Spring

Lake Overview

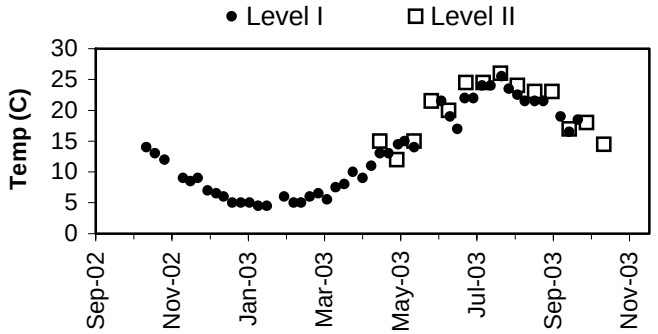
Volunteer monitoring began at Spring Lake in the 1980s and has continued through 2003, with the exception of 1995. The data indicate this lake is moderate in primary productivity (mesotrophic) with good water quality. Since the lake surface makes up 15% of the drainage area, direct precipitation is important in addition to watershed inputs. Land use analysis of 2002 aerial photographs showed over 44% of the surrounding watershed has been developed for uses other than agriculture or forestry.

Spring Lake has a public access boat launch, and a moderate infestation of Eurasian milfoil was found in 2001. King County and area residents completed an Integrated Aquatic Vegetation Management Plan and received a grant from the Washington Department of Ecology to control noxious weeds.

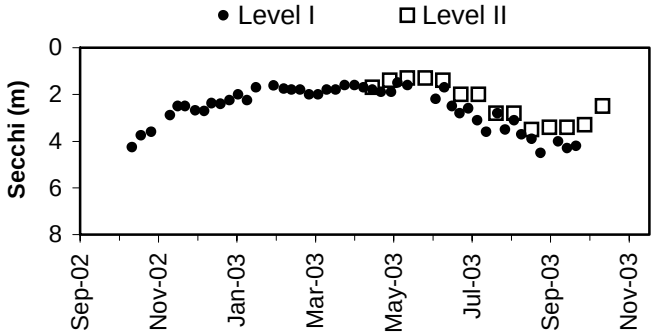
Physical Parameters

Secchi transparency ranged from 1.3 to 4.5m through the year. Water temperatures ranged from 4.5 to 26.0 degrees Celsius during the same period. Precipitation and water level records were excellent, showing that water levels follow the typical pattern of winter-high stands dropping to fall low-stands. Beaver activities have been found on the outlet stream, which may impact water levels in the future.

