SOME LIMNOLOGICAL ASPECTS OF 20 SELECTED LAKES IN EAGAN AND APPLE VALLEY, MINNESOTA

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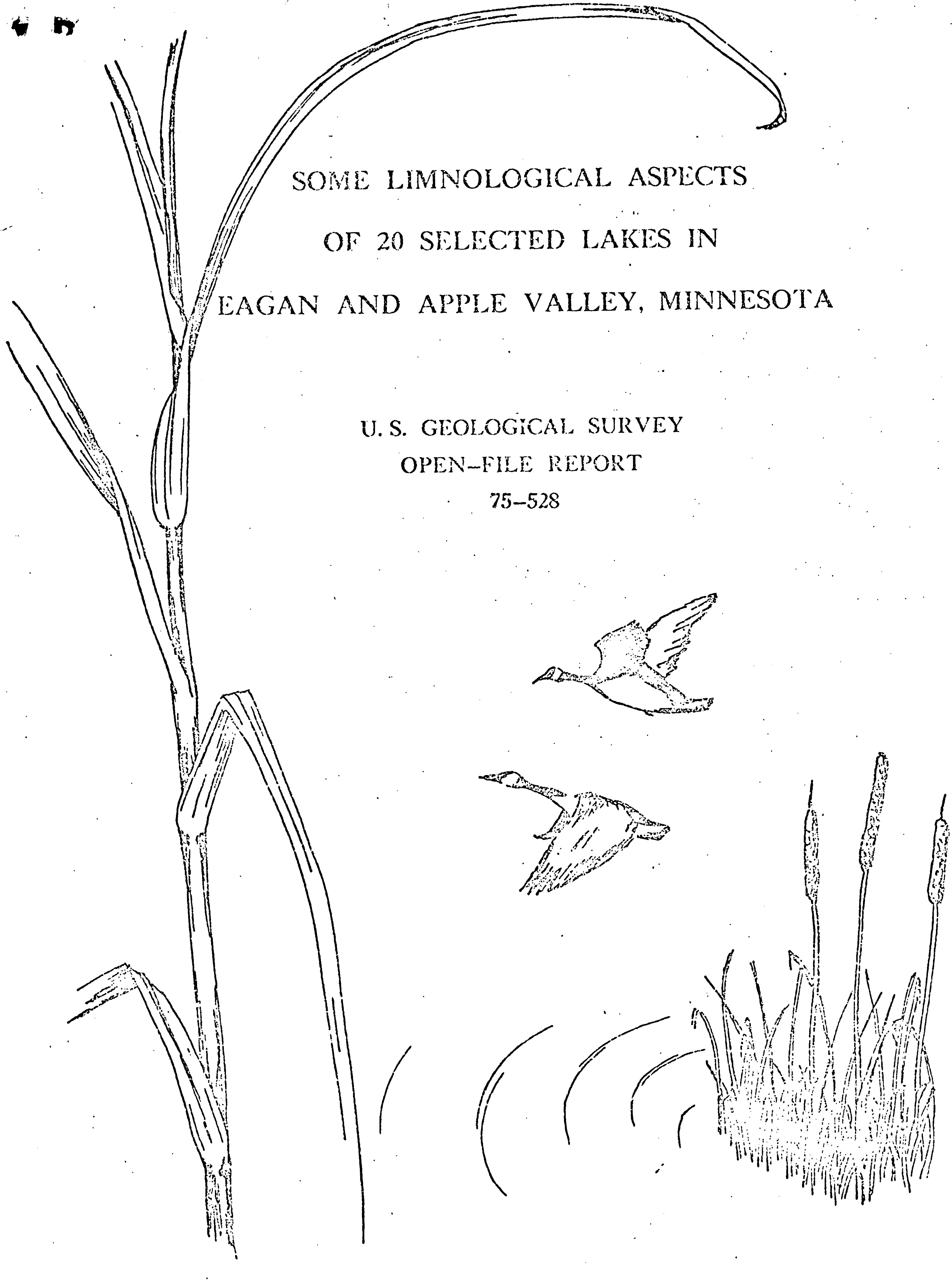

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SOME LIMNOLOGICAL ASPECTS OF 20 SELECTED LAKES IN EAGAN AND APPLE VALLEY, MINNESOTA

By Mark R. Have

Open-File Report 75-528

Prepared in cooperation with the
Minnesota Department of Natural Resources
Division of Waters, Soils, and Minerals,
and the cities of Eagan and Apple Valley

St. Paul, Minnesota

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GLOSSARY

ALGAE (Alga) - Simple plants, many microscopic, containing chlorophyll.

ALGAL BLOOM - A readily visible concentrated growth or aggregation of phytoplankton.

ALKALINITY - The capacity of water to neutralize acid. Since the sources of alkalinity are many, it is often expressed as calcium carbonate.

BIODEGRADEABLE - The breakdown of organic matter to inorganic matter by living organisms.

BIOCHEMICAL OXYGEN DEMAND (BOD) - Indicates the quantity of oxidizable compounds present in a water and will vary with water compositions, temperature, period of contact, and other factors.

BLUE-GREEN ALGAE - A group of algae with a blue-green pigment, in addition to the green chlorophyll. A stench is often associated with the decomposition of dense blooms of blue-green algae in fertile lakes.

COLIFORM, FECAL - Coliform bacteria that are present in the intestine of warmblooded animals. They are often used as indicators of the sanitary quality of water.

COLIFORM, TOTAL - A particular group of bacteria that often are used as indicators of possible sewage pollution.

DIATOMS - Algae that are characterized by the presence of silica in the cell walls which are sculptured with striae and other markings, and by the presence of a brown pigment associated with the chlorophyll.

DISSOLVED SOLIDS - Anhydrous residues of the dissolved substances in water.

ENRICHMENT - Addition or accumulation of nutrients within a body of water.

EPILIMNION - That region of a body of water that extends from the surface to the thermocline and does not have a permanent temperature stratification.

EUTROPHICATION - The natural process of aging a body of water through ecological succession and enrichment.

FALL CIRCULATION - A physical phenomenon that may take place in a body of water during the early autumn. The sequence of events leading to fall circulation include: (1) cooling of surface waters, (2) density change in surface waters producing convection currents from top to bottom, (3) circulation of the total water volume by wind action, and (4) vertical temperature equality, 4°C. The overturn results in a uniformity of the physical and chemical properties of the water.

FLAGELLATTES - Those algae which possess flexible, whiplike appendages used for locomotion.

GENUS - A group (in the classification system for plants and animals) into which are placed species that resemble one another more than they do other species.

GREEN ALGAE - Algae that have pigments similar in color to those of higher green plants. Common forms produce algal mats or floating "moss" in lakes.

HYPOLIMNION - The region of a body of water that extends from the thermocline to the bottom of the lake and is removed from surface influence to a large degree.

ION - An atom or radical that has lost or gained one or more electrons, and has thus acquired an electric charge.

LIMNOLOGY - The study of the physical, chemical, and biological aspects of inland waters.

LITTORAL ZONE - The shoreward region of a body of water.

MESOTROPHIC LAKE - A lake with a moderate content of dissolved nutrients.

NITROGEN FIXATION - The ability of certain bacteria and blue-green algae to utilize atmospheric or dissolved gaseous nitrogen in their physiological processes.

NUTRIENT - Any substance that is required by an organism for the continuation of growth, for repair of tissue, or for reproduction.

OLIGOTROPHIC WATERS - Waters with a small supply of nutrients; thus, they support little biological production.

ORTHOPHOSPHORUS - The most common ionized form of phosphorus which is available for algae growth.

PH - Indicates the degree of acidity or alkalinity of a solution; pH 7 indicates a neutral solution.

PHOTOSYNTHESIS - The process by which simple sugars are manufactured from carbon dioxide and water by living plant cells with the aid of chlorophyll in the presence of light.

PHYTOPLANKTON - Plant microorganisms, such as certain algae floating freely in the water.

PRODUCTION (Productivity) - Total amount of organic matter that is formed from raw materials.

RESPIRATION - The exchange of respiratory gases between the organism and the environment.

SPECIES - An interbreeding population or group of populations that is reproductively isolated from other such populations.

SPECIFIC CONDUCTANCE - Is a measure of the ability of a water to conduct an electrical current and is expressed in micromhos per centimeter at 25°C. Because the specific conductance is related to the number and specific chemical types of ions in solution, it can be used for approximating the dissolved-solids content in the water.

SPRING CIRCULATION - A physical phenomenon that may take place in a body of water during the early spring. The sequence of events leading to spring circulation include: (1) melting of ice cover, (2) warming of surface waters, (3) density change in surface waters producing convection currents from top to bottom, (4) circulation of the total water volume by wind action, and (5) vertical temperature equality, 4°C. The circulation results in a uniformity of the physical and chemical properties of the water.

STREPTOCOCCI, FECAL - Bacteria found in the intestines of warm-blooded animals. Their presence in water is considered to verify fecal pollution.

SUSPENDED SOLIDS - Those solids which are not dissolved or in solution.

TERMINAL MORAINE - The belt of rock material accumulated at the end of a valley glacier or at the edge of an ice-cap.

TITRATION - A method for determining volumetrically the concentration of a desired substance in solution.

TURBIDITY - An expression of the optical property of water which causes light to be scattered and absorbed rather than be transmitted in straight lines through the water column. Turbidity is caused by the presence of suspended matter.

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ABSTRACT

Selected physical, chemical, and biological parameters were determined to assess the quality of 20 lakes in the cities of Eagan and Apple Valley, Minn. All the lakes are eutrophic except Holland and Fish Lakes, which are mesotrophic. Some lakes (including Fish Lake) have storm sewer inlets but are not discernibly different in quality than lakes with no such inlets.

INTRODUCTION

Since the late 1950's, the communities of Eagan and Apple Valley (fig. 1) have undergone suburban growth. The effects of

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Figure 1 near here.

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the growth on the environment, particularly the lake environment had not been studied. Changes in land use and increases in storm-sewer and septic-tank effluents in and around lakes can have a decided effect on nutrient loadings in lakes, resulting in accelerated eutrophication. With this in mind, representatives of the communities requested that the U.S. Geological Survey, in cooperation with the Minnesota Department of Natural Resources, monitor 20 selected lakes for quality (fig. 1). Some of the lakes have storm-sewer inlets, some have outlets, some have both, and others have none.

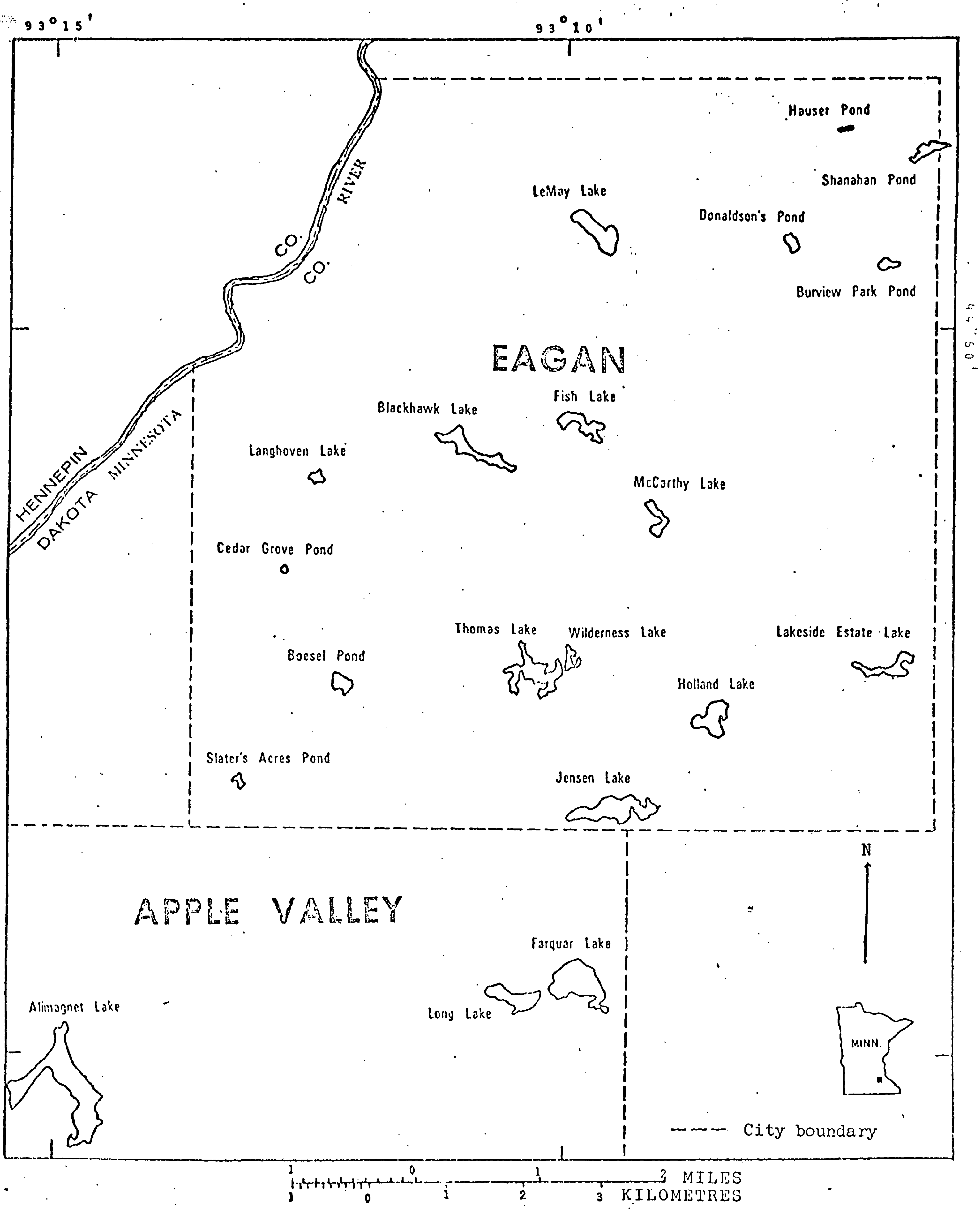

Figure 1.--Location of lakes and ponds sampled in Eagan and Apple Valley.

