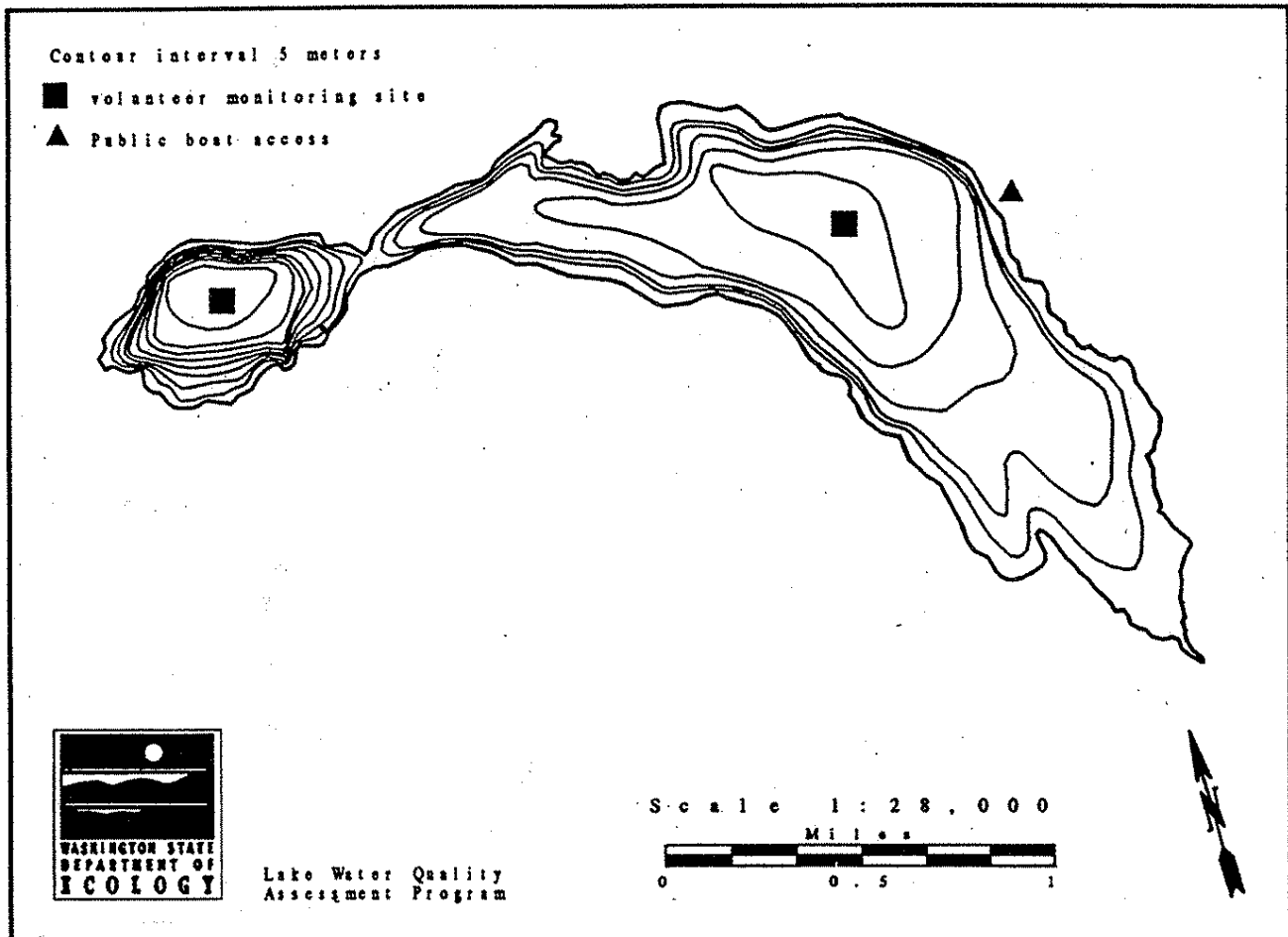


Lake Samish -- Whatcom County

Lake Samish is located 6.5 miles southeast of Bellingham. It is comprised of two basins which are connected by a narrow strait. The west arm is a small deep bay, and the east arm is a larger shallow bay. There are several small inlets that flow into the lake, including Lake Creek and Barnes Creek. Lake Samish drains via Friday Creek to the Samish River.

