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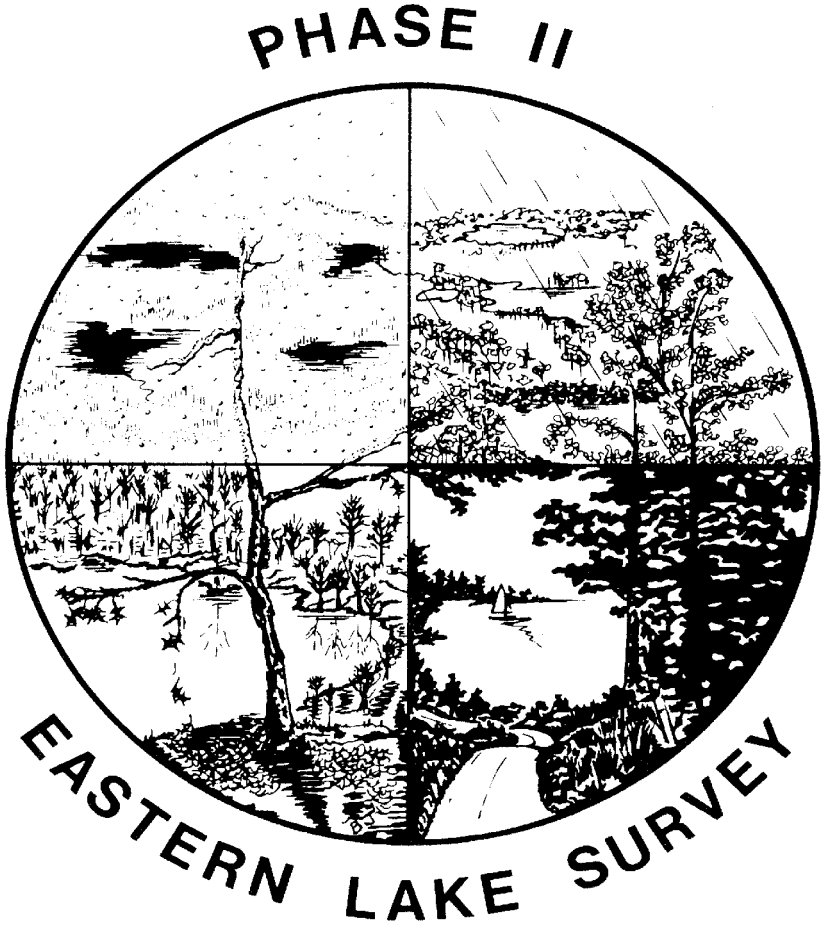
National Surface Water Survey

Eastern Lake Survey Phase II Northeastern Lakes, Database Dictionary



Aquatic Effects Research Program

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NATIONAL SURFACE WATER SURVEY: EASTERN LAKE SURVEY - PHASE II NORTHEASTERN LAKES, DATABASE DICTIONARY

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IMPORTANT NOTICE TO DATABASE USERS

The Eastern Lake Survey - Phase II (ELS-II) seasonal chemistry data sets available for public distribution are DS3B, the reduced version of the validated database, and DS4A, the enhanced (final) database. The enhanced database is the easiest to use for general analysis. It contains one data line for each lakewater sample (replicates have been averaged) and the database has been readied to make population estimates as described in Section 2. The validated database contains all the unreplaced, unaveraged data, including some of the lakewater QA data. Database file names are:

SEASON	FILE NAME	DATA TYPE	n	Number of Variables
Spring 1986	SPSVBM01	Validated	234	188
	SPSFIM01	Enhanced	146	148
Summer 1986	SUSVBM01	Validated	301	257
	SUSFIM01	Enhanced	270	194
Fall 1986	FASVBM01	Validated	265	199
	FASFIM01	Enhanced	239	156

Ancillary data sets from other ELS-II activities are discussed in Appendix A.

Due to problems discovered during the verification and validation of the Phase II data, the data verification phase was repeated for selected analytes measured at both contract laboratories. The reevaluation resulted in a new "modified verified" database. Based on our analyses, we make the following recommendations for data use:

1. Chloride (variable name= CL98/CL11) values measured at one of the analytical laboratories should not be used. The suspect chloride values are present in the validated data set and the associated chloride flag variable (CL11F) has a Ul code. In the enhanced data set (DS4A), these suspect chloride values have been set to "missing" values. Population estimates for chloride should not be made for the summer and spring (all fall values were measured at the other analytical laboratory and are not considered suspect).

2. Field conductivity (variables - Cxxxx1D and CON601D) measurements appear to be unreliable and should be interpreted with caution. These measurements were not validated. There were no problems detected with the laboratory conductivity (CONDl1) values.

3. Total aluminum (ALTL11) data showed very poor agreement between laboratories and precision was highly variable. Discretion is advised in interpreting the total aluminum data. Note, these problems do not relate to total monomeric aluminum (ALD02), organic monomeric aluminum (ALO_02), or inorganic monomeric aluminum (ALDI98).

4. Air-equilibrated dissolved inorganic carbon (DICE11) and air-equilibrated pH (PHEQ11) showed some laboratory bias and poor precision at higher pH. It is strongly recommended that data users use the closed-system dissolved inorganic carbon (DIC02) and pH (PH02) measurements for data analysis.

