

Martha Lake

Martha Lake (Martha S.) has moderate to high water clarity, low phosphorus levels, and moderate algae and aquatic plants. The lake shows signs of increasing eutrophication, such as higher phosphorus in the bottom waters and blue-green algal blooms. The lake may be at risk of future declines in water quality unless nutrients from the lake shore and watershed are controlled.

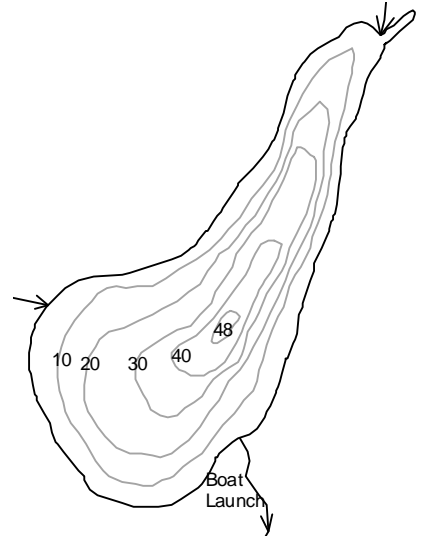


State of the Lakes Report
March 2003

Snohomish County Public Works
Surface Water Management

LAKE AND WATERSHED DATA

Lake Area: 57 acres
 Watershed Area: 448 acres
 Watershed to Lake Area Ratio: 7.9
 Maximum Depth: 48 feet (14.6 meters)
 Average Depth: 24 feet (7.3 meters)
 Lake Volume: 1300 acre-feet
 Length of Shore: 1.4 miles



	<u>1973</u>	<u>MID-90'S</u>
# of nearshore homes	85	97
# of homes/1000' of shoreline	11.5	13.1
% of homes with bulkhead or fill		72%
% of homes with some native vegetation near shore		34%
% of watershed developed (residential or commercial)	25%	80% (est.)



LAKE ASSESSMENT

DESCRIPTION

■ Location/Access – Martha Lake (referred to as “Martha S.” elsewhere in the State of the Lakes Report) is located just east of Interstate 5 between Lynnwood and Mill Creek. The lake is fed primarily by a small stream from the north and by another stream that drains a portion of the freeway. The lake drains south into Martha Creek and eventually into Swamp Creek. Martha Lake County Park is located on the south shore of the lake next to a state-owned public boat launch. Gas-powered boats are not permitted on the lake.

■ Size/Shape – The lake is 57 acres in size. It has a maximum depth of 14.6 meters and an average depth of 7.3 meters. The lake volume contains 1300 acre-feet of water.

■ Watershed – The watershed, including the lake, covers 448 acres. The watershed is 7.9 times the size of the lake, which is one of the smaller watershed ratios in the county. This means that Martha Lake should have less potential for pollution impacts from the surrounding watershed than lakes with larger watersheds. In 1973 approximately 25% of the watershed contained residential or commercial uses. There were also significant areas of agriculture north of the lake. In the next two decades, the watershed underwent some of the most dramatic changes of any lake watershed in the county. By the mid-90s, suburban development had expanded to 80% of the watershed and agricultural uses had disappeared. This rapid change may be affecting the health of the lake.

■ Shoreline – The shoreline of Martha Lake is 1.4 miles long. Along the shoreline, there were 85 homes in 1973 and 97 by the mid-90s. This is one of the most densely developed lakefronts in the county. Approximately 72% of the existing nearshore homes have modified the shoreline with bulkheads or fill—again a high percentage relative to other lakes. About 34% of the homes have retained some native vegetation along the shore. A zone of vegetation is important for filtering pollution.



LAKE CONDITIONS

■ Water Clarity – Martha Lake water clarity is moderate to high. Summer averages ranged from 3.9 to 5.1 meters between 1990 and 2000. However, water clarity was substantially higher in 2001 and 2002, averaging 6.5 and 6.0 meters respectively. The causes of this recent increase are unknown, but may be part of the natural variation for Martha Lake.

■ Color – The lake water is usually described as light to medium green in color. This color is probably the result of algae in the water.

■ Nutrients – Entranco conducted a detailed Phase I diagnostic study of the lake for Snohomish County SWM in 1990. The study found that phosphorus levels were relatively low and that there was little evidence of phosphorus recycling from the lake sediments. The summer total phosphorus concentrations in 1990 were 7 µg/l in the epilimnion and 17 µg/l in the hypolimnion. Summer average total phosphorus concentrations from 1996-2002 were similar, ranging from 4 to 12 µg/l in the epilimnion and 9 to 29 µg/l in the hypolimnion. However, there was one extremely high reading in the hypolimnion in 2000. If real, this value may indicate the beginnings of nutrient releases from the sediments. Composite total phosphorus samples collected by the Department of Ecology in 1990 and 1992-1997 are not directly comparable to discrete samples, but reveal similar low to moderate values. Total nitrogen

concentrations in the epilimnion averaged 920 µg/l during the 1990 Entranco study. Ecology total nitrogen sample data from 1990 to 1997 averaged 480 µg/l in the epilimnion. These data show that nitrogen is abundant and that phosphorus is the nutrient that limits algal growth. Martha Lake is listed on the State's 303(d) list as impaired due to excess phosphorus.

