# Lake Overview

Volunteer monitoring began at Shadow Lake in the 1980s and has continued through 2003, with two gaps. The data indicate this lake is moderate in primary productivity (mesotrophic) with good water quality. Since the lake surface makes up 12% of the drainage area, direct precipitation is important in addition to watershed inputs. There is one large Class 1 wetland in the watershed adjacent to the lake, from which a creek exits (King County, 1990). Land use analysis of 2002 aerial photographs showed over 66% of the surrounding watershed has been developed for uses other than agriculture or forestry.

Shadow Lake has a public access boat launch. Eurasian milfoil has been found in the lake since 1995, but does not appear to be increasing. Residents should keep an eye on aquatic plants growing nearshore to catch any increases in patches of this, Brazilian elodea, and other noxious weeds.

Physical Parameters

Secchi transparency ranged from 1.9 to 4.0m from late April through October. Water temperatures reached 25.0 degrees Celsius during the same period. Excellent local precipitation and water level records detailed a pattern similar to the winter-high, summer-low stands characteristic of the region, but through a smaller vertical change than many other lakes.

Lake Temperature
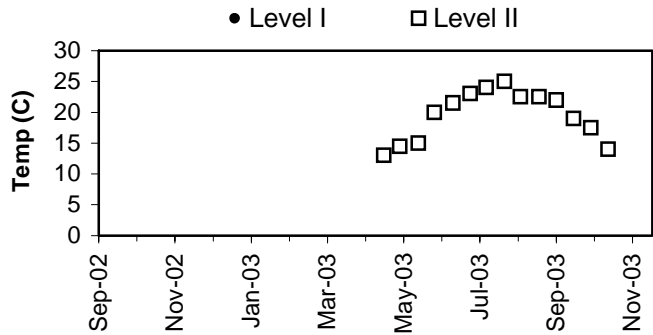
Secchi Depth
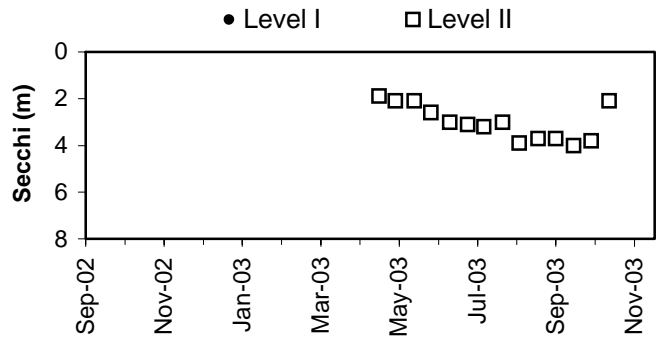
Lake Level and Precipitation
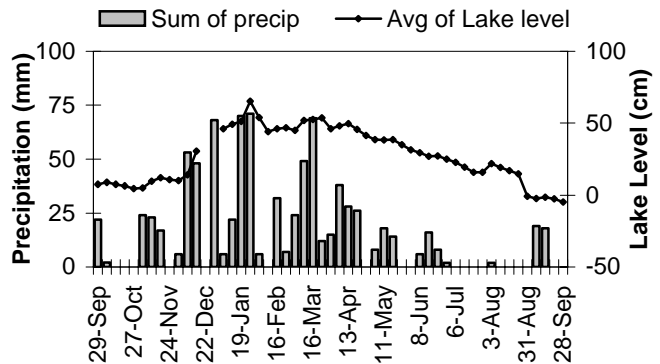
Shadow