The ELS-II was designed to estimate characteristics of an explicitly defined target population of lakes in the northeastern United States, not just the sampled lakes. To make inferences about the ELS-II population, it is necessary to weight each sample by the ELS-II weighting factor (variable WT2T99; see Section 5). The ELS-II sample weighting factor Indicates how many lakes in the ELS-II target population are represented by each sample. Details on making ELS-II population estimates are given in the ELS-II final report (Herlihy et al., 1991).

SECTION 1
INTRODUCTION

Database management support for the U.S. Environmental Protection Agency's (EPA) Eastern Lake Survey - Phase II (ELS-II) was provided by Systems Applications, Inc (SAI). The major functions of the database management program were to create, update, distribute, and safeguard the various databases containing the information collected in the three seasonal chemistry surveys (spring, summer, and fall) of lakes in the northeastern United States.

OVERVIEW OF THE ELS-II STUDY

In cooperation with the National Acid Precipitation Assessment Program (NAPAP), the EPA conducted the National Surface Water Survey (NSWS), the purpose of which was to (1) document the chemical and biological status of lakes and streams in regions of the United States potentially sensitive to acidic deposition, and (2) select regionally representative surface waters so that changes in aquatic resources could be quantified through a long-term monitoring program. The NSWS consisted of two phases:

- Phase I - a synoptic survey of lake and stream chemistry.
- Phase II - an evaluation of the chemical variability and biological status of a subset of lakes sampled in Phase I.

The NSWS, conducted between 1984 and 1986, consisted of two major components: the National Lake Survey, including the Eastern Lake Survey (Linthurst et al., 1986) and the Western Lake Survey (Landers et al., 1987), and the National Stream Survey (Kaufmann et al., 1988). The primary emphasis of the NSWS was to develop a regional and national perspective on the current status of surface water chemistry through the conduct of appropriate surveys rather than a process-oriented, cause-and-effect research program.

National Lake Survey - Phase I

The objectives of Phase I of the National Lake Survey were:

- To determine the percentage (by number and area) and location of lakes that are acidic in potentially susceptible regions of the United States.
- To assess the percentage (by number and area) and location of lakes that have low acid neutralizing capacity (ANC) in potentially susceptible regions of the United States.
- To select regionally characteristic lakes for further study in Phase II and for possible future long-term monitoring.

Phase I was specifically designed to provide the above information within definable confidence limits. Thus, a particular strength of Phase I of the lake survey was the quantitative assessment of the chemical characteristics of lakes within a probability sampling frame that allowed regional estimates to be made. An important limitation on these objectives was that issues concerning temporal variability and biological resources could not be addressed. These issues are of particular concern in Phase II of the lake survey.

Eastern Lake Survey - Phase II

The focus of ELS-II was on the northeastern United States (ELS Region 1). ELS-II involved the resampling of a subset of lakes in the northeastern United States sampled in ELS-I to determine chemical variability and biological status (Figure 1-1). Particular attention was given to lakes considered most susceptible to acidification. Chemical variability among lakes was examined by sampling the lakes during the spring, summer, and fall of 1986. Furthermore, within-index period variability was examined in the fall of 1986 to provide insight concerning the ability to detect chemical changes over time, and the precision of the estimates of the number of acidic lakes from Phase I.

The primary objectives of ELS-II were to:

- Assess the sampling error associated with the ELSII fall index sample.
- Estimate the number of lakes with low acid neutralizing capacity (ANC) (i.e, potentially susceptible) that are not acidic in the fall but that are acidic in other seasons.
- Establish seasonal water chemistry characteristics among lakes.

The ELS-II sample lakes were selected from those ELS-I lakes with ANC < 400 μeq/L, depth > 1.5 m, and low nitrogen or phosphorous concentrations, using a systematic random sample (see Herlihy et al., 1991). A total of 147 statistically selected lakes were targeted for field visitation during ELS-II in the spring, summer, and fall of 1986. In addition to these seasonal surveys, a variability study was conducted during the fall seasonal survey. The Fall Variability Study was designed to sample a subset of 50 of the ELS-II lakes at three different times at independently selected locations believed to be the deepest point in a lake during the fall index period.

In situ measurements of pH, conductivity, temperature, and dissolved oxygen were made at 1.5 m below the surface and 1.5 m above the bottom in all lakes. If the lake was stratified (temperature difference > 4^0C), depth profiles of the in situ measurements were made. Water samples for laboratory analyses were collected from the epilimnion at 1.5 m below the surface in lakes more than 3 m deep. In lakes less than 3 m deep, epilimnetic samples were collected at 0.5 m below the surface. ELS-Il field operations are discussed in detail by Merritt and Sheppe (1988).

