

# Margaret

## Margaret Overview

Volunteer monitoring began at Lake Margaret in 2000 and continued through 2004. The data indicate that this lake is relatively low in primary productivity (oligotrophic) with very good water quality. Lake Margaret is a source of domestic water for homes nearby, making water quality a paramount concern.

Lake Margaret has a public access boat launch, and residents should keep a watch on aquatic plants growing nearshore to catch early infestations of Eurasian milfoil, Brazilian elodea, or other noxious weeds.

## Physical Parameters

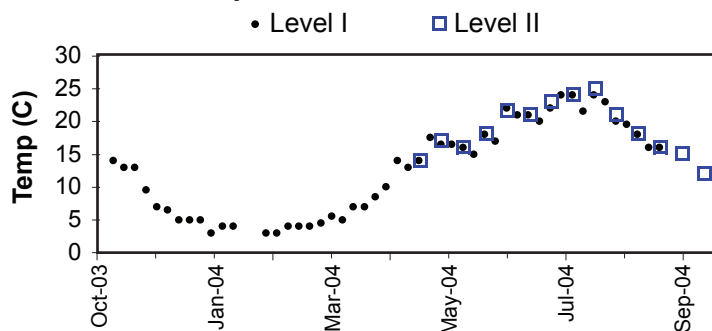
Secchi transparency ranged from 3.1 to 5.9 m through the year. The summer average of 4.8 m placed it in the upper range for small lakes monitored in 2004. Annual water temperatures ranged from 3.0 to 25.0 degrees Celsius. The maximum was in the mid range for summer high temperatures recorded among the group.

Excellent records were kept of precipitation and the fluctuations of water level, which illustrated that management at the outlet by the water district was aimed at minimizing storm impacts and maximizing water availability.

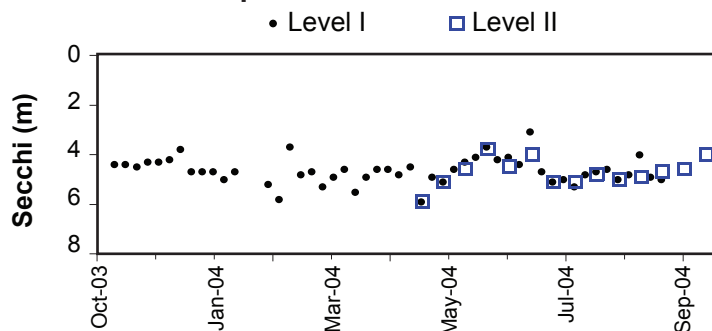
## Nutrient Analysis and TSI Ratings

Total nitrogen decreased slightly from an initial high to steady in summer, followed by a steady increase again in fall. Total phosphorus remained steady throughout the period. The N:P ratio ranged from 17 to 48, averaging 33 which suggested generally poor conditions for nuisance bluegreen growth.

