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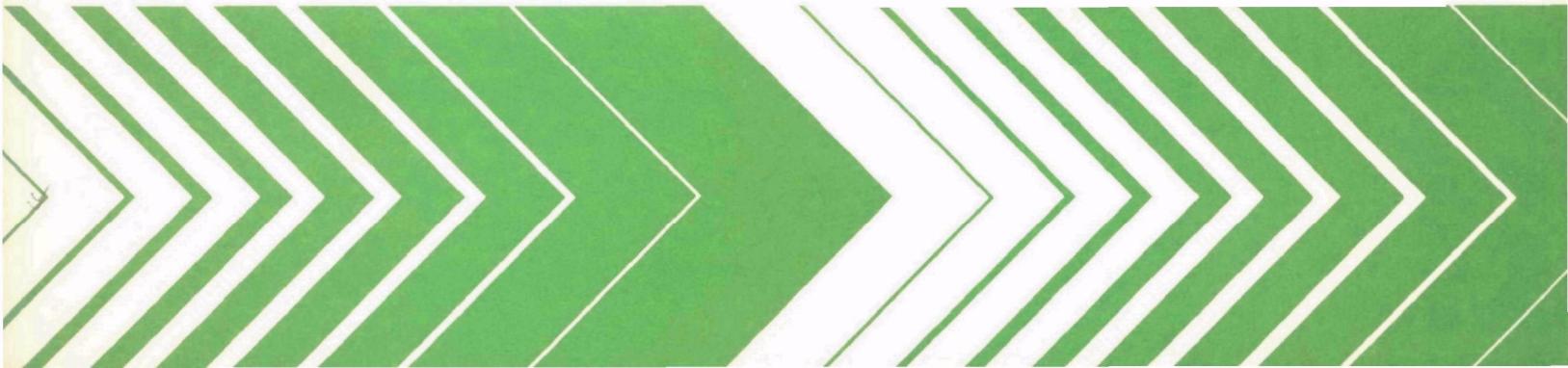
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Research and Development



Distribution of Phytoplankton in Idaho Lakes



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DISTRIBUTION OF PHYTOPLANKTON IN IDAHO 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 13 lakes sampled by the National Eutrophication Survey in the State of Idaho, 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
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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 13 lakes sampled in the State of Idaho (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 IDAHO

STORET No.	Lake Name	County
1601	American Falls Reservoir	Bannock, Bingham, Power
1602	Cascade Lake	Valley
1603	Coeur d'Alene	Benewah, Kootenai
1604	Dworshak Reservoir	Clearwater
1605	Hauser Lake	Kootenai
1606	Hayden Lake	Kootenai
1607	Island Park Reservoir	Fremont
1608	Lake Lowell (Deer Flat Reservoir)	Canyon
1609	Magic Reservoir	Blaine, Camas
1610	Palisades Reservoir	Bonneville (Lincoln in Wyo.)
1611	Lower Payette	Valley
1612	Lower Twin Lakes	Kootenai

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

STORET No.	Lake Name	County
0613	Upper Twin Lakes	Kootenai

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	<u>Myxophyceae</u> Desmideae	0.0-0.4	0.1-3.0
Chlorophycean	<u>Chlorococcales</u> Desmideae	0.0-0.7	0.2-9.0
Diatom	<u>Centric Diatoms</u> Pennate Diatoms	0.0-0.3	0.0-1.75
Euglenophyte	<u>Euglenophyta</u> Myxophyceae + Chlorococcales	0.0-0.2	0.0-1.0
Compound	Myxophyceae + Chlorococcales + <u>Centric Diatoms + Euglenophyta</u> 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 i th taxon in the sample, which is calculated from n_j/N ; n_j is the number of individuals per milliliter of the i th 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:

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

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 sites is equal to $\log S$, or 1. Therefore diversity in sites 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 IDAHO

<i>Achnanthes lanceolata</i>	<i>Diatoma vulgare</i>
<i>Actinostrum hantzschii</i>	<i>Dictyosphaerium pulchellum</i>
v. <i>fluviatile</i>	<i>Dinobryon bavaricum</i>
<i>Amphora ovalis</i>	<i>Dinobryon cylindricum</i>
v. <i>affinis</i>	<i>Dinobryon divergens</i>
<i>Anabaena flos-aquae</i>	<i>Dinobryon sertularia</i>
<i>Ankistrodesmus falcatus</i>	<i>Dinobryon sociale</i>
<i>Ankistrodesmus falcatus</i>	v. <i>americanum</i>
v. <i>acicularis</i>	<i>Diploneis elliptica</i>
<i>Ankistrodesmus falcatus</i>	<i>Diploneis oblongella</i>
v. <i>mirabilis</i>	<i>Elakatothrix</i>
<i>Aphanizomenon flos-aquae</i>	<i>Epithemia sorex</i>
<i>Aphanocapsa delicatissima</i>	<i>Epithemia turgida</i>
<i>Aphanocapsa elachista</i>	<i>Euastnum</i>
<i>Aphanothece</i>	<i>Eudorina elegans</i>
<i>Arthrodesmus</i>	<i>Euglena</i>
<i>Asterionella formosa</i>	<i>Eunotia flexuosa</i>
<i>Bulbochaete</i>	<i>Eunotia incisa</i>
<i>Campylodiscus</i>	<i>Eunotia indica</i>
<i>Ceratium hirundinella</i>	<i>Eunotia serra</i>
<i>Ceratium hirundinella</i>	v. <i>diadema</i>
f. <i>scotticum</i>	<i>Fragilaria brevistriata</i>
<i>Chlamydomonas</i>	<i>Fragilaria capucina</i>
<i>Chroococcus limneticus</i>	v. <i>mesolepta</i>
<i>Closterium ehrenbergii</i>	<i>Fragilaria construens</i>
f. <i>magnum</i>	<i>Fragilaria crotontensis</i>
<i>Cocconeis placentula</i>	<i>Fragilaria intermedia</i>
<i>Cocconeis placentula</i>	<i>Fragilaria leptostauron</i>
v. <i>lineata</i>	<i>Fragilaria virescens</i>
<i>Coelastrum microporum</i>	<i>Frustulia</i>
<i>Coelastrum reticulatum</i>	<i>Glenodinium gymmodinium</i>
<i>Coelosphaerium kuetzingianum</i>	<i>Glenodinium lannicki</i>
<i>Coelosphaerium naegelianum</i>	<i>Glenodinium oculatum</i>
<i>Coelosphaerium pallidum</i>	<i>Gomphonema acuminatum</i>
<i>Cosmarium</i>	v. <i>pusilla</i>
<i>Crucigenia apiculata</i>	<i>Gomphonema augur</i>
<i>Crucigenia quadrata</i>	<i>Gomphonema olivaceum</i>
<i>Crucigenia rectangularis</i>	<i>Gomphonema parvulum</i>
<i>Crucigenia tetrapedia</i>	<i>Gomphonema truncatum</i>
<i>Cryptomonas erosa</i>	<i>Gymnodinium album</i>
<i>Cryptomonas marssonii</i>	<i>Gyrosigma</i>
<i>Cryptomonas reflexa</i>	<i>Hantzschia amphioxys</i>
<i>Cyclotella meneghiniana</i>	<i>Hapalosiphon</i>
<i>Cymatopleura elliptica</i>	<i>Kirchneriella lunaris</i>
<i>Cymbella cistula</i>	<i>Lyngbya</i>
<i>Cymbella mexicana</i>	<i>Mallomonas acaroides</i>
<i>Cymbella minuta</i>	<i>Melosira distans</i>
v. <i>silesiaca</i>	<i>Melosira granulata</i>
<i>Cymbella muelleri</i>	v. <i>angustissima</i>
<i>Dactylococcopsis</i>	<i>Melosira italica</i>
<i>Desmidium swartzii</i>	
<i>Diatoma elongatum</i>	

