIAMOND	28-Aug-07	0.35	21.9	8.8	116	385	8.14	144		2.68	60.1	
DIAMOND	12-Sep-07	0.30	17.6	11.4	138	367	8.06	202		3.23	74.8	
DIAMOND	24-Sep-07	0.40	19.6	10.1	111	397	7.13	211		4.38	64.2	
DIAMOND	15-Oct-07	0.45	10.7	4.9	44	340	6.80	210		9.27	65.2	
	Mean	0.64	19.7	9.7	111	377	7.87	151		3.33	44.6	
	Std.Dev.	0.47	5.2	2.1	30.4	29.3	0.51	56.4		<.89	25.24	
	Summer Mean (May-Sept)	0.56	21.2	10.3	120	381	8.03	154		2.92	46.3	

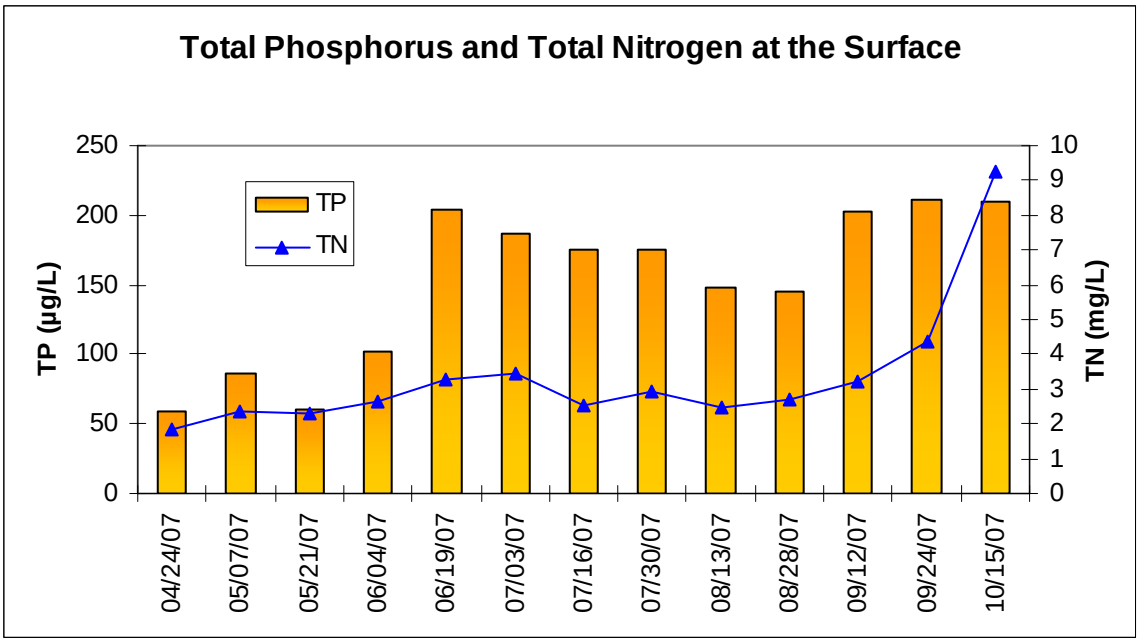
Secchi = Secchi Disc Transparency, meters
Temp = Temperature of Water, degrees Celsius
DO = Dissolved Oxygen, in mg/L and percent of saturation
Temperature, DO, DO%, Specific Conductivity and Ph are measured at the surface.
Sp. Cond = Specific Conductance, microsiemens per centimeter at 25C
TP = Total Phosphorus, µg/L
SRP = Soluble Reactive Phosphorus, µg/L
TN = Total Nitrogen, mg/L
Chl-*a* = Chlorophyl *a*, µg/L

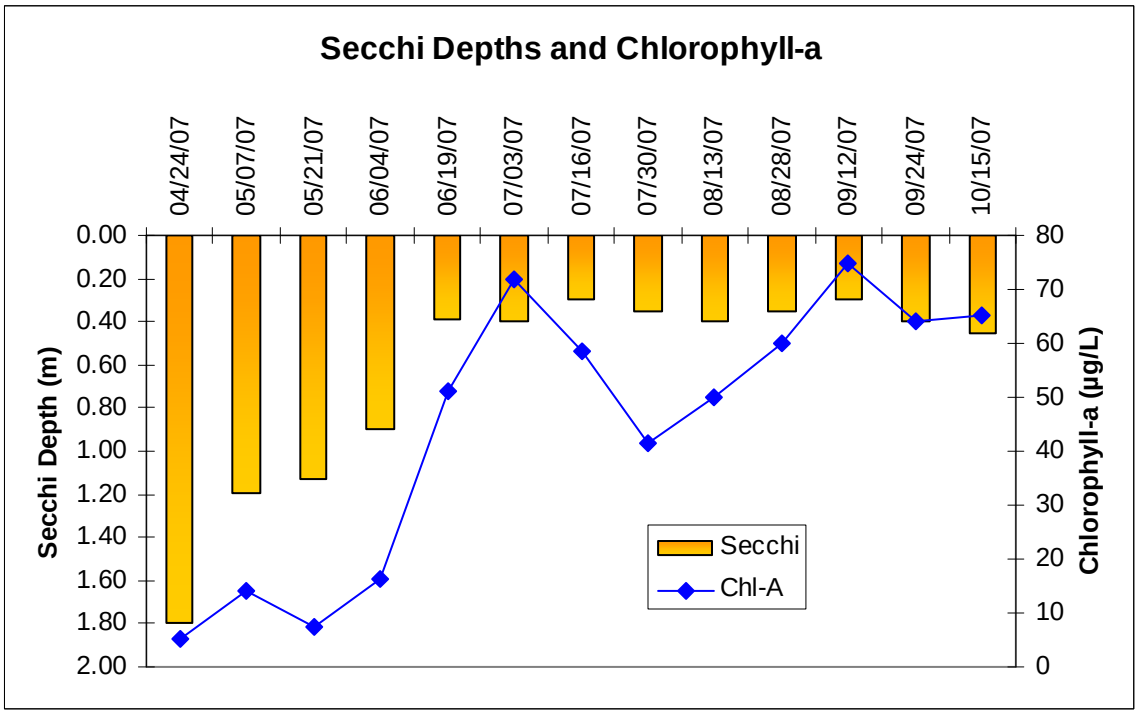
Diamond Lake

Lake Water Quality Data

Date	Depth m	Temp ° C	DO mg/L	% DO	SpCond mS/cm	pH	TP µg/L	TN mg/L	Chla µg/L	Secchi m
04/24/07	0.393	14.96	9.25	91.7	0.371	7.51	59.6	1.844	5.29	1.80
04/24/07	1.05	14.95	9.13	90.6	0.371	7.51				1.80
04/24/07	2.043	14.86	9.18	90.8	0.37	7.54				1.80
04/24/07	2.384	14.57	2.59	25.5	0.373	7.4				1.80
05/07/07	0.349	14.87	9.76	96.6	0.324	8	86.8	2.333	14	1.19
05/07/07	1.06	14.82	9.52	94.2	0.323	8				1.19
05/07/07	2.079	14.66	8.44	83.2	0.324	7.92				1.19
05/07/07	2.338	14.52	0.44	4.3	0.332	7.62				1.19
05/21/07	0.172	18.1	10.67	113	0.405	8.09	60.3	2.274	7.335024	1.13
05/21/07	1.037	17.7	10.39	109.2	0.406	8.15				1.13
05/21/07	2.064	16.83	0.39	4	0.449	7.47				1.13
05/21/07	2.016	16.9	0.28	2.9	0.452	7.36				1.13
06/04/07	0.336	21.12	8.38	94.4	0.409	8.04	101.6	2.626	16.4	0.90
06/04/07	1.035	21.14	8.08	91	0.409	8.01				0.90
06/04/07	2.036	21.13	7.95	89.5	0.409	7.99				0.90
06/04/07	2.279	20.71	0.43	4.8	0.427	7.46				0.90
06/19/07	0.237	23.5	9.47	111.5	0.412	8.39	203.5	3.261	50.997	0.39
06/19/07	1.1	23.45	9.36	110.3	0.412	8.39				0.39
06/19/07	2.163	23.46	0.52	6.3	0.44	6.92				0.39
07/03/07							187.1	3.421	71.85504	0.40
07/16/07	0.501	24.74	12.74	153.6	0.383	8.4	174.9	2.547	58.45084	0.30
07/16/07	1.057	24.04	11.86	141.1	0.385	8.42				0.30
07/16/07	2.056	22.78	0.22	2.5	0.438	7.34				0.30
07/30/07	0.224	29.36	11.29	147.8	0.35	8.02	175.6	2.946	41.39301	0.35
07/30/07	1.019	28	10.78	137.8	0.348	8.06				0.35
07/30/07	2.052	26.54	0.25	3.1	0.374	6.76				0.35
08/13/07							148.7	2.47	49.8457	0.40
08/28/07	0.483	21.94	8.77	115.5	0.385	8.14	144.4	2.68	60.05765	0.35
08/28/07	1.059	21.9	8.56	112.9	0.3856	8.25				0.35
08/28/07	2.063	21.79	0.93	12.3	0.4083	7.96				0.35
08/28/07	2.121	21.8	0.49	6.5	0.407	7.9				0.35
09/12/07	0.638	17.6	11.44	137.8	0.3665	8.06	202.2	3.23	74.83743	0.30
09/12/07	1.052	17.56	11.69	140.8	0.3661	8.11				0.30
09/12/07	2.048	17.19	0.95	11.6	0.3966	7.82				0.30
09/24/07	0.37	19.62	10.14	110.9	0.397	7.13	211.2	4.382	64.24554	0.40
09/24/07	1.008	19.59	10.3	112.5	0.397	7.09				0.40
09/24/07	2.013	19.4	0.66	7.1	0.404	6.98				0.40
10/15/07	0.319	10.68	4.86	43.9	0.34	6.8	210.2	9.265	65.19072	0.45
10/15/07	1.024	10.68	4.67	42	0.34	6.76				0.45
10/15/07	2.049	10.68	4.48	40.4	0.34	6.75				0.45
10/15/07	2.335	10.97	0.57	5.1	0.34	6.69				0.45