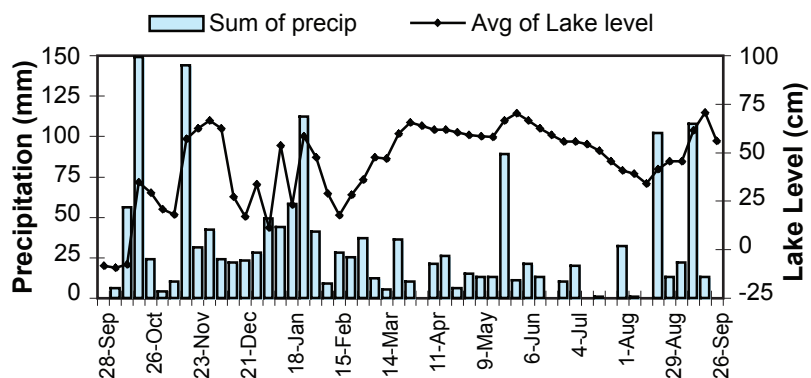
### Lake Temperature



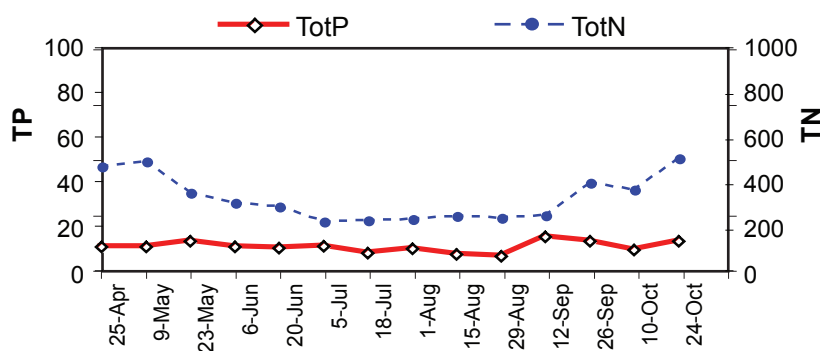
### Secchi Depth



### Lake Level and Precipitation



### Nutrient Analysis



Profile data indicate that thermal stratification was present early in the season and persisted through the summer. However, phosphorus in the deep water showed no sign of accumulation over time. Chlorophyll data indicated that algae were equally distributed through the shallow depths of the water column in May, but that abundant algae were present in the mid water column by late summer.

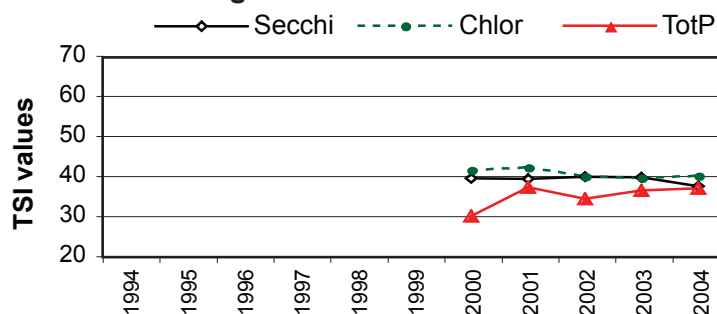
The 2004 TSI values were in fairly close agreement with each other in the upper range of oligotrophy, similar to 2003.

### Phytoplankton and Chlorophyll Concentrations

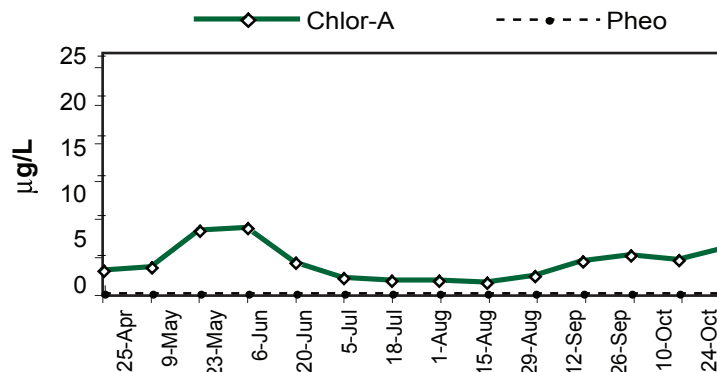
Chlorophyll made a peak in late May, declined to low levels through summer, and increased in the fall. The phytoplankton during the spring characterized by the diatom *Cyclotella* and an unidentified chrysophyte species. The summer low period was dominated by the colonial bluegreen *Anacystis*, while the fall increase was dominated by the chrysophyte *Dinobryon*.

Date	Secchi	depth-m	degC	Chlor-A	TP µg/L	TN µg/L
5/23/04	4.6	1	16.0	6.57	12.8	347
		6	8.0	5.61	13.0	434
		11.5	6.5		11.7	498
8/29/04	5.0	1	21.0	1.80	5.9	234
		6	12.0	13.00	13.8	349
		11.5	9.0		11.0	852

### TSI Ratings



### Chlorophyll a Concentrations (µg/L)



### Common Algae

	Group
<i>Cyclotella comta</i>	Bacillariophyta
<i>Anacystis sp.</i>	Cyanobacteria
<i>Dinobryon cf sertularia</i>	Chrysophyta

