Lake Overview

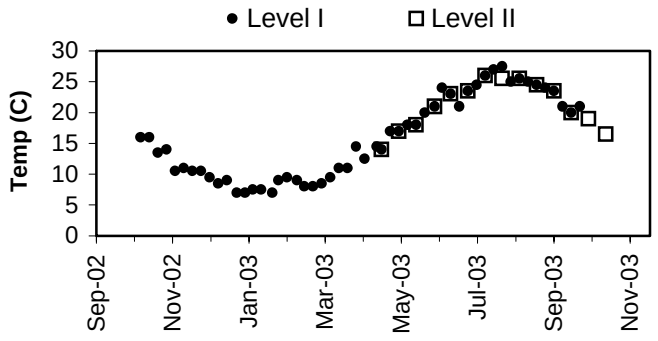
Volunteer monitoring began at Mirror Lake in early 1997 and continued through 2003. The data indicate this city lake (Federal Way) is moderate in primary productivity (mesotrophic) with good water quality. Since the lake surface makes up 11% of the drainage area, direct precipitation is fairly important in addition to watershed inputs. There are no inventoried wetlands in the basin, although there is a hydrological connection with Fishers Bog. Land use analysis of 2002 aerial photographs showed almost 88% of the surrounding watershed has been developed for uses other than agriculture.

Mirror Lake has no public access boat launch, but residents should watch the nearshore environment for Eurasian milfoil, Brazilian elodea, and other noxious weeds.

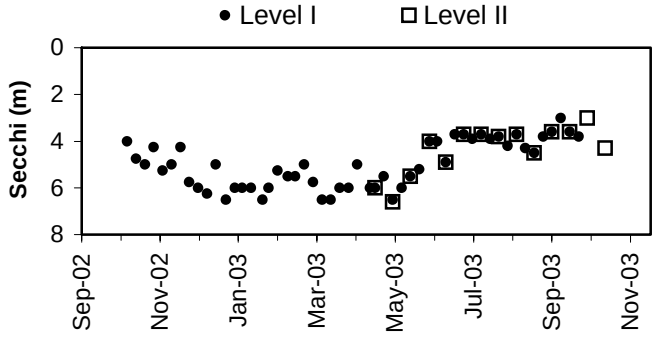
Physical Parameters

Secchi transparency ranged from 3.0 to 6.6m through the year. Annual water temperatures ranged from 5 to 25 degrees Celsius. Excellent records were kept for precipitation and water levels. The lake level followed the winter high - summer low pattern, consistent with other small lakes in the region.