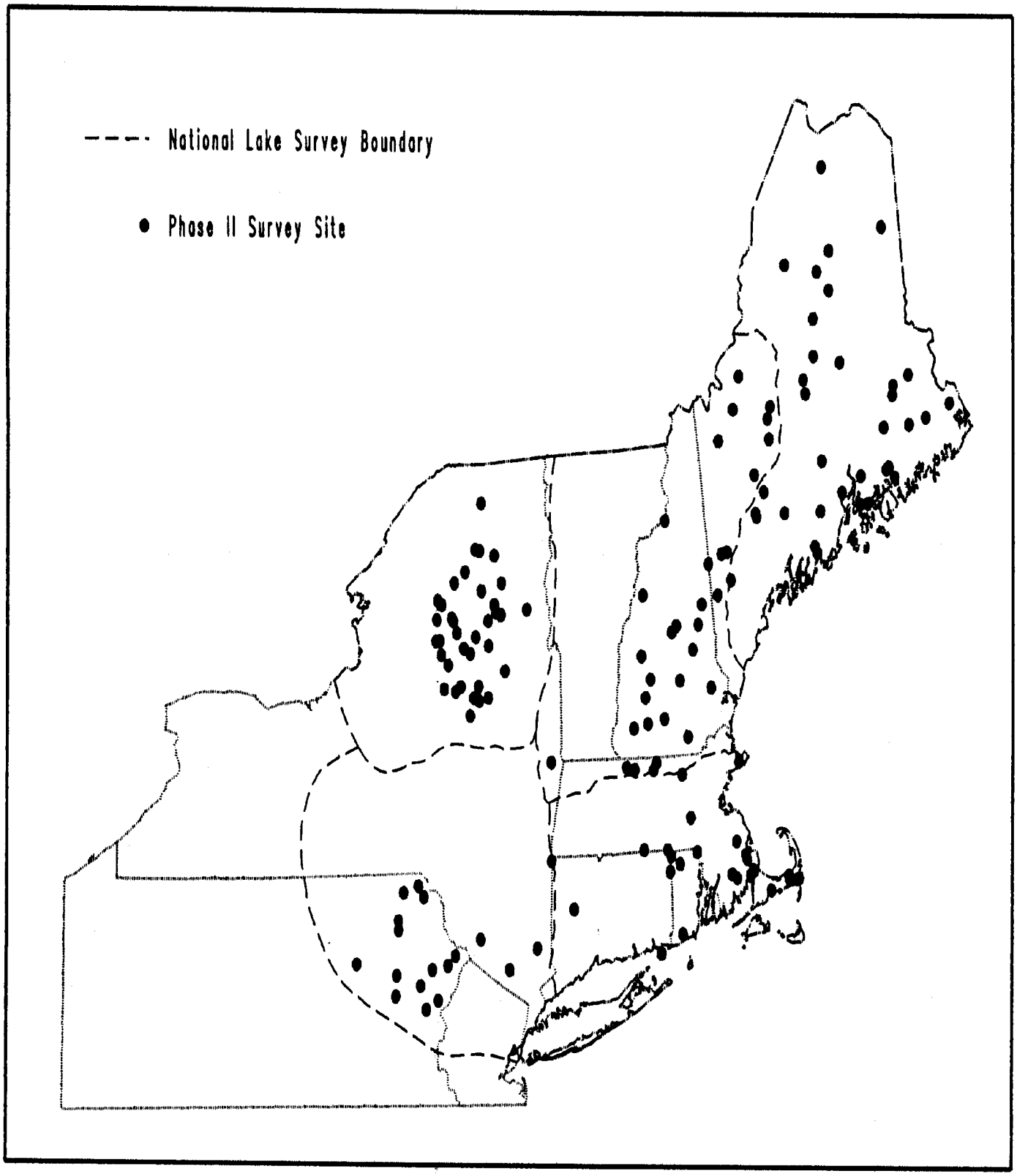

Figure 1-1. ELS-II study lakes.

Components of ELS-II Chemistry Surveys

Spring Survey: Northeastern lakes in ELS-II were sampled once in the spring of 1986 in the epilimnion at the same location on the lake as the fall index sample in ELSI. Lakes were sampled as soon after ice-out as practical. Water samples were collected from 146 lakes between March 25 and May 3,1986.

Summer Survey: ELS-II lakes were sampled once in the epilimnion in the summer of 1986 at the same location on the lake as the fall index sample in ELS-I. Water samples were collected from 147 lakes. In addition to the epilimnetic sample, a hypolimnetic sample was collected in 123 of these lakes. Hypolimnetic samples were drawn from the middle of the hypolimnion in stratified lakes, and at 1.5 m from the bottom in nonstratified lakes or lakes < 5 m deep. Hypolimnetic samples were not collected from lakes < 3 m deep. Summer seasonal survey samples were collected between July 23 and August 11, 1986.

Fall Survey and Variability Study: A variability study was conducted in the fall of 1986 along with the regular seasonal survey to assess the within-season and within-lake spatial variability in lake chemistry. In addition to the fall seasonal survey of ELS-I sample locations, a subset of 50 ELS-II lakes, in 2 groups of 25, were selected for sampling at 2 additional times during the fall index period at 2 independently selected locations on the lake. Independent field crews selected the Fall Variability Study sampling locations at the time of the sample visits by locating a spot that appeared to be the deepest part of the lake, according to lake shape, surrounding topography, and depth measurements, in the same way the original ELS-I sites were chosen.

A set of 25 fall variability lakes was randomly selected from all ELS-II lakes in each of two geographic regions of the northeastern United States: the Adirondacks and central and southeastern New England (Connecticut, Rhode Island, Massachusetts, and southern New Hampshire). Due to inclement weather and logistic constraints, only 41 of the 50 selected lakes (17 in the Adirondacks and 24 in central and southeastern New England) were sampled 3 times in the fall.

ELS-II lakes not included in the Fall Variability Study were sampled only once in the fall, at the same location as the ELS-I sample. In total, water samples were collected from 152 lakes, 7 of which were special interest sites (lakes that were not part of the statistical sample but are of interest in comparing ELS-II results with those of other researchers). Only epilimnetic water samples were collected. All fall seasonal and variability study samples were collected between October 8 and November 14, 1986.

Water samples were transported from the sample site in coolers containing frozen chemical refrigerant packs that maintained a temperature of approximately 4^0C until they arrived at the central processing laboratory. Samples were shipped by overnight courier to ensure their arrival at the processing laboratory in Las Vegas, Nevada, on the morning after collection.