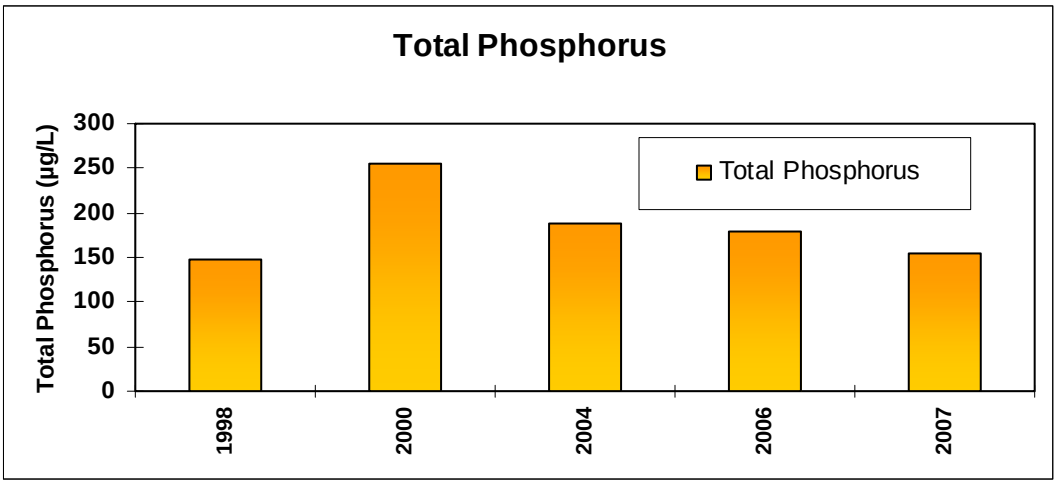
Diamond Lake

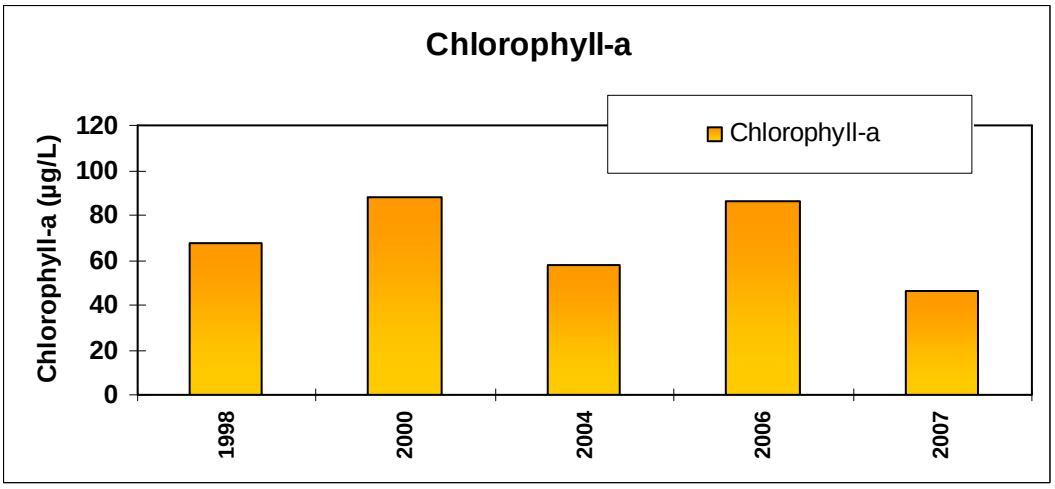


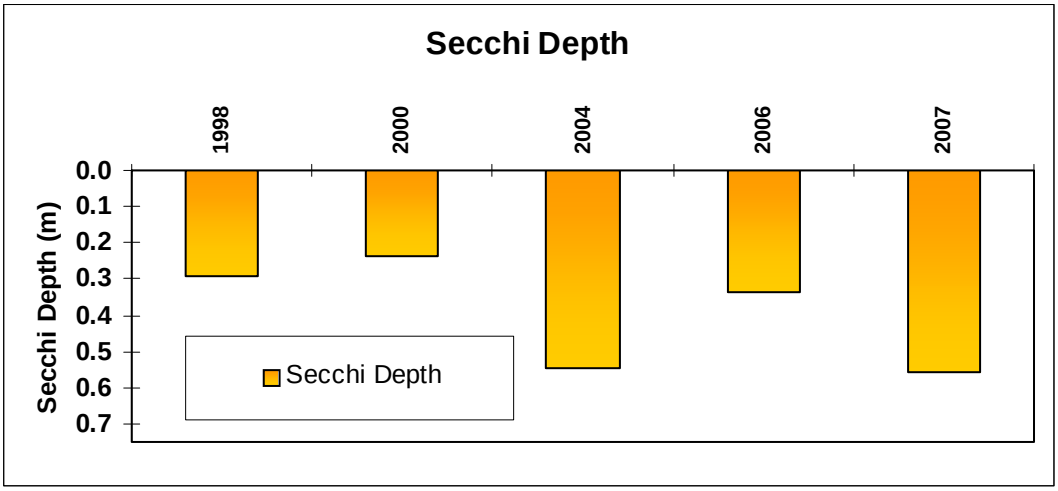


Diamond Lake

Historical Data



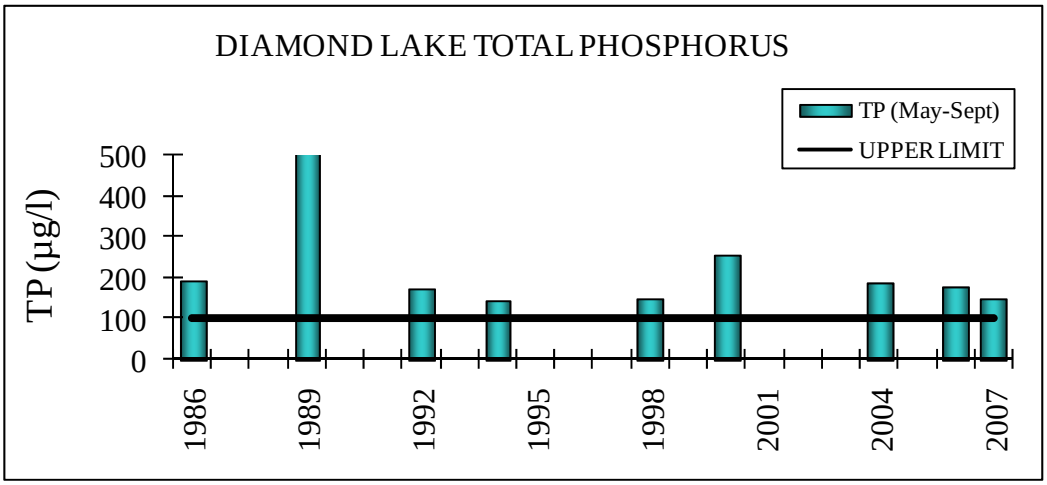


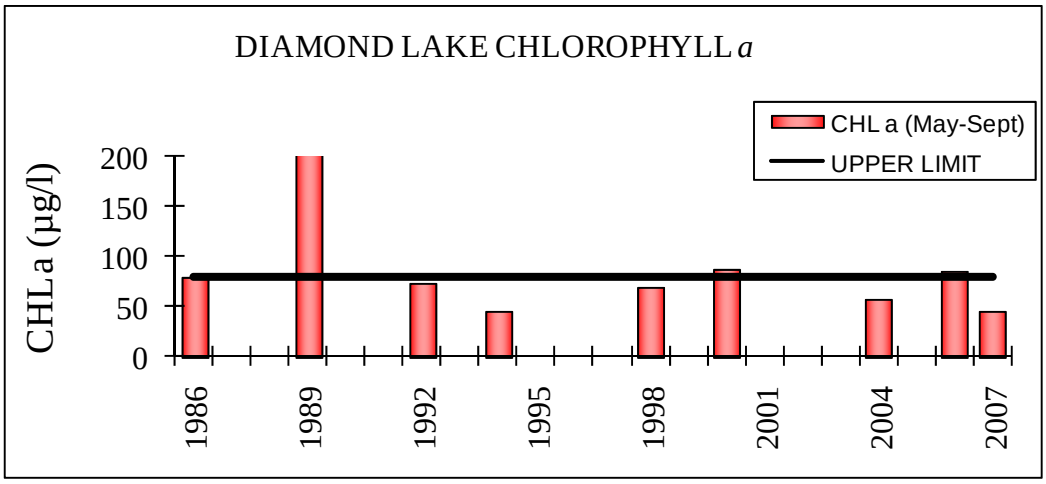


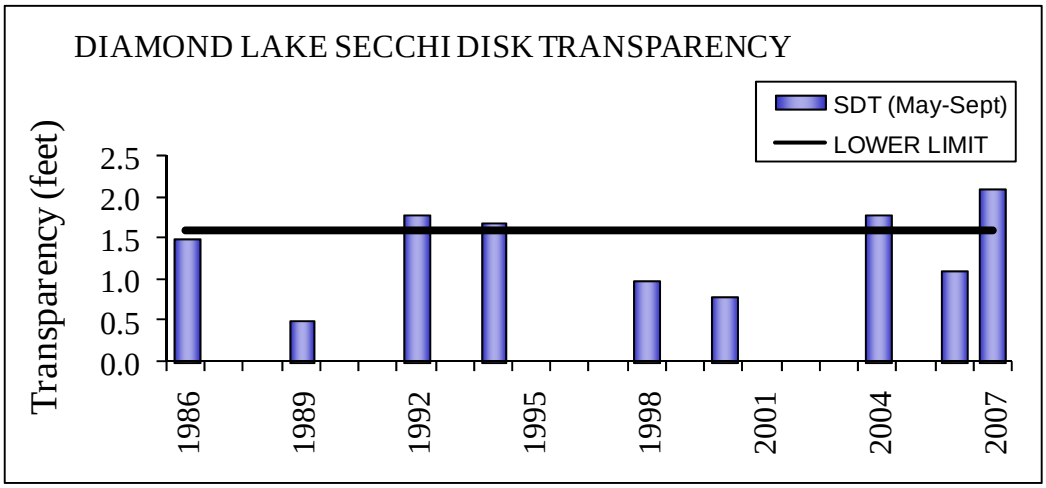
Source: Three Rivers Park District
Summer Mean (May-Sept)

Diamond Lake

Historical Data







Source: HCDES

Fish Lake

The Three Rivers Park District in-lake phosphorus concentration goal to support direct contact recreational use for Fish Lake is 36µg/L. The average phosphorus concentration for Fish Lake in 2007 was 50µg/L, which is higher than our goal as well as the Minnesota Pollution Control Agency impaired water criteria of 40µg/L. The highest phosphorus concentrations in 2007 coincided with lake turnover cycles, which occur in the spring and fall of the year. The process of lake turnover re-suspends nutrients throughout the water column and contributes to high total phosphorus concentrations near the end of April and beginning of May (75-80µg/L) and mid October (76µg/L). Throughout the remaining portion of the year, the total phosphorus levels fluctuated ranging between 37µg/L and 62µg/L. Although these phosphorus concentrations can potentially inhibit recreational use, the average 2007 total phosphorus concentration is lower than the 2006 average of 57µg/L.

The excess in-lake phosphorus concentrations were conducive for the development of algae blooms. In 2007, the Fish Lake average chlorophyll-a concentration was 31µg/L, which is significantly higher than the water quality goal of 12µg/L. Despite the high chlorophyll-a concentrations, the water clarity was not as significantly impaired. The average secchi depth transparency of 1.23 m in 2007 was close to the water clarity goal of 1.4 m for recreational use. During the month of May chlorophyll-a concentrations were at their lowest, resulting in the highest Secchi depth transparency of the year, which was 3m. The water clarity in Fish Lake did not begin to degrade significantly until mid-July when conditions were more conducive for algae growth. Consequently, the warmer weather conditions resulted in higher chlorophyll-a concentrations that persisted throughout the summer. The Secchi depth transparency ranged between 0.6 and 0.88 m within this time period.