<i>Melosira varians</i>	<i>Peridinium umbonatum</i>
<i>Meridion circulare</i>	<i>Peridinium willei</i>
<i>Merismopedia glauca</i>	<i>Pinnularia mesolepta</i>
<i>Merismopedia minima</i>	<i>Pinnularia viridis</i>
<i>Merismopedia tenuissima</i>	<i>Rhizosolenia</i>
<i>Micrasterias apiculata</i>	<i>Rhoicosphenia</i>
v. <i>fimbriata</i>	<i>Rhopalodia gibba</i>
<i>Micrasterias radiata</i>	<i>Scenedesmus abundans</i>
<i>Microchaete</i>	<i>Scenedesmus bijuga</i>
<i>Microcystis aeruginosa</i>	<i>Scenedesmus denticulatus</i>
<i>Microcystis incerta</i>	<i>Scenedesmus dimorphus</i>
<i>Mougeotia</i>	<i>Scenedesmus quadricauda</i>
<i>Navicula aurora</i>	<i>Schroederia setigera</i>
<i>Navicula cuspidata</i>	<i>Sphaerocystis schroeteri</i>
<i>Navicula radiosha</i>	<i>Spirogyra</i>
<i>Neidium hitchcockii</i>	<i>Staurastrum tetracerum</i>
<i>Nitzschia acicularis</i>	<i>Stauroneis anceps</i>
<i>Nitzschia tryblionella</i>	f. <i>linearis</i>
v. <i>levidensis</i>	<i>Stephanodiscus astraea</i>
<i>Nitzschia vernicularis</i>	v. <i>minutula</i>
<i>Oedogonium</i>	<i>Stephanodiscus niagarensis</i>
<i>Oocystis</i>	<i>Surirella</i>
<i>Oscillatoria limnetica</i>	<i>Synedra delicatissima</i>
<i>Pandorina morum</i>	<i>Synedra ulna</i>
<i>Pediastrum boryanum</i>	<i>Tabellaria fenestrata</i>
<i>Pediastrum duplex</i>	<i>Tetradesmus wisconsinense</i>
v. <i>clathratum</i>	<i>Tetraedron caudatum</i>
<i>Pediastrum duplex</i>	<i>Tetraedron caudatum</i>
v. <i>reticulatum</i>	v. <i>longispinum</i>
<i>Pediastrum obtusum</i>	<i>Tetraedron lobulatum</i>
<i>Pediastrum tetras</i>	<i>Tetraedron minimum</i>
<i>Pediastrum tetras</i>	<i>Trachelomonas volvocina</i>
v. <i>tetraodon</i>	<i>Ulothrix tenerrima</i>
<i>Peridinium quadrivids</i>	

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: AMERICAN FALLS RES.
STORET NUMBER: 1601

NYGAARD TROPHIC STATE INDICES

DATE 05 15 75 08 05 75 09 18 75

MYXOPHYCEAN	01/0 E	03/0 E	1.00 E
CHLOROPHYCEAN	01/0 E	01/0 E	4.00 E
EUGLENOPHYTE	0.50 E	0/04 ?	0.20 ?
DIATOM	0.20 ?	0.14 ?	0.37 E
COMPOUND	06/0 E	06/0 E	9.00 E

PALMER'S ORGANIC POLLUTION INDICES

DATE 05 15 75 08 05 75 09 18 75

GENUS	06	04	04
SPECIES	01	00	02

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE 05 15 75 08 05 75 09 18 75

AVERAGE DIVERSITY	H	2.55	1.70	2.25
NUMBER OF TAXA	S	26.00	24.00	22.00
NUMBER OF SAMPLES COMPOSITED	M	5.00	5.00	5.00
MAXIMUM DIVERSITY	MAXH	4.70	4.58	4.46
MINIMUM DIVERSITY	MINH	0.04	0.05	0.15
TOTAL DIVERSITY	D	26849.95	10499.75	3800.25
TOTAL NUMBER OF INDIVIDUALS/ML	N	10529.00	6176.00	1699.00
EVENNESS COMPONENT	J	0.54	0.37	0.50
RELATIVE EVENNESS	RJ	0.54	0.37	0.49
MEAN NUMBER OF INDIVIDUALS/TAXA	L	404.96	257.33	76.77
NUMBER/ML OF MOST ABUNDANT TAXON	K	4856.00	3684.00	745.00

LAKE NAME: AMERICAN FALLS RES.
STORET NUMBER: 1801

CONTINUED

TAXA	FURN	05 15 75			08 05 75			09 18 75		
		18	%C	ALGAL UNITS PER ML	18	%C	ALGAL UNITS PER ML	18	%C	ALGAL UNITS PER ML
ACTINAESTRUM HANTZSCHII	CEL	1	1		1	1		1	1	X
V. FLUVIATILE	FIL	1					X			
ANAPHAENA	CEL	1	1.0	102	1159.7	3684	1144.1	745		
ANKISTRODESmus	CEL	1	20.4	2147	1.7	104				
APHANIZOMENON FLOS-AQUAE	FIL	1								
ASTERIONELLA FORMOSA	CEL	12	20.4	2147	1.7	104				
CERATIUM HIRUNDINELLA	CEL	1								
F. SCOTTICUM	CEL	1								
CHROOMONAS ?	CEL	1	11.7	1227	1.7	104	1520.6	348		
CLOSTERIUM	CEL	1								
COCCONEIS	CEL	1				X				
COPLASTRUM	CEL	1				X				
CRYPTOMONAS	CEL	1	2.9	307						
CRYPTOMONAS MARSHONII	CEL	11	46.1	4856			2114.7	248		
CYCLOTELLA	CEL	1								
CYCLOTELLA MENEGHINIANA	CEL	1								
CYMATOPLEURA	CEL	1	1.0	102						
CYMBELLA #1	CEL	1								
CYMBELLA #2	CEL	1				X				
CYMBELLA #3	CEL	1				X				
CYMBELLA spp.	CEL	1	1.4	153	1.5	156				
DACTYLOCOPCSIS	CEL	1				X				
DIATOMA ELONGATUM	CEL	1	1.0	102						
DIATOMA VULGARE	CEL	13	4.4	460		X				
DINOBRYON SERTULARIA	CEL	1								
EUCLENA	CEL	1								
FRAGILARIA #1	CEL	1			X					
FRAGILARIA #2	CEL	1			X					
FRAGILARIA BREVISTRIATA	CEL	1								
FRAGILARIA CRUTUMENRIS	CEL	1			2124.4	1505	31.8	149		
FRAGILARIA LEPTOSTAURON	CEL	1				X				
FRAGILARIA spp.	CEL	1	0.5	51						
GLENODINIUM LONNICKI	CEL	1								
GOMPHONEMA	CEL	1			X					
GOMPHONEMA PARVULUM	CEL	1				X				
GYMMODINIUM ALRULUM	CEL	1	1.0	102						
HELOSIRA	CEL	1								
HELOSIRA GRANULATA	CEL	1			13.6.7	415				
HELOSIRA VARIANS	CEL	1			X					
MICROCYSTIS INCERTA	COL	1			X					
NAVICULA	CEL	1			X					
NAVICULA #1	CEL	1					X			
NAVICULA #2	CEL	1					X			
NAVICULA #3	CEL	1				X				
NAVICULA spp.	CEL	1			141.3.4	208				
NITZSCHIA	CEL	1			X					
NITZSCHIA ACICULARIS	CEL	1	2.9	307						
NITZSCHIA TRYBLIONELLA	CEL	1								
V. LEVIDENSIS	CEL	1			X					
NITZSCHIA VERMICULATRA	CEL	15	1.5	153						
OOCYSTIS	COL	1						3.0	50	
PEDIASTRUM DUPLEX	COL	1								
V. CLATHRATUM	COL	1								
PINNULARIA NESOLEFTA	CEL	1								
RHOICOEPhENIA	CEL	1					X			
SCENEDESMUS QUADRICAUDA	COL	1								
STEPHANODIACUS	CEL	1	1.9	204			X			
SURIRELIA	CEL	14	2.4	256			X			
SYNEDRA ULNA	CEL	1	1	1						
TOTAL				10522		6176		1689		