1A (2 fols)

Chemical and biological sampling was begun in 17 lakes in Eagan in October 1972, and in 3 lakes in Apple Valley in September 1973. The objects of the monitoring are to establish base-line limnological data and to study the effects of urbanization and associated land-use changes on lake quality over an extended period. The scope of the project is limited by the selected information that can be derived from sample analyses.

The purpose of this interim report is to describe the activities and findings of the first 2 years of study.

ENVIRONMENTAL SETTING

Eagan and Apple Valley, Dakota County, lie in southeastern Minnesota (fig. 1) and are included in one of the fastest developing areas in the State. Much of the development is of the commercial, industrial, and multiple-family-dwelling types.

Topographic relief in the study area is about 200 ft (feet) or 61 m (metres). Land-surface altitudes range from about 1000 ft (305 m) above mean sea level on the morainal hills to about 800 ft (244 m) in the depressions. Despite the relief, the area is poorly drained and contains numerous ponds and lakes. The area is a terminal moraine, characterized by knob and kettle topography. The lakes sampled, surface areas, and inlet and outlet conditions are shown in table 1.

METHODS USED AND PARAMETERS DETERMINED

Semiannual (spring and fall) samples were collected at the surface near the middle of each lake. In addition, some samples were collected at or near the bottom to determine changes in selected parameters with depth. Parameters determined at the

Table 1.--Outlet and inlet conditions of lakes and ponds sampled in Eagan and Apple Valley.

Lake Name	Lake Area (acres)	Lake Outlet	Storm Sewer Inlet
Apple Valley:			
Alimagnet	113		X
Farquar	74		X[1]
Long	36	X	X
Eagan:			
Blackhawk	34		
Boesel	12		
Burview Park	3		
Cedar Grove	2	X	X
Donaldson's	8		X
Fish	14		X[2]
Hauser	--		
Holland	34		
Jensen	52	X	
Lakeside Estate	12		X
Langhoven	6	X	X
LeMay	34	X	X
McCarthy	9		
Shanahan	11		
Slater's Acres	3		
Thomas	35		
Wilderness	8		X

1 Overflow from Long Lake.
2 Equipped with siltation pond.

sampling sites included pH, specific conductance, DO (dissolved oxygen), water temperature, and total and fecal coliform bacteria. Parameters determined in the laboratory included phosphorus, nitrogen, silica, suspended and dissolved solids, turbidity, chloride, sodium, potassium, calcium, magnesium, BOD (biochemical oxygen demand), alkalinity, and phytoplankton.

Chloride, sodium, potassium, calcium, and magnesium were analyzed for baseline information and for determining general water type. The bacteria were analyzed to determine the sanitary quality of the lakes. The remaining parameters were analyzed to determine the stage of eutrophication.

Beginning in October 1974, BOD, total coliform, and some of the more common inorganic constituents were deleted from the analysis schedule because of adverse effects by the phytoplankton and lack of significant changes in concentration, respectively. Fecal *Streptococci*, TOC (total organic carbon), inorganic carbon, nitrogen, and phosphorus determinations of bottom sediments were added.

Samples for the physical and chemical parameters were collected and determined by the methods of Brown and others (1970), and by Goerlitz and Brown (1972). DO concentration was determined by a DO meter. DO concentration and water temperature were used in the calculation of percent saturation of DO, according to Am. Public Health Assoc. and others (1971, p. 480).

Total coliform, fecal coliform, and fecal *Streptococci* were determined by the membrane-filter technique described by Slack and others (1970). Phytoplankton concentration also was determined by the methods described in Slack and others (1973).

A BRIEF DISCUSSION OF EUTROPHICATION

Limnologists have paid increasing attention in recent years to eutrophication and accelerated eutrophication of lakes. Greeson (1969) presents a discussion about eutrophication in general. The abstract from his publication is quoted below.

> "Lake eutrophication is an economic, recreational, and aesthetic problem that affects every lake of the world. Eutrophication is the natural process of lake aging, and progresses irrespective of man's activities. Pollution, however, can hasten the natural rate of aging and shorten the life expectancy of a body of water. The eutrophication of a lake consists of the gradual progression from one life stage to another based on the degree of nourishment or productivity. The extinction of a lake is attributed to enrichment by nutritive materials, biological productivity, decay, and sedimentation. Presently used methods for retarding eutrophication are the abatement of cultural enrichment, treatment of eutrophic symptoms, and control of fundamental causes."

Ott and others (1973) presented characteristics commonly used to describe oligotrophic and eutrophic lakes (table 2). They state that the classification of lakes based upon the measurement of several trophic indicators is, at best, qualitative.

Many factors complicate eutrophication, recycling of nutrients caused by death and disintegration of algae, for example, nitrogen fixation ability of many algae, and varying nitrogen and phosphorous requirements of different species of algae.

Table 2.--Physical, chemical, and biological characteristics commonly used to describe oligotrophic and eutrophic lakes (from Ott and others 1973).

Parameter	Oligotrophic lakes	Eutrophic lakes
Volume to surface ratio	High	Low
Volume of hypolimnion to volume of epilimnion	High	Low
Transparency	10 meters	≤ 10 meters
Color	Blue, blue-green, or green	Green or yellow brown
Dissolved solids	Low	High
Algal bloom	Rare	Frequent
Algal species variety	Many	Variable to few
Dominant algal groups		Blue-green
Chlorophyll	≤ 1 mg per m^3	>1 mg per m^3
Cell counts	≤ 500 per ml	>500 per ml
Ash-free weight of seston	≤ 0.1 mg/l	>0.1 mg/l
Littoral vegetation	Sparse	Abundant

RESULTS AND DISCUSSION

Physical and chemical characteristics

Except for Fish and Holland Lakes, all the lakes are shallow. Near the middle of each shallow lake the average depth was less than 10 ft (3 m) (fig. 2). Although most of the lakes are shallow,

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Figure 2 near here.

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depth, temperature, DO, and specific conductance differed in some lakes in June 1973. Owing to the hilly terrain, mechanical wind mixing is not as effective as in a flatter and more open terrain. Also, these lakes are not big enough to produce big waves and, hence, effective wind mixing (Greeson, 1971, p. 56).

Figures 3, 4, and 5 show the June 1973 results of measurements

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Figures 3, 4, and 5 near here.

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of those lakes where temperature, DO, and specific conductance were determined both near the surface and near the bottom.

All the lakes sampled were warmer near the surface than near the bottom in June 1973 (fig. 3), which is not unusual in even relatively shallow lakes. Because of the lack of mixing, the net heat absorbed from solar radiation tends to be retained near the surface.

The lower DO concentrations and higher specific conductances near the bottoms of some of the lakes shown in figures 4 and 5 reflect the bacterial and biochemical decomposition of organic materials. The phytoplankton are continually dying as well as reproducing. As the dead cells fall to the bottom, their simpler decomposition products of inorganic elements cause a higher

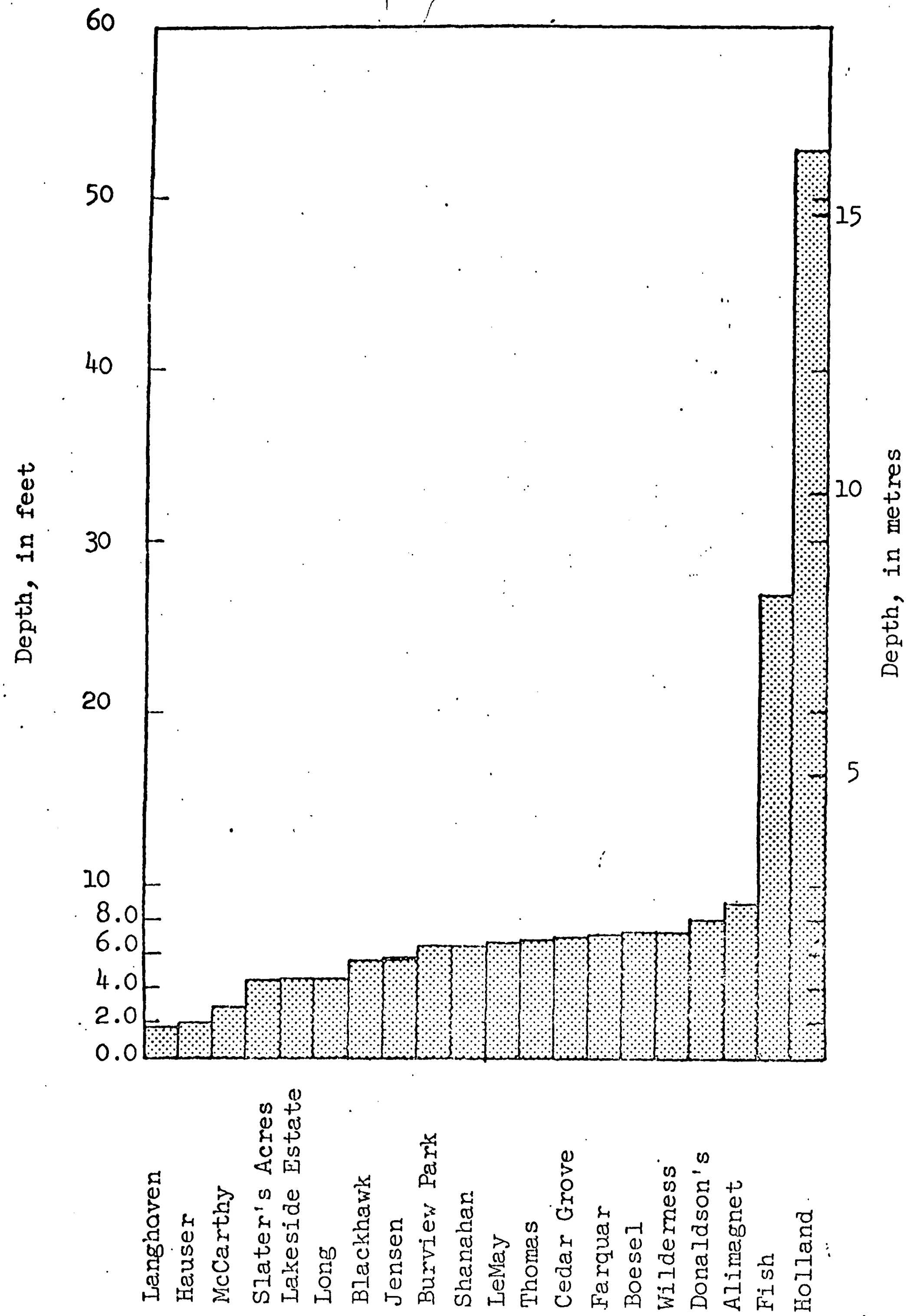

Figure 2.--Approximate depth near middle of lakes.

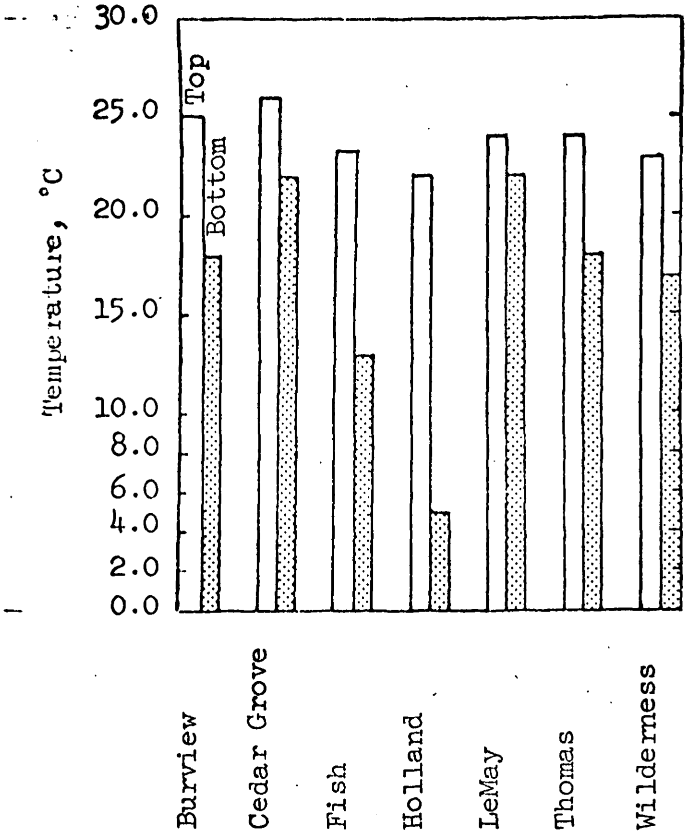

Figure 3.--Temperature near the top and bottom of selected lakes sampled in June 1973.