	<u>East Arm</u>	<u>West Arm</u>
Size (acres)	680	130
Maximum Depth (feet)	75	140
Mean Depth (feet)	31	71
Lake Volume (acre-feet)	24,000	9,100
Drainage Area (miles ²)	9.2	3.7
Altitude (feet)	273	273
Shoreline Length (miles)	6.3	1.8

Data from Bortleson *et al.* (1976)



Overall Assessment

Water quality of Lake Samish was good in 1994. Except for one high concentration of total phosphorus measured during the May survey, all three major trophic state parameters (total phosphorus, chlorophyll *a*, and Secchi depths) indicated very good water quality. Secchi depths, water chemistry results, and profile data results are listed in tables at the end of this summary.

Profile data were similar to data collected during previous surveys. The only thing of note is that pH was somewhat high (for a western Washington lake) on both sampling dates. Most likely the lake has naturally low buffering capacity, so that even small amounts of algae can raise the pH of the water. Although low buffering capacity is usually found in higher elevation lakes in western Washington, it is also found in nearby Lake Whatcom.

Since 1989, Secchi depths have been more variable in the west basin than in the east basin (see graph of Secchi depth data). However, values for both basins were similar each year. To determine whether there was a trend in water clarity, a statistical trend test was applied to data collected since 1989. A seasonal Kendall test for trend showed that there was no significant trend in either basin. Results were not significant at the 80% level for both basins ($p = 0.22$ for the east basin, and $p = 0.11$ for the west basin).

Aquatic plants observed by Ecology staff during field visits include tapegrass (also known as wild celery; *Vallisneria americana*), coontail (*Ceratophyllum demersum*), watershield (*Brasenia schreberi*), duckweed (*Lemna minor*), Nuttall's waterweed (*Elodea nuttali*), white-flowering lily (*Nymphaea odorata*), slender pondweed (possibly *Potamogeton berchtoldii*) and water buttercup (*Ranunculus sp.*). Tapegrass is usually the most abundant plant in shallow areas of the lake.

Lake Samish exhibited both oligotrophic and mesotrophic characteristics in 1994, and as a result, was classified as oligo-mesotrophic. Oligotrophic characteristics include the low chlorophyll *a* concentrations on both sampling dates, the low August concentration of total phosphorus, and the good water clarity in both basins. Mesotrophic characteristics include the moderately high concentration of total phosphorus during the May survey, the increasing amounts of aquatic plants in the lake that is heavy in areas, as well as the low concentrations of dissolved oxygen near the lake bottom.

Summary of Questionnaire Results and Information From the Volunteers

The following is a summary of the volunteer's remarks and responses to questionnaires completed from 1989 to 1994.

Lake Samish is used for fishing, boating, water skiing, swimming, rowing, and jet skiing. Public recreational facilities on the lakeshore include a park, a picnic area,

Lake Samish -- Whatcom County

a beach, and one boat ramp. About 5% of the shoreline is publicly-owned. Currently the watershed is being logged, and the lakeshore is being developed further for residences. In the past, the watershed was logged and used for animal grazing, and the lake was dredged. In 1990 there were about 60 culverts or stormdrains that drained into the lake.

There are 301 residences on the lakeshore (of roughly 530 residences in the Lake Samish basin). Lake water is withdrawn for drinking and other domestic uses. The lakeshore is fully sewerred. There is a lake management district and a community association for the lake.

No fish were stocked in the lake in 1994. No aquatic plant or algae control activities occurred in 1994, but the outlet channel was cleared to the county line for flood control. A dam is now being built at the outlet, to stabilize stream flow during the dry season.

