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Research and Development

Distribution of Phytoplankton in Utah Lakes

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December 1979

DISTRIBUTION OF PHYTOPLANKTON IN UTAH 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 25 lakes sampled by the National Eutrophication Survey in the State of Utah, 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 1975, the Survey sampled 156 lakes in 11 States. Over 450 algal species and varieties were identified and enumerated from the 430 water samples examined.

This report presents the species and abundance of phytoplankton in the 25 lakes sampled in the State of Utah (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 UTAH

STORET No.	Lake Name	County
4901	Bear Lake	Rich (Bear Lake in Idaho)
4902	Lower Bown's Reservoir	Garfield
4903	Deer Creek Reservoir	Wasatch
4904	Echo Reservoir	Summit
4905	Lynn Reservoir	Box Elder
4906	Fish Lake	Seiver
4907	Huntington North Reservoir	Emery
4908	Joe's Valley Reservoir	Emery
4909	Minersville Reservoir	Beaver
4910	Moon Lake	Duchesne
4911	Navajo Lake	Kane
4912	Newcastle Reservoir	Iron

(Continued)

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

STORET No.	Lake Name	County
4913	Otter Creek Reservoir	Piute
4914	Panquitch Lake	Garfield
4915	Pelican Lake	Uintah
4916	Pineview Reservoir	Weber
4917	Piute Reservior	Piute
4918	Porcupine Reservoir	Cache
4919	Pruess (Garrison) Reservoir	Millard
4920	Sevier Bridge Reservoir	Sanpete, Juab
4921	Starvation Reservoir	Duchesne
4922	Steinaker Reservoir	Uintah
4923	Tropic Peservoir	Garfield
4924	Utah Lake	Utah
4925	Willard Bay Reservoir	Box Elder

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	Myxophyceae / Desmideae	0.0-0.4	0.1-3.0
Chlorophycean	Chlorococcales / Desmideae	0.0-0.7	0.2-9.0
Diatom	Centric Diatoms / Pennate Diatoms	0.0-0.3	0.0-1.75
Euglenophyte	Euglenophyta / Myxophyceae + Chlorococcales	0.0-0.2	0.0-1.0
Compound	Myxophyceae + Chlorococcales + Centric Diatoms + Euglenophyta / 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 UTAH

Achnanthes microcephala
Achnanthes minutissima
Actinastrum gracilimum
Anabaena planctonica
Ankistrodesmus falcatus
Ankistrodesmus falcatus
v. *acicularis*
Aphanizomenon flos-aquae
Aphanocapsa delicatissima
Aphanothece
Asterionella formosa
Botryococcus braunii
Caloneis
Carteria
Ceratium hirundinella
Ceratium hirundinella
f. *furcoides*
Ceratium hirundinella
f. *scotticum*
Chaetoceros elmorei
Chlamydomonas
Chlorogonium
Chroococcus
Closterium
Cocconeis placentula
Coelastrum microporum
Coelosphaerium kuetzingianum
Coelosphaerium naegelianum
Cosmarium
Crucigenia rectangularis
Crucigenia tetrapedia
Cryptomonas erosa
Cryptomonas erosa
v. *reflexa*
Cryptomonas marssonii
Cryptomonas ovata
Cryptomonas reflexa
Cyclotella comta
Cyclotella meneghiniana
Cymatopleura solea
Cymbella
Dactylococcopsis fascicularis
Dactylococcopsis irregularis
Diatoma tenue
v. *elongatum*
Diatoma vulgare
Diatoma vulgare
v. *breve*
Diatoma vulgare
v. *linearis*
Dictyosphaerium pulchellum
Dinobryon divergens
Dinobryon sertularia
Dinobryon sociale
Dinobryon sociale
v. *americanum*
Diploneis smithii
Diplopsalis acuta
Elakatothrix gelatinosa
Elakatothrix viridis
Entomoneis
Epithemia sorex
Epithemia turgida
Eudorina elegans
Euglena acus
Euglena ehrenbergii
Euglena gracilis
Euglena oxyuris
v. *minor*
Eunotia curvata
Fragilaria capucina
v. *mesolepta*
Fragilaria crotonensis
Fragilaria intermedia
Fragilaria leptostauron
Franceia ovalis
Glenodinium edax
Glenodinium oculatum
Gloeocapsa
Gloeotrichia
Gomphonema acuminatum
Gomphonema gracile
Gomphonema parvulum
Gomphonema truncatum
Gymnodinium albulum
Gyrosigma kutzingii
Hannaea arcus
Hantzschia
Kirchneriella
Lagerheimia ciliata
Lagerheimia longiseta
v. *major*
Lagerheimia quadriseta
Lyngbya contorta
Mallomonas acaroides
Mallomonas pseudocoronata
Melosira distans
Melosira granulata
Melosira granulata
v. *angustissima*
Melosira varians
Meridion circulare

Merismopedia tenuissima
Microcystis aeruginosa
Microcystis incerta
Mougeotia
Navicula cryptocephala
Navicula tripunctata
Nitzschia longissima
Nitzschia longissima
v. *reversa*
Nitzschia vermicularis
Oedogonium
Oocystis eremosphaeria
Oscillatoria limnetica
Pandorina morum
Pediastrum boryanum
Pediastrum duplex
Pediastrum duplex
v. *clathratum*
Pediastrum integrum
Pediastrum simplex
Peridinium cinctum
Peridinium inconspicuum
Peridinum willei
Phacus megalopsis
Phacus tortus
Phormidium mucicola
Pinnularia
Pleurosigma delicatulum
Pteromonas angulosa
Quadrigula chodatii
Rhoicosphenia curvata
Rhopalodia gibba
Scenedesmus acuminatus
Scenedesmus arcuatus
Scenedesmus balatonicus
Scenedesmus bicaudatus
Scenedesmus bijuga
Scenedesmus dimorphus
Scenedesmus opoliensis
Scenedesmus quadricauda
Schroederia setigera
Skeletonema potamos
Sphaerocystis schroeteri
Spirogyra
Spondylosium planum
Staurastrum
Stephanodiscus niagarae
Surirella ovata
Synedra acus
Synedra delicatissima
v. *angustissima*
Synedra ulna
Synedra ulna
v. *impressa*
Synura uvella
Tabellaria fenestrata
Tetraedron caudatum
Tetraedron gracile
Tetraedron minimum
Tetraedron minimum
v. *scrobiculatum*
Tetraedron muticum
Tetraedron regulare
v. *incus*
Tetrastrum glabrum
Tetrastrum staurogeniaeforme
Trachelomonas crebea
Trachelomonas fluviatilis
Trachelomonas granulosa
Treubaria setigerum
Treubaria triappendiculata
Ulothrix

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.

LAKE NAME: BEAR LAKE
STORET NUMBER: 4901

NYGAARD TROPHIC STATE INDICES

DATE	05 14 75	08 06 75	09 19 75
MYXOPHYCEAN	0/0 D	01/0 E	01/0 E
CHLOROPHYCEAN	03/0 E	03/0 E	04/0 E
EUGLENOPHYTE	0/03 ?	0/04 ?	0/05 ?
DIATOM	0/0 ?	0.50 E	0/01 ?
COMPOUND	03/0 E	05/0 E	05/0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 14 75	08 06 75	09 19 75
GENUS	02	00	00
SPECIES	03	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 14 75	08 06 75	09 19 75
AVERAGE DIVERSITY	H	0.30	1.92	1.99
NUMBER OF TAXA	S	4.00	8.00	8.00
NUMBER OF SAMPLES COMPOSITED	M	7.00	7.00	7.00
MAXIMUM DIVERSITY	MAXH	2.00	3.00	3.00
MINIMUM DIVERSITY	MINH	0.03	0.23	0.12
TOTAL DIVERSITY	D	317.70	549.12	1257.68
TOTAL NUMBER OF INDIVIDUALS/ML	N	1059.00	286.00	632.00
EVENNESS COMPONENT	J	0.15	0.64	0.66
RELATIVE EVENNESS	RJ	0.14	0.62	0.65
MEAN NUMBER OF INDIVIDUALS/TAXA	L	264.75	35.75	79.00
NUMBER/ML OF MOST ABUNDANT TAXON	K	1003.00	95.00	181.00

LAKE NAME: BEAR LAKE
STORET NUMBER: 4901

CONTINUED

TAXA	FORM	05 14 75			08 06 75			09 19 75		
		IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML
ANKISTRODESMUS FALCATUS	CEL	1	94.7	1003						X
CHROOMONAS ?	CEL	2	5.3	56				4	21.4	135
CRYPTOMONAS	CEL				2	16.8	48			
CYMBELLA	CEL						X			
DINOBRYON DIVERGENS	CEL									X
ELAKATOTHRIX VIRIDIS	COL							2	21.4	135
FRAGILARIA	CEL									X
FRAGILARIA CROTONENSIS	CEL						X			
KIRCHNERIELLA ?	CEL				4	33.2	95			
LAGERHEIMIA QUADRISETA	CEL			X	1	33.2	95			X
LYNGBYA CONTORTA	FIL							1	28.6	181
MELOSIRA GRANULATA	CEL						X			
OOCYSTIS	CEL			X				1	28.6	181
OSCILLATORIA	FIL				1	16.8	48			
TETRAEDRON MINIMUM	CEL						X			
TOTAL				1059			286			632

LAKE NAME: LOWER BOWN'S RES.
STORET NUMBER: 4902

NYGAARD TROPHIC STATE INDICES

DATE	05 09 75	08 13 75	09 25 75
MYXOPHYCEAN	0/01 O	3.00 E	4.00 E
CHLOROPHYCEAN	1.00 E	2.00 E	4.00 E
EUGLENOPHYTE	0/01 ?	0/05 ?	0/08 ?
DIATOM	0/05 ?	0/02 ?	0/01 ?
COMPOUND	1.00 O	5.00 E	8.00 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 09 75	08 13 75	09 25 75
GENUS	00	00	01
SPECIES	00	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 09 75	08 13 75	09 25 75
AVERAGE DIVERSITY	H	0.40	1.60	1.94
NUMBER OF TAXA	S	9.00	11.00	13.00
NUMBER OF SAMPLES COMPOSITED	M	1.00	1.00	1.00
MAXIMUM DIVERSITY	MAXH	3.17	3.46	3.70
MINIMUM DIVERSITY	MINH	0.25	0.25	0.07
TOTAL DIVERSITY	D	124.00	657.60	4159.36
TOTAL NUMBER OF INDIVIDUALS/ML	N	310.00	411.00	2144.00
EVENNESS COMPONENT	J	0.13	0.46	0.52
RELATIVE EVENNESS	RJ	0.06	0.43	0.52
MEAN NUMBER OF INDIVIDUALS/TAXA	L	34.44	37.36	164.92
NUMBER/ML OF MOST ABUNDANT TAXON	K	286.00	231.00	970.00

LAKE NAME: LOWER BOWN'S RES.
STORET NUMBER: 4902

CONTINUED

TAXA	FORM	05 09 75 IS	05 09 75 %C	05 09 75 ALGAL UNITS PER ML	08 13 75 IS	08 13 75 %C	08 13 75 ALGAL UNITS PER ML	09 25 75 IS	09 25 75 %C	09 25 75 ALGAL UNITS PER ML
ANABAENA	FIL				2	12,4	51			
APHANOCAPSA	COL							2	26,2	562
ASTERIONELLA FORMOSA	CEL			X						
BOTRYOCOCCUS BRAUNII	COL						X			
CERATIUM HIRUNDINELLA	CEL						X			
CHROOMONAS ?	CEL	2	7,7	24	4	25,1	103	1	45,2	970
COCCONEIS	CEL									X
COCCONEIS PLACENTULA	CEL						X			
CRUCIGENIA RECTANGULARIS	COL									X
CRYPTOMONAS EROSA	CEL	1	92,3	286			X	3	16,7	357
CRYPTOMONAS OVATA	CEL									X
ELAKATOTHRIX GELATINOSA	COL									X
FRAGILARIA	CEL			X						
FRAGILARIA CROTONENSIS	CEL			X						
GLOEOCAPSA	CEL									X
GLOEOTRICHIA	FIL				1	56,2	231	5	4,8	102
GYROSIGMA ?	CEL			X						
MICROCYSTIS AERUGINOSA	COL									X
MICROCYSTIS INCERTA	COL				3	6,3	26			
OOCYSTIS	CEL									X
RHOPALODIA GIBBA	CEL						X			
SPHAEROCYSTIS SCHROETERI	COL						X			X
STAURASTRUM	CEL			X			X	4	7,1	153
SYNEDRA	CEL			X						
TETRAEDRON MINIMUM	CEL			X						
TOTAL				310			411			2144