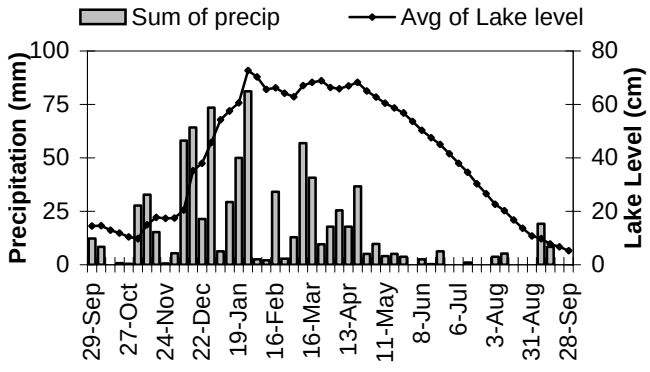
Lake Temperature



Secchi Depth

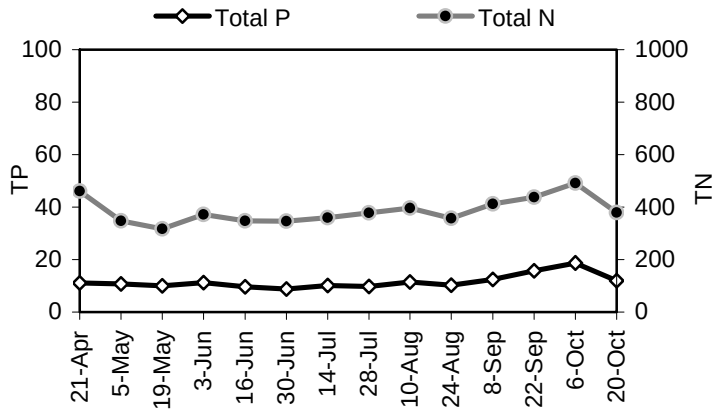


Lake Level and Precipitation

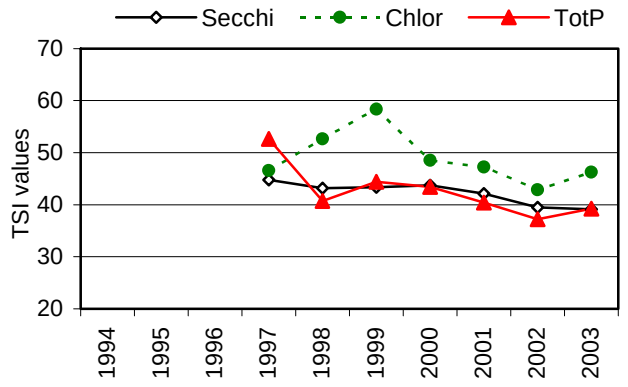


Mirror

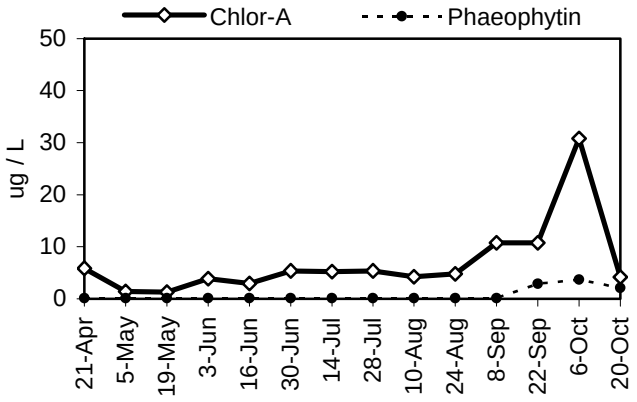
Nutrient Analysis



TSI Ratings



Chlorophyll a Concentrations (ug/L)



Common algae	Group
Dinobryon spp.	chrysophyte
Mallomonas sp.	chrysophyte
unidentified species	unidentified group

Nutrient Analysis and TSI Ratings

Total phosphorus and total nitrogen remained in relatively constant proportion to each other through much of the sampling period, rising slightly in the autumn. The N:P ratio ranged from 26 to 42. In 2003 the average TSI-chlor was in the mid-range for mesotrophy, higher than the other two indicators, and similar to the pattern over the past five years. Average TSI values for Secchi and total phosphorus were on the threshold between mesotrophy and oligotrophy.

Chlorophyll and Algae

Chlorophyll concentrations were at low levels through most of the sampling period, but made a large peak in early October that dropped off quickly. Dominant algae included the chrysophytes *Dinobryon* and *Mallomonas*. An unidentified colonial species was responsible for the large peak in autumn. Very few bluegreen algae were found in the samples, and all were in trace amounts.