Fish Lake

Lake Water Quality Data

Date	Depth m	Temp ° C	DO mg/L	% DO	SpCond mS/cm	pH	TP µg/L	TN mg/L	Chla µg/L	Secchi m
04/24/07	0.428	12.55	17.08	160.7	0.438	7.78	74.8	1.93	53.75992	1.38
04/24/07	1.062	12.49	16.63	156.2	0.438	7.78				1.38
04/24/07	2.076	12.46	16.61	155.9	0.439	7.78				1.38
04/24/07	3.029	12.15	16.35	152.4	0.44	7.76				1.38
04/24/07	4.064	12.03	15.86	147.4	0.441	7.73				1.38
04/24/07	5.099	10.85	13.99	126.6	0.445	7.66				1.38
04/24/07	6.082	9.78	12.78	112.8	0.449	7.61				1.38
04/24/07	7.012	8.09	12.09	102.4	0.452	7.51				1.38
04/24/07	8.05	7.11	11.59	95.8	0.453	7.46				1.38
04/24/07	9.083	6.29	11.12	90.2	0.454	7.45				1.38
04/24/07	10.055	6.05	10.94	88.1	0.455	7.45				1.38
04/24/07	10.805	5.82	0.94	7.6	0.466	7.34				1.38
05/07/07	0.33	14.41	11.66	114.3	0.366	8.59	79.5	1.619	23.5	1.60
05/07/07	1.019	14.32	11.72	114.6	0.364	8.65				1.60
05/07/07	2.027	13.95	11.64	112.9	0.365	8.6				1.60
05/07/07	3.039	13.74	11.06	106.8	0.367	8.53				1.60
05/07/07	4.036	13.46	10.65	102.2	0.368	8.47				1.60
05/07/07	5.055	12.84	9.84	93.2	0.371	8.34				1.60
05/07/07	6.062	10.94	7.64	69.3	0.381	8.03				1.60
05/07/07	7.059	8.35	4.59	39.2	0.388	7.7				1.60
05/07/07	8.017	7.76	4.42	37.1	0.388	7.61				1.60
05/07/07	9.055	6.94	4.57	37.6	0.389	7.59				1.60
05/07/07	10.044	6.39	4.71	38.3	0.388	7.57				1.60
05/07/07	11.039	6.07	4.67	37.6	0.39	7.55				1.60
05/07/07	12.058	5.98	3.32	26.7	0.391	7.49				1.60
05/07/07	12.372	5.94	0.86	6.9	0.406	7.15				1.60
05/21/07	0.248	17.55	10.88	114	0.447	8.32	36.7	1.345	6.035802	3.00
05/21/07	1.032	17.44	10.82	113.2	0.447	8.4				3.00
05/21/07	2.072	17.4	10.69	111.7	0.447	8.44				3.00
05/21/07	3.028	17.34	10.63	110.9	0.447	8.44				3.00
05/21/07	4.04	17.18	10.55	109.7	0.448	8.43				3.00
05/21/07	5.07	15.52	7.34	73.7	0.453	8.12				3.00
05/21/07	6.057	12.39	2.92	27.4	0.462	7.79				3.00
05/21/07	7.031	9.84	0.96	8.5	0.469	7.65				3.00
05/21/07	8.014	9.27	0.82	7.1	0.466	7.62				3.00
05/21/07	9.005	7.48	0.6	5	0.472	7.58				3.00
05/21/07	10.01	7.02	0.55	4.6	0.472	7.56				3.00
05/21/07	10.886	6.36	0.38	3.1	0.5	7.24				3.00
06/04/07	0.312	21.27	9.66	109.1	0.423	8.64	61.9	1.242	16.2	1.60
06/04/07	1.056	21.11	9.82	110.5	0.423	8.69				1.60
06/04/07	2.035	20.91	9.74	109.2	0.423	8.69				1.60
06/04/07	3.052	20.85	9.59	107.3	0.423	8.69				1.60
06/04/07	4.046	20.7	9.4	104.9	0.424	8.66				1.60
06/04/07	5.016	18.93	7.45	80.3	0.445	8.36				1.60
06/04/07	6.017	16.17	2.68	27.3	0.451	7.83				1.60
06/04/07	7	9.53	0.8	7	0.472	7.64				1.60
06/04/07	8.096	9.53	0.8	7	0.472	7.64				1.60
06/04/07	9.062	8.18	0.59	5	0.471	7.6				1.60
06/04/07	10.017	6.95	0.46	3.8	0.474	7.57				1.60
06/04/07	11.059	6.57	0.36	3	0.476	7.54				1.60
06/04/07	12.098	6.36	0.3	2.4	0.479	7.51				1.60
06/04/07	13.048	6.31	0.26	2.1	0.481	7.48				1.60

Fish Lake

Lake Water Quality Data

Date	Depth m	Temp ° C	DO mg/L	% DO	SpCond mS/cm	pH	TP µg/L	TN mg/L	Chla µg/L	Secchi m
06/04/07	13.582	6.24	0.23	1.9	0.497	7.25				1.60
06/18/07	0.457	25.25	5.37	65.4	0.457	8.47	52.6	1.359	19.36428	1.40
06/18/07	1.067	25.24	5.42	65.9	0.457	8.5				1.40
06/18/07	2.096	24.36	2.59	31	0.459	8.42				1.40
06/18/07	3.024	24.07	2.68	31.9	0.46	8.37				1.40
06/18/07	4.013	23.17	2.52	29.6	0.461	8.27				1.40
06/18/07	5.039	20.89	1.02	11.4	0.461	8.15				1.40
06/18/07	6.081	18.1	0	0	0.468	7.82				1.40
06/18/07	7.029	14.22	0	0	0.485	7.78				1.40
06/18/07	8.069	10.62	0	0	0.496	7.72				1.40
06/18/07	9.09	7.81	0	0	0.507	7.57				1.40
06/18/07	10.019	7.44	0	0	0.505	7.49				1.40
06/18/07	11.01	7.37	0	0	0.504	7.49				1.40
06/18/07	12.051	7.02	0	0	0.504	7.47				1.40
06/18/07	13.005	6.68	0	0	0.507	7.46				1.40
06/18/07	14.061	6.55	0	0	0.513	7.44				1.40
07/02/07	0.112	24.5	8.92	107	0.465	8.64	41.9	1.433	30.28403	1.10
07/02/07	1.011	24.54	9.02	108.3	0.465	8.61				1.10
07/02/07	2.042	24.53	8.9	107	0.464	8.6				1.10
07/02/07	3.01	24.5	8.76	105	0.464	8.6				1.10
07/02/07	4.007	22.78	3.5	40.9	0.472	8.02				1.10
07/02/07	5.039	20.01	0.76	8.5	0.479	7.78				1.10
07/02/07	6.107	16.35	0.56	5.6	0.492	7.71				1.10
07/02/07	6.997	13.43	0.56	5.4	0.508	7.57				1.10
07/02/07	8.121	11.35	0.5	4.5	0.508	7.51				1.10
07/02/07	9.012	8.56	0.51	4.5	0.515	7.5				1.10
07/02/07	10.003	7.23	0.46	3.9	0.511	7.46				1.10
07/02/07	11.097	6.94	0.43	3.5	0.512	7.42				1.10
07/02/07	12.027	6.88	0.41	3.4	0.513	7.4				1.10
07/02/07	13.015	6.82	0.4	3.4	0.515	7.36				1.10
07/02/07	13.994	6.78	0.4	3.2	0.52	7.32				1.10
07/02/07	14.678	6.73	0.43	3.5	0.614	6.88				1.10
07/16/07	0.711	25.29	12.11	147.5	0.44	8.24	41.6	1.345	36.64201	0.88
07/16/07	1.071	24.95	12.33	149.3	0.44	8.3				0.88
07/16/07	2.064	24.46	12.26	147	0.439	8.3				0.88
07/16/07	3.057	23.82	10.3	122	0.442	8.22				0.88
07/16/07	4.04	23.46	8.26	97.2	0.445	8.11				0.88
07/16/07	5.077	21.74	0.92	10.5	0.447	7.81				0.88
07/16/07	5.998	19.42	0.64	7	0.46	7.75				0.88
07/16/07	7.091	15.84	0.55	5.6	0.467	7.66				0.88
07/16/07	8.041	13.02	0.55	5.2	0.473	7.61				0.88
07/16/07	9.006	10.34	0.54	4.8	0.48	7.57				0.88
07/16/07	10.056	8.2	0.54	4.6	0.485	7.53				0.88
07/16/07	11.049	7.53	0.47	3.9	0.49	7.48				0.88
07/16/07	12.016	7	0.42	3.4	0.496	7.44				0.88
07/16/07	13.022	6.85	0.35	2.9	0.499	7.41				0.88
07/16/07	14.072	6.76	0.32	2.6	0.505	7.36				0.88
07/16/07	14.19	6.65	0.22	1.8	0.527	7.18				0.88
07/30/07	0.399	27.52	10.44	132.3	0.38	8.07	42.5	1.712	39.80837	0.60
07/30/07	1.072	26.94	10.55	132.4	0.38	8.21				0.60
07/30/07	2.086	26.71	10.21	127.5	0.381	8.21				0.60
07/30/07	3.061	25.31	3.75	45.7	0.395	7.95				0.60