LAKE NAME: DEER CREEK RES.
STORET NUMBER: 4903

NYGAARD TROPHIC STATE INDICES

DATE	05 12 75	08 11 75	09 19 75
MYXOPHYCEAN	0/0 O	3.00 E	3.00 E
CHLOROPHYCEAN	01/0 E	4.00 E	0/01 O
EUGLENOPHYTE	0/01 ?	0/07 ?	0/03 ?
DIATOM	0.29 ?	0.50 E	0.33 E
COMPOUND	03/0 E	8.00 E	4.00 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 12 75	08 11 75	09 19 75
GENUS	00	00	00
SPECIES	00	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 12 75	08 11 75	09 19 75
AVERAGE DIVERSITY	H	1.79	0.06	1.39
NUMBER OF TAXA	S	14.00	12.00	12.00
NUMBER OF SAMPLES COMPOSITED	M	3.00	3.00	3.00
MAXIMUM DIVERSITY	MAXH	3.81	3.58	3.58
MINIMUM DIVERSITY	MINH	0.02	0.02	0.04
TOTAL DIVERSITY	D	20311.13	457.56	4479.97
TOTAL NUMBER OF INDIVIDUALS/ML	N	11347.00	7626.00	3223.00
EVENNESS COMPONENT	J	0.47	0.02	0.39
RELATIVE EVENNESS	RJ	0.47	0.02	0.39
MEAN NUMBER OF INDIVIDUALS/TAXA	L	810.50	635.50	268.58
NUMBER/ML OF MOST ABUNDANT TAXON	K	5047.00	7571.00	2365.00

LAKE NAME: DEER CREEK RES, CONTINUED
STORET NUMBER: 4903

TAXA	FORM	05 12 75 S	05 12 75 %C	05 12 75 ALGAL UNITS PER ML	08 11 75 S	08 11 75 %C	08 11 75 ALGAL UNITS PER ML	09 19 75 S	09 19 75 %C	09 19 75 ALGAL UNITS PER ML
ANABAENA	FIL							4	1.1	34
APHANIZOMENON FLOS-AQUAE	FIL						X	1	73.4	2365
ASTERIONELLA FORMOSA	CEL	5	0.7	74			X			
CHROOMONAS T	CEL	3	30.2	3426			X	5	11.7	377
COELOSPHAERIUM NAEGELIANUM	COL						X	3	2.1	69
COSMARIUM	CEL						X			X
CRYPTOMONAS	CEL								2.1	69
CRYPTOMONAS MARSSONII	CEL	2	6.2	700						
CYMATOPLEURA SOLEA	CEL			X						
DIATOMA TENUE										
V. ELONGATUM	CEL			X						
DIATOMA VULGARE	CEL			X						
DINOBRYON DIVERGENS	CEL									X
FLAGELLATE	CEL	4	18.5	2100						
FLAGELLATE #2	CEL								7.4	240
FRAGILARIA #2	CEL									X
FRAGILARIA CROTONENSIS	CEL			X	1	99.3	7571			X
FRAGILARIA LEPTOSTAURON	CEL			X						
HANNAEA ARCUS	CEL			X						
MELOSIRA VARIANS	CEL						X			
MICROCYSTIS INCERTA	COL						X			
NAVICULA	CEL									X
PEDIASTRUM BORYANUM	COL			X			X			
SCENEDESMUS ARCUATUS	COL						X			
SPHAEROCYSTIS SCHROETERI	COL				2	0.7	55			
STEPHANODISCUS	CEL							2	2.1	69
STEPHANODISCUS #1	CEL			X						
STEPHANODISCUS #2	CEL	1	44.5	5047						
SYNEDRA ULNA	CEL			X						
TETRAEDRON GRACILE	CEL						X			
TOTAL				11347			7626			3223

LAKE NAME: ECHO RES.
STORET NUMBER: 4904

NYGAARD TROPHIC STATE INDICES

DATE	05 12 75	08 07 75	09 18 75
MYXOPHYCEAN	0/0 U	01/0 E	01/0 E
CHLOROPHYCEAN	02/0 E	04/0 E	01/0 E
EUGLENOPHYTE	0/02 ?	0/05 ?	0/02 ?
DIATOM	0.60 E	0/05 ?	0/02 ?
COMPOUND	05/0 E	05/0 E	02/0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 12 75	08 07 75	09 18 75
GENUS	00	00	00
SPECIES	00	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 12 75	08 07 75	09 18 75
AVERAGE DIVERSITY	H	1.29	1.79	1.72
NUMBER OF TAXA	S	15.00	13.00	8.00
NUMBER OF SAMPLES COMPOSITED	M	2.00	2.00	2.00
MAXIMUM DIVERSITY	MAXH	3.91	3.70	3.00
MINIMUM DIVERSITY	MINH	0.02	0.22	0.05
TOTAL DIVERSITY	D	16362.36	1039.99	3020.32
TOTAL NUMBER OF INDIVIDUALS/ML	N	12684.00	581.00	1756.00
EVENNESS COMPONENT	J	0.33	0.48	0.57
RELATIVE EVENNESS	RJ	0.33	0.46	0.57
MEAN NUMBER OF INDIVIDUALS/TAXA	L	845.60	44.69	219.50
NUMBER/ML OF MOST ABUNDANT TAXON	K	9335.00	305.00	918.00

LAKE NAME: ECHO RES.
STORET NUMBER: 4904

CONTINUED

TAXA	FORM	05 12 75 S	05 12 75 %C	05 12 75 ALGAL UNITS PER ML	08 07 75 S	08 07 75 %C	08 07 75 ALGAL UNITS PER ML	09 18 75 S	09 18 75 %C	09 18 75 ALGAL UNITS PER ML
ANKISTRODESMUS FALCATUS V. ACICULARIS	CEL			X	1	5.3	31			
APHANIZOMENON FLOS-AQUAE	FIL						X	1	2.3	40
ASTERIONELLA FORMOSA	CEL	1	0.9	119	1	5.3	31	1	2.3	40
CENTRIC DIATOM	CEL	4	9.6	1221						
CHRODOMONAS 7	CEL	11	73.6	9336	3	52.5	305	2	34.1	598
COCCONEIS	CEL						X			
CRYPTOMONAS EROSA	CEL			X	1	26.3	153		2.3	40
CRYPTOMONAS MARSSONII	CEL	3	7.1	906				1	2.3	40
CRYPTOMONAS OVATA	CEL			X						
CRYPTOMONAS REFLEXA	CEL							3	4.6	80
CYMBELLA	CEL			X			X			
DIATOMA VULGARE	CEL			X						
EUDORINA ELEGANS	COL						X			
FRAGILARIA CROTONENSIS	CEL	2	8.7	1103	2	10.5	61	1	52.3	918
MELOSIRA VARIANS	CEL			X						
NAVICULA	CEL						X			
NAVICULA TRIPUNCTATA	CEL			X						
OOCYSTIS	CEL			X			X			
PEDIASTRUM BORYANUM	COL						X			
SCHROEDERIA SETIGERA	CEL						X			X
STEPHANODISCUS	CEL			X						
SYNURA UVELLA	COL			X						
TOTAL				12684			581			1756

LAKE NAME: LYNN RES.
STORET NUMBER: 4905

NYGAARD TROPHIC STATE INDICES

DATE	05 15 75	08 16 75	09 17 75
MYXOPHYCEAN	01/0 E	0/0 O	03/0 E
CHLOROPHYCEAN	0/0 O	01/0 E	03/0 E
EUGLENOPHYTE	1.00 E	0/01 ?	0/06 ?
DIATOM	0.12 ?	0.50 E	0.15 ?
COMPOUND	03/0 E	02/0 E	08/0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 15 75	08 16 75	09 17 75
GENUS	05	01	10
SPECIES	03	00	05

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 15 75	08 16 75	09 17 75
AVERAGE DIVERSITY	H	2.89	0.23	2.33
NUMBER OF TAXA	S	15.00	6.00	25.00
NUMBER OF SAMPLES COMPOSITED	M	1.00	1.00	1.00
MAXIMUM DIVERSITY	MAXH	3.91	2.58	4.64
MINIMUM DIVERSITY	MINH	0.21	0.13	0.02
TOTAL DIVERSITY	D	2155.94	92.23	34504.97
TOTAL NUMBER OF INDIVIDUALS/ML	N	746.00	401.00	14809.00
EVENNESS COMPONENT	J	0.74	0.09	0.50
RELATIVE EVENNESS	RJ	0.73	0.05	0.50
MEAN NUMBER OF INDIVIDUALS/TAXA	L	49.73	66.83	592.36
NUMBER/ML OF MOST ABUNDANT TAXON	K	239.00	386.00	7130.00

LAKE NAME: LYNN RES.
STORET NUMBER: 4905

CONTINUED

TAXA	FORM	05 15 75 IS	05 15 75 %C	05 15 75 ALGAL UNITS PER ML	08 16 75 IS	08 16 75 %C	08 16 75 ALGAL UNITS PER ML	09 17 75 IS	09 17 75 %C	09 17 75 ALGAL UNITS PER ML
ACHNANTHES	CEL		3.6	27						
ANABAENA	FIL							3	3.7	548
APHANIZOMENON FLOS-AQUAE	FIL							11	48.1	7130
ASTERIONELLA FORMOSA	CEL						X	5	3.2	480
CENTRIC DIATOM	CEL			X						
CHROOMONAS ?	CEL								1.9	274
COCCONEIS	CEL		3.6	27						
COCCONEIS PLACENTULA	CEL									X
CRYPTOMONAS EROSA	CEL						X		0.5	69
CRYPTOMONAS EROSA V. REFLEXA	CEL		3.6	27						
CRYPTOMONAS MARSSONII	CEL	3	7.1	53			X		0.5	69
CYMBELLA	CEL									X
DIATOMA TENUE V. ELONGATUM	CEL								3.7	548
EUNOTIA CURVATA	CEL									X
FRAGILARIA	CEL									X
FRAGILARIA CROTONENSIS	CEL						X			
GOMPHONEMA ACUMINATUM	CEL									X
GOMPHONEMA TRUNCATUM	CEL								0.5	69
LYNGBYA	FIL								0.5	69
MELOSIRA GRANULATA	CEL				1	96.3	386		0.9	137
MELOSIRA VARIANS	CEL								0.9	137
NAVICULA #1	CEL			X						
NAVICULA #2	CEL			X					1.4	206
NAVICULA CRYPTOCEPHALA	CEL			X						
NAVICULA SPP.	CEL	12	32.0	239						
NITZSCHIA	CEL								4.2	617
NITZSCHIA VERMICULARIS	CEL									X
OEDOGONIUM	FIL							4	2.8	411
OOCYSTIS	CEL									X
PANDORINA MORUM	COL	1	14.2	106						
PEDIASTRUM DUPLEX	COL									X
PHORMIDIUM	FIL	4	21.3	159						
RHOICOSPHENIA CURVATA	CEL		3.6	27						X
SCHROEDERIA SETIGERA	CEL				2	3.7	15			X
SURIRELLA OVATA	CEL		3.6	27						
SYNEDRA ULNA	CEL		3.6	27				2	27.3	4045
TRACHELOMONAS GRANULOSA	CEL	5	3.6	27						
TOTAL				745			401			14809

LAKE NAME: FISH LAKE
STORET NUMBER: 4906

NYGAARD TROPHIC STATE INDICES

DATE	08 12 75	09 25 75
MYXOPHYCEAN	6.00 E	2.00 E
CHLOROPHYCEAN	7.00 E	6.00 E
EUGLENOPHYTE	0/13 ?	0/08 ?
DIATOM	0.07 ?	0/06 ?
COMPOUND	14.0 E	8.00 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	08 12 75	09 25 75
GENUS	14	05
SPECIES	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		08 12 75	09 25 75
AVERAGE DIVERSITY	H	2.86	2.25
NUMBER OF TAXA	S	32.00	19.00
NUMBER OF SAMPLES COMPOSITED	M	3.00	3.00
MAXIMUM DIVERSITY	MAXH	5.00	4.25
MINIMUM DIVERSITY	MINH	0.07	0.10
TOTAL DIVERSITY	D	18238.22	5334.75
TOTAL NUMBER OF INDIVIDUALS/ML	N	6377.00	2371.00
EVENNESS COMPONENT	J	0.57	0.53
RELATIVE EVENNESS	RJ	0.57	0.52
MEAN NUMBER OF INDIVIDUALS/TAXA	L	199.28	124.79
NUMBER/ML OF MOST ABUNDANT TAXON	K	2082.00	1103.00

