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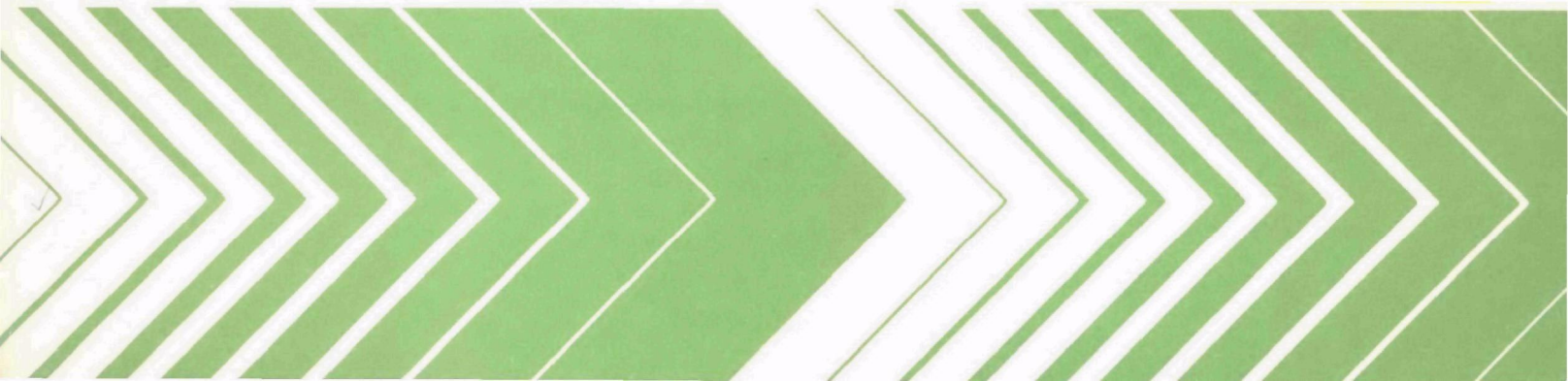
Distribution of Phytoplankton in Iowa Lakes



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DISTRIBUTION OF PHYTOPLANKTON IN IOWA LAKES

by

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FOREWORD

Protection of the environment requires effective regulatory actions which are based on sound technical and scientific information. This information must include the quantitative description and linking of pollutant sources, transport mechanisms, interactions, and resulting effects on man and his environment. Because of the complexities involved, assessment of specific pollutants in the environment requires a total systems approach which transcends the media of air, water, and land. The Environmental Monitoring and Support Laboratory-Las Vegas contributes to the formation and enhancement of a sound monitoring data base for exposure assessment through programs designed to:

- develop and optimize systems and strategies for monitoring pollutants and their impact on the environment
- demonstrate new monitoring systems and technologies by applying them to fulfill special monitoring needs of the Agency's operating programs

This report presents the species and abundance of phytoplankton in the 15 lakes sampled by the National Eutrophication Survey in the State of Iowa, along with results from the calculation of several commonly used biological indices of water quality and community structure. These data can be used to biologically characterize the study lakes, and as baseline data for future investigations. This report was written for use by Federal, State, and local governmental agencies concerned with water quality analysis, monitoring, and or regulation. Private industry and individuals similarly involved with the biological aspects of water quality will find the document useful. For further information contact the Water and Land Quality Branch, Monitoring Operations Division.

George B. Morgan
Director
Environmental Monitoring and Support Laboratory
Las Vegas

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INTRODUCTION

The collection and analysis of phytoplankton data were included in the National Eutrophication Survey in an effort to determine relationships between algal characteristics and trophic status of individual lakes.

During spring, summer, and fall of 1974, the Survey sampled 179 lakes in 10 States. Over 700 algal species and varieties were identified and enumerated from the 573 water samples examined.

This report presents the species and abundance of phytoplankton in the 15 lakes sampled in the State of Iowa (Table 1). The Nygaard's Trophic State (Nygaard 1949), Palmer's Organic Pollution (Palmer 1969), and species diversity and abundance indices are also included.

TABLE 1. LAKES SAMPLED IN THE STATE OF IOWA

STORET No.	Lake Name	County
1901	Lake Ahquabi	Polk
1902	Big Creek Reservoir	Polk
1903	Black Hawk Lake	Sac
1904	Clear Lake	Cerro Gordo
1905	Lake Darling	Washington
1906	Lost Island Lake	Palo Alto
1907	Lake McBride	Johnson
1908	Prairie Rose Lake	Shelby
1909	Rathbun Reservoir	Appanoose, Wayne, Lucas
1910	Red Rock Reservoir	Marion
1911	Rock Creek Lake	Jasper
1912	Silver Lake	Worth

(Continued)

TABLE 1. LAKES SAMPLED IN THE STATE OF IOWA (Continued)

STORET No.	Lake Name	County
1913	Spirit Lake	Dickinson
1914	Viking Lake	Montgomery
1915	West Lake Okoboji	Dickinson

MATERIALS AND METHODS

LAKE AND SITE SELECTION

Lakes and reservoirs included in the Survey were selected through discussions with State water pollution agency personnel and U.S. Environmental Protection Agency Regional Offices (U.S. Environmental Protection Agency 1975). Screening and selection strongly emphasized lakes with actual or potential accelerated eutrophication problems. As a result, the selection was limited to lakes:

(1) impacted by one or more municipal sewage treatment plant outfalls either directly into the lake or by discharge to an inlet tributary within approximately 40 kilometers of the lake;

(2) 40 hectares or larger in size; and

(3) with a mean hydraulic retention time of at least 30 days.

Specific selection criteria were waived for some lakes of particular State interest.

Sampling sites for a lake were selected based on available information on lake morphometry, potential major sources of nutrient input, and on-site judgment of the field limnologist (U.S. Environmental Protection Agency 1975). Primary sampling sites were chosen to reflect the deepest portion of each major basin in a test lake. Where many basins were present, selection was guided by nutrient source information on hand. At each sampling site, a depth-integrated phytoplankton sample was taken. Depth-integrated samples were uniform mixtures of water from the surface to a depth of 15 feet (4.6 meters) or from the surface to the lower limit of the photic zone representing 1 percent of the incident light, whichever was greater. If the depth at the sampling site was less than 15 feet (4.6 meters), the sample was taken from just off the bottom to the surface. Normally, a lake was sampled three times in 1 year, providing information on spring, summer, and fall conditions.

SAMPLE PREPARATION

To preserve the sample 4 milliliters (ml) of Acid-Lugol's solution (Prescott 1970) were added to each 130-ml sample from each site at the time of collection. The samples were shipped to the Environmental Monitoring and Support Laboratory, Las Vegas, Nevada, where equal volumes from each site

were mixed to form two 130-ml composite samples for a given lake. One composite sample was put into storage and the other was used for the examination.

Prior to examination, the composite samples were concentrated by the settling method. Solids were allowed to settle for at least 24 hours prior to siphoning off the supernate. The volume of the removed supernate and the volume of the remaining concentrate were measured and concentrations determined. A small (8-ml) library subsample of the concentrate was then taken. The remaining concentrate was gently agitated to resuspend the plankton and poured into a capped, graduated test tube. If a preliminary examination of a sample indicated the need for a more concentrated sample, the contents of the test tube were further concentrated by repeating the settling method. Final concentrations varied from 15 to 40 times the original.

Permanent slides were prepared from concentrated samples after analysis was complete. A ring of clear Karo® corn syrup with phenol (a few crystals of phenol were added to each 100 ml of syrup) was placed on a glass slide. A drop of superconcentrate from the bottom of the test tube was placed in the ring. This solution was thoroughly mixed and topped with a coverglass. After the syrup at the edges of the coverglass had hardened, the excess was scraped away and the mount was sealed with clear fingernail polish. Permanent diatom slides were prepared by drying sample material on a coverglass, heating in a muffle furnace at 400° C for 45 minutes, and mounting in Hyrax®. Finally, the mounts were sealed with clear fingernail polish.

Backup samples, library samples, permanent sample slides, and Hyrax®mounted diatom slides are being stored and maintained at the Environmental Monitoring and Support Laboratory-Las Vegas.

EXAMINATION

The phytoplankton samples were examined with the aid of binocular compound microscopes. A preliminary examination was performed to precisely identify and list all forms encountered. The length of this examination varied depending on the complexity of the sample. An attempt was made to find and identify all of the forms present in each sample. Often forms were observed which could not be identified to species or to genus. Abbreviated descriptions were used to keep a record of these forms (e.g., lunate cell, blue-green filament, Navicula #1). Diatom slides were examined using a standard light microscope. If greater resolution was essential to accurately identify the diatoms, a phase-contrast microscope was used.

After the species list was compiled, phytoplankton were enumerated using a Neubauer Counting Chamber with a 40X objective lens and a 10X ocular lens. All forms within each field were counted. The count was continued until a minimum of 100 fields had been viewed, or until the dominant form had been observed a minimum of 100 times.

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QUALITY CONTROL

Project phycologists performed internal quality control intercomparisons regularly on 7 percent of the species identification and counts. Although an individual had primary responsibility for analyzing a sample, taxonomic problems were discussed among the phycologists.

Additional quality control checks were performed on the Survey samples by Dr. G. W. Prescott of the University of Montana at the rate of 5 percent. Quality control checks were made on 75 percent of these samples to verify species identifications while checks were made on the remaining 25 percent of the samples to verify genus counts. Presently, the agreement between quality control checks for species identification and genus enumerations is satisfactory.

RESULTS

A phytoplankton species list for the State is presented in Appendix A. Appendix B summarizes all of the phytoplankton data collected from the State by the Survey. The latter is organized by lake, and includes an alphabetical phytoplankton species list with concentrations for individual species given by sampling date. Results from the application of several indices are presented (Nygaard's Trophic State, Palmer's Organic Pollution, and species diversity and abundance). Each lake has been assigned a four-digit STORET number. (STORET (STOrage and RETrieval) is the U.S. Environmental Protection Agency's computer system which processes and maintains water quality data.) The first two digits of the STORET number identify the State; the last two digits identify the lake.

NYGAARD'S TROPHIC STATE INDICES

Five indices devised by Nygaard (1949) were proposed under the assumption that certain algal groups are indicative of levels of nutrient enrichment. These indices were calculated in order to aid in determining the surveyed lakes' trophic status. As a general rule, Cyanophyta, Euglenophyta, centric diatoms, and members of the Chlorococcales are found in waters that are eutrophic (rich in nutrients), while desmids and many pennate diatoms generally cannot tolerate high nutrient levels and so are found in oligotrophic waters (poor in nutrients).

In applying the indices to the Survey data, the number of taxa in each major group was determined from the species list for each sample. The ratios of these groups give numerical values which can be used as a biological index of water richness. The five indices and the ranges of values established for Danish lakes by Nygaard for each trophic state are presented in Table 2. The appropriate symbol, (E) eutrophic and (O) oligotrophic, follows each calculated value in the tables in Appendix B. A question mark (?) following a calculated value in these tables was entered when that value was within the range of both classifications.

PALMER'S ORGANIC POLLUTION INDICES

Palmer (1969) analyzed reports from 165 authors and developed algal pollution indices for use in rating water samples with high organic pollution. Two lists of organic-pollution-tolerant forms were prepared, one containing 20 genera, the other, 20 species (Tables 3 and 4). Each form was assigned a pollution index number ranging from 1 for moderately tolerant forms to 6 for

TABLE 2. NYGAARD'S TROPHIC STATE INDICES ADAPTED FROM HUTCHINSON (1967)

Index	Calculation	Oligotrophic	Eutrophic
Myxophycean	$\frac{\text{Myxophyceae}}{\text{Desmideae}}$	0.0-0.4	0.1-3.0
Chlorophycean	$\frac{\text{Chlorococcales}}{\text{Desmideae}}$	0.0-0.7	0.2-9.0
Diatom	$\frac{\text{Centric Diatoms}}{\text{Pennate Diatoms}}$	0.0-0.3	0.0-1.75
Euglenophyte	$\frac{\text{Euglenophyta}}{\text{Myxophyceae + Chlorococcales}}$	0.0-0.2	0.0-1.0
Compound	$\frac{\text{Myxophyceae + Chlorococcales + Centric Diatoms + Euglenophyta}}{\text{Desmideae}}$	0.0-1.0	1.2-25

TABLE 3. ALGAL GENUS POLLUTION INDEX (Palmer 1969)

Genus	Pollution Index
Anacystis	1
Ankistrodesmus	2
Chlamydomonas	4
Chlorella	3
Closterium	1
Cyclotella	1
Euglena	5
Gomphonema	1
Lepocinclis	1
Melosira	1
Micractinium	1
Navicula	3
Nitzschia	3
Oscillatoria	5
Pandorina	1
Phacus	2
Phormidium	1
Scenedesmus	4
Stigeoclonium	2
Synedra	2

TABLE 4. ALGAL SPECIES POLLUTION INDEX (Palmer 1969)

Species	Pollution Index
Ankistrodesmus falcatus	3
Arthrospira jenneri	2
Chlorella vulgaris	2
Cyclotella meneghiniana	2
Euglena gracilis	1
Euglena viridis	6
Gomphonema parvulum	1
Melosira varians	2
Navicula cryptocephala	1
Nitzschia acicularis	1
Nitzschia palea	5
Oscillatoria chlorina	2
Oscillatoria limosa	4
Oscillatoria princeps	1
Oscillatoria putrida	1
Oscillatoria tenuis	4
Pandorina morum	3
Scenedesmus quadricauda	4
Stigeoclonium tenue	3
Synedra ulna	3

extremely tolerant forms. Palmer based the index numbers on occurrence records and/or where emphasized by the authors as being especially tolerant of organic pollution.

In analyzing a water sample, any of the 20 genera or species of algae present in concentrations of 50 per milliliter or more are recorded. The pollution index numbers of the algae present are totaled, providing a genus score and a species score. Palmer determined that a score of 20 or more for either index can be taken as evidence of high organic pollution, while a score of 15 to 19 is taken as probable evidence of high organic pollution. Lower figures suggest that the organic pollution of the sample is not high, that the sample is not representative, or that some substance or factor interfering with algal persistence is present and active.