Fish Lake

Lake Water Quality Data

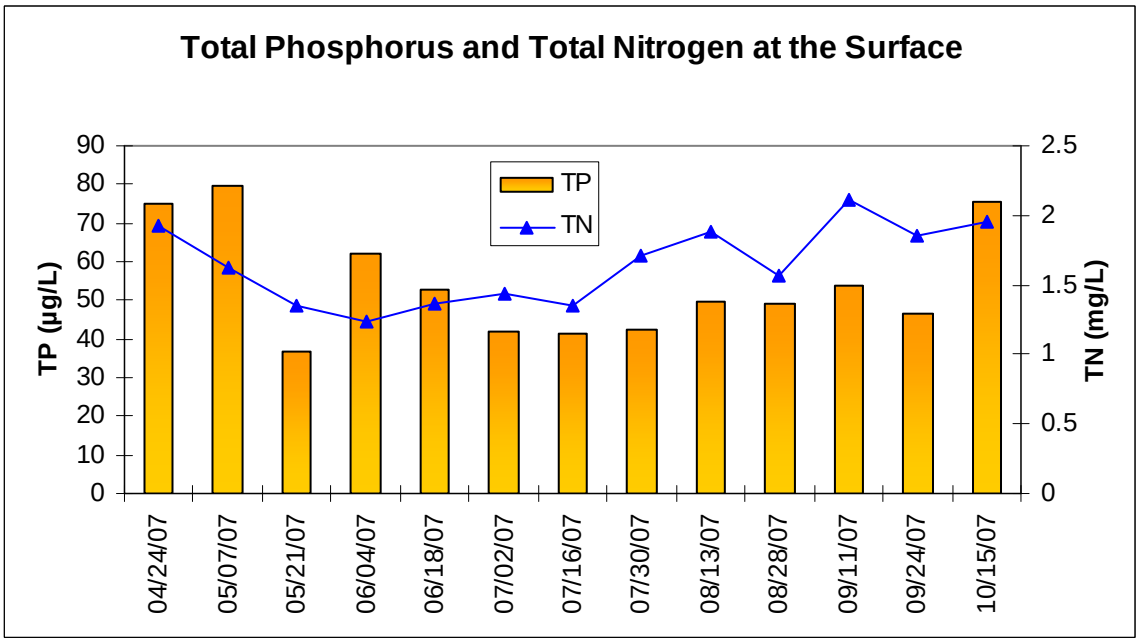
Date	Depth m	Temp ° C	DO mg/L	% DO	SpCond mS/cm	pH	TP µg/L	TN mg/L	Chla µg/L	Secchi m
07/30/07	4.055	23.88	0.98	11.7	0.403	7.79				0.60
07/30/07	5.004	22.09	0.59	6.7	0.415	7.74				0.60
07/30/07	6.047	18.34	0.32	3.5	0.428	7.63				0.60
07/30/07	7.036	16.02	0.31	3.2	0.432	7.57				0.60
07/30/07	8.068	11.84	0.31	2.9	0.446	7.49				0.60
07/30/07	9.029	11.3	0.3	2.8	0.43	7.46				0.60
07/30/07	10.029	8.63	0.26	2.3	0.448	7.42				0.60
07/30/07	11.039	7.41	0.24	2	0.451	7.36				0.60
07/30/07	12.003	7.22	0.22	1.8	0.452	7.34				0.60
07/30/07	13.086	6.91	0.16	1.3	0.458	7.29				0.60
07/30/07	14.089	6.85	0.13	1.1	0.464	7.24				0.60
07/30/07	14.56	6.82	0.13	1	0.48	7.12				0.60
08/13/07							49.5	1.88	42.23406	0.70
08/28/07	0.446	22.3	8.76	119.4	0.45	8.15	49	1.57	46.64704	0.70
08/28/07	1.062	22.3	8.72	118.6	0.4502	8.18				0.70
08/28/07	2.069	22.27	8.56	116.5	0.4518	8.22				0.70
08/28/07	3.042	22.13	7.44	101.4	0.4543	8.21				0.70
08/28/07	4.006	21.94	6.34	86	0.4575	8.15				0.70
08/28/07	5.047	21.29	2.44	32.7	0.4624	8.02				0.70
08/28/07	6.084	19.12	0.89	11.8	0.5038	7.92				0.70
08/28/07	7.061	16.18	0.68	8.5	0.5359	7.86				0.70
08/28/07	8.034	12.61	0.4	4.8	0.5358	7.8				0.70
08/28/07	9.076	9.68	0.28	3	0.5363	7.78				0.70
08/28/07	10.064	8.39	0.18	2	0.54	7.73				0.70
08/28/07	11.045	7.84	0.14	1.5	0.5402	7.71				0.70
08/28/07	12.043	7.44	0.11	1.2	0.5495	7.65				0.70
08/28/07	12.361	7.25	0.1	1	0.5631	7.55				0.70
09/11/07	0.361	21.01	7.73	102.6	0.4438	7.78	53.6	2.11	38.11051	0.80
09/11/07	1.011	21.03	7.8	103.5	0.444	7.86				0.80
09/11/07	2.072	20.97	7.71	102.4	0.4441	7.94				0.80
09/11/07	3.036	20.95	7.69	102	0.4443	7.96				0.80
09/11/07	4.083	20.77	7.19	95.1	0.4461	7.98				0.80
09/11/07	5.053	20.7	6.78	89.6	0.4465	8				0.80
09/11/07	6.017	20.1	4.61	60.7	0.4616	7.94				0.80
09/11/07	7.02	15.69	0.87	11	0.537	7.76				0.80
09/11/07	8.022	12.51	0.51	6	0.5279	7.73				0.80
09/11/07	9.071	10.44	0.4	4.5	0.5254	7.71				0.80
09/11/07	10.024	9.14	0.31	3.4	0.5188	7.69				0.80
09/11/07	11.064	7.86	0.23	2.4	0.5291	7.65				0.80
09/11/07	12.029	7.48	0.17	1.7	0.5334	7.61				0.80
09/11/07	13.02	7.38	0.12	1.3	0.5368	7.59				0.80
09/11/07	13.769	7.21	0.09	1	0.5518	7.42				0.80
09/24/07	0.444	19.31	10.75	116.8	0.441	7.26	46.3	1.854	38.32732	1.10
09/24/07	1.07	19.22	10.84	117.5	0.441	7.25				1.10
09/24/07	2.043	19.03	10.81	116.8	0.441	7.23				1.10
09/24/07	3.092	18.81	10.17	109.4	0.442	7.21				1.10
09/24/07	4.012	18.7	9.77	105	0.442	7.21				1.10
09/24/07	5.013	17.88	6.13	64.6	0.446	7.17				1.10
09/24/07	6.037	17.7	4.32	45.5	0.449	7.13				1.10
09/24/07	7.025	17.54	3.11	32.7	0.448	7.11				1.10
09/24/07	8.027	15.93	0.93	9.3	0.476	7.05				1.10
09/24/07	9.031	12.39	0.74	6.9	0.531	6.98				1.10

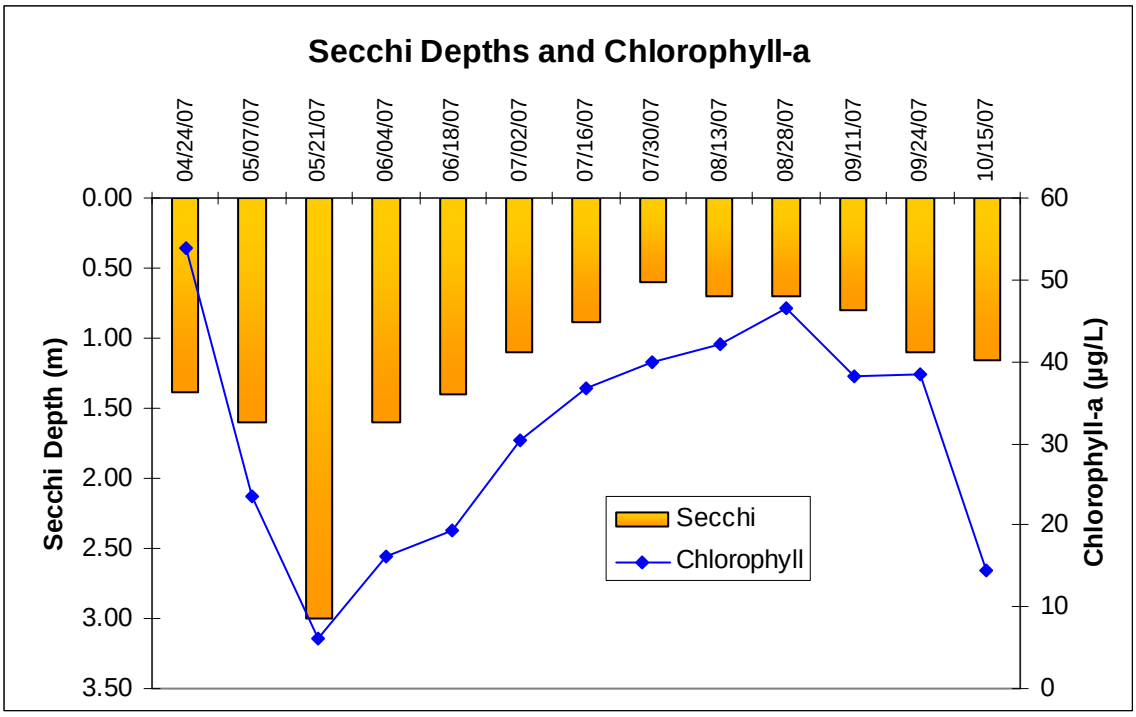
Fish Lake

Lake Water Quality Data

Date	Depth m	Temp ° C	DO mg/L	% DO	SpCond mS/cm	pH	TP µg/L	TN mg/L	Chla µg/L	Secchi m
09/24/07	10.055	9.52	0.57	5	0.527	6.94				1.10
09/24/07	11.081	8.56	0.43	3.7	0.527	6.9				1.10
09/24/07	12.022	7.88	0.31	2.7	0.532	6.88				1.10
09/24/07	13.031	7.57	0.21	1.8	0.537	6.86				1.10
09/24/07	14.095	7.48	0.18	1.5	0.544	6.84				1.10
09/24/07	14.578	7.42	0.14	1.2	0.555	6.8				1.10
10/15/07	0.4	14.05	3.65	35.5	0.36	6.78	75.6	1.954	14.39344	1.15
10/15/07	1.047	14.06	3.35	32.7	0.36	6.76				1.15
10/15/07	2.035	14.06	3.2	31.2	0.36	6.75				1.15
10/15/07	3.012	14.06	3.13	30.3	0.36	6.73				1.15
10/15/07	4.034	14.06	3.11	30.2	0.36	6.73				1.15
10/15/07	5.027	14.07	3.09	30.2	0.36	6.71				1.15
10/15/07	6.083	14.07	3.08	30	0.36	6.71				1.15
10/15/07	7.057	14.07	3.07	30	0.36	6.71				1.15
10/15/07	8.069	14.02	3.06	29.7	0.37	6.69				1.15
10/15/07	9.031	13.9	3.05	29.7	0.37	6.69				1.15
10/15/07	10.06	11.97	1.86	17.2	0.42	6.59				1.15
10/15/07	11.09	8.48	0.83	7.1	0.44	6.53				1.15
10/15/07	12.046	8.11	0.62	5.3	0.44	6.51				1.15
10/15/07	13.057	7.78	0.46	3.9	0.45	6.48				1.15
10/15/07	13.357	7.59	0.38	3.2	0.48	6.36				1.15

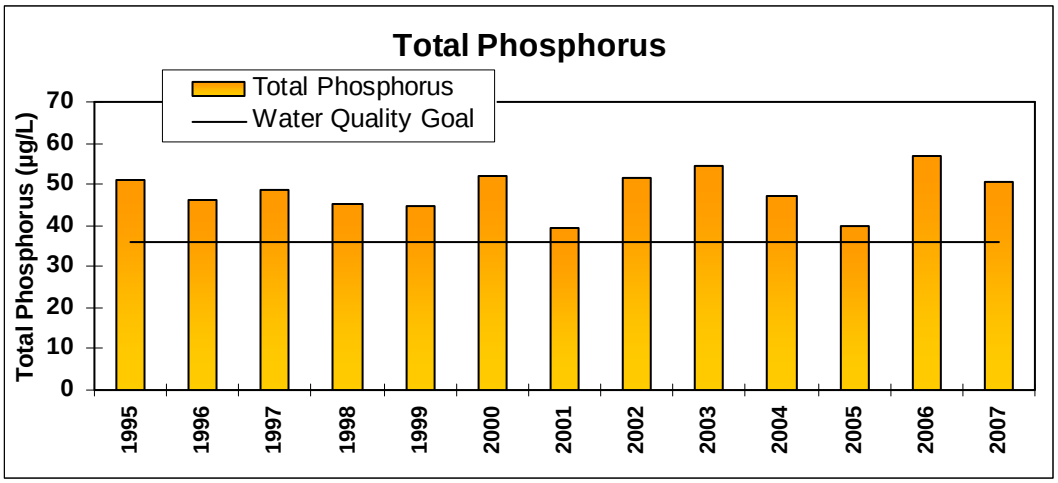
Fish Lake

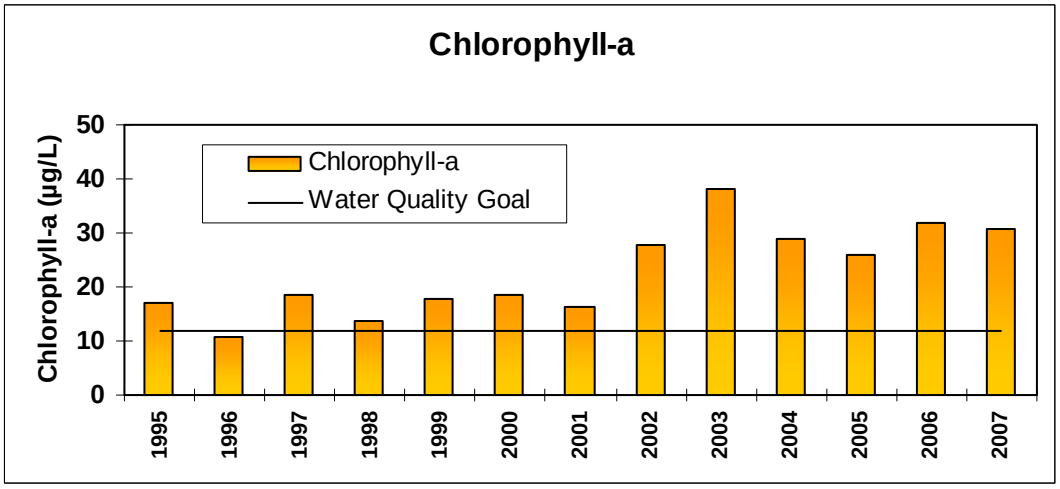

Total Phosphorus and Total Nitrogen at the Surface
TP (µg/L)
TN (mg/L)
TP
TN
90
80
70
60
50
40
30
20
10
0
2.5
2
1.5
1
0.5
0
04/24/07
05/07/07
05/21/07
06/04/07
06/18/07
07/02/07
07/16/07
07/30/07
08/13/07
08/28/07
09/11/07
09/24/07
10/15/07