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## 2004 Level I Data

### Daily Data Summary

Week of	Sum of precip. (mm)	# of days	Avg of lake level (cm)	# of days
28-Sep-03	0.0	4	-8.5	4
5-Oct-03	6.1	7	-9.4	7
12-Oct-03	56.0	7	-7.7	7
19-Oct-03	183.1	7	34.7	7
26-Oct-03	24.1	7	29.3	7
2-Nov-03	4.0	7	20.6	7
9-Nov-03	10.0	5	18.1	7
16-Nov-03	144.0	8	56.9	7
23-Nov-03	31.2	7	62.3	7
30-Nov-03	42.1	7	66.4	7
7-Dec-03	24.1	6	62.3	7
14-Dec-03	22.1	7	29.9	7
21-Dec-03	23.1	7	12.7	7
28-Dec-03	28.0	7	34.0	7
4-Jan-04	49.1	7	11.1	7
11-Jan-04	44.1	7	53.6	7
18-Jan-04	58.1	7	23.0	7
25-Jan-04	112.1	7	58.4	7
1-Feb-04	41.1	7	47.4	7
8-Feb-04	9.0	7	29.0	7
15-Feb-04	28.1	7	17.7	7
22-Feb-04	25.1	7	28.1	7
29-Feb-04	37.1	7	36.0	7
7-Mar-04	12.1	7	47.6	7
14-Mar-04	5.2	7	46.7	7
21-Mar-04	36.1	7	59.6	7
28-Mar-04	10.1	7	65.3	7
4-Apr-04	0.0	7	63.7	7
11-Apr-04	21.0	7	61.7	7
18-Apr-04	26.0	7	61.6	7
25-Apr-04	6.0	7	60.3	7
2-May-04	15.1	7	59.1	7
9-May-04	13.1	7	58.3	7
16-May-04	13.1	7	58.0	7
23-May-04	89.0	7	65.0	7
30-May-04	11.1	7	71.1	7
6-Jun-04	21.1	7	66.6	7
13-Jun-04	13.0	7	62.3	7
20-Jun-04	0.1	7	58.9	7
27-Jun-04	10.0	7	55.7	7
4-Jul-04	20.0	7	55.6	7
11-Jul-04	0.1	7	54.4	7
18-Jul-04	1.0	7	50.9	7
25-Jul-04	0.0	7	45.6	7
1-Aug-04	32.0	7	40.6	7
8-Aug-04	1.0	7	39.0	7
15-Aug-04	0.0	7	34.0	7
22-Aug-04	102.1	7	41.3	7
29-Aug-04	13.1	7	45.4	7
5-Sep-04	22.1	7	45.4	7
12-Sep-04	107.6	7	61.3	7
19-Sep-04	13.0	7	70.6	7
26-Sep-04	0.0	5	55.9	5
<b>Min</b>	0.0		-9.4	
<b>Max</b>	183.1		71.1	
<b>Total</b>	1614.6			