Daily Data Summary

Week of	Sum of precip. (mm)	# of days	Avg of lake level (cm)	# of days
29-Sep-02	12.2	5	14.4	5
6-Oct-02	8.4	7	14.6	7
13-Oct-02	0.0	7	12.9	7
20-Oct-02	0.8	7	11.7	7
27-Oct-02	0.5	7	10.3	7
3-Nov-02	27.7	7	9.7	7
10-Nov-02	32.8	7	14.9	7
17-Nov-02	15.2	7	17.7	7
24-Nov-02	0.6	7	17.3	7
1-Dec-02	5.3	7	17.4	7
8-Dec-02	58.2	7	20.4	7
15-Dec-02	64.3	7	35.1	7
22-Dec-02	21.3	7	38.0	7
29-Dec-02	73.4	7	45.7	7
5-Jan-03	6.4	3	54.3	3
12-Jan-03	29.2	7	57.6	7
19-Jan-03	50.0	7	60.6	7
26-Jan-03	81.0	7	72.7	7
2-Feb-03	2.5	7	70.3	7
9-Feb-03	2.0	7	65.6	7
16-Feb-03	34.1	7	66.1	7
23-Feb-03	2.8	7	64.1	7
2-Mar-03	12.7	7	62.9	7
9-Mar-03	56.9	7	67.0	7
16-Mar-03	40.6	7	68.3	7
23-Mar-03	9.7	7	68.9	7
30-Mar-03	17.8	7	66.3	7
6-Apr-03	25.4	7	65.9	7
13-Apr-03	17.8	4	66.9	7
20-Apr-03	36.6	7	68.3	7
27-Apr-03	5.1	7	65.0	7
4-May-03	9.7	7	62.7	7
11-May-03	4.1	7	60.4	7
18-May-03	5.1	7	58.6	7
25-May-03	3.8	7	56.9	7
1-Jun-03	0.0	7	53.7	7
8-Jun-03	2.6	7	50.3	7
15-Jun-03	0.3	7	47.6	7
22-Jun-03	6.4	7	45.0	7
29-Jun-03	0.0	7	41.6	7
6-Jul-03	0.0	7	38.0	7
13-Jul-03	1.0	7	34.6	7
20-Jul-03	0.0	7	30.3	7
27-Jul-03	0.0	7	26.6	7
3-Aug-03	3.8	7	22.6	7
10-Aug-03	5.2	7	20.1	7
17-Aug-03	0.0	7	16.7	7
24-Aug-03	0.0	7	13.6	7
31-Aug-03	0.0	7	10.7	7
7-Sep-03	19.1	7	9.7	7
14-Sep-03	8.4	7	7.9	7
21-Sep-03	0.0	7	6.7	7
28-Sep-03	0.0	3	5.3	3
Min	0.0		5.3	
Max	81.0		72.7	
Total	820.7			