Overall, the volunteers found that Lake Samish had excellent water quality. The worst water quality problems in 1994 were ranked as (1) excessive aquatic plant growth, and (2) algae. The plants spread more each year, creating more problems.

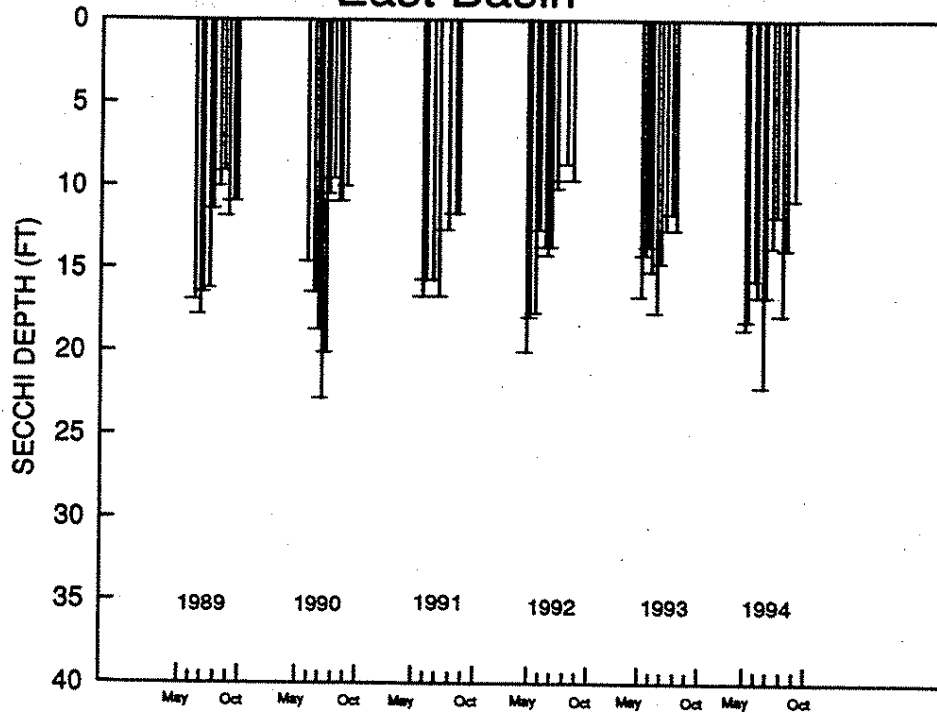
Acknowledgments

I thank A.B. Davis and J. David Jenkins for volunteering their time to monitor the east and west basins of Lake Samish, respectively, from 1989 through 1994.

SAMISH (EAST ARM) Lake -- WHATCOM County
 1994 Volunteer-collected Data

Date	Temperature (°C) (°F)	pH	Water Color	%Cloud Cover	Recent Rain	Wind	Secchi (ft)	Lake Ht(in)	Abbrev.	Comments
STATION 1										
94/05/21	18.0	64.4	0.0		100	None	Breezy	17.8	268.1	On site visit.
94/06/01	18.8	65.8	0.0	Lt Green	50	Mod	Calm	17.3	0.0	
94/06/21	20.0	68.0	0.0	Lt Green	0	None	Light	14.8	267.4	
94/06/30	20.0	68.0	0.0	Lt Green	90	None	Breezy	15.8	268.3	
94/07/18	22.0	71.6	0.0	Lt Green	0	Trace	Light	21.3	267.1	
94/08/01	25.0	77.0	0.0	Lt Green	0	None	Light	15.8	267.6	
94/08/16	23.0	73.4	0.0	Lt Green	75	None	Calm	12.8	267.7	
94/09/01	22.0	71.6	0.0	Lt Green	25	None	Breezy	11.0	267.4	Reading taken at SE corner due to blustering wind.
94/09/19	22.0	71.6	0.0	Lt Green	0	None	Breezy	17.0	267.7	
94/10/04	19.5	67.1	0.0	Lt Green	0	None	Light	13.0	267.7	Yellow greenish scum along beach in cove.
94/10/29	15.0	59.0	0.0	Lt Green	10	Light	Calm	10.0	267.9	

