

Pine

Lake Overview

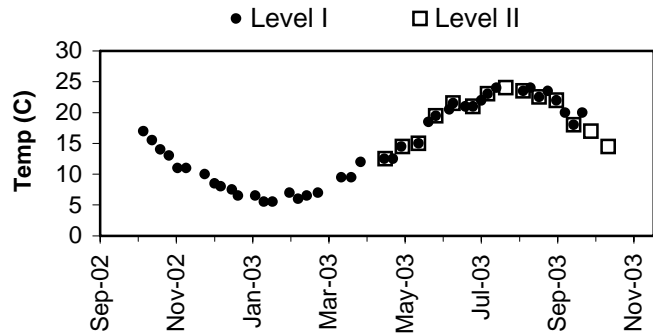
Volunteer monitoring began at Pine Lake in the 1980s and has continued through 2003, with a gap from 1990 to 1992 and in 1994. The data indicate this city lake (Sammamish) is currently low in primary productivity (oligotrophic) with very good water quality. Diversion of wetland flow from the western catchment was completed in 1988 to decrease phosphorus input, reducing the functional watershed from 640 acres to 487. Since the lake surface makes up 18% of the current drainage area, direct precipitation is very important in addition to watershed inputs. Land use analysis of 2002 aerial photographs showed slightly less than 80% of the surrounding watershed has been developed for uses other than agriculture.

Pine Lake has a public access boat launch, and residents should watch the nearshore environment for early infestations of Eurasian milfoil, Brazilian elodea, and other noxious weeds.

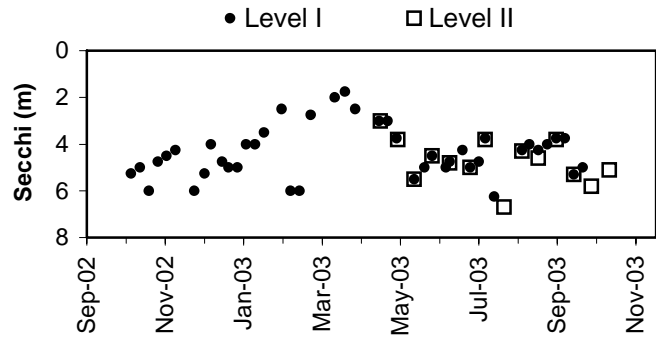
Physical Parameters

Secchi transparency ranged from 1.8 to 6.7m through the year, with a distinct minimum in March. Annual water temperatures ranged from 5.5 to 24.0 degrees Celsius. Excellent records of precipitation and water level were kept over the year. The lake level followed the winter high - summer low pattern, consistent with other small lakes in the region.

