

Pipe

Lake Overview

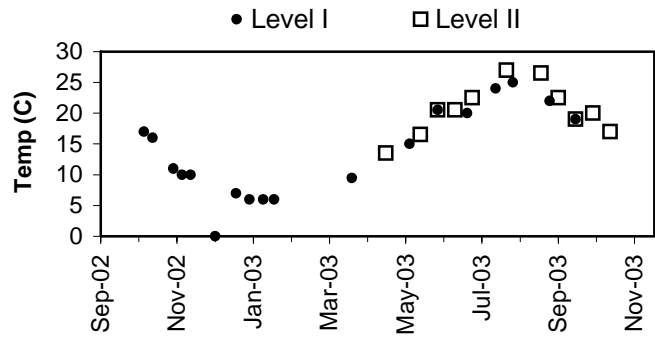
Volunteer monitoring began at Pipe Lake in the 1980s and has continued through 2003, with a gap from 1989–1992. The data indicate this city lake (Maple Valley–Covington) is low to moderate in primary productivity (oligotrophic - mesotrophic) with very good water quality. Since the lake surface makes up 17% of the drainage area, direct precipitation is important in addition to watershed inputs. Land use analysis of 2002 aerial photographs showed almost 66% of the surrounding watershed has been developed for uses other than agriculture.

Pipe Lake has no public access boat launch, but has a history of both milfoil and hydrilla infestations for which eradication efforts have been funded by government agencies since 1995. Residents should watch aquatic plants growing nearshore to catch growing patches of these and other noxious weeds.

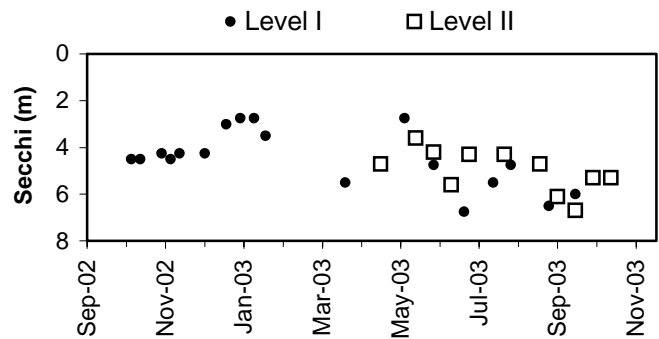
Physical Parameters

Secchi transparency through the year ranged from 2.8 to 6.8m. Water temperatures for the same period ranged from 6.0 to 27.0 degrees Celsius. Local precipitation was measured through the year, but was not accompanied by water level observations.