In almost all cases, processing laboratory analyses were completed and samples were preserved and split into aliquots within 36 hours after sampling. The samples were then shipped by overnight courier to a contracted analytical laboratory for chemical analysis. Two analytical laboratories analyzed samples during ELS-II. One laboratory performed all the spring analyses and the other performed all the fall analyses. Both laboratories analyzed summer samples.

RELATED ELS-II ACTIVITIES

The original plan for ELS-II called for fish studies in all the lakes for which chemical samples were to be collected. However, as a result of funding limitations, it was decided to restrict the fish studies to a subset of lakes located in the Upper Midwest (see Cusimano et al.,1990). The databases described in this dictionary contain only the lake chemistry data for the northeast lakes. In addition to the data included in the seasonal ELS-II databases, other parameters were measured in ELS-II lakes. In the summer, zooplankton data were collected in all the ELS-II lakes (described in Tessier and Horwitz, 1988, 1990). Also, summer trace metal and chlorophyll data were collected from ELS-II lakes. It was found, however, that the measured trace metal concentrations in most lakes were below the system detection limit calculated from field blanks, thus the data yielded little information. In addition, detailed bathymetric data were collected from 123 ELS-II lakes. Details and file names of these ancillary ELS-II data sets are discussed in Appendix A. Note that the trace metal data were not released due to the high detection limits.

PURPOSE AND STRUCTURE OF THIS REPORT

The purpose of this data dictionary is to provide information pertaining to the contents and structure of the ELS-II chemistry database. The data dictionary does not describe the design, protocols, or findings of the study, which are described in Herlihy et al. (1991). Section 2 describes the overall design and development of the ELS-II database. Section 3 is a summary of data quality. Section 4 identifies all variables in the database, and Section 5 provides detailed definitions of the variables. Section 6 describes 'tags" and "flags," which are two types of data qualifiers.

SECTION 2
DEVELOPMENT OF THE ELS-II DATABASE

Representatives from the Systems Applications, Inc. (SAI), data management staff, the U.S. EPA Environmental Monitoring Systems Laboratory at Las Vegas (EMSL-Las Vegas), and the U.S. EPA Environmental Research Laboratory in Corvallis (ERL-Corvallis) met to define the responsibilities of each organization in developing the ELS-II databases. A data management plan for the ELS-II was developed from the meeting. The key steps in this activity are shown in Figure 2-1.

Conceptually, ELS-II data management was similar to that of Phase I of the Eastern and Western Lake Surveys (Kanciruk et al., 1986,1987). The ELS-II database was developed using SAS software. Originally, all data files in the ELS-II database were processed into SAS relational (tabular) data files and were uploaded to a Prime 750 minicomputer at the Systems Applications offices. Data files were output to magnetic tape and transferred to the EPA's IBM mainframe computer at the EPA's National Computer Center, Research Triangle Park, North Carolina. The quality assurance staff at EMSL-Las Vegas and the project staff at ERL-Corvallis accessed the data sets at the National Computer Center.

Problems found during verification and validation necessitated a reverification of the ELS-II chemistry data sets. EMSL-Las Vegas completed their reverification of the merged data sets by directly making changes to copies of the verified data sets to create the modified verified database. Staff at ERL-Corvallis transferred copies of the modified verified data to their VAX 8600 minicomputer for re-validation. After re-validation of the data, ERL-Corvallis staff downloaded the files to IBM compatible microcomputer diskettes for transfer to SAI. SAI and ERL-Corvallis staff then created the validated and final (enhanced) data sets on IBM compatible microcomputers using PC-SAS.

DATABASE DESIGN

The ELS-II database consists of information collected in three seasonal chemistry surveys (spring, summer, and fall of 1986). Four levels or versions of data sets were developed for each seasonal study. These versions were operationally defined as the raw, verified, validated, and enhanced (final) databases (Figure 2-1).

Each raw data set (designated as DS1) contains the original data as reported on the field forms and by the analytical laboratories. The raw data sets were reviewed by the quality assurance (QA) staff at EMSL-Las Vegas to verify the reported results. A verified data set (version DS2) was developed from each raw data set. The raw and verified data sets for each seasonal survey were reviewed by staff at ERL-Corvallis to determine the quality of the data with respect to its intended use, resulting in the development of validated data sets. Two versions of each validated data set were created: a complete version