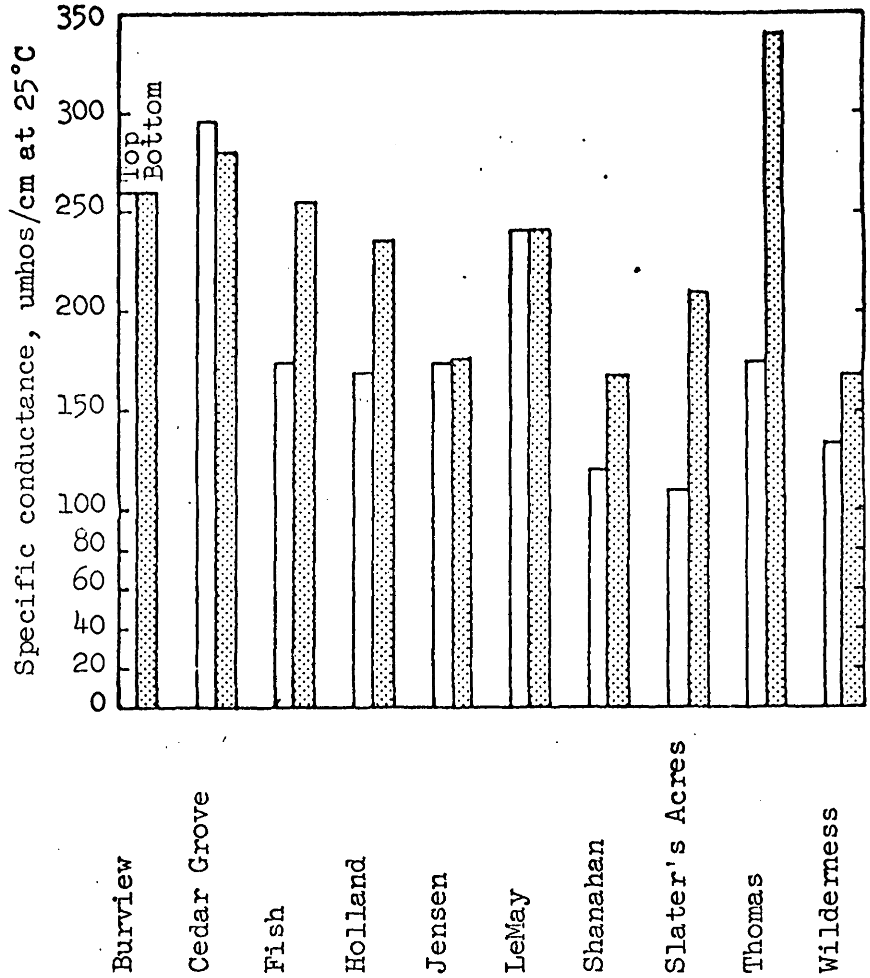

Figure 5.--Specific conductance near the top and bottom of selected lakes sampled in June 1973.

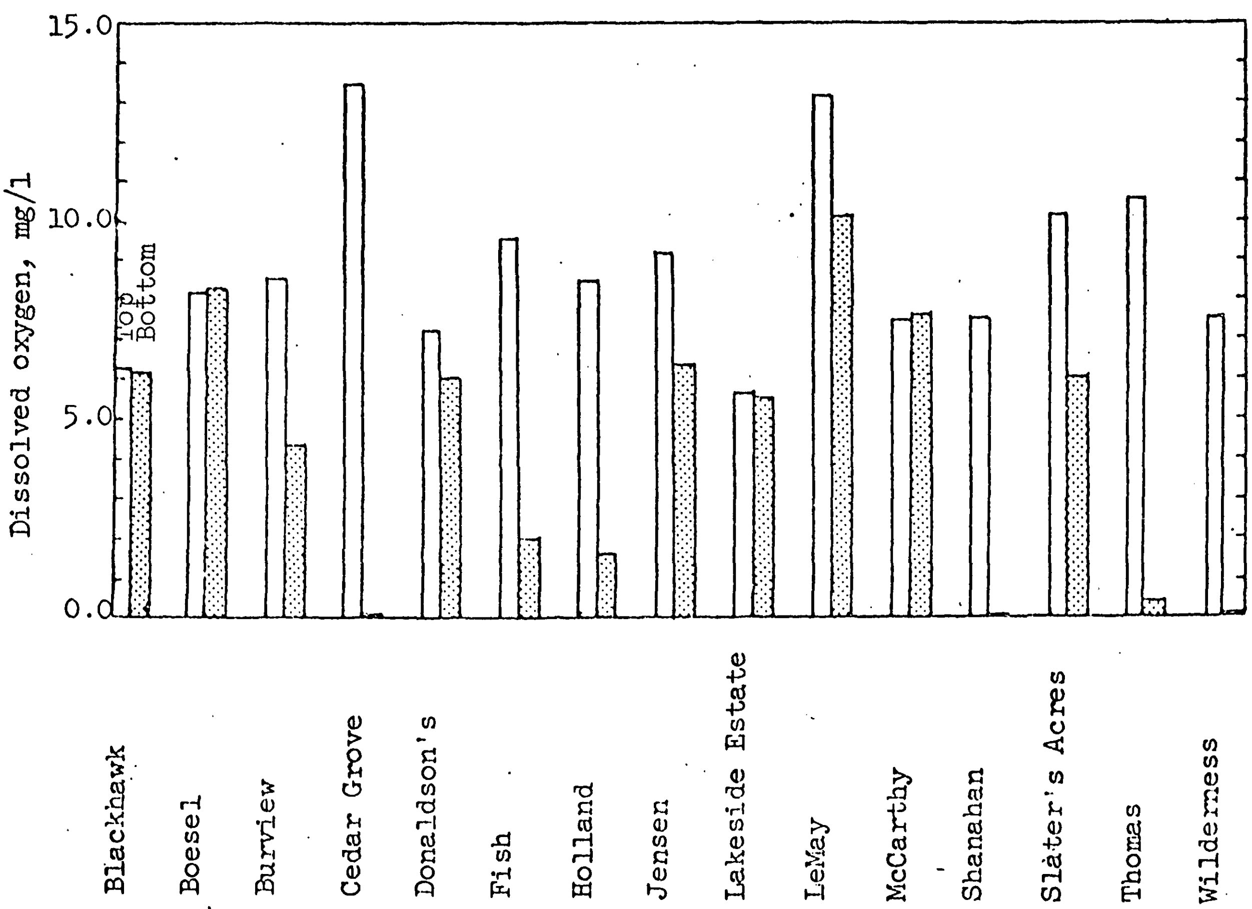

Figure 4.--Dissolved oxygen near the top and bottom of selected lakes sampled in June 1973.

specific conductance. These decomposition processes use oxygen, thus producing a lower dissolved oxygen concentration near the bottom.

Burview, Cedar Grove, Jensen, and LeMay Lakes are not much different in specific conductance between top and bottom, but DO concentration is higher near the top. At the time of sampling, conditions may have been such that chemical oxidation and precipitation were significant enough to decrease both the specific conductance and DO.

DO, specific conductance, and temperature profiles were made of Holland Lake because this lake goes through a seasonal cycle of spring and fall circulations and summer stratification. As shown in table 3, Holland was first sampled during the fall circulation on November 14, 1972. It was well mixed both thermally and chemically.

For the other three sampling periods shown in table 3, Holland Lake was stratified, with the epilimnion extending in depth to about 10 ft (3 m) in June 1973 to about 30 ft (6 m) in September 1973. The DO was deficient in the hypolimnion during the fall after stratification had persisted through the summer.

Evidence of photosynthesis is shown in the pH values and percent saturation of DO (figs. 6 and 7). Because algae remove

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Figures 6 and 7 near here.

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carbon dioxide from solution and convert it into cellular material, the carbonate equilibrium, as it exists in natural waters, is affected in that the carbonate concentration and the pH increase.

Table 3.-- Temperature, specific conductance, and dissolved oxygen profiles for Holland Lake.

Date	Depth ft	Temperature °C	Specific Conductance umhos/cm at 25°C	Dissolved Oxygen mg/l
11-14-72	0.5	4.0	185	8.0
	10	4.0	185	7.7
	20	4.5	188	7.7
	30	4.5	190	7.6
	40	4.5	190	7.5
	50	4.5	193	7.3
6-22-73	0.5	22.0	172	8.5
	5.0	21.0	170	8.6
	10	20.0	170	8.7
	15	13.0	185	8.2
	20	9.0	185	6.7
	25	6.0	185	5.9
	30	5.0	190	5.4
	35	5.0	195	1.8
	40	5.0	205	1.6
	45	5.0	215	1.6
	50	5.0	235	1.6
9-20-73	0.5	17.0	140	9.4
	5.0	17.0	145	9.2
	10	17.0	145	9.1
	15	17.0	147	9.1
	20	16.5	170	8.6
	22	14.5	180	1.7
	25	12.0	180	.8
	30	10.0	185	.7
	40	6.0	215	.4
	50	5.0	225	.3
10-17-74	0.5	10.0	160	9.7
	10	10.0	--	9.4
	15	10.0	--	9.2
	20	8.0	--	1.0
	25	5.5	--	.7
	30	5.5	--	.4
	40	5.0	--	.3
	50	5.0	225	.3

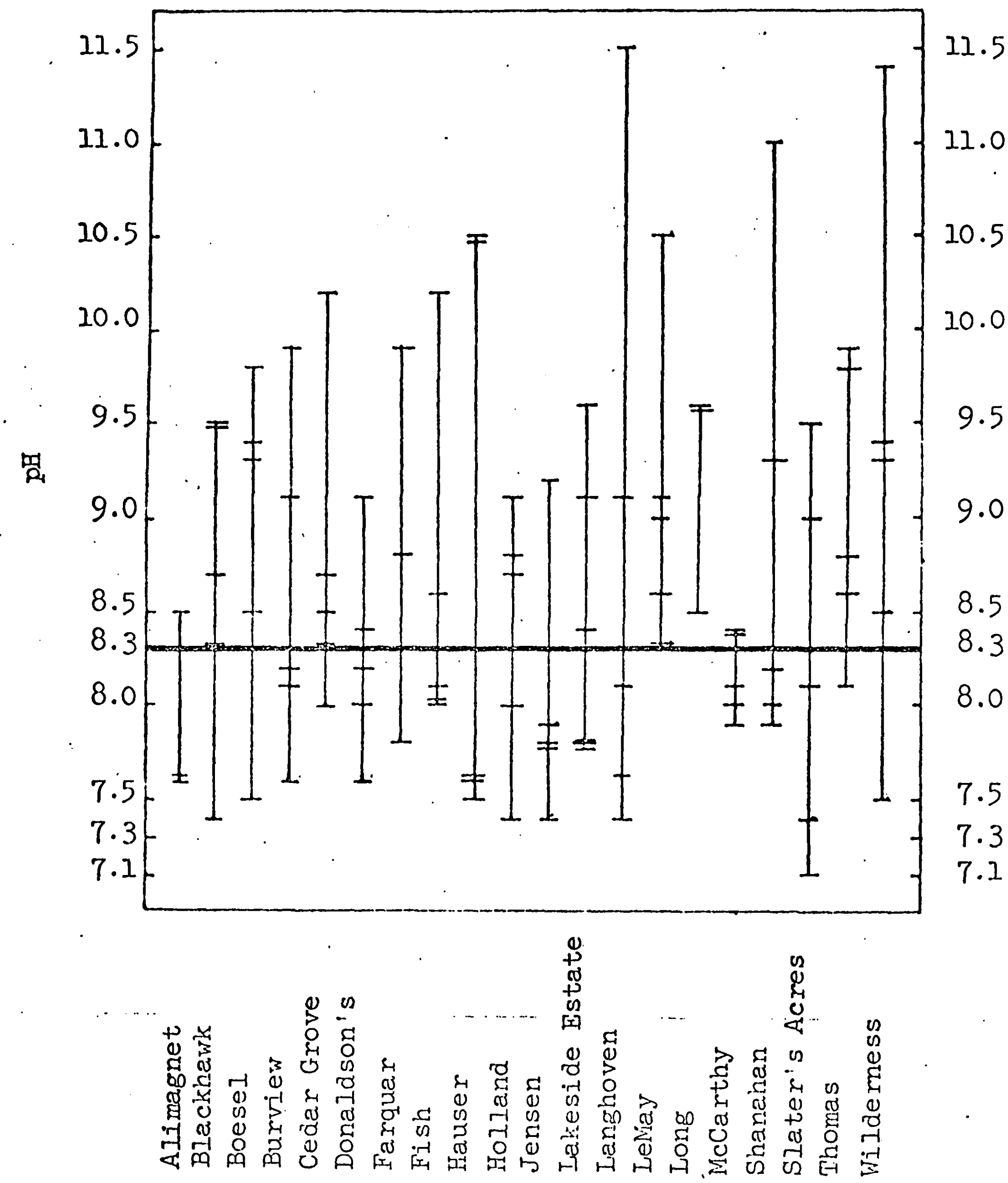

Figure 6.--pH values for all lakes. Span indicates range between maximum and minimum values. Each mark across the vertical lines represents a sampled value. Horizontal line across graph at 8.3 represents carbonate end point.