SPECIES DIVERSITY AND ABUNDANCE INDICES

"Information content" of biological samples is being used commonly by biologists as a measure of diversity. Diversity in this connection means the degree of uncertainty attached to the specific identity of any randomly selected individual. The greater the number of taxa and the more equal their proportions, the greater the uncertainty, and hence, the diversity (Pielou 1966). There are several methods of measuring diversity, e.g., the formulas given by Brillouin (1962) and Shannon and Weaver (1963). The method which is appropriate depends on the type of biological sample on hand.

Pielou (1966) classifies the types of biological samples and gives the measure of diversity appropriate for each type. The Survey phytoplankton samples are what she classifies as larger samples (collections in Pielou's terminology) from which random subsamples can be drawn. According to Pielou, the average diversity per individual (H) for these types of samples can be estimated from the Shannon-Wiener formula (Shannon and Weaver 1963):

$$H = -\sum_{i=1}^{S} P_i \log_x P_i$$

where P is the proportion of the ith taxon in the sample, which is calculated from n_i/N; n_i is the number of individuals per milliliter of the ith taxon; N is the total number of individuals per ml; and S is the total number of taxa. However, Basharin (1959) and Pielou (1966) have pointed out that H calculated from the subsample is a biased estimator of the sample H, and if this bias is to be accounted for, we must know the total number of taxa present in the sample since the magnitude of this bias depends on it.

Pielou (1966) suggests that if the number of taxa in the subsample falls only slightly short of the number in the larger sample, no appreciable error will result in considering S, estimated from the subsample, as being equal to the sample value. Even though considerable effort was made to find and identify all taxa, the Survey samples undoubtedly contain a fair number of rare phytoplankton taxa which were not encountered.

In the Shannon-Wiener formula, an increase in the number of taxa and/or an increase in the evenness of the distribution of individuals among taxa will increase the average diversity per individual from its minimal value of zero. Sager and Hasler (1969) found that the richness of taxa was of minor importance in determination of average diversity per individual for phytoplankton and they concluded that phytoplankton taxa in excess of the 10 to 15 most abundant ones have little effect on H. This was verified by our own calculations. Our counts are in number per milliliter and since logarithms to the base 2 were used in our calculations, H is expressed in units of bits per individual. When individuals of a taxon were so rare that they were not counted, a value of 1/130 per milliliter or 0.008 per milliliter was used in the calculations since at least one individual of the taxon must have been present in the collection.

A Survey sample for a given lake represents a composite of all phytoplankton collected at different sampling sites on the lake during a given sampling period. Since the number of samples (M) making up a composite is a function of both the complexity of the lake sampled and its size, it should affect the richness-of-taxa component of the diversity of our phytoplankton collections. The maximum diversity (MaxH) (i.e., when the individuals are distributed among the taxa as evenly as possible) was estimated from $\log_2 S$ (Pielou 1966), while the minimum diversity (MinH), was estimated from the formula:

$$\text{MinH} = -\frac{S-1}{N}\log_2\frac{1}{N} - \frac{N-(S-1)}{N}\log_2\frac{N-(S-1)}{N}$$

given by Zand (1976). The total diversity (D) was calculated from HN (Pielou 1966). Also given in Appendix B are L (the mean number of individuals per taxa per milliliter) and K (the number of individuals per milliliter of the most abundant taxon in the sample).

The evenness component of diversity (J) was estimated from H/MaxH (Pielou 1966). Relative evenness (RJ) was calculated from the formula:

$$\text{RJ} = \frac{\text{H-MinH}}{\text{MaxH-MinH}}$$

given by Zand (1976). Zand suggests that RJ be used as a substitute for both J and the redundancy expression given by Wilhm and Dorris (1968). As pointed out by Zand, the redundancy expression given by Wilhm and Dorris does not properly express what it is intended to show, i.e., the position of H in the range between MaxH and MinH. RJ may range from 0 to 1; being 1 for the most even samples and 0 for the least even samples.

Zand (1976) suggests that diversity indices be expressed in units of "sits", i.e., in logarithms to base S (where S is the total number of taxa in the sample) instead of in "bits", i.e., in logarithms to base 2. Zand points out that the diversity index in sits per individual is a normalized number ranging from 1 for the most evenly distributed samples to 0 for the least evenly distributed samples. Also, it can be used to compare different samples, independent of the number of taxa in each. The diversity in bits per

individual should not be used in direct comparisons involving various samples which have different numbers of taxa. Since MaxH equals log S, the expression in sits is equal to $\log_S S$, or 1. Therefore diversity in sits per individual is numerically equivalent to J, the evenness component for the Shannon-Wiener formula.

SPECIES OCCURRENCE AND ABUNDANCE

The alphabetic phytoplankton species list for each lake, presented in Appendix B, gives the concentrations of individual species by sampling date. Concentrations are in cells, colonies, or filaments (CEL, COL, FIL) per milliliter. An "X" after a species name indicates that the species identified in the preliminary examination was in such a low concentration that it did not appear in the count. A blank space indicates that the organism was not found in the sample collected on that date. Column S is used to designate the examiner's subjective opinion of the five dominant taxa in a sample, based upon relative size and concentration of the organism. The percent column (%C) presents, by abundance, the percentage composition of each taxon.

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APPENDIX A

PHYTOPLANKTON SPECIES LIST FOR THE STATE OF IOWA

Achnanthes sp.
Actinastrum hantzschii
Amphora sp.
Anabaena planctonica
Anabaena spiroides
Anabaenopsis circularis
Anabaenopsis raciborskii
Ankistrodesmus falcatus
Aphanizomenon flos-aquae
Aphanizomenon flos-aquae
v. *gracile*
Aphanocapsa delicatissima
Aphanocapsa elachista
Aphanocapsa elachista
v. *planctonica*
Aphanothece castagnei
Aphanothece clathrata
Arthrodesmus sp.
Asterionella formosa
Botryococcus braunii
Caloneis amphisbaena
Caloneis lewisii
v. *inflata*
Carteria sp.
Ceratium hirundinella
Ceratium hirundinella
v. *furcoides*
Ceratium hirundinella
v. *robustum*
Chilomonas ? paramaecium
Chlamydomonas pseudopertyi
Chlorogonium sp.
Chroococcus dispersus
Chroococcus dispersus
v. *minor*
Chroococcus limneticus
Chroomonas nordstedtii
Closteriopsis longissima
Closterium gracile ?
Cocconeis placentula
Cocconeis placentula
v. *euglypta*
Coelastrum cambricum
Coelastrum cambricum
v. *intermedium*
Coelastrum reticulatum
Coelastrum sphaericum
Coelosphaerium minutissimum
Coelosphaerium naegelianum
Cosmarium clepsydra
v. *nanum*
Crucigenia apiculata
Crucigenia quadrata
Crucigenia rectangularis
Crucigenia tetrapedia
Cryptomonas erosa
Cryptomonas marssonii
Cryptomonas ovata
Cryptomonas reflexa
Cyclotella meneghiniana
Cylindrospermum stagnale ?
Cymatopleura elliptica
Cymatopleura solea
Cymbella affinis
Cymbella triangulum
Dactylococcopsis irregularis
Diatoma vulgare
Dictyosphaerium pulchellum
Dinobyron cylindricum
Dinobyron divergens
Dinobyron sertularia
Dinobyron sociale
Elakatothrix gelatinosa
Epithemia turgida
Errerella ? bornhemiensis
Euastrum denticulatum
Eudorina elegans
Euglena acus
Euglena deses
Euglena gracilis
Euglena oxyuris
Euglena sciotensis ?
Euglena spiroides
Euglena tripteris
Eunotia gracilis
Fragilaria construens
Fragilaria crotonensis
Fragilaria intermedia
Franceia sp.
Glenodinium aciculiferum
Glenodinium gymnodinium
Glenodinium gymnodinium
v. *biscutelliforme*
Glenodinium oculatum
Gloeocystis vesiculosa
Golenkinia sp.
Gomphonema acuminatum
v. *coronata*

Gomphonema constrictum
Gomphonema parvulum
Gomphosphaeria
Gymnodinium albulum
Gymnodinium ordinatum
Gyrosigma sp.
Kirchneriella elongata
Kirchneriella lunaris
v. *irregularis*
Lagerheimia citriformis
Lepocinclis acuta ?
Lepocinclis butschlii
Lyngbya circumcreta
Lyngbya limnetica
Mallomonas acaroides
Mastogloia sp.
Melosira distans
Melosira granulata
Melosira granulata
v. *angustissima*
Melosira granulata
v. *angustissima* f. *spiralis*
Melosira islandica
Melosira varians
Merismopedia minima
Merismopedia punctata
Merismopedia tenuissima
Mesostigma viridis
Microcystis aeruginosa
Microcystis incerta
Microcystis stagnalis
Navicula cryptocephala
Navicula cuspidata
Navicula cuspidata
v. *ambigua*
Navicula exigua
Navicula zanoni
Nitzschia acicularis
Nitzschia filiformis
Nitzschia holsatica
Nitzschia palea
Nostoc sp.
Oocystis submarina
Oscillatoria agardhii
Oscillatoria limnetica
Oscillatoria subbrevis
Pandorina morum
Pediastrum bicaudata
v. *longecornutum*
Pediastrum boryanum
Pediastrum duplex
Pediastrum duplex
v. *clathratum*
Pediastrum duplex
v. *reticulatum*
Pediastrum kawraiskyi
Pediastrum simplex
Pediastrum tetras
Pediastrum tetras
v. *tetraodon*
Peridinium cinctum
Peridinium inconspicuum
Peridinium quadridens
Peridinium umbonatum
Phacus acuminatus
Phacus caudatus
Phacus longicauda
Phacus megalopsis
Phacus nordstedtii
Phacus orbicularis ?
Phacus pleuronectes
Phacus pseudonordstedtii
Phacus pyrum
Phacus tortus
Phormidium mucicola
Pinnularia sp.
Polyedriopsis sp.
Pteromonas angulosa
Quadrigula sp.
Raphidiopsis curvata
Rhoicosphenia sp.
Rhopalodia gibba
Scenedesmus abundans
Scenedesmus acuminatus
Scenedesmus arcuatus
Scenedesmus bicaudatus
Scenedesmus bijuga
Scenedesmus bijuga
v. *flexuosus*
Scenedesmus denticulatus
Scenedesmus dimorphus
Scenedesmus granulatus
v. *longispina* f. *granulata*
Scenedesmus intermedius
Scenedesmus intermedius
v. *bicaudatus*
Scenedesmus protuberans
Scenedesmus quadricauda
Scenedesmus quadricauda
v. *biornatus* f. *giganticus*

Scenedesmus quadricauda
v. *quadrispina*
Scenedesmus reniforme
Schizochlamys ? compacta
Schroederia setigera
Spermatozoopsis sp.
Sphaerocystis schroeteri
Spirogyra sp.
Staurastrum chaetocerus
Staurastrum tetracerum
Stauroneis
Stephanodiscus astraea
Stephanodiscus hantzschii ?
Stephanodiscus niagarae
Surirella angustata
Synedra acus
Synedra ulna
Tetraedron caudatum
Tetraedron caudatum
v. *longecornutum*
Tetraedron constrictum
Tetraedron hastatum
Tetraedron minimum
v. *scrobiculatum*
Tetraedron muticum
Tetraedron regulare
Tetraedron regulare
v. *incus*
Tetrastrum elegans
Tetrastrum heteracanthum
Tetrastrum staurogeniaeforme
Trachelomonas atomaria
Trachelomonas ensifera
v. *javanica*
Trachelomonas fluviatilis
Trachelomonas gibberosa
Trachelomonas intermedia
Trachelomonas oblonga
Trachelomonas planctonica
Trachelomonas pulchella
Trachelomonas scabra
Trachelomonas urceolata
Trachelomonas volvocina
Treubaria sp.
Westella botryoides ?

APPENDIX B. SUMMARY OF PHYTOPLANKTON DATA

This appendix was generated by computer. Because it was only possible to use upper case letters in the printout, all scientific names are printed in upper case and are not italicized.

The alphabetic phytoplankton lists include taxa without species names (e.g., EUNOTIA, EUNOTIA #1, FLAGELLATE, FLAGELLATES, MICROCYSTIS INCERTA ?, CHLOROPHYTAN COCCOID CELLED COLONY). When species determinations were not possible, symbols or descriptive phrases were used to separate taxa for enumeration purposes. Each name on a list, however, represents a unique species different from any other name on the same list, unless otherwise noted, for counting purposes.

Numbers were used to separate unidentified species of the same genus. A generic name listed alone is also a unique species. A question mark (?) is placed immediately after the portion of a name which was assigned with uncertainty. Numbered, questioned, or otherwise designated taxa were established on a lake-by-lake basis; therefore NAVICULA #2 from lake A cannot be compared to NAVICULA #2 from lake B. Pluralized categories (e.g., FLAGELLATES, CENTRIC DIATOMS, SPP.) were used for counting purposes when taxa could not be properly differentiated on the counting chamber.

ERRATA

Minimum and evenness are misspelled in the computer printout of the species diversity and abundance indices data.