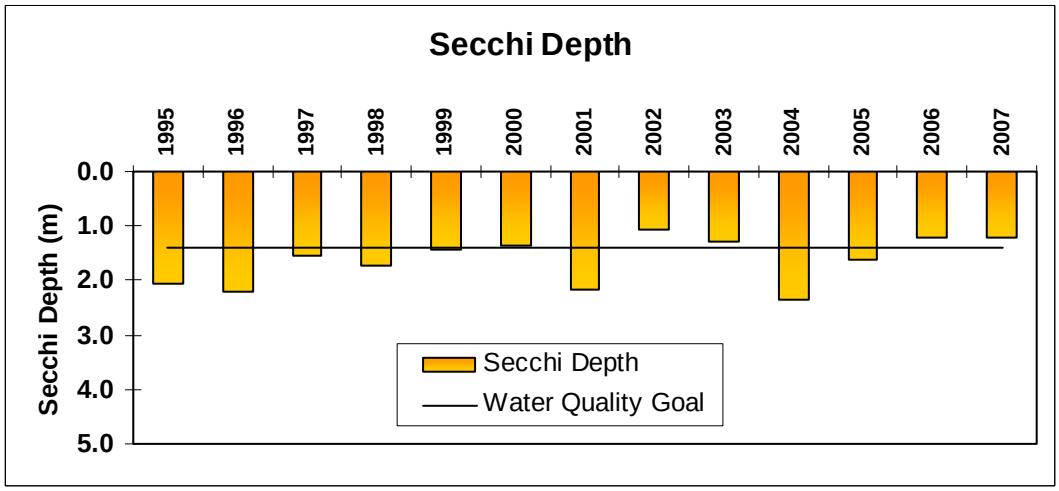

Secchi Depths and Chlorophyll-a
Secchi Depth (m)
Chlorophyll-a (µg/L)
Secchi
Chlorophyll
04/24/07
05/07/07
05/21/07
06/04/07
06/18/07
07/02/07
07/16/07
07/30/07
08/13/07
08/28/07
09/11/07
09/24/07
10/15/07
0.00
0.50
1.00
1.50
2.00
2.50
3.00
3.50
60
50
40
30
20
10
0

Fish Lake

Historical Data



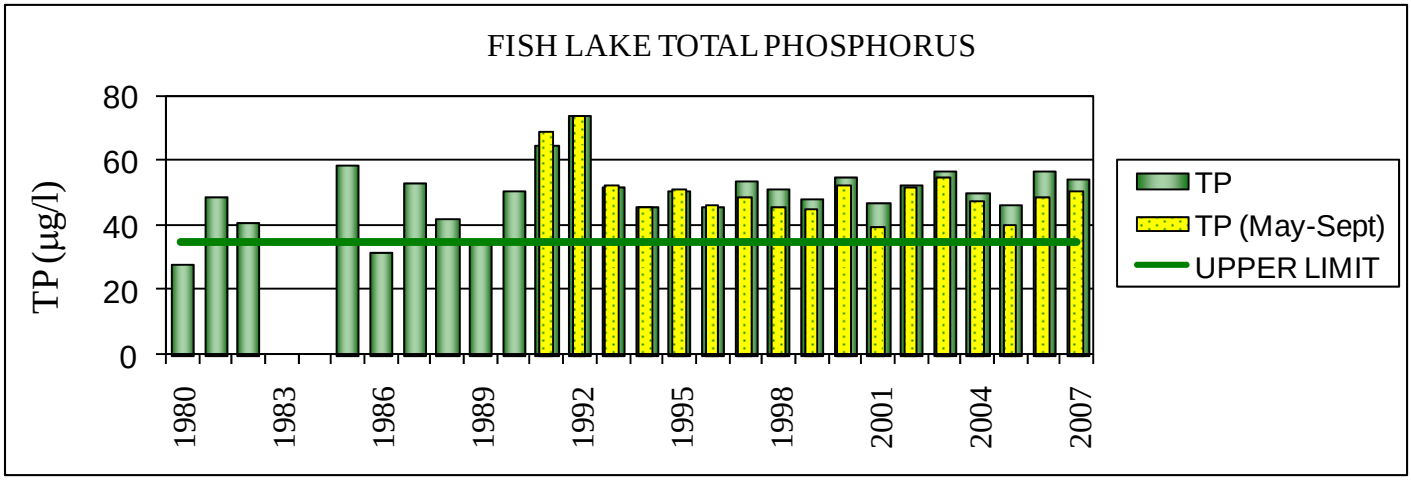


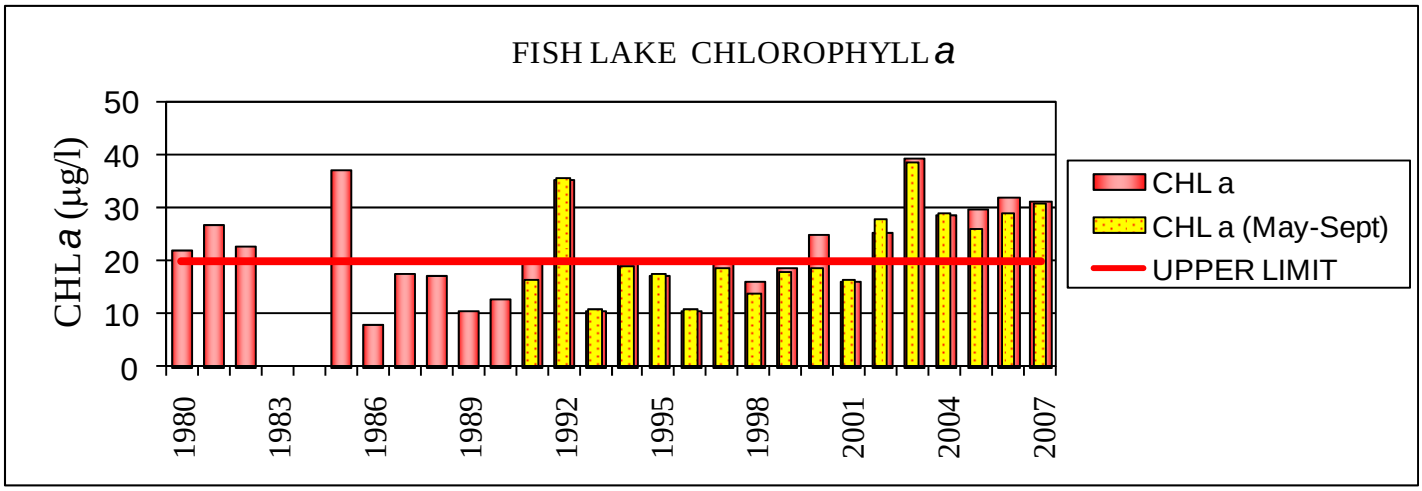


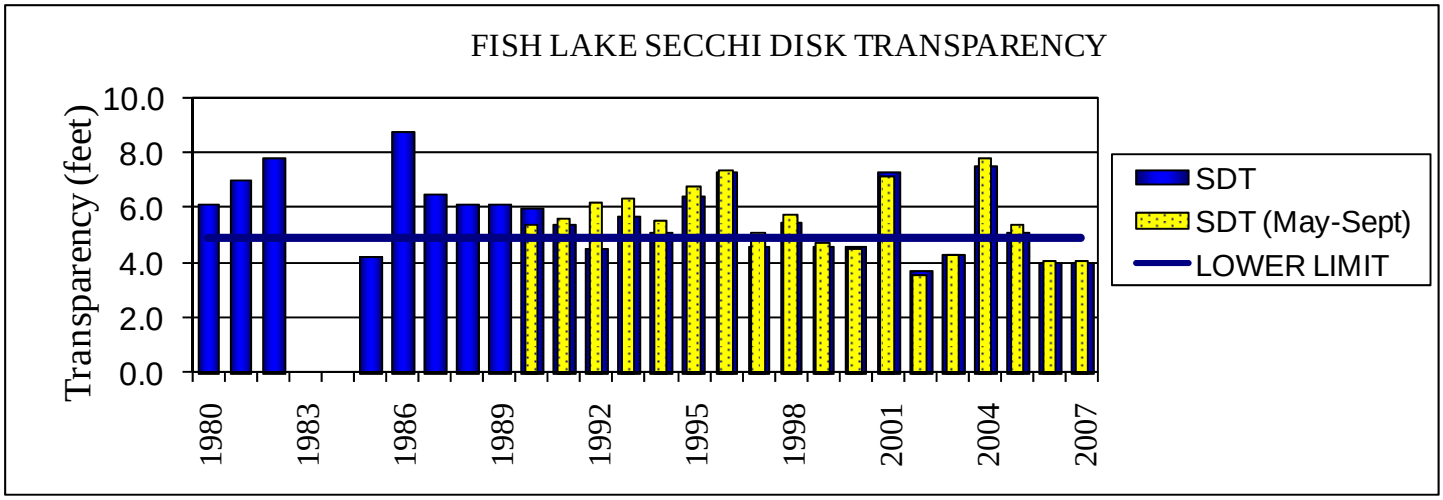
Source: Three Rivers Park District
Summer Mean (May-Sept)

Fish Lake

Historical Data







Source: HCDES
(Apr-Oct)

Weaver Lake

The Weaver Lake water quality in 2007 achieved the in-lake goals to support full contact recreational use. In 2007, the Weaver Lake average phosphorus concentration was 36µg/L with values ranging between 27 and 72µg/L from May through September. The concentrations were below the water quality goal of 40µg/L. The low phosphorus concentrations resulted in significantly less algae production in 2007 with average chlorophyll-a concentration of 7µg/L. Consequently, Weaver Lake had excellent water clarity conditions in 2007. The average Secchi depth transparency for Weaver Lake was 2.8 m. A clear water phase that developed in May, with water clarity conditions of over 6 m, helped to increase the yearly average Secchi depth. Throughout the remainder of the season, Secchi depth measurements of 1.7 to 3.0 m exceeded water quality goals. Average Secchi depth has shown a steady decrease since 2005, but compared to the past ten years, Secchi measurements still remain high.

The Weaver Lake water quality conditions in 2007 significantly improved relative to the overall declining water quality trend that has occurred the past ten years; However, 2007 water quality declined slightly from 2006. Several factors may have contributed to the significant improvement in water quality conditions over the past ten years. A significant influence of Weaver Lake water quality conditions was the amount watershed nutrient loading that the lake receives. The variation in watershed nutrient loading is mainly due to changes in the annual precipitation and in 2007, the amount of precipitation was below average for most of the summer. At the end of August, we approached record amounts of rainfall for the month. Weaver Lake may have received less phosphorus loading from the watershed because of the 2004 legislative ban on phosphorus fertilizer, in combination with the low precipitation.

A possible additional influence on the Weaver Lake water quality was the senescence of curlyleaf pondweed. Weaver Lake has a substantial amount of curlyleaf pondweed that inhibits potential recreational use. Consequently, a substantial amount of internal loading is due to the senescence of curlyleaf pondweed. The released nutrients from the senescence of curlyleaf pondweed often resulted in an algae bloom that persists throughout the summer. In 2005 through 2007, a whole-lake Fluoridone herbicide treatment was completed in Weaver Lake in an attempt to control curlyleaf pondweed. There was significantly less curlyleaf pondweed in Weaver Lake due to the herbicide treatment. The minimal increase in phosphorus concentration from 2005 to 2007 suggests that there was some curlyleaf pondweed reestablishment within the lake. A significant decrease in the amount of curlyleaf pondweed in Weaver Lake would reduce the amount of internal nutrient loading, and subsequently improve water quality conditions.