LAKE SAMISH (WHATCOM COUNTY) East Basin



SAMISH (WEST ARM) Lake -- WHATCOM County
 1994 Volunteer-collected Data

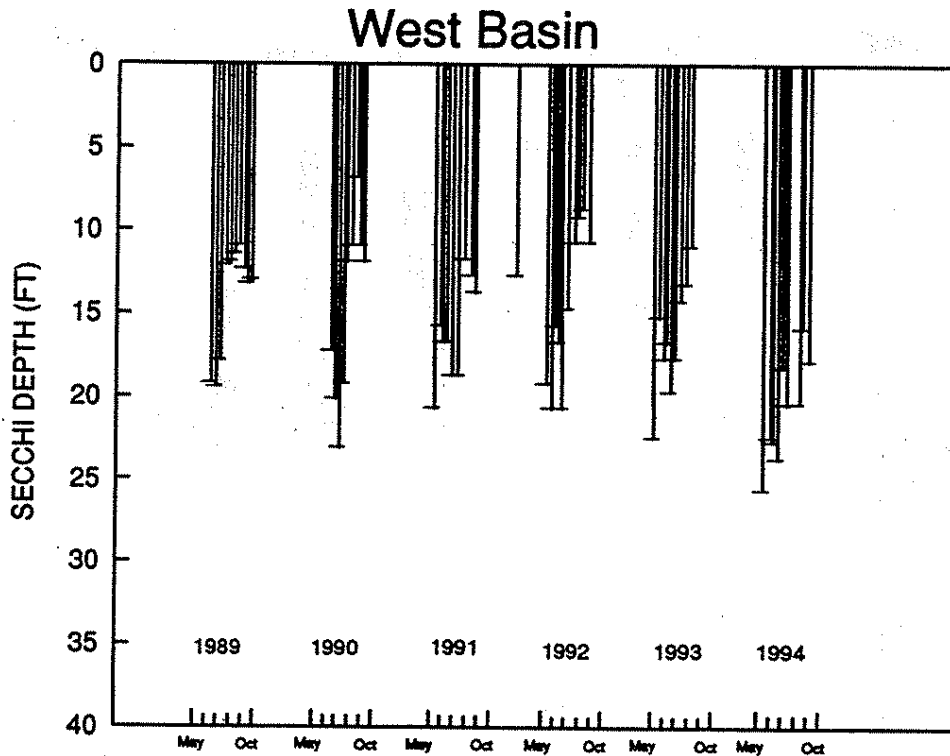
Date	Temperature (°C) (°F)	Water pH	Color	%Cloud Cover	Recent Rain	Wind	Secchi (ft)	Lake Ht(in)	Abbrev.	Comments
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STATION 1

94/07/18	22.0	71.6	0.0	Lt Green	0	Trace	Light	22.8	267.1	
94/08/16	23.0	73.4	0.0	Lt Green	75	None	Calm	19.6	267.7	

STATION 2

94/06/01	19.3	66.7	0.0	Lt Green	50	Mod	Calm	24.7	267.9	Second Secchi with view tube.
94/06/21	21.0	69.8	0.0	Lt Green	0	None	Light	21.6	267.4	Second Secchi with view tube.
94/06/30	20.5	68.9	0.0	Lt Green	90	None	Breezy	21.8	268.3	Second Secchi with view tube.
94/08/01	24.5	76.1	0.0	Lt Green	0	None	Light	17.3	267.6	Second Secchi with view tube.
94/09/01	25.0	77.0	0.0	Lt Green	25	None	Breezy	19.5	267.4	Due to breeze - sampled at calmer location than usual. Second Secchi with view tube.
94/09/19	22.0	71.6	0.0	Lt Green	0	None	Breezy	19.5	266.7	Thick algae. Second Secchi with view tube.
94/10/04	19.5	67.1	0.0	Lt Green	0	None	Light	15.0	267.7	Second Secchi with view tube.
94/10/29	14.0	57.2	0.0	Lt Green	10	Light	Calm	17.0	267.9	Second Secchi with view tube. Lots of drift visible with view scope.