■ Oxygen/Temperature – Vertical profiles of dissolved oxygen and temperature for the summers of 1995 through 2002 show strong stratification between the warm, oxygenated upper waters and cool, oxygen-depleted bottom waters. The graphs indicate that decaying organic matter in the lake bottom depletes dissolved oxygen below 7 to 8 meters during the warm months. Several measurements in 1998 and 1999 showed spikes in dissolved oxygen around 5 meters in depth, suggesting vigorous algal growth at this level.

■ Algae – During the 1990 Entranco study, the chlorophyll *a* summer average was 4.3 µg/l, which indicates moderate levels of algae. Occasional chlorophyll *a* data collected from 1992-1997 ranged from 0.4 to 3.9 µg/l. Four samples in summer 2002 averaged 3.8 µg/l, with one reading of 12 µg/l indicating an algal bloom. The 1990 study revealed that diatoms dominated the lake in winter, spring and early summer, blue-green algae dominated in the mid summer, and green algae were prevalent in the late summer/early fall. This pattern is typical of moderately productive lakes. Observations by SWM staff and volunteers through the years have also noted regular blue-green algal blooms during the summer.

■ Aquatic Plants – Martha Lake is also moderately productive of aquatic plants. Shallow areas at the north end and around the southern shore of the lake support moderate to dense growths of aquatic plants. The dominant plants are naiad, nitella, thin-leaf pondweed, and the non-native fragrant water-lily.

■ Waterfowl – Martha Lake has a serious problem with excess waterfowl. Canada geese and domestic and migratory ducks are numerous during much of the year. Waterfowl droppings are unpleasant and pollute the water with nutrients and bacteria.

■ Water Levels – Martha Lake has experienced high water levels and flooding of surrounding low-lying properties during wet winters, especially in 1996 and 1997. Analysis by Snohomish County SWM showed that flooding is caused by the flatness of the outflow stream and limited capacity in some of the channel. The County cleaned a portion of the outlet channel as a first step in alleviating the flooding. A more extensive drainage project may be needed in the future.

SUMMARY

■ Trophic State – Based on moderately high water clarity, low to moderate phosphorus concentrations, hypolimnetic oxygen depletion, and moderate productivity of algae and aquatic plants, Martha Lake may be classified as mesotrophic.

■ Current Conditions/Trends – Martha Lake is currently in satisfactory condition. There are no statistically significant trends in water quality. However, the lake shows some possible signs of increasing eutrophication, such as spikes in hypolimnetic phosphorus and periodic severe algal blooms. Therefore, the lake may be at risk of future declines in water quality.

■ Future Concerns/Targets – The primary concern for Martha Lake is for increased nutrient pollution coming from the watershed which could result in increased nutrient levels in the lake and more algal production. Maintaining current water clarity and low phosphorus levels is the target for the lake.

■ Recommendations – The lake should be monitored carefully to determine if water clarity remains high, algal blooms become more severe, and nutrient recycling from the sediment occurs. New development in the watershed should take precautions to control runoff and reduce nutrient pollution. Nuisance waterfowl should be controlled. Other recommendations are also included in the lake management plan developed as part of the 1990 Entranco study.

CITIZEN VOLUNTEERS

Thanks to Tom Eble, Keith Johnson, Kathy Pike, John Moore, and the late John Guentz for volunteer monitoring of the lake.

DATA SUMMARY TABLE

Source	Date	Secchi Depth (meters)	Total Phosphorus (ug/l)		Color (Pt-Co scale)	Chlorophyll a (ug/l)
			Surface	Bottom	Epilimnion	Epilimnion
Bortleson, et al, 1976	7/25/73	4.0	3	9	0	-
Entranco, 1991 or DOE	Summer 1990	3.3 - 6.2 (5.0) <i>n</i> = 17	3 - 12 (7) <i>n</i> = 11	3 - 28 (17) <i>n</i> = 11	-	2.3 - 7.5 (4.3) <i>n</i> = 11
DOE	Summer 1991	4.3 - 5.5 (4.8) <i>n</i> = 12	-	-	-	-
Volunteer or DOE	Summer 1992	4.3 - 5.8 (4.9) <i>n</i> = 11	-	-	10 - 20 (15) <i>n</i> = 2	0.4 - 1.1 (0.8) <i>n</i> = 2
Volunteer or DOE	Summer 1993	3.4 - 7.3 (5.1) <i>n</i> = 12	-	-	-	1.1 (1.1) <i>n</i> = 2
Volunteer or DOE	Summer 1994	2.9 - 6.0 (4.4) <i>n</i> = 10	-	-	-	1.8 - 2.5 (2.2) <i>n</i> = 2
Volunteer or DOE	Summer 1995	3.9 - 6.1 (4.8) <i>n</i> = 11	-	-	-	1.9
Volunteer or DOE	Summer 1996	3.6 - 5.9 (4.7) <i>n</i> = 13	3 - 5 (4) <i>n</i> = 2	6 - 12 (9) <i>n</i> = 2	-	2.1 - 3.9 (3.0) <i>n</i> = 2
SWM Staff, Volunteer or DOE	Summer 1997	3.0 - 5.6 (4.2) <i>n</i> = 10	5 - 13 (9) <i>n</i> = 2	10 - 15 (13) <i>n</i> = 2	-	2.0
SWM Staff, Volunteer or DOE	Summer 1998	3.6 - 6.0 (4.5) <i>n</i> = 10	5 - 8 (6) <i>n</i> = 4	15 - 22 (20) <i>n</i> = 4	-	-
SWM Staff or Volunteer	Summer 1999	3.3 - 5.7 (4.3) <i>n</i> = 11	7 - 10 (9) <i>n</i> = 4	12 - 21 (18) <i>n</i> = 4	-	-
SWM Staff or Volunteer	Summer 2000	3.1 - 4.4 (3.9) <i>n</i> = 7	7 - 10 (8) <i>n</i> = 4	16 - 199 (29) ^a <i>n</i> = 4	-	-
Volunteer	Summer 2001	5.5 - 6.9 (6.5) <i>n</i> = 5	7 - 22 (12) <i>n</i> = 4	14 - 20 (18) <i>n</i> = 4	-	-
SWM Staff	Summer 2002	4.2 - 7.5 (6.0) <i>n</i> = 4	6 - 10 (7) <i>n</i> = 4	12 - 30 (18) <i>n</i> = 4	-	0.9 - 12 (3.8) <i>n</i> = 4