LAKE NAME: FISH LAKE
STORET NUMBER: 4906

CONTINUED

TAXA	FORM	08 12 75 18	08 12 75 %C	08 12 75 ALGAL UNITS PER ML	09 25 75 18	09 25 75 %C	09 25 75 ALGAL UNITS PER ML
ACHNANTHES	CEL						X
APHANOCAPSA	COL		2.1	132			
ASTERIONELLA FORMOSA	CEL		1.0	66			
CHLAMYDOMONAS	CEL		1.0	66		46.5	1103
CHROOCOCCUS	COL		11.9	760			
CHRODMONAS ?	CEL				3	12.1	286
COCCONEIS PLACENTULA	CEL		1.0	66			X
COELOSPHAERIUM	COL			X			
COSMARIUM	CEL			X			
CRYPTOMONAS	CEL						X
CYCLOTELLA	CEL		1.6	99			
CYMBELLA #1	CEL		0.5	33			
CYMBELLA #2	CEL			X			
DINOBRYON DIVERGENS	CEL		2.1	132			
FLAKATOTHRIX	COL						X
EPITHEMIA TURGIDA	CEL		1.0	66			
FRAGILARIA #2	CEL						X
FRAGILARIA CROTONENSIS	CEL	5	6.7	430			X
FRAGILARIA INTERMEDIA	CEL	3	29.0	1851			
FRANCEIA OVALIS	CEL				5	3.5	82
GOMPHONEMA GRACILE	CEL		0.5	33			
KIRCHNERIELLA	CEL					5.2	123
LAGERHEIMIA CILIATA	CEL		1.6	99			
LAGERHEIMIA QUADRISETA	CEL			X	4	5.2	123
MERISMOPEDIA	COL			X			
MICROCYSTIS INCERTA	COL	2	32.6	2082		3.5	82
MOUGEOTIA	FIL						X
NAVICULA #2	CEL						X
NAVICULA PEREGRINA ?	CEL	4	3.1	198			X
OOCYSTIS	CEL			X	2	22.4	531
PEDIASTRUM BORYANUM	COL			X			
PEDIASTRUM INTEGRUM	COL			X			
PHORMIDIUM	FIL		1.0	66		1.7	41
PINNULARIA	CEL			X			
PINNULARIA #2	CEL			X			
RHOPALODIA GIBBA	CEL		0.5	33			
SCENEDESMUS BIJUGA	COL		2.1	132			
STAURASTRUM	CEL						X
SURIRELLA	CEL			X			
SYNEDRA ACUS	CEL			X			
TETRAEDRON MINIMUM	CEL		0.5	33			
TETRAEDRON MINIMUM V. SCROBICULATUM	COL						X
ULOTHRIX	FIL			X			
TOTAL				6377			2371

LAKE NAME: HUNTINGTON NORTH RES.
STORET NUMBER: 4907

NYGAARD TROPHIC STATE INDICES

DATE	05 13 75	09 24 75	08 12 77
MYXOPHYCEAN	0/0 O	01/0 E	4.00 E
CHLOROPHYCEAN	01/0 E	01/0 E	3.00 E
EUGLENOPHYTE	0/01 ?	0.50 E	0/07 ?
DIATOM	0/05 ?	01/0 E	0.50 E
COMPOUND	01/0 E	04/0 E	10.0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 13 75	09 24 75	08 12 77
GENUS	02	00	00
SPECIES	03	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 13 75	09 24 75	08 12 77
AVERAGE DIVERSITY	H	1.82	1.16	2.26
NUMBER OF TAXA	S	10.00	13.00	24.00
NUMBER OF SAMPLES COMPOSITED	M	1.00	1.00	1.00
MAXIMUM DIVERSITY	MAXH	3.32	3.70	4.58
MINIMUM DIVERSITY	MINH	0.19	0.25	1.22
TOTAL DIVERSITY	D	910.00	578.84	370.64
TOTAL NUMBER OF INDIVIDUALS/ML	N	500.00	499.00	164.00
EVENNESS COMPONENT	J	0.55	0.31	0.49
RELATIVE EVENNESS	RJ	0.53	0.27	0.31
MEAN NUMBER OF INDIVIDUALS/TAXA	L	50.00	38.38	6.83
NUMBER/ML OF MOST ABUNDANT TAXON	K	182.00	333.00	47.00

LAKE NAME: HUNTINGTON NORTH RES. CONTINUED
STORET NUMBER: 4907

TAXA	FORM	09 13 75 IS	09 13 75 %C	09 13 75 ALGAL UNITS PER ML	09 24 75 IS	09 24 75 %C	09 24 75 ALGAL UNITS PER ML	08 12 77 IS	08 12 77 %C	08 12 77 ALGAL UNITS PER ML
ACHNANTHES MICROCEPHALA	CEL							3	10.9	31
ANABAENA	FIL									X
ANKISTRODESMUS FALCATUS V. ACICULARIS	CEL	1	36.4	182						
APHANIZOMENON FLOS-AQUAE	FIL									X
APHANOCAPSA ?	COL							2	21.8	39
ASTERIONELLA FORMOSA	CEL			X						X
CHAETOCEROS	CEL									X
CHROOMONAS ?	CEL	4	36.4	182	2	26.7	133			X
CHRYSOPHYTAN COCCOID CELL	CEL									X
COSMARIUM	CEL									X
CRUCIGENIA TETRAPEDIA	COL							3	10.9	31
CRYPTOMONAS EROSA	CEL	2	18.2	91			X	4	9.8	16
CRYPTOMONAS MARSSONII	CEL						X			
CRYPTOMONAS REFLEXA	CEL						X			
CRYPTOMONAS SPP.	CEL				1	66.7	133			
CYCLOTELLA COMTA	CEL							1	20.7	47
CYCLOTELLA MENEGHINIANA	CEL									X
DINOBRYON DIVERGENS	CEL			X			X			X
FLAGELLATE	CEL									X
FRAGILARIA CROTONENSIS	CEL			X						X
GLENODINIUM EDAX	CEL						X			
GLENODINIUM OCULATUM	CEL									X
MALLOMONAS	CEL				3	6.6	33			
MALLOMONAS ACAROIDES	CEL			X						X
MICROCYSTIS ? INCERTA	COL						X			X
NAVICULA	CEL									X
NITZSCHIA	CEL			X						
OOCYSTIS	COL									X
PHACUS MEGALOPSIS	CEL						X			
PLEUROSIGMA DELICATULUM	CEL									X
SPHAEROCYSTIS SCHROETERI	COL									X
SPIROGYRA	FIL						X			
STEPHANODISCUS	CEL						X			
SYNEDRA	CEL			X						X
SYNEDRA ULNA	CEL	3	9.0	45						
TETRAEDRON MINIMUM V. SCROBICULATUM	CEL						X			
TOTAL				500			499			164

LAKE NAME: JOE'S VALLEY RES.
STORET NUMBER: 4908

NYGAARD TROPHIC STATE INDICES

DATE	05 13 75	08 12 75	09 24 75
MYXOPHYCEAN	01/0 E	02/0 E	01/0 E
CHLOROPHYCEAN	0/0 O	0/0 O	0/0 O
EUGLENOPHYTE	0/01 ?	0/02 ?	0/01 ?
DIATOM	0/03 ?	0,17 ?	0/01 ?
COMPOUND	01/0 E	03/0 E	01/0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 13 75	08 12 75	09 24 75
GENUS	01	02	01
SPECIES	00	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 13 75	08 12 75	09 24 75
AVERAGE DIVERSITY	H	1,54	1,56	1,57
NUMBER OF TAXA	S	9,00	13,00	4,00
NUMBER OF SAMPLES COMPOSITED	M	2,00	2,00	2,00
MAXIMUM DIVERSITY	MAXH	3,17	3,70	2,00
MINIMUM DIVERSITY	MINH	0,04	0,05	0,03
TOTAL DIVERSITY	D	4319,70	4623,84	1789,80
TOTAL NUMBER OF INDIVIDUALS/ML	N	2805,00	2964,00	1140,00
EVENNESS COMPONENT	J	0,49	0,42	0,79
RELATIVE EVENNESS	RJ	0,48	0,42	0,79
MEAN NUMBER OF INDIVIDUALS/TAXA	L	311,67	228,00	285,00
NUMBER/ML OF MOST ABUNDANT TAXON	K	1354,00	1976,00	610,00

LAKE NAME: JOE'S VALLEY RES. CONTINUED
STORET NUMBER: 4908

TAXA	FORM	05 13 75 IS	05 13 75 %C	05 13 75 ALGAL UNITS PER ML	08 12 75 IS	08 12 75 %C	08 12 75 ALGAL UNITS PER ML	09 24 75 IS	09 24 75 %C	09 24 75 ALGAL UNITS PER ML
ACHNANTHES MICROCEPHALA	CEL			X			X			
ANABAENA	FIL						X			
CARTERIA	CEL	4	1.7	48						
CHROOMONAS 7	CEL	3	8.6	242	3	8.6	256			
CRYPTOMONAS	CEL	8	1.7	48	4	2.5	73	4	3.6	41
CYCLOTELLA	CEL				1	66.7	1976			
DIATOMA TENUE										
V. ELONGATUM	CEL			X						
DINOBRYON DIVERGENS	CEL				2	16.1	476	2	14.3	163
DINOBRYON SOCIALE	CEL			X						
FLAGELLATE	CEL	2	48.3	1354						
FRAGILARIA	CEL						X			
FRAGILARIA CROTONENSIS	CEL			X			X	1	28.6	326
GOMPHONEMA PARVULUM	CEL						X			
MICROCYSTIS INCERTA	COL	1	39.7	1113		3.7	110	3	53.5	610
MOUGEOTIA	CEL				5	2.5	73			
NAVICULA	CEL						X			
NAVICULA #1	CEL						X			
TOTAL				2805			2964			1140

LAKE NAME: MINERSVILLE RES.
STORET NUMBER: 4909

NYGAARD TROPHIC STATE INDICES

DATE	05 08 75	08 12 75	09 25 75
MYXOPHYCEAN	02/0 E	5.00 E	01/0 E
CHLOROPHYCEAN	0/0 D	3.00 E	01/0 E
EUGLENOPHYTE	0/02 ?	0/08 ?	0.50 E
DIATOM	0.17 ?	0.33 E	01/0 E
COMPOUND	03/0 E	9.00 E	04/0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 08 75	08 12 75	09 25 75
GENUS	00	01	00
SPECIES	00	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 08 75	08 12 75	09 25 75
AVERAGE DIVERSITY	H	0.74	1.73	0.34
NUMBER OF TAXA	S	11.00	17.00	4.00
NUMBER OF SAMPLES COMPOSITED	M	2.00	2.00	2.00
MAXIMUM DIVERSITY	MAXH	3.46	4.09	2.00
MINIMUM DIVERSITY	MINH	0.03	0.05	0.00
TOTAL DIVERSITY	D	3125.02	7968.38	4105.50
TOTAL NUMBER OF INDIVIDUALS/ML	N	4223.00	4606.00	12075.00
EVENNESS COMPONENT	J	0.21	0.42	0.17
RELATIVE EVENNESS	RJ	0.21	0.42	0.17
MEAN NUMBER OF INDIVIDUALS/TAXA	L	383.91	270.94	3018.75
NUMBER/ML OF MOST ABUNDANT TAXON	K	3728.00	3118.00	11379.00