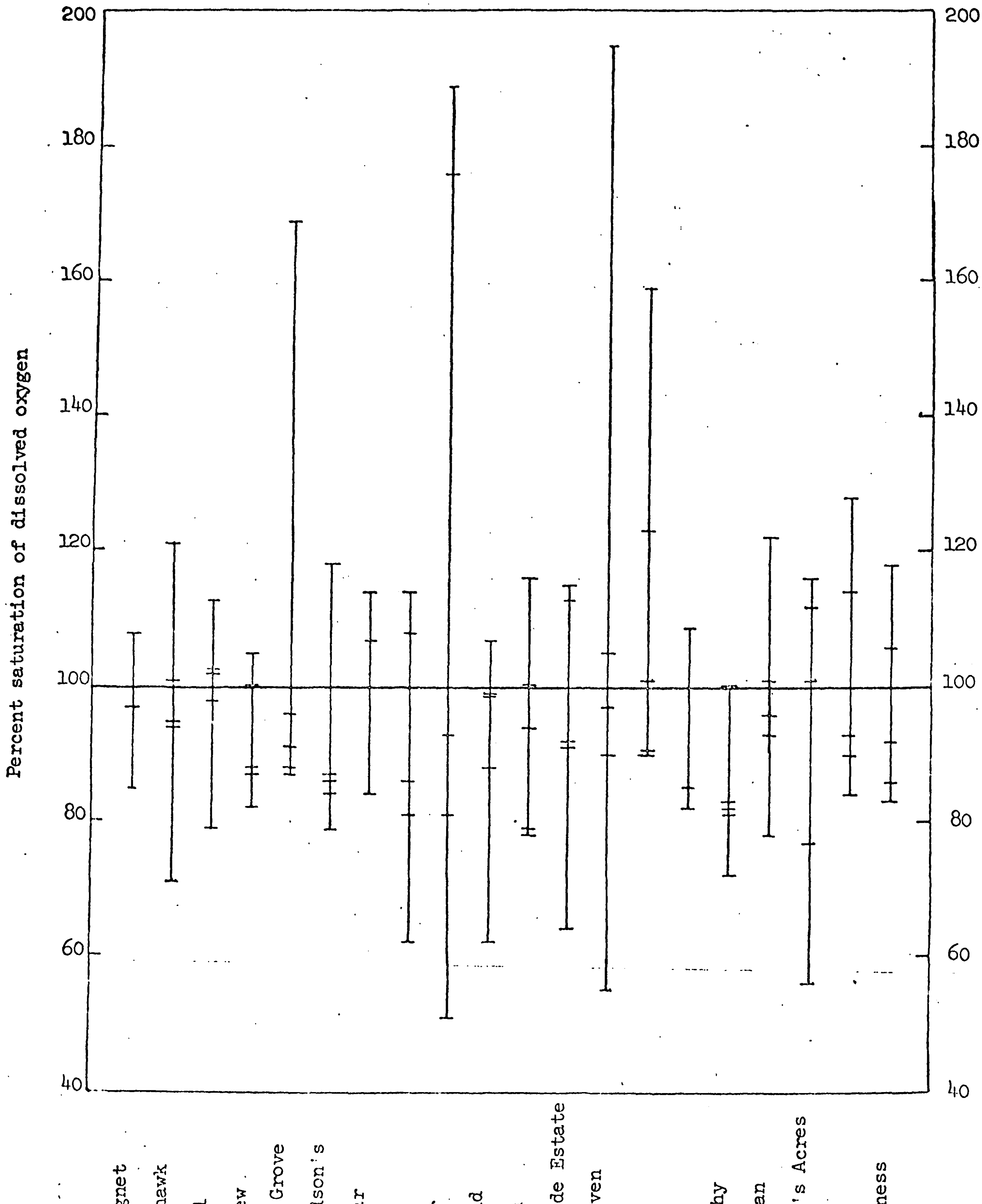

Figure 7.--Percent saturation of dissolved oxygen values for all lakes. Span indicates range between maximum and minimum values. Each mark across the vertical lines represents a sampled value.

An upper limit on pH is formed by precipitation of calcium carbonate, which controls the amount of carbonate ion that can coexist in solution with calcium ion (Symons and others, 1964, p. 18).

A pH of 8.3 is generally accepted as the carbonate end point when titrating for alkalinity with a strong acid. More specifically, at a pH of 8.3 carbonate constitutes 1 percent of the total dissolved carbon dioxide species (Hem, 1970, p. 156). Fifty-four percent of the total number of pH values were over 8.3, and 35 percent were 9.0 or greater, as shown in figure 6. At this time in the project, it is difficult to establish the natural background pH range, but the higher pH values are related to photosynthesis.

Ranges of the percent saturation of DO are shown in figure 7. Thirty-seven percent of the total number of samples were supersaturated (over 100 percent saturation). Marked supersaturation is attributable to photosynthesis.

Langhoven Lake had the highest pH and percent saturation of DO and one of the lowest pH and percent saturation values. In highly productive lakes, low pH and low DO follow massive algal blooms. Respiration, which is continuous, also can produce detectable variations in the oxygen content of the surface waters of productive lakes (Hutchinson, 1957, p. 599).

The silica values for all lakes were low. This may be why the diatom populations were small.

As shown in table 4 of the appendix, most of the nitrogen is in organic form. The ammonia and especially the nitrite and nitrate are low. This general fractionation is characteristic of eutrophic lakes, because algae assimilate their essential quantities of nitrogen in the inorganic form.

Both dissolved orthophosphorus and dissolved phosphorus are low in relation to total phosphorus, suggesting that most of the phosphorus is incorporated within the cellular material of the algae (appendix).

Inorganic carbon, nitrogen, and phosphorus were determined on bottom material samples of all the lakes in October and November 1974. Adequate supplies of nutrients are available at the lake bottoms to support bloom conditions (appendix table 4). Algal blooms often follow spring or fall circulation. Note that in Holland and Fish Lakes during the May 1974 sampling period, blooms followed shortly after the spring circulation probably because nutrients from the bottom became available at that time. Bottom nutrients are less available to the algae during summer and winter stratification. In the shallower lakes, however, bottom nutrients are probably continuously available by way of mixing and diffusion.

BOD samples were collected near the bottoms of the lakes in order to determine the oxygen demand of decomposition processes. Fish and Holland Lakes showed relatively low demands compared with the other lakes. The low BOD's indicate low concentrations of biodegradeable matter near the lake bottom.

The BOD of the other lakes were strongly influenced by the respiration and presence of algae. In September 1973 BOD's were commonly high when many of the lakes had large algal blooms.

The suspended solids and turbidities generally varied with the phytoplankton counts. Perfect correlation, however, cannot be expected because turbidity depends on particle size as well as concentration, and suspended solid material would vary more with masses rather than the numbers of phytoplankton cells. Phytoplankton vary considerably between species in both size and mass.

Specific conductance, dissolved solids, calcium, magnesium, sodium, potassium, and chloride were collected mainly for base data. The lake waters are calcium bicarbonate types.

Biological characteristics

Several species of algae are capable of producing blooms. Some of the types most frequently involved are blue-green algae, green algae, diatoms, and flagellates. Blooms of blue-green algae are particularly obnoxious.

There are many records of acute and often fatal poisoning of livestock which drank from ponds containing dense algal blooms. Animals affected include horses, cattle, hogs, sheep, dogs, rabbits, and poultry. In all cases, the alga implicated in producing the toxic agents is the blue-green *Anacystis (Microcystis)* (Palmer, 1962, p. 53).

Most of the lakes sampled for phytoplankton were typical eutrophic lakes. Blue-green algae were the dominant forms in approximately 78 percent of the samples. Blue-green algae dominated the cell counts 100 percent of the time in Blackhawk, Boesel, Burview, Cedar Grove, Farquar, Lakeside Estate, LeMay, Long, Thomas, and Wilderness Lakes (tables 6-9, 11, 16, 18, 19, 23, and 24 in appendix). Except for the November 1972 samples for Boesel and Lakeside Estate Lakes, all of the samples had cell counts of over 500 cells/ml (millilitre). *Oscillatoria, Lyngbya,* and *Anabaena* were the most common genera.

Fish and Holland Lakes seem to be of better quality biologically as indicated by both cell counts and type of algae (tables 12 and 14 in appendix). Blue-green algae were dominant in Fish Lake only in the October 1974 sample. The data do not show blue-greens to be a problem in Holland Lake. Based on phytoplankton cell counts and observations of littoral vegetation, Fish and Holland Lakes seem to be mesotrophic. All other ponds and lakes, based on similar biological characteristics, are categorized as being eutrophic.

Total coliform, fecal coliform, and fecal *Streptococci* counts were generally low (tables 5-24 in appendix). Many factors, such as sunlight, temperature, amount of organic matter, and presence of other microorganisms, affect the concentration and type of bacteria in water. In a literature search of the effects of various environmental factors on bacteria, Rudolfs, Falk, and Ragotzkie (1950) found much contradictory evidence. But, as a general rule, fecal coliform and fecal *Streptococci* counts reflect the degree of fecal pollution.

Ponds and lakes, where water is relatively slow moving, generally act as settling basins. This settles bacteria, especially those adsorbed to particulate matter (Salle, 1961, p. 547).

SUMMARY AND CONCLUSIONS

Although not all of the parameters shown in table 2 were determined, it seems that Holland and Fish Lakes are mesotrophic. The other 18 lakes show evidence of being eutrophic.

The lakes with storm sewer inlets show no evidence of being different in quality than the lakes without storm sewer inlets.

This may result from all lakes being subjected to overland runoff from the hilly terrain. Hence, it probably makes little difference, as far as nutrient enrichment is concerned, whether the overland runoff enters the lakes directly or through a storm sewer.

There are no apparent trends in the scant data available concerning the quality of the lakes.

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APPENDIX

Table 4.--Physical and chemical analyses for lakes sampled at Eagan and Apple Valley, Minn. Except for pH, values represent milligrams per litre unless otherwise indicated. (JTU, Jackson turbidity units; $CaCO_3$, calcium carbonate; N, nitrogen; P, phosphorus)