### Weekly Data Summary

Sample date	Sample time	Secchi (m)	Temp (°C)	Algae* (Shore)	Algae* (at site)	Goose Count*
11-Oct-03	14:00	4.4	14.0	P1	P1	0
18-Oct-03	15:00	4.4	13.0	P1	P1	0
25-Oct-03	11:00	4.5	13.0	P1	P1	0
1-Nov-03	16:00	4.3	9.5	P1	P1	0
8-Nov-03	11:00	4.3	7.0	P2	P1	0
15-Nov-03	13:30	4.2	6.5	P2	P2	0
22-Nov-03	14:00	3.8	5.0	P1	P1	0
29-Nov-03	14:30	4.7	5.0	P1	P1	0
6-Dec-03	15:30	4.7	5.0	P1	P1	0
13-Dec-03	14:30	4.7	3.0	P1	P1	0
20-Dec-03	15:00	5.0	4.0	P1	P1	0
27-Dec-03	15:50	4.7	4.0	P1	P1	0
5-Jan-04						0
10-Jan-04						
17-Jan-04	16:00	5.2	3.0	NA	NA	0
24-Jan-04	14:00	5.8	3.0	NA	NA	0
31-Jan-04	14:30	3.7	4.0	NA	NA	0
7-Feb-04	15:00	4.8	4.0	NA	NA	0
14-Feb-04	15:30	4.7	4.0	NA	NA	0
21-Feb-04	14:30	5.3	4.5	NA	NA	0
28-Feb-04	15:00	4.9	5.5	P1	P1	0
6-Mar-04	8:30	4.6	5.0	P1	P1	0
13-Mar-04	10:30	5.5	7.0	P1	P1	0
20-Mar-04	8:30	4.9	7.0	P1	P1	3
27-Mar-04	14:00	4.6	8.5	P1	P1	0
3-Apr-04	11:30	4.6	10.0	P1	P1	0
10-Apr-04	15:00	4.8	14.0	P1	P1	0
17-Apr-04	15:00	4.5	13.0	P1	P1	0
24-Apr-04	12:00	5.9	14.0	P1	P1	0
1-May-04	18:00	4.9	17.5	P2	P2	0
8-May-04	14:30	5.1	16.5	P1	P1	0
15-May-04	14:30	4.6	16.5	P1	P1	0
22-May-04	15:00	4.3	16.0	P1	P1	13
29-May-04	15:30	4.1	15.0	P1	P1	2
5-Jun-04	12:00	3.7	18.0	P1	P1	0
12-Jun-04	13:30	4.2	17.0	P1	P1	11
19-Jun-04	15:00	4.1	22.0	P1	P1	11
26-Jun-04	13:00	4.4	21.0	P1	P1	0
3-Jul-04	16:00	3.1	21.0	P3	P3	0
10-Jul-04	12:00	4.7	20.0	P1	P1	12
17-Jul-04	9:30	5.1	22.0	P1	P1	0
24-Jul-04	12:30	5.0	24.0	P1	P1	11
31-Jul-04	15:00	5.3	24.0	NA	NA	0
7-Aug-04	13:30	4.8	21.5	P1	P1	0
14-Aug-04	16:00	4.7	24.0	P1	P1	0
21-Aug-04	15:30	4.6	23.0	P1	P1	0
28-Aug-04	10:30	5.0	20.0	P1	P1	0
4-Sep-04	10:00	4.8	19.5	P1	P1	0
11-Sep-04	14:30	4.0	18.0	P2	P1	0
18-Sep-04	16:30	4.9	16.0	P1	P1	0
25-Sep-04	11:00	5.0	16.0	P1	P1	0
<b>Min</b>		3.1	3.0			
<b>Max</b>		5.9	24.0			

\* See introduction for discussion of algae assessment and goose count methods.

## 2004 Level II Data

Date (2004)	Temp (°C)	Secchi (m)	Chl-a (µg/l)	TP (µg/l)	TN (µg/l)	Algae Obsv.	N:P	Calculated TSI		
								Secc	chl-a	TP
25-Apr	14.0	5.9	2.40	10.3	465	1	45	34.4	39.2	37.8
9-May	17.0	5.1	2.72	10.1	490	1	49	36.5	40.4	37.5
23-May	16.0	4.6	6.57	12.8	347	1	27	38.0	49.0	40.9
6-Jun	18.0	3.8	6.89	10.2	301	1	30	40.7	49.5	37.7
20-Jun	21.5	4.5	3.20	9.5	286	1	30	38.3	42.0	36.6
5-Jul	21.0	4.0	1.60	10.5	217	1	21	40.0	35.2	38.1
18-Jul	23.0	5.1	1.30	7.3	224	1	31	36.5	33.1	32.8
1-Aug	24.0	5.1	1.30	9.3	230	1	25	36.5	33.1	36.3
15-Aug	25.0	4.8	1.10	6.8	242	1	36	37.4	31.5	31.8
29-Aug	21.0	5.0	1.80	5.9	234	1	40	36.8	36.3	29.8
12-Sep	18.0	4.9	3.36	14.6	247	1	17	37.1	42.5	42.8
26-Sep	16.0	4.7	4.01	12.6	393	1	31	37.7	44.2	40.7
10-Oct	15.0	4.6	3.52	8.8	362	1	41	38.0	42.9	35.5
24-Oct	12.0	4.0	4.73	12.85	502	1	39	40.0	45.8	41.0
	Temp (°C)	Secchi (m)	Chl-a (µg/l)	TP (µg/l)	TN (µg/l)	Algae	N:P	Calculated TSI		
								Secc	chl-a	TP
Mean	18.7	4.7	3.2	10.1	324.3	1.0	33	37.7	40.3	37.1
Median	18.0	4.8	3.0	10.2	293.5	1	31	37.5	41.2	37.6
Min	12.0	3.8	1.1	5.9	217.0	1	17	34.4	31.5	29.8
Max	25.0	5.9	6.9	14.6	501.5	1	49	40.7	49.5	42.8
Count	14	14	14	14	14	14	14	14	14	14

TSI Average = 38.4