Neilson (Holm)

Lake Overview

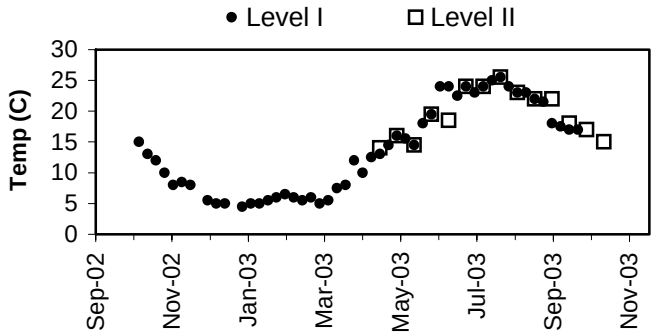
Volunteer monitoring began at Neilson (Holm) Lake in early 1997 and has continued through 2003. The data indicate this lake is moderate in primary productivity (mesotrophic) with good water quality. Since the lake surface makes up 10% of the drainage area, direct precipitation is less important than watershed inputs. The north and west shorelines of the lake are considered to be Class 2 wetland (King County, 1990). Land use analysis of 2002 aerial photographs showed nearly 53% of the surrounding watershed has been developed for uses other than agriculture.

Neilson (Holm) Lake has a public access boat launch, and pioneering infestations of Eurasian milfoil were observed in the summer of 2001 (King County, 2002). Residents should watch the nearshore environment for further infestations of milfoil, Brazilian elodea, and other noxious weeds.

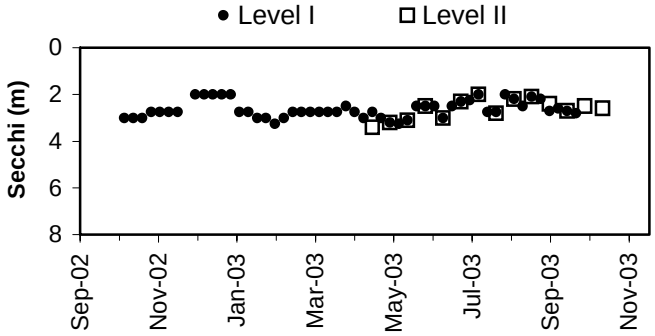
Physical Parameters

Secchi transparency was stable, ranging from 2.0 to 3.4m through the year. Annual water temperatures ranged from 4.5 to 25.5 degrees Celsius. Excellent record keeping showed that water levels followed a winter high - summer low pattern consistent with other small lakes in the region.