LAKE NAME: CASCADE LAKE
STORET NUMBER: 1602

NYGAARD TROPHIC STATE INDICES

DATE 06 04 75 08 01 75 09 16 75

MYXOPHYCEAN	0/0	0	1.00	E	1.00	E
CHLOROPHYCEAN	03/0	E	0.75	E	0/03	0
EUGLENOPHYTE	0/03	?	0/07	?	0.33	E
DIATOM	0.29	?	0.67	E	0.67	E
COMPOUND	05/0	E	2.25	E	2.00	E

PALMFR'S ORGANIC POLLUTION INDICES

DATE 06 04 75 08 01 75 09 16 75

GENUS	06		02		01	
SPECIES	00		00		00	

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE 06 04 75 08 01 75 09 16 75

AVERAGE DIVERSITY	H	1.62	2.27	2.07
NUMBER OF TAXA	S	15.00	23.00	18.00
NUMBER OF SAMPLES COMPOSITED	M	5.00	5.00	5.00
MAXIMUM DIVERSITY	MAXH	3.91	4.52	4.17
MINIMUM DIVERSITY	MINH	0.03	0.10	0.12
TOTAL DIVERSITY	D	11764.44	6412.75	3717.72
TOTAL NUMBER OF INDIVIDUALS/ML	N	7262.00	2825.00	1796.00
EVENNESS COMPONENT	J	0.41	0.50	0.50
RELATIVE EVENNESS	RJ	0.41	0.50	0.49
MEAN NUMBER OF INDIVIDUALS/TAXA	L	484.13	122.83	99.78
NUMBER/ML OF MOST ABUNDANT TAXON	K	5069.00	1206.00	979.00

LAKE NAME: CASCADE LAKE
STORET NUMBER: 1602

CONTINUED

TAXA	FORM	06 04 75			08 01 75			09 16 75		
		IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML
ANABAENA	FIL						X			X
ANABAENA FLLOS-AQUAE	FIL						X			
ANKISTRODEGENUS FALCATUS										
V. ACICULARIS	CEL	0.5	38	1229.3	827	154.5				
APHANIZOMENON FLLOS-AQUAE	FIL			13.6	103					
APHANOTHECE	COL			3.6	103					
ASTERIONELLA FORMOSA	CEL	69.8	5069	143.6	103	2.3	41			
CENTRIC DIATOM	CEL	2.1	151							
CERATIUM WIRUNDINELIA	CEL					X				
CHLOROPHYTAN COCCOID CELL	CEL					X				
CHROOMONAS ?	CEL			4.9	138	4.6	82			
COELOSPHAERIUM NAEGLERIUM	COL									X
COSMARIA #1	CEL					X				X
COSMARIA #2	CEL					X				
CRYPTOMONAS	CEL	15	1.6	113				14	9.1	163
CRYPTOMONAS EROSA	CEL				2.4	69	13	11.4		204
CRYPTOMONAS MARSHONII	CEL			15	2.4	69				
CRYPTOMONAS RETIFLEXA	CEL									
DICTYOSPHAERIUM	CEL	1.0	76							
DIMOBRYON DIVERGENS	COL			X						
EUDORINA ELEGANS	CEL	12	12.0	870		X				
EUGLENA	CEL					X				
FRAGILARIA	CEL			X						
FRAGILARIA ?	CEL									X
FRAGILARIA CROTONENSIS	CEL									
MELOBIRA GRANULATA	CEL	1.6	113	142.7	1206	13.6	245			
MELOSIRA GRANULATA	CEL							15	4.6	82
V. ANGUSTISSIMA	CEL									
MELORIRA ITALICA	CEL	31	2.1	151	9.8	276				
MAVICULA	CEL					X				
WITZSCHIA	CFL									
DOCYSTIS	COL	1.0	76							
PEDIASTRUM BORYANUM	COL			X		X				
SPHAEROCYATIS SCHROETERI	COL				1.2	34				
STATOSPORE	CEL									
STAURASTRUM	CEL									
STAURASTRUM #1	CEL									
STAURASTRUM #2	CEL					X				X
STAURONEIS ANCEPS										
F. LINEARIS	CEL			X						
STEPHANODISCUS	CEL						X			
SYNEDRA	CEL			X						
SYNEDRA #1	CEL	141	8.3	605						
TOTAL					7262		2825		1796	

LAKE NAME: COEUR D'ALENE
STURET NUMBER: 1603

NYGAARD TROPHIC STATE INDICES

DATE 04 04 75 07 22 75 09 09 75

MYXOPHYCEAN	0/0	C	03/0	E	3.00	E
CHLOPOPHYCEAN	0/0	O	04/0	E	3.00	E
EUGLENOPHYTE	0/0	?	0/07	?	0/06	?
DIATOM	0.57	E	0.75	E	0.40	E
COMPOUND	04/0	E	10/0	E	8.00	E

PALMER'S ORGANIC POLLUTION INDICES

DATE 04 04 75 07 22 75 09 09 75

GENUS	03		01		00	
SPECIES	00		00		00	

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE 04 04 75 07 22 75 09 09 75

AVERAGE DIVERSITY	H	0.70	2.98	2.18	
NUMBER OF TAXA	S	13.00	17.00	18.00	
NUMBER OF SAMPLES COMPOSITED	M	7.00	8.00	8.00	
MAXIMUM DIVERSITY	MAXH	3.70	4.09	4.17	
MINIMUM DIVERSITY	MINH	0.02	0.13	0.16	
TOTAL DIVERSITY	D	7455.70	4520.66	2725.00	
TOTAL NUMBER OF INDIVIDUALS/ML	N	10651.00	1517.00	1250.00	
EVENNESS COMPONENT	J	0.19	0.73	0.52	
RELATIVE EVENNESS	RJ	0.19	0.72	0.51	
MEAN NUMBER OF INDIVIDUALS/TAXA	L	819.31	89.24	69.44	
NUMBER/ML OF MOST ABUNDANT TAXON	K	9509.00	350.00	471.00	

LAKE NAMOI COEUR D'ALENE
STORET NUMBER 1603

CONTINUED

TAXA	FORM	04 04 75			07 22 75			09 09 75		
		18	%C	ALGAL UNITS PER ML	18	%C	ALGAL UNITS PER ML	18	%C	ALGAL UNITS PER ML
ANABAENA	FIL			1315.41	333					
ANABAENA f1	FIL									X
ANKistrodesmus falcatus										
V. MIRABILIS	CEL			2.61	39					
APHAENOMENON	FIL			1217.91	272					
APHAENOMENON FLUS-AQUAE	FIL									
APHAENOMENON	COL							1.91	24	
APHAENOMENON	CEL	121	5.61	592			X	1.91	24	
ASTERIONELLA FORMOSA	CEL							1.91	24	
CERATIUM HIRUNDINELLUM	CEL							1.91	24	
CHLOROPHYTAN FILAMENT	FIL							1.91	24	
CHROONOMAS ?	CEL			7.71	117					
CRYPTOMONAS	CEL			5.11	78					
CRYPTOMONAS EROSA	CEL	0.41	12	15				9.41	118	
DINOBRYON DIVERGENS	CEL						X			
FRAGILARIA COTONEIFERA	CEL	141	0.81	85	1417.91	272				X
GUMPHINEMA	CEL			42						
GYMNOCLIDIUM	CEL			X						
MELOBIRA DISTANS	CEL	151	0.81	85	112.61	39				
MELOBIRA ITALICA	CEL	11189.31	9509	11123.11	350			3.01	47	
MERIDIUM CIRCULARE	CEL			X						
MUGGEOTIA	CEL							1.91	24	
Oscillatoriaria	FIS				2.61	39				
PEDIASTRUM TETRAS	COL						X			
RHEOBOLINIA	CEL			X	2.61	39				X
SCENEDESMUS	COL									
SCENEDESMUS DIMORPHUS	COL						X			
SCENEDESMUS QUADRIFIDUS	COL				2.61	39				X
SCHROEDERIA SETIGERA	CEL									
Sphaerocystis ACHROETERI	COL									X
STAUROSTIUM	CEL									X
STEPHANOJECUS NIAGARAE	CEL			X						X
STEPHANOJECUS NIAGARAE f	CEL									X
SYNDRA f1	CEL									
SYNDRA f2	CEL			X			X			
SYNEDRA DELICATISSIMA	CEL	131	2.01	296						
SYNEDRA ULNA	CEL							1413.91	47	
TABELLARIA FENESTRATA	CEL			X			X	11137.71	471	
TOTAL				10651		1517		1250		