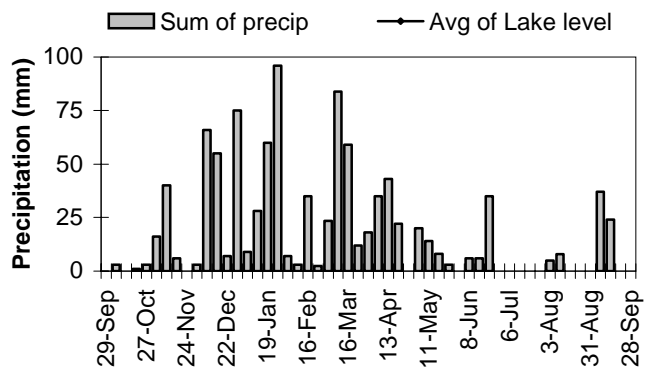
Lake Temperature



Secchi Depth

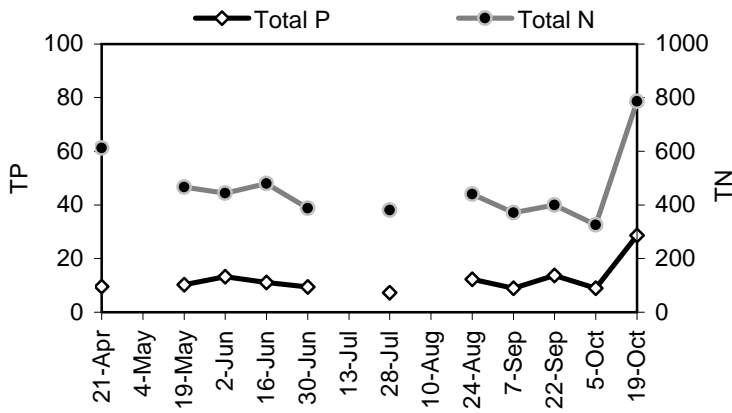


Lake Level and Precipitation

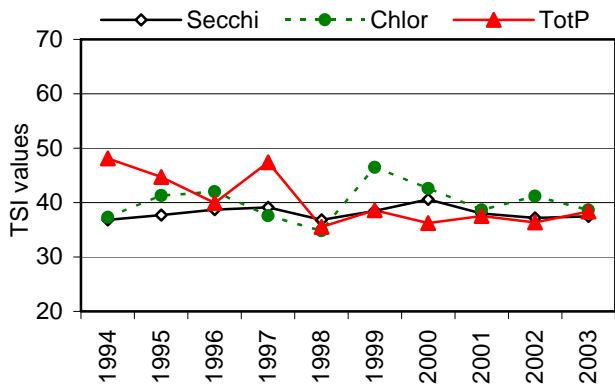


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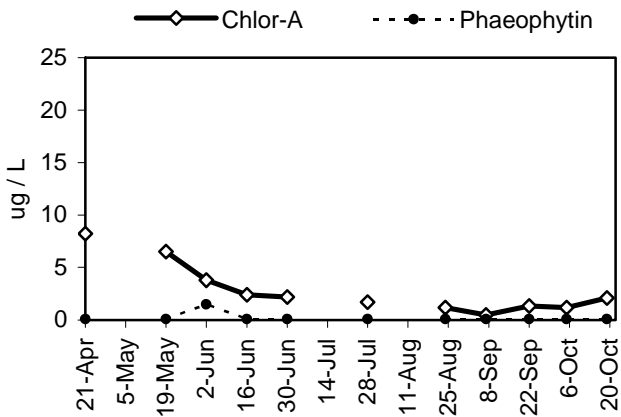
Nutrient Analysis



TSI Ratings



Chlorophyll a Concentrations (ug/L)



Nutrient Analysis and TSI Ratings

Total phosphorus and total nitrogen remained in fairly constant proportion to each other through the sampling period, with both showing a sharp increase on the last sample date. The N:P ratio ranged from 28 to 64. The 2003 TSI values were very close to each other at the high end of the oligotrophic range, similar to 2001. In some other years, the indicators have not been in close agreement with each other, but with no distinct pattern to the divergence.

Chlorophyll and Algae

Chlorophyll was high at the beginning of the sample season, declining to low values through the rest of the period. The most common species included the large colonial chlorophyte *Botryococcus braunii* and an unidentified chrysophyte species, along with the diatom *Fragilaria*. The bluegreens *Anacystis*, *Aphanizomenon*, and *Snowella* were also frequently encountered in the samples, but did not make large populations.

Common algae	Group
unidentified species	chrysophyte
<i>Botryococcus braunii</i>	chlorophyte
<i>Fragilaria crotonensis</i>	diatom-chrysophyte

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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				
6-Oct-02	3.0	7		
13-Oct-02	0.0	7		
20-Oct-02	1.0	7		
27-Oct-02	3.0	7		
3-Nov-02	16.0	7		
10-Nov-02	40.0	7		
17-Nov-02	6.0	7		
24-Nov-02	0.0	7		
1-Dec-02	3.0	7		
8-Dec-02	66.0	5		
15-Dec-02	55.0	7		
22-Dec-02	7.0	5		
29-Dec-02	75.0	7		
5-Jan-03	9.0	7		
12-Jan-03	28.0	7		
19-Jan-03	60.0	7		
26-Jan-03	96.0	7		
2-Feb-03	7.0	7		
9-Feb-03	3.0	7		
16-Feb-03	35.0	4		
23-Feb-03	2.4	**		
2-Mar-03	23.4	**		
9-Mar-03	83.8	6		
16-Mar-03	59.0	7		
23-Mar-03	12.0	7		
30-Mar-03	18.0	7		
6-Apr-03	35.0	7		
13-Apr-03	43.0	7		
20-Apr-03	22.0	7		
27-Apr-03	0.0	4		
4-May-03	20.0	6		
11-May-03	14.0	7		
18-May-03	8.1	7		
25-May-03	3.0	7		
1-Jun-03	0.0	7		
8-Jun-03	6.0	7		
15-Jun-03	6.0	7		
22-Jun-03	35.0	5		
29-Jun-03	0.0	0		
6-Jul-03	0.0	6		
13-Jul-03	0.1	7		
20-Jul-03	0.0	7		
27-Jul-03	0.0	7		
3-Aug-03	5.0	7		
10-Aug-03	8.0	7		
17-Aug-03	0.1	7		
24-Aug-03	0.0	7		
31-Aug-03	0.0	7		
7-Sep-03	37.0	6		
14-Sep-03	24.0	7		
21-Sep-03	0.0	7		
28-Sep-03	0.0	3		
Min	0.0		0.0	
Max	96.0		0.0	
Total	977.7			