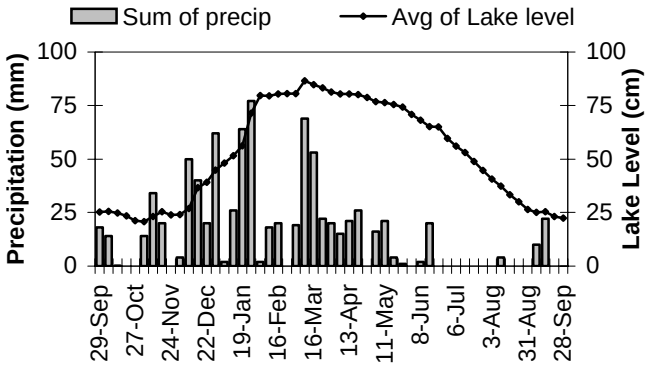
Lake Temperature



Secchi Depth

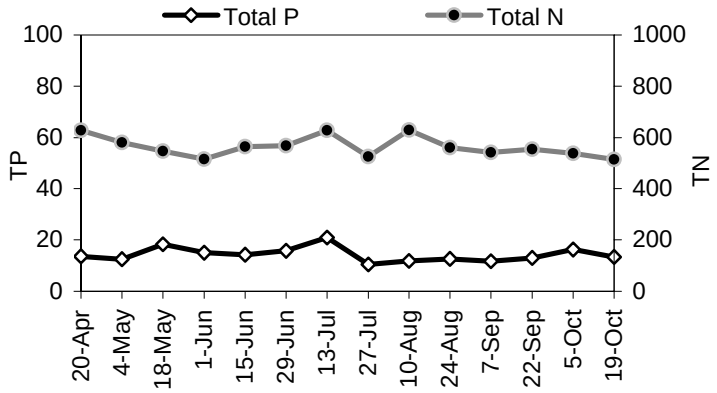


Lake Level and Precipitation

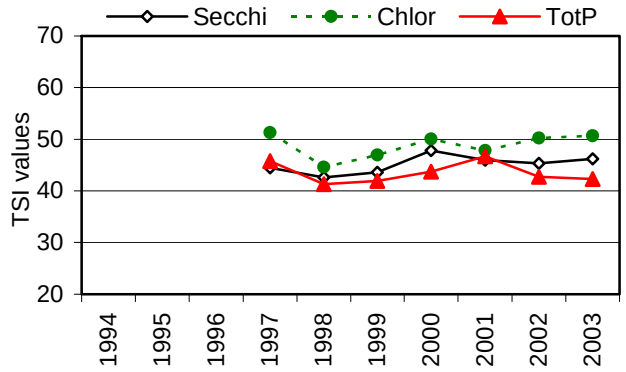


Neilson (Holm)

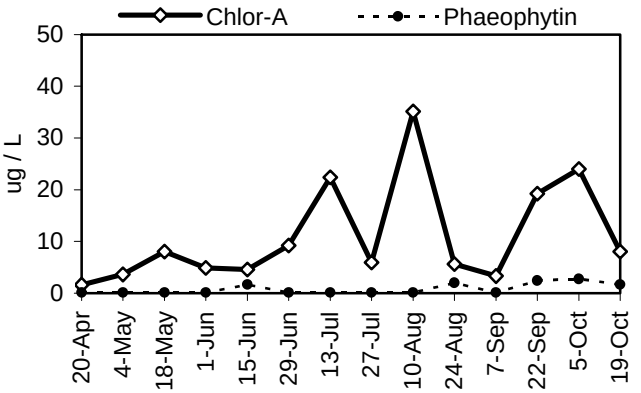
Nutrient Analysis



TSI Ratings



Chlorophyll a Concentrations (ug/L)



Common algae	Group
Dinobryon spp.	chrysophyte
Botryococcus braunii	chlorophyte
unidentified species	unidentified group

Nutrient Analysis and TSI Ratings

Total phosphorus and total nitrogen remained in fairly constant proportion to each other through the sampling period. The N:P ratio ranged from 30 to 53, discouraging growth of bluegreen algae. In 2003 the spread of the average TSI values was similar to that of 2000 and 2002 across the range for mesotrophy. Similar to past years, the average TSI-Chlor is higher than the other two indicators.

Chlorophyll and Algae

Chlorophyll concentrations remained low in spring, but reached several peaks during the summer and autumn. The algae in the plankton were dominated by several species of the chrysophyte *Dinobryon* throughout the sample period, with both the chlorophyte *Botryococcus braunii* and an unidentified chrysophyte species commonly occurring as well. Bluegreen algae were extremely scarce.

Neilson (Holm)