LAKE NAME: DWORSHAK RES.
STORET NUMBER: 1604

NYGAARD TROPHIC STATE INDICES

	DATE	04 07 75	07 23 75	09 11 75
MYXOPHYCEAN		02/0 E	01/0 E	4.00 E
CHLOROPHYCEAN		01/0 E	03/0 E	2.00 E
EUGLENOPHYTE		0/03 ?	0/04 ?	0/06 ?
DIATOM		0.33 E	1.00 E	0.50 E
COMPOUND		04/0 E	06/0 E	8.00 E

PALMER'S ORGANIC POLLUTION INDICES

	DATE	04 07 75	07 23 75	09 11 75
GENUS		01	02	01
SPECIES		00	03	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

	DATE	04 07 75	07 23 75	09 11 75
AVERAGE DIVERSITY	H	1.06	1.73	2.06
NUMBER OF TAXA	S	10.00	11.00	18.00
NUMBER OF SAMPLES COMPOSITED	M	5.00	5.00	5.00
MAXIMUM DIVERSITY	MAXH	3.32	3.46	4.17
MINIMUM DIVERSITY	MINH	0.08	0.16	0.18
TOTAL DIVERSITY	D	1464.92	1155.64	2282.48
TOTAL NUMBER OF INDIVIDUALS/ML	N	1382.00	668.00	1108.00
EVENNESS COMPONENT	J	0.32	0.50	0.49
RELATIVE EVENNESS	RJ	0.31	0.48	0.48
MEAN NUMBER OF INDIVIDUALS/TAXA	L	138.20	60.73	61.56
NUMBER/ML OF MOST ABUNDANT TAXON	K	1036.00	286.00	579.00

LAKE NAMEI DNRSHAK RES.
STORET NUMBER: 1604

CONTINUED

TAXA	FORM	04 07 75			07 23 75			09 11 75		
		IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML
ANABAENA	FIL						X			X
ANKISTRODESMUS FALCATUR	CEL			14114.2		95				
V. ACICULARIS										
ANKISTRODESMUS FALCATUR	CEL							6.3		.48
V. MIRABILIS	FIL							131 8.7		.96
APHANIZUMENON FLOR-AQUAE	COL									X
APHANOTHECE	CEL						X	141 4.3		.48
ASTERIONELLA FORMOSA	CEL	3113.9	192					151 4.3		.48
CHRUDOMONAS ?	CEL							1152.3		579
COELOSPHAGRIUM KUETZINGIANUM	COL									
CRYPTOMONAS	CEL	2111.1	154							
CRYPTOMONAS EROSA	CEL						X			X
DINOBRYON DIVERGENS	CEL							4.3		.48
EUDORINA ELEGANS	COL			X			X			X
FRAGILARIA CROTONENSIS	CEL									
GLENODINIUM	CEL									X
GYROSIGMA	CEL									
MALLOMONAS ACAROIDES	CEL			2142.0		286				
MELOBIRA DISTANS	CEL	1175.0	1036				X	12121.0		241
MELOBIRA GRANULATA										
V. ANGUSTISSIMA	CEL			31 7.2		48				X
NITZCHIA	CEL			X						
OOCYSTIS	COL			X	1135.8	239				
OSCILLATORIA #1	FIL			X						
OSCILLATORIA #2	FIL			X						
PENNATE DIATOM	CEL									X
SCHEDEDESMUS BIJUGA	COL						X			X
SPHAEROCYSTIS SCHROETERI	COL									
STAURASTRUM	CEL									X
SYNEDRA	CEL						X			
TARELLARIA FENESTRATA	CEL	1	1	X	1	1				
TOTAL					1382		668		1108	

LAKE NAME: HAUSER LAKE
STORET NUMBER: 1605

NYGAARD TROPHIC STATE INDICES

DATE	06	03	75	07	23	75	09	10	75	10	23	75
MYXOPHYCEAN	01/0	E		3.00	E		06/0	E		08/0	E	
CHLOROPHYCEAN	02/0	E		3.00	E		02/0	E		01/0	E	
EUGLENOPHYTE	0/03	?		0/06	?		0.12	?		0/09	?	
DIATOM	0.25	?		0.50	E		1.00	E		0.33	E	
COMPOUND	04/0	E		7.00	F		12/0	E		10/0	E	

PALMER'S ORGANIC POLLUTION INDICES

DATE	06	03	75	07	23	75	09	10	75	10	23	75
GENUS		05			00			11			01	
SPECIES		03			00			00			00	

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE	06	03	75	07	23	75	09	10	75	10	23	75
AVERAGE DIVERSITY	H		2.12		2.62		2.55		2.62			
NUMBER OF TAXA	S		14.00		14.00		22.00		19.00			
NUMBER OF SAMPLES COMPOSITED	M		2.00		2.00		2.00		2.00			
MAXIMUM DIVERSITY	MAXH		3.81		3.81		4.46		4.25			
MINIMUM DIVERSITY	MINH		0.19		0.18		0.07		0.23			
TOTAL DIVERSITY	D	1621.80		2040.98		10860.45		2274.16				
TOTAL NUMBER OF INDIVIDUALS/ML	N	765.00		779.00		4259.00		868.00				
EVENNESS COMPONENT	J	0.56		0.69		0.57		0.62				
RELATIVE EVENNESS	RJ	0.54		0.68		0.57		0.60				
MEAN NUMBER OF INDIVIDUALS/TAXA	L	54.64		55.64		193.59		45.68				
NUMBER/ML OF MOST ABUNDANT TAXON	K	306.00		260.00		2225.00		186.00				

TAXA	FORM	06 03 75			07 23 75			09 10 75			10 23 75		
		IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML
ANABAENA #1	FIL						4.7	37					X
ANABAENA #2	FIL												X
ANKISTRODESMUS FALCATUS	CEL	120,0	153	4.7	37								
V. ACICULARIS	CEL			X									
ANKISTRODESMUS FALCATUS	CEL						4.7	37					
V. MIRABILIS	CEL												
APHANIZOMENON FL08-AQUAE	CEL						4.7	37					
APHANOCAPSA DELICATISSIMA	COL								52.2	2225			
APHANOCAPSA	COL								2.2	95			
APHANOCAPSA	COL												
ASTERIONELLA FORMOSA	CEL			X	12	9.5	74						X
CELL	CEL	120,0	92										
CERATIUM HIRUNDINELLA	CEL								X				
CHLAMYDOMONAS	CEL												
CHLOROCOCALEAN COLONY #9	COL								X				
CHLOROPHYTAN COLONY	COL												
CHROOMONAS ?	CEL			X									
COELOSPHAERIUM NAEGETIANUM	CEL				15	33.4	260		3.3	142		13	21.4
CRYPTOMONAS	COL												X
CRYPTOMONAS ERORA	CEL	120,0	153										
CRYPTOMONAS REFLEXA ?	CEL	140,0	306	4.7	37								
DINOBYRON DIVERGENS	CEL			X									
EUGLENA	CEL												
FLAGELLATE	CEL												
FLAGELLATE #1	CEL												
FRAGILARIA CROTONENSIS	CEL												
LYNGBYA	FIL			X									
MALLOMONAS	CEL												
MALLOMONAS ACAROIDES	CEL			X									
MELODIPPA GRAMMATICA	CEL			X									
V. ANGUSTISSIMA	CEL												
MELOSIRA ITALICA	CEL			X									
MICROCYSTIS AERUGINOSA	COL								X				
NAVICULA AURORA	CEL												
NITZSCHIA	CEL	120,0	61										
OOCYSTIS	CEL												
OSCILLATORIA	FIL												
OSCILLATORIA ?	FIL												
OSCILLATORIA #1	FIL												
OSCILLATORIA #2	FIL												
PENNATE DIATOM	FIL												
PHORMIDIUM FRIGIDUM ?	CEL												
SCHROEDERIA SETIGERA	FIL												
Sphaerocystis SCHROFFERI	CEL												
STAURASTRUM	COL												
STEPHANODISCUS	CEL												
SYNEDRA CYCLOPUM ?	CEL			X									
TAHELIARIA FENESTRATA	CEL			X	11	23.9	186		4.4	189			X
TOTAL					765		779		4289		86		

