McDonald

Lake Overview

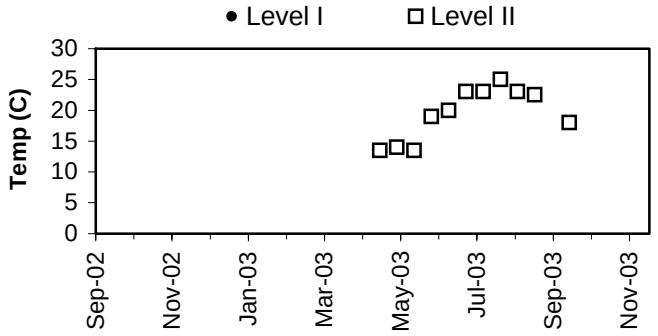
Volunteer monitoring began at Lake McDonald in 1996 and continued through 2003. The data indicate that this lake has decreased recently in primary productivity (eutrophic to mesotrophic); currently it has good water quality. Since the lake surface makes up 19% of the drainage area, direct precipitation is important, in addition to watershed inputs. Land use analysis of 2002 aerial photographs showed over 69% of the surrounding watershed has been developed for uses other than agriculture. Seagulls attracted to King County's Cedar Hills Landfill were reported on the lake in the past, which may have contributed nutrients to the water. Changes in landfill practices have resulted in a decrease in use of the lake by the gulls.

Lake McDonald has no public access boat launch, but residents should keep an eye on aquatic plants growing nearshore to catch early infestations of Eurasian milfoil or other noxious weeds.

Physical Parameters

Secchi transparency was not measured. Water temperatures reached a maximum of 25.0 degrees Celsius. Excellent precipitation and water level records were kept, corresponding with the regional pattern of winter high - autumn low stands.

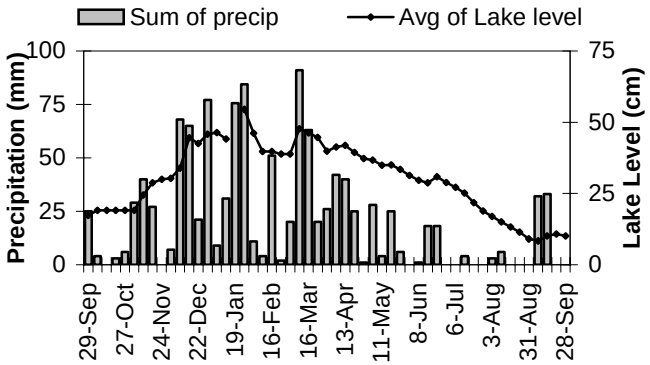
Lake Temperature



Secchi Depth

No Data Available

Lake Level and Precipitation



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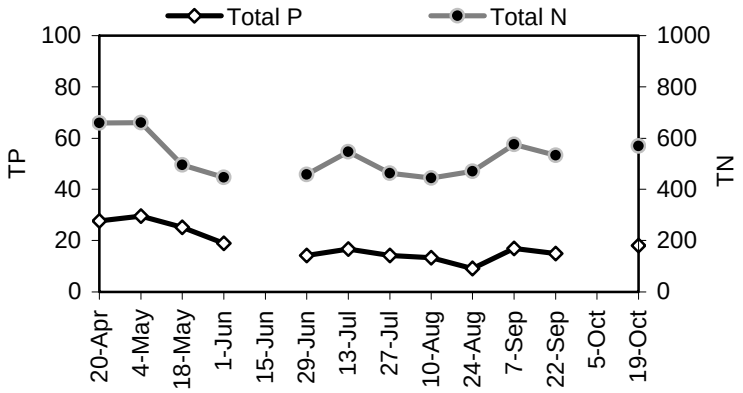
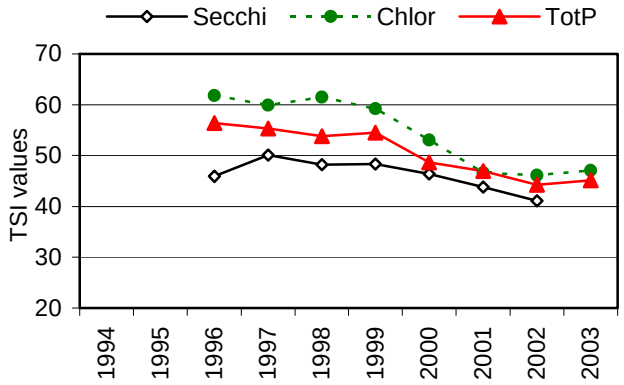
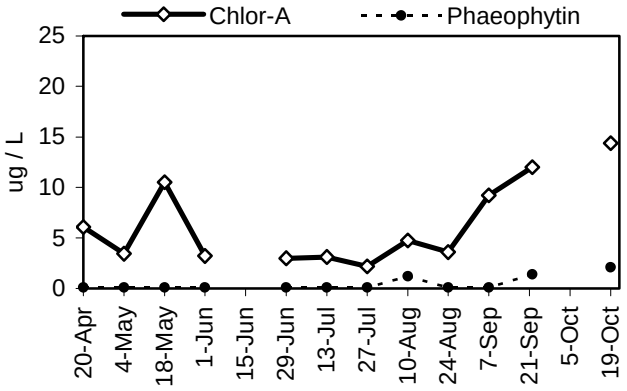
Nutrient Analysis



TSI Ratings



Chlorophyll a Concentrations (ug/L)



Common algae	Group
Anabaena spp.	bluegreen
Tabellaria fenestrata	diatom-chrysophyte
Aphanizomenon flos-aquae	bluegreen

Nutrient Analysis and TSI Ratings

Total phosphorus and total nitrogen tracked each other closely through the sampling period. The N:P ratio ranged from 20 to 52. The 2003 TSI values were in close agreement with each other, similar to values in 2001 and 2002. TSI-Secchi could not be calculated.