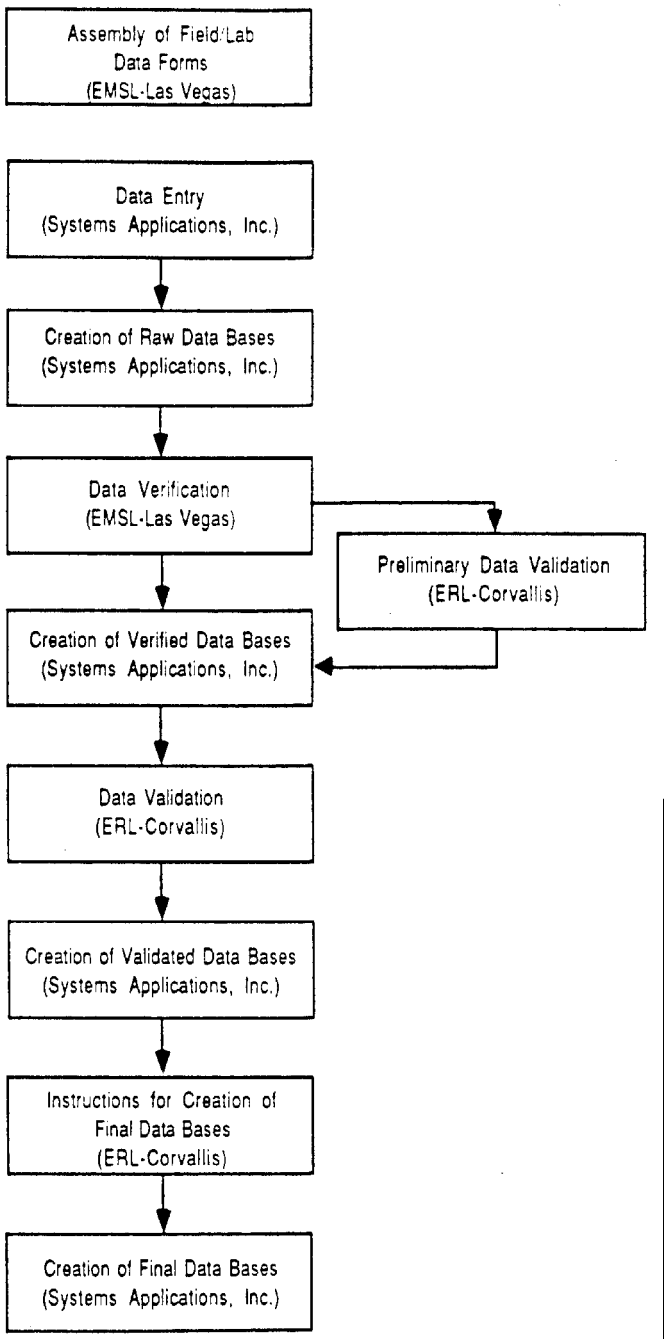

Figure 2-1. Flow diagram of the creation of the ELS-II databases.

(DS3A) and a reduced version (DS3B) that contained fewer variables. The enhanced data set, used for calculating population estimates and data interpretation, was developed from the DS3B version. Only the reduced validated (DS3B) and the enhanced (DS4A) data sets are being distributed.

This data dictionary documents the reduced validated and enhanced (final) data sets, DS3B and DS4A. Data set DS3B (validated) should be used by investigators who require unaveraged, unreplaced data. Verification and validation suspect values are present in data set DS3B and may be removed by the user if desired (validation outliers have a U code in the variable flag field). DS3B also contains some of the QA data. Data set DS4A (enhanced) is easier to use for general analysis (there is only one data line per lakewater sample) and is the data set used for making population estimates in the ELS-II data report.

CREATION OF THE RAW DATA SETS

Development of the raw data set involved checking the data forms from the field and analytical laboratories and entering the data from these forms. EMSL-Las Vegas provided copies of the field data forms for each seasonal chemistry survey, along with hard copies of summaries of the results of laboratory analyses for the spring seasonal chemistry survey. The data management staff developed data entry screens for the field data forms using the dBase III Plus software package implemented on IBM compatible microcomputers. The entry screens for the laboratory data were developed by modifying the data entry software package that EMSL-Las Vegas had developed for the ELS-II. EMSL-Las Vegas then provided the analytical laboratory data for the summer and fall seasonal chemistry surveys on diskettes as dBase compatible files.

To insure accurate transcription of data from the field and laboratory forms, data were initially entered independently by two operators. After entry, each file was sorted and converted to an ASCII-format file. The two files were compared using a program written in the "C" programming language. The output was a listing of the data records and variables for which discrepancies were found. In addition, data records that occurred in one file but not the other were also identified. Entry errors, duplicate records, and missing records were subsequently corrected. The comparison procedure was repeated, and another list of discrepancies was output. At this point a member of the data management team reviewed any remaining discrepancies, and questions were referred to the QA staff at EMSL-Las Vegas. One of the data files was corrected and used in the creation of the raw data set.

The dBase files containing analytical laboratory data were also converted to ASCII format, with each record written as a single line. A program was developed to break the lines into lengths compatible with the personal computer version of SAS. In a few cases, the dBase file was entered directly into a SAS data file using the PROC DBF procedure.

For both field data and analytical data files, a SAS program was written to define the data file structure (variable

names, types, field widths, and labels) and read the ASCII file when necessary. The result of this operation was the creation of a raw data set in SAS. Copies of each raw data set were transferred to the National Computer Center, where they could be accessed from EMSL-Las Vegas and ERL-Corvallis.

CREATION OF THE VERIFIED DATA SETS

The QA staff at EMSL-Las Vegas subjected the raw data sets to a set of quality control (QC) checks and identified various modifications to the raw data (Mitchell-Hall et al., 1989). “Transaction files" were generated in SAS containing the changes that were to be made to the raw data sets. A preliminary version of each verified data set was generated by applying the transaction files to the raw data sets. The transaction files were transferred to the data management staff, who applied them to the official raw data sets. Each resulting verified data set was compared to its preliminary version. If the two data sets were identical, then the resultant updated data set was considered to be the verified data set for a seasonal chemistry survey. If the comparison failed, then the discrepancies were resolved by comparing the updated data set to the original data forms (Mitchell-Hall et al., 1989).

Following verification, a reverification was performed because of suspected data quality problems, primarily with spring anion data. As a result of this special data assessment (described in detail in Mitchell-Hall et al., 1989), a new modified verified database was created that was then used in validation and in the creation of the validated and enhanced data sets. Copies of the modified verified data sets were transferred to the National Computer Center where they could be accessed from EMSL-Las Vegas and ERL-Corvallis.