LAKE NAME: HAYDEN LAKE
STORET NUMBER: 1606

NYGAARD TROPHIC STATE INDICES

	DATE	04	04	75	07	23	75	09	10	75
MYXOPHYCEAN		0/0	0		02/0	E		4.00	E	
CHLOROPHYCEAN		02/0	E		02/0	E		1.00	E	
EUGLENOPHYTE		0/02	?		0/04	?		0/05	?	
DIATOM		0.11	?		0.33	E		0.25	?	
COMPOUND		04/0	E		05/0	E		6.00	E	

PALMER'S ORGANIC POLLUTION INDICES

	DATE	04	04	75	07	23	75	09	10	75
GENUS			04			01		00		
SPECIES			03			00		00		

SPECIES DIVERSITY AND ABUNDANCE INDICES

	DATE	04	04	75	07	23	75	09	10	75
AVERAGE DIVERSITY	H	2.28		1.44		1.31				
NUMBER OF TAXA	S	25.00		10.00		16.00				
NUMBER OF SAMPLES COMPOSITED	M	3.00		3.00		3.00				
MAXIMUM DIVERSITY MAXH		4.64		3.32		4.00				
MINIMUM DIVERSITY MINH		0.24		0.16		0.98				
TOTAL DIVERSITY	D	2644.80		871.20		167.68				
TOTAL NUMBER OF INDIVIDUALS/ML	N	1160.00		605.00		128.00				
EVENNESS COMPONENT	J	0.49		0.43		0.33				
RELATIVE EVENNESS	RJ	0.47		0.41		0.11				
MEAN NUMBER OF INDIVIDUALS/TAXA	L	45.40		60.50		8.00				
NUMBER/ML OF MOST ABUNDANT TAXON	K	510.00		333.00		80.00				

LAKE NAME: HAYDEN LAKE
STORET NUMBER: 1606

CONTINUED

TAXA	FORM	04 04 75			07 23 75			09 10 75		
		IS	SC	ALGAL UNITS PER ML	IS	SC	ALGAL UNITS PER ML	IS	SC	ALGAL UNITS PER ML
AMPHORA	CEL			X						
ANABAENA	FIL				13	5.0	30			
ANABAENA #1	FIL						X			
ANKISTRODESmus FALCATUS	CEL	9.7	113	14	5.0	30				
ANKISTRODESmus FALCATUS V. ACICULARIS	CEL			X						
APHANIZOMENON FLOS-AQUAE	FIL									
APHANTHECE	COL									X
ASTERIONELLA FORMOSA	CEL	4114.7	170				X	3112.5		16
CAMPYLODISCUS	CEL	2.4	20							X
CHLOROPHYLL COCCOID CELLED COLONY	COL									X
CHROOCOCCUS	COL									X
CHROOMONAS ?	CEL							2125.0		32
COCCOID CELLED COLONY	COL			X						X
COCCONEIS PLACENTULA	CPL									X
COELOSPHAERIUM NAEGLIANIUM	COL									X
CRUCIGENIA RECTANGULARIS	COL									X
CRYPTOMONAS	CEL			X			X			X
CRYPTOMONAS ERosa	CEL									X
CYCLOTELLA COMTA ?	CEL	319.7	113	1135.0		212				
DIATOMA VULGARE	CEL			X						
DINOBRYON DIVERGENS	CEL	2144.0	510	2155.0		333				X
DIPLOMEIS OBLONGELLA	CEL			X						
EPITHENIA TURGIDA	CEL									
EUNOTIA INCISA	CEL			X						
FRAGILARIA	CEL			X						
FRAGILARIA CRUTONENSIS	CEL						X			X
GOMPHONEMA ACUMINATUM	CEL			X						
HELOSIRA ITALICA	CEL	1117.1	198							
MAVICULA RADIOSA	CEL			X						
NEIDIUM	CEL									X
NEIDIUM HITCHCOCKII	CEL			X						
NITZSCHIA	CEL									
OOCYATIS	CEL			X						
PINNULARIA	CEL						X			
RHOPALODIA GIBBA	CEL			X						
SPONDYLIUM ?	CEL			X						X
STETHANODISCUS ASTREA	CEL									
V. MINUTHA	CEL							1162.5		80
SURIRELLA	CEL			X						
SYKEDRA	CEL			X						
TABELLARIA FENESTRATA	CEL	1912.4	20							X
TOTAL					1160		605		120	

LAKE NAME: ISLAND PARK RES.
STORET NUMBER: 1607

NYGAARD TROPHIC STATE INDICES

	DATE	07	30	75	09	03	75	10	20	75
MYXOPHYCEAN		03/0	E		5.00	E		01/0	E	
CHLOROPHYCEAN		0/0	O		3.00	E		0/0	O	
EUGLENOPHYTE		0/03	?		0/08	?		0/01	?	
DIATOM		0/05	?		0.07	?		0.67	E	
COMPOUND		03/0	E		9.00	E		03/0	E	

PALMER'S ORGANIC POLLUTION INDICES

	DATE	07	30	75	09	03	75	10	20	75
GENUS				01			00		01	
SPECIES				00			00		00	

SPECIES DIVERSITY AND ABUNDANCE INDICES

	DATE	07	30	75	09	03	75	10	20	75
AVERAGE DIVERSITY	H		2.26		0.18		2.01			
NUMBER OF TAXA	S		11.00		29.00		9.00			
NUMBER OF SAMPLES COMPOSITED	M		3.00		3.00		3.00			
MAXIMUM DIVERSITY	MAXH		3.46		4.86		3.17			
MINIMUM DIVERSITY	MINH		0.12		0.11		0.06			
TOTAL DIVERSITY	D	2147.00		599.40		3250.17				
TOTAL NUMBER OF INDIVIDUALS/ML	N	950.00		3330.00		1617.00				
EVENNESS COMPONENT	J	0.65		0.04		0.63				
RELATIVE EVENNESS	RJ	0.65		0.02		0.63				
MEAN NUMBER OF INDIVIDUALS/TAXA	L	86.36		114.83		179.67				
NUMBER/ML OF MOST ABUNDANT TAXON	K	454.00		3254.00		596.00				

TAXA	FORM	07 10 75			09 03 75			10 20 75		
		IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML
ACHMANTHES	FIL									
AMPHORA	CEL						X			
ANABAENA	COL									
APHAENIZOMENOS FLOR-AQUAE	FIL	11147.81	454	1197.71	3254	1134.21	553			
ASTERIONELLA FORMOSA	CEL				X				X	
CERATIUM HIRUNDINELLA	CEL				X					
CHROONOMAS ?	CEL	12117.41	168	1211.11	38	1210.51	170			
CHRYSDOPHYTA FLAGELLATE	CEL		4.31	41						
COCCONEAIA	CEL			X		X				
COELOSPHAERIUM PALLIDUM	COL									
CRYPTOMONAS	CEL	1410.71	83			X				
CRYPTOMONAS MARSHONII	CEL									
CYANOPHYTA FILAMENT	FIL	1510.71	83				1315.31	88		
CYMATOPLEURA ELLIPTICA	CEL									
EPITHEMIA TURGIDA	CEL				X					
EUDORINA ELEGANS	COL					X				
FRAGILARIA	CEL			X		X				
FRAGILARIA #1	CEL									
FRAGILARIA CRUTONENSIS	CEL						X	1236.91	596	
GOMPHOHEMA	CEL					X				
GOMPHOHEMA OLIVACEUM	CEL			X						
GYROBIFIGA	CEL									
MELOSIRA GRANULATA	CEL				121.11	38	1513.21	213		
MELOSIRA GRANULATA										X
V. ANGUSTISSIMA	CEL									
MICROCYSTIS AERUGINOSA	COL	1310.71	83			X				
MICROCYSTIS INCERTA	COL					X				
MOOUKUTIA	FIL									
NAVICULA	CEL					X				
NAVICULA #1	CEL									
NAVICULA #2	CEL									
NAVICULA CUSPIDATA	CEL									
PEDIASTRUM BORYANUM	COL									
PINNULARIA	CEL			X						
SCHROEDERIA SETIGERA	CEL									
SPHAENOCYSTIS SCHROETERI	COL									
STAURASTRUM	CEL									
STAURONEIS	CEL									
SURIRALLA	CEL									
ULOTHRIX	FIL									X
TOTAL				950		3330		1617		