LAKE NAME: MINERSVILLE RES. CONTINUED
STORET NUMBER: 4909

TAXA	FORM	05 08 75 IS	05 08 75 %C	05 08 75 ALGAL UNITS PER ML	08 12 75 IS	08 12 75 %C	08 12 75 ALGAL UNITS PER ML	09 25 75 IS	09 25 75 %C	09 25 75 ALGAL UNITS PER ML
ACHNANTHES MICROCEPHALA	CEL			X			X			
ANABAENA	FIL						X			
APHANIZOMENON FLOS-AQUAE	FIL			X	11	9.4	432	11	94.2	11379
ASTERIONELLA	CEL						X			
ASTERIONELLA FORMOSA	CEL	15	2.1	90						
CHROOMONAS ?	CEL					4.2	192			
COCCONEIS PLACENTULA	CEL			X			X			
CRYPTOMONAS	CEL	14	1.1	45						
CRYPTOMONAS EROSA	CEL				15	3.1	144			
CRYPTOMONAS MARSSONII	CEL					1.0	48			
CYST	CEL						X			
EUNOTIA	CEL	13	1.1	45			X			
FRAGILARIA #1	CEL		1.1	45						
FRAGILARIA CROTONENSIS	CEL			X						
GLOEOTRICHIA	FIL				12	9.4	432			
MICROCYSTIS AERUGINOSA	COL				13	1.0	48			
MICROCYSTIS INCERTA	COL			X						
OOCYSTIS	CEL									X
PHORMIDIUM MUCICOLA	FIL				14	67.7	3118			
QUADRIGULA CHODATII	CEL						X			
SCHROEDERIA SETIGERA	CEL					3.1	144			
SPHAEROCYSTIS SCHROETERI	COL						X			
STAURASTRUM	CEL						X			
STEPHANODISCUS NIAGARAE	CEL	12	6.4	270		1.0	48	12	5.3	646
SYNURA ?	CEL	11	88.3	3720						
TRACHELOMONAS	CEL							13	0.4	50
TOTAL				4223			4606			12075

LAKE NAME: MOON LAKE
STORET NUMBER: 4910

NYGAARD TROPHIC STATE INDICES

DATE	08 11 75	09 23 75
MYXOPHYCEAN	0/0 0	0/01 0
CHLOROPHYCEAN	0/0 0	0/01 0
EUGLENOPHYTE	0/0 ?	0/0 ?
DIATOM	0/03 ?	0.17 ?
COMPOUND	0/0 0	1.00 0

PALMER'S ORGANIC POLLUTION INDICES

DATE	08 11 75	09 23 75
GENUS	00	01
SPECIES	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		08 11 75	09 23 75
AVERAGE DIVERSITY	H	1.50	1.62
NUMBER OF TAXA	S	5.00	12.00
NUMBER OF SAMPLES COMPOSITED	M	2.00	2.00
MAXIMUM DIVERSITY	MAXH	2.32	3.58
MINIMUM DIVERSITY	MINH	0.25	0.25
TOTAL DIVERSITY	D	205.50	746.82
TOTAL NUMBER OF INDIVIDUALS/ML	N	137.00	461.00
EVENNESS COMPONENT	J	0.65	0.45
RELATIVE EVENNESS	RJ	0.61	0.42
MEAN NUMBER OF INDIVIDUALS/TAXA	L	27.40	38.42
NUMBER/ML OF MOST ABUNDANT TAXON	K	69.00	251.00

LAKE NAME: MOON LAKE
STORET NUMBER: 4910

CONTINUED

TAXA	FORM	08 11 75 IS	08 11 75 %C	08 11 75 ALGAL UNITS PER ML	09 23 75 IS	09 23 75 %C	09 23 75 ALGAL UNITS PER ML
ASTERIONELLA FORMOSA	CEL	11	24.8	34	13	9.1	42
CHRONOMONAS ?	CEL	12	50.4	69			X
CRYPTOMONAS	CEL			X			
CYCLOTELLA	CEL				11	54.4	251
DINOBRYON SOCIALE	CEL						X
DINOBRYON SOCIALE V. AMERICANUM	CEL				14	9.1	42
FRAGILARIA CROTONENSIS	CEL			X			X
NAVICULA	CEL						X
NITZSCHIA	CEL						X
PENNATE DIATOM	CEL	13	24.8	34	12	27.3	126
PERIDINIUM INCONSPICUUM	CEL						X
SPONDYLOSIUM PLANUM	CEL						X
TABELLARIA FENESTRATA	CEL						X
TOTAL				137			461

LAKE NAME: NAVAJO LAKE
STORET NUMBER: 4911

NYGAARD TROPHIC STATE INDICES

DATE	04 30 75	08 13 75	09 25 75
MYXOPHYCEAN	01/0 E	3.00 E	0/01 O
CHLOROPHYCEAN	0/0 O	4.00 E	4.00 E
EUGLENOPHYTE	0/01 ?	0/07 ?	0/04 ?
DIATOM	0.67 E	01/0 E	01/0 E
COMPOUND	03/0 E	8.00 E	5.00 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	04 30 75	08 13 75	09 25 75
GENUS	00	01	00
SPECIES	00	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		04 30 75	08 13 75	09 25 75
AVERAGE DIVERSITY	H	0.01	1.70	2.19
NUMBER OF TAXA	S	8.00	15.00	8.00
NUMBER OF SAMPLES COMPOSITED	M	1.00	2.00	2.00
MAXIMUM DIVERSITY	MAXH	3.00	3.91	3.00
MINIMUM DIVERSITY	MINH	0.65	0.10	0.07
TOTAL DIVERSITY	D	0.83	3070.20	2527.26
TOTAL NUMBER OF INDIVIDUALS/ML	N	83.00	1806.00	1154.00
EVENNESS COMPONENT	J	0.00	0.43	0.73
RELATIVE EVENNESS	RJ	-0.27	0.42	0.73
MEAN NUMBER OF INDIVIDUALS/TAXA	L	10.38	120.40	144.25
NUMBER/ML OF MOST ABUNDANT TAXON	K	83.00	1204.00	437.00

LAKE NAME: NAVAJO LAKE
STORET NUMBER: 4911

CONTINUED

TAXA	FORM	04 30 75			08 13 75			09 25 75		
		S	%C	ALGAL UNITS PER ML	S	%C	ALGAL UNITS PER ML	S	%C	ALGAL UNITS PER ML
APHANIZOMENON FLOS-AQUAE	FIL						X			
ASTERIONELLA FORMOSA	CEL			X						
CENTRIC DIATOM	CEL			X						
CHROOMONAS ?	CEL				3	5.8	105			
COSMARIUM	CEL						X	1	13.5	156
CRYPTOMONAS EROSA	CEL	1	100.	83	2	4.4	79			X
CRYPTOMONAS MARSSONII	CEL			X						
CYCLOTELLA MENEGHINIANA	CEL			X						
ELAKATOTHRIX	CEL								5.4	62
FLAGELLATE 01	CEL				1	66.7	1204			
FRAGILARIA CROTONENSIS	CEL			X						
GYMNODINIUM	CEL					1.4	26			
KIRCHNERIELLA	CEL				5	14.5	262	8	37.9	437
MERISMOPEDIA	COL						X			
MOUGEOTIA	FIL						X			
NITZSCHIA	CEL			X						
OOCYSTIS	CEL					1.4	26	3	13.5	156
OSCILLATORIA	FIL			X						
PERIDINIUM INCONSPICUUM	CEL				4	2.9	52	4	2.7	31
PHORMIDIUM	FIL					2.9	52			
SCENEDESMUS BIJUGA	COL						X			
STEPHANODISCUS	CEL						X			X
TETRAEDRON MINIMUM V. SCROBICULATUM	CEL						X	2	27.0	312
TOTAL				83			1806			1154

LAKE NAME: NEWCASTLE PES.
STORET NUMBER: 4912

NYGAARD TROPHIC STATE INDICES

DATE	05 08 75	08 13 75	09 26 75
MYXOPHYCEAN	0/0 O	1.00 E	3.00 E
CHLOROPHYCEAN	01/0 E	3.00 E	5.00 E
EUGLENOPHYTE	0/01 ?	0/04 ?	0.12 ?
DIATOM	1.00 E	2.00 E	0.50 E
COMPOUND	02/0 E	6.00 E	11.0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 08 75	08 13 75	09 26 75
GENUS	03	01	09
SPECIES	01	02	02

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 08 75	08 13 75	09 26 75
AVERAGE DIVERSITY	H	0.91	0.88	2.74
NUMBER OF TAXA	S	6.00	10.00	19.00
NUMBER OF SAMPLES COMPOSITED	M	1.00	1.00	1.00
MAXIMUM DIVERSITY	MAXH	2.58	3.32	4.25
MINIMUM DIVERSITY	MINH	0.01	0.05	0.03
TOTAL DIVERSITY	D	6832.28	1877.92	23654.42
TOTAL NUMBER OF INDIVIDUALS/ML	N	7508.00	2134.00	8633.00
EVENNESS COMPONENT	J	0.35	0.27	0.64
RELATIVE EVENNESS	RJ	0.36	0.26	0.65
MEAN NUMBER OF INDIVIDUALS/TAXA	L	1251.33	213.40	454.37
NUMBER/ML OF MOST ABUNDANT TAXON	K	6117.00	1771.00	3798.00

LAKE NAME: NEWCASTLE RES.
STORET NUMBER: 4912

CONTINUED

TAXA	FORM	05 08 75			08 13 75			09 26 75		
		IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML
ANABAENA PLANCTONICA	CEL							1	0.6	49
APHANIZOMENON FLOS-AQUAE	FIL						X	5	6.3	543
ASTERIONELLA FORMOSA	CEL						X	11	44.0	3799
CHLAMYDOMONAS	CEL							1	6.3	543
CHROOMONAS ?	CEL	3	3.7	278			X	1	1.7	148
CLOSTERIUM	CEL							1	0.6	49
CRYPTOMONAS EROSA	CEL							1	0.6	49
CRYPTOMONAS MARSSONII	CEL			X						
CYCLOTELLA MENEGHINIANA	CEL				3	10.6	227	1	4.6	395
ELAKATOTHRIX	COL				11	83.0	1771			X
EUDORINA ELEGANS	COL				2	2.1	45			
EUGLENA	CEL									X
FRAGILARIA CROTONENSIS	CEL							4	9.7	839
GLENODINIUM EDAX	CEL	6	0.7	56						
GYROSIGMA	CEL							1	0.6	49
KIRCHNERIELLA	CEL									X
MELOSIRA GRANULATA	CEL							1	1.1	99
MELOSIRA GRANULATA V. ANGUSTISSIMA	CEL						X			
MICROCYSTIS INCERTA	COL							1	1.1	99
NITZSCHIA ACICULARIS ?	CEL	12	13.3	1001						
OOCYSTIS	COL				4	4.3	91	3	14.3	1233
PEDIASTRUM	COL									X
SCHROEDERIA SETIGERA	CEL	5	0.7	56			X			
SPHAEROCYSTIS SCHROETERI	COL							1	1.7	148
STAURASTRUM	CEL						X			
STEPHANODISCUS	CEL	11	81.5	6117						
SYNEDRA DELICATISSIMA V. ANGUSTISSIMA	CEL							2	6.9	592
TOTAL				7508			2134			8633

LAKE NAME: OTTER CREEK RES.
STORET NUMBER: 4913

NYGAARD TROPHIC STATE INDICES

DATE	05 09 75	08 13 75	09 25 75
MYXOPHYCEAN	0/0 O	01/0 E	02/0 E
CHLOROPHYCEAN	01/0 E	01/0 E	02/0 E
EUGLENOPHYTE	0/01 ?	0/02 ?	0/04 ?
DIATOM	1.00 E	0.50 E	0.60 E
COMPOUND	04/0 E	03/0 E	07/0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 09 75	08 13 75	09 25 75
GENUS	05	01	00
SPECIES	00	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 09 75	08 13 75	09 25 75
AVERAGE DIVERSITY	H	2.01	1.11	1.55
NUMBER OF TAXA	S	12.00	9.00	17.00
NUMBER OF SAMPLES COMPOSITED	M	2.00	2.00	2.00
MAXIMUM DIVERSITY	MAXH	3.58	3.17	4.09
MINIMUM DIVERSITY	MINH	0.02	0.02	0.29
TOTAL DIVERSITY	D	19171.38	6824.28	920.70
TOTAL NUMBER OF INDIVIDUALS/ML	N	9538.00	6148.00	594.00
EVENNESS COMPONENT	J	0.56	0.35	0.38
RELATIVE EVENNESS	RJ	0.56	0.35	0.34
MEAN NUMBER OF INDIVIDUALS/TAXA	L	794.83	683.11	34.94
NUMBER/ML OF MOST ABUNDANT TAXON	K	5323.00	4919.00	372.00