CREATION OF THE VALIDATED DATA SETS

The validated data set for each seasonal survey was created by changing the verified set according to specific instructions from the project staff at ERL-Corvallis. The changes were implemented as individual transactions, that is, each transaction was made by running a SAS program on the appropriate verified data set to identify the data records of interest and to create a transaction file. Then the transaction file was applied to the verified data set to create the validated data set for each seasonal survey.

In situations where one transaction was dependent on another, a temporary data set was created by applying the first transaction to the verified data set and then the second transaction to the temporary data set. Each resulting data set was checked against the verified data set and the instructions from ERL-Corvallis. Any discrepancies were resolved, and the result was considered the complete validated data set (version DS3A). The reduced validated data set (version DS3B) was created by eliminating some of the internal QA variables and empty flag fields from DS3A.

The creation of the seasonal validated data sets involved (1) changing units from mg/L to μeq/L where appropriate,

(2) creating two new variables, mean Secchi depth (SECME98), and labile (inorganic) monomeric aluminum (ALDI98), calculated as the difference between total monomeric aluminum (ALD02) and organic monomeric aluminum (ALO_02), (3) adding physical data from detailed bathymetry derived by the Adirondack Lake Survey Corporation, (4) adding cluster and phase II weights, (5) rounding, (6) fixing miscellaneous errors, and (7) concatenating the validation flags to the verification flags.

During validation, missing values and values with known errors based on relationships with other variables were identified and assigned validation flags (U0 or Ul; see Section 4). Values with either a U0 or Ul validation flag were deleted in the creation of the enhanced data set. Only the 24 major variables listed In Table 2-1 were validated in ELS-II. Population estimates cannot be made if there are missing values, thus missing values and validation outliers were replaced in the enhanced (but NOT in the validated) data set if they were required to make population estimates (epilimnion samples from target lakes).

CREATION OF THE ENHANCED (FINAL) DATA SETS

Several sets of instructions for the creation of the final data sets were provided by the project staff at ERL-Corvallis. The first set of instructions was applied to the validated data sets, and temporary data set were created. The next set of instructions was applied to the temporary final data sets, and new temporary data sets were created. This process continued until the data management staff had implemented all instructions. At this point, the final data sets were checked against the validated data sets and all the instructions from ERL-Corvallis. These final data sets were designated as the complete versions DS4A.

The enhanced (final) data set (version DS4A) for each seasonal chemistry survey was constructed from DS3B by (1) deleting all trailer duplicates (SAMCD02= 'TD'), laboratory QA splits (SAMCD02='S'), and all values with a U0 or Ul validation flag, (2) averaging all replicate values (from field duplicate samples), (3) changing negative values (except for ANC and BNC) to zero, and (4) replacing all missing values for the 24 major variables in Table 2-1 with values calculated from regression models, so that population estimates could be made. In addition, a drop code variable (DRPCDE) was added to the enhanced data set to distinguish the ELS-II target lake samples from nontarget samples. Only 30 values were replaced during the creation of the enhanced ELS-II data sets: 12 in the spring, 14 in the summer, and 4 in the fall.

DATABASE QUALITY CONTROL

All phases of the data management program included various quality control checks to minimize errors. Computer programs were checked by a person that was not involved in writing the code.

Table 2-1. Major Variables Validated in ELS-II

ACCO11	ALD02	ALO_02
ALEX11	ALKA11	CA98
CL98	COLOR02	COND11
D1C02	DOC11	FE11
FTL98	K98	MG98
MN11	NA98	NH498
N0398	PHEQ11	PH02
PTL11	SO498	SIO211

Comments, program logic, and test cases were examined. All data entry screens were examined to insure consistency of appearance with the field or laboratory forms and to insure that the data were stored in the correct fields.

For each raw data set, a listing of variable names, data types, field widths, formats, and SAS labels (generated from the SAS CONTENTS procedure) was reviewed for errors. A listing of all values in each data set was generated and compared to either the original field data forms or listings of data on the original diskettes to verify that all data fields were present and in the correct format. In addition, individual data values were selected at random and compared with those on the original data forms or diskettes.

For each verified data set, any discrepancies between the verified data sets developed at SAl and at EMSL-Las Vegas were identified using the SAS COMPARE procedure. Listings from the SAS CONTENTS and PRINT procedures were reviewed in the same manner as were the raw data sets. In addition, the SAS log files were examined to insure that the appropriate processing steps had been completed.

For the validated data sets, each transaction was checked individually. The SAS programs were checked for logic and internal documentation (i.e., comments). SAS log files were checked for errors and problems. SAS list files containing the actual data changes were examined to be certain that all validation changes requested by ERL-Corvallis were implemented. Listings generated by the SAS CONTENTS and PRINT procedures were reviewed in the same manner as were the raw and verified data sets.

For the final data sets, all SAS programs were checked for logic and comments. SAS log and list files were examined for any errors or deviations from the ERL-Corvallis instructions. Listings from SAS CONTENTS and PRINT procedures were reviewed as described for the other data sets.

SECTION 3
DATA QUALITY SUMMARY

A detailed discussion of the ELS-II QA data is given in the ELS-II QA report (Mitchell-Hall et al., 1989) and summarized in the ELS-II data report (Herlihy et al., 1991). Two analytical laboratories and a central processing laboratory analyzed samples in the ELS-II. The central processing laboratory in Las Vegas analyzed PH02, D1C02, COLOR02, TURO2, ALD02, and ALO_02 (see Section 5 for variable definitions) in all seasons. One analytical laboratory analyzed all the other chemical data for the spring; the other analytical laboratory analyzed all the fall data. Summer samples were analyzed by both analytical laboratories.