Nutrient Analysis
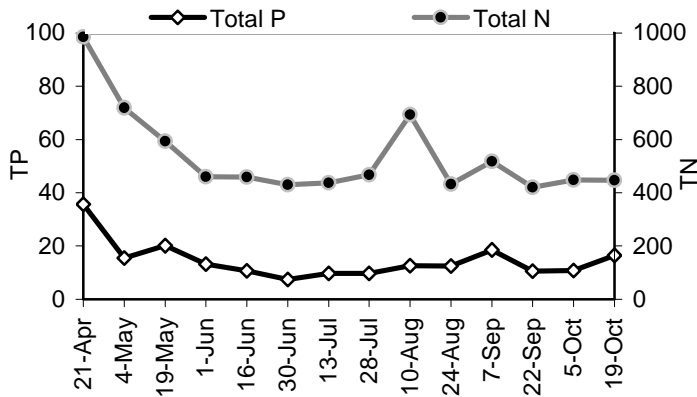
TSI Ratings
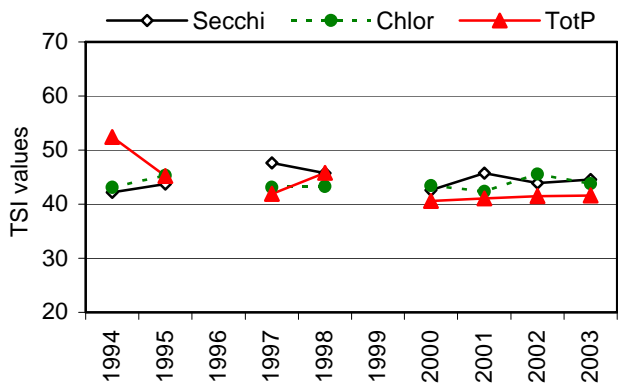
Chlorophyll a Concentrations (ug/L)
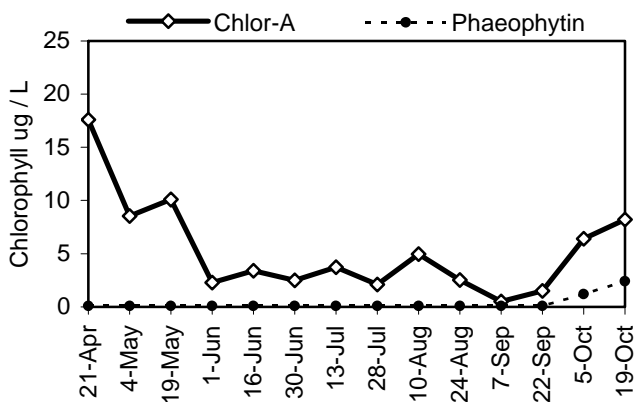
Common algae	Group
Aphanizomenon flos-aquae	bluegreen
Dinobryon spp.	chrysophyte
unidentified species	chrysophyte

Nutrient Analysis and TSI Ratings

Total nitrogen decreased early in the season and then remained in relatively constant proportion to total phosphorus, with the exception of one higher nitrogen value in August (see chart). The N:P ratio ranged from 27 to 57. In 2003 the average TSI values were close together in the lower midrange of mesotrophy, similar to recent years.

Chlorophyll and Algae

Chlorophyll concentrations were highest at the beginning of the sample period, descending to moderately low values through summer and rising to a smaller peak in autumn. The spring algae were dominated by a combination of the bluegreen *Aphanizomenon flos-aquae* and several chrysophyte *Dinobryon* species. The smaller fall increase was co-dominated by *Aphanizomenon* and an unidentified chrysophyte species. Other commonly occurring algae included the diatoms *Asterionella* and *Tabellaria*, as well as the bluegreens *Anabaena*, *Aphanothece* and *Chroococcus*.