LAKE NAME: OTTER CREEK RES, CONTINUED
STORET NUMBER: 4913

TAXA	FORM	05 09 75 IS	05 09 75 %C	05 09 75 ALGAL UNITS PER ML	08 13 75 IS	08 13 75 %C	08 13 75 ALGAL UNITS PER ML	09 25 75 IS	09 25 75 %C	09 25 75 ALGAL UNITS PER ML
ANABAENA	FIL				13	10.4	642			
ANABAENA PLANCTONICA	FIL							13	12.5	74
APHANIZOMENON FLOS-AQUAE	FIL									X
CERATIUM HIRUNDINELLA	CEL				11	3.5	214	14	12.5	74
CHLAMYDOMONAS	CEL	15	9.3	887						
CHROOMONAS ?	CEL	13	11.2	1065		0.9	53			X
CRUCIGENIA TETRAPEDIA	COL									X
CRYPTOMONAS EROSA	CEL	14	4.7	444				12	12.5	74
CRYPTOMONAS MARSSONII	CEL				14	0.9	53	11	62.6	372
CRYPTOMONAS OVATA	CEL						X			
CYCLOTELLA	CEL	11	55.8	5323						
DIATOMA VULGARE	CEL									X
EPITHEMIA SOREX	CEL					0.9	53			
FLAGELLATE	CEL	12	14.0	1331						
FRAGILARIA	CEL									X
FRAGILARIA #1	CEL			X						
FRAGILARIA CROTONENSIS	CEL				12	80.0	4919			X
FRAGILARIA LEPTOSTAURON	CEL			X						
GLENODINIUM EDAX	CEL			X						
MALLOMONAS ACAROIDES	CEL									X
MELOSIRA GRANULATA	CEL			X						X
MELOSIRA GRANULATA V. ANGUSTISSIMA	CEL				15	3.5	214			X
NITZSCHIA	CEL			X						
OOCYSTIS EREMOSPHAERIA	CEL									X
PEDIASTRUM BORYANUM	COL						X			
RHOPALODIA GIBBA	CEL									X
SCHROEDERIA SETIGERA	CEL		2.8	266						
STEPHANODISCUS	CEL		2.3	222						X
SYNEDRA ULNA	CEL									X
TOTAL				9538			6149			694

LAKE NAME: PANGUITCH LAKE
STORET NUMBER: 4914

NYGAARD TROPHIC STATE INDICES

DATE	08 13 75	09 25 75
MYXOPHYCEAN	3.00 E	03/0 E
CHLOROPHYCEAN	1.00 E	0/0 D
EUGLENOPHYTE	0/04 ?	0/03 ?
DIATOM	0.50 E	1.00 E
COMPOUND	5.00 E	04/0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	08 13 75	09 25 75
GENUS	01	00
SPECIES	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		08 13 75	09 25 75
AVERAGE DIVERSITY	H	1.13	0.00
NUMBER OF TAXA	S	10.00	7.00
NUMBER OF SAMPLES COMPOSITED	M	2.00	2.00
MAXIMUM DIVERSITY	MAXH	3.32	2.81
MINIMUM DIVERSITY	MINH	0.03	0.01
TOTAL DIVERSITY	D	4331.29	0.00
TOTAL NUMBER OF INDIVIDUALS/ML	N	3833.00	8979.00
EVENNESS COMPONENT	J	0.34	0.00
RELATIVE EVENNESS	RJ	0.34	0.00
MEAN NUMBER OF INDIVIDUALS/TAXA	L	383.30	1282.71
NUMBER/ML OF MOST ABUNDANT TAXON	K	3127.00	8979.00

LAKE NAME: PANGUITCH LAKE
STORET NUMBER: 4914

CONTINUED

TAXA	FORM	09 13 75 IS	09 13 75 %C	09 13 75 ALGAL UNITS PER ML	09 25 75 IS	09 25 75 %C	09 25 75 ALGAL UNITS PER ML
ANABAENA	FIL			X			X
APHANIZOMENON FLOS-AQUAE	FIL	11	81.6	3127	11	100.0	8979
CERATIUM HIRUNDINELLA	CEL						X
CHROOMONAS ?	CEL		1.5	59			
CLOSTERIUM	CEL	1	0.8	29			
CRYPTOMONAS EROSA	CEL		2.3	88			
CRYPTOMONAS MARSSONII	CEL						X
FRAGILARIA #2	CEL		0.8	29			
FRAGILARIA CROTONENSIS	CEL	2	7.7	295			
MICROCYSTIS AERUGINOSA	COL						X
MICROCYSTIS INCERTA	COL	4	3.1	118			
NITZSCHIA	CEL						X
SPHAEROCYSTIS SCHROETERI	COL	3	2.3	88			
STEPHANODISCUS	CEL			X			X
TOTAL				3833			8979

LAKE NAME: PELICAN LAKE
STORET NUMBER: 4915

NYGAARD TROPHIC STATE INDICES

DATE	05 13 75	08 07 75	09 23 75
MYXOPHYCEAN	0/0 O	08/0 E	06/0 E
CHLOROPHYCEAN	01/0 E	08/0 E	08/0 E
EUGLENOPHYTE	0/01 ?	0.19 ?	0/14 ?
DIATOM	0/02 ?	0/04 ?	0/03 ?
COMPOUND	01/0 E	19/0 E	14/0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 13 75	08 07 75	09 23 75
GENUS	08	05	06
SPECIES	00	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 13 75	08 07 75	09 23 75
AVERAGE DIVERSITY	H	2.02	2.95	0.53
NUMBER OF TAXA	S	7.00	31.00	19.00
NUMBER OF SAMPLES COMPOSITED	M	2.00	2.00	2.00
MAXIMUM DIVERSITY	MAXH	2.81	4.95	4.25
MINIMUM DIVERSITY	MINH	0.03	0.23	0.00
TOTAL DIVERSITY	D	4480.36	4714.10	40291.13
TOTAL NUMBER OF INDIVIDUALS/ML	N	2218.00	1598.00	76021.00
EVENNESS COMPONENT	J	0.72	0.60	0.12
RELATIVE EVENNESS	RJ	0.72	0.58	0.13
MEAN NUMBER OF INDIVIDUALS/TAXA	L	316.86	51.55	4001.11
NUMBER/ML OF MOST ABUNDANT TAXON	K	801.00	376.00	70495.00

LAKE NAME: PELICAN LAKE
STORET NUMBER: 4915

CONTINUED

TAXA	FORM	05 13 75 S	05 13 75 %C	05 13 75 ALGAL UNITS PER ML	08 07 75 S	08 07 75 %C	08 07 75 ALGAL UNITS PER ML	09 23 75 S	09 23 75 %C	09 23 75 ALGAL UNITS PER ML
ACTINASTRUM GRACILIMUM	COL						X			
ANABAENA	FIL						X			
CERATIUM HIRUNDINELLA	CEL						X			
CHLAMYDOMONAS	CEL	1	36.1	901						
CHLOROPHYTAN CELL	CEL							1	92.7	70495
CHROOMONAS ?	CEL	4	22.2	493		14.7	235			
COCCONEIS PLACENTULA	CEL						X			X
COELOSPHAERIUM	COL						X			X
CRYPTOMONAS	CEL						X			
CRYPTOMONAS EROSA	CEL			X					0.1	95
CRYPTOMONAS MARSSONII	CEL	3	11.1	246						
CRYPTOMONAS REFLEXA	CEL						X			
CRYPTOMONAS SPP.	CEL				3	11.9	188			
DACTYLOCOCCOPSIS FASCICULARIS	CEL						X	4	1.8	1334
DICTYOSPHAERIUM PULCHELLUM	COL						X		0.1	95
DINOBRYON SOCIALE	CEL				5	2.9	47			
EPITHEMIA	CEL									X
EUGLENA	CEL						X			
FRAGILARIA CAPUCINA V. MESOLEPTA	CEL	2	27.8	616	2	17.6	282			X
MERISMOPEDIA TENUISSIMA	COL					8.8	141	5	1.3	953
MICROCYSTIS AERUGINOSA	COL						X			
MICROCYSTIS INCERTA	COL						X	2	3.0	2287
MOUGEOTIA	FIL						X			
OOCYSTIS	CEL					8.8	141			X
OSCILLATORIA #2	FIL						X	3	0.9	667
OSCILLATORIA #3	FIL									X
OSCILLATORIA LIMNETICA	FIL					5.9	94			
PEDIASTRUM BORYANUM	COL									X
PEDIASTRUM DUPLEX	COL						X			
PERIDINIUM INCONSPICUUM	CEL				4	5.9	94			
PHACUS	CEL						X			
PHACUS MEGALOPSIS	CEL						X			
RHOPALODIA GIBBA	CEL			X						
SCENEDESMUS BICAUDATUS	COL						X			
SCENEDESMUS BIJUGA	COL	5	2.8	62						
SCENEDESMUS QUADRICAUDA	COL									X
SURIRELLA OVATA	CEL						X			
SYNEDRA	CEL						X			
TETRAEDRON CAUDATUM	CEL						X			X
TETRAEDRON MINIMUM V. SCROBICULATUM	CEL				1	23.5	376		0.1	95
TETRAEDRON MUTICUM	CEL						X			X
TREUBARIA TRIAPPENDICULATA	CEL									X
TOTAL				2218			1598			76021

LAKE NAME: PINEVIEW RES,
STORET NUMBER: 4916

NYGAARD TROPHIC STATE INDICES

DATE	05 14 75	08 07 75	09 23 75
MYXOPHYCEAN	0/0 O	02/0 E	1.00 E
CHLOROPHYCEAN	04/0 E	06/0 E	2.00 E
EUGLENOPHYTE	0/04 ?	0.12 ?	0/03 ?
DIATOM	0.14 ?	1.00 E	2.00 E
COMPOUND	05/0 E	10/0 E	5.00 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 14 75	08 07 75	09 23 75
GENUS	09	00	00
SPECIES	03	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 14 75	08 07 75	09 23 75
AVERAGE DIVERSITY	H	2.26	2.16	2.26
NUMBER OF TAXA	S	18.00	15.00	11.00
NUMBER OF SAMPLES COMPOSITED	M	4.00	4.00	4.00
MAXIMUM DIVERSITY	MAXH	4.17	3.91	3.46
MINIMUM DIVERSITY	MINH	0.04	0.05	0.13
TOTAL DIVERSITY	D	11779.12	7311.60	1966.20
TOTAL NUMBER OF INDIVIDUALS/ML	N	5212.00	3385.00	870.00
EVENNESS COMPONENT	J	0.54	0.55	0.65
RELATIVE EVENNESS	RJ	0.54	0.55	0.64
MEAN NUMBER OF INDIVIDUALS/TAXA	L	289.56	225.67	79.09
NUMBER/ML OF MOST ABUNDANT TAXON	K	2552.00	1855.00	332.00

LAKE NAME: PINEVIEW RES.
STORET NUMBER: 4916

CONTINUED

TAXA	FORM	05 14 75 IS	05 14 75 %C	05 14 75 ALGAL UNITS PER ML	08 07 75 IS	08 07 75 %C	08 07 75 ALGAL UNITS PER ML	09 23 75 IS	09 23 75 %C	09 23 75 ALGAL UNITS PER ML
ACHNANTHES MICROCEPHALA	CEL			X						
ANKISTRODESMUS FALCATUS	CEL		1.0	54						
APHANIZOMENON FLOS-AQUAE	FIL					2.1	00071	1	19.1	166
CERATIUM HIRUNDINELLA	CEL						X			
CHLAMYDOMONAS	CEL	4	9.4	489						
CHROOMONAS ?	CEL	2	49.0	2552		11.8	00399		19.1	166
COSMARIUM	CEL									X
CRYPTOMONAS EROSA	CEL	3	7.3	380		9.0	00306	5	4.7	41
CRYPTOMONAS MARSSONII	CEL	1	19.8	1031				4	14.3	124
CRYPTOMONAS OVATA	CEL				4	4.2	141			
CYMBELLA	CEL			X						
CYST	CEL				5	7.7	00259			
DINOBRYON DIVERGENS	CEL									X
FLAGELLATE #2	CEL		4.2	217						
FRAGILARIA #2	CEL			X						
FRAGILARIA CROTONENSIS	CEL			X	1	54.8	01855	2	38.2	332
GLENODINIUM	CEL		1.0	54						
MELOSIRA GRANULATA	CEL						X			X
MICROCYSTIS INCERTA	COL					0.7	24			
NAVICULA	CEL			X						
NITZSCHIA	CEL		2.1	109						
OOCYSTIS	CEL						X			
OOCYSTIS SPP.	CEL						X			
PEDIASTRUM BORYANUM	COL									X
PHACUS	CEL						X			
SCENEDESMUS BIJUGA	COL						X			
SCENEDESMUS QUADRICAUDA	COL			X						
SCHROEDERIA SETIGERA	CEL	5	6.3	326		9.0	00306			
SPHAEROCYSTIS SCHROETERI	COL					0.7	24			X
STEPHANODISCUS	CEL			X				3	4.7	41
SURIRELLA OVATA	CEL			X						
TETRAEDRON REGULARE V. INCUS	CEL			X						
TOTAL				5212			3385			870