	Date	Temperature, °C	Depth at sampling point, ft	Specific conductance, µmhos/cm at 25°C	Dissolved solids	Suspended solids	Turbidity, JTU	pH	Dissolved oxygen	Dissolved oxygen, percent saturation	Alkalinity as $CaCO_3$	Silica	Ammonia as N	Organic nitrogen	Ammonia plus organic N as N	Nitrite plus nitrate as N	Total nitrogen	Nitrogen in bottom material, mg/kg	Dissolved ortho-phosphate as P	Dissolved phosphorus	Total phosphorus	Phosphorus in bottom material, mg/kg	Calcium	Magnesium	Sodium	Potassium	Chloride	Biochemical oxygen demand	Total organic carbon	Inorganic carbon in bottom material, g/kg
Alimagnet Lake at Apple Valley, Mn.	9-26-73	17.5	9.4	[1]185 [2]185	111	13	9	7.6	10.2	108	74	.2	.51	2.5	--	.04	3.0	--	.00	.02	.18	--	19	6.1	6.3	5.8	11	8.3	--	--
	5-20-74	[1]15.0 [2]14.5	8.0	189	120	7	4	[1]8.5 [2]4.5	[1]9.6 [2]9.2	[1]97 [2]93	65	.1	.09	1.3	--	.05	1.5	--	.00	.06	.08	--	19	5.4	6.2	4.1	11	4.2	--	--
	11-04-74	[1]8.5 [2]8.5	10.0	215	143	5	4	7.6	[1]10.0 [2]9.7	[1]87 [2]85	--	--	--	--	1.2	.01	1.2	700	.01	--	.06	69	--	--	--	--	12	--	11	<.1
Blackhawk Lake at Eagan, Mn.	11-09-72	5.5	6.3	[1]233 [2]233	180	41	4	8.3	[1]11.7 [2]11.7	95	107	--	--	2.0	--	.06	2.7	--	.01	.04	.05	--	33	8.7	1.4	3.8	3.1	4.6	--	--
	6-21-73	20.0	6.5	183	135	37	9	9.5	[1]6.3 [2]6.2	71	81	--	.27	2.3	--	.01	2.6	--	.01	.02	.11	--	21	8.5	2.3	3.9	2.1	8.2	--	--
	9-25-73	17.5	6.7	192	158	31	50	7.4	[1]11.4 [2]9.0	121	96	8.8	.85	7.7	--	.01	8.5	--	.03	.03	.22	--	24	8.9	1.8	4.8	2.2	--	--	--
	5-23-74	[1]17.5 [2]17.5	6.0	159	121	6	3	[1]9.5 [2]9.4	[1]9.4 [2]9.2	[1]101 [2]99	66	1.2	.09	2.0	--	.03	2.1	--	.00	.07	.09	--	16	7.6	1.6	3.8	2.3	6.9	--	--
	10-21-74	7.5	2.0	230	163	32	8	8.7	11.0	94	--	--	--	--	5.9	.00	5.9	3,400	.01	--	.17	184	--	--	--	--	2.8	--	--	13
Boesel Pond at Eagan, Mn.	11-02-72	6.5	10	110	96	20	3	7.5	[1]9.4 [2]9.5	79	34	--	.17	.93	--	.09	1.2	--	.06	.06	.07	--	11	3.2	1.7	6.4	3.7	2.0	--	--
	6-19-73	23.0	8.1	112	98	8	2	9.4	[1]8.2 [2]8.3	98	42	--	.05	1.1	--	.00	1.1	--	.05	.07	.10	--	11	3.3	2.1	6.5	4.2	1.7	--	--
	9-21-73	14.0	6.5	136	98	12	20	9.3	11.4	113	57	5.0	1.5	2.0	--	.08	3.6	--	.03	.03	.25	--	14	3.8	2.5	8.7	4.7	17	--	--
	5-23-74	[1]17.0 [2]17.5	7.0	126	81	5	4	[1]9.8 [2]9.7	[1]9.6 [2]9.3	[1]102 [2]100	50	2.6	.07	1.7	--	.05	1.9	--	.00	.03	.12	--	13	3.4	2.2	6.3	4.2	10	--	--
	10-30-74	[1]13.0 [2]12.0	5.5	145	76	14	10	8.5	[1]10.5 [2]8.5	[1]102 [2]74	--	--	--	--	4.3	.04	4.3	1,200	.01	--	.12	220	--	--	--	--	4.8	--	19	.1
Burview Park Pond at Eagan, Mn.	11-02-72	6.5	6.1	[1]246 [2]246	178	23	4	7.6	[1]9.8 [2]9.7	82	103	--	.10	--	--	.02	--	--	.01	.02	.02	--	27	11	4.8	3.0	15	2.3	--	--
	6-14-73	[1]25.0 [2]18.0	4.5	[1]279 [2]279	198	9	4	9.9	[1]8.6 [2]4.3	105	122	--	.08	1.4	--	.00	1.5	--	.00	.02	.10	--	35	9.4	5.1	4.1	12	--	--	--
	9-13-73	18.0	7.7	218	123	8	4	8.2	8.2	88	92	.8	.10	1.5	--	.01	1.6	--	.00	.00	.11	--	22	10	5.5	3.8	14	5.2	--	--
	5-30-74	20.0	7.0	275	160	8	4	[1]9.1 [2]8.7	[1]9.0 [2]6.8	[1]100 [2]76	117	.6	.16	1.4	--	.01	1.6	--	.00	.01	.11	--	34	9.5	5.2	3.4	11	4.6	--	--
	10-23-74	[1]10.0 [2]9.0	7.7	240	161	17	5	8.1	[1]9.6 [2]6.5	[1]87 [2]58	--	--	--	--	3.0	.00	3.0	1,600	.01	--	.14	300	--	--	--	--	11	--	13	<.1
Cedar Grove Pond at Eagan, Mn.	10-31-72	6.0	7.5	[1]158 [2]158	118	88	20	8.5	[1]11.0 [2]10.8	91	62	--	--	1.3	--	.02	1.3	--	.00	.02	.05	--	20	5.1	5.0	2.2	7.8	1.7	--	--
	6-13-73	[1]26.0 [2]26.0	7.8	[1]281 [2]265	155	15	20	10.2	13.5	169	50	--	.12	2.5	--	.00	2.6	--	.00	.02	.13	--	18	3.7	29	3.5	45	--	--	--
	9-18-73	15.5	7.2	157	114	19	50	8.3	8.5	87	38	2.8	.21	1.4	--	.00	1.6	--	.00	.02	.26	--	13	2.6	14	2.8	23	29	--	--
	5-28-74	18.0	7.0	236	122	10	8	[1]8.7 [2]7.5	[1]8.1 [2].8	[1]88 [2]9	52	2.4	.10	1.4	--	.02	1.5	--	.00	.03	.11	--	15	4.2	22	2.9	34	8.4	--	--
	11-04-74	[1]7.5 [2]7.5	6.0	160	108	3	4	8.0	[1]11.2 [2]11.1	[1]96 [2]99	--	--	--	--	2.7	.12	2.8	1,200	.01	--	.15	60	--	--	--	--	12	--	19	0.2

[1] Sampled near water surface.
[2] Sampled near lake bottom.

Table 4.--Physical and chemical analyses for lakes sampled at Eagan and Apple Valley, Minn. Except for pH, values represent milligrams per litre unless otherwise indicated. (JTU, Jackson turbidity units; $CaCO_3$, calcium carbonate: N, nitrogen: P, phosphorus)--Continued

Lake	Date	Temperature, °C	Depth at sampling point, ft	Specific conductance, µmhos/cm at 25°C	Dissolved solids	Suspended solids	Turbidity, JTU	pH	Dissolved oxygen	Dissolved oxygen, percent saturation	Alkalinity as $CaCO_3$	Silica	Ammonia as N	Organic nitrogen	Ammonia plus organic N as N
Donaldson's Pond at Eagan, Mn.	11-03-72	6.0	8.2	[1]171 [2]171	116	28	10	8.0	[1]9.5 [2]9.6	79	70	--	.12	.26	--
	6-20-73	23.0	9.0	254	164	6	3	8.4	[1]7.2 [2]6.0	86	84	--	.07	.66	--
	9-24-73	16.0	7.5	230	145	8	5	8.2	8.4	87	78	4.5	.50	.47	--
	5-21-74	[1]18.5 [2]16.0	8.0	290	0	1	1	[1]9.1 [2]9.2	[1]10.4 [2]10.8	[1]118 [2]111	63	1.5	.03	.52	--
	10-29-74	[1]12.0 [2]10.0	8.0	230	139	2	3	7.6	[1]8.8 [2]6.0	[1]84 [2]54	--	--	--	--	1.1
Farquar Lake at Apple Valley, Mn.	9-25-73	16.0	6.3	[1]165 [2]165	108	16	20	8.8	[1]10.4 [2]10.0	[1]107 [2]103	71	4.3	.09	3.9	--
	5-15-74	12.0	8.0	163	106	16	8	9.9	12.0	114	62	.2	.06	2.9	--
	10-31-74	[1]12.5 [2]11.5	7.5	195	134	28	20	7.8	[1]8.7 [2]7.8	[1]84 [2]74	--	--	--	--	4.0
Fish Lake at Eagan, Mn.	10-30-72	6.5	25	[1]215 [2]220	142	--	2	8.0	[1]10.2 [2]10.1	86	98	--	.05	.64	--
	6-14-73	[1]23.5 [2]23.5	27	[1]180 [2]255	131	2	1	10.2	[1]9.6 [2]2.0	114	87	--	.03	.78	--
	9-20-73	16	28	[1]205 [2]280	136	6	1	8.0	[1]6.0 [2]4.0	62	98	1.2	.04	.67	--
	5-10-74	11.5	28	259	155	1	1	8.6	11.4	108	119	--	.13	.53	--
	10-24-74	[1]10.5 [2]8.5	28	230	138	1	1	8.1	[1]8.8 [2].5	[1]81 [2]4	--	--	--	--	1.0
Hauser Pond at Eagan, Mn.	11-10-72	5.0	1.8	243	198	50	5	7.6	10.1	81	114	--	.11	.85	--
	6-15-73	30.5	3.0	172	150	32	20	10.5	13.8	189	93	--	.17	2.2	--
	9-12-73	17.0	1.5	290	183	13	10	7.5	4.8	51	128	16	1.4	1.9	--
	5-29-74	24.0	2.0	167	113	2	3	[1]10.5 [2]9.6	[1]14.6 [2]12.7	[1]176 [2]153	76	.5	.09	1.1	--
	10-22-74	11.0	1.0	240	159	11	3	7.6	10.0	93	--	--	--	--	1.9
Holland Lake at Eagan, Mn.	11-14-72	[1]4.0 [2]4.5	58	[1]185 [2]193	86	6	3	7.4	[1]8.0 [2]7.3	62	83	--	.10	.71	--
	6-22-73	[1]22.0 [2]5.0	57.5	[1]170 [2]235	118	10	2	8.8	[1]8.5 [2]1.6	99	77	--	.06	.69	--
	9-20-73	[1]17.0 [2]5.0	50.0	[1]140 [2]225	106	1	1	[1]8.7 [2]7.2	[1]9.4 [2]0.3	[1]99 [2]2	66	.2	.04	.50	--
	5-24-74	15.0	50	136	83	1	1	9.1	10.6	107	62	.1	.11	.11	--
	10-17-74	[1]10.0 [2]5.0	50	[1]160 [2]225	102	17	1	8.0	[1]9.7 [2]0.3	[1]88 [2]2	--	--	--	--	.76

Lake	Date	Nitrite plus nitrate as N	Total nitrogen	Nitrogen in bottom material, mg/kg	Dissolved ortho-phosphate as P	Dissolved phosphorus	Total phosphorus	Phosphorus in bottom material, mg/kg	Calcium	Magnesium	Sodium	Potassium	Chloride	Biochemical oxygen demand	Total organic carbon	Inorganic carbon in bottom material, g/kg
Donaldson's Pond at Eagan, Mn.	11-03-72	.10	.48	--	.04	.05	.05	--	26	3.3	4.4	1.7	7.5	1.9	--	--
	6-20-73	.00	.73	--	.00	.02	.02	--	28	4.4	16	2.1	25	2.9	--	--
	9-24-73	.18	1.1	--	.00	--	.06	--	29	4.0	11	1.9	15	4.1	--	--
	5-21-74	.07	.62	--	.00	.04	.04	--	26	3.0	23	1.6	39	1.5	--	--
	10-29-74	.06	1.2	140	.00	--	.05	328	--	--	--	--	15	--	9.5	8.9
Farquar Lake at Apple Valley, Mn.	9-25-73	.08	4.1	--	.01	.02	.24	--	15	6.7	5.7	7.0	11	20	--	--
	5-15-74	.21	3.2	--	.01	.01	.10	--	16	6.3	5.1	5.8	10	13	--	--
	10-31-74	.04	4.0	1,600	.00	--	.13	413	--	--	--	--	12	--	22	<.1
Fish Lake at Eagan, Mn.	10-30-72	.02	.71	--	.02	.02	.02	--	26	9.8	2.0	2.7	4.5	3.5	--	--
	6-14-73	.00	.81	--	.01	.01	.05	--	19	9.2	3.1	2.4	5.6	--	--	--
	9-20-73	.01	.72	--	.00	.01	.01	--	22	10	3.2	2.3	6.0	3.5	--	--
	5-10-74	.03	.69	--	.01	.02	.02	--	33	9.9	4.7	3.1	7.7	--	--	--
	10-24-74	.00	1.0	80	.00	--	.01	158	--	--	--	--	8.0	--	9.0	2.6
Hauser Pond at Eagan, Mn.	11-10-72	.01	.97	--	--	--	.05	--	30	10	2.5	3.8	3.1	3.0	--	--
	6-15-73	.00	2.4	--	.01	.02	.12	--	18	4.9	2.0	1.6	1.5	--	--	--
	9-12-73	.00	3.3	--	.04	.07	.10	--	37	12	3.2	4.9	4.1	8.0	--	--
	5-29-74	.02	1.2	--	.00	.03	.05	--	19	7.8	2.1	1.2	1.5	2.4	--	--
	10-22-74	.03	1.9	300	.01	--	.00	190	--	--	--	--	5.1	--	20	<.1
Holland Lake at Eagan, Mn.	11-14-72	.00	.81	--	.00	.02	.05	--	22	4.1	2.0	2.4	5.1	--	--	--
	6-22-73	.00	.75	--	.00	.00	.01	--	20	8.0	2.5	2.2	4.1	2.4	--	--
	9-20-73	.00	.54	--	.00	.00	.00	--	17	7.7	2.5	1.9	4.7	2.5	--	--
	5-24-74	.01	.23	--	.00	.03	.03	--	13	7.1	3.3	1.4	4.1	1.5	--	--
	10-17-74	.01	.77	4,900	.01	--	.01	85	--	--	--	--	5.3	--	10	<.1

[1] Sampled near water surface.
[2] Sampled near lake bottom.