LAKE NAME: Ahquabi
STORET NUMBER: 1901

NYGAARD TROPHIC STATE INDICES

DATE	04 17 74	07 02 74	09 25 74
MYXOPHYCEAN	2.00 E	6.00 E	3.50 E
CHLOROPHYCEAN	0.01 O	1.00 E	3.00 E
EUGLENOPHYTE	0.50 E	0.43 E	0.15 ?
DIATOM	0.50 E	0.75 E	2.00 E
COMPOUND	5.00 E	13.00 E	8.50 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	04 17 74	07 02 74	09 25 74
GENUS	05	09	06
SPECIES	03	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		04 17 74	07 02 74	09 25 74
AVERAGE DIVERSITY	H	2.47	2.62	2.36
NUMBER OF TAXA	S	14.00	21.00	22.00
NUMBER OF SAMPLES COMPOSITED	M	1.00	1.00	1.00
MAXIMUM DIVERSITY	MAXH	3.81	4.39	4.46
MINUMUM DIVERSITY	MINH	0.11	0.13	0.15
TOTAL DIVERSITY	D	3324.62	5067.08	3894.00
TOTAL NUMBER OF INDIVIDUALS/ML	N	1346.00	1934.00	1650.00
EVENESS COMPONENT	J	0.65	0.60	0.53
RELATIVE EVENESS	RJ	0.64	0.59	0.52
MEAN NUMBER OF INDIVIDUALS/TAXA	L	96.14	92.10	75.00
NUMBER/ML OF MOST ABUNDANT TAXON	K	475.00	575.00	768.00

LAKE NAME: AHQUABI
STORET NUMBER: 1901

CONTINUED

TAXA	FORM	06 17 74 S	06 17 74 %	06 17 74 ALGAL UNITS PER ML	07 02 74 S	07 02 74 %	07 02 74 ALGAL UNITS PER ML	09 25 74 S	09 25 74 %	09 25 74 ALGAL UNITS PER ML
ANABAENA	FIL				11	29.7	575			
ANABAENA #1	FIL						X	4	4.7	77
ANABAENA PLANCTONICA	FIL									X
APHANIZOMENON FLOS-AQUAE	FIL	4	11.7	158		2.7	52	3	9.3	154
ASTERIONELLA FORMOSA	CEL	3	14.7	198						
CALONEIS LEWISII V. INFLATA	CEL						X			
CENTRIC DIATOM	CEL	7	20.6	277	4	16.2	314			
CERATIUM HIRUNDINELLA	CEL						X			
CLOSTERIUM #1	CEL			X			X			X
COCCOID CHRYSOPHYTAN	CEL			X						
COELASTRUM CAMBRICUM	COL									X
COELOSPHAERIUM MINUTISSIMUM	COL									X
COELOSPHAERIUM NAEGELIANUM	COL							5	2.3	39
CRUCIGENIA APICULATA	COL								2.3	39
CRYPTOMONAS EROSA	CEL		5.9	79			X			
CRYPTOMONAS REFLEXA	CEL			X						
EUDORINA ELEGANS	COL					2.7	52			
FLAGELLATE #1	CEL		3.0	40						
FRAGILARIA	CEL			X			X			
LEPOCINCLIS	CEL						X			
LYNGBYA	FIL									X
MALLOMONAS ACAROIDES	CEL								2.3	39
MELOSIRA GRANULATA	CEL			X			X			X
MELOSIRA GRANULATA V. ANGUSTISSIMA	CEL							2	23.3	384
MELOSIRA VARIANS	CEL						X			
MICROCYSTIS AERUGINOSA	COL				3	5.4	105			
NITZSCHIA #1	CEL	5	8.8	119						
NITZSCHIA #2	CEL									X
NITZSCHIA #3	CEL						X			
NITZSCHIA #4	CEL					2.7	52			
NOSTOC	CEL						X			
OOCYSTIS	CEL									X
OSCILLATORIA AGARDHII	FIL							1	46.5	768
OSCILLATORIA LIMNETICA	FIL			X		2.7	52			
PEDIASTRUM DUPLEX V. RETICULATUM	COL									X
PYRAMONAS ANGULOSA	CEL								2.3	39
SCENEDESMUS ARCUATUS	COL									X
SCHROEDERIA SETIGERA	CEL				5	5.4	105			
SPHAEROCYSTIS SCHROETERI	COL									X
STAURASTRUM CHAETOCERUS	CEL									X
SYNEDRA ULNA	CEL	11	35.3	475						
TRACHELOMONAS ATOMARIA	CEL					2.7	52			
TRACHELOMONAS INTERMEDIA	CEL			X					4.7	77
TRACHELOMONAS OBLONGA	CEL								2.3	39
TRACHELOMONAS PLANCTONICA	CEL				12	29.7	575			
TOTAL				1346			1934			1650

LAKE NAME: BIG CREEK
STORET NUMBER: 1902

NYGAARD TROPHIC STATE INDICES

DATE	04 18 74	07 09 74	09 25 74
MYXOPHYCEAN	0/0 D	01/0 E	3.00 E
CHLOROPHYCEAN	02/0 E	0/0 D	2.00 E
EUGLENOPHYTE	1.00 E	1.00 E	0/05 ?
DIATOM	0.40 E	0.50 E	1.00 E
COMPOUND	06/0 E	03/0 E	7.00 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	04 18 74	07 09 74	09 25 74
GENUS	06	00	01
SPECIES	03	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		04 18 74	07 09 74	09 25 74
AVERAGE DIVERSITY	H	0.80	1.20	1.58
NUMBER OF TAXA	S	19.00	7.00	20.00
NUMBER OF SAMPLES COMPOSITED	M	2.00	2.00	2.00
MAXIMUM DIVERSITY	MAXH	4.25	2.81	4.32
MINIMUM DIVERSITY	MINH	0.02	0.06	0.14
TOTAL DIVERSITY	D	13274.40	1317.60	2629.12
TOTAL NUMBER OF INDIVIDUALS/ML	N	16593.00	1098.00	1664.00
EVENESS COMPONENT	J	0.19	0.43	0.37
RELATIVE EVENESS	RJ	0.19	0.42	0.35
MEAN NUMBER OF INDIVIDUALS/TAXA	L	873.32	156.86	83.20
NUMBER/ML OF MOST ABUNDANT TAXON	K	14887.00	595.00	1167.00

LAKE NAME: BIG CREEK
STORET NUMBER: 1902

CONTINUED

TAXA	FORM	04 18 74 S	04 18 74 %C	04 18 74 ALGAL UNITS PER ML	07 09 74 S	07 09 74 %C	07 09 74 ALGAL UNITS PER ML	09 25 74 S	09 25 74 %C	09 25 74 ALGAL UNITS PER ML
ANKISTRODESMUS FALCATUS	CEL	5	1.5	250						
APHANIZOMENON FLOS-AQUAE	FIL						X		2.4	40
APHANOTHECE CASTAGNEI	COL								2.4	40
ASTERIONELLA FORMOSA	CEL				1	54.2	595			
CERATIUM HIRUNDINELLA F. ROBUSTUM	CEL									X
CHILOMONAS ? PARAMAECIUM	CEL									X
CHLAMYDOMONAS	CEL		1.3	208						
CHLOROPHYTAN FLAGELLATE	CEL									X
COCCONEIS PLACENTULA V. EUGLYPTA	CEL			X						
COELASTRUM CAMBRICUM	COL									X
COSMARIUM #1	CEL									X
CRYPTOMONAS #1	CEL							4	2.4	40
CRYPTOMONAS #2	CEL		0.5	83						
CRYPTOMONAS EROSA	CEL						X			
CRYPTOMONAS REFLEXA	CEL									X
CYMATOPLEURA SOLEA	CEL			X						
DINORRYON SERTULARIA	CEL		0.8	125						X
EUDORINA ELEGANS	COL							5	1.2	20
EUGLENA	CEL			X						
FLAGELLATE #1	CEL	4	2.3	374	3	4.2	46		2.4	40
FLAGELLATE #7	CEL	3	1.8	291						
FRAGILARIA CROTONENSIS	CEL							2	15.4	257
GLENODINIUM ACICULIFERUM	CFL		0.5	83						
GLENODINIUM OCULATUM	CEL		0.3	42						
GLOEOCYSTIS VESICULOSA	COL									X
GOMPHONEMA	CEL		0.3	42						
GYMNODINIUM ORDINATUM	CFL	2	1.0	166						
MELOSIRA	CEL		0.3	42						
MELOSIRA GRANULATA	CFL							1	70.1	1167
NAVICULA	CFL			X						
NITZSCHIA #1	CEL			X						X
OSCILLATORIA LIMNETICA	FIL								1.2	20
PANDORINA MORUM	COL									X
PEDIASTRUM DUPLEX	COL									X
PHACUS CROICULARIS ?	CEL						X			
RHOICOSPHENIA	CEL						X			
SCENEDESMUS QUADRICAUDA V. QUADRISPINA	COL			X						
STEPHANODISCUS ASTRAEA	CEL				2	41.6	457	3	2.4	40
STEPHANODISCUS HANTZSCHII ?	CFL	1	89.7	14887						
TRACHELOMONAS	CFL			X						
TOTAL				16593			1098			1664

LAKE NAME: BLACK HAWK
STORET NUMBER: 1903

NYGAARD TROPHIC STATE INDICES

DATE	04 19 74	07 03 74	09 25 74
MYXOPHYCEAN	04/0 E	2.00 E	7.00 E
CHLOROPHYCEAN	16/1 E	4.67 E	6.33 E
EUGLENOPHYTE	0.10 ?	0.10 ?	0.23 E
DIATOM	0.80 E	0.22 ?	1.67 E
COMPOUND	26/1 E	8.00 E	18.5 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	04 19 74	07 03 74	09 25 74
GENUS	16	06	27
SPECIES	11	04	06

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		04 19 74	07 03 74	09 25 74
AVERAGE DIVERSITY	H	2.77	2.38	3.05
NUMBER OF TAXA	S	39.00	39.00	47.00
NUMBER OF SAMPLES COMPOSITED	M	2.00	2.00	2.00
MAXIMUM DIVERSITY	MAXH	5.29	5.29	5.55
MINIMUM DIVERSITY	MINH	0.01	0.02	0.01
TOTAL DIVERSITY	D	163690.38	60052.16	165663.80
TOTAL NUMBER OF INDIVIDUALS/ML	N	59094.00	25232.00	54316.00
EVENESS COMPONENT	J	0.52	0.45	0.55
RELATIVE EVENESS	RJ	0.53	0.45	0.55
MEAN NUMBER OF INDIVIDUALS/TAXA	L	1515.23	646.97	1155.66
NUMBER/ML OF MOST ABUNDANT TAXON	K	20231.00	9323.00	28092.00

LAKE NAME: BLACK HAWK
STORET NUMBER: 1903

CONTINUED

TAXA	FORM	04 19 74 S	04 19 74 %C	04 19 74 ALGAL UNITS PER ML	07 03 74 S	07 03 74 %C	07 03 74 ALGAL UNITS PER ML	09 25 74 S	09 25 74 %C	09 25 74 ALGAL UNITS PER ML
ACTINASTRUM	CFL		0.2	106					3.1	1697
ANABAENA	FIL			X		1.7	417		1.3	679
ANABAENOPSIS CIRCULARIS	FIL									X
ANABAENOPSIS RACIBORSKII	FIL								1.9	1019
ANKISTRODESMUS FALCATUS	CEL	5	4.9	2875						
APHANIZOMENON FLOS-AQUAE	CEL				1	36.9	9323		0.6	339
APHANIZOMENON FLOS-AQUAE V. GRACILE	FIL							3	4.7	2546
APHANOCAPSA ELACHISTA	COL								0.6	339
APHANOTHECE	COL								0.5	255
ASTERIONELLA FORMOSA	CEL						X			
CERATIUM HIRUNDINELLA F. FURCOIDES	CEL						X			
CHLAMYDOMONAS	CFL			X					0.6	339
CHROOCOCCUS DISPERSUS	COL						X			
CHROOCOCCUS DISPERSUS V. MINOR	COL									X
CLOSTERIOPSIS	CFL		0.4	213						
CLOSTERIOPSIS ? LONGISSIMA	CEL						X			
CLOSTERIUM	CEL						X			
CLOSTERIUM #1	CEL					0.4	93			X
CLOSTERIUM #2	CEL									X
CLOSTERIUM SPP.	CEL								0.3	170
COCCONEIS	CEL			X						X
COELASTRUM CAMBRICUM	COL			X		0.2	46			
COSMARIUM	CFL						X			
CRUCIGENIA TETRAPEDIA	COL					4.6	1160			
CRYPTOMONAS	CEL					1.3	325		0.6	339
CRYPTOMONAS EROSA	CEL			X						
CRYPTOMONAS REFLEXA	CEL			X			X			
CRYPTOMONAS SPP.	CEL	3	5.4	3194						
CYCLOTELLA MENEGHINIANA	CEL		1.4	852						X
CYMATOPLEURA SOLEA	CEL		0.4	213			X			
CYMBELLA TRIANGULUM	CEL				5	1.5	371			
DACTYLOCOCCOPSIS	CEL		1.6	958						
DICTYOSPHAERIUM	COL			X					0.5	255
ELAKATOTHRIX	CEL								1.6	339
ELAKATOTHRIX GELATINOSA	COL					0.6	139			
EPITHEMIA TURGIDA	CEL						X			
ERRERELLA ? BORNHEMIENSIS	CEL						X			
EUGLENA	CFL			X					0.2	85
FLAGELLATE #1	CEL	14	13.5	7986					5.8	3147
FLAGELLATES	CEL		3.1	1810						
KIRCHNERIELLA ?	CEL								1.3	679
LEPOCINCLIS	CFL								0.3	171
MELOSIRA #4	CEL		1.1	639						
MELOSIRA GRANULATA	CEL			X		0.4	93			X
MELOSIRA GRANULATA V. ANGUSTISSIMA	CEL								0.8	425
MERISMOPEDIA MINIMA	COL		1.4	852				11	51.7	29197
MERISMOPEDIA TENUISSIMA	COL					0.6	139			
MESOSTIGMA VIRIDIS	CEL		0.2	106					0.3	170
MICROCYSTIS AERUGINOSA	COL								1.8	424
MICROCYSTIS INCERTA	COL						X	4	3.6	1952
NAVICULA	CEL		0.5	319						
NAVICULA #1	CEL						X			
NITZSCHIA ACICULARIS	CEL	11	34.2	20231			X		0.5	255
NITZSCHIA PALEA	CEL		0.7	426					0.6	339
NOSTOC	CEL						X			
OOCYSTIS	CEL				3	22.2	5612		1.3	679
OSCILLATORIA	FIL			X				2	7.2	3914
OSCILLATORIA #1	FIL									X
OSCILLATORIA #2	FIL									X
PEDIASTRUM BORYANUM	COL						X			
PEDIASTRUM DUPLEX	COL		0.2	106						
PEDIASTRUM DUPLEX V. RETICULATUM	COL						X			X
PEDIASTRUM KAWRAISKYI	COL						X			
PEDIASTRUM TETRAS	COL								0.2	85
PHACUS	CEL		0.4	213						
PHACUS CAUDATUS	CEL								0.5	255
PHACUS MEGALOPSIS	CEL								0.3	170
PHACUS PYRUM ?	CEL						X			
PINNULARIA	CEL						X			
QUADRIGULA	CEL			X						
SCENEDESMUS	COL						X			
SCENEDESMUS ABUNDANS	COL									X
SCENEDESMUS ACUMINATUS	COL		0.2	106						
SCENEDESMUS DIMORPHUS	COL		0.4	213			X		1.6	339
SCENEDESMUS INTERMEDIUS	COL		0.7	426						
SCENEDESMUS PROTUBERANS	COL			X						