LAKE NAME: PIUTE RES.
STORET NUMBER: 4917

NYGAARD TROPHIC STATE INDICES

DATE	05 09 75	08 13 75	09 24 75
MYXOPHYCEAN	0/0 O	0/01 O	3.00 E
CHLOROPHYCEAN	03/0 E	6.00 E	8.00 E
EUGLENOPHYTE	0.33 E	0.17 ?	0.36 E
DIATOM	0.14 ?	0.25 ?	0.27 ?
COMPOUND	05/0 E	8.00 E	18.0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 09 75	08 13 75	09 24 75
GENUS	01	00	10
SPECIES	02	00	06

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 09 75	08 13 75	09 24 75
AVERAGE DIVERSITY	H	1.00	2.55	2.97
NUMBER OF TAXA	S	15.00	19.00	33.00
NUMBER OF SAMPLES COMPOSITED	M	3.00	3.00	2.00
MAXIMUM DIVERSITY	MAXH	3.91	4.25	5.04
MINIMUM DIVERSITY	MINH	0.02	0.15	0.08
TOTAL DIVERSITY	D	12617.00	3738.30	15830.10
TOTAL NUMBER OF INDIVIDUALS/ML	N	12617.00	1466.00	5330.00
EVENNESS COMPONENT	J	0.26	0.60	0.59
RELATIVE EVENNESS	RJ	0.26	0.59	0.59
MEAN NUMBER OF INDIVIDUALS/TAXA	L	841.13	77.16	161.52
NUMBER/ML OF MOST ABUNDANT TAXON	K	10007.00	489.00	1635.00

LAKE NAME: PIUTE RES.
STORET NUMBER: 4917

CONTINUED

TAXA	FORM	08 09 75 IS	08 09 75 %C	08 09 75 ALGAL UNITS PER ML	08 13 75 IS	08 13 75 %C	08 13 75 ALGAL UNITS PER ML	09 24 75 IS	09 24 75 %C	09 24 75 ALGAL UNITS PER ML
ACHNANTHES MINUTISSIMA	CEL			X						
ACTINASTRUM	COL		0,2	27						
ANKISTRODESMUS FALCATUS V. ACICULARIS	CEL			X		2,4	35			
APHANIZOMENON FLOS-AQUAE	FIL									X
ASTERIONELLA FORMOSA	CEL						X			
CERATIUM HIRUNDINELLA	CEL						X			
CHROOMONAS 7	CEL					23,8	349			X
COELOSPHAERIUM	COL									X
CRUCIGENIA TETRAPEDIA	COL								1,0	53
CRYPTOMONAS EROSA	CEL				3	14,3	209		4,0	211
CRYPTOMONAS OVATA	CEL							3	9,9	528
CRYPTOMONAS REFLEXA	CEL				2	11,9	174			
CRYPTOMONAS SPP.	CEL	4	0,6	80						
CYCLOTELLA MENEGHINIANA	CEL	3	3,4	426				2	30,7	1638
CYMATOPLEURA	CEL		0,2	27						
CYMBELLA	CEL			X					1,0	53
DIATOMA TENUE V. ELONGATUM	CEL	1	79,3	10007			X	5	4,0	211
DINOBRYON DIVERGENS	CEL	2	15,4	1943						
DIPLOPSALIS ACUTA	CEL				4	4,8	70			
EUGLENA	CEL	5	0,2	27						
EUGLENA SPP.	CEL							4	6,9	369
FRAGILARIA CROTONENSIS	CEL						X			X
GOMPHONEMA	CEL									X
GYMNODINIUM ALBULUM	CEL		0,6	80						
GYROSIGMA	CEL									X
LAGERHEIMIA CILIATA	CEL						X			
LYNGBYA	FIL								1,0	53
MALLOMONAS ACARDIOES	CEL							1	25,7	1372
MALLOMONAS PSEUDOCORONATA	CEL				1	33,4	489			
MELOSIRA GRANULATA V. AUGUSTISSIMA	CEL									X
NAVICULA	CEL			X						
NAVICULA CRYPTOCEPHALA	CEL									X
NITZSCHIA	CEL									X
NITZSCHIA SIGMA 1	CEL									X
NITZSCHIA VERMICULARIS	CEL			X						
OOCISTIS	CEL					4,8	70		4,0	211
PEDIASTRUM DUPLEX	COL								1,0	53
SCENEDESMUS BIJUGA	COL						X			X
SCENEDESMUS DIMORPHUS	COL									X
SCENEDESMUS QUADRICAUDA	COL			X			X		1,0	53
SCHROEDERIA SETIGERA	CEL								6,9	369
STAURASTRUM	CEL				5	4,8	70		1,0	53
STEPHANODISCUS	CEL						X		1,0	53
SURIRELLA OVATA	CEL			X			X			X
SYNEDRA ULNA	CEL									X
SYNEDRA ULNA V. IMPRESSA	CEL									X
TETRASTRUM STAUROGENIAEFORME	COL						X			X
TRACHELOMONAS #1	CEL								1,0	53
TRACHELOMONAS FLUVIATILIS	CEL						X			X
TOTAL				12617			1466			5330

LAKE NAME: PORCUPINE RES.
STORET NUMBER: 4918

NYGAARD TROPHIC STATE INDICES

DATE	05 14 75	08 06 75	09 23 75
MYXOPHYCEAN	01/0 E	0/0 O	0/0 O
CHLOROPHYCEAN	0/0 O	04/0 E	01/0 E
EUGLENOPHYTE	0/01 ?	0/04 ?	0/01 ?
DIATOM	0/04 ?	0.33 E	1.00 E
COMPOUND	01/0 E	05/0 E	03/0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 14 75	08 06 75	09 23 75
GENUS	00	01	02
SPECIES	00	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 14 75	08 06 75	09 23 75
AVERAGE DIVERSITY	H	0.95	1.69	2.11
NUMBER OF TAXA	S	10.00	13.00	8.00
NUMBER OF SAMPLES COMPOSITED	M	2.00	2.00	1.00
MAXIMUM DIVERSITY	MAXH	3.32	3.70	3.00
MINIMUM DIVERSITY	MINH	0.03	0.07	0.05
TOTAL DIVERSITY	D	3952.00	3680.82	3658.74
TOTAL NUMBER OF INDIVIDUALS/ML	N	4160.00	2178.00	1734.00
EVENNESS COMPONENT	J	0.29	0.46	0.70
RELATIVE EVENNESS	RJ	0.28	0.45	0.70
MEAN NUMBER OF INDIVIDUALS/TAXA	L	416.00	167.54	216.75
NUMBER/ML OF MOST ABUNDANT TAXON	K	3196.00	1147.00	887.00

LAKE NAME: PORCUPINE RES.
STORET NUMBER: 4910

CONTINUED

TAXA	FORM	05 14 75 IS	05 14 75 %C	05 14 75 ALGAL UNITS PER ML	08 06 75 IS	08 06 75 %C	08 06 75 ALGAL UNITS PER ML	09 23 75 IS	09 23 75 %C	09 23 75 ALGAL UNITS PER ML
ANABAENA	FIL			X						
ANKISTRODESMUS FALCATUS	CEL					1.7	38			
ASTERIONELLA FORMOSA	CEL			X			X	4	9.3	161
CHROOMONAS ?	CEL	1	76.8	3196						
CRYPTOMONAS EROSA	CEL	3	4.9	203			X	5	7.0	121
CRYPTOMONAS MARSSONII	CEL						X			
CRYPTOMONAS SPP.	CEL				3	8.8	191			
CYCLOTELLA COMTA	CEL				1	31.6	688	1	51.2	887
CYMATOPLEURA SOLEA	CEL						X			
CYMBELLA	CEL			X						
DINOBRYON DIVERGENS	CEL	2	18.3	761	2	52.7	1147	5	11.6	202
ELAKATOTHRIX	COL						X			
FRAGILARIA CROTONENSIS	CEL									X
GLENODINIUM OCULATUM	CEL			X						
GOMPHONEMA TRUNCATUM	CEL			X						
MELOSIRA GRANULATA	CEL							3	14.0	242
MERIDION CIRCULARE	CEL						X			
NAVICULA	CEL			X						
OOCYSTIS	COL				5	3.5	76		7.0	121
PERIDINIUM WILLEI	CEL			X	4	1.7	38			X
SPHAEROCYSTIS SCHROETERI	COL						X			
TOTAL				4160			2178			1734

LAKE NAME: PRUESS RES.
STORET NUMBER: 4919

NYGAARD TROPHIC STATE INDICES

DATE	05 08 75	08 13 75	09 26 75
MYXOPHYCEAN	01/0 E	0/01 O	1.00 E
CHLOROPHYCEAN	0/0 O	3.00 E	4.00 E
EUGLENOPHYTE	1.00 E	0.33 E	0.60 E
DIATOM	0.33 E	0.40 E	0.25 ?
COMPOUND	03/0 E	6.00 E	9.00 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 08 75	08 13 75	09 26 75
GENUS	00	00	00
SPECIES	00	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 08 75	08 13 75	09 26 75
AVERAGE DIVERSITY	H	0.22	1.30	2.16
NUMBER OF TAXA	S	10.00	13.00	16.00
NUMBER OF SAMPLES COMPOSITED	M	1.00	1.00	1.00
MAXIMUM DIVERSITY	MAXH	3.32	3.70	4.00
MINIMUM DIVERSITY	MINH	0.04	0.46	0.70
TOTAL DIVERSITY	D	623.48	319.80	414.72
TOTAL NUMBER OF INDIVIDUALS/ML	N	2834.00	246.00	192.00
EVENNESS COMPONENT	J	0.07	0.35	0.54
RELATIVE EVENNESS	RJ	0.06	0.26	0.45
MEAN NUMBER OF INDIVIDUALS/TAXA	L	283.40	18.92	12.00
NUMBER/ML OF MOST ABUNDANT TAXON	K	2732.00	154.00	72.00

LAKE NAME: PRUESS RES.
STORET NUMBER: 4919

CONTINUED

TAXA	FORM	05 08 75 IS	05 08 75 %C	05 08 75 ALGAL UNITS PER ML	08 13 75 IS	08 13 75 %C	08 13 75 ALGAL UNITS PER ML	09 26 75 IS	09 26 75 %C	09 26 75 ALGAL UNITS PER ML
APHANIZOMENON FLOS-AQUAE	FIL							4	12.5	24
BOTRYOCOCCUS BRAUNII	COL						X			
CALONEIS							X			
CERATIUM HIRUNDINELLA	CEL			X						
CHROOMONAS ?	CEL	21	3.6	102						
CLOSTERIUM	CEL						X			X
COCCONEIS PLACENTULA	CEL						X			
COELASTRUM MICROPORUM	COL									X
CRYPTOMONAS EROSA	CEL			X			X	3	12.5	24
CRYPTOMONAS MARSSONII	CEL									X
CYMBELLA	CEL									X
DACTYLOCOCCOPSIS IRREGULARIS	CEL	11	96.4	2732						
DIPLONEIS	CEL						X			
DIPLONEIS SMITHII	CEL									X
EUGLENA	CEL			X						
EUGLENA EHRENBERGII	CEL							5	12.5	24
EUGLENA OXYURIS V. MINOR	CEL									X
HANTZSCHIA	CEL									X
MELOSIRA GRANULATA	CEL			X			X			X
NITZSCHIA	CEL			X						
NITZSCHIA LONGISSIMA	CEL			X						
PHACUS TORTUS	CEL						X			X
RHOPALODIA GIBBA	CEL						X			
SCENEDESMUS BIJUGA	COL									X
SCHROEDERIA SETIGERA	CEL				11	62.6	154	1	37.5	72
SPHAEROCYSTIS SCHROETERI	COL				3	24.8	61	2	25.0	48
SPIROGYRA	FIL			X						
STEPHANODISCUS	CEL				2	12.6	31			
SURIRELLA	CEL			X						
SURIRELLA OVATA	CEL						X			
SYNEDRA ULNA	COL									X
TOTAL				2834			246			192