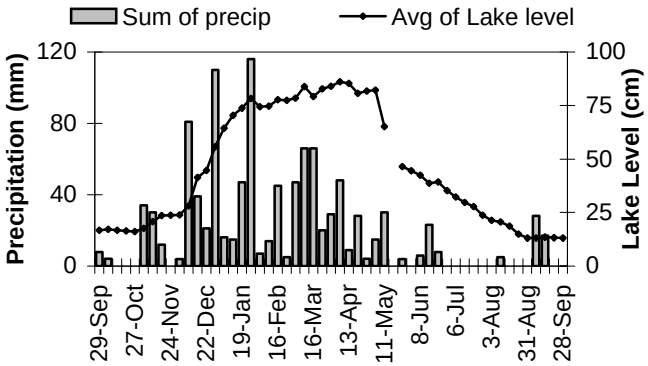
Lake Temperature



Secchi Depth

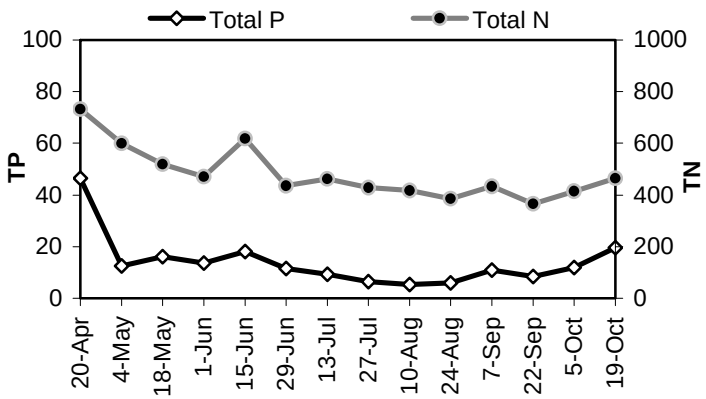


Lake Level and Precipitation

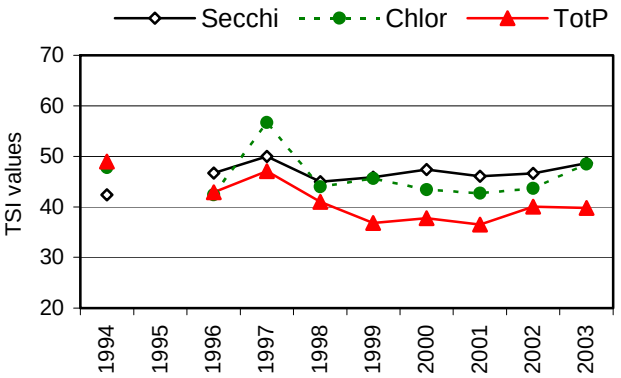


Spring

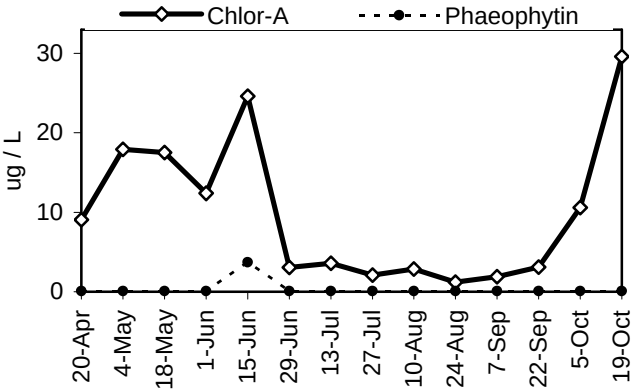
Nutrient Analysis



TSI Ratings



Chlorophyll a Concentrations (ug/L)



Common algae	Group
unidentified species	chrysophyte
Dinobryon spp.	chrysophyte
Anabaena sp.	bluegreen

Nutrient Analysis and TSI Ratings

Both nitrogen and phosphorus declined from peak values on the first sample date, but maintained relatively close proportions to each other. The N:P ratio ranged from 16 to 79. In 2003, the average TSI values spanned the mesotrophic range, with TSI-TP lower than the other two indicators.

Chlorophyll and Algae

Chlorophyll concentration was relatively high in spring, reaching a peak in mid-June and then decreasing to low values until October, when it rose again to the highest value of the sample season. Spring algae were dominated by the chrysophyte *Dinobryon* and an unidentified chrysophyte species, while the fall algae contained a significant amount of the bluegreen *Anabaena*. Other commonly occurring algae included several species of cryptophyte algae, the large colonial chlorophyte *Botryococcus* and the bluegreens *Aphanizomenon flos-aquae* and *Anacystis*.