These two factors may have significantly influenced the water quality conditions in Weaver Lake for 2005 through 2007. Unfortunately, it is difficult to determine the influence that each potential factor may have had on improving water quality conditions. Additional monitoring efforts would be necessary to determine the influence each potential factor may have had on the water quality conditions. Consequently, it becomes critical to maintain monitoring Weaver Lake to determine potential changes in water quality conditions.

Questions regarding the 2007 monitoring of Diamond, Fish and Weaver Lakes should be directed to John Barten, (763)694-7841 or jbarten@threeriversparkdistrict.org.

Weaver Lake

Lake Water Quality Data

Date	Depth m	Temp ° C	DO mg/L	% DO	SpCond mS/cm	pH	TP µg/L	TN mg/L	Chla µg/L	Secchi m
04/24/07	0.234	12.52	12.67	119.1	0.422	7.72	29.5	0.951	7.073898	3.21
04/24/07	1.044	12.46	12.72	119.4	0.422	7.71				3.21
04/24/07	2.053	12.36	12.7	118.9	0.422	7.71				3.21
04/24/07	3.068	12.21	12.66	118.2	0.422	7.7				3.21
04/24/07	4.079	11.59	12.75	117.4	0.421	7.68				3.21
04/24/07	5.051	9.95	13.03	115.5	0.423	7.64				3.21
04/24/07	6.058	8.57	13.34	114.3	0.423	7.62				3.21
04/24/07	7.073	6.1	13.98	112.8	0.426	7.56				3.21
04/24/07	8.041	5.26	13.82	109.1	0.426	7.55				3.21
04/24/07	9.037	5.11	13.77	108.2	0.425	7.55				3.21
04/24/07	10.087	4.91	13.75	107.5	0.427	7.53				3.21
04/24/07	11.043	4.69	13.51	105.1	0.427	7.53				3.21
04/24/07	12.029	4.56	13.26	102.8	0.428	7.52				3.21
04/24/07	13.067	4.51	13.03	100.8	0.428	7.52				3.21
04/24/07	14.049	4.47	12.79	98.9	0.428	7.51	31.3			3.21
04/24/07	14.536	4.35	3.03	23.4	0.45	7.3				3.21
05/07/07	0.359	14.49	11.06	108.6	0.358	8.58	32.3	0.986	2.01	6.45
05/07/07	1.053	14.38	10.97	107.4	0.358	8.68				6.45
05/07/07	2.022	14.21	10.94	106.8	0.357	8.7				6.45
05/07/07	3.036	14.02	10.94	106.3	0.358	8.7				6.45
05/07/07	4.048	13.89	10.94	106	0.358	8.7				6.45
05/07/07	5.041	13.64	10.89	104.9	0.358	8.68				6.45
05/07/07	6.058	10.22	11.33	101	0.362	8.45				6.45
05/07/07	7.055	7.55	11.6	97	0.363	8.23				6.45
05/07/07	8.018	6.27	11.96	96.9	0.361	8.15	37.5			6.45
05/07/07	9.025	5.64	12.17	96.9	0.362	8.1				6.45
05/07/07	10.038	5.11	12.19	95.8	0.362	8.06				6.45
05/07/07	11.061	4.87	12.04	94.1	0.362	8.02				6.45
05/07/07	12.076	4.79	11.54	90	0.363	7.95				6.45
05/07/07	13.057	4.62	8.72	67.6	0.365	7.8				6.45
05/07/07	14.086	4.57	6.96	53.9	0.366	7.69				6.45
05/07/07	15.083	4.54	5.69	44.1	0.368	7.63				6.45
05/07/07	16.087	4.53	5.48	42.5	0.368	7.6	86.5			6.45
05/07/07	16.822	4.5	0.51	3.9	0.392	7				6.45
05/21/07	0.248	17.39	12.26	128.1	0.427	8.86	27.9	0.786	4.667516	3.50
05/21/07	1.099	17.16	12.36	128.4	0.428	8.93				3.50
05/21/07	2.009	17.1	12.32	127.9	0.428	8.94				3.50
05/21/07	3.011	16.72	12.26	126.2	0.428	8.93				3.50
05/21/07	4.034	16.4	12.12	124	0.428	8.92				3.50
05/21/07	5.026	16.04	11.87	120.5	0.428	8.88				3.50
05/21/07	6.07	10.85	10.08	91.2	0.441	8.25				3.50
05/21/07	7.014	7.81	10.03	84.4	0.436	8.03				3.50
05/21/07	8.006	6.41	9.86	80.1	0.438	7.92	33.9			3.50
05/21/07	9.011	5.58	9.89	78.7	0.438	7.87				3.50
05/21/07	10.011	5.12	9.78	76.9	0.439	7.83				3.50
05/21/07	11.066	4.87	8.28	64.7	0.441	7.76				3.50
05/21/07	12.091	4.78	5.35	41.7	0.443	7.65				3.50
05/21/07	13.047	4.74	3.81	29.7	0.445	7.59				3.50
05/21/07	14.015	4.73	3.21	25	0.445	7.56				3.50
05/21/07	15.035	4.72	2.48	19.3	0.446	7.51				3.50

Weaver Lake

Lake Water Quality Data

Date	Depth m	Temp ° C	DO mg/L	% DO	SpCond mS/cm	pH	TP µg/L	TN mg/L	Chla µg/L	Secchi m
05/21/07	16.051	4.7	2.21	17.2	0.447	7.48	112.2			3.50
05/21/07	16.432	4.65	0.91	7	0.469	7.03				3.50
06/04/07	0.41	21.02	10.79	121.2	0.404	8.84	27	0.767	8.3	3.00
06/04/07	1.092	21.01	10.72	120.4	0.404	8.88				3.00
06/04/07	2.02	20.97	10.58	118.7	0.404	8.89				3.00
06/04/07	3.032	20.97	10.47	117.5	0.404	8.9				3.00
06/04/07	4.005	20.88	10.38	116.3	0.404	8.9				3.00
06/04/07	5.028	16.97	8.12	84	0.422	8.66				3.00
06/04/07	6.027	14.79	5.92	58.5	0.431	8.33				3.00
06/04/07	7.028	9.14	6.57	57.1	0.439	8.08				3.00
06/04/07	8.072	6.7	6.94	56.8	0.438	7.98				3.00
06/04/07	9.019	6.16	7.11	57.4	0.439	7.9				3.00
06/04/07	10.029	5.48	6.68	53	0.44	7.84				3.00
06/04/07	11.035	5.2	4.9	38.6	0.441	7.74				3.00
06/04/07	12.035	4.99	2.56	20	0.445	7.63				3.00
06/04/07	13.079	4.93	0.9	7	0.445	7.57	107.4			3.00
06/04/07	14.004	4.92	0.51	4	0.445	7.53				3.00
06/04/07	15.003	4.9	0.41	3.2	0.446	7.51	114.4			3.00
06/04/07	15.78	4.85	0.32	2.5	0.472	7.3				3.00
06/18/07	0.403	25.63	5.09	62.4	0.421	8.8	40.5	0.898	6.884755	2.05
06/18/07	1.061	25.62	6.27	76.8	0.421	8.89				2.05
06/18/07	2.019	25.6	6.28	76.9	0.421	8.89				2.05
06/18/07	3.019	25.53	5.1	62.4	0.421	8.9				2.05
06/18/07	4.071	21.75	5.52	62.9	0.43	8.86				2.05
06/18/07	5.058	19.52	4.28	46.7	0.435	8.6				2.05
06/18/07	6.028	16.59	3.24	33.3	0.446	8.42				2.05
06/18/07	7.057	10.32	1.32	11.8	0.453	8.09	163.6			2.05
06/18/07	8.087	7.2	0.82	6.8	0.463	7.95				2.05
06/18/07	9	6.19	0.69	5.6	0.463	7.92				2.05
06/18/07	10.031	6.19	0.69	5.6	0.463	7.92				2.05
06/18/07	11.089	5.04	0.05	0.4	0.474	7.85				2.05
06/18/07	12.03	5.02	0.05	0.4	0.474	7.83				2.05
06/18/07	13.052	4.98	0.05	0.4	0.477	7.79	39.6			2.05
06/18/07	13.398	4.98	0	0	0.491	7.59				2.05
07/03/07							72	1.143	7.487748	2.15
07/03/07							46.9			2.15
07/03/07							215.6			2.15
07/16/07	0.519	24.43	9.38	112.5	0.429	8.14	38.2	0.811	6.299198	2.70
07/16/07	1.04	24.33	9.63	115.2	0.427	8.17				2.70
07/16/07	2.03	24.18	9.75	116.3	0.427	8.21				2.70
07/16/07	3.059	24.13	9.88	117.8	0.427	8.26				2.70
07/16/07	4.07	23.61	9.64	113.8	0.428	8.28				2.70
07/16/07	5.003	22.23	7.61	87.5	0.43	8.18				2.70
07/16/07	6.066	15.58	0.89	9	0.448	7.92	46			2.70
07/16/07	7.033	13.79	0.84	8.1	0.444	7.89				2.70
07/16/07	8.041	10.08	0.7	6.2	0.452	7.86				2.70
07/16/07	9.038	8.06	0.67	5.7	0.449	7.82				2.70
07/16/07	10.016	7.54	0.6	5	0.447	7.79				2.70
07/16/07	11.014	6.06	0.53	4.3	0.454	7.75				2.70
07/16/07	12.038	5.63	0.41	3.3	0.456	7.73				2.70