LAKE NAME: SEVIER BRIDGE RES.
STORET NUMBER: 4920

NYGAARD TROPHIC STATE INDICES

DATE	05 12 75	08 12 75	09 24 75
MYXOPHYCEAN	01/0 E	0.67 E	03/0 E
CHLOROPHYCEAN	08/0 E	4.00 E	10/0 E
EUGLENOPHYTE	0.11 ?	0.21 E	0.23 E
DIATOM	0.14 ?	1.00 E	0.30 ?
COMPOUND	11/0 E	6.67 E	19/0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 12 75	08 12 75	09 24 75
GENUS	07	06	15
SPECIES	00	07	09

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 12 75	08 12 75	09 24 75
AVERAGE DIVERSITY	H	2.30	3.12	3.60
NUMBER OF TAXA	S	25.00	32.00	31.00
NUMBER OF SAMPLES COMPOSITED	M	3.00	3.00	3.00
MAXIMUM DIVERSITY	MAXH	4.64	5.00	4.95
MINIMUM DIVERSITY	MINH	0.12	0.08	0.11
TOTAL DIVERSITY	D	5821.30	17871.36	12895.20
TOTAL NUMBER OF INDIVIDUALS/ML	N	2531.00	5728.00	3582.00
EVENNESS COMPONENT	J	0.50	0.62	0.73
RELATIVE EVENNESS	RJ	0.49	0.62	0.73
MEAN NUMBER OF INDIVIDUALS/TAXA	L	101.24	179.00	115.55
NUMBER/ML OF MOST ABUNDANT TAXON	K	1191.00	2309.00	937.00

LAKE NAME: BEVIER BRIDGE RES.
STORET NUMBER: 4920

CONTINUED

TAXA	FORM	05 12 75 IS	05 12 75 %C	05 12 75 ALGAL UNITS PER ML	08 12 75 IS	08 12 75 %C	08 12 75 ALGAL UNITS PER ML	09 24 75 IS	09 24 75 %C	09 24 75 ALGAL UNITS PER ML
ANABAENA	FIL						X			X
ANKISTRODESMUS FALCATUS	CEL								1.5	55
APHANIZOMENON FLOS-AQUAE	FIL				2	9.1	520	3	1.5	55
CERATIUM HIRUNDINELLA F. FURCOIDES	CEL					0.6	33			
CHAETOCENOS ELMOREI	CEL				4	4.5	260			
CHROOMONAS ?	CEL		13.7	347		4.0	228		6.2	221
CLOSTERIUM	CEL					1.1	65			
COELASTRUM MICROPORUM	COL					4.0	228		1.5	55
COSMARIUM	CEL					0.6	33			
CRUCIGENIA TETRAPEDIA	COL			X	1	40.3	2309		4.6	165
CRYPTOMONAS EROSA	CEL			X		9.7	553		9.2	331
CRYPTOMONAS MARSSONII	CEL			X						
CRYPTOMONAS SPP.	CEL	3	9.8	248						
CYCLOTELLA MENEGHINIANA	CEL						X	1	26.2	937
DACTYLOCOCCOPSIS	CEL									X
DIATOMA TENUE V. ELONGATUM	CEL	4	5.9	149						
DIATOMA VULGARE V. BREVE	CEL									X
DIATOMA VULGARE V. LINEARIS	CEL									X
DINOBRYON DIVERGENS	CEL			X						
DIPLONEIS SMITHII	CEL									X
ELAKATOTHRIX	CEL					1.1	68			
ELAKATOTHRIX ?	CEL	1	47.1	1191						
ENTOMONEIS	CEL			X			X			
EUGLENA	CEL	5	2.0	50		0.6	33	4	1.5	55
EUGLENA ACUS	CEL						X			
FLAGELLATE	CEL			X						
FRAGILARIA CROTONENSIS	CEL			X	5	6.8	390			X
GYROSIGMA	CEL			X		1.7	98			X
KIRCHNERIELLA	CEL						X			
MELOSIRA GRANULATA V. ANGUSTISSIMA	CEL			X						X
MICROCYSTIS AERUGINOSA	COL			X						
NAVICULA	CEL						X			
NAVICULA CRYPTOCEPHALA	CEL									X
NITZSCHIA	CEL								3.1	110
NITZSCHIA LONGISSIMA V. REVERSA	CEL			X				2	10.8	386
OOCYSTIS	COL			X	3	9.7	553			
PANDORINA MORUM	COL					1.1	65			
PEDIASTRUM BORYANUM	COL			X		0.6	33		1.5	55
PEDIASTRUM DUPLEX	COL									X
PEDIASTRUM DUPLEX V. CLATHRATUM	COL						X			
PERIDINIUM CINCTUM ?	CEL						X			
SCENEDESMUS BIJUGA	COL					0.6	33		1.5	55
SCENEDESMUS DIMORPHUS	COL									X
SCENEDESMUS QUADRICAUDA	COL		1.0	25		1.7	98		4.6	165
SCHROEDERIA SETIGERA	CEL								1.5	55
SKELETONEMA POTAMOS	CEL								9.2	331
SPHAEROCYSTIS SCHROETERI	COL			X						
STAURASTRUM	CEL						X			
STEPHANODISCUS	CEL					1.1	65			
SURIRELLA	CEL								1.5	55
SURIRELLA OVATA	CEL		1.0	25						
SYNEDRA #1	CEL		2.9	74						
SYNEDRA #2	CEL	2	16.7	422						
SYNEDRA ULNA	CEL									X
TETRAEDRON MINIMUM	CEL					0.6	33			
TETRAEDRON MINIMUM V. SCRORICULATUM	CEL			X						
TETRASTRUM ? GLABRUM	COL						X			
TETRASTRUM STAUROGENIAEFORME	COL			X				5	9.2	331
TRACHELOMONAS	CEL					0.6	33			
TRACHELOMONAS CREBEA	CEL								3.1	110
TRACHELOMONAS FLUVIATILIS	CEL								1.5	55
TREUBARIA SETIGERUM	CEL						X			
TOTAL				2531			5728			3582

LAKE NAME: STARVATION RES.
STORET NUMBER: 4921

NYGAARD TROPHIC STATE INDICES

DATE	05 13 75	08 11 75	09 24 75
MYXOPHYCEAN	0/0 O	0/01 O	1.00 E
CHLOROPHYCEAN	01/0 E	1.00 E	3.00 E
EUGLENOPHYTE	0/01 ?	0/01 ?	0.12 ?
DIATOM	0.33 E	0/01 ?	0.33 E
COMPOUND	02/0 E	1.00 O	5.00 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 13 75	08 11 75	09 24 75
GENUS	00	00	02
SPECIES	00	00	03

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 13 75	08 11 75	09 24 75
AVERAGE DIVERSITY	H	1.58	1.89	2.19
NUMBER OF TAXA	S	10.00	9.00	21.00
NUMBER OF SAMPLES COMPOSITED	M	4.00	4.00	4.00
MAXIMUM DIVERSITY	MAXH	3.32	3.17	4.39
MINIMUM DIVERSITY	MINH	0.04	0.20	0.53
TOTAL DIVERSITY	D	4202.80	778.68	823.44
TOTAL NUMBER OF INDIVIDUALS/ML	N	2660.00	412.00	376.00
EVENNESS COMPONENT	J	0.48	0.60	0.50
RELATIVE EVENNESS	RJ	0.47	0.57	0.44
MEAN NUMBER OF INDIVIDUALS/TAXA	L	266.00	45.78	17.90
NUMBER/ML OF MOST ABUNDANT TAXON	K	1179.00	165.00	125.00

LAKE NAME: STARVATION RES.
STORET NUMBER: 4921

CONTINUED

TAXA	FORM	05 13 75 IS	05 13 75 %C	05 13 75 ALGAL UNITS PER ML	08 11 75 IS	08 11 75 %C	08 11 75 ALGAL UNITS PER ML	09 24 75 IS	09 24 75 %C	09 24 75 ALGAL UNITS PER ML
ANKISTRODESMUS FALCATUS V. ACICULARIS	CEL							4	16.0	63
APHANOTHECE	COL									X
ASTERIONELLA FORMOSA	CEL	2	19.3	514			X			X
CERATIUM HIRUNDINELLA	CEL						X			X
CHROOMONAS ?	CEL			X	3	26.7	110	3	33.2	125
CLOSTERIUM	CEL									X
COSMARIUM	CEL						X			X
CRYPTOMONAS EROSA	CEL			X	4	13.3	55	2	25.0	94
CRYPTOMONAS MARSSONII	CEL			X						
CYST	CEL									X
DIATOMA TENUE V. ELONGATUM	CEL	4	1.1	30						
DINOBRYON DIVERGENS	CEL				2	19.9	82			X
DIPLOPSALIS ACUTA	CEL						X			
EUGLENA	CEL									X
FRAGILARIA	CEL									X
FRAGILARIA CROTONENSIS	CEL	1	38.2	917						X
GLENODINIUM EDAX	CEL			X						
GLOEOCAPSA	COL									X
LAGERHEIMIA LONGISETA V. MAJOR	CEL									X
MALLOMONAS	CEL			X						
MALLOMONAS ACAROIDES	CEL							5	9.2	31
OOCYSTIS	CEL			X	1	40.0	165			X
PEDIASTRUM BORYANUM	COL									X
PERIDINIUM CINCTUM	CEL						X			
SCHROEDERIA SETIGERA	CEL									X
SPHAEROCYSTIS SCHROETERI	COL									X
STEPHANODISCUS	CEL	3	44.3	1179				1	16.8	63
TOTAL				2660			412			376

LAKE NAME: STEINAKER RES.
STORET NUMBER: 4922

NYGAARD TROPHIC STATE INDICES

DATE	05 13 75	08 07 75	09 23 75
MYXOPHYCEAN	0/0 O	01/0 E	1.00 E
CHLOROPHYCEAN	01/0 E	01/0 E	0/01 O
EUGLENOPHYTE	0/01 ?	0/02 ?	0/01 ?
DIATOM	0.50 E	0.25 ?	0/02 ?
COMPOUND	02/0 E	03/0 E	1.00 O

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 13 75	08 07 75	09 23 75
GENUS	02	01	01
SPECIES	03	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 13 75	08 07 75	09 23 75
AVERAGE DIVERSITY	H	1.61	1.19	1.33
NUMBER OF TAXA	S	8.00	13.00	6.00
NUMBER OF SAMPLES COMPOSITED	M	3.00	3.00	3.00
MAXIMUM DIVERSITY	MAXH	3.00	3.70	2.58
MINIMUM DIVERSITY	MINH	0.08	0.32	0.13
TOTAL DIVERSITY	D	1663.13	452.20	490.77
TOTAL NUMBER OF INDIVIDUALS/ML	N	1033.00	380.00	369.00
EVENNESS COMPONENT	J	0.54	0.32	0.52
RELATIVE EVENNESS	RJ	0.53	0.26	0.49
MEAN NUMBER OF INDIVIDUALS/TAXA	L	129.13	29.23	61.50
NUMBER/ML OF MOST ABUNDANT TAXON	K	533.00	253.00	201.00

LAKE NAME: STEINAKER RES.
STORET NUMBER: 4922

CONTINUED

TAXA	FORM	05 13 75 IS	05 13 75 %C	05 13 75 ALGAL UNITS PER ML	08 07 75 IS	08 07 75 %C	08 07 75 ALGAL UNITS PER ML	09 23 75 IS	09 23 75 %C	09 23 75 ALGAL UNITS PER ML
ANKISTRODESMUS FALCATUS	CEL	3	19.4	200						
APHANOCAPSA DELICATISSIMA	COL				1	66.6	253	1	54.5	201
ASTERIONELLA FORMOSA	CEL			X			X	3	9.2	34
CERATIUM HIRUNDINELLA F. ACOTTICUM	CEL						X			
CHROOMONAS ?	CEL	2	51.6	533	2	25.0	95	2	36.3	134
COSMARIUM	CEL									X
CRYPTOMONAS EROSA	CEL						X			
CRYPTOMONAS MARSSONII	CEL			X			X			
CRYPTOMONAS REFLEXA	CEL			X						X
CRYPTOMONAS SPP.	CEL	1	25.8	267						
CYCLOTELLA	CEL	4	3.2	33						
CYMBELLA	CEL						X			
DINOBRYON DIVERGENS	CEL						X			
FRAGILARIA CROTONENSIS	CEL			X						X
NAVICULA ?	CEL						X			
PERIDINIUM	CEL						X			
SCHROEDERIA SETIGERA	CEL				3	8.4	32			
STEPHANODISCUS	CEL						X			
SYNEDRA	CEL						X			
TOTAL				1033			380			369