LAKE NAME: BLACK HAWK
STORET NUMBER: 1903

CONTINUED

TAXA	FORM	04 19 74 S	04 19 74 %C	04 19 74 ALGAL UNITS PER ML	07 03 74 S	07 03 74 %C	07 03 74 ALGAL UNITS PER ML	09 25 74 S	09 25 74 %C	09 25 74 ALGAL UNITS PER ML
SCENEDESMUS QUADRICAUDA	COL			X		0.6	139			
SCENEDESMUS SPP.	COL								0.5	255
SCHROEDERIA SETIGERA	CEL			X		0.4	93		3.3	1782
SPHAEROCYSTIS SCHROETERI	COL				4	25.6	6447			
STEPHANODISCUS #1	CEL								0.3	170
STEPHANODISCUS #2	CEL							5	4.5	2461
STEPHANODISCUS ASTRAEA	CEL	2	28.1	16611						
STEPHANODISCUS NIAGARAE	CEL				2	3.3	835			
SURIRELLA #1	CEL						X			
SURIRELLA #2	CEL						X			
TETRASTRUM ELEGANS	COL			X					0.2	85
TETRASTRUM HETERACANTHUM	COL			X						
TETRASTRUM SPP.	COL		1.1	639						
TETRASTRUM STAUROGENIAEFORME	COL			X						
TRACHELOMONAS #1	CEL									X
TRACHELOMONAS #2	CEL								0.2	85
TRACHELOMONAS FLUVIATILIS	CEL						X			
TOTAL				59094			25232			54316

LAKE NAME: CLEAR
STORET NUMBER: 1904

NYGAARD TROPHIC STATE INDICES

DATE	04 18 74	07 03 74	09 23 74
MYXOPHYCEAN	3.50 E	3.00 E	12.0 E
CHLOROPHYCEAN	5.50 E	5.50 E	12.0 E
EUGLENOPHYTE	0.04 ?	0/17 ?	0/24 ?
DIATOM	0.50 E	0.43 E	1.00 E
COMPOUND	10.5 E	10.0 E	26.0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	04 18 74	07 03 74	09 23 74
GENUS	14	06	02
SPECIES	06	04	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		04 18 74	07 03 74	09 23 74
AVERAGE DIVERSITY	H	2.94	2.78	2.22
NUMBER OF TAXA	S	33.00	39.00	32.00
NUMBER OF SAMPLES COMPOSITED	M	3.00	3.00	3.00
MAXIMUM DIVERSITY	MAXH	5.04	5.29	5.00
MINUMUM DIVERSITY	MINH	0.03	0.04	0.03
TOTAL DIVERSITY	D	44667.42	39815.16	35453.40
TOTAL NUMBER OF INDIVIDUALS/ML	N	15193.00	14322.00	15970.00
EVENESS COMPONENT	J	0.58	0.53	0.44
RELATIVE EVENESS	RJ	0.59	0.53	0.45
MEAN NUMBER OF INDIVIDUALS/TAXA	L	460.39	367.23	499.06
NUMBER/ML OF MOST ABUNDANT TAXON	K	5340.00	5919.00	8132.00

LAKE NAME: CLEAR
STORET NUMBER: 1904

CONTINUED

TAXA	FORM	04 18 74 S	04 18 74 %C	04 18 74 ALGAL UNITS PER ML	07 03 74 S	07 03 74 %C	07 03 74 ALGAL UNITS PER ML	09 23 74 S	09 23 74 %C	09 23 74 ALGAL UNITS PER ML
ACTINASTRUM	CEL			X						
ANABAENA PLANCTONICA	FIL				4	3.3	477			
ANABAENA SPIROIDES	FIL									X
ANKISTRODESMUS FALCATUS	CEL		0.9	140						
APHANOCAPSA DELICATISSIMA	COL							2	22.9	3653
APHANOCAPSA ELACHISTA	COL								1.8	295
APHANOTHECE ?	COL			X						
ASTERIONELLA FORMOSA	CEL	4	5.8	884			X		0.4	59
CERATIUM HIRUNDINELLA	CEL					0.8	119			X
CHLAMYDOMONAS	CEL						X			
CHROOCOCCUS LIMNETICUS	COL									X
CHROOMONAS NORDSTEDTII	CEL					0.8	119			
COELOSPHAERIUM	COL				3	11.2	1609			
COELOSPHAERIUM NAEGELIANUM	COL			X						X
COSMARIUM	CEL						X			
COSMARIUM #2	CEL									X
CRUCIGENIA QUADRATA	COL		0.3	47					0.7	118
CRUCIGENIA RECTANGULARIS	COL								0.7	118
CRYPTOMONAS	CEL		3.4	511				5	1.5	236
CYANOPHYTAN FILAMENT	FIL								1.5	236
CYMBELLA #1	CEL						X			
CYMBELLA #2	CEL						X			
CYMBELLA SPP.	CEL					1.2	179			
DICTYOSPHAERIUM PULCHELLUM	COL			X		0.4	60			
DINOBRYON CYLINDRICUM	CEL						X			
DINOBRYON DIVERGENS	CEL	1	35.1	5340			X			X
DINOBRYON SPP.	CEL					1.2	179			
ELAKATOTHRIX	CEL		2.8	419			X			X
FLAGELLATE #1	CEL	5	5.2	793		0.8	119		2.9	471
FRAGILARIA #1	CEL						X			
FRAGILARIA CONSTRUENS	CEL						X			
FRAGILARIA CROTONENSIS	CEL	3	13.8	2091		3.7	536			X
GLENODINIUM GYMNODINIUP V. BISCUTELLIFORME	CEL						X			
GOMPHONEMA CONSTRICTUM	CEL						X			
GOMPHOSPHAERIA	COL		0.3	47						
GYMNODINIUM	CEL		0.6	93						
KIRCHNERIELLA	CEL		1.2	187			X			
LYNGBYA	FIL					1.7	238			
LYNGBYA #1	FIL		2.4	370						X
LYNGBYA LIMNETICA	FIL		0.9	140						
MELOSIRA	CEL	2	22.6	3432						
MELOSIRA GRANULATA	CEL						X			
MELOSIRA ISLANDICA	CEL						X	4	11.8	1886
MELOSIRA SPP.	CEL				1	41.3	5919			
MERISMOPEDIA MINIMA	COL		0.3	47		1.7	238			X
MICROCYSTIS ? STAGNALIS	COL				2	22.9	3277			
MICROCYSTIS #1	COL									X
MICROCYSTIS AERUGINOSA	COL							3	2.6	412
MICROCYSTIS INCERTA	COL								0.7	118
MICROCYSTIS STAGNALIS	COL							1	50.9	8132
OOCYSTIS	CEL				5	3.7	536		0.4	59
OSCILLATORIA	FIL		0.9	140						
PEDIASTRUM #1	COL		0.3	46						
PEDIASTRUM BORYANUM	COL					0.4	60			
PEDIASTRUM DUPLEX	COL									X
PEDIASTRUM DUPLEX V. CLATHRATUM	COL						X			
PEDIASTRUM KAWRAISKYI	COL			X			X		0.4	59
PERIDINIUM CINCTUM	CEL			X						
RAPHIDIOPSIS CURVATA	FIL					1.2	179			
SCENEDESMUS #2	COL					0.4	60			
SCENEDESMUS BIJUGA V. FLEXUOSUS	COL						X			X
SCENEDESMUS DIMORPHUS	COL			X						
SCENEDESMUS QUADRICAUDA	COL					0.4	60			X
SCENEDESMUS QUADRICAUDA V. BIORNATUS F. GIGANTICUS	COL									X
SCENEDESMUS SPP.	COL		0.9	140						
SCHROEDERIA SETIGERA	CEL		0.6	93		1.2	179		0.7	118
SPHAEROCYSTIS	COL									X
STATOSPORE (DINOBRYON DIVERGENS)	CEL			X						
STAURASTRUM	CEL			X						
STAURASTRUM #1	CEL						X			
STAURASTRUM #3	CEL			X						
STAURONEIS	CEL			X						
STEPHANODISCUS ASTRAEA	CEL		0.6	93		1.2	179			
SYNEDRA ULNA	CEL		0.6	93						
TETRAEDRON CAUDATUM	CEL									X
TRACHELOMONAS VOLVOCINA	CEL		0.3	47						
TOTAL				15193			14322			15979

LAKE NAME: DARLING
STORET NUMBER: 1905

NYGAARD TROPHIC STATE INDICES

DATE	04 18 74	09 24 74
MYXOPHYCEAN	02/0 E	1.00 E
CHLOROPHYCEAN	02/0 E	1.50 E
EUGLENOPHYTE	0.75 E	0.40 E
DIATOM	0.50 E	01/0 E
COMPOUND	08/0 E	4.00 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	04 18 74	09 24 74
GENUS	09	02
SPECIES	03	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		04 18 74	09 24 74
AVERAGE DIVERSITY	H	2.45	1.45
NUMBER OF TAXA	S	19.00	15.00
NUMBER OF SAMPLES COMPOSITED	M	2.00	2.00
MAXIMUM DIVERSITY	MAXH	4.25	3.91
MINUMUM DIVERSITY	MINH	0.09	0.03
TOTAL DIVERSITY	D	6220.55	10682.15
TOTAL NUMBER OF INDIVIDUALS/ML	N	2539.00	7367.00
EVENESS COMPONENT	J	0.58	0.37
RELATIVE EVENESS	RJ	0.57	0.37
MEAN NUMBER OF INDIVIDUALS/TAXA	L	133.63	491.13
NUMBER/ML OF MOST ABUNDANT TAXON	K	1367.00	5665.00

LAKE NAME: DARLING
STORET NUMBER: 1905

CONTINUED

TAXA	FORM	04 18 74 IS	04 18 74 %C	04 18 74 ALGAL UNITS PER ML	09 24 74 IS	09 24 74 %C	09 24 74 ALGAL UNITS PER ML
ANABAENA PLANCTONICA	FIL						X
ANKISTRODESMUS FALCATUS	CEL	12	7.7	195			
APHANIZOMENON FLOS-AQUAE	FIL				11	76.9	5665
CLOSTERIUM	CEL				14	0.5	40
COCCOID CELL	CEL	14	1.4	36			
COELASTRUM CAMBRICUM	COL					0.8	59
COSMARIUM	CEL					0.3	20
CRYPTOMONAS EROSA	CEL			X	12	7.8	574
CRYPTOMONAS SPP.	CEL	11	53.8	1367			
CYANOPHYTAN FILAMENT	FIL		0.7	18			
CYCLOTELLA	CEL		3.5	89			
DINOBRYON DIVERGENS	CEL			X			
EUGLENA #1	CEL			X			
EUGLENA #2	CEL			X			
EUGLENA SPP.	CEL	13	2.1	53			
FLAGELLATE #1	CEL		3.5	89		4.3	317
FLAGELLATE #2	CEL		11.2	284			
GLENODINIUM GYMNODINIUM V. BISCUTELLIFORME	CEL						X
KIRCHNERIELLA	CEL		2.1	53			
LEPOCINCLIS #1	CEL					0.8	59
LEPOCINCLIS #2	CEL		2.1	53			
MELOSIRA GRANULATA	CEL					0.6	59
NAVICULA #2	CEL			X			
NAVICULA SPP.	CEL		1.4	36			
NAVICULA ZANONI	CEL			X			
PALMELLOID CHLOROPHYTAN COLONY	COL					0.8	59
PERIDINIUM UMBONATUM	CEL	15	2.1	53			
QUADRIGULA	COL					0.3	20
RAPHIDIOPSIS CURVATA	FIL		8.4	213			
SCHROEDERIA SETIGERA	CEL					3.2	238
STEPHANODISCUS	CEL				15	2.1	158
TRACHELOMONAS	CEL				13	1.3	99
TOTAL				2539			7367

LAKE NAME: LOST ISLAND
STORET NUMBER: 1906

NYGAARD TROPHIC STATE INDICES

DATE	09 23 74	04 24 76
MYXOPHYCEAN	15/0 E	2.67 E
CHLOROPHYCEAN	13/0 E	3.00 E
EUGLENOPHYTE	0/28 ?	0.29 E
DIATOM	2.00 E	0.19 ?
COMPOUND	34/0 E	8.67 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	09 23 74	04 24 76
GENUS	12	26
SPECIES	01	07

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		09 23 74	04 24 76
AVERAGE DIVERSITY	H	3.50	4.47
NUMBER OF TAXA	S	41.00	61.00
NUMBER OF SAMPLES COMPOSITED	M	2.00	1.00
MAXIMUM DIVERSITY	MAXH	5.36	5.93
MINUMUM DIVERSITY	MINH	0.02	0.10
TOTAL DIVERSITY	D	136552.50	39680.19
TOTAL NUMBER OF INDIVIDUALS/ML	N	39015.00	8877.00
EVENESS COMPONENT	J	0.65	0.75
RELATIVE EVENESS	RJ	0.66	0.75
MEAN NUMBER OF INDIVIDUALS/TAXA	L	951.59	145.52
NUMBER/ML OF MOST ABUNDANT TAXON	K	7769.00	1614.00