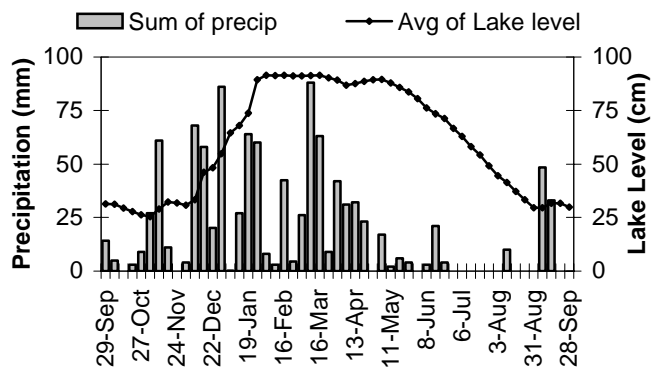
Lake Temperature



Secchi Depth

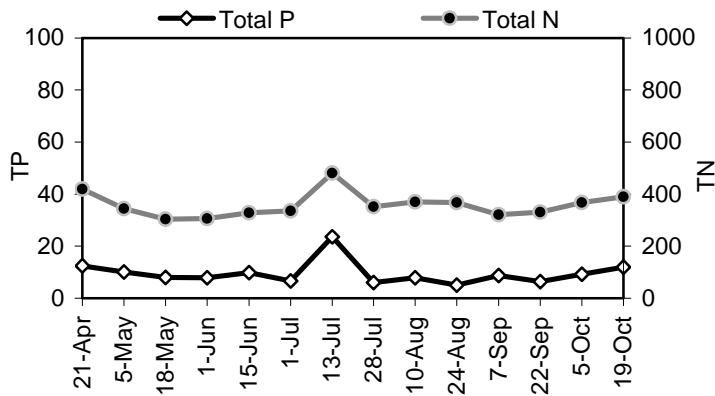


Lake Level and Precipitation

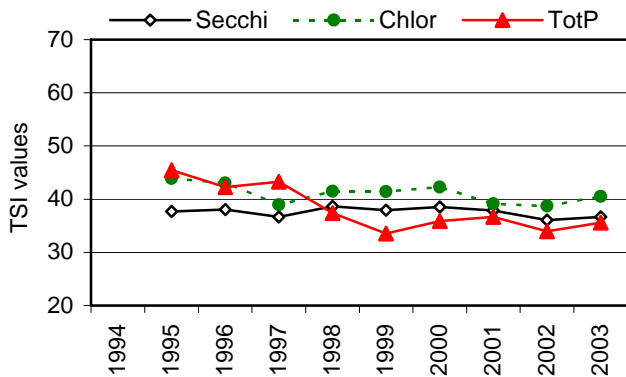


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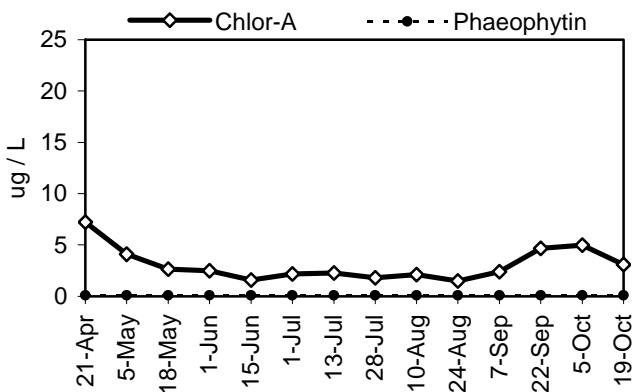
Nutrient Analysis



TSI Ratings



Chlorophyll a Concentrations (ug/L)



Nutrient Analysis and TSI Ratings

Total phosphorus and total nitrogen remained in stable proportions to each other through the sampling period, with little change in values except for one date in mid-July. The N:P ratio ranged from 20 to 74. The 2003 TSI values were close to each other at the high end of the oligotrophic range, similar to recent years in which TSI-chlor has been slightly higher than the other two indicators.

Chlorophyll and Algae

Chlorophyll remained at low values throughout the sample season, but was slightly higher in April and again in early autumn. The spring algae were dominated by diatoms such as *Asterionella* and *Tabellaria*, while the autumn increase was due to the bluegreens *Aphanizomenon* and *Anabaena*, accompanied by the dinoflagellate *Ceratium*.

Common algae

Group

<i>Asterionella formosa</i>	diatom-chrysophyte
<i>Tabellaria fenestrata</i>	diatom-chrysophyte
<i>Aphanizomenon flos-aquae</i>	bluegreen

Pine

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	12.5	3.0	7.2	12.5	419	1	34	44.1	49.9	40.6	
5-May	14.5	3.8	4.1	10.1	344		34	40.7	44.4	37.5	Too much wind and debris to determine algae.
18-May	15.0	5.5	2.7	8.0	303	1	38	35.4	40.2	34.1	
1-Jun	19.5	4.5	2.5	7.9	306		39	38.3	39.6	34.0	Cottonwood confuses algae count.
15-Jun	21.5	4.8	1.6	9.9	328	1	33	37.4	35.2	37.2	
1-Jul	21.0	5.0	2.2	6.6	336	1	51	36.8	38.3	31.4	
13-Jul	23.0	3.8	2.3	23.6	481	1	20	40.7	38.6	49.8	
28-Jul	24.0	22.0	1.8	6.0	351		59	15.4	36.3	30.0	
11-Aug	23.5	4.3	2.1	7.9	371	1	47	39.0	38.0	33.9	
24-Aug	22.5	4.6	1.5	5.0	368	1	74	38.0	34.5	27.4	
7-Sep	22.0	3.8	2.4	8.7	320	1	37	40.7	39.2	35.4	
21-Sep	18.0	5.3	4.7	6.4	330	1	52	35.9	45.6	30.9	
5-Oct	17.0	5.8	5.0	9.3	368	1	40	34.6	46.3	36.3	
19-Oct	14.5	5.1	3.1	11.9	390	1	33	36.5	41.7	39.9	
	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	19.2	5.8	3.1	9.6	358.2	1.0	42	36.7	40.6	35.6	TSI Average = 37.6
Median	20.3	4.7	2.5	8.4	347.5	1	38	37.7	39.4	34.8	
Min	12.5	3.0	1.5	5.0	303.0	1	20	15.4	34.5	27.4	
Max	24.0	22.0	7.2	23.6	481.0	1	74	44.1	49.9	49.8	
Count	14	14	14	14	14	11	14	14	14	14	