Shadow

Daily Data Summary

Weekly Data Summary

Week of	Sum of precip. (mm)	# of days	Avg of lake level (cm)	# of days	Sample date	Sample time	Secchi (m)	Temp (°C)	Algae (Shore)	Algae (at site)	Goose Count
29-Sep-02	22.0	5	7.6	5							
6-Oct-02	2.1	7	8.9	7							
13-Oct-02	0.0	7	7.6	7							
20-Oct-02	0.0	7	6.4	7							
27-Oct-02	0.1	7	4.7	7							
3-Nov-02	24.0	7	5.0	7							
10-Nov-02	23.1	7	9.4	7							
17-Nov-02	17.0	7	12.0	7							
24-Nov-02	0.0	7	10.6	7							
1-Dec-02	6.0	7	10.0	7							
8-Dec-02	53.0	7	13.9	7							
15-Dec-02	48.0	4	30.5	4							
22-Dec-02											
29-Dec-02	68.0	1									
5-Jan-03	6.0	2	46.0	1							
12-Jan-03	22.0	7	49.3	7							
19-Jan-03	70.0	7	51.3	7							
26-Jan-03	71.0	7	65.1	7							
2-Feb-03	6.0	7	53.9	7							
9-Feb-03	0.0	7	44.0	7							
16-Feb-03	32.0	7	46.1	7							
23-Feb-03	7.0	7	46.7	7							
2-Mar-03	24.0	7	45.0	7							
9-Mar-03	49.0	4	51.8	4							
16-Mar-03	69.0	7	52.6	7							
23-Mar-03	12.0	7	53.6	7							
30-Mar-03	15.0	7	46.0	7							
6-Apr-03	38.0	7	48.1	7							
13-Apr-03	28.1	7	49.7	7							
20-Apr-03	26.1	7	45.6	7							
27-Apr-03	0.0	7	41.3	7							
4-May-03	8.0	2	38.5	2							
11-May-03	18.1	7	38.3	7							
18-May-03	14.1	7	38.4	7							
25-May-03	0.1	7	34.9	7							
1-Jun-03	0.0	7	31.4	7							
8-Jun-03	6.0	7	29.4	7							
15-Jun-03	16.1	7	27.0	7							
22-Jun-03	8.0	7	27.1	7							
29-Jun-03	2.0	7	25.0	7							
6-Jul-03	0.0	7	22.7	7							
13-Jul-03	0.1	7	19.3	7							
20-Jul-03	0.0	7	15.7	7							
27-Jul-03	0.0	7	15.7	7							
3-Aug-03	2.0	7	21.7	7							
10-Aug-03	0.0	7	19.1	7							
17-Aug-03	0.0	7	16.8	6							
24-Aug-03	0.0	7	14.6	7							
31-Aug-03	0.0	6	-0.8	6							
7-Sep-03	19.1	7	-2.3	7							
14-Sep-03	18.0	7	-1.4	7							
21-Sep-03	0.0	7	-2.6	7							
28-Sep-03	0.0	3	-4.7	3							
Min	0.0		-4.7			**Min**	0.0	0.0			
Max	71.0		65.1			**Max**	0.0	0.0			
Total	849.7										

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	
21-Apr	13.0	1.9	17.6	35.7	985	2	28	50.7	58.7	55.7	
4-May	14.5	2.1	8.5	15.5	719	2	46	49.3	51.6	43.7	
19-May	15.0	2.1	10.1	20.1	594	2	30	49.3	53.3	47.4	
1-Jun	20.0	2.6	2.3	13.3	460	2	35	46.2	38.7	41.5	
16-Jun	21.5	3.0	3.4	10.7	459	2	43	44.1	42.6	38.3	
30-Jun	23.0	3.1	2.5	7.5	430	2	57	43.7	39.6	33.2	
13-Jul	24.0	3.2	3.7	9.7	437	2	45	43.2	43.5	36.9	
28-Jul	25.0	3.0	2.1	9.7	468	1	48	44.1	37.8	36.9	
10-Aug	22.5	3.9	5.0	12.6	694	2	55	40.4	46.3	40.7	
25-Aug	22.5	3.7	2.5	12.5	432	2	35	41.1	39.7	40.6	
8-Sep	22.0	3.7	0.6	18.6	518	2	28	41.1		46.3	Chlor-a value was <MDL. Reported as .6µgl.
22-Sep	19.0	4.0	1.5	10.6	420	2	40	40.0	34.7	38.2	
6-Oct	17.5	3.8	6.4	10.9	448	2	41	40.7	48.8	38.6	
20-Oct	14.0	2.1	8.2	16.5	447	2	27	49.3	51.2	44.6	
	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	19.5	3.0	5.3	14.6	536.5	1.9	40	44.5	45.1	41.6	**TSI Average = 43.3**
Median	20.8	3.1	3.6	12.6	459.5	2	40	43.9	43.5	40.6	
Min	13.0	1.9	0.6	7.5	420.0	1	27	40.0	34.7	33.2	
Max	25.0	4.0	17.6	35.7	985.0	2	57	50.7	58.7	55.7	
Count	14	14	14	14	14	14	14	14	13	14	