Chlorophyll and Algae

Chlorophyll concentrations peaked in mid-May and rose again in early September, with the highest concentrations occurring on the last date of the sampling season. The spring peak was dominated by colonial chlorophyte species and the chrysophyte *Dinobryon*, while the fall bloom was characterized by the bluegreens *Anabaena* and *Aphanizomenon*, as well as the diatom *Tabellaria*.

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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	25.0	5	17.2	5
6-Oct-02	4.0	7	19.0	7
13-Oct-02	0.0	7	19.0	7
20-Oct-02	3.0	7	19.0	7
27-Oct-02	6.0	7	19.0	7
3-Nov-02	29.0	7	19.0	7
10-Nov-02	40.0	7	24.4	7
17-Nov-02	27.0	7	28.7	7
24-Nov-02	0.0	7	30.0	7
1-Dec-02	7.0	7	30.3	7
8-Dec-02	68.0	7	33.9	7
15-Dec-02	65.0	7	44.6	7
22-Dec-02	21.0	7	42.6	7
29-Dec-02	77.0	7	45.9	7
5-Jan-03	9.0	7	46.4	7
12-Jan-03	31.0	5	44.2	5
19-Jan-03	75.5	**		
26-Jan-03	84.4	6	54.5	6
2-Feb-03	11.0	7	46.1	7
9-Feb-03	4.0	7	39.7	7
16-Feb-03	51.0	7	39.7	7
23-Feb-03	2.0	7	38.9	7
2-Mar-03	20.0	7	38.9	7
9-Mar-03	91.0	7	47.7	7
16-Mar-03	63.0	7	46.3	7
23-Mar-03	20.0	7	44.7	7
30-Mar-03	26.0	7	39.9	7
6-Apr-03	42.0	7	41.3	7
13-Apr-03	40.0	7	41.9	7
20-Apr-03	25.0	7	39.4	7
27-Apr-03	1.0	7	37.3	7
4-May-03	28.0	7	36.7	7
11-May-03	4.0	7	34.9	7
18-May-03	25.0	7	35.0	7
25-May-03	6.0	7	33.5	6
1-Jun-03	0.0	7	31.3	7
8-Jun-03	1.0	7	29.6	7
15-Jun-03	18.0	7	28.7	7
22-Jun-03	18.0	7	30.9	7
29-Jun-03	0.0	7	28.9	7
6-Jul-03	0.0	7	27.1	7
13-Jul-03	4.0	7	25.1	7
20-Jul-03	0.0	7	21.7	7
27-Jul-03	0.0	7	18.9	7
3-Aug-03	3.0	7	16.9	7
10-Aug-03	6.0	7	15.0	7
17-Aug-03	0.0	7	13.1	7
24-Aug-03		0	11.4	7
31-Aug-03	0.0	6	9.0	7
7-Sep-03	32.0	7	8.3	7
14-Sep-03	33.0	7	10.0	7
21-Sep-03	0.0	7	10.7	7
28-Sep-03	0.0	3	10.0	3
Min	0.0		8.3	
Max	91.0		54.5	
Total	1145.9			

Weekly Data Summary

Sample date	Sample time	Secchi (m)	Temp (°C)	Algae (Shore)	Algae (at site)	Goose Count
	Min	0.0	0.0			
	Max	0.0	0.0			

McDonald **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	13.5		6.1	27.7	660		24		48.2	52.1	
4-May	14.0		3.4	29.5	661		22		42.7	53.0	
18-May	13.5		10.5	25.1	496		20		53.6	50.6	
1-Jun	19.0		3.2	18.9	447		24		42.0	46.6	
15-Jun	20.0					1					Written observations, but no water sample.
29-Jun	23.0		3.0	14.1	458	3	32		41.3	42.3	
13-Jul	23.0		3.1	16.6	547	1	33		41.7	44.7	
27-Jul	25.0		2.2	14.1	463	1	33		38.3	42.3	
10-Aug	23.0		4.7	13.3	444		33		45.8	41.5	
24-Aug	22.5		3.6	9.1	471	1	52		43.1	36.0	
8-Sep	NR		9.2	16.9	576	1	34		52.4	44.9	
21-Sep	18.0		12.0	14.9	533	2	36		54.9	43.1	
7-Oct											No sample.
20-Oct	NR		14.4	18.0	570		32		56.7	45.8	
	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	-	6.3	18.2	527.2	1.4	31	-	46.7	45.2	**TSI Average** = 46.0**
Median	20.0	-	4.2	16.8	514.5	1	33	-	44.5	44.8	**Secchi not included in TSI calculations.
Min	13.5	-	2.2	9.1	444.0	1	20	-	38.3	36.0	
Max	25.0	-	14.4	29.5	661.0	3	52	-	56.7	53.0	
Count	11	0	12	12	12	7	12	0	12	12	