NOTES

- Table includes summer (May-Oct) data only.
- Each box shows the range on top, followed by summer average in () and number of samples (n).
- Total phosphorus data are from samples taken at discrete depths only.
- DOE = Washington Department of Ecology

^a Median is shown for 2000 rather than average (mean) to avoid bias from one high TP value

SUMMARY OF OTHER DATA

■ ***Total Phosphorus*** – composite samples taken by the Department of Ecology in 1990 and 1992-1997 ranged from 5 -- 16 µg/l (with one high value of 33 µg/l) in the epilimnion and from 10 -- 40 µg/l in the hypolimnion (average 20 µg/l). These are not directly comparable to the discrete samples shown above, but confirm that Martha S. has relatively low phosphorus levels.

■ ***Nitrogen*** – single total nitrogen samples in 1973 showed 0.38 mg/l in the epilimnion and 1.41 mg/l in the hypolimnion; during Entranco’s 1990 study, total nitrogen averaged 0.92 mg/l in the epilimnion and nitrate was moderately high (0.43 mg/l epilimnion average); Ecology total nitrogen composite samples from 1990-1997 averaged 0.48 mg/l in the epilimnion and 0.50 mg/l in the hypolimnion; these data suggest that nitrogen is abundant and is not limiting algal growth.

■ ***Alkalinity*** – data from the 1990 study averaged 36 mg/l CaCO₃ throughout the whole lake, which indicates that Martha has a moderate buffering capacity.

■ ***pH*** – 1997-2000 data averaged 7.2 in the epilimnion and 6.7 in the hypolimnion, with a few peaks above 8.5 during algal blooms; this is a typical range for Snohomish County lakes. Readings from 2002 were similar.

■ ***Conductivity*** – 1990 data ranged from 56 – 85 µmhos; 1997-2000 data averaged 90 µmhos in the epilimnion and 104 µmhos in the hypolimnion; these data indicate moderate to high levels of dissolved materials in the water. Readings from 2002 were similar.

■ ***Algae*** – samples collected during the 1989-1990 Entranco study showed that during May through mid-October biovolumes were low and dominated by diatoms and cryptomonads, with a brief period

of blue-green blooms in mid-summer. Green algae were somewhat abundant in late summer.. Diatoms were again dominant from fall through spring.