LAKE NAME: LOST ISLAND
STORET NUMBER: 1906

CONTINUED

TAXA	FORM	09 23 74 %S	09 23 74 %C	09 23 74 ALGAL UNITS PER ML	04 24 76 %S	04 24 76 %C	04 24 76 ALGAL UNITS PER ML
ACTINASTRUM	CEL					1.3%	115
ANABAENA	FIL						X
ANABAENA #1	FIL		0.7%	256			
ANABAENA #2	FIL		2.4%	939			
ANKISTRODESMUS FALCATUS	CEL				1.5%	7.8%	692
APHANIZOMENON FLOS-AQUAE	FIL	1.5%	5.5%	2134			
APHANOCAPSA ?	COL	14.1%	19.9%	7769			
APHANOTHECE CLATHRATA	COL		2.0%	768			
ASTERIONELLA FORMOSA	CEL					0.7%	58
CARTERIA	CEL					1.3%	115
CENTRIC DIATOMS	CEL		1.3%	512			
CHROOCOCCUS DISPERSUS	COL			X			
COCCONEIS PLACENTULA	CEL					3.6%	317
COELASTRUM CAMBRICUM	COL						X
COELOSPHAERIUM	COL		0.4%	171			
COSMARIUM	CEL					0.3%	29
CRYPTOMONAS	CEL		0.4%	171			
CRYPTOMONAS EROSA	CEL						X
CRYPTOMONAS REFLEXA	CEL						X
CRYPTOMONAS SPP.	CEL				11.%	9.7%	865
CYANOPHYTAN FILAMENT	FIL					1.3%	114
CYCLOTELLA	CEL					1.6%	144
CYCLOTELLA MENEGHINIANA	CEL			X			
CYMBELLA AFFINIS	CEL						X
CYMBELLA SPP.	CEL					3.2%	288
DINOBRYON DIVERGENS	CEL					4.9%	432
ELAKATOTHRIX	CEL			X			
EPITHERIA	CEL					1.0%	86
EUGLENA SPP.	CEL					1.9%	173
EUNOTIA #1	CEL						X
EUNOTIA GRACILIS	CEL						X
EUNOTIA SPP.	CEL					0.3%	29
FLAGELLATE #1	CEL		1.5%	598		18.2%	1614
FLAGELLATE #3	CEL					2.6%	231
FRAGILARIA #2	CEL					2.6%	231
FRAGILARIA CROTONENSIS	CEL				64.%	6.5%	576
FRAGILARIA INTERMEDIA	CEL						X
GOMPHONEMA ACUMINATUM V. CORONATA	CEL						X
GOMPHONEMA CONSTRICTUM	CEL						X
GOMPHONEMA PARVULUM	CEL						X
GOMPHONEMA SPP.	CEL					2.3%	202
GYROSIGMA	CEL					0.3%	29
KIRCHNERIELLA	CEL		0.9%	341		4.5%	403
KIRCHNERIELLA #1	CEL			X			
KIRCHNERIELLA ELONGATA	CEL			X			
LAGERHEIMIA CITRIFORMIS	CEL			X			
LYNGBYA CIRCUMCRETA	FIL		3.9%	1537			
LYNGBYA LIMNETICA	FIL	11.%	15.8%	6147			
MALLOMONAS	CEL			X			
NASTOGLOIA	CEL					1.0%	86
NELOSIRA	CEL			X			
NELOSIRA GRANULATA	CEL			X			X
NELOSIRA GRANULATA V. ANGUSTISSIMA	CEL			X			
NELOSIRA ISLANDICA	CEL						X
NELOSIRA SPP.	CEL	13.%	14.9%	5805			
NERISMOPEDIA	COL					1.0%	86
NERISMOPEDIA MINIMA	COL		10.1%	3927			
NERISMOPEDIA TENUISSIMA	COL			X			
NICROCYSTIS	COL					1.3%	115
NICROCYSTIS AERUGINOSA	COL		3.3%	1281			
NICROCYSTIS INCERTA	COL			X			X
NAVICULA CUSPIDATA	CEL						X
NAVICULA CUSPIDATA V. AMBIGUA	CEL						X
NAVICULA SPP.	CEL					3.6%	317
NITZSCHIA ACICULARIS	CEL		2.0%	768			
NITZSCHIA HOLSATICA	CEL	12.%	11.2%	4354			
NITZSCHIA PALEA	CEL						X
OOCYSTIS	CEL		0.4%	171			X
OSCILLATORIA	FIL		2.4%	939		2.3%	202
PEDIASTRUM BORYANUM	COL						X
PEDIASTRUM DUPLEX	COL			X			
PEDIASTRUM KAWRAISKYI	COL			X			
PEDIASTRUM TETRAS	COL			X			
PHACUS ACUMINATUS	CEL						X
PHACUS MEGALOPSIS	CEL					0.3%	29
PHACUS SPP.	CEL					0.3%	29
PHORMIDIUM #2	FIL					0.3%	29
PHORMIDIUM MUCICOLA	COL			X			
PINNULARIA	CEL					0.7%	58
RAPHIDIOPSIS	FIL					4.9%	432
RHOPALODIA GIBBA	CEL						X
SCENEDESMUS ABUNDANS	COL					0.7%	58

LAKE NAME: LOST ISLAND
STORET NUMBER: 1906

CONTINUED

TAXA	FORM	09 23 74 BS	09 23 74 %C	09 23 74 ALGAL UNITS PER ML	04 24 76 BS	04 24 76 %C	04 24 76 ALGAL UNITS PER ML
SCENEDESMUS ACUMINATUS	COL			X			
SCENEDESMUS BIJUGA	COL					2.6	231
SCENEDESMUS QUADRICAUDA	COL					1.3	115
SPERMATOZOOPSIS	CEL					0.7	58
SPIROGYRA	CEL				13	0.3	29
STAURASTRUM	CEL						X
STAURASTRUM #2	CEL						X
STEPHANODISCUS	CEL			X			
STEPHANODISCUS ASTRAEA	CEL				12	2.3	202
SYNEDRA	CEL		0.7	256			
SYNEDRA ACUS	CEL					0.7	58
TETRAEDRON CAUDATUM	CEL			X			
TETRAEDRON HASTATUM	CEL			X			
TETRASTRUM ELEGANS	COL		0.4	171			
TOTAL				39015			8877

LAKE NAME: MCBRIDE
STORET NUMBER: 1907

NYGAARD TROPHIC STATE INDICES

DATE	04 18 74	07 03 74	09 24 74
MYXOPHYCEAN	01/0 E	3.00 E	4.00 E
CHLOROPHYCEAN	02/0 E	4.00 E	13.0 E
EUGLENOPHYTE	0.33 E	0.43 E	0.24 E
DIATOM	3.00 E	3.00 E	0.87 E
COMPOUND	07/0 E	13.0 E	26.0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	04 18 74	07 03 74	09 24 74
GENUS	00	02	10
SPECIES	00	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		04 18 74	07 03 74	09 24 74
AVERAGE DIVERSITY	H	1.52	1.77	3.17
NUMBER OF TAXA	S	17.00	20.00	45.00
NUMBER OF SAMPLES COMPOSITED	M	3.00	3.00	3.00
MAXIMUM DIVERSITY	MAXH	4.09	4.32	5.49
MINUMUM DIVERSITY	MINH	0.02	0.04	0.07
TOTAL DIVERSITY	D	20988.16	10651.86	30885.31
TOTAL NUMBER OF INDIVIDUALS/ML	N	13808.00	6018.00	9743.00
EVENESS COMPONENT	J	0.37	0.41	0.58
RELATIVE EVENESS	RJ	0.37	0.41	0.58
MEAN NUMBER OF INDIVIDUALS/TAXA	L	812.24	300.90	216.51
NUMBER/ML OF MOST ABUNDANT TAXON	K	8889.00	4077.00	3770.00

LAKE NAME: MCBRIDE
STUDY NUMBER: 1907

CONTINUED

TAXA	FORM	04 18 74 IS	04 18 74 %C	04 18 74 ALGAL UNITS PER ML	07 03 74 IS	07 03 74 %C	07 03 74 ALGAL UNITS PER ML	09 24 74 IS	09 24 74 %C	09 24 74 ALGAL UNITS PER ML
ACHNANTHES	CEL									X
ANABAENA	FIL						X			
ANKISTRODESMUS FALCATUS	CEL			X						X
APHANIZOMENON FLOS-AQUAE	FIL		0.9	119		0.7	40			
ASTERIONELLA FORMOSA	CEL	19	4.3	593			X			
CENTRIC DIATOM	CEL	111	64.4	8889						
CHLOROCOCCALEAN CELL	CEL								0.4	37
COCCONEIS	CEL									X
COELOSPHAERIUM NAEGELIANUM	COL						X			
CRUCIGENIA APICULATA	COL									X
CRUCIGENIA TETRAPEDIA	COL									X
CRYPTOMONAS	CEL							13	6.5	635
CRYPTOMONAS EROSA	CEL			X						
CRYPTOMONAS MARSSONII	CEL			X			X			
CRYPTOMONAS REFLEXA	CEL			X	12	3.3	198	5	0.4	37
CRYPTOMONAS SPP.	CEL	48	4.7	652						
CYCLOTELLA MENEGHINIANA	CEL									X
DACTYLOCOCCOPSIS	CEL								1.9	187
DACTYLOCOCCOPSIS IRREGULARIS	CEL									X
DICTYOSPHAERIUM	COL					1.3	79			
DINOBRYON SOCIALE	CEL			X						
EUASTRUM DENTICULATUM	CEL									X
EUDORINA ELEGANS	COL					1.3	79			
EUGLENA	CEL									X
EUGLENA SCIOTENSIS ?	CEL									X
FLAGELLATE #1	CEL			X			X			
FLAGELLATES	CEL	12	22.3	3081		5.3	317	1	12.6	1232
FRANCEIA	CEL								0.4	37
GLENODINIUM	CEL								0.4	37
GYMNODINIUM ALBULUM	CEL			X						
LEPOCINCLIS	CEL				5	2.0	119			
LUNATE CELL	CEL									X
MELOSIRA #1	CEL							14	6.1	597
MELOSIRA DISTANS	CEL							11	38.7	3770
MELOSIRA GRANULATA	CEL			X	11	67.7	4077	12	2.3	224
MELOSIRA GRANULATA										
V. ANGUSTISSIMA	CEL				14	3.3	198	1	3.8	373
MELOSIRA GRANULATA										
V. ANGUSTISSIMA F. SPIRALIS	CEL								1.1	112
MERISMOPEDIA TENUISSIMA	COL								0.4	37
MESOSTIGMA	CEL									X
NAVICULA	CEL								0.4	37
NITZSCHIA	CEL								0.8	75
OOCYSTIS	CEL				13	13.2	792			
OSCILLATORIA ?	FIL									X
PANDORINA MORUM	COL			X						
PEDIASTRUM BICAUDATA										
V. LONGECORNUTUM	COL									X
PEDIASTRUM DUPLEX										
V. CLATHRATUM	COL						X			
PEDIASTRUM SIMPLEX	COL									X
PENNATE DIATOMS	CEL								8.8	859
PHACUS	CEL									X
PHACUS LONGICAUDA	CEL			X			X			
PHACUS PYRUM	CEL									X
PTEROMONAS ANGULOSA	CEL								0.8	75
SCENEDESMUS DENTICULATUS	COL									X
SCENEDESMUS QUADRICAUDA	COL			X						
SCENEDESMUS QUADRICAUDA										
V. ?	COL									X
SCENEDESMUS SPP.	COL								1.9	187
SCHROEDERIA SETIGERA	CEL						X			
STAURASTRUM	CEL					0.7	40			
STEPHANODISCUS	CEL								3.8	373
STEPHANODISCUS NIAGARAE	CEL	13	3.4	474			X			
SURIRELLA	CEL									X
SYNEDRA	CEL								6.5	635
SYNEDRA ACUS ?	CEL									X
TETRAEDRON MINIMUM										
V. SCROBICULATUM	CEL								0.8	75
TETRAEDRON MUTICUM	CEL									X
TETRASTRUM HETERACANTHUM	COL									X
TETRASTRUM STAUROGENIAEFORME	COL								1.1	112
TRACHELOMONAS	CEL					1.3	79			
TOTAL				13808			6018			9743

LAKE NAME: PRAIRIE ROSE
STORET NUMBER: 1908

NYGAARD TROPHIC STATE INDICES

DATE	04 17 74	07 02 74	09 25 74
MYXOPHYCEAN	2.00 E	1.67 E	1.67 E
CHLOROPHYCEAN	3.00 E	2.00 E	1.67 E
EUGLENOPHYTE	0.40 E	0.18 E	0.30 E
DIATOM	0.71 E	2.00 E	2.00 E
COMPOUND	4.50 E	5.00 E	5.00 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	04 17 74	07 02 74	09 25 74
GENUS	06	11	05
SPECIES	00	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		04 17 74	07 02 74	09 25 74
AVERAGE DIVERSITY	H	2.33	3.10	2.41
NUMBER OF TAXA	S	36.00	22.00	22.00
NUMBER OF SAMPLES COMPOSITED	M	2.00	2.00	2.00
MAXIMUM DIVERSITY	MAXH	5.17	4.46	4.46
MINUMUM DIVERSITY	MINH	0.04	0.11	0.12
TOTAL DIVERSITY	D	30956.38	7483.40	5333.33
TOTAL NUMBER OF INDIVIDUALS/ML	N	13286.00	2414.00	2213.00
EVENESS COMPONENT	J	0.45	0.70	0.54
RELATIVE EVENESS	RJ	0.45	0.69	0.53
MEAN NUMBER OF INDIVIDUALS/TAXA	L	369.06	109.73	100.59
NUMBER/ML OF MOST ABUNDANT TAXON	K	7006.00	522.00	681.00