SAMISH (EAST ARM) (WHATCOM) Lake -- WHATCOM County
 Chemistry Data -- Station 1

Date	Sta.	Strata	Total Phosphorus (µg/L)	Total Nitrogen (mg/L)	Chlorophyll (µg/L)	Fecal Col. Bacteria (colonies/100 mL)		Turbidity (NTU)	Suspended Solids		Color (Pt-Co)
						Site 1	Site 2		Total (mg/L)	Non-Volatile (mg/l)	
74/08/24		E				(Source: Water Supply Bulletin 43)					
89/06/27	1	E	6	0.62	2.7						
89/09/26	1	E	12	0.40	6.3						
90/06/04	1	E	13								
90/08/15	1	E	10	0.36							
91/05/28	1	E		0.58							
92/05/01	1	E	4	0.66	1.2						
92/05/01	2	E	6		1.5						
92/05/01	1	H	12	0.69							
92/08/04	1	E	10	0.25	1.3						
92/08/04	2	E	10	0.23	3.9						
92/08/04	1	H	12	0.53							
93/05/22	1	E	22	0.57	1.2						
93/05/22	1	H	18	0.59							
93/08/16	1	E	8	0.32	3.0						
93/08/16	2	E	6								
93/08/16	1	H	12	0.54							
94/05/21	1	E	25	0.64	1.8						
94/05/21	1	E			1.4						
94/05/21	1	H	31	0.65							
94/08/20	1	E	7	0.48J	1.3J						
94/08/20	1	H	25	0.57J							

E=epilimnion composite, H=hypolimnion composite

Remarks codes: U = Below detection limits; J = Estimate.

Unless source is specified, data are from Ecology's Lake Water Quality Assessment Program

SAMISH (EAST ARM) (WHATCOM) Lake -- WHATCOM County
1994 Profile Data

Date Spring	Depth (M)	Temp (°C)	Diss.			Date Summer	Depth (M)	Temp (°C)	Diss.		
			pH	Oxygen (mg/L)	Cond (µmho/cm)				pH	Oxygen (mg/L)	Cond (µmho/cm)
STATION 1											
94/05/21	0.0	16.6	9.2	10.2	64.0	94/08/20	0.0	22.1	8.4	9.4	62.0
	1.1	16.6	9.1	10.1	64.0		1.0	22.1	8.4	9.3	62.0
	2.1	16.6	9.0	9.9	64.0		2.0	22.1	8.4	9.3	62.0
	3.0	16.6	8.8	9.8	64.0		3.0	22.1	8.4	9.3	62.0
	3.9	16.6	8.7	9.8	65.0		4.0	22.1	8.4	9.3	61.0
	5.0	16.5	8.6	9.7	64.0		5.0	21.9	8.4	9.3	61.0
	6.1	14.4	8.5	10.4	64.0		6.0	21.8	8.4	9.2	62.0
	8.1	10.9	8.4	10.4	62.0		7.1	21.3	8.2	8.9	61.0
	10.1	9.5	8.2	8.9	62.0		8.0	19.1	8.0	9.0	60.0
	12.0	8.9	8.1	8.0	61.0		10.0	15.1	8.1	5.7	59.0
	14.0	8.4	8.0	7.4	62.0		12.0	11.2	7.8	1.4	59.0
	14.9	8.3	8.0	6.7	60.0		14.0	9.6	7.7	0.3	60.0