Table 4.--Physical and chemical analyses for lakes sampled at Eagan and Apple Valley, Minn. Except for pH, values represent milligrams per litre unless otherwise indicated. (JTU, Jackson turbidity units: $CaCO_3$, calcium carbonate; N, nitrogen: P, phosphorus)--Continued

	Date	Temperature, °C	Depth at sampling point, ft	Specific conductance, µmhos/cm at 25°C	Dissolved solids	Suspended solids	Turbidity, JTU	pH	Dissolved oxygen	Dissolved oxygen, percent saturation	Alkalinity as $CaCO_3$	Silica	Ammonia as N	Organic nitrogen	Ammonia plus organic N as N	Nitrite plus nitrate as N	Total nitrogen	Nitrogen in bottom material, mg/kg	Dissolved ortho-phosphate as P	Dissolved phosphorus	Total phosphorus	Phosphorus in bottom material, mg/kg	Calcium	Magnesium	Sodium	Potassium	Chloride	Biochemical oxygen demand	Total organic carbon	Inorganic carbon in bottom material, g/kg
Jensen Lake at Eagan, Mn.	11-01-72	6.0	6.3	193	156	105	5	7.4	[1]9.6 [2]9.8	79	84	--	.11	1.6	--	.01	1.7	--	.00	.02	.06	--	24	8.6	3.1	.8	6.0	5.9	--	--
	6-22-73	[1]19.0 [2]18.0	6.9	[1]173 [2]175	137	24	6	9.2	[1]9.1 [2]6.3	100	76	--	.07	1.9	--	.00	2.0	--	.00	.01	.11	--	19	8.8	3.9	0.6	6.0	25	--	--
	9-19-73	15.5	4.5	190	149	17	7	7.8	11.4	116	94	1.3	.05	1.7	--	0.1	1.7	390	.01	.01	0.10	92	23	9.3	3.9	0.4	5.8	29	--	--
	5-24-74	[1]15.0 [2]14.5	6.0	194	122	2	2	[1]7.9 [2]7.9	[1]9.3 [2]8.4	[1]94 [2]84	84	.2	.12	.09	--	.01	.22	--	.00	.03	.05	--	21	8.8	4.4	.9	6.5	3.7	--	--
	10-17-74	10.0	5.0	200	138	4	3	7.8	8.6	78	--	--	--	--	1.6	.00	1.6	600	.01	--	.05	69	--	--	--	--	7.6	--	29	<.1
Lakeside Estate Lake at Eagan, Mn.	11-03-72	6.0	4.2	[1]169 [2]169	132	13	6	7.8	[1]11.0 [2]11.1	91	67	--	.09	1.1	--	.03	1.2	--	.04	.04	.30	--	24	6.1	2.9	4.2	4.9	3.2	--	--
	6-20-73	20.0	5.8	171	122	22	4	7.8	[1]5.7 [2]5.6	64	79	--	.09	1.2	--	.00	1.3	--	.00	.02	.06	--	20	6.4	2.4	3.6	4.4	4.7	--	--
	9-13-73	19.0	4.0	184	117	9	4	8.4	8.4	92	88	3.6	.15	--	--	.01	--	--	.01	.01	.10	--	22	7.1	3.6	4.1	5.1	6.8	--	--
	5-29-74	19.0	5.0	174	117	16	9	[1]9.6 [2]8.7	[1]10.5 [2]4.6	[1]115 [2]50	76	2.2	.58	3.1	--	.04	3.7	--	.01	.13	.30	--	18	6.4	3.8	3.8	4.2	--	--	--
	10-23-74	11.0	3.8	195	125	11	6	9.1	12.2	113	--	--	--	--	3.5	.01	3.5	1,600	.01	--	.19	182	--	--	--	--	5.2	--	14	<.1
Langhoven Lake at Eagan, Mn.	10-26-72	8.4	1.6	[1]275 [2]260	140	44	30	7.4	10.3	90	121	--	.09	.13	--	.12	.34	--	.00	.01	.09	--	37	9.9	3.8	3.4	6.7	6.4	--	--
	6-13-73	23.0	2.0	230	194	8	10	11.5	16.4	195	105	--	.07	1.4	--	.01	1.5	--	.04	.12	.20	--	24	7.9	5.8	3.6	11	--	--	--
	9-18-73	12.0	1.6	290	193	6	10	8.1	10.2	97	137	6.1	.12	1.5	--	.00	1.6	--	.02	.05	.23	--	42	9.5	4.5	5.4	7.8	13	--	--
	5-22-73	23.0	2.0	230	142	8	6	9.1	8.9	105	80	1.7	.13	.97	--	.14	1.2	--	.01	.06	.16	--	27	6.5	8.5	2.8	13	4.4	--	--
	10-30-74	13.5	1.5	285	147	11	7	7.6	5.6	55	--	--	--	--	2.6	.03	2.6	170	.01	--	.28	360	--	--	--	--	9.4	--	21	5.5
LeVay Lake at Eagan, Mn.	10-26-72	6.5	7.2	[1]335 [2]335	178	23	5	8.3	[1]10.7 [2]10.9	[1]90 [2]92	130	--	.17	.10	--	.13	.40	--	.00	.01	.06	--	36	13	11	4.3	17	4.1	--	--
	6-12-73	[1]24.0 [2]22.0	8.0	[1]232 [2]232	136	4	3	10.5	[1]13.2 [2]10.1	[1]159 [2]117	71	--	.05	1.1	--	.00	1.1	--	.00	.01	.04	--	14	11	12	2.3	19	--	--	--
	9-17-73	17.0	6.1	262	178	18	20	9.1	9.6	101	102	--	.16	2.5	--	.13	2.8	--	.03	.04	.16	--	22	12	15	4.9	22	16	--	--
	5-21-74	[1]20.0 [2]13.0	7.5	312	169	8	5	[1]9.0 [2]8.9	[1]11.1 [2]9.9	[1]123 [2]108	111	2.1	.07	1.2	--	.08	1.4	--	.01	.04	.09	--	29	12	15	3.3	23	5.1	--	--
	10-29-74	12.0	5.0	325	204	6	4	8.6	9.5	90	--	--	--	--	2.0	.00	2.0	50	.01	--	.10	279	--	--	--	--	24	--	21	5.4
Long Lake at Apple Valley, Mn.	9-26-73	20.0	4.7	189	142	32	20	9.6	7.6	85	73	2.0	.45	4.6	--	.03	5.0	--	.00	.03	.25	--	19	6.9	6.3	4.3	15	20	--	--
	5-15-74	10.0	5.0	190	118	11	8	9.6	12.0	109	70	.4	.07	2.5	--	.02	2.6	--	.01	.03	.11	--	19	7.0	5.9	3.1	14	13	--	--
	10-31-74	12.5	4.0	210	139	13	9	8.5	8.5	82	--	--	--	--	4.0	.01	4.0	70	.00	--	.19	143	--	--	--	--	17	--	29	<.1

[1] Sampled near water surface.
[2] Sampled near lake bottom.

Table 4.--Physical and chemical analyses for lakes sampled at Eagan and Apple Valley, Minn. Except for pH, values represent milligrams per litre unless otherwise indicated. (JTU, Jackson turbidity units; $CaCO_3$, calcium carbonate; N, nitrogen; P, phosphorus)--Continued

Lake	Date	Temperature, °C	Depth at sampling point, ft	Specific conductance, µmhos/cm at 25°C	Dissolved solids	Suspended solids	Turbidity, JTU	pH	Dissolved oxygen	Dissolved oxygen, percent saturation	Alkalinity as $CaCO_3$	Silica	Ammonia as N	Organic nitrogen	Ammonia plus organic N as N	Nitrite plus nitrate as N	Total nitrogen	Nitrogen in bottom material, mg/kg	Dissolved ortho-phosphate as P	Dissolved phosphorus	Total phosphorus	Phosphorus in bottom material, mg/kg	Calcium	Magnesium	Sodium	Potassium	Chloride	Biochemical oxygen demand	Total organic carbon	Inorganic carbon in bottom material, g/kg
McCarthy Lake at Eagan, Mn.	11-13-72	2.0	3.2	205	160	8	3	8.0	10.9	81	140	--	.07	.88	--	.02	.97	--	.01	.03	.04	--	39	12	3.5	4.7	6.2	3.0	--	--
	6-21-73	19.5	4.4	248	163	6	2	8.4	7.5	83	121	--	.07	.70	--	.00	.77	--	.01	.03	.05	--	30	11	3.1	2.5	3.5	2.9	--	--
	9-26-73	17.5	3.0	221	120	3	2	8.4	7.7	82	113	2.7	.07	.93	--	.02	1.0	--	.03	.02	.09	--	25	11	2.9	2.9	2.6	8.2	--	--
	5-22-74	20.0	2.5	255	146	1	1	8.1	9.0	100	118	.4	.05	.67	--	.01	.73	--	.00	.03	.05	--	31	9.9	3.6	4.3	5.5	2.1	--	--
	10-18-74	11.0	1.5	285	174	17	2	7.9	7.8	72	--	--	--	--	1.5	.02	1.5	40	.01	--	.08	170	--	--	--	--	6.9	--	15	2.4
[illegible] Pond at Eagan, Mn.	11-10-72	5.5	6.5	[1]120 [2]120	106	39	7	8.2	[1]12.4 [2]12.5	101	45	--	.12	1.8	--	.00	1.9	--	--	--	.05	--	10	5.1	2.9	4.6	3.2	10	--	--
	6-15-73	24.5	9.0	[1]120 [2]170	111	18	8	11.0	7.6	93	52	--	.15	2.2	--	.03	2.3	--	.00	.00	.08	--	12	2.7	2.8	4.2	3.6	--	--	--
	9-12-73	22.0	4.0	[1]124 [2]160	85	20	10	9.3	10.5	122	56	.9	.13	2.7	--	.00	2.8	--	.01	.03	.12	--	11	5.6	3.1	4.5	4.5	15	--	--
	5-30-74	20.0	7.0	116	91	9	6	[1]8.0 [2]6.8	[1]7.0 [2]5.6	[1]78 [2]62	37	.7	.26	2.6	--	.04	2.9	--	.00	.02	.12	--	11	4.3	2.8	4.1	3.9	4.6	--	--
	10-22-74	10.0	6.5	120	120	13	4	7.9	10.6	96	--	--	--	--	3.1	.05	3.2	140	.04	--	.14	93	--	--	--	--	4.7	--	32	<.1
Slater's Acres Pond at Eagan, Mn.	10-31-72	5.5	4.1	109	104	114	3	7.4	[1]9.5 [2]9.5	77	32	--	.10	1.0	--	.30	1.5	--	.01	.04	.04	--	10	3.4	1.9	5.5	7.7	12	--	--
	6-19-73	[1]20.5 [2]18.0	6.0	[1]110 [2]210	101	10	20	9.0	[1]10.2 [2]6.0	116	44	--	.26	2.5	--	.00	2.8	--	.03	.08	.25	--	10	3.6	2.4	7.6	6.5	9.5	--	--
	9-21-73	12.0	3.8	132	90	5	6	7.1	5.9	56	53	1.0	.98	1.0	--	.07	2.1	--	.12	.16	.20	--	13	4.2	2.9	9.8	8.4	3.3	--	--
	5-28-74	20.0	7.0	104	59	2	4	[1]8.1 [2]8.1	[1]9.1 [2]9.1	[1]101 [2]101	31	.4	.12	1.3	--	.06	1.5	--	.02	.11	.13	--	9.4	3.1	2.0	5.4	4.8	9.6	--	--
	10-21-74	8.0	1.5	105	69	7	2	9.5	13.0	112	--	--	--	--	1.4	.00	1.4	6,200	.01	--	.23	233	--	--	--	--	5.1	--	15	<.
Thomas Lake at Eagan, Mn.	10-30-72	6.0	6.8	[1]183 [2]190	138	84	30	8.6	[1]11.2 [2]11.4	93	66	--	.42	3.2	--	.08	3.7	--	.02	.02	.11	--	17	5.9	6.5	4.4	15	16	--	--
	6-11-73	[1]24.0 [2]18.0	8.2	[1]174 [2]340	128	26	30	9.8	[1]10.6 [2].4	128	63	--	.09	3.0	--	.00	3.1	--	.00	.03	.15	--	19	5.9	7.4	4.6	14	--	--	--
	9-14-73	18.0	7.0	197	130	9	30	8.8	7.8	84	72	4.5	.65	5.1	--	.01	5.7	--	.02	.02	.18	--	19	6.6	8.3	5.3	16	23	--	--
	5-16-74	12.0	7.0	[1]185 [2]175	130	14	20	[1]9.9 [2]9.6	[1]12.0 [2]10.0	[1]114 [2]95	64	1.3	.12	3.8	--	.08	4.0	--	.00	.02	.15	--	17	5.7	7.5	4.6	15	>24	--	--
	10-18-74	10.0	5.5	230	140	16	8	8.1	9.9	90	--	--	--	--	6.6	.16	6.8	6,700	.02	--	.13	190	--	--	--	--	19	--	37	<.
Wilderness Lake at Eagan, Mn.	10-30-72	6.0	8.0	152	90	98	8	9.3	[1]12.8 [2]12.6	106	66	--	.16	1.8	--	.02	2.0	--	--	.02	.05	--	17	4.8	3.1	3.6	7.7	--	--	--
	6-12-73	[1]23.0 [2]17.0	9.6	[1]137 [2]167	84	11	7	11.4	[1]7.7 [2]0.0	92	53	--	.08	1.6	--	.02	1.7	--	.00	.01	.08	--	15	4.1	2.9	5.0	6.5	--	--	--
	9-19-73	15.0	7.5	140	109	18	20	8.5	8.2	83	61	2.5	.46	3.6	--	.00	4.1	--	.02	.01	.13	--	16	4.2	4.1	5.3	6.7	27	--	--
	5-16-74	[1]14.0 [2]10.0	7.0	123	98	16	6	[1]9.4 [2]8.4	[1]12.0 [2]4.1	[1]118 [2]37	48	.2	.33	3.1	--	.13	3.5	--	.00	.02	.17	--	14	3.5	3.2	3.9	5.8	>23	--	--
	10-24-74	10.5	4.9	155	113	38	20	7.5	9.4	86	--	--	--	--	6.2	.33	6.5	2,100	.00	--	.32	157	--	--	--	--	8.2	--	19	<.