LAKE NAME: TROPIC RES.
STORET NUMBER: 4923

NYGAARD TROPHIC STATE INDICES

DATE	05 08 75	08 14 75	09 25 75
MYXOPHYCEAN	01/0 E	3.00 E	1.00 E
CHLOROPHYCEAN	01/0 E	1.00 E	1.00 E
EUGLENOPHYTE	0/02 ?	0/04 ?	0/02 ?
DIATOM	1.00 E	0/02 ?	0/02 ?
COMPOUND	03/0 E	4.00 E	2.00 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 08 75	08 14 75	09 25 75
GENUS	00	00	00
SPECIES	00	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 08 75	08 14 75	09 25 75
AVERAGE DIVERSITY	H	0.03	0.30	1.67
NUMBER OF TAXA	S	5.00	10.00	10.00
NUMBER OF SAMPLES COMPOSITED	M	1.00	1.00	2.00
MAXIMUM DIVERSITY	MAXH	2.32	3.32	3.32
MINIMUM DIVERSITY	MINH	1.37	0.03	0.55
TOTAL DIVERSITY	D	0.42	1456.80	233.80
TOTAL NUMBER OF INDIVIDUALS/ML	N	14.00	4856.00	140.00
EVENNESS COMPONENT	J	0.01	0.09	0.50
RELATIVE EVENNESS	RJ	-1.41	0.09	0.41
MEAN NUMBER OF INDIVIDUALS/TAXA	L	2.80	485.60	14.00
NUMBER/ML OF MOST ABUNDANT TAXON	K	14.00	4660.00	80.00

LAKE NAME: TROPIC RES.
STORET NUMBER: 4923

CONTINUED

TAXA	FORM	05 08 75 IS	05 08 75 %C	05 08 75 ALGAL UNITS PER ML	08 14 75 IS	08 14 75 %C	08 14 75 ALGAL UNITS PER ML	09 25 75 IS	09 25 75 %C	09 25 75 ALGAL UNITS PER ML
ANABAENA	FIL				2	1.3	65			
CERATIUM HIRUNDINELLA F. SCOTTICUM	CEL						X			
CHRUOMONAS ?	CEL				4	2.0	98			X
CHROOMONAS SPP.	CEL							1	57.1	80
COELOSPHAERIUM KUFTZINGIANUM	COL									X
COSMARIUM	CEL									X
CRYPTOMONAS EROSA	CEL			X			X	3	14.3	20
CRYPTOMONAS EROSA V. REFLEXA	CEL							4	14.3	20
CYMBELLA	CEL			X						
FRAGILARIA CROTONENSIS	CEL						X			
GLOEOTRICHIA	FIL				1	96.0	4660			
MELOSIRA	CEL			X						
MICROCYSTIS AERUGINOSA	COL						X			
MOUGEOTIA	FIL									X
OOCYSTIS	CEL			X						
OSCILLATORIA LIMNETICA	FIL	1	100.	14						
PEDIASTRUM SIMPLEX	COL							2	14.3	20
RHOPALODIA GIBBA	CEL						X			X
SPHAEROCYSTIS SCHROETERI	COL						X			
STAURASTRUM	CEL				3	0.7	33			
SYNEDRA ULNA	CEL									X
TOTAL				14			4856			140

LAKE NAME: UTAH LAKE
STORET NUMBER: 4924

NYGAARD TROPHIC STATE INDICES

DATE	05 13 75	08 08 75	09 19 75
MYXOPHYCEAN	2.00 E	2.00 E	2.00 E
CHLOROPHYCEAN	6.00 E	2.00 E	2.50 E
EUGLENOPHYTE	0.12 ?	0/04 ?	0.22 E
DIATOM	0.67 E	1.00 E	02/0 E
COMPOUND	13.0 E	6.00 E	6.50 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 13 75	08 08 75	09 19 75
GENUS	14	07	10
SPECIES	06	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 13 75	08 08 75	09 19 75
AVERAGE DIVERSITY	H	3.04	0.85	0.86
NUMBER OF TAXA	S	27.00	13.00	19.00
NUMBER OF SAMPLES COMPOSITED	M	8.00	8.00	8.00
MAXIMUM DIVERSITY	MAXH	4.75	3.70	4.25
MINIMUM DIVERSITY	MINH	0.07	0.02	0.03
TOTAL DIVERSITY	D	15336.80	9387.40	6646.94
TOTAL NUMBER OF INDIVIDUALS/ML	N	5045.00	11044.00	7729.00
EVENNESS COMPONENT	J	0.64	0.23	0.20
RELATIVE EVENNESS	RJ	0.64	0.23	0.20
MEAN NUMBER OF INDIVIDUALS/TAXA	L	186.85	849.54	406.79
NUMBER/ML OF MOST ABUNDANT TAXON	K	1618.00	9639.00	6854.00

LAKE NAME: UTAH LAKE
STORET NUMBER: 4924

CONTINUED

TAXA	FORM	05 13 75 IS	05 13 75 %C	05 13 75 ALGAL UNITS PER ML	08 08 75 IS	08 08 75 %C	08 08 75 ALGAL UNITS PER ML	09 19 75 IS	09 19 75 %C	09 19 75 ALGAL UNITS PER ML
ANABAENA	FIL							11	88.7	6854
ANABAENA SPIROIDES ?	FIL				11	87.3	9630			
ANKISTRODESMUS FALCATUS	CEL		1.6	81						
CERATIUM HIRUNDINELLA	CEL				3	0.3	38	5	0.3	27
CHLAMYDOMONAS	CEL		2.1	108						
CHLOROGONIUM	CEL		0.5	27						
CHLOROPHYTAN COCCOID CELLED COLONY	COL									X
CHROOMONAS ?	CEL	3	32.1	1619		2.8	304			
CLOSTERIUM	CEL		1.6	81						
CLOSTERIUM #1	CEL						X		0.3	27
CLOSTERIUM #2	CEL									X
COELASTRUM MICROPORUM	COL									X
CRYPTOMONAS EROSA	CEL	2	18.2	917	4	1.4	152	4	2.1	165
CYCLOTELLA	CEL					0.7	76		0.3	27
CYCLOTELLA MENEGHINIANA	CEL		1.1	54						
DICTYOSPHAERIUM PULCHELLUM	COL		1.6	81						
DINOBRYON SERTULARIA	CEL			X						
DIPLONEIS SMITHII	CEL			X						
DIPLOPSALIS ACUTA	CEL						X			
EUGLENA	CEL									X
EUGLENA GRACILIS	CEL	1	8.0	405						
GLENODINIUM	CEL		2.1	108						
GLENODINIUM OCULATUM	CEL							3	1.0	137
GYROSIGMA	CEL						X			
GYROSIGMA KUTZINGII	CEL			X						
MELOSIRA DISTANS	CEL		0.5	27						
MELOSIRA GRANULATA	CEL		3.2	162					0.7	95
MELOSIRA GRANULATA V. ANGUSTISSIMA	CEL		3.7	189	5	4.1	455			
MERISMOPEDIA TENUISSIMA	COL								0.3	27
MICROCYSTIS AERUGINOSA	COL									X
MICROCYSTIS INCERTA	COL		0.5	27						
NAVICULA #1	CEL			X						
NAVICULA #2	CEL			X						
OOCYSTIS	CEL			X						
OSCILLATORIA	FIL			X	2	3.1	342	2	2.8	219
PHACUS MEGALOPSIS	CEL								0.3	27
PINNULARIA	CEL						X			
PTERONONAS ANGULOSA	CEL	5	4.3	216						
SCENEDESMUS ACUMINATUS	COL								0.7	95
SCENEDESMUS BIJUGA	COL									X
SCENEDESMUS DIMORPHUS	COL						X			
SCENEDESMUS OPOLIENSIS	COL			X		0.3	38		1.1	82
SCHROEDERIA SETIGERA	CEL	4	17.6	890					0.3	27
SURINELLA	CEL		0.5	27						
SYNEDRA ULNA	CEL			X						
TETRASTRUM GLABRUM	COL		0.5	27						
TOTAL				5045			11044			7729

LAKE NAME: WILLARD BAY RES.
STORET NUMBER: 4925

NYGAARD TROPHIC STATE INDICES

DATE	05 14 75	08 06 75	09 23 75
MYXOPHYCEAN	0/01 O	01/0 E	02/0 E
CHLOROPHYCEAN	3.00 E	03/0 E	02/0 E
EUGLENOPHYTE	0/03 ?	0.25 E	0.25 E
DIATOM	0.50 E	0.50 E	0/0 ?
COMPOUND	5.00 E	06/0 E	05/0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 14 75	08 06 75	09 23 75
GENUS	02	08	00
SPECIES	03	03	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 14 75	08 06 75	09 23 75
AVERAGE DIVERSITY	H	0.11	1.62	0.17
NUMBER OF TAXA	S	11.00	10.00	9.00
NUMBER OF SAMPLES COMPOSITED	M	4.00	4.00	4.00
MAXIMUM DIVERSITY	MAXH	3.46	3.32	3.17
MINIMUM DIVERSITY	MINH	0.05	0.02	0.08
TOTAL DIVERSITY	D	269.28	9020.16	192.44
TOTAL NUMBER OF INDIVIDUALS/ML	N	2448.00	5568.00	1132.00
EVENNESS COMPONENT	J	0.03	0.49	0.05
RELATIVE EVENNESS	RJ	0.02	0.49	0.03
MEAN NUMBER OF INDIVIDUALS/TAXA	L	222.55	556.80	125.78
NUMBER/ML OF MOST ABUNDANT TAXON	K	2412.00	2987.00	1104.00

LAKE NAME: WILLARD BAY RES. CONTINUED
STORET NUMBER: 4925

TAXA	FORM	05 14 75 IS	05 14 75 %C	05 14 75 ALGAL UNITS PER ML	08 06 75 IS	08 06 75 %C	08 06 75 ALGAL UNITS PER ML	09 23 75 IS	09 23 75 %C	09 23 75 ALGAL UNITS PER ML
ANABAENA	FIL									X
ANKISTRODESMUS FALCATUS	CEL	1	98.5	2412		3.6	202			
APHANIZOMENON FLOS-AQUAE	FIL						X	1	97.8	1104
ASTERIONELLA FORMOSA	CEL			X			X			
CERATIUM HIRUNDINELLA	CEL						X			
CHROOMONAS ?	CEL									X
CLOSTERIUM	CEL			X						
CRYPTOMONAS EROSA	CEL	2	1.5	36	3	4.5	253			X
CRYPTOMONAS REFLEXA	CEL							2	2.5	28
DIATOMA VULGARE	CEL			X						
EUDORINA ELEGANS	COL									X
EUGLENA #1	CEL									X
EUGLENA #2	CEL				5	0.9	51			
FRAGILARIA CROTONENSIS	CEL			X	2	33.6	1873			
MELOSIRA GRANULATA	CEL			X	1	53.6	2987			
MERIDION CIRCULARE	CEL			X						
OOCYSTIS	CEL			X	4	3.6	202			X
PEDIASTRUM DUPLEX V. CLATHRATUM	COL									X
SCENEDESMUS BALATONICUS	COL						X			
SCENEDESMUS QUADRICAUDA	COL			X						
STEPHANODISCUS	CEL			X						
TOTAL				2448			5568			1132

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 25 lakes sampled by the National Eutrophication Survey in the State of Utah. 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	Utah lake eutrophication Nygaard's trophic indices Palmer's organic pollution indices Species diversity and abundance	06 C, M 08 H 13 B

18. DISTRIBUTION STATEMENT RELEASE TO PUBLIC	19. SECURITY CLASS *(This Report)* UNCLASSIFIED	21. NO. OF PAGES 72
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