LAKE NAME: PRAIRIE ROSE
STORET NUMBER: 1908

CONTINUED

TAXA	FORM	04 17 74 BS	04 17 74 %C	04 17 74 ALGAL UNITS PER ML	07 02 74 BS	07 02 74 %C	07 02 74 ALGAL UNITS PER ML	09 25 74 BS	09 25 74 %C	09 25 74 ALGAL UNITS PER ML
ANABAENA	FIL		X							
ANABAENA SPIROIDES	FIL				11	20.5	494		X	
ANKISTRODESMUS ?	CEL	3	3.3	435						
APHANIZOMENON FLOS-AQUAE	FIL				2	15.9	385	1	1.9	43
APHANOCAPSA	COL						X			
ASTERIONELLA FORMOSA	CEL	13	52.7	7006						
BOTRYOCOCCUS BRAUNII	COL						X			
CENTRIC DIATOM	CEL	1	16.2	2158						
CERATIUM HIRUNDINELLA	CEL				1	1.1	27			
CHLAMYDOMONAS ?	CEL		X							
CLOSTERIOPSIS LONGISSIMA	CEL							1	30.8	683
CLOSTERIUM #1	CEL				1	1.1	27			
CLOSTERIUM #2	CEL									X
CLOSTERIUM #3	CEL		X							
COCCOID CHRYSOPHYTAN	CEL		X							
COELASTRUM CAMBRICUM	COL	1	0.2	23			X			X
COELOSPHAERIUM NAEGELIANUM	COL		X		1	1.1	27			X
COSMARIUM	CEL						X			X
CRYPTOMONAS	CEL				15	9.1	220			
CRYPTOMONAS EROSA	CEL	12	2.5	337						
CRYPTOMONAS EROSA ?	CEL							1	26.9	596
CRYPTOMONAS MARSSONII	CEL	1	1.5	193						
CRYPTOMONAS MARSSONII ?	CEL							1	7.7	170
CRYPTOMONAS REFLEXA	CEL	1	0.4	48						
CYMATOPLEURA ELLIPTICA	CEL			X						
DICTYOSPHAERIUM PULCHELLUM	COL	1	0.2	23			X			X
DINOBRYON DIVERGENS	CEL	11	6.3	835						
EUGLENA	CEL			X		3.4	82			
EUGLENA #1	CEL			X						
EUGLENA UXYURIS	CEL									X
FLAGELLATE #1	CEL	15	11.2	1487	1	1.1	27			
FRAGILARIA CROTONENSIS	CEL	1	3.5	68	1	11.4	275	2	17.3	383
GYROSIGMA ?	CEL			X						
HALLOPONAS	CEL			X						
MELOSIRA DISTANS	CEL			X						
MELOSIRA GRANULATA	CEL	1	0.4	48	13	21.6	522			X
MELOSIRA VARIANS	CEL	1	0.3	46						
MICROCYSTIS AERUGINOSA	COL									X
NITZSCHIA	CEL	1	0.2	23						
NITZSCHIA #1	CEL	1	0.5	71						
OOCYSTIS	CEL	1	1.0	138						X
OSCILLATORIA	FIL			X						
OSCILLATORIA AGARDHII	FIL			X						
OSCILLATORIA SUBBREVIS	FIL				14	8.0	192	14	11.5	299
PEDIASTRUM DUPLEX	COL						X			
PEDIASTRUM DUPLEX V. CLATHRATUM	COL			X						
PEDIASTRUM DUPLEX V. RETICULATUM	COL									X
PEDIASTRUM SIMPLEX	COL						X			
PENNATE DIATOM	CEL	3	0.2	23						
PHACUS TORTUS	CEL									X
PHACUS TORTUS ?	CEL		X							
SCENEDESMUS QUADRICAUDA	COL		X							
SCHIZOCHLAMYS ? COMPACTA	COL									X
STAURASTRUM	CEL				1	1.1	27			X
STAURASTRUM CHAETOCERUS	CEL			X						
STEPHANODISCUS ASTRAEA	CEL	14	2.4	324	1	3.4	82	1	3.8	85
TETRAEDRON CONSTRICTUM	CEL						X			
TRACHELOMONAS	CEL				1	1.1	27			
TRACHELOMONAS ?	CEL		X							
TRACHELOMONAS VOLVOCINA	CEL									X
TOTAL				13286			2414			2213

LAKE NAME: RATHBUN
STORET NUMBER: 1909

NYGAARD TROPHIC STATE INDICES

DATE	04 19 74	07 03 74	09 24 74
MYXOPHYCEAN	1.00 E	01/0 E	6.00 E
CHLOROPHYCEAN	6.00 E	04/0 E	9.00 E
EUGLENOPHYTE	0.86 E	0.60 E	0.53 E
DIATOM	0.60 E	1.67 E	1.00 E
COMPOUND	16.0 E	13/0 E	28.0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	04 19 74	07 03 74	09 24 74
GENUS	03	01	09
SPECIES	03	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		04 19 74	07 03 74	09 24 74
AVERAGE DIVERSITY	H	0.63	3.47	3.39
NUMBER OF TAXA	S	27.00	21.00	45.00
NUMBER OF SAMPLES COMPOSITED	M	6.00	6.00	6.00
MAXIMUM DIVERSITY	MAXH	4.75	4.39	5.49
MINUMUM DIVERSITY	MINH	0.01	0.22	0.21
TOTAL DIVERSITY	D	21306.60	3612.27	9081.81
TOTAL NUMBER OF INDIVIDUALS/ML	N	33820.00	1041.00	2679.00
EVENESS COMPONENT	J	0.13	0.79	0.62
RELATIVE EVENESS	RJ	0.14	0.78	0.61
MEAN NUMBER OF INDIVIDUALS/TAXA	L	1252.59	49.57	59.53
NUMBER/ML OF MOST ABUNDANT TAXON	K	30898.00	190.00	818.00

LAKE NAME: RAINBOW
STORET NUMBER: 1409

CONTINUED

TAXA	FORM	04 19 74 IS	04 19 74 EC	04 19 74 ALGAL UNITS PER ML	07 03 74 IS	07 03 74 EC	07 03 74 ALGAL UNITS PER ML	09 24 74 IS	09 24 74 EC	09 24 74 ALGAL UNITS PER ML
ACHNANTHES ?	CEL					X				
ACTINASTRUM	CEL			X						
ANABAENA	FIL									X
ANKISTRODESMUS FALCATUS	CEL	141	2.3	760		X				
ASTERIONELLA FORMOSA	CEL			X						
CARTERIA	CEL									X
CHROOMONAS ? NORDSTEDTII	CEL									X
CLOSTERIUM	CEL			X						X
COELASTRUM CAMBRICUM V. INTERMEDIUM	COL							1	1.9	50
CRYPTOMONAS	CEL	1	0.6	192	12	13.6	142			
CRYPTOMONAS SPP.	CEL							12	9.3	248
CYANOPHYTAN FILAMENT	FIL					4.5	47			
CYANOPHYTAN FILAMENT #1	FIL							1	0.9	25
CYANOPHYTAN FILAMENT #2	FIL							1	0.9	25
CYCLOTELLA MENEGHINIANA	CEL					4.5	47			
DICTYOSPHAERIUM PULCHELLUM	COL			X						
DINOFLAGELLATE	CEL			X						
EUGLENA	CEL			X				1	2.8	74
EUGLENA ACUS	CEL			X			X			
EUGLENA DESES	CEL									X
EUGLENA SPP.	CEL					4.5	47			
EUGLENA TRIPTERIS	CEL			X			X			
FLAGELLATE #1	CEL	12	2.8	958		6.8	71	1	5.6	149
FLAGELLATE #2	CEL				14	13.6	142			X
FLAGELLATE #3	CEL							3	15.7	421
FRAGILARIA ?	CEL							1		X
GYMNODINIUM ? ORBIMATUM	CEL			X						
KIRCHNERIELLA	CEL				1	9.1	95	1	1.9	50
LEPOCINCLIS	CEL							1	0.9	25
MALLOMONAS	CEL							1	0.9	25
MELOSIRA	CEL	1	1	X	1	1		1	1	
MELOSIRA DISTANS	CEL	13	1.4	479	15	6.8	71	1	1	
MELOSIRA GRANULATA	CEL				13	18.3	190			X
MELOSIRA ISLANDICA	CEL									X
MELOSIRA SPP.	CEL							31	30.5	818
MELOSIRA VARIANS	CEL					4.5	47			
MERISMOPEDIA TENUISSIMA	COL							1	1.9	50
NAVICULA	CEL							1	1.9	50
NAVICULA ZANONI	CEL						X			
NITZSCHIA	CEL					4.5	47			X
OSCILLATORIA	FIL			X						
PALMELLOID COLONY	COL						X			
PANDORINA MORUM	COL			X						
PEDIASTRUM TETRAS V. TETRADON	COL			X						
PENNATE DIATOM	CEL									X
PENNATE DIATOM #1	CEL			X						
PENNATE DIATOM #2	CEL			X						
PENNATE DIATOM #3	CEL			X						
PERIDINIUM	CEL							1	0.9	25
PERIDINIUM QUADRIDENS	CEL									X
PHACUS	CEL									X
PHACUS CAUDATUS	CEL									X
PHACUS MEGALOPSIS	CEL			X						
PHACUS NORDSTEDTII	CEL			X						
RAPHIDIOPSIS	FIL							1	4.6	124
RAPHIDIOPSIS CURVATA	FIL									X
SCENEDESMUS	COL	1	0.1	48						
SCENEDESMUS BICAUDATUS	COL									X
SCENEDESMUS RIJUGA	COL						X			
SCENEDESMUS QUADRICAUDA	COL									X
SCHROEDERIA	CEL									X
SCHROEDERIA SETIGERA	CEL						X			
STEPHANODISCUS	CEL	13	91.4	39898	13	6.8	71	14	7.4	198
STEPHANODISCUS #2	CEL									X
STEPHANODISCUS ASTRAEA	CEL									X
SYNEDRA	CEL			X						
SYNEDRA ULNA	CEL									X
TETRAEDRON CONSTRICTUM	CEL									X
TETRAEDRON MUTICUM	CEL									X
TETRASTRUM HETERACANTHUM	COL	1	0.6	192				1	1.9	50
TETRASTRUM STAUROGENIAEFORME	COL							2	2.8	74
TRACHELOMONAS	CEL	15	0.8	287	1	1				
TRACHELOMONAS ?	CEL	1				2.3	24			
TRACHELOMONAS PLANCTONICA	CEL	1	1		1	1				X
TRACHELOMONAS PULCHELLA	CEL									X
TRACHELOMONAS SCABRA	CEL									X
TRACHELOMONAS SPP.	CEL							13	7.4	198
TOTAL				33820			1041			2679

LAKE NAME: RED ROCK
STORET NUMBER: 1910

NYGAARD TROPHIC STATE INDICES

DATE	04 18 74	07 08 74	09 24 74
MYXOPHYCEAN	2.00 E	07/0 E	3.00 E
CHLOROPHYCEAN	5.00 E	14/0 E	7.00 E
EUGLENOPHYTE	0.57 E	0.24 E	0.10 ?
DIATOM	0.50 E	0.83 E	1.50 E
COMPOUND	14.0 E	31/0 E	17.0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	04 18 74	07 08 74	09 24 74
GENUS	19	19	21
SPECIES	00	07	04

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		04 18 74	07 08 74	09 24 74
AVERAGE DIVERSITY	H	1.55	4.10	2.59
NUMBER OF TAXA	S	25.00	42.00	25.00
NUMBER OF SAMPLES COMPOSITED	M	2.00	5.00	3.00
MAXIMUM DIVERSITY	MAXH	4.64	5.39	4.64
MINUMUM DIVERSITY	MINH	0.03	0.14	0.05
TOTAL DIVERSITY	D	20884.70	16014.60	16143.47
TOTAL NUMBER OF INDIVIDUALS/ML	N	13474.00	3906.00	6233.00
EVENESS COMPONENT	J	0.33	0.76	0.56
RELATIVE EVENESS	RJ	0.33	0.76	0.56
MEAN NUMBER OF INDIVIDUALS/TAXA	L	538.96	93.00	249.32
NUMBER/ML OF MOST ABUNDANT TAXON	K	9795.00	454.00	3213.00

LAKE NAME: RED ROCK
STORET NUMBER: 1910

CONTINUED

TAXA	FORM	04 18 74 IS	04 18 74 % C	04 18 74 ALGAL UNITS PER ML	07 08 74 IS	07 08 74 % C	07 08 74 ALGAL UNITS PER ML	09 24 74 IS	09 24 74 % C	09 24 74 ALGAL UNITS PER ML
ACTINASTRUM	CEE					9.38	363			
ACTINASTRUM HANTZSCHII	CEL			X						X
ANABAENA	FIL				131	4.78	182			
ANKISTRODESMUS ?	CEL		2.40	325						
APHANIZOMENON FLOS-AQUAE	FIL				111	5.88	227			
APHANOCAPSA	COL					X				
ARTHRODESMUS	CEL			X						
ASTERIONELLA FORMOSA	CEL			X		X				
CALONEIS AMPHISBAENA	CEL			X						
CENTRIC DIATOM	CEL	12	72.78	9795						
CHLOROPHYTAN COCCOID CELLED COLONY	COL		1.61	216						
CLOSTERIUM	CEL									X
COELASTRUM CAMBRICUM V. INTERMEDIUM	COL					X				
COELOSPHAERIUM	COL				158	7.08	273			
CRUCIGENIA TETRAPEDIA	COL					1.28	45			
CRYPTOMONAS	CEL					3.58	136			
CRYPTOMONAS EROSA	CEL	141	3.68	487					1.01	64
CRYPTOMONAS EROSA ?	CEL						X			
CRYPTOMONAS REFLEXA	CEL			X						
CYCLOTELLA	CEL							111	51.58	3213
CYCLOTELLA MENEGHINIANA	CEL					3.58	136			
DACTYLOCOCCOPSIS	CEL					4.78	182			
DACTYLOCOCCOPSIS IRREGULARIS	CEL								3.18	193
DICTYOSPHAERIUM PULCHELLUM	COL								1.01	64
DINOBRYON SOCIALE	CEL		0.48	54						
EUGLENA	CEL					4.78	182		1.01	64
EUGLENA #1	CEL			X			X			
EUGLENA #2	CEL		0.88	108						
FLAGELLATE #1	CEL							151	5.28	321
FLAGELLATE #2	CEL					5.88	227			
GLENODINIUM OCULATUM	CEL						X			
KIRCHNERIELLA	CEL					2.38	91			
LUNATE CELL	CEL									X
MELOSIRA	CEL									X
MELOSIRA #4	CEL							131	7.28	490
MELOSIRA DISTANS	CEL					2.38	91	141	4.18	257
MELOSIRA GRANULATA	CEL			X			X			
MELOSIRA GRANULATA V. ANGUSTISSIMA	CEL						X			X
MERISMOPEDIA TENUISSIMA	COL					2.38	91		4.18	257
NAVICULA	CEL		0.48	54						
NAVICULA CRYPTOCEPHALA	CEL						X			
NAVICULA EXIGUA	CEL						X			
NITZSCHIA #1	CEL								3.18	193
NITZSCHIA #2	CEL									X
NITZSCHIA ACICULARIS	CEL					11.68	454			X
NITZSCHIA FILIFORMIS	CEL						X			
NITZSCHIA HOLSATICA	CEL						X			
OSCILLATORIA	FIL	156	1.28	162	128	11.68	454			
OSCILLATORIA LIMNETICA	FIL			X				128	12.48	771
PALMELLOID COLONY	COL					1.28	45			
PEDIASTRUM	COL						X			
PEDIASTRUM DUPLEX	COL									X
PEDIASTRUM DUPLEX V. CLATHRATUM	COL						X			
PEDIASTRUM DUPLEX V. RETICULATUM	COL			X						
PEDIASTRUM TETRAS V. TETRAODON	COL									X
PHACUS CAUDATUS	CEL			X						
PHACUS MEGALOPSIS	CEL						X			
PHACUS PSEUDONORDSTEDTII	CEL		0.48	54						
SCENEDESMUS ABUNDANS	COL									X
SCENEDESMUS ACUMINATUS	COL					1.28	45			
SCENEDESMUS BIJUGA	COL					2.38	91			
SCENEDESMUS BIJUGA V. FLEXUOSUS	COL						X			
SCENEDESMUS DIMORPHUS	COL			X					1.01	64
SCENEDESMUS GRANULATUS V. LONGISPINA F. GRANULATA	COL						X			
SCENEDESMUS QUADRICAUDA	COL			X		2.38	91		2.18	129
SCENEDESMUS RENIFORME	COL						X			
SCHROEDERIA SETIGERA	CEL						X			
STEPHANODISCUS ASTRAEA	CEL	118	9.28	1245	148	8.18	318			X
SURIRELLA ANGUSTATA	CEL			X						
SYNEDRA	CEL	136	7.28	974					3.18	193
SYNEDRA ULNA	CEL			X						
TETRASTRUM STAUROGENIAEFORME	COL					4.78	182			
TRACHELOMONAS ENSIFERA V. JAVANICA	CEL						X			
TRACHELOMONAS URCEOLATA	CEL						X			
TOTAL				13474			3906			6233

