

Echo (Shoreline)

Lake Overview

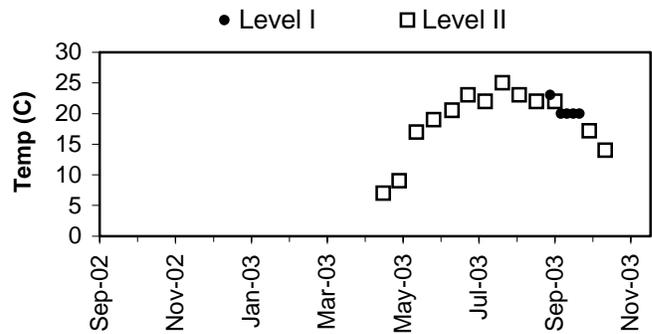
Volunteer monitoring began at Echo Lake (Shoreline) in 2001 and was continued in 2003. The data indicate that this lake in the city of Shoreline is high in primary productivity (eutrophic) with fair water quality. Since the lake surface makes up only 4% of the drainage area, direct precipitation is not as important as inlet streams, stormwater runoff and ground-water inputs. There are no significant wetlands in the basin other than the lake shore itself. Land use analysis of 2002 aerial photographs showed almost 99% of the surrounding watershed has been developed for uses other than agriculture. Enhancement of productivity through human impacts is very likely occurring.

Echo Lake has no public access boat ramp, but car top boats may be launched from the city park. Residents should keep a watch on aquatic plants growing nearshore to catch early infestations of Eurasian milfoil, Brazilian elodea or other noxious aquatic weeds.

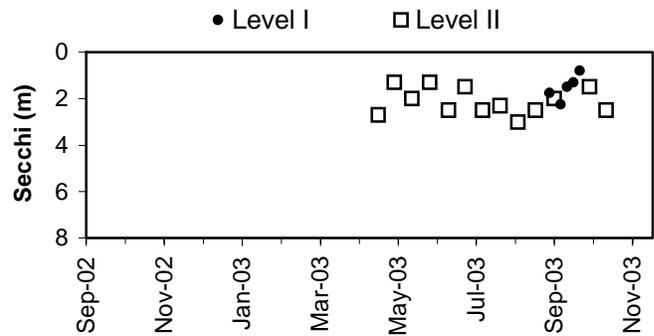
Physical Parameters

The Secchi transparency during the sampling season ranged between 0.8 and 3.0m. Level II surface water temperatures reached 25.0 degrees Celsius in August. Precipitation and water level records were limited to the end of the water year.

Lake Temperature

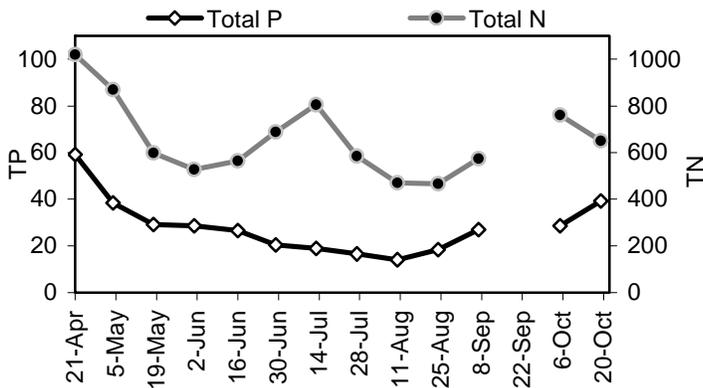


Secchi Depth

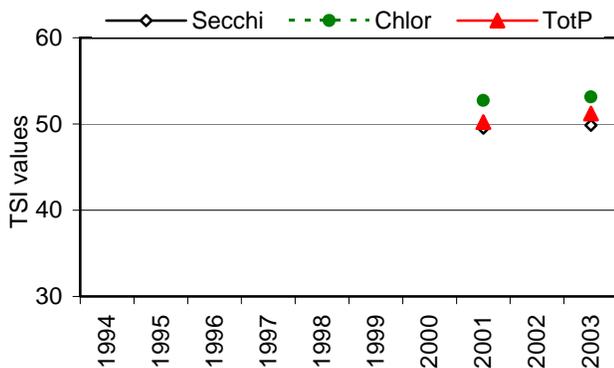


Echo (Shoreline)