LAKE NAME: LAKE LOWELL
STORET NUMBER: 1608

NYGAARD TROPHIC STATE INDICES

DATE 08 01 75 09 16 75

MYXOPHYCEAN	1.50 E	0.33 ?
CHLOROPHYCEAN	6.00 E	2.67 E
EUGLENOPHYTE	0/15 ?	0/09 ?
DIATOM	0.60 E	0.60 E
COMPOUND	9.00 E	4.00 E

PALMER'S ORGANIC POLLUTION INDICES

DATE 08 01 75 09 16 75

GENUS	01	03
SPECIES	00	03

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE 08 01 75 09 16 75

AVERAGE DIVERSITY	H	1.29	0.85
NUMBER OF TAXA	S	30.00	21.00
NUMBER OF SAMPLES COMPOSITED	M	3.00	3.00
MAXIMUM DIVERSITY	MAXH	4.91	4.39
MINIMUM DIVERSITY	MINH	0.06	0.05
TOTAL DIVERSITY	D	9294.45	4992.05
TOTAL NUMBER OF INDIVIDUALS/ML	N	7205.00	5873.00
EVENNESS COMPONENT	J	0.26	0.19
RELATIVE EVENNESS	RJ	0.26	0.19
MEAN NUMBER OF INDIVIDUALS/TAXA	L	240.17	279.67
NUMBER/ML OF MOST ABUNDANT TAXON	K	5622.00	5126.00

LAKE NAME: LAKE LOWELL
STORET NUMBER: 1608

CONTINUED

TAXA	FORM	08 01 78			09 16 78		
		IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML
ACHMANTHES LANCEOLATA	CEL			X			
ANKISTRODESmus FALCATUS	CEL						
V. ACICULARIS	FIL	78.0	5622	21 4.8	2,7	160	267
APHANIZOMENON FLUS-AQUAE	CEL			X			
ASTERIONELLA FORMOSA	CEL						
CERATIUM HIRUNDINELLA	CEL			X			
CHLAMYDOMONAS	CEL	0.21	14				
CHROOONMAS ?	CEL	1.21	84				
CLOSTERIUM	CEL						
COELASTRUM MICROPORUM	COL			X			
COELASTRUM RETICULATUM	COL	0.21	14				
COSMARIUM	CEL				4	1.8	107
CRUCIGENIA APICULATA	COL			X			
CRYPTOMONAS EROSA	CEL	0.91	62		0.91	83	
CYCLOTELLA MENEGHINIANA	CEL	0.31	22				
CYMSELLA	CEL						
DICTYOSPHAERIUM PULCHELLUM	COL	0.21	14				
ELAKATOTHRIX	CEL	0.31	22				
FRAGILARIA	CEL			X			
FRAGILARIA CROTONENSIS	CEL	2.9	208				
KIRchnerIELLA LUNARIS	COL			X			
MALLomonas	CEL			X			
MELOSIRA GRANULATA	CEL				107.3	5126	
MELOSIRA ITALICA	CEL	12.0	961				
MELOSIRA VARIANS	CEL						
MERISNOEDIA MINIMA	COL			X			
MICROCYSTIS INCERTA	COL	0.21	14				
NAVICULA	CEL						
NITZSCHIA #1	CEL						
NITZSCHIA #2	CEL						
OOCYSTIS	COL	0.7	54	5	1.8	107	
PEDIASTRUM BORYANUM	COL			X			
PEDIASTRUM DUPLEX	COL						
V. RETICULATUM	COL			X			
SCHEDESMUS ABUNDANS	COL	0.21	14				
SCHEDESMUS QUADRICAUDA	COL						
SCHROEDERIA SETIGERA	CEL	1.11	76				
Sphaerocystis SCHROTERI	COL			X			
STAURASTRUM #1	CEL			X			
STAURASTRUM #2	CEL			X			
STEPHANODISCUS	CEL				13	0.9	83
STEPHANODISCUS NIAGARE	CEL	1.7	124				
SYNEDRA	CEL			X			
TOTAL				7205		5873	

LAKE NAME: MAGIC RES.
STORET NUMBER: 1600

NYGAARD TROPHIC STATE INDICES

	DATE	05	15	75	08	05	75	09	17	75
MYXOPHYCEAN		02/0	E		1.50	E		02/0	E	
CHLOROPHYCEAN		0/0	O		0/02	O		0/0	O	
EUGLENOPHYTE		0/02	?		0/03	?		0/02	?	
DIATOM		02/0	E		0.25	?		2.00	E	
COMPOUND		04/0	E		2.50	E		04/0	E	

PALMER'S ORGANIC POLLUTION INDICES

	DATE	05	15	75	08	05	75	09	17	75
GFMU8			00			00			01	
SPECIES			00			00			00	

SPECIES DIVERSITY AND ABUNDANCE INDICES

	DATE	05	15	75	08	05	75	09	17	75
AVERAGE DIVERSITY	H		0.62		2.60		0.87			
NUMBER OF TAXA	S		8.00		18.00		8.00			
NUMBER OF SAMPLES COMPOSITED	M		3.00		3.00		3.00			
MAXIMUM DIVERSITY MAXH			3.00		4.17		3.00			
MINIMUM DIVERSITY MINH			0.02		0.40		0.02			
TOTAL DIVERSITY	D	2934.46		1125.80		3367.77				
TOTAL NUMBER OF INDIVIDUALS/ML	N	4733.00		433.00		3871.00				
EVENNESS COMPONENT	J	0.21		0.62		0.29				
RELATIVE EVENNESS	RJ	0.21		0.59		0.29				
MEAN NUMBER OF INDIVIDUALS/TAXA	L	591.63		24.06		483.88				
NUMBER/ML OF MOST ABUNDANT TAXON	K	4099.00		132.00		3297.00				

LAKE NAMAK MAGIC RES.
STORET NUMBER 1609

CONTINUED

TAXA	FORM	05 15 75			09 05 75			09 17 75		
		IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML
ANABAENA #1	FIL			X	1	1	1			
ANABAENA #2	FIL				14	8.8	38			X
APHAENOMENON FLOS-AQUAE	FIL			X	15	6.4	19	1185.2	3297	
ASTERIONELLA FORMOSA	CEL			12	12.9	56				
CERATIUM HIRUNDINELLA	CEL						X	12	8.9	230
CHROOMonas ?	CEL	112.5	592	10.5	132	51	4.0	153		
COELOSPHAGIUM NAKEGIAMIUM	COL					X				
COSMARIA	CEL					X				
CRYPTOMONAS EROSA	CEL	1	0.9	44	17.3	75	14	1.0	38	
CYNTHELLA MUELLERI	CEL					X				
DIATOMA VULGARE	CEL					X				
FRAGILARIA	CEL					X				
FRAGILARIA CROTUNENSIS	CEL				117.3	75				X
GYMNOIDIUM	CEL			X						
HANTZSCHIA AMPHIOKYS	CEL					X				
MELOSIRA GRANULATA	CEL				31	8.0	38	31	4.0	153
MITZSCHIA VERMICULARIS	CEL					X				
PANDORINA MORUM	COL			X						
STAURASTRUM	CEL					X				
STEPHANODISCUS #1	CEL	186.6	6099							
STEPHANODISCUS NIAGARAE	CEL	1	1	X	1	1	X	1	1	X
SYNEDRA	CEL	1	1	1	1	1	X	1	1	
TOTAL				4733		433		3871		