[1] Sampled near water surface.
[2] Sampled near lake [illegible]

Table 5.--Biological analyses for Alimagnet Lake.

PHYTOPLANKTON ANALYSES

Group:	Sample No.:	Date:	Total cells/ml:	Dominant group(s):
D, diatom	1.	Sept. 26, 73	9,900	G
G, green	2.	May 20, 74	220,000	BG
BG, blue-green	3.	Nov. 4, 74	76,000	BG
Fl, flagellate				

Alga name	Group	Percent of total	Samples found in
Oocystis	G	27, 3	1, 3
Pediastrum	G	21, 3, 20	1, 2, 3
Anabaena	BG	81	2
Gomphosphaeria	BG	14	2
Cyclotella	D	1	2
Anacystis	BG	57	3
Ochromonas	Fl	5	3
Coelastrum	G	5	3
Scenedesmus	G	3	3
Selenastrum	G	1	3
Fragilaria	D	2	3
Pandorina	Fl	2	3
Ankistrodesmus	G	1	3
Tetrastrum	G	1	3

BACTERIA ANALYSES

Date	Total coliform (colonies/100 ml)	Fecal coliform (colonies/100 ml)	Fecal *Streptococci* (colonies/100 ml)
9-26-73	180	25	--
5-20-74	0	0	--
11-04-74	--	4	31

Table 6.--Biological analyses for Blackhawk Lake.

PHYTOPLANKTON ANALYSES

Group:	Sample No.:	Date:	Total cells/ml:	Dominant group(s):
D, diatom	1.	Nov. 9, 72	3,800	BG
G, green	2.	June 21, 73	410,000	BG
BG, blue-green	3.	Sept. 25, 73	9,000,000	BG
Fl, flagellate	4.	May 23, 74	710,000	BG
	5.	Oct. 21, 74	2,500,000	BG

Alga name	Group	Percent of total	Samples found in
Anacystis	BG	35, 3, 2	1, 4, 5
Lyngbya contorta	BG	36	2
Aphanizomenon	BG	27	2
Lyngbya	BG	16, 68	2, 5
Anabaena	BG	99, 8	3, 5
Oscillatoria	BG	97	4
Anacystis incerta	BG	18	5
Agmenellum	BG	3	5
Gomphosphaeria	BG	1	5

BACTERIA ANALYSES

Date	Total coliform (colonies/100 ml)	Fecal coliform (colonies/100 ml)	Fecal *Streptococci* (colonies/100 ml)
11-09-72	96	8	--
6-21-73	8	0	--
9-25-73	290	32	--
5-23-74	6	4	--
10-21-74	--	0	8

Table 7.--Biological analyses for Boesel Pond.

PHYTOPLANKTON ANALYSES

Group:	Sample No.:	Date:	Total cells/ml:	Dominant group(s):
D, diatom	1.	Nov. 2, 72	42	BG
G, green	2.	June 19, 73	16,000	BG
BG, blue-green	3.	Sept. 21, 73	233,000	BG
Fl, flagellate	4.	May 23, 74	820,000	BG
	5.	Oct. 30, 74	7,600,000	BG

Alga name	Group	Percent of total	Samples found in
Oscillatoria	BG	50, 8	1, 5
Lyngbya	BG	85, 92, 91	2, 4, 5
Anabaena	BG	93, 3	3, 4
Anacystis	BG	50, 3, 1	1, 4, 5
Scenedesmus	G	1, 1	4
Synedra	D	1	4

BACTERIA ANALYSES

Date	Total coliform (colonies/100 ml)	Fecal coliform (colonies/100 ml)	Fecal *Streptococci* (colonies/100 ml)
11-02-72	35	0	--
6-19-73	7	3	--
9-21-73	140	16	--
5-23-74	2	2	--
10-30-74	--	14	12

Table 8.--Biological analyses for Burview Park Pond.

PHYTOPLANKTON ANALYSES

Group:	Sample No.:	Date:	Total cells/ml:	Dominant group(s):
D, diatom	1.	Nov. 2, 72	520	G
G, green	2.	June 14, 73	43,000	BG
BG, blue-green	3.	Sept. 13, 73	1,100,000	BG
Fl, flagellate	4.	May 30, 74	300,000	BG

Alga name	Group	Percent of total	Samples found in
Dactylococcopsis	G	47	1
Rhodomonas	Fl	28	1
Anacystis	BG	49, 21, 48	2, 4, 5
Anabaena	BG	19, 1	2, 5
Schroederia setigera	G	18	2
Gomphosphaeria	BG	87	3
Agmenellum	BG	33, 51	4, 5
Anacystis incerta	BG	38	4
Oscillatoria	BG	1	5

BACTERIA ANALYSES

Date	Total coliform (colonies/100 ml)	Fecal coliform (colonies/100 ml)	Fecal *Streptococci* (colonies/100 ml)
11-02-72	150	4	--
6-14-73	6	1	--
9-13-73	230	20	--
5-30-74	8	0	--
10-23-74	---	0	4

Table 9.--Biological analyses for Cedar Grove Pond.

PHYTOPLANKTON ANALYSES

Group:	Sample No.:	Date:	Total cells/ml:	Dominant group(s):
D, diatom	1.	Oct. 31, 72	11,000	BG
G, green	2.	June 13, 73	740,000	BG
BG, blue-green	3.	Sept. 18, 73	7,700,000	BG
Fl, flagellate	4.	May 28, 74	2,400,000	BG
	5.	Nov. 4, 74	620,000	BG

Alga name	Group	Percent of total	Samples found in
Oscillatoria	BG	93, 38, 71, 53, 68	1, 2, 3, 4, 5
Lyngbya	BG	31, 46, 22	2, 4, 5
Anabaena	BG	28, 1, 2	2, 4, 5
Gomphosphaeria	BG	25	3
Anacystis	BG	6	5
Actinastrum	G	3	5

BACTERIA ANALYSES

Date	Total coliform (colonies/100 ml)	Fecal coliform (colonies/100 ml)	Fecal *Streptococci* (colonies/100 ml)
10-31-72	20	18	--
6-13-73	45	0	--
9-18-73	--	11	--
5-28-74	9	1	--
11-04-74	--	40	28

Table 10.--Biological analyses for Donaldson's Pond.

PHYTOPLANKTON ANALYSES

Group:	Sample No.:	Date:	Total cells/ml:	Dominant group(s):
D, diatom	1.	Nov. 3, 72	7	G
G, green	2.	June 20, 73	120,000	BG
BG, blue-green	3.	Sept. 25, 73	13,000	BG
Fl, flagellate	4.	May 21, 74	5,400	BG
	5.	Oct. 29, 74	2,100	Fl

Alga name	Group	Percent of total	Samples found in
Dactylococcopsis	G	100	1
Oscillatoria	BG	84	2
Anabaena	BG	99, 94	3, 4
Ankistrodesmus	G	3	4
Oedogonium	G	2	4
Cyclotella	D	1	4
Ochromonas	Fl	74	5
Schroederia	G	9	5
Cryptomonas	Fl	7	5
Quadrigula	G	5	5
Chlamydomonas	Fl	4	5
Trachelomonas	Fl	1	5
Phacus	Fl	1	5

BACTERIA ANALYSES

Date	Total coliform (colonies/100 ml)	Fecal coliform (colonies/100 ml)	Fecal *Streptococci* (colonies/100 ml)
11-03-72	150	2	--
6-20-73	20	4	--
9-24-73	20	1	--
5-21-74	5	0	--
10-29-74	---	42	700

Table 11.--Biological analyses for Farquar Lake.

PHYTOPLANKTON ANALYSES

Group:	Sample No.:	Date:	Total cells/ml:	Dominant group(s):
D, diatom	1.	Sept. 25, 73	7,900,000	BG
G, green	2.	May 15, 74	1,100,000	BG
BG, blue-green	3.	Oct. 31, 74	1,700,000	BG
Fl, flagellate				

Alga name	Group	Percent of total	Samples found in
Gomphosphaeria	BG	49	1
Oscillatoria	BG	40, 62, 1	1, 2, 3
Lyngbya	BG	20, 30	2, 3
Anacystis incerta	BG	15, 5	2, 5
Anabaena	BG	2	2
Aphanizomenon	BG	44	3
Anacystis	BG	20	3
Agmenellum	BG	1	3

BACTERIA ANALYSES

Date	Total coliform (colonies/100 ml)	Fecal coliform (colonies/100 ml)	Fecal *Streptococci* (colonies/100 ml)
9-25-73	35	0	--
5-15-74	2	0	--
10-31-74	--	8	12

Table 12.--Biological analyses for Fish Lake.

PHYTOPLANKTON ANALYSES

Group:	Sample No.:	Date:	Total cells/ml:	Dominant group(s):
D, diatom	1.	Oct. 30, 72	810	Fl
G, green	2.	June 14, 73	940	Fl
BG, blue-green	3.	Sept. 20, 73	190	Fl
Fl, flagellate	4.	May 10, 74	11,000	Fl
	5.	Oct. 24, 74	520	BG

Alga name	Group	Percent of total	Samples found in
Ochromonas	Fl	74	1
Cryptomonas	Fl	31, 5	2, 4
Anacystis	BG	16	2
Chlamydomonas	Fl	47	3
Dinobryon	Fl	72	4
Trachelomonas	Fl	11, 3	4, 5
Scenedesmus	G	6	4
Lyngbya	BG	4	4
Ankistrodesmus	G	1	4
Euglena	Fl	1	4
Gomphosphaeria	BG	82	5
Aphanizomenon	BG	10	5
Quadrigula	G	5	5

BACTERIA ANALYSES

Date	Total coliform (colonies/100 ml)	Fecal coliform (colonies/100 ml)	Fecal *Streptococci* (colonies/100 ml)
10-30-72	2	2	--
6-14-73	--	0	--
9-20-73	10	4	--
5-10-74	--	--	--
10-24-74	--	0	2

Table 13.--Biological analyses for Hauser Pond.

PHYTOPLANKTON ANALYSES

Group:	Sample No.:	Date:	Total cells/ml:	Dominant group(s):
D, diatom	1.	Nov. 10, 72	290	Fl
G, green	2.	June 15, 73	7,600	BG
BG, blue-green	3.	Sept. 12, 73	1,100	G
Fl, flagellate	4.	May 29, 74	3,200	D
	5.	Oct. 22, 74	380	BG

Alga name	Group	Percent of total	Samples found in
Euglena	Fl	64, 2	1, 5
Anabaena	BG	33	2
Oocystis	G	22	2
Chlorella	G	37	3
Chlamydomonas	Fl	25	3
Fragilaria	D	32	4
Oscillatoria	BG	23	4
Anacystis incerta	BG	13	4
Synedra	D	11, 3	4, 5
Sphaerocystis	G	9	4
Spirogyra	G	4	4
Agmenellum	BG	4	4
Melosira	D	1	4
Cyclotella	D	1	4
Ankistrodesmus	G	1	4
Anacystis	BG	63	5
Cryptomonas	Fl	21	5
Scenedesmus	G	7	5
Navicula	D	3	5
Trachelomonas	Fl	1	5
Closterium	G	1	5

BACTERIA ANALYSES

Date	Total coliform (colonies/100 ml)	Fecal coliform (colonies/100 ml)	Fecal *Streptococci* (colonies/100 ml)
11-10-72	16	2	--
6-15-73	90	0	--
9-12-73	160	60	--
5-29-74	0	0	--
10-22-74	--	20	4

Table 14.--Biological analyses for Holland Lake.

PHYTOPLANKTON ANALYSES

Group:	Sample No.:	Date:	Total cells/ml:	Dominant group(s):
D, diatom	1.	Nov. 14, 72	520	BG, G, Fl
G, green	2.	June 22, 73	110	BG
BG, blue-green	3.	Sept. 20, 73	150	Fl
Fl, flagellate	4.	May 24, 74	5,600	Fl
	5.	Oct. 17, 74	1,000	Fl

Alga name	Group	Percent of total	Samples found in
Anabaena	BG	36, 2	1, 4
Selenastrum	G	27	1
Dinobryon	Fl	21, 59, 42	1, 3, 4
Anacystis	BG	78	2
Ochromonas	Fl	39	4
Palmellococcus	G	14	4
Quadrigula	G	2	4
Mallomonas	Fl	54	5
Cryptomonas	Fl	30	5
Chlamydomonas	Fl	14	5
Synedra	D	3	5

BACTERIA ANALYSES

Date	Total coliform (colonies/100 ml)	Fecal coliform (colonies/100 ml)	Fecal *Streptococci* (colonies/100 ml)
11-14-72	10	6	--
6-22-73	8	3	--
9-20-73	88	1	--
5-24-74	2	0	--
10-17-74	--	0	12

Table 15.--Biological analyses for Jensen Lake.