For most of the major analytes described in Table 2-1, data quality (precision and accuracy) in ELS-II was comparable to that achieved in the other components of the National Surface Water Survey. Chloride measurements made by one laboratory, however, are suspect (based on both the QA data and charge balance/calculated conductivity checks) and we recommend against their use in data interpretation. This would eliminate chloride data from the entire spring database and from about half the summer database. In addition, three other analytes appear to produce inconsistent QA results: air-equilibrated dissolved inorganic carbon (DICEl1), air-equilibrated pH (PHEQ11), and total aluminum (ALTL11). The closed-system pH and dissolved inorganic carbon analyses (PH02 and DIC02), however, achieved acceptable precision. For all analytes, especially aluminum variables, nitrate, ammonia, and total phosphorous, care should be taken in interpreting values around and below the system detection limit (SDL). The SDL represents the concentration that was significantly greater (95% confidence) than field blank (deionized water) concentrations. SDLs for each variable are summarized in Mitchell-Hall et al. (1989).

In summary, as listed in the notice to data users, we make the following recommendations for data use:

1. Chloride (CL98/CL11) values measured at one of the analytical laboratories should not be used. The suspect chloride values are present in the validated data set (DS3B) and the chloride flag (CL11F) has a Ul code. In the enhanced data set (DS4A), these suspect chloride values have been set to "missing" values. Population estimates for chloride should not be made for the summer and spring (all fall values were measured at the other analytical laboratory).

2. All field (in situ) conductivity (variables - Cxxxx1 D and CON601D) measurements appear to be unreliable and should be interpreted with caution. These measurements were not validated. No problems were identified with laboratory conductivity (COND11) values.

3. Total aluminum (ALTL11) data showed very poor agreement between laboratories and precision was highly variable. This problem is evident in all NSWS surveys. In addition, a number of total aluminum values were less than the total monomeric aluminum values. Discretion is advised in interpreting total aluminum data. These problems do not relate to total monomeric aluminum (ALD02), organic monomeric aluminum (ALO_02), or inorganic monomeric aluminum (ALDI98).

4. **Air-equilibrated dissolved inorganic carbon (DICEl1) and air-equilibrated pH (PHEQ11) showed some laboratory bias and poor precision at higher pH. Users are strongly advised to use the closed-system dissolved inorganic carbon (DIC02) and pH (PH)2) measurements for data analysis.**

SECTION 4
LIST OF VARIABLES

The variables in the three seasonal reduced validated (DS3B) SAS data sets are listed in the following three tables produced using the SAS procedure CONTENTS.

- Table 4-1. Spring Seasonal Data Set
- Table 4-2. Summer Seasonal Data Set
- Table 4-3. Fall Seasonal Data Set

Variables are listed alphabetically, and each table provides the variable name, type (numeric or character), length (in bytes, as structured in SAS), format, and SAS label.

Variable labels are printed as they appear in the SAS data sets. The use of all capital letters and "UEQ/L" and US/CM" for "μeq/L' and "μS/cm" are examples of constraints imposed by limitations of the computer character set. Units of measure are defined in Section 5.

In addition to the variables listed in these tables, a drop code variable (DRPCDE) has been added to each enhanced (final) seasonal data set. DRPCDE is a numeric variable of length 8, format F8., which is used to distinguish target from nontarget lakewater samples.

Table 4-1. Variables in the Reduced Validated Spring Seasonal (SPSVBM01) Data Set