Weaver Lake

Lake Water Quality Data

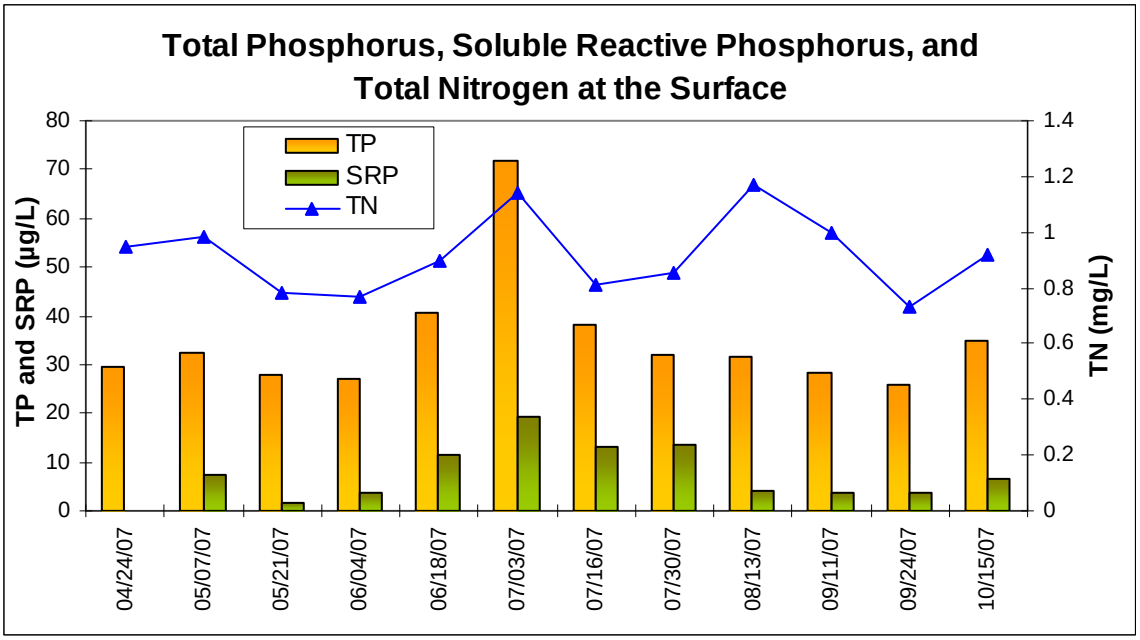
Date	Depth m	Temp ° C	DO mg/L	% DO	SpCond mS/cm	pH	TP µg/L	TN mg/L	Chla µg/L	Secchi m
07/16/07	13.039	5.39	0.36	2.8	0.46	7.7				2.70
07/16/07	14.007	5.26	0.34	2.7	0.463	7.68				2.70
07/16/07	15.033	5.17	0.3	2.4	0.465	7.65				2.70
07/16/07	16.073	5.13	0.27	2.1	0.466	7.64	334.9			2.70
07/16/07	16.584	5.05	0.2	1.6	0.492	7.46				2.70
07/30/07	0.427	28.11	9.9	126.8	0.386	7.95	32	0.854	6.49894	1.70
07/30/07	1.085	27.54	10.15	128.8	0.385	8.13				1.70
07/30/07	2.077	27.38	10.18	128.7	0.384	8.16				1.70
07/30/07	3.049	26.89	9.67	121.2	0.386	8.2				1.70
07/30/07	4.009	25	8.45	102.3	0.386	8.14				1.70
07/30/07	5.026	21.83	0.88	10	0.391	7.87	61.8			1.70
07/30/07	6.006	20.41	0.81	9	0.38	7.86				1.70
07/30/07	7.063	13.51	0.72	6.9	0.402	7.77				1.70
07/30/07	8.066	10.18	0.67	6	0.399	7.69				1.70
07/30/07	9.035	7.81	0.53	4.4	0.406	7.61				1.70
07/30/07	10.02	7	0.48	3.9	0.406	7.55				1.70
07/30/07	11.064	6.29	0.43	3.4	0.408	7.52				1.70
07/30/07	12.041	5.87	0.38	3	0.411	7.5				1.70
07/30/07	13.07	5.6	0.33	2.7	0.413	7.48				1.70
07/30/07	14.038	5.43	0.29	2.3	0.416	7.47				1.70
07/30/07	15.039	5.34	0.25	2	0.418	7.46				1.70
07/30/07	16.088	5.25	0.23	1.8	0.42	7.45	387.9			1.70
07/30/07	16.511	5.17	0.18	1.4	0.439	7.26				1.70
08/13/07							31.7	1.17	7.329097	2.00
08/13/07							46.4			2.00
08/13/07							325.8			2.00
08/28/07	0.492	22.35	8.64	117.5	0.4418	8.13	29.5	0.81	10.68107	2.43
08/28/07	1.077	22.35	8.68	117.9	0.4418	8.23				2.43
08/28/07	2.079	22.35	8.65	117.6	0.442	8.31				2.43
08/28/07	3.059	22.35	8.63	117.3	0.4422	8.38				2.43
08/28/07	4.046	21.93	7.69	103.8	0.4454	8.4				2.43
08/28/07	5.04	20.96	5.5	73	0.4475	8.32				2.43
08/28/07	6.052	18.46	0.92	11.6	0.4636	8.17	34.7			2.43
08/28/07	7.065	12.5	0.5	5.6	0.4822	8.1				2.43
08/28/07	8.043	9.73	0.28	3	0.4829	8.05				2.43
08/28/07	9.026	7.67	0.18	1.8	0.4884	7.98				2.43
08/28/07	10.095	6.67	0.12	1.2	0.487	7.92				2.43
08/28/07	11.015	6.36	0.1	1	0.4886	7.9				2.43
08/28/07	12.074	5.96	0.07	0.8	0.4915	7.88				2.43
08/28/07	13.048	5.86	0.07	0.8	0.4929	7.86				2.43
08/28/07	13.048	5.86	0.07	0.8	0.4929	7.86	375			2.43
08/28/07	14.413	5.55	0.05	0.6	0.5108	7.71				2.43
09/11/07	0.37	20.62	8.86	116.1	0.4297	7.96	28.2	1	7.718436	2.15
09/11/07	1.029	20.62	8.89	116.5	0.4299	8.06				2.15
09/11/07	2.069	20.63	8.96	117.4	0.4297	8.18				2.15
09/11/07	3.013	20.63	8.96	117.5	0.4299	8.28				2.15
09/11/07	4.074	20.62	8.97	117.5	0.4299	8.35				2.15
09/11/07	5.019	20.61	8.93	117	0.4299	8.42				2.15
09/11/07	6.032	19.75	8.1	104.6	0.4372	8.4				2.15
09/11/07	7.085	12.47	0.52	6	0.4713	8.06	81.1			2.15

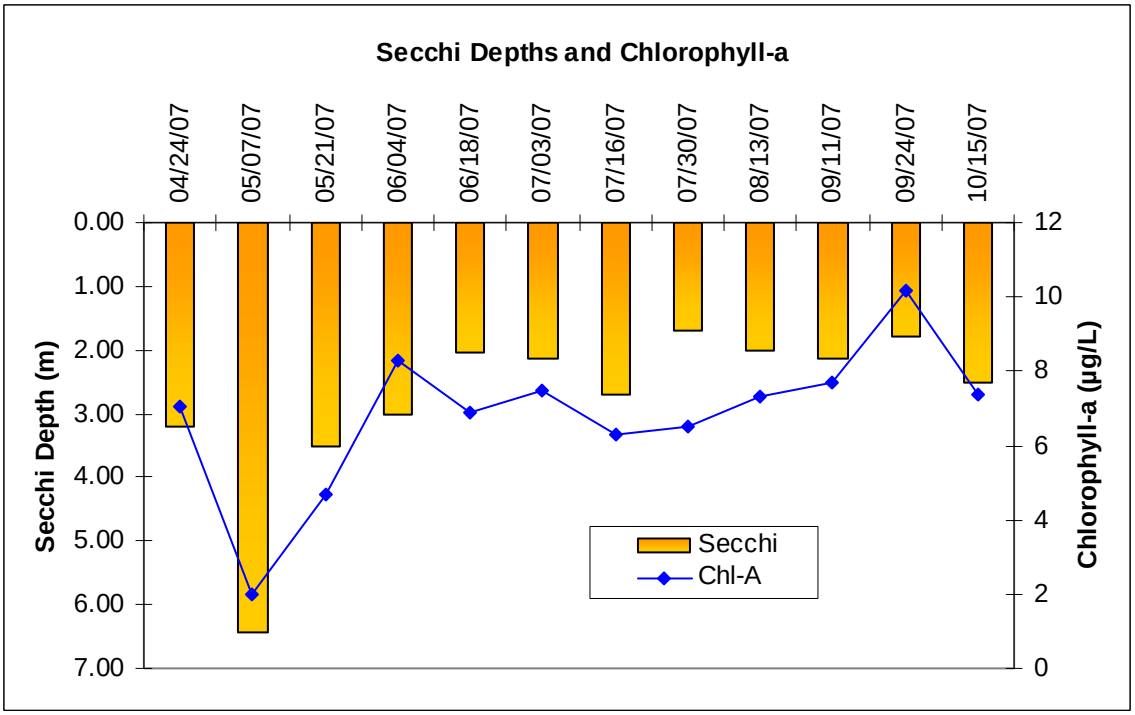
Weaver Lake

Lake Water Quality Data

Date	Depth m	Temp ° C	DO mg/L	% DO	SpCond mS/cm	pH	TP µg/L	TN mg/L	Chla µg/L	Secchi m
09/11/07	8.095	9.36	0.37	4	0.469	8.02				2.15
09/11/07	9.079	7.94	0.28	2.7	0.4684	7.98				2.15
09/11/07	10.069	6.73	0.14	1.3	0.4745	7.88				2.15
09/11/07	11.074	6.71	0.12	1.2	0.4734	7.86				2.15
09/11/07	12.003	6.09	0.1	1	0.4777	7.82				2.15
09/11/07	13.072	5.92	0.09	0.8	0.4793	7.8				2.15
09/11/07	14.067	5.82	0.07	0.8	0.4811	7.8				2.15
09/11/07	14.685	5.67	0.07	0.6	0.5095	7.61	354.1			2.15
09/24/07	0.402	19.31	11.94	129.8	0.425	7.28	25.8	0.73	10.15134	1.80
09/24/07	1.077	19.3	12.02	130.5	0.425	7.28				1.80
09/24/07	2.072	19.21	12.13	131.5	0.425	7.3				1.80
09/24/07	3.059	18.54	11.97	128.1	0.425	7.38				1.80
09/24/07	4.067	18.05	11.76	124.5	0.425	7.42				1.80
09/24/07	5.035	17.88	11.53	121.6	0.425	7.46				1.80
09/24/07	6.013	17.51	11.06	115.8	0.425	7.48				1.80
09/24/07	7.074	15.43	0.99	10	0.442	7.38	34.7			1.80
09/24/07	8.006	12.22	0.99	9.3	0.463	7.36				1.80
09/24/07	9.041	8.43	0.61	5.1	0.47	7.26				1.80
09/24/07	10.017	8.13	0.52	4.5	0.467	7.23				1.80
09/24/07	11.076	6.94	0.43	3.5	0.472	7.21				1.80
09/24/07	12.012	6.48	0.36	3	0.474	7.19				1.80
09/24/07	13.008	6.15	0.31	2.5	0.477	7.17				1.80
09/24/07	14.019	6.05	0.3	2.4	0.479	7.15				1.80
09/24/07	15.038	6	0.28	2.2	0.481	7.15	395.1			1.80
09/24/07	15.585	5.88	0.23	1.7	0.495	7.03				1.80
10/15/07	0.486	13.26	4.59	44	0.35	6.86	35	0.916	7.39056	2.50
10/15/07	1.031	13.3	3.92	37.5	0.35	6.84				2.50
10/15/07	2.049	13.31	3.82	36.5	0.35	6.84				2.50
10/15/07	3.088	13.31	3.79	36.4	0.35	6.82				2.50
10/15/07	4.028	13.31	3.78	36.2	0.35	6.82				2.50
10/15/07	5.085	13.3	3.78	36.2	0.35	6.82				2.50
10/15/07	6.079	13.3	3.79	36.2	0.35	6.82				2.50
10/15/07	7.063	13.27	3.78	36.2	0.35	6.82				2.50
10/15/07	8.069	13.1	3.72	35.4	0.35	6.82				2.50
10/15/07	9.085	12.75	3.51	33.2	0.35	6.8				2.50
10/15/07	10.088	7.67	1.2	10	0.39	6.71	212.2			2.50
10/15/07	11.031	7.05	0.79	6.5	0.39	6.67				2.50
10/15/07	12.043	6.44	0.4	3.4	0.39	6.65				2.50
10/15/07	13.064	6.3	0.3	2.5	0.4	6.63				2.50
10/15/07	14.029	6.17	0.18	1.3	0.4	6.63				2.50
10/15/07	15.034	6.09	0.14	1.1	0.4	6.61				2.50
10/15/07	16.07	5.98	0.11	1	0.45	6.48	46.9			2.50
10/15/07	16.153	5.98	0.11	1	0.46	6.42				2.50