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	18.0	5	25.2	5
6-Oct-02	14.0	7	25.4	7
13-Oct-02	0.1	7	24.7	7
20-Oct-02	0.0	7	23.4	7
27-Oct-02	0.0	7	21.1	7
3-Nov-02	14.0	7	20.7	7
10-Nov-02	34.0	7	23.1	7
17-Nov-02	20.0	7	25.3	7
24-Nov-02	0.0	7	23.9	7
1-Dec-02	4.0	7	24.0	7
8-Dec-02	50.0	7	26.9	7
15-Dec-02	40.0	7	36.6	7
22-Dec-02	20.0	6	39.1	7
29-Dec-02	62.0	7	44.9	7
5-Jan-03	2.0	7	48.1	7
12-Jan-03	26.0	7	51.6	7
19-Jan-03	64.1	7	56.3	7
26-Jan-03	77.0	7	71.6	7
2-Feb-03	2.0	7	79.6	7
9-Feb-03	18.0	7	79.4	7
16-Feb-03	20.0	7	80.4	7
23-Feb-03	0.0	7	80.6	7
2-Mar-03	19.0	7	80.6	7
9-Mar-03	69.0	6	86.6	7
16-Mar-03	53.0	7	84.7	7
23-Mar-03	22.0	7	83.1	7
30-Mar-03	20.0	6	81.3	6
6-Apr-03	15.1	7	80.3	7
13-Apr-03	21.0	7	80.4	7
20-Apr-03	26.0	7	80.0	7
27-Apr-03	0.1	7	78.7	7
4-May-03	16.0	7	76.7	7
11-May-03	21.0	7	76.3	7
18-May-03	4.0	7	75.4	7
25-May-03	1.0	7	74.1	7
1-Jun-03	0.0	7	70.9	7
8-Jun-03	2.0	7	68.1	7
15-Jun-03	20.0	7	65.3	7
22-Jun-03	0.0	6	65.0	7
29-Jun-03	0.0	5	59.7	7
6-Jul-03	0.0	7	56.1	7
13-Jul-03	0.0	6	53.1	7
20-Jul-03	0.0	7	48.9	7
27-Jul-03	0.0	7	44.7	7
3-Aug-03	0.0	7	40.6	7
10-Aug-03	4.1	7	37.3	7
17-Aug-03	0.0	7	33.3	7
24-Aug-03	0.0	7	30.0	7
31-Aug-03	0.0	2	26.4	7
7-Sep-03	10.0	2	25.0	7
14-Sep-03	22.0	2	25.3	7
21-Sep-03			23.1	7
28-Sep-03			22.3	3
Min	0.0		20.7	
Max	77.0		86.6	
Total	830.3			

Weekly Data Summary

Sample date	Sample time	Secchi (m)	Temp (°C)	Algae* (Shore)	Algae* (at site)	Goose Count*
6-Oct-02	14:00	3.0	15.0	C2/P1	C2/P1	0
13-Oct-02	14:30	3.0	13.0	C2/P1	C2/P1	0
20-Oct-02	15:15	3.0	12.0	C1/P1	C1/P1	0
27-Oct-02	12:50	2.8	10.0	C2/P1	C1/P1	
3-Nov-02	12:30	2.8	8.0	C1/P1	C1/P1	0
10-Nov-02	13:50	2.8	8.5	C1/P1	C1/P1	0
17-Nov-02	13:30	2.8	8.0	C1/P1	C1/P1	0
1-Dec-02	13:00	2.0	5.5	C2/P1	C2 P2	0
8-Dec-02	14:00	2.0	5.0	C3/P1	C3/P1	0
15-Dec-02	13:00	2.0	5.0	C3/P1	C3/P1	
22-Dec-02	13:10	2.0		C2/P1	C2/P1	
29-Dec-02	15:30	2.0	4.5	C2/P1	C2/P1	45
5-Jan-03	15:30	2.8	5.0	P1	P1	40
12-Jan-03	14:15	2.8	5.0	P1	P1	0
19-Jan-03	14:45	3.0	5.5	NA	NA	0
26-Jan-03	16:00	3.0	6.0	NA	NA	12
2-Feb-03	14:15	3.3	6.5	P1	P1	
9-Feb-03	15:30	3.0	6.0			
16-Feb-03	13:50	2.8	5.5	P1	P1	4
23-Feb-03	14:15	2.8	6.0	P1	P1	12
2-Mar-03	16:30	2.8	5.0	P1	P1	0
9-Mar-03	16:15	2.8	5.5	P1	P1	4
16-Mar-03	15:00	2.8	7.5	P1	P1	0
23-Mar-03	14:20	2.8	8.0	P1	P1	12
30-Mar-03	14:15	2.5	12.0	C1/P1	C1/P1	10
6-Apr-03	14:00	2.8	10.0	P2	P2	
13-Apr-03	14:15	3.0	12.5	P2	P2	
20-Apr-03	14:30	2.8	13.0	P2	P2	
27-Apr-03	17:15	3.0	14.5	P2	P2	
4-May-03	15:15	3.2	16.0	P2	P2	30
11-May-03	14:00	3.3	15.5	P2	P2	5
18-May-03	12:38	3.1	14.5	P2	P2	25
25-May-03	16:00	2.5	18.0	P3	P3	4
1-Jun-03	12:30	2.5	19.5	P3	P3	4
8-Jun-03	15:45	2.5	24.0	P3	P3	14
15-Jun-03	12:20	3.0	24.0	P3	P3	14
22-Jun-03	15:00	2.5	22.5	P3	P3	18
29-Jun-03	14:00	2.3	24.0	P3	P3	18
6-Jul-03	14:30	2.3	23.0	P3	P3	
13-Jul-03	13:00	2.0	24.0	P3	P3	20
20-Jul-03	16:30	2.8	25.0	P3	P3	14
27-Jul-03	14:00	2.8	25.5	P3	P3	16
3-Aug-03	14:00	2.0	24.0	P3	P3	13
10-Aug-03	15:15	2.2	23.0	P3	P3	46
17-Aug-03	17:00	2.5	23.0	P3	P3	
24-Aug-03	16:00	2.1	22.0	P3	P3	21
31-Aug-03	16:15	2.2	21.5	P3	P3	38
7-Sep-03	15:30	2.7	18.0	P3	P3	
14-Sep-03	16:10	2.6	17.5	P3	P3	
21-Sep-03	14:30	2.7	17.0	P2	P2	
28-Sep-03	14:50	2.8	17.0	P2	P2	
	Min	2.0	4.5			0
	Max	3.3	25.5			46