LAKE NAME: PALISADES RES.
STORET NUMBER: 1610

NYGAARD TROPHIC STATE INDICES

	DATE	08	05	75	09	18	75	10	20	75
MYXOPHYCERAN		0/0	0		02/0	E		01/0	E	
CHLOROPHYCEAN		0/0	0		01/0	E		0/0	0	
EUGLENOPHYTE		0/0	?		0/03	?		0/01	?	
DIATOM		0,14	?		0,33	E		0,75	E	
COMPOUND		01/0	E		06/0	E		04/0	E	

PALMER'S ORGANIC POLLUTION INDICES

	DATE	08	05	75	09	18	75	10	20	75
GENUS		00			00			01		
SPECIES		00			00			00		

SPECIES DIVERSITY AND ABUNDANCE INDICES

	DATE	08	05	75	09	18	75	10	20	75
AVERAGE DIVERSITY	H	2,32			1,36			2,53		
NUMBER OF TAXA	S	12,00			24,00			12,00		
NUMBER OF SAMPLES COMPOSITED	M	5,00			5,00			5,00		
MAXIMUM DIVERSITY	MAXH	3,58			4,58			3,58		
MINIMUM DIVERSITY	MINH	0,14			0,55			0,07		
TOTAL DIVERSITY	D	2018,40			579,36			5108,07		
TOTAL NUMBER OF INDIVIDUALS/ML	N	870,00			426,00			2019,00		
EVENNESS COMPONENT	J	0,65			0,30			0,71		
RELATIVE EVENNESS	RJ	0,64			0,21			0,71		
MEAN NUMBER OF INDIVIDUALS/TAXA	L	72,50			17,75			168,25		
NUMBER/ML OF MOST ABUNDANT TAXON	K	339,00			237,00			638,00		

TAXA	FORM	06 05 75			09 10 75			10 20 75		
		IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML
ANABAENA	FIL	1	1	1	1	1	X	1	1	
APHANIZOMENON FLOS-AQUAE	FIL									
ASTERIONELLA FORMOSA	CEL	13	27.0	242	21	11.0	237	11	31.6	630
CERATIUM	CEL						47	14	2.6	53
CERATIUM HIRUNDINELLA F. ROBUSTUM ?	CEL									X
CERATIUM HIRUNDINELLA F. SCOTTICUM	CEL	11	5.5	48						
CHLAMYDOMONAS	CEL	15	5.5	48			X			
CHROOMONAS ?	CEL	21	39.0	339	31	33.3	142	15	23.7	478
COCCOCEIS	CEL						X			
CRYPTOMONAS	CEL	14	11.1	97						
CRYPTOMONAS ERUDA	CEL						X	12	10.6	372
CRYPTOMONAS MARSHONIT	CEL								5.3	106
CYCLOIOELLA	CEL						X			
CYMBELLA	CEL									
DIATOMA VULGARE	CEL			X			X			
EPITHENIA	CEL						X			
EUDORINA ELEGANS	COL						X			
FRAGILARIA #2	CEL						X			
FRAGILARIA CROTONENSIS	CEL			X			X			X
FRAGILARIA INTERMEDIA	CEL			X			X			
FRAGILARIA VIRESCENS	CEL						X			
GOMPHONEMA OLIVACEUM	CEL									
MELOBIRIA GRANULATA	CEL	1	5.5	48			X	13	5.3	106
MELOBIRIA GRANULATA V. ANGUSTISSIMA	CEL			X					10.5	213
MOUGEOETIA	FIL						X			
NITZSCHIA	CEL						X			
NITZSCHIA ACICULARIS	CEL	1	5.5	48						X
OOCYSTIS	CEL						X			
PERIDINIUM #1	CEL						X			
PERIDINIUM #2	CEL						X			
SPIROGYRA	COL						X			
STEPHANODISCUS	CEL						X		2.6	53
TABELLARIA FENESTRATA	CEL						X			
ULOTHRIX TEHERRIHA	COL						X			
TOTAL					870		426		2019	

LAKE NAME: LOWER PAYETTE
STORET NUMBER: 1611

NYGAARD TROPHIC STATE INDICES

DATE	06 04 75	08 01 75	09 16 75
MYXOPHYCEAN	0/0 0	0/01 0	0/01 0
CHLOROPHYCEAN	0/0 0	1.00 E	1.00 E
EUGLENOPHYTE	0/0 ?	0/01 ?	0/01 ?
DIATOM	0.33 E	0.33 E	0.50 E
COMPOUND	01/0 E	2.00 E	2.00 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	06 04 75	08 01 75	09 16 75
GENUS	03	03	01
SPECIES	00	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE	06 04 75	08 01 75	09 16 75
AVERAGE DIVERSITY	H 1.62	2.15	1.60
NUMBER OF TAXA	S 8.00	9.00	6.00
NUMBER OF SAMPLES COMPOSITED	M 3.00	3.00	3.00
MAXIMUM DIVERSITY	MAXH 3.00	3.17	2.58
MINIMUM DIVERSITY	MINH 0.03	0.03	0.05
TOTAL DIVERSITY	D 4228.20	8412.95	2084.80
TOTAL NUMBER OF INDIVIDUALS/ML	N 2610.00	3913.00	1303.00
EVENNESS COMPONENT	J 0.54	0.68	0.62
RELATIVE EVENNESS	RJ 0.54	0.68	0.62
MEAN NUMBER OF INDIVIDUALS/TAXA	L 326.25	434.78	217.17
NUMBER/ML OF MOST ABUNDANT TAXON	K 1170.00	1505.00	629.00

LAKE NAME: LOWER PAYETTE
STOREY NUMBER: 1611

CONTINUED

TAXA	FORM	06 04 75			08 01 75			09 16 75		
		IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML
ARTHRODESmus	CEL	1	1	1	1	1	1	1	1	X
ASTERIONELLA FORMOSA	CEL	1	1	44.8	1170	1	1	38.9	1505	1
CHROOMONAS ?	CEL	1	1	3.4	90	1	1	9.0	351	1
CRUCIGENIA TETRAPODA	COL	1	1	1	1	1	1	1	1	X
CRYPTOMONAS	CEL	1	1	1.7	45	1	1	1	45	1
DINOBRYON CYLINDRICUM	CEL	1	1	1	1	1	1	1	1	1
GLENODINIUM GYMNOCLIDIUM	CEL	1	1	1	X	1	1	1	1	1
GYMNOCLIDIUM ALBULUM	CEL	1	1	1	1	1	1	1	1	1
MELOBIRIA DISTANS	CEL	1	1	41.6	1080	1	1	32.0	1254	1
PERIDINIUM QUADRIPEDIS	CRL	1	1	1	1	1	1	1	1	1
SYNEDRA	CEL	1	1	8.6	225	1	1	3.9	151	1
TABELLARIA FENESTRATA	CEL	1	1	1	1	1	1	1	1	1
TETRAEDRON MINIMUM	CEL	1	1	1	1	1	1	X	1	1
TOTAL				2610			3913		1303	

LAKE NAME: LOWER TWIN LAKES
STORET NUMBER: 1612

NYGAARD TROPHIC STATE INDICES

DATE	06	03	75	07	23	75	09	10	75	10	24	75
MYXOPHYCEAN	02/0	F		4.00	E		5.00	E		01/0	E	
CHLOROPHYCEAN	02/0	F		2.00	E		7.00	E		01/0	E	
EUGLENOPHYTE	0/04	?		0/06	?		0/12	?		0/02	?	
DIATOM	0.10	?		0.20	?		0.27	?		0.50	E	
COMPOUND	05/0	E		8.00	E		15.0	E		03/0	E	