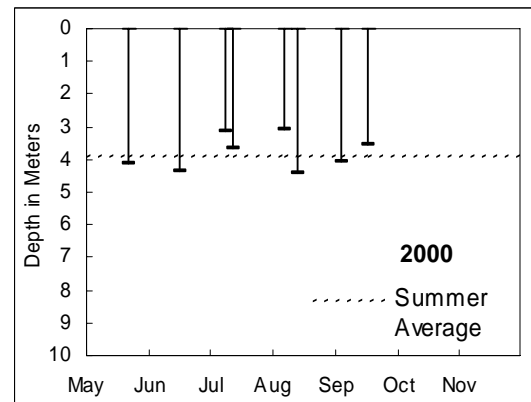
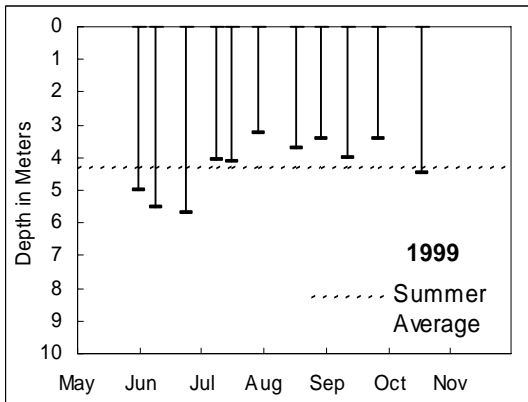
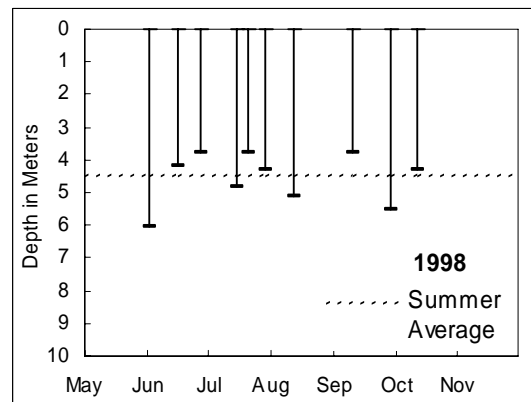
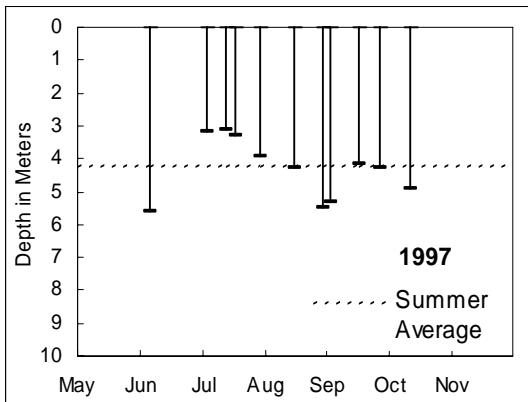
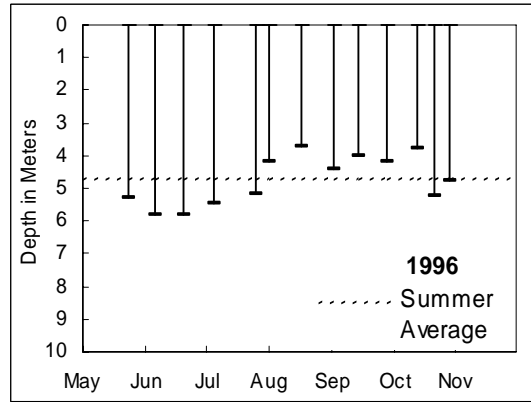
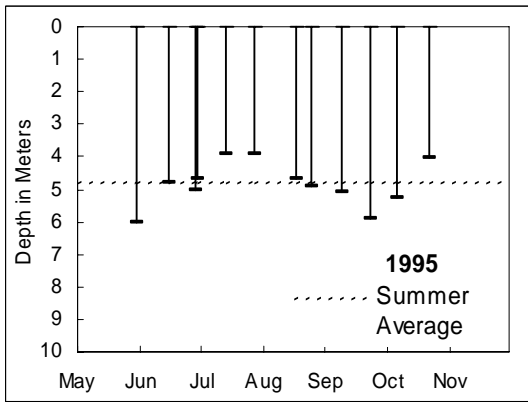
ALGAE TYPES	Estimated Percentages	
	May-Oct. 1990	Nov.-April 1989-1990
Cyanophyta (Blue-greens)	10%	0%
Chlorophyta (Greens)	20%	3%
Chrysophyta (Golden/diatoms)	34%	64%
Cryptophyta (Cryptomonads)	36%	33%
Euglenophyta (Euglenoids)	0%	0%
Pyrrhophyta (Dinoflagellates)	0%	0%
TOTAL BIOVOLUME (mm ³ /l)	0.329	0.9

■ ***Fish*** – according to the Washington State Department of Fish and Wildlife (WDFW), fish species found in Martha Lake include rainbow trout, largemouth bass, yellow perch, and brown bullhead catfish. WDFW usually stocks the lake each year with rainbow trout.

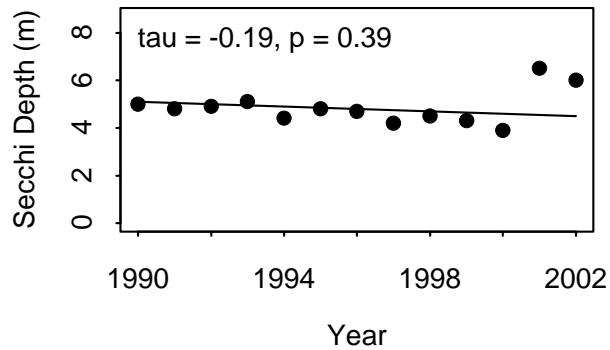
DATA SOURCES

In addition to data from Snohomish County SWM staff and citizen volunteers, data for Martha Lake are also available from: Bortleson, et. al., 1976; Entranco Engineers, 1991; Rector, 1994; Rector, 1996; Smith and Rector, 1997; and Smith, et. al., 2000. Please refer to the full list of references in the County-Wide Summary.