Weekly Data Summary

Sample date	Sample time	Secchi (m)	Temp (°C)	Algae* (Shore)	Algae* (at site)	Goose Count*
6-Oct-02	13:00	4.5	17.0	C1	C1	0
13-Oct-02	14:00	4.5	16.0	C1	C1	0
30-Oct-02	13:00	4.3	11.0	C1	C1	0
6-Nov-02	13:00	4.5	10.0	C1	C1	0
13-Nov-02	14:00	4.3	10.0	C1	C1	0
3-Dec-02	14:00	4.3		C1	C1	50
20-Dec-02	13:00	3.0	7.0	C1	C1	10
31-Dec-02	11:00	2.8	6.0	C1	C1	0
11-Jan-03	11:00	2.8	6.0	C1	C1	0
20-Jan-03	13:00	3.5	6.0	C1	C1	0
24-Mar-03	13:00	5.5	9.5	C1	C1	0
10-May-03	11:00	2.8	15.0	C2	C2	0
2-Jun-03	16:00	4.8	20.5	C1	C1	0
26-Jun-03	8:00	6.8	20.0	C1	C1	0
19-Jul-03	9:00	5.5	24.0	C1	C1	40
2-Aug-03	9:00	4.8	25.0	C1	C1	3
1-Sep-03	9:00	6.5	22.0	C1	C1	0
22-Sep-03	13:00	6.0	19.0	C1	C1	35
Min		2.8	6.0			0
Max		6.8	25.0			50

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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	
21-Apr	13.5	4.7	8.2	9.5	613	3	65	37.7	51.2	36.6	Something is blooming.
5-May											No sample.
19-May	16.5	3.6	6.5	10.2	466		46	41.5	49.0	37.7	
2-Jun	20.5	4.2	3.8	13.2	444	1	34	39.3	43.7	41.4	
16-Jun	20.5	5.6	2.4	11.0	480	1	44	35.1	39.2	38.7	
30-Jun	22.5	4.3	2.2	9.3	388	1	42	39.0	38.3	36.3	
13-Jul											No sample.
28-Jul	27.0	4.3	1.7	7.2	380	0	53	39.0	35.8	32.6	
11-Aug											No sample.
25-Aug	26.5	4.7	1.2	12.2	440	2	36	37.7	32.4	40.2	Chlor-a might be high; Spirogyra included in
8-Sep	22.5	6.1	0.6	8.8	371	0	42	33.9		35.5	Chlor-a value was <MDL. Reported as .6µgl.
22-Sep	19.0	6.7	1.4	13.6	399	2	29	32.6	33.6	41.8	
6-Oct	20.0	5.3	1.2	8.9	325	0	37	35.9	32.4	35.7	
20-Oct	17.0	5.3	2.1	28.6	786	0	28	35.9	37.8	52.5	
	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	20.5	5.0	2.8	12.0	462.9	1.0	41	37.0	39.3	39.0	TSI Average = 38.0
Median	20.5	4.7	2.1	10.2	440.0	1	42	37.7	38.1	37.7	
Min	13.5	3.6	0.6	7.2	325.0	0	28	32.6	32.4	32.6	
Max	27.0	6.7	8.2	28.6	786.0	3	65	41.5	51.2	52.5	
Count	11	11	11	11	11	10	11	11	10	11	