Weekly Data Summary

Sample date	Sample time	Secchi (m)	Temp (°C)	Algae* (Shore)	Algae* (at site)	Goose Count*
7-Oct-02	11:00	4.0	16.0	NA	P1	0
14-Oct-02	11:00	4.8	16.0	NA	NA	1
21-Oct-02	11:00	5.0	13.5	NA	P1	0
28-Oct-02	10:30	4.3	14.0	NA	P2	0
4-Nov-02	10:00	5.3	10.5	NA	P1	0
11-Nov-02	10:30	5.0	11.0	NA	P1	0
18-Nov-02	11:45	4.3	10.5	NA	NA	0
25-Nov-02	11:15	5.8	10.5	NA	P1	1
2-Dec-02	11:45	6.0	9.5	NA	P1	0
9-Dec-02	14:45	6.3	8.5	NA	P1	0
16-Dec-02	11:00	5.0	9.0	NA	P1	0
24-Dec-02	11:30	6.5	7.0	NA	P1	0
31-Dec-02	11:45	6.0	7.0	NA	P1	0
6-Jan-03	10:30	6.0	7.5	NA	P1	0
13-Jan-03	10:30	6.0	7.5	NA	P1	0
22-Jan-03	10:30	6.5	7.0	NA	P1	0
27-Jan-03	10:30	6.0	9.0	NA	C1	0
3-Feb-03	12:00	5.3	9.5	NA	P1	5
11-Feb-03	15:00	5.5	9.0	NA	P1	6
17-Feb-03	10:30	5.5	8.0	NA	P1	6
24-Feb-03	11:00	5.0	8.0	C3*	P1	6
3-Mar-03	10:30	5.8	8.5	C3*	P1	6
10-Mar-03	11:00	6.5	9.5	C3*	P1	1
17-Mar-03	10:30	6.5	11.0	C3*	P1	6
24-Mar-03	10:15	6.0	11.0	C3*	P1	1
31-Mar-03	10:45	6.0	14.5	NA	P1	2
7-Apr-03	11:00	5.0	12.5	NA	P1	4
17-Apr-03	10:15	6.0	14.5	NA	P1	4
21-Apr-03	15:30	6.0	14.0	NA	P1	3
28-Apr-03	11:30	5.5	17.0	NA	P1	3
5-May-03	14:30	6.5	17.0		P2	2
12-May-03	11:00	6.0	18.0	NA	P2	8
19-May-03	11:45	5.5	18.0	NA	P2	4
26-May-03	11:00	5.2	20.0	NA	P2	10
3-Jun-03	9:45	4.0	21.0	NA	P2	22
9-Jun-03	15:30	4.0	24.0	NA	P2	10
16-Jun-03	15:30	4.9	23.0	NA	P2	14
23-Jun-03	11:00	3.7	21.0	NA	P3	13
30-Jun-03	12:15	3.7	23.5	NA	P3	19
7-Jul-03	11:00	3.9	24.5	NA	C3	17
14-Jul-03	17:00	3.7	26.0	NA	C3	12
21-Jul-03	14:00	3.9	27.0	NA	C3	19
28-Jul-03	14:00	3.8	27.5	NA	C3	12
4-Aug-03	11:00	4.2	25.0	NA	P2	6
11-Aug-03	14:30	3.7	25.5	NA	C3	0
18-Aug-03	11:30	4.3	25.0	NA	C2	0
25-Aug-03	15:00	4.5	24.5	NA	P2	0
1-Sep-03	10:30	3.8	24.0	NA	P3	0
8-Sep-03	12:00	3.6	23.5	NA	P1	0
15-Sep-03	11:30	3.0	21.0	NA	C2	2
22-Sep-03	11:30	3.6	20.0	NA	P2	0
29-Sep-03	11:15	3.8	21.0	NA	P2	0
	Min	3.0	7.0			0
	Max	6.5	27.5			22

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	14.0	6.0	5.9	11.1	461	1	42	34.1	47.9	38.9	
5-May	17.0	6.6	1.4	10.8	347	2	32	32.8	33.8	38.5	
19-May	18.0	5.5	1.3	10.0	317	2	32	35.4	33.1	37.4	
3-Jun	21.0	4.0	3.9	11.3	372	2	33	40.0	43.9	39.1	
16-Jun	23.0	4.9	2.9	9.7	347	2	36	37.1	41.1	36.9	
30-Jun	23.5	3.7	5.3	8.8	346	3	39	41.1	47.0	35.5	
14-Jul	26.0	3.7	5.2	10.2	360	3	35	41.1	46.8	37.7	
28-Jul	25.5	3.8	5.3	9.8	378	3	39	40.7	47.0	37.1	
11-Aug	25.5	3.7	4.3	11.5	396	3	34	41.1	44.8	39.4	
25-Aug	24.5	4.5	4.8	10.3	357	2	35	38.3	46.0	37.8	
8-Sep	23.5	3.6	10.7	12.5	412	1	33	41.5	53.8	40.6	
22-Sep	20.0	3.6	10.7	15.8	438	2	28	41.5	53.8	44.0	
6-Oct	19.0	3.0	30.9	18.7	492	3	26	44.1	64.2	46.4	
20-Oct	16.5	4.3	4.2	12.0	379	1	32	39.0	44.7	40.0	
	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	21.2	4.4	6.9	11.6	385.8	2.1	34	39.1	46.3	39.2	**TSI Average = 41.5**
Median	22.0	3.9	5.0	11.0	375.0	2	34	40.4	46.4	38.7	
Min	14.0	3.0	1.3	8.8	317.0	1	26	32.8	33.1	35.5	
Max	26.0	6.6	30.9	18.7	491.5	3	42	44.1	64.2	46.4	
Count	14	14	14	14	14	14	14	14	14	14	