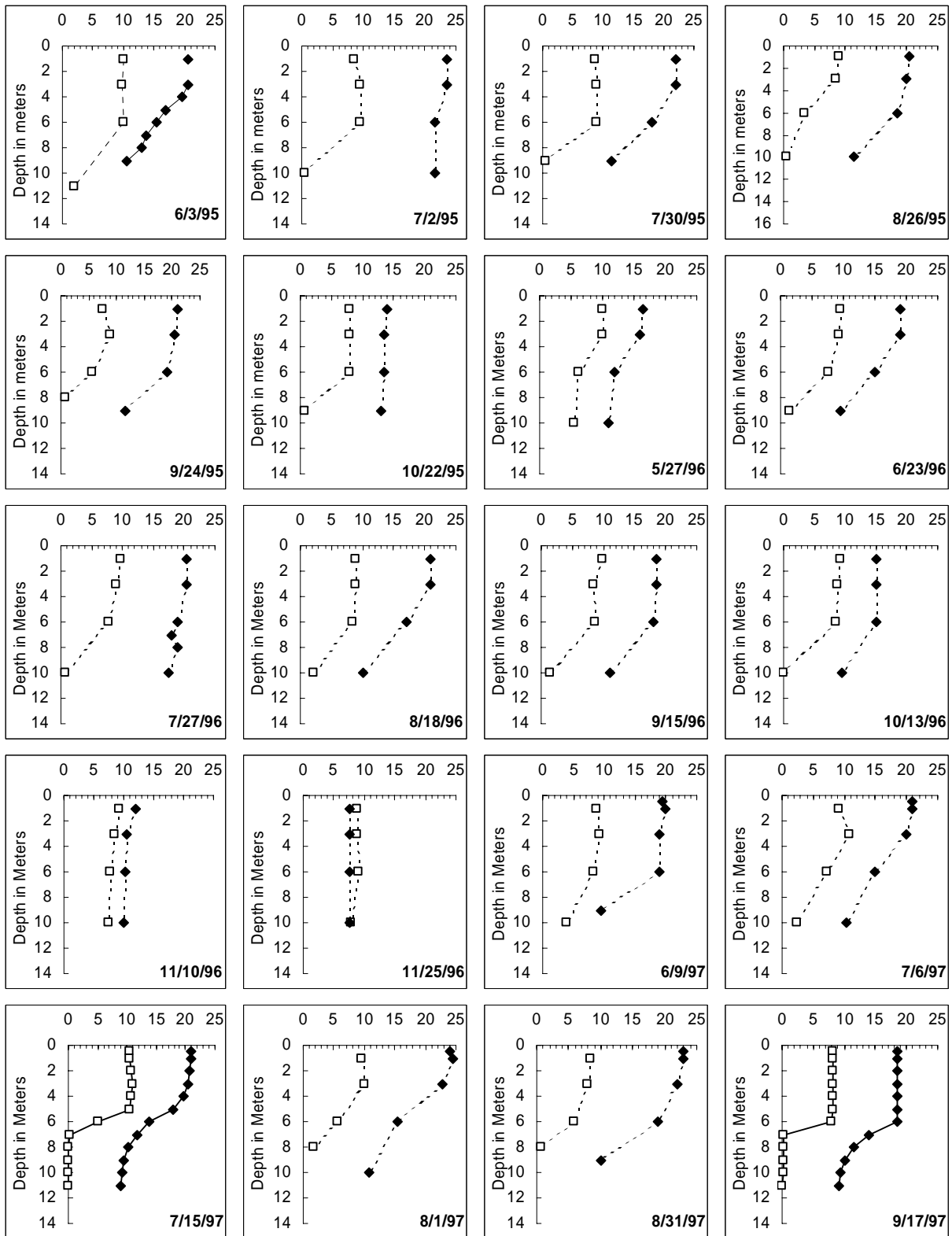
WATER CLARITY



TREND ANALYSIS

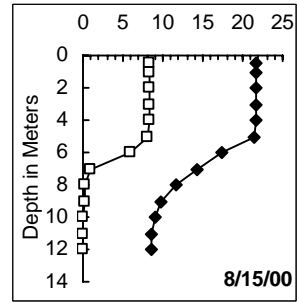
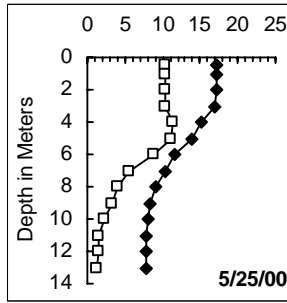
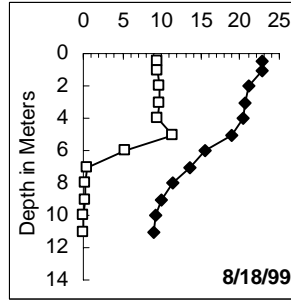
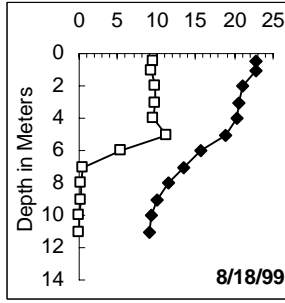
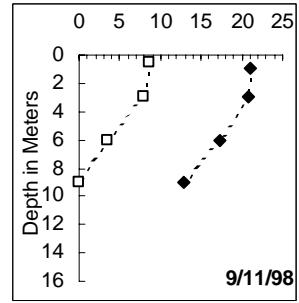
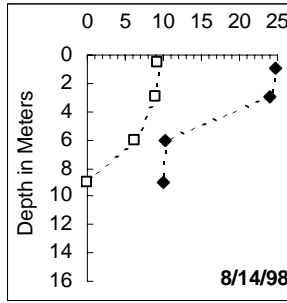
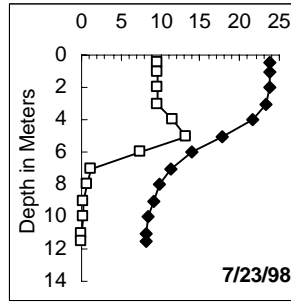
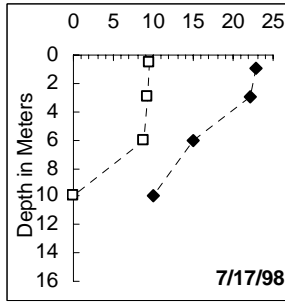
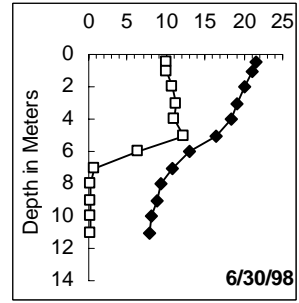
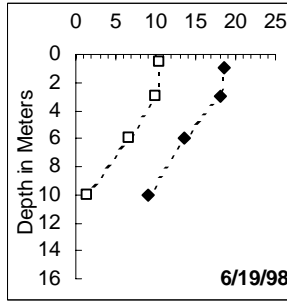
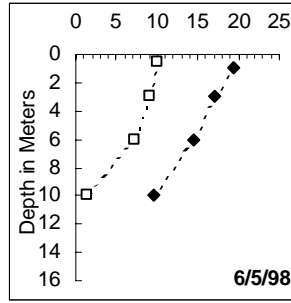
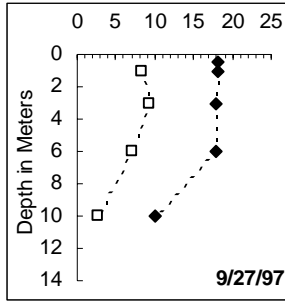