LAKE NAME: ROCK CREEK
STORET NUMBER: 1911

NYGAARD TROPHIC STATE INDICES

DATE	04 19 74	07 03 74	09 24 74
MYXOPHYCEAN	0.50 E	0/03 D	2.50 E
CHLOROPHYCEAN	1.00 E	0/03 D	2.50 E
EUGLENOPHYTE	0.67 E	12/0 E	0.30 E
DIATOM	0.43 E	0.75 E	0.67 E
COMPOUND	4.00 E	5.00 E	7.50 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	04 19 74	07 03 74	09 24 74
GENUS	07	10	06
SPECIES	03	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		04 19 74	07 03 74	09 24 74
AVERAGE DIVERSITY	H	0.69	2.31	1.76
NUMBER OF TAXA	S	24.00	30.00	26.00
NUMBER OF SAMPLES COMPOSITED	M	2.00	2.00	2.00
MAXIMUM DIVERSITY	MAXH	4.58	4.91	4.70
MINUMUM DIVERSITY	MINH	0.02	0.23	0.08
TOTAL DIVERSITY	D	12482.10	3411.87	7835.52
TOTAL NUMBER OF INDIVIDUALS/ML	N	18090.00	1477.00	4452.00
EVENESS COMPONENT	J	0.15	0.47	0.37
RELATIVE EVENESS	RJ	0.15	0.45	0.37
MEAN NUMBER OF INDIVIDUALS/TAXA	L	753.75	49.23	171.23
NUMBER/ML OF MOST ABUNDANT TAXON	K	16387.00	502.00	2759.00

LAKE NAME: ROCK CREEK
STORET NUMBER: 1911

CONTINUED

TAXA	FORM	08 19 74 BS	08 19 74 %C	08 19 74 ALGAL UNITS PER ML	07 03 74 BS	07 03 74 %C	07 03 74 ALGAL UNITS PER ML	09 24 74 BS	09 24 74 %C	09 24 74 ALGAL UNITS PER ML
ANABAENA #1	FIL									X
ANABAENA #2	FIL									X
APHANIZOMENON FLOS-AQUAE	FIL		0.3	52				81	62.0	2759
ASTERIONELLA FORMOSA	CEL		0.2	35						
CENTRIC DIATOM	CEL				13	28.0	413			
CHLAMYDOMONAS	CEL	15	0.7	122				14	7.0	313
CHLAMYDOMONAS PSEUDOPERTYI	CEL						X			
CLOSTERIUM #1	CEL						X			X
CLOSTERIUM #2	CEL						X			
CLOSTERIUM #3	CEL						X			
CLOSTERIUM #4	CEL			X						
COELASTRUM CAMBRICUM	COL									X
COELOSPHAERIUM NAEGELIANUM	COL									X
CRUCIGENIA QUADRATA	COL								2.0	125
CRYPTOMONAS EROSA	CEL	13	2.2	400	11	34.0	502			X
CRYPTOMONAS OVATA	CEL									X
CRYPTOMONAS REFLEXA	CEL	12	1.0	174						
CRYPTOMONAS SPP.	CEL							12	15.5	690
CYCLOTELLA	CEL	13	90.6	16387						
CYMATOPLEURA SOLEA	CEL			X						
CYMBELLA	CEL									X
DINOBRYON SOCIALE	CEL		0.1	17						
EUDORINA ELEGANS	CEL						X			
EUGLENA	CEL					2.0	30			
EUGLENA #1	CEL						X			
EUGLENA ACUS	CEL						X			
EUGLENA GRACILIS	CEL						X			
EUGLENA OXYURIS	CEL				15	2.0	30			
EUGLENA SPIROIDES	CEL									X
EUGLENA TRIPTERIS	CEL						X			
FLAGELLATE #1	CEL		3.9	712		4.0	59	15	9.9	439
GLENODINIUM GYMNODINIUM V. #ISCUTELLIFORME	CEL									X
GLOEOCYSTIS ?	COL						X			
GYMNODINIUM	CEL		0.3	52						
GYROSIGMA	CEL									X
GYROSIGMA ?	CEL			X			X			
LEPOCINCLIS #1	CEL						X			
LEPOCINCLIS ACUTA ?	CEL						X			X
LEPOCINCLIS BUTSCHLII	CEL						X			
LEPOCINCLIS SPP.	CEL					4.0	59			
MALLOMONAS ACAROIDES	CEL			X						
MELOSIRA GRANULATA	CEL			X	14	4.0	59			X
MELOSIRA GRANULATA V. ANGUSTISSIMA	CEL						X			X
MICROCYSTIS AERUGINOSA	COL									X
NAVICULA ZANONI ?	CEL			X						
NITZSCHIA #1	CEL			X			X			
NITZSCHIA #2	CEL						X			
NITZSCHIA SPP.	CEL				12	22.0	325			
OOCYSTIS	CEL									X
PANDORINA MORUM	COL						X			
PEDIASTRUM DUPLEX V. RETICULATUM	COL									X
PHACUS ?	CEL						X			
PHACUS LONGICAUDA ?	CEL						X			
PHACUS PLEURONECTES	CEL			X						
SCENEDESMUS INTERMEDIUS V. BICAUDATUS	COL		0.1	17						
SCHROEDERIA SETIGERA	CEL			X						
STAURASTRUM CHAETOCERUS	CEL			X						X
STEPHANODISCUS ASTRAEA	CEL		0.2	35						
SURIRELLA	CEL		0.1	17						
SYNEDRA	CEL						X			
SYNEDRA ACUS	CEL							13	1.4	63
SYNEDRA ULNA	CEL	14	0.4	70						X
TETRAEDRON CONSTRICTUM	CEL									
TRACHELOMONAS GIBBEROSA	CEL						X			
TRACHELOMONAS VOLVOCINA	CEL								1.4	63
TOTAL				18090			1477			4452

LAKE NAME: SILVER
STORET NUMBER: 1912

NYGAARD TROPHIC STATE INDICES

DATE	07 03 74	09 23 74
MYXOPHYCEAN	4.00 E	3.00 E
CHLOROPHYCEAN	7.67 E	3.50 E
EUGLENOPHYTE	0.06 ?	0/26 ?
DIATOM	0.40 E	0.75 E
COMPOUND	13.0 E	7.25 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	07 03 74	09 23 74
GENUS	13	08
SPECIES	07	04

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		07 03 74	09 23 74
AVERAGE DIVERSITY	H	2.61	1.08
NUMBER OF TAXA	S	52.00	40.00
NUMBER OF SAMPLES COMPOSITED	M	2.00	1.00
MAXIMUM DIVERSITY	MAXH	5.70	5.32
MINIMUM DIVERSITY	MINH	0.01	0.00
TOTAL DIVERSITY	D	215792.19	229099.32
TOTAL NUMBER OF INDIVIDUALS/ML	N	82679.00	212129.00
EVENESS COMPONENT	J	0.46	0.20
RELATIVE EVENESS	RJ	0.46	0.21
MEAN NUMBER OF INDIVIDUALS/TAXA	L	1589.98	5303.23
NUMBER/ML OF MOST ABUNDANT TAXON	K	45876.00	180490.00

LAKE NAME: SILVER CONTINUED
STORET NUMBER: 1912

TAXA	FORM	07 03 74 IS	07 03 74 %C	07 03 74 ALGAL UNITS PER ML	09 23 74 IS	09 23 74 %C	09 23 74 ALGAL UNITS PER ML
ACTINASTRUM	COL	1	0.51	386	1		
ANABAENOPSIS CIRCULARIS	FIL	1			1	0.51	1062
ANKISTRODESMUS FALCATUS	CEL	1	0.11	97	1		X
APHANIZOMENON FLOS-AQUAE	FIL	11	13.21	10914	12	4.81	13192
APHANOCAPSA DELICATISSIMA	COL	1			1	0.61	1274
APHANOCAPSA ELACHISTA	COL	1	0.11	97	1		
APHANOTHECE CLATHRATA	COL	1			1	0.31	637
CENTRIC DIATOM	CEL	1			1	0.11	212
CERATIUM HIRUNDINELLA	CEL	1	0.11	97	1		
CHLOROGONIUM	CEL	1			1		X
CHROOCOCCUS	COL	1	0.11	97	1		
CHROOCOCCUS #1	COL	1		X	1		
CHROOCOCCUS #2	COL	1			1		X
COELASTRUM SPHAERICUM	COL	1		X	1		
COSMARIUM #1	CEL	1	0.11	97	1		X
COSMARIUM CLEPSYDRA		1			1		
V. NANUM	CEL	1	0.11	97	1		X
CRYPTOMONAS	CEL	1	0.91	773	1	0.21	425
CYMATOPLEURA SOLEA	CEL	1		X	1		X
DICTYOSPHAERIUM PULCHELLUM	COL	1		X	1		
EPITHEMIA	CEL	1		X	1		
EUGLENA	CEL	1		X	1		
FLAGELLATES	CEL	1	1.61	1352	1	0.11	212
FRAGILARIA	CEL	1	1.41	1159	1		X
GLENODINIUM GYMNODINIUM	CEL	1		X	1		
GOLENKINIA	CEL	1	1.81	1449	1		X
KIRCHNERIELLA LUNARIS		1			1		
V. IRREGULARIS	CEL	1	0.51	386	1		
LAGERHEIMIA	CEL	1	0.11	97	1		
LYNGBYA	FIL	1		X	1		
LYNGBYA & OSCILLATORIA	FIL	12	55.51	45876	1		
LYNGBYA CIRCUMCRETA	FIL	1	2.01	1642	14	2.11	4459
LYNGBYA LIMNETICA	FIL	1			1		X
LYNGBYA LIMNETICA & OSCILLATORIA LI	FIL	1			43	85.11	180490
MALLOMONAS ACARDIOLS	CEL	1		X	1		
MELOSIRA	CEL	14	6.11	5022	15	0.31	637
MERISMOPEDIA PUNCTATA	COL	1		X	1		
MERISMOPEDIA TENUISSIMA	COL	1		X	1	0.11	212
MICROCYSTIS AERUGINOSA	COL	15	2.11	1738	13	2.81	5946
MICROCYSTIS INCERTA	COL	1	0.91	773	1	1.11	2335
NITZSCHIA HOLSATICA	CEL	1	0.91	773	1		X
PEDIASTRUM BORYANUM	COL	1	0.21	193	1		X
PEDIASTRUM DUPLEX		1			1		
V. CLATHRATUM	COL	1		X	1		
PEDIASTRUM DUPLEX		1			1		
V. RETICULATUM	COL	1		X	1		X
PHACUS MEGALOPSIS	CEL	1		X	1		
PHORMIDIUM AUCICOLA	COL	1		X	1		X
POLYEDRIOPSIS ?	CEL	1	0.11	97	1		
SCENEDESMUS ABUNDANS	COL	1	2.61	2125	1	0.61	1274
SCENEDESMUS ACUMINATUS	COL	1		X	1		X
SCENEDESMUS BIJUGA	COL	1	0.81	676	1		
SCENEDESMUS BIJUGA		1			1		
V. FLEXUOSUS	COL	1			1	0.21	425
SCENEDESMUS DIMORPHUS	COL	1	0.11	97	1	0.21	425
SCENEDESMUS QUADRICAUDA	COL	1	0.71	579	1	0.21	425
SCHROEDERIA SETIGERA	CEL	1		X	1		
SPHAEROCYSTIS SCHROETERI	COL	1		X	1		
STAURASTRUM #1	CEL	1	0.11	97	1		X
STAURASTRUM TETRACERUM	CEL	1			1		X
STEPHANODISCUS ASTRAEA	CEL	1	1.21	966	1		X
SYNEDRA	CEL	13	5.41	4443	1	0.51	1062
TETRAEDRON CAUDATUM		1			1		
V. LONGECORNUTUM	CEL	1	0.41	290	1		
TETRAEDRON MASTATUM	CEL	1	0.11	97	1		X
TETRAEDRON MINIMUM		1			1		
V. SCROBICULATUM	CEL	1	0.11	97	1		X
TETRAEDRON REGULARE	CEL	1			1		X
TETRAEDRON REGULARE		1			1		
V. INCUS	CEL	1			1	0.21	425
TREUBARIA	CEL	1		X	1		X
WESTELLA BOTRYOIDES ?	CEL	1		X	1		
TOTAL				82679			232129