Neilson (Holm) **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	14.0	3.4	1.6	13.7	628	2	46	42.3	35.2	41.9	
4-May	16.0	3.2	3.6	12.5	581	2	46	43.2	43.2	40.6	
18-May	14.5	3.1	8.0	18.3	547	2	30	43.7	51.0	46.1	
1-Jun	19.5	2.5	4.8	15.0	516	3	34	46.8	46.0	43.2	
15-Jun	18.5	3.0	4.5	14.3	565	2	40	44.1	45.3	42.5	Algae blooming at sunset.
29-Jun	24.0	2.3	9.2	15.8	568	3	36	48.0	52.4	44.0	
13-Jul	24.0	2.0	22.4	20.9	628	3	30	50.0	61.1	48.0	
27-Jul	25.5	2.8	5.9	10.5	526	3	50	45.1	47.9	38.1	Bloom occurs in late afternoons.
10-Aug	23.0	2.2	35.1	11.9	629	3	53	48.6	65.5	39.9	Algae bloom continues.
24-Aug	22.0	2.1	5.6	12.6	561	3	45	49.3	47.5	40.7	
7-Sep	22.0	2.4	3.3	11.8	542	3	46	47.4	42.3	39.8	
21-Sep	18.0	2.7	19.2	13.0	554	2	43	45.7	59.6	41.2	
5-Oct	17.0	2.5	24.0	16.3	538	3	33	46.8	61.7	44.4	
19-Oct	15.0	2.6	8.0	13.4	514	2	38	46.2	51.0	41.6	
	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	2.6	11.1	14.3	564.1	2.6	41	46.2	50.7	42.3	**TSI Average = 46.4**
Median	19.0	2.6	6.9	13.6	557.5	3	41	46.5	49.5	41.7	
Min	14.0	2.0	1.6	10.5	514.0	2	30	42.3	35.2	38.1	
Max	25.5	3.4	35.1	20.9	629.0	3	53	50.0	65.5	48.0	
Count	14	14	14	14	14	14	14	14	14	14	