DISSOLVED OXYGEN AND TEMPERATURE PROFILES (SELECTED YEARS)



□ DO (mg/l)

◆ Temp (°C)



—□— DO (mg/l)

—◆— Temp (°C)

AQUATIC PLANTS



Area	Density	Dominant Plants	Other Plants
A	Moderate	<i>Najas flexilis</i> (Water-nymph, Naiad) <i>Nitella sp.</i> (Brittlewort) <i>Potamogeton sp.</i> (Thin-leaf pondweed)	<i>Elodea canadensis</i> (Common elodea)
B	Moderate	<i>Najas flexilis</i> (Water-nymph, Naiad) <i>Nitella sp.</i> (Brittlewort)	<i>Utricularia vulgaris</i> (Common bladderwort)
C	Sparse	<i>Najas flexilis</i> (Water-nymph, Naiad) <i>Nitella sp.</i> (Brittlewort)	<i>Elodea canadensis</i> (Common elodea)
D	Moderate	<i>Najas flexilis</i> (Water-nymph, Naiad) <i>Nitella sp.</i> (Brittlewort) <i>Utricularia vulgaris</i> (Common bladderwort)	<i>Chara sp.</i> (Stonewort, Muskgrass) <i>Potamogeton sp.</i> (Thin-leaf pondweed)
E	Dense	<i>Najas flexilis</i> (Water-nymph, Naiad) <i>Nitella sp.</i> (Brittlewort) <i>Potamogeton sp.</i> (Thin-leaf pondweed) <i>Elodea canadensis</i> (Common elodea)	<i>Utricularia vulgaris</i> (Common bladderwort)
N	Dense	<i>Nymphaea odorata</i> (Fragrant water-lily)	<i>Nuphar polysepalum</i> (Yellow water-lily)

Note: *Iris pseudacorus* (Yellow iris), an invasive, non-native plant, *Typha sp.* (Cattail), and *Scirpus sp.* (Bulrush) are found in places around the shoreline.

BASIC MONITORING DATA

1995									
DATE	Secchi Depth (meters)	Air Temp (C)	Water Temp (C)	Lake Level (in)	Clouds (%)	Rain	Wind	Color	COMMENT
6/3/1995	6.2	21.5	21	17	0	none	light	lt green	Slight aquatic plants (water lilies). 40 ducks, 31 Canada geese.
6/18/1995	5.0	26	19	18	90	mod	breezy	medgreen	Aquatic plants mod - heavy. Approx 14 Canada geese, 1 Cormorant.
7/1/1995	5.0	29	24	19.8	0	none	calm	lt green	
7/2/1995	4.7	17	22.5	19.8	100	mod	breezy	medgreen	Slight algae, aquatic plants mod-heavy. 10 ducks, 69 Canada geese, 1 heron, 1 grebe, 24 crows.
7/16/1995	3.9	31	22.5	21.5	0	none	light	medgreen	Aquatic plants mod-heavy. Addendum to 7/2/95 report one severe case of "swimmers itch" noted.
7/30/1995	3.9	39.5	22.5	23.3	0	none	gusty	grn brown	Slight algae, heavy aquatic plants, north end of lake. 20 ducks/geese. Sample of submersed plant taken (from ~19').
8/19/1995	4.4	19.4	19	20.8	100	mod	light	medgreen	Moderate algae, heavy aquatic plants. 24 ducks. Algae buildup in pockets at north end of lake.
8/26/1995	4.9	22.5	19.5	21.5	75	mod	breezy	medgreen	Moderate algae, mod-heavy plants. Approx 12 ducks/geese. Submergent weed has continued. Water-lily at both ends of the lake.
9/24/1995	5.9	26	21	25	0	none	light	medgreen	Approx 31 ducks/geese. Algae are moderate - heavy. Heavy aquatic plants at north end of lake.
10/7/1995	5.3	19.5	17.5	22	75	heavy	calm		Moderate algae in the water. Heavy aquatic plants at north and south ends. Approx 60 ducks/geese.
10/10/1995	5.4	32	23	23.3	10	trace	light	medgreen	Heavy blue-green algae in water. Moderate scum. Moderate aquatic plants around lake perimeter. Odor noted in sediment at northend of lake. Approx 19 geese.
10/22/1995	4.1	12	14	17.5	100	none		medgreen	Mod algae, aquatic plants. 33 geese, 13 ducks, 12 mudhens. Density in water lilies has decreased due to colder temperatures.
11/6/1995	4.5	7.5	10	17.5	10	heavy	calm	grn brown	Moderate algae, plants, and odor; no scum; 60 ducks/geese estimated; hail with heavy rain.
11/19/1995	4.7	15	11	10.8	0	heavy	light	grn brown	Moderate algae, slight plants; no odor, scum; severe wind & rain storm from SW - Nov 18, 12 pm to 3 am
12/21/1995	4.2	11	7	4	0	none	calm	lt green	Slight algae, north end; Storm damage: evergreen boughs broken, dock damage, styrofoam floats washed up on shore. Septic odor at north end of lake.