Spring

2003 Level I Data

Daily Data Summary

Week of	Sum of precip. (mm)	# of days	Avg of lake level (cm)	# of days
29-Sep-02	8.0	5	16.7	5
6-Oct-02	4.1	7	17.1	7
13-Oct-02	0.1	7	16.6	7
20-Oct-02	0.1	7	16.3	7
27-Oct-02	0.1	4	16.0	4
3-Nov-02	34.0	4	17.5	4
10-Nov-02	30.1	7	20.7	7
17-Nov-02	12.1	7	23.6	7
24-Nov-02	0.0	7	23.6	7
1-Dec-02	4.0	7	23.9	7
8-Dec-02	81.0	7	28.0	7
15-Dec-02	39.1	7	41.4	7
22-Dec-02	21.1	7	44.7	7
29-Dec-02	110.0	7	55.7	7
5-Jan-03	16.0	7	64.4	7
12-Jan-03	15.0	7	70.5	7
19-Jan-03	47.0	4	73.8	4
26-Jan-03	116.1	7	78.2	7
2-Feb-03	7.0	7	74.4	7
9-Feb-03	14.0	7	74.6	7
16-Feb-03	45.0	7	77.7	7
23-Feb-03	5.1	7	77.4	7
2-Mar-03	47.0	7	78.4	7
9-Mar-03	66.0	7	83.8	7
16-Mar-03	66.0	7	79.1	7
23-Mar-03	20.0	5	82.7	5
30-Mar-03	29.1	7	84.0	7
6-Apr-03	48.0	7	86.0	7
13-Apr-03	9.0	7	85.4	7
20-Apr-03	28.0	7	80.6	7
27-Apr-03	4.1	7	81.7	7
4-May-03	15.0	7	82.2	7
11-May-03	30.1	7	65.2	7
18-May-03				
25-May-03	4.0	6	46.4	6
1-Jun-03	0.0	7	44.5	7
8-Jun-03	6.0	7	42.4	7
15-Jun-03	23.0	7	38.7	7
22-Jun-03	8.0	7	39.3	7
29-Jun-03	0.0	7	35.3	7
6-Jul-03	0.1	7	32.2	7
13-Jul-03	0.0	7	29.6	7
20-Jul-03	0.0	7	27.8	7
27-Jul-03	0.0	7	23.6	7
3-Aug-03	0.0	7	21.4	7
10-Aug-03	5.0	7	20.6	7
17-Aug-03	0.0	7	18.6	7
24-Aug-03	0.0	7	14.8	7
31-Aug-03	0.0	3	13.0	3
7-Sep-03	28.0	2	13.0	2
14-Sep-03	17.0	7	13.5	7
21-Sep-03	0.0	7	13.2	7
28-Sep-03	0.0	2	13.0	2
Min	0.0		13.0	
Max	116.1		86.0	
Total	1061.7			

Weekly Data Summary

Sample date	Sample time	Secchi (m)	Temp (°C)	Algae* (Shore)	Algae* (at site)	Goose Count*
12-Oct-02	16:15	4.3	14.0	NA	NA	0
19-Oct-02	14:00	3.8	13.0	NA	NA	0
27-Oct-02	10:30	3.6	12.0	C1	P1	0
11-Nov-02	12:00	2.9	9.0	NA	P2	6
17-Nov-02	12:00	2.5	8.5	C1	P2	0
23-Nov-02	12:00	2.5	9.0	C1	P2	0
1-Dec-02	12:00	2.7	7.0	C2/P1	P1	6
8-Dec-02	12:00	2.7	6.5	C2/P1	P1	0
14-Dec-02	11:00	2.4	6.0	C1/P2	C1/P2	21
21-Dec-02	10:00	2.4	5.0	C2/P2	C1/P2	6
28-Dec-02	11:30	2.3	5.0	C2/P2	C1/P2	5
4-Jan-03	11:00	2.0	5.0	P1	P2	
11-Jan-03	12:00	2.3	4.5	P2	P2	14
18-Jan-03	14:00	1.7	4.5	C3/P3	P3	
1-Feb-03	10:30	1.6	6.0	P2	P2	
9-Feb-03	13:30	1.8	5.0	P3	P2	
15-Feb-03	9:00	1.8	5.0	P1	P2	
22-Feb-03	14:30	1.8	6.0	P1	P2	2
1-Mar-03	13:30	2.0	6.5	P3	P3	
8-Mar-03	9:30	2.0	5.5	P3	P3	
15-Mar-03	14:00	1.8	7.5	P3	P3	2
22-Mar-03	10:00	1.8	8.0	P3	P3	5
29-Mar-03	13:30	1.6	10.0	P3	P3	
6-Apr-03	10:00	1.6	9.0	P3	P3	2
13-Apr-03	12:00	1.7	11.0	P3	P3	2
20-Apr-03	12:00	1.8	13.0	P1	P1	
27-Apr-03	17:00	1.9	13.0	P1	P1	6
5-May-03	12:00	1.9	14.5	P1	P1	
10-May-03	12:00	1.5	15.0	P1	P1	
18-May-03	12:00	1.6	14.0	NA	NA	
						46
9-Jun-03	12:00	2.2	21.5	NA	P1	12
16-Jun-03	12:00	1.7	19.0	p2	P3	
22-Jun-03	12:00	2.5	17.0	NA	P1	
28-Jun-03	12:00	2.8	22.0	NA	NA	1
5-Jul-03	16:00	2.6	22.0	NA	NA	1
12-Jul-03	12:30	3.1	24.0	NA	NA	
19-Jul-03	15:00	3.6	24.0	NA	NA	
28-Jul-03	20:00	2.8	25.5	NA	NA	
3-Aug-03	12:30	3.5	23.5	NA	NA	
10-Aug-03		3.1	22.5	NA	NA	
16-Aug-03		3.7	21.5	NA	NA	
24-Aug-03		3.9	21.5	P2	NA	
31-Aug-03		4.5	21.5	P2	NA	
						12
14-Sep-03		4.0	19.0	P2	P1	
21-Sep-03		4.3	16.5	NA	NA	
28-Sep-03		4.2	18.5	NA	NA	
	Min	1.5	4.5			0
	Max	4.5	25.5			46