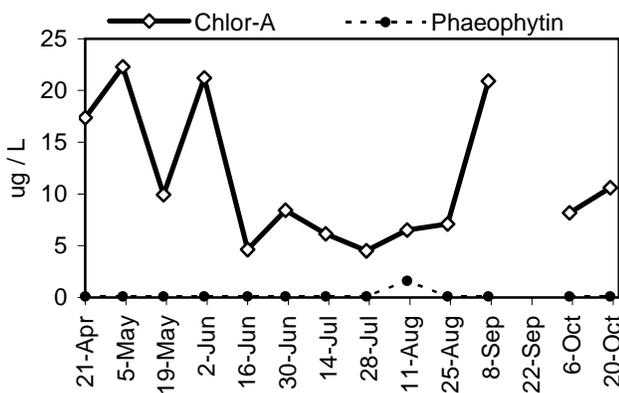
Nutrient Analysis



TSI Ratings



Chlorophyll a Concentrations (ug/L)



Common algae	Group
<i>Aphanizomenon flos-aquae</i>	bluegreen
<i>Staurastrum</i> sp.	chlorophyte
unidentified colonial species	bluegreen

Nutrient Analysis and TSI Ratings

Total nitrogen was at a maximum at the beginning of the period, reached another peak in mid-July and rose again in autumn. Phosphorus remained relatively stable through the sampling period, with higher values in spring and fall. The N:P ratio ranged from 17 to 43. The 2003 TSI-Chlor was slightly higher than the other TSI values, as it was in 2001, but all three values were in the lower range for eutrophy.

Chlorophyll and Algae

Chlorophyll content was high in spring and fall, with mid-season values generally at moderately low levels. The phytoplankton community was dominated in spring and fall by the bluegreen *Aphanizomenon*. Other common algae included a variety of chlorophytes, such as *Staurastrum*, and the dinoflagellate *Ceratium*.

Echo (Shoreline)

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	7.0	2.7	17.4	59.1	1020	3	17	45.7	58.6	63.0	Lots of green suspended particles.
4-May	9.0	1.3	22.3	38.4	869	3	23	56.2	61.0	56.8	
18-May	17.0	2.0	9.9	29.1	598	1	21	50.0	53.1	52.8	
1-Jun	19.0	1.3	21.2	28.6	528	3	18	56.2	60.5	52.5	
16-Jun	20.5	2.5	4.6	26.5	564	3	21	46.8	45.6	51.4	
29-Jun	23.0	1.5	8.4	20.4	689	1	34	54.1	51.5	47.7	
13-Jul	22.0	2.5	6.1	18.9	805	1	43	46.8	48.4	46.6	Water is completely clear.
27-Jul	25.0	2.3	4.5	16.5	585		35	48.0	45.3	44.6	
10-Aug	23.0	3.0	6.5	14.1	470	2	33	44.1	48.9	42.3	
24-Aug	22.0	2.5	7.1	18.3	466	2	25	46.8	49.8	46.1	
8-Sep	22.0	2.0	20.9	26.9	574	2	21	50.0	60.4	51.6	No sample.
22-Sep											
6-Oct	17.2	1.5	8.2	28.6	761	3	27	54.1	51.2	52.5	
19-Oct	14.0	2.5	10.6	39.2	651	2	17	46.8	53.7	57.1	
	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	18.5	2.1	11.4	28.0	660.0	2.2	26	49.7	52.9	51.2	TSI Average = 51.2
Median	20.5	2.3	8.4	26.9	598.0	2	23	48.0	51.5	51.6	
Min	7.0	1.3	4.5	14.1	466.0	1	17	44.1	45.3	42.3	
Max	25.0	3.0	22.3	59.1	1020.0	3	43	56.2	61.0	63.0	
Count	13	13	13	13	13	12	13	13	13	13	