Non-summer data indicated by shading.

*Indicates data collected by Snohomish County staff.

1996									
DATE	Secchi Depth (meters)	Air Temp (C)	Water Temp (C)	Lake Level (in)	Clouds (%)	Rain	Wind	Color	COMMENT
1/7/1996	3.4	11.5	7	4.5	90	heavy	breezy	dk brown	County park site flooded with no silt barrier between dirt pile and lake. Re: Complaint 95-110607.
2/8/1996	3.6	11.5	5	-1	100	heavy	light	black	Strong musty and septic odors at N end of lake
5/27/1996	5.2	18	7	9.5	100	none	strong	dk green	No scum, odor, slight algae, moderate plants, 42 ducks/geese. 2 eagles sighted-opening of fishing season, 4/27/96. They were being harassed by crows but avoided them by landing in a tall cedar-west side of lake near Nishikawa's home.
6/9/1996	5.6	20.5	19	11.5	75	trace	light	medgreen	Weed growth similar to last year. Large trash bags were picked up, location was downwind from county park site. 3 eagles in early May.
6/23/1996	5.7	15	19	13.3	10	light	light	medgreen	No scum, odor, moderate algae, heavy plants at north and south ends of lake. 62 geese, 20 ducks, 1 grebe. Plant sample taken WA/DOT outfall.
7/7/1996	5.5	27.5	21	15.5	0	none	breezy	peasoup green	North wind - unusual. Saw one totally red Dragonfly. No scum, odor, moderate algae, plants at N. & S. ends. 36 canada geese, 17 ducks.
7/27/1996	4.9	18.5	22.5	17	100	light	light	peasoup	82 ducks and 18 geese
8/3/1996	4.0	19.5	22.5	19.3	50	light	light	medgreen	Gravel beach installed at 16222 Eastshore Dr
8/18/1996	3.6	22	21.5	21.3	90	none	calm	grn brown	No scum, or plants at test site. Slight algae and heavy plants at north & south ends of lake. TP sample taken S.W. end in the morning. While filling DO sample bottle may have allowed some air to mix with the sample. "DUP" should be ok.
9/3/1996	4.3	19	21.5	22.8	100	moderate	light	dk green	
9/15/1996	3.7	15.5	18	22	90	moderate	gusty	dk brown	No algae, odor, moderate scum (near shoreline where Eastshore Dr & 155th join), heavy plants at N & S end. 2 coots, 28 ducks. At County park site-excavated dirt pile along 164th St - not covered; dirt is starting to erode.
9/29/1996	3.9	16.5	17	22.3	100	none	calm	lt green	Heavy fog lifting to treeline
10/13/1996	3.8	11	15	20	100	heavy	light	black	No scum, odor, slight algae, moderate plants at north & south end. Wind is swirling.
10/29/1996	4.8	11	11.5	12.8	25	heavy	light	medgreen	40 to 50 mallards, no geese
11/10/1996	5.4	14	12	13.3	10	none	calm	dk brown	
11/25/1996	6.5	7.5	7.5	9.75	90	heavy	calm	dk green	Phosphate sample taken at north channel head

1997									
DATE	Secchi Depth (meters)	Air Temp (C)	Water Temp (C)	Lake Level (in)	Clouds (%)	Rain	Wind	Color	COMMENT
6/9/1997	5.6	24	19.5	11.5	0	none	light	lt green	Slight algae, plants, no scum, odor. 74 geese, 19 ducks. north wind
7/6/1997	3.0	22	21	11.8	50	mod	breezy	medgreen	Moderate algae, plants. 92 geese/ 41 ducks. north wind. used sight tube - got slightly better secchi result - 3.2 & 3.3 m.
*07/15/97	3.1				100	trace	breezy	medgreen	
7/20/1997	3.2	25.5	22.5	12.8	0	none	calm	medgreen	Moderate algae, slight plants. approx 43 ducks, 60 geese. Secchi depth reading is consistently less than last year at this time.
8/1/1997	4.0	27.5	24	15.5	0	none	light	medgreen	Moderate algae, plants. heavy bloom. north wind.
8/17/1997	4.2	26.5	25	18.3	0	none	calm	medgreen	Heavy algae, moderate plants.
8/31/1997	5.4	27	23	19.5	25	none	light	lt green	heavy algae, moderate plants.
*09/17/97	4.2				90	mod	strong	lt green	boat & anchor started to move had to reposition boat.
9/27/1997	3.9	17.75	18.25	18	100	heavy	gusty	black	Heavy algae, slight scum (near station), moderate plants, no odor. Property at 15703 Larch Way N - sediment fence is below waterline. Foam at N end of lake.
10/12/1997	4.7	12	14.75	13.3	100	heavy	calm	medgreen	Heavy algae, no scum, odor, moderate plants. Sediment fence at construction site is below water line - will contact grading inspection again. Lots of particles in the water from surface to 2.5m.