PALMER'S ORGANIC POLLUTION INDICES

DATE	06	03	75	07	23	75	09	10	75	10	24	75
GENUS		00			03			01			02	
SPECIES		00			03			00			03	

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE	06	03	75	07	23	75	09	10	75	10	24	75
AVERAGE DIVERSITY	H		1.87		2.12		1.15		1.82			
NUMBER OF TAXA	S		21.00		26.00		35.00		11.00			
NUMBER OF SAMPLES COMPOSITED	M		3.00		2.00		3.00		3.00			
MAXIMUM DIVERSITY	MAXH		4.39		4.70		5.13		3.46			
MINIMUM DIVERSITY	MINH		0.14		0.20		0.12		0.29			
TOTAL DIVERSITY	D	3145.34		3243.60		4330.90		622.44				
TOTAL NUMBER OF INDIVIDUALS/ML	N	1682.00		1530.00		3766.00		342.00				
EVENNESS COMPONENT	J	0.43		0.45		0.22		0.53				
RELATIVE EVENNESS	RJ	0.41		0.43		0.21		0.49				
MEAN NUMBER OF INDIVIDUALS/TAXA	L	80.10		58.85		107.60		31.09				
NUMBER/ML OF MOST ABUNDANT TAXON	K	1027.00		875.00		3081.00		128.00				

TAXA	FORM	06 03 75				07 23 75				09 10 75				10 24 75			
		IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML	
AMPHORA	CEL						1						X				
AMPHORA OVALIS	FIL	14	2.6	47													
V. AFFINIS				X													
ANABENA	CEL																
ANKIATRODESMUS FALCATUS	FIL																
ANKIATRODESMUS FALCATUS	CEL																
V. ACICULARIS				X													
ANKIATRODESMUS FALCATUS	CEL																
V. MIRABILIS				X													
APHANIZOMONION FLOR-AQUAE	CEL																
APHANOTHECE	FIL																
ASTERIONELLA FORMOSA	COL																
CERATIUM HIRUNDINELLA	CEL	12	11.1	187	12	5.7	87										
CHLOROPHYTAN Coccoid Cell	CEL																
CHLOROPHYTAN COLONY	COL																
CHROOCOCCUS LINNETICUS	COL																
CHROOMONAS ?	COL																
COELOSPHAERIUM	COL																
COELOSPHAERIUM KUETZINGIANUM	COL																
COELOSPHAERIUM MAEGElianum	COL																
COSMARIA #1	CEL																
COSMARIA #2	CEL																
CRUCIGENIA QUADRATA	COL																
CRUCIGENIA TETRAPODIA	COL																
CRYPTOMONAS ERosa	CEL																
CRYPTOMONAS HARSSONIT	CEL																
CYCLOTELLA	CEL																
CYMBELLA	CEL																
DINOBYRON BAVARICUM	CEL																
DINOBYRON CYLINDRICUM	CEL	13	11.1	187													
DINOBYRON DIVERGENS	CEL	11	11.1	1027													
DINOBYRON SOCIALE	CEL																
V. AMERICANUM	CEL																
DIPLOWEIB ELLIPTICA	CEL																
EPITHEMIA	CEL																
EUNOTIA	CEL																
EUNOTIA ?	CEL																
FLAGELLATE	CEL	19	0.3	140													
FRAGILARIA	CEL																
FRAGILARIA CROTONENSIS	CEL																
FRUSTRULIA	CEL																
GLENDONIUM OCULATUM	CEL																
GOMPHONEMA ACURINATUM	CEL																
GOMPHONEMA ACUMINATUM	CEL																
V. PUSILLA	CEL																
GOMPHONEMA TRUNCATUM	CEL																
LUMATE CELLED COLONY	COL																
MALLOMUNAS ACANOIDES	CEL																
MELOSIRA	CEL																
MELOSIRA DISTANS	CEL																
MELOSIRA ITALICA	CEL																
MELOSIRA VARIANS	CEL																
MERISHPEDIA TENUIBRIMA	COL																
NAVICULA	CEL																
NAVICULA ?	CEL																
NAVICULA CUSPIDATA ?	CEL																
NITZCHIA	CEL	2	0	47													
OOCYATIS	COL																
OSCILLATORIA LIMNETICA	FIL																
PEDIASTRUM TETRAB	COL																
V. TETRAODON	CEL																
PERIDINIUM WILLEI	CEL																
PINNULARIA	CEL																
RHOPALODIA GIBBA	CEL																
SCENEDESMUS BIJUGA	COL																
SURIRELLA	CEL																
TABELLARIA FENESTRATA	CEL																
TETRAEDRON CAUDATUM	CEL	1	2.0	47													
TOTAL							1682			1530			3766			342	

LAKE NAME: UPPER TWIN LAKES
STORET NUMBER: 1613

NYGAARD TROPHIC STATE INDICES

DATE	06 03 75	07 23 75	09 10 75	10 24 75
MYXOPHYCEAN	01/0 E	04/0 E	1.00 E	0.50 E
CHLOROPHYCEAN	02/0 E	01/0 E	1.00 E	0.50 ?
EUGLENOPHYTE	0/03 ?	0/05 ?	0.06 ?	0/02 ?
DIATOM	0/03 ?	0.14 ?	0.06 ?	1.00 E
COMPOUND	03/0 E	06/0 E	2.33 E	1.50 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	06 03 75	07 23 75	09 10 75	10 24 75
GENUS	02	00	10	04
SPECIES	03	00	05	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE	06 03 75	07 23 75	09 10 75	10 24 75
AVERAGE DIVERSITY	H	2.75	1.96	4.26
NUMBER OF TAXA	S	12.00	18.00	68.00
NUMBER OF SAMPLES COMPOSITED	M	2.00	2.00	2.00
MAXIMUM DIVERSITY MAXH		3.58	4.17	6.09
MINIMUM DIVERSITY MINH		0.08	0.31	0.21
TOTAL DIVERSITY	D	4490.75	1138.76	18795.12
TOTAL NUMBER OF INDIVIDUALS/ML	N	1633.00	581.00	4412.00
EVENNESS COMPONENT	J	0.77	0.47	0.70
RELATIVE EVENNESS	RJ	0.77	0.43	0.69
MEAN NUMBER OF INDIVIDUALS/TAXA	L	136.08	32.28	64.88
NUMBER/ML OF MOST ABUNDANT TAXON	K	450.00	291.00	687.00
				1200.00

LAKE NAME: UPPER TWIN LAKES
STORET NUMBER: 1613

CONTINUED

TAXA	FORM	06 03 75			07 23 75			09 10 75			10 24 75		
		IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML
SURIRELLIA	CEL	1	1	1	1	1	1	1	1	X	1	1	1
SYNEDRA	CEL	1	1	1	1	1	1	1	1	49	1	1	1
TARELLARIA FENESTRATA	CEL	131	3.41	56	1	1	1	1	1	1.11	49	1	1
TETRAEDRUS WIRCONSTITENSE	CEL	1	1	1	1	1	1	1	1	X	1	1	1
TETRAEDRON CAUDATUM	CEL	1	1	1	1	1	1	1	1	X	1	1	1
V. LONGISPINUM	CEL	1	1	1	1	1	1	1	1	1.11	49	1	1
TETRAEDRON LOBULATUM	CEL	1	1	1	1	1	1	1	1	1.11	49	1	1
TRACHELOMONAS VOLVOCINA	CEL	1	1	1	1	1	1	1	1	1.11	49	1	1
TOTAL				1633			581			4412			2736

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

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4. TITLE AND SUBTITLE DISTRIBUTION OF PHYTOPLANKTON IN IDAHO LAKES		5. REPORT DATE December 1979
		6. PERFORMING ORGANIZATION CODE
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16. ABSTRACT This is a data report presenting the species and abundance of phytoplankton in the 13 lakes sampled by the National Eutrophication Survey in the State of Idaho. 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).		
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