LAKE NAME: SPIRIT
STORET NUMBER: 1913

NYGAARD TROPHIC STATE INDICES

DATE	04 23 74	07 09 74	09 23 74
MYXOPHYCEAN	01/0 E	06/0 E	9.00 E
CHLOROPHYCEAN	01/0 E	04/0 E	3.00 E
EUGLENOPHYTE	0/02 ?	0/10 ?	0.08 ?
DIATOM	0.12 ?	0.33 E	0.50 E
COMPOUND	03/0 E	12/0 E	14.0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	04 23 74	07 09 74	09 23 74
GENUS	01	01	07
SPECIES	00	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		04 23 74	07 09 74	09 23 74
AVERAGE DIVERSITY	H	2.40	2.36	2.98
NUMBER OF TAXA	S	17.00	20.00	19.00
NUMBER OF SAMPLES COMPOSITED	M	3.00	3.00	3.00
MAXIMUM DIVERSITY	MAXH	4.09	4.32	4.25
MINUMUM DIVERSITY	MINH	0.13	0.08	0.06
TOTAL DIVERSITY	D	3686.40	6855.80	11055.80
TOTAL NUMBER OF INDIVIDUALS/ML	N	1536.00	2905.00	3710.00
EVENESS COMPONENT	J	0.59	0.55	0.70
RELATIVE EVENESS	RJ	0.58	0.54	0.70
MEAN NUMBER OF INDIVIDUALS/TAXA	L	90.35	145.25	195.26
NUMBER/ML OF MOST ABUNDANT TAXON	K	672.00	1569.00	1182.00

LAKE NAME: SPIRIT
STORET NUMBER: 1913

CONTINUED

TAXA	FORM	04 23 74			07 09 74			09 23 74		
		IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML
ANABAENA PLANCTONICA	FIL				11	8.0	232	11	19.8	734
APHANIZOMENON ? FLOS-AQUAE	FIL				12	9.0	262			
APHANIZOMENON FLOS-AQUAE	FIL							12	8.8	326
APHANOCAPSA ?	COL				13	54.0	1569			
APHANOTHECE ?	COL		6.2	96						
APHANOTHECE ? CLATHRATA	COL							13	31.9	1182
ASTERIONELLA FORMOSA	CEL			X			X			X
CLOSTERIUM	CEL									X
COCCONEIS PLACENTULA	CEL					2.0	58			X
COELOSPHAERIUM NAEGELIANUM	COL							14	7.7	285
CRYPTOMONAS EROSA	CEL	11	9.4	144	14	5.0	145		4.4	163
CYANOPHYTAN FILAMENT	FIL					2.0	58			
CYLINDROSPERMUM STAGNALE ?	CEL									X
CYMBELLA	CEL			X			X			
DINOBRYON SOCIALE	CEL	15	15.6	240						
DINOFLAGELLATE CYST	CEL	14	3.1	48						
EPITHEMIA	CEL			X						
EUGLENA ?	CEL									X
EUNOTIA ?	CEL		3.1	48						
FLAGELLATE #1	CEL	12	43.7	672	15	4.0	116		5.5	204
FLAGELLATE #2	CEL	13	15.6	240						
FRAGILARIA #1	CEL						X			
FRAGILARIA #2	CEL			X						
FRAGILARIA CROTONENSIS	CEL						X			
FRAGILARIA INTERMEDIA	CEL			X						
MALLOMONAS	CEL			X						
MELOSIRA GRANULATA	CEL						X			
MELOSIRA ISLANDICA	CEL			X						X
MERISMOPEDIA MINIMA	COL					4.0	116		4.4	163
MICROCYSTIS AERUGINOSA	COL							15	5.5	204
NAVICULA	CEL						X			
NITZSCHIA FILIFORMIS	CEL			X						
OOCYSTIS	CEL					3.0	87			X
OSCILLATORIA	FIL						X		6.6	245
PEDIASTRUM BORYANUM	COL						X			X
PEDIASTRUM SIMPLEX	COL						X			
PHORMIDIUM MUCICOLA	COL								3.3	122
SCHROEDERIA SETIGERA	CEL		3.1	46		9.0	262		2.2	82
STEPHANODISCUS ASTRAEA	CEL						X			
SYNEDRA ULNA	CEL			X						
TOTAL				1536			2905			3710

LAKE NAME: VIKING
STORET NUMBER: 1914

NYGAARD TROPHIC STATE INDICES

DATE	04 17 74	07 02 74	09 25 74
MYXOPHYCEAN	01/0 E	5.00 E	1.25 E
CHLOROPHYCEAN	01/0 E	3.00 E	0.50 ?
EUGLENOPHYTE	0/02 ?	0.12 ?	0.14 ?
DIATOM	0/01 ?	1.00 E	1.00 E
COMPOUND	02/0 E	10.0 E	2.25 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	04 17 74	07 02 74	09 25 74
GENUS	00	05	02
SPECIES	00	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		04 17 74	07 02 74	09 25 74
AVERAGE DIVERSITY	H	0.56	2.47	2.22
NUMBER OF TAXA	S	7.00	16.00	17.00
NUMBER OF SAMPLES COMPOSITED	M	1.00	1.00	1.00
MAXIMUM DIVERSITY	MAXH	2.81	4.00	4.09
MINUMUM DIVERSITY	MINH	0.00	0.05	0.05
TOTAL DIVERSITY	D	30812.88	9862.71	9446.10
TOTAL NUMBER OF INDIVIDUALS/ML	N	55023.00	3993.00	4255.00
EVENESS COMPONENT	J	0.20	0.62	0.54
RELATIVE EVENESS	RJ	0.20	0.62	0.54
MEAN NUMBER OF INDIVIDUALS/TAXA	L	7860.43	249.56	250.29
NUMBER/ML OF MOST ABUNDANT TAXON	R	49981.00	1719.00	1684.00

LAKE NAME: VIKING
STORET NUMBER: 1914

CONTINUED

TAXA	FORM	04 17 74			07 02 74			09 25 74		
		I/S	%C	ALGAL UNITS PER ML	I/S	%C	ALGAL UNITS PER ML	I/S	%C	ALGAL UNITS PER ML
ANABAENA PLANCTONICA	FIL				11	17.5	700	1	1.4	61
ANABAENA SPIROIDS	FIL							15	2.9	122
APHANIZOMENON FLOS-AQUAE	FIL	12	6.6	3617	12	16.1	641	12	9.4	398
ASTERIONELLA FORMOSA	CEL	11	90.8	49981						
CERATIUM HIRUNDINELLA	CEL				1	0.7	29	1		X
CLOSTERIUM GRACILE 7					1			1		
V. ELONGATUM	CEL				1			1	0.7	31
COELOSPHAERIUM KAEGELIANUM	COL	1			14	3.7	148	11	39.6	1684
COSMARIUM	CEL							1		X
CRYPTOMONAS	CEL	14	0.4	219	1			1	2.2	92
CRYPTOMONAS EROSA	CEL	1			15	6.6	262	1		
DICTYOSPHAERIUM PULCHELLUM	COL	1		X	1			1		
DINOBRYON CYLINDRICUM	CEL	15	0.6	329	1			1		
FLAGELLATE #1	CEL	13	1.4	767	1	2.2	87	1	1.4	61
FRAGILARIA CROTONENSIS	CEL	1			13	43.1	1719	14	35.3	1500
GYMNODINIUM	CEL	1	0.2	110	1			1		
LEPOCINCLIS	CEL	1			1			1		
MELOSIRA	CEL	1			1		X	1		
MELOSIRA GRANULATA	CEL	1			1			1	2.9	122
MICROCYSTIS AERUGINOSA	COL	1			1		X	13	4.3	184
OOCYSTIS	CEL	1			1	2.2	87	1		X
OSCILLATORIA	FIL	1			1	2.2	00087	1		
PEDIASTRUM DUPLEX		1			1			1		
V. CLATHRATUM	COL	1			1		X	1		
PERIDINIUM INCONSPICUUM	CEL	1			1		X	1		
SCHROEDERIA SETIGERA	CEL	1			1	5.8	233	1		
SPHAEROCYSTIS SCHROETERI	COL	1			1			1		X
STAURASTRUM #1	CEL	1			1		X	1		X
STAURASTRUM #2	CEL	1			1			1		X
TRACHELOMONAS VOLVOCINA	CEL	1			1			1		X
TOTAL				55023			3993			4255

LAKE NAME: WEST LAKE OKOBOJI
STORET NUMBER: 1915

NYGAARD TROPHIC STATE INDICES

DATE	04 22 74	07 09 74	09 23 74
MYXOPHYCEAN	01/0 E	06/0 E	10.0 E
CHLOROPHYCEAN	0/0 D	06/0 E	7.00 E
EUGLENOPHYTE	1.00 E	0/12 ?	0/17 ?
DIATOM	0.37 E	1.00 E	0.57 E
COMPOUND	05/0 E	15/0 E	21.0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	04 22 74	07 09 74	09 23 74
GENUS	02	01	02
SPECIES	02	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		04 22 74	07 09 74	09 23 74
AVERAGE DIVERSITY	H	1.95	2.62	3.34
NUMBER OF TAXA	S	21.00	20.00	34.00
NUMBER OF SAMPLES COMPOSITED	M	3.00	3.00	3.00
MAXIMUM DIVERSITY	MAXH	4.39	4.32	5.09
MINIMUM DIVERSITY	MINH	0.09	0.12	0.43
TOTAL DIVERSITY	D	5924.10	4970.14	2889.10
TOTAL NUMBER OF INDIVIDUALS/ML	N	3038.00	1897.00	865.00
EVENESS COMPONENT	J	0.44	0.61	0.66
RELATIVE EVENESS	RJ	0.44	0.60	0.63
MEAN NUMBER OF INDIVIDUALS/TAXA	L	144.67	94.85	25.44
NUMBER/ML OF MOST ABUNDANT TAXON	K	1395.00	642.00	164.00

LAKE NAME: WEST LAKE DROBOJT CONTINUED
STUDY NUMBER: 1915

TAXA	FORM	04 22 74 IS	04 22 74 %C	04 22 74 ALGAL UNITS PER ML	07 09 74 IS	07 09 74 %C	07 09 74 ALGAL UNITS PER ML	09 23 74 IS	09 23 74 %C	09 23 74 ALGAL UNITS PER ML
AMPHORA	CEL									X
ANABAENA	FIL					3.0	57			X
APHANIZOMENON FLOS-AQUAE	FIL				2	15.0	285	1	7.2	62
APHANOCAPSA DELICATISSIMA	COL				1	24.8	471			
APHANOCAPSA ELACHISTA V. PLANCTONICA	COL								2.4	21
APHANOTHECE ? CLATHRATA	COL								2.4	21
ASTERIONELLA FORMOSA	CEL		1.0	31						X
BOTRYOCOCCUS BRAUNII	COL					X				X
CLOSTERIUM	CEL									X
COCCOID CHRYSOPHYTAN	CEL			X						
COCCONEIS	CEL									X
COELASTRUM RETICULATUM	COL									X
COELOSPHAERIUM NAEGELIANUM	COL				1	6.7	128		2.4	21
CRYPTOMONAS	CEL					0.7	14			X
CRYPTOMONAS EROSA	CEL		1.0	31						X
CRYPTOMONAS REFLEXA	CEL			X						
CYCLOTELLA	CEL	12	45.9	1395						
CYMATOPLEURA SOLEA	CEL			X						
CYMBELLA	CEL			X						
DIATOMA VULGARE	CEL			X						
DINOBRYON CYLINDRICUM	CEL			X						
EUDORINA	CEL									X
FLAGELLATE #1	CEL	13	15.3	465	13	33.6	642	1	14.2	123
FLAGELLATE #3	CEL									X
FRAGILARIA	CEL	1	30.6	930		8.3	157			X
GYMNODINIUM ALBULUM	CEL		2.0	62						
GYROSIGMA	CEL					X				
LUNATE CELL	CEL		1.0	31						
MELOSIRA GRANULATA	CEL					1.5	29	13	9.5	82
MELOSIRA GRANULATA ?	CEL			X						
MELOSIRA GRANULATA V. ANGUSTISSIMA	CEL									X
MELOSIRA VARIANS	CEL	14	2.0	62			X			
MICROCYSTIS AERUGINOSA	CEL			X		1.5	29	14	9.5	82
MICROCYSTIS INCERTA	COL								7.2	62
NAVICULA	CEL									X
NITZSCHIA ? #3	CEL						X			
NITZSCHIA #1	CEL			X						
NITZSCHIA #2	CEL			X						
NITZSCHIA #3	CEL			X						
OOCYSTIS	CEL						X	1	19.0	164
OOCYSTIS SUBMARINA	CEL									X
OSCILLATORIA	FIL									X
OSCILLATORIA AGARDHII	FIL								2.4	21
PEDIASTRUM	COL									X
PEDIASTRUM BORYANUM	COL						X			
PENNATE DIATOM	CEL								2.4	21
PERIDINIUM	CEL	15	1.0	31						
PHORMIDIUM MUCICOLA	COL						X			X
SCHROEDERIA SETIGERA	CEL				1	3.7	71		4.7	41
SPHAEROCYSTIS SCHROETERI	CEL					0.7	14	12	16.6	144
STEPHANODISCUS	CEL					X				X
STEPHANODISCUS ASTRAEA	CEL									X
SYNEDRA	CEL									X
TETRAEDRON REGULARE	CEL					X				
TRACHELOMONAS VOLVOCINA	CEL			X						
TOTAL				3038			1897			865

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

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15. SUPPLEMENTARY NOTES

16. ABSTRACT

This is a data report presenting the species and abundance of phytoplankton in the 15 lakes sampled by the National Eutrophication Survey in the State of Iowa. Results from the calculation of several water quality indices are also included (Nygaard's Trophic State Index, Palmer's Organic Pollution Index, and species diversity and abundance indices).

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
*aquatic microbiology lakes *phytoplankton water quality	Iowa lake eutrophication Nygaard's trophic indices Palmer's organic pollution indices Species diversity and abundance indices	06 C, M 08 H 13 B

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