1998									
DATE	Secchi Depth (meters)	Air Temp (C)	Water Temp (C)	Lake Level (in)	Clouds (%)	Rain	Wind	Color	COMMENT
6/5/1998	5.9	20.5	19.5	13.3	90	none	light	medgreen	No odor; slight scum and aquatic plants; heavy algae; 67 geese; 33 ducks; weed growth around lake substantially increased.
6/19/1998	4.2	23.5	18.5	15.3	90	light	light	lt green	No scum, aquatic plants or odor; moderate algae; S.W. wind; algae 3-6 meters deep.
*6/30/98	3.8				0	none	calm	murky	No scum; slight algae; moderate plants. Major problem with waterfowl - 65 ducks/ 70 geese.
7/17/1998	4.7	32	23.5	17.5	0	none	light	lt green	Secchi reading w/sight tube showed 4.8 & 4.9; heavy algae; no odor; heavy algae concentration at 2-3m depth; swirling wind.
*7/23/98	3.8				100	none	light	murky	6 geese/ 4 ducks; no scum, odor; slight plants, algae.
7/31/1998	4.2	24	24.75	19.5	100	trace	breezy	medgreen	Heavy algae; slight scum; no odor; moderate plants at lake perimeter; S. wind; heavy algae bloom approx. 4 m.
8/14/1998	5.0	29.25	24.75	22.5	0	none	light	medgreen	Heavy algae; no scum or odor; moderate plants at lake perimeter; 1 report of milfoil adjacent to boat launch; phosphorous sample taken.
9/11/1998	3.6	21	21	26.5	25	none	light	lt green	Heavy algae; no scum or odor; moderate plants at lake perimeter; 12 geese; 18 ducks; west wind.
9/30/1998	5.4	32.75	22.5	24.5	0	none	calm	medgreen	Heavy algae; no scum or odor; moderate plants at lake perimeter; 23 ducks; wind S.W. to N.E.

1999									
DATE	Secchi Depth (meters)	Air Temp (C)	Water Temp (C)	Lake Level (in)	Clouds (%)	Rain	Wind	Color	COMMENT
6/3/1999	5	18.5	16.5	21	10	trace	light	yellowgrn	New lake level datum.
6/12/1999	5.6	24.5	18.5	20.8	75	none	calm	dk green	
6/26/1999	5.7	15.5	17.5	19.3	90	heavy	light	dk green	
7/11/1999	4.1	23	21	19.5	0	none	light	medgreen	Park goers feeding geese, need educational signs in park. Lily pads. 2 Great Blue Herons.
7/18/1999	4.2	20.5	19.5	20.5	0	trace	light	dk green	1Eagle.
7/31/1999	3.3	30	22.5	22.8	0	none	light	dk green	
*8/18/99	3.7	22	22.8		0	none	calm	medgreen	
8/30/1999	3.5	21.5	20.5	26	100	trace	calm	dk green	
9/12/1999	4	23	19.5	27.8	0	none	light	dk green	
9/27/1999	3.5	19.5	17	29.3	10	none	light	medgreen	
10/18/1999	4.5	14.5	13.5	30	0	none	light	grnbrown	1 Eagle.
11/14/1999	4.7	19	11	17.3	90	light	light	grnbrown	

2000									
DATE	Secchi Depth (meters)	Air Temp (C)	Water Temp (C)	Lake Level (in)	Clouds (%)	Rain	Wind	Color	COMMENT
*05/25/00	4.1	16.5	17.25	24.5	0	none	light	green	5 ducks, no algae or algae scum, and slight aquatic plants.
6/19/2000	4.4	16	17.5	25.3	100	trace	light	clear	80 ducks and no algae, algae scum, or aquatic plants.
7/11/2000	3.2	18.5	20.5	28	100	none	calm	dk green	55 ducks, slight algae, and no algae scum or aquatic plants.
7/15/2000	3.7				0	none	breezy	medgreen	50 ducks, moderate algae and algae scum, and no aquatic plants.
8/8/2000	3.1	25	24.5	32	0	none	light	medgreen	15 ducks, slight algae, and no algae scum or aquatic plants.
*08/15/00	4.4	19	21.74		75	none	light	medgreen	24 ducks, moderate algae and aquatic plants, and no algae scum.
9/5/2000	4.1	20.5	18.5	35	100	none	calm	medgreen	50 ducks and no algae, algae scum, or aquatic plants.
9/18/2000	3.6	19.5	19.5	36	100	trace	light	medgreen	21 ducks and no algae, algae scum, or aquatic plants.

[Click here to view more recent data.](#)

HOW YOU CAN HELP MARTHA LAKE

- Educate yourself about lake ecology and the lake's health.
- Use lawn and garden fertilizers sparingly; test your soil first; choose low or no phosphorus fertilizers.
- Retain or plant native vegetation adjacent to the water to protect the shoreline and filter pollution.
- Infiltrate or filter the runoff from rooftops, patios, and driveways rather than piping it to the lake.



- Cover or mulch bare soil areas.
- Use pesticides, herbicides, and household chemicals sparingly and never near the water.
- Maintain your septic system—have it inspected every two years and pumped when needed.
- Conserve water both inside and outside.
- Clean up pet wastes and keep livestock away from the lake shore.

- Learn to identify non-native invasive aquatic plants and animals; check your boat and trailer for invaders; never empty an aquarium into the lake.
- Do not feed geese or ducks.
- Join with neighbors or the local property owners' association to work together to protect the lake.



Contact Snohomish County Surface Water Management at 425-388-3464 for information about these topics or if you have questions about Martha Lake.

(TTY users call 425-388-3700)