Spring **2003 Level II Data**

Date (2003)	Temp (°C)	Secchi (m)	Chl-*a* (µg/l)	TP (µg/l)	TN (µg/l)	Algae Obsv.	N:P	Calculated TSI			Notes
								Secc	chl-a	TP	
20-Apr	15.0	1.7	9.1	46.4	732	3	16	52.3	52.2	59.5	
4-May	12.0	1.4	17.9	12.5	599	3	48	55.1	58.9	40.6	There was a number of rotifers in sample.
18-May	15.0	1.3	17.5	16.1	519	3	32	56.2	58.6	44.2	
1-Jun	21.5	1.3	12.4	13.7	470	3	34	56.2	55.3	41.9	
15-Jun	20.0	1.4	24.6	18.1	618	3	34	55.1	62.0	45.9	Distinct swirls of algae in water.
29-Jun	24.5	2.0	3.1	11.6	435	3	38	50.0	41.6	39.5	Not nearly as dense as two weeks ago.
13-Jul	24.5	2.0	3.6	9.3	461	3	50	50.0	43.1	36.3	
27-Jul	26.0	2.8	2.1	6.4	428	3	67	45.1	37.8	30.9	
10-Aug	24.0	2.8	2.9	5.3	417	3	79	45.1	40.9	28.2	
24-Aug	23.0	3.5	1.2	6.0	386	3	64	41.9	32.4	30.0	
7-Sep	23.0	3.4	1.9	10.9	433	2	40	42.3	36.9	38.6	
21-Sep	17.0	3.4	3.1	8.4	366	3	44	42.3	41.7	34.8	Surface bloom at dock, not at sample site.
5-Oct	18.0	3.3	10.6	11.9	415		35	42.8	53.7	39.9	
19-Oct	14.5	2.5	29.6	19.6	464	3	24	46.8	63.8	47.1	Surface bloom at dock, not at sample site.
	Temp (°C)	**Secchi (m)**	**Chl-*a* (µg/l)**	**TP (µg/l)**	**TN (µg/l)**	**Algae Obsv.**	**N:P**	**Calculated TSI**			
								Secc	**chl-a**	**TP**	
Mean	19.9	2.3	10.0	14.0	481.6	2.9	43	48.7	48.5	39.8	**TSI Average = 45.7**
Median	20.8	2.3	6.3	11.8	448.0	3	39	48.4	47.7	39.7	
Min	12.0	1.3	1.2	5.3	366.0	2	16	41.9	32.4	28.2	
Max	26.0	3.5	29.6	46.4	732.0	3	79	56.2	63.8	59.5	
Count	14	14	14	14	14	13	14	14	14	14	