PHOTOPLANKTON ANALYSES

Group:	Sample No.:	Date:	Total cells/ml:	Dominant group(s):
D, diatom	1.	Nov. 17, 72	5,400	G
G, green	2.	June 22, 73	31,000	G
BG, blue-green	3.	Sept. 19, 73	2,400,000	BG
Fl, flagellate	4.	May 24, 74	79,000	BG
	5.	Oct. 17, 74	9,400	BG

Alga name	Group	Percent of total	Samples found in
Dictyosphaerium	G	35, 51, 27	1, 2, 5
Lyngbya	BG	21	2
Oscillatoria	BG	69	3
Gomphosphaeria	BG	20	3
Anacystis incerta	BG	77, 33	4, 5
Anacystis	BG	6, 12	4, 5
Scenedesmus	G	5, 6	4, 5
Kirchneriella	G	3	4
Uroglenopsis	Fl	3	4
Ochromonas	Fl	1	4
Ankistrodesmus	G	1, 1	4, 5
Crucigenia	G	1, 11	4, 5
Chlamydomonas	Fl	1	4
Dinobryon	Fl	4	5
Oocystis	G	2	5
Tetraedron	G	1	5
Synedra	D	1	5
Cyclotella	D	1	5
Quadrigula	G	1	5

BACTERIA ANALYSES

Date	Total coliform (colonies/100 ml)	Fecal coliform (colonies/100 ml)	Fecal *Streptococci* (colonies/100 ml)
11-17-72	76	2	--
6-22-73	68	--	--
9-19-73	--	11	--
5-24-74	2	0	--
10-17-74	--	0	0

Table 16.--Biological analyses for Lakeside Estate Lake.

PHYTOPLANKTON ANALYSES

Group:	Sample No.:	Date:	Total cells/ml:	Dominant Group(s):
D, diatom	1.	Nov. 3, 72	410	BG
G, green	2.	June 20, 73	6,100	BG
BG, blue-green	3.	Sept. 13, 73	200,000	BG
Fl, flagellate	4.	May 29, 74	800,000	BG
	5.	Oct. 23, 74	450,000	BG

Alga name	Group	Percent of total	Samples found in
Dactylococcopsis	BG	28	1
Anabaena	BG	14, 96, 10	1, 4, 5
Cryptomonas	Fl	24	1
Anacystis	BG	18, 2	2, 5
Oscillatoria	BG	80, 1	3, 4
Lyngbya	BG	1, 64	4, 5
Trachelomonas	Fl	1	4
Anacystis incerta	BG	15	5
Scenedesmus	G	3	5
Ochromonas	Fl	2	5
Nitzschia	D	1	5
Tetraedron	G	1	5

BACTERIA ANALYSES

Date	Total coliform (colonies/100 ml)	Fecal coliform (colonies/100 ml)	Fecal *Streptococci* (colonies/100 ml)
11-03-72	72	0	--
6-20-73	36	10	--
9-13-73	46	2	--
5-29-74	0	0	--
10-23-74	--	0	44

Table 17.--Biological analyses for Langhoven Lake.

PHYTOPLANKTON ANALYSES

Group:	Sample No.:	Date:	Total cells/ml:	Dominant group(s):
D, diatom	1.	Oct. 26, 72	440	Fl
G, green	2.	June 13, 73	230	BG
BG, blue-green	3.	Sept. 18, 73	26,000	G & Fl
Fl, flagellate	4.	May 22, 74	2,100	BG
	5.	Oct. 30, 74	15,000	BG & Fl

Alga name	Group	Percent of total	Samples found in
Euglena	Fl	38, 5, 12	1, 4, 5
Chlamydomonas	Fl	21, 2	1, 4
Aphanizomenon flosaquae	BG	77	2
Ankistrodesmus	G	22, 5, 1	3, 4, 5
Eudorina	Fl	20	3
Lyngbya	BG	59, 37	4, 5
Cryptomonas	Fl	10, 22	4, 5
Cyclotella	D	5, 5	4, 5
Trachelomonas	Fl	5, 1	4, 5
Anacystis	BG	4	4
Synedra	D	2	4
Glenodinium	Fl	1, 6	4, 5
Tetraedron	G	1	4
Kirchneriella	G	1	4
Uroglena	Fl	14	5
Spirulina	BG	2	5
Gomphonema	D	1	5
Phacus	Fl	1	5

BACTERIA ANALYSES

Date	Total coliform (colonies/100 ml)	Fecal coliform (colonies/100 ml)	Fecal *Streptococci* (colonies/100 ml)
10-26-72	105	40	--
6-13-73	34	3	--
9-18-73	26,000	92	--
5-22-74	460	460	--
10-30-74	--	116	900

Table 18.--Biological analyses for LeMay Lake.

PHYTOPLANKTON ANALYSES

Group:	Sample No.:	Date:	Total cells/ml:	Dominant group(s):
D, diatom	1.	Oct. 26, 72	3,400	BG
G, green	2.	June 12, 73	47,000	BG
BG, blue-green	3.	Sept. 17, 73	6,600,000	BG
Fl, flagellate	4.	May 21, 74	230,000	BG
	5.	Oct. 29, 74	250,000	BG

Alga name	Group	Percent of total	Samples found in
Anacystis	BG	27, 43, 28	1, 4, 5
Aphanizomenon	BG	44	2
Lyngbya	BG	35, 8, 40	2, 4, 5
Gomphosphaeria	BG	44	3
Oscillatoria	BG	29, 38, 18	3, 4, 5
Anabaena	BG	18	3
Dinobryon	Fl	6, 1	4, 5
Kirchneriella	G	4	4
Synedra	D	1	4
Coelastrum	G	8	5
Cryptomonas	Fl	3	5
Scenedesmus	G	1	5

BACTERIA ANALYSES

Date	Total coliform (colonies/100 ml)	Fecal coliform (colonies/100 ml)	Fecal *Streptococci* (colonies/100 ml)
10-26-72	10	0	--
6-12-73	8	0	--
9-17-73	40	8	--
5-21-74	0	0	00
10-29-74	--	5	52

Table 19.--Biological analyses for Long Lake.

PHYTOPLANKTON ANALYSES

Group:	Sample No.:	Date:	Total cells/ml:	Dominant group(s):
D, diatom	1.	Sept. 26, 73	4,000,000	BG
G, green	2.	May 15, 74	400,000	BG
BG, blue-green	3.	Oct. 31, 74	60,000	BG
Fl, flagellate				

Alga name	Group	Percent of total	Samples found in
Lyngbya limnetica	BG	78	1
Oscillatoria	BG	90, 9	2, 3
Lyngbya	BG	8, 87	2, 3
Anabaena	BG	1, 2	2, 3
Protococcus	G	1	2
Anacystis	BG	1	3
Gomphosphaeria	BG	1	3

BACTERIA ANALYSES

Date	Total coliform (colonies/100 ml)	Fecal coliform (colonies/100 ml)	Fecal *Streptococci* (colonies/100 ml)
9-26-73	520	42	--
5-15-74	2	2	--
10-31-74	--	8	30

Table 20.--Biological analyses for McCarthy Lake.

PHYTOPLANKTON ANALYSES

Group:	Sample No.:	Date:	Total cells/ml:	Dominant group(s):
D, diatom	1.	Nov. 13, 72	110	Fl
G, green	2.	June 21, 73	2,500	BG
BG, blue-green	3.	Sept. 26, 73	740	BG
Fl, flagellate	4.	May 22, 74	1,400	Fl
	5.	Oct. 18, 74	2,400	BG

Alga name	Group	Percent of total	Samples found in
Glenodinium	Fl	77, 1	1, 5
Oscillatoria	BG	74, 32	2, 4
Anabaena	BG	58	3
Uroglenopsis	Fl	63	4
Navicula	D	1, 1	4, 5
Euglena	Fl	1, 2	4, 5
Tetrastrum	G	1	4
Selenastrum	G	1	4
Lyngbya	BG	74	5
Cryptomonas	Fl	10	5
Achromonas	Fl	5	5
Trachelomonas	Fl	4	5
Nitzschia	D	2	5
Phacus	Fl	1	5

BACTERIA ANALYSES

Date	Total Coliform (colonies/100 ml)	Fecal Coliform (colonies/100 ml)	Fecal *Streptococci* (colonies/100 ml)
11-13-72	1	0	--
6-21-73	13	12	--
9-26-73	--	0	--
5-22-74	10	3	--
10-18-74	--	8	20

Table 21.--Biological analyses for Shanahan Pond.

PHYTOPLANKTON ANALYSES

Group:	Sample No.:	Date:	Total cells/ml:	Dominant group(s):
D, diatom	1.	Nov. 10, 72	6,300	BG
G, green	2.	June 15, 73	210,000	BG
BG, blue-green	3.	Sept. 12, 73	5,200,000	BG
Fl, flagellate	4.	May 30, 74	620,000	BG
	5.	Oct. 22, 74	61,000	G

Alga Name	Group	Percent of total	Samples found in
Anacystis	BG	19, 1	1, 4
Lyngbya	BG	15, 72	1, 2
Gomphosphaeria	BG	52, 23	3, 5
Oscillatoria	BG	42, 10	3, 5
Anacystis incerta	BG	92	4
Scenedesmus	G	4, 41	4, 5
Kirchneriella	G	1	4
Oocystis	G	6	5
Ochromonas	Fl	5	5
Pediastrum	G	3	5
Anabaena	BG	3	5
Dinobryon	Fl	2	5
Coelastrum	G	2	5
Ankistrodesmus	G	2	5
Cryptomonas	Fl	1	5
Nitzschia	D	1	5
Navicula	D	1	5
Trachelomonas	Fl	1	5

BACTERIA ANALYSES

Date	Total coliform (colonies/100 ml)	Fecal coliform (colonies/100 ml)	Fecal *Streptococci* (colonies/100 ml)
11-10-72	64	0	--
6-15-73	20	4	--
9-12-73	33	6	--
5-30-74	44	44	--
10-22-74	--	0	60

Table 22.--Biological analyses for Slater's Acres Pond.

PHYTOPLANKTON ANALYSES

Group:	Sample No.:	Date:	Total cells/ml:	Dominant group(s):
D, diatom	1.	Oct. 31, 72	21	Fl
G, green	2.	June 19, 73	540,000	BG
BG, blue-green	3.	Sept, 21, 73	190	Fl & G
Fl, flagellate	4.	May 28, 74	2,400	BG
	5.	Oct. 21, 74	2,400	Fl

Alga name	Group	Percent of total	Samples found in
Trachelmonas	Fl	33, 5	1, 5
Chlamydomonas	Fl	33	1
Ochromonas	Fl	33, 46	1, 5
Aphanizomenon flosaquae	BG	99	2
Uroglenopsis	Fl	17, 10	3, 4
Schroederia ancora	G	17	3
Lyngbya	BG	14	5
Cryptomonas	Fl	12, 1	5, 4
Scenedesmus	G	12	5
Ankistrodesmus	G	4	5
Pinnularia	D	2	5
Euglena	Fl	2	5
Staurastrum	G	2	5
Cosmarium	G	2	5
Gomphosphaeria	BG	42	4
Chrysochromulina	D	37	4
Anacystis	BG	8	4
Navicula	D	1	4
Centritractus	D	1	4

BACTERIA ANALYSES

Date	Total coliform (colonies/100 ml)	Fecal coliform (colonies/100 ml)	Fecal *Streptococci* (colonies/100 ml)
10-31-72	36	6	--
6-19-73	15	7	--
9-21-73	40	4	--
5-28-74	28	28	--
10-21-74	--	0	2

Table 23.--Biological analyses for Thomas Lake.

PHYTOPLANKTON ANALYSES

Group:	Sample No.:	Date:	Total cells/ml:	Dominant group(s):
D, diatom	1.	Oct. 30, 72	13,000	BG
G, green	2.	June 11, 73	1,000,000	BG
BG, blue-green	3.	Sept. 14, 73	18,000,000	BG
Fl, flagellate	4.	May 16, 74	2,300,000	BG
	5.	Oct. 18, 74	1,100,000	BG

Algo name	Group	Percent of total	Samples found in
Oscillatoria	BG	92, 84, 35, 66	1, 2, 4, 5
Anabaena	BG	15, 99, 14	2, 3, 5
Lyngbya	BG	60, 11	4, 5
Anacystis incerta	BG	3	4
Anacystis	BG	1, 8	4, 5
Ochromonas	Fl	1	5

BACTERIA ANALYSES

Date	Total coliform (colonies/100 ml)	Fecal coliform (colonies/100 ml)	Fecal *Streptococci* (colonies/100 ml)
10-30-72	18	5	--
6-11-73	18	1	~~11~~ --
9-14-73	55	0	--
5-16-74	4	4	--
10-18-74	--	0	0