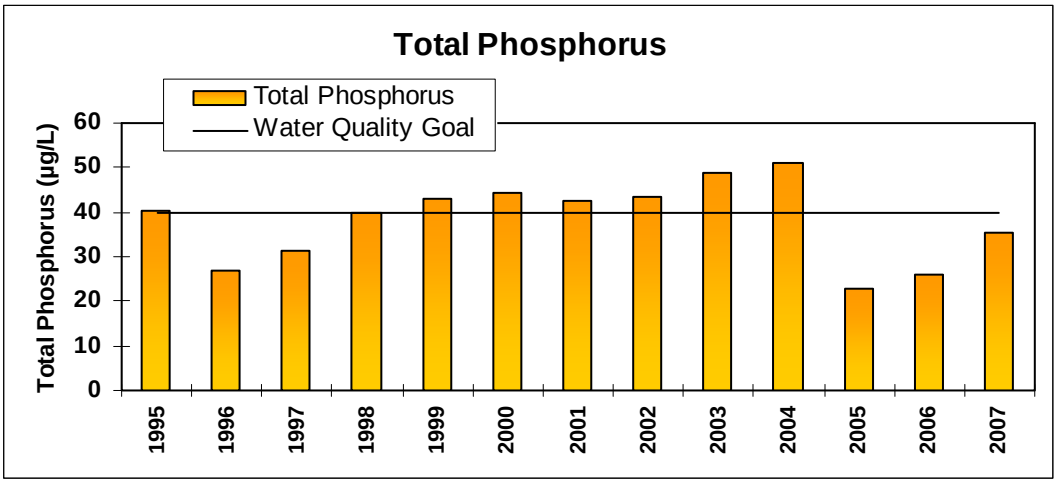
Weaver Lake

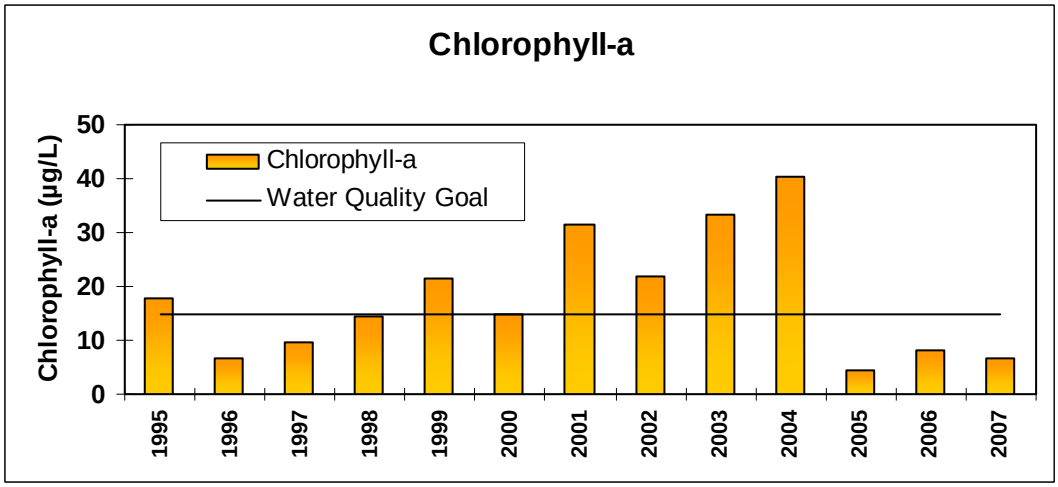

Total Phosphorus, Soluble Reactive Phosphorus, and Total Nitrogen at the Surface
TP
SRP
TN
TP and SRP (µg/L)
TN (mg/L)
0
10
20
30
40
50
60
70
80
0
0.2
0.4
0.6
0.8
1
1.2
1.4
04/24/07
05/07/07
05/21/07
06/04/07
06/18/07
07/03/07
07/16/07
07/30/07
08/13/07
09/11/07
09/24/07
10/15/07

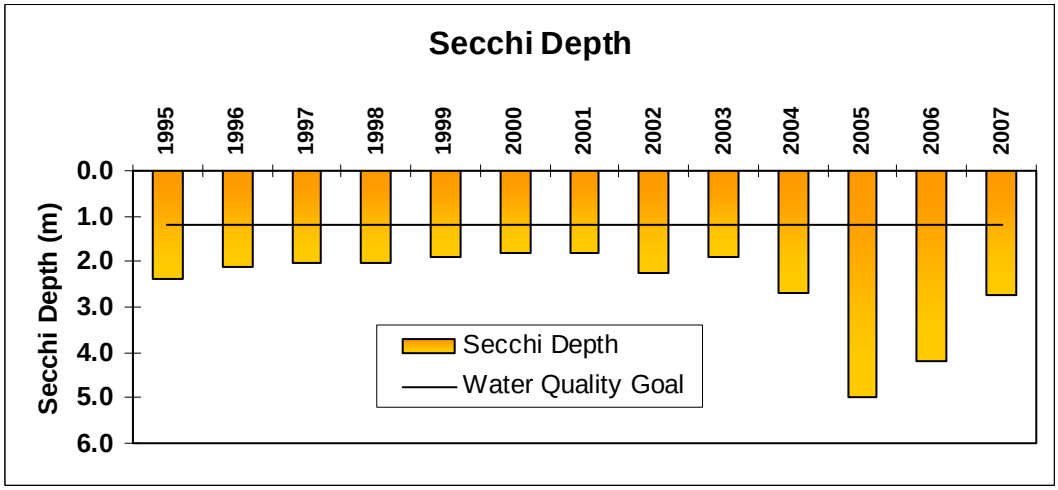

Secchi Depths and Chlorophyll-a
04/24/07
05/07/07
05/21/07
06/04/07
06/18/07
07/03/07
07/16/07
07/30/07
08/13/07
09/11/07
09/24/07
10/15/07
Secchi Depth (m)
0.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
Chlorophyll-a (µg/L)
0
2
4
6
8
10
12
Secchi
Chl-A

Weaver Lake

Historical Data



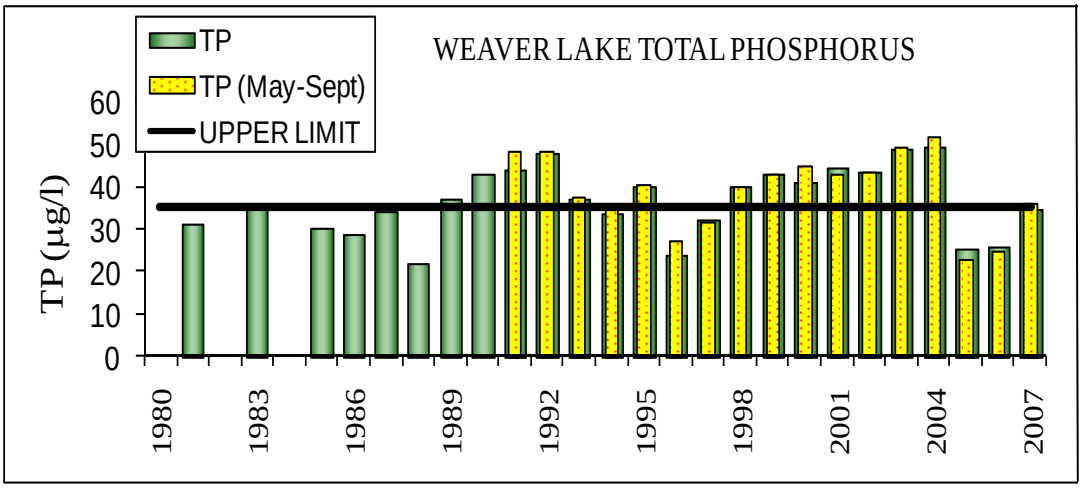


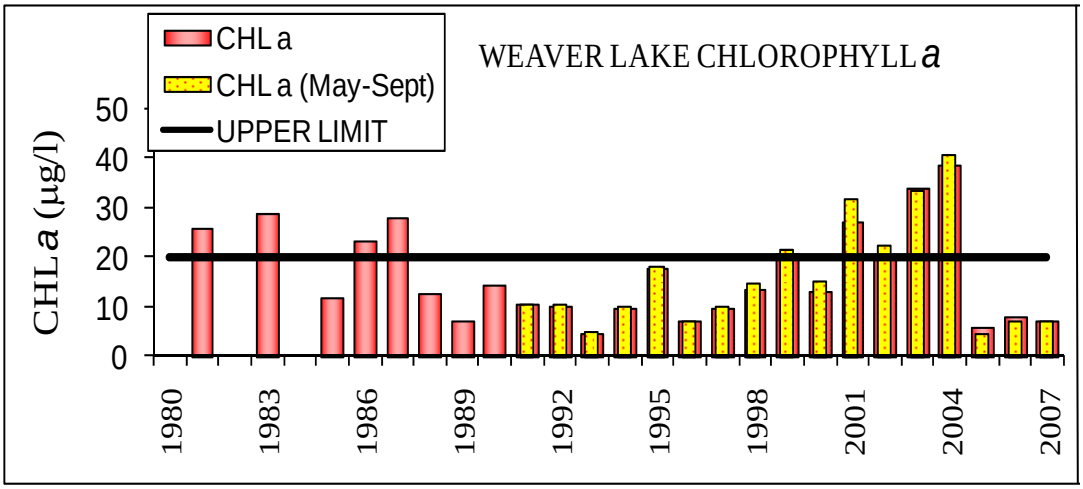


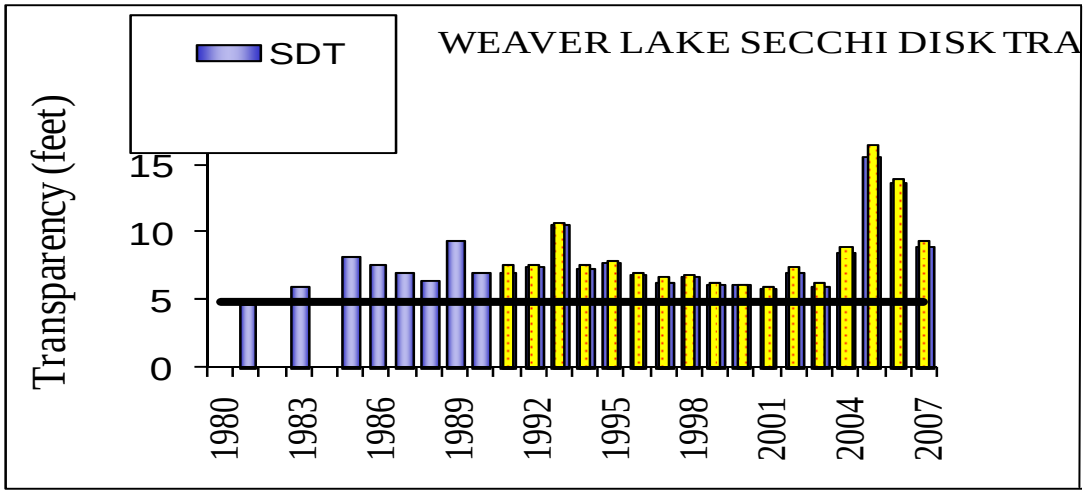
Source: Three Rivers Park District
Summer Mean (May-Sept)

Weaver Lake

Historical Data







Source: HCDES
(Apr-Oct)

Lake Monitoring Schedule

	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992	1991	1990	1989	1988	1987	1986
Cook							x									x		x		x		x
Cowley	*	*										*										
Diamond	x	x		x						x				*		x			x			x
Dubay																			x			x
Fish	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
French		x	x	*		*	*											x				
Henry	*	x	*										*									
Jubert								*									x		x		x	
Mill Pond						x			x								x			x		
Mud																						x
Rice	*																					
Sylvan											x											
Weaver	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

x = monitored by Three Rivers Park District/Hennepin Parks
* = monitored through the CAMP program