Variable	Type	Length	Format	SAS Label
ACCOll	Num	8	F8.1	CO2-AClDITY (UEQ/L) FORM 11
ACCO11F	Char	12		FLAG FOR ACCOl 1
ALD02	Num	8	F8.4	PCV ALUMINUM DISSOLVED (UG/L) FORM 2
ALD02F	Char	12		FLAG FOR ALD02
ALDI98	Num	8	F8.4	LABILE MONOMERIC AL (UG/L)
ALEX11	Num	8	F8.4	ALUMINUM-EXTRACTRACTABLE (UG/L) FORM 11
ALEX11F	Char	12		FLAG FOR ALEX11
ALKA11	Num	8	F8.1	ALKALINITY (UEQ/L) FORM 11
ALKA11	Char	12		FLAG FOR ALKAl1
ALO_02	Num	8	F8.4	PCV ALUMINUM ORGANIC (UG/L) FORM 2
ALO_02F	Char	12		FLAG FOR ALO_02
ALTLT11	Num	8	F8.4	TOTAL ALUMINUM (UG/L) FORM 11
ALTL1lF	Char	12		FLAG FOR ALTL11
ANCAT98	Num	8	F8.4	CATIONS/ANIONS RATIO
ANDEF98	Num	8	F8.4	CATSUM-ANSUM (UEQ/L)
ANSUM98	Num	8	F8.4	SUM OF ANIONS (UEQ/L)
BAT_ID	Num	8	F8.	BATCH IDENTIFICATION NUMBER
BNSTR99	Num	8	F8.	POPULATION SIZE BY STRATA
C0151D	Num	8	F8.	CONDUCTIVITY (US/CM) AT 1.5 M FORM 1ID
C0151DF	Char	12		FLAG FOR C0151D
C04051 D	Num	8	F8.	CONDUCTIVITY AT 4 OR 5 M (US/CM) FORM 1D
C06101D	Num	8	F8.	CONDUCTIVITY AT 6 OR 10 M (US/CM) FORM 1D
C08151D	Num	8	F8.	CONDUCTIVITY AT 8 OR 15 M (US/CM) FORM 1D
C10201D	Num	8	F8.	CONDUCTIVITY AT 10 OR 20 M (US/CM) FORM 1D
C12251D	Num	8	F8.	CONDUCTIVITY AT 12 OR 25 M (US/CM) FORM 1D
C14301D	Num	8	F8.	CONDUCTIVITY AT 14 OR 30 M (US/CM) FORM 1D
C16351D	Num	8	F8.	CONDUCTIVITY AT 16 OR 35 M (US/CM) FORM 1D
C18401D	Num	8	F8.	CONDUCTIVITY AT 18 OR 40 M (US/CM) FORM 1D
C20451D	Num	8	F8.	CONDUCTIVITY AT 20 OR 45 M (US/CM) FORM 1D
CA11	Num	8	F8.3	CALCIUM (MG/L) FORM 11
CA98	Num	8	F8.4	CALCIUM (UEQ/L)
CA11F	Char	12		FLAG FOR CA11
CATSU98	Num	8	F8.4	SUM OF CATIONS (UEQ/L)
CL1	Num	8	F8.3	CHLORIDE ION (MG/L) FORM 11
CL98	Num	a	F8.4	CHLORIDE (UEQ/L)
CL11F	Char	12		FLAG FOR CL11
CLSTR99	Num	8	8.	PHASEII CLUSTER (1, 2 or 3)
CNTY99	Char	5		FIPS CODE (ST, COUNTY)
CO398	Num	8	F8.4	CARBONATE ALKALINITY (UEQ/L)
COLOR02	Num	8	F8.	COLOR (PCU) FORM 2
COLOR02F	Char	12		FLAG FOR COLOR 02
CON601D	Num	8	F8.	CONDUCTIVITY AT 0.6 * DEPTH (US/CM) FORM 1D
CONCA98	Num	8	F8.4	CALCULATED CONDUCTIVITY (US/CM)
COND11	Num	8	F8.l	CONDUCTIVITY (US/CM) FORM 11
COND11F	Char	12		FLAG FOR COND11
CON_B1D	Num	8	F8.	CONDUCT AT BOTTOM-1.5 M (US/CM) FORM 1D
CXX50lD	Num	8	F8.	CONDUCTIVITY AT 50 M (US/CM) FORM 1D

(Continued)

Table 4-1. (Continued)

Variable	Type	Length	Format	SAS Label
DATSH02	Num	8	DATE7.	DATE SHIPPED FORM 2
DATSH1D	Num	8	DATE7.	DATE SHIPPED FORM 1D
DATSMP	Num	8	DATE7.	DATE SAMPLED
DIC02	Num	8		DIC (MG/L) FORM 2
DIC02F	Char	12		FLAG FOR DIC02
DICE11	Num	8	F8.3	DIC-EQUIL (MG/L) FORM 11
DICE11F	Char	12		FLAG FOR DICE11
DICI11	Num	8	F8.3	DIC-INIT (MG/L) FORM 11
DICI11F	Char	12		FLAG FOR DICI11
DISM99	Num	8	F8.	DISTANCE FROM COAST (MILES)
DOC11	Num	8	F8.2	DOC (MG/L) FORM 11
DOC11F	Char	12		FLAG FOR DOC11
DO_151D	Num	8	F8.2	DISSOLVED OXYGEN (MG/L) 1.5 M FORM 1D
DO_601D	Num	8	F8.2	DISSOLVED OXYGEN AT 0.6 * DEPTH FORM 1D
DO_B1D	Num	8	F8.2	DISOXYGEN (MG/L) BOTTOM-1.5 M FORM 1D
DPCA1D	Num	8	F8.	DEPTH CATEGORY 4 = <20 M 5 = >20 M FORM 1D
DPSIT1D	Num	8	F8.1	SITE DEPTH (M) FORM 1D
DPSITX1D	Num	8	F8.1	MAXIMUM LAKE DEPTH (M)-ALSC
DP_601D	Num	8	F8.1	DEPTH 0.6 * BOTTOM (M) FORM 1D
DP_B1D	Num	8	F8.1	DEPTH AT BOTTOM-1.5 M (M) FORM 1D
ELEV99	Num	8	F8.1	LAKE ELEVATION (M)
ELEVX99	Num	8	F8.1	LAKE ELEVATION (M)-ALSC
FE11	Num	8	F8.3	IRON (UG/L) FORM 11
FE11F	Char	12		FLAG FOR FE11
FTL11	Num	8	F8.4	FLUORIDE (MG/L) FORM 11
FTL98	Num	8	F8.4	FLUORIDE (UEQ/L)
FTL11F	Char	12		FLAG FOR FTL11
H98	Num	8	F8.4	HYDROGEN FROM PHAC11 (UEQ/L)
HCO398	Num	8	F8.4	HCO3 (UEQ/L)
HDEP99	Num	8	F8.3	HYDROGEN ION DEPOSITION (G/M ** 2/YR)
HYDID1D	Char	4		HYDROLAB METER IDENTIFIER CODE FORM 1D
HYTYP99	Char	9		HYDROLOGIC TYPE
INOUT99	Char	6		PRESENCE/ABSENCE OF INLETS/OUTLETS
K11	Num	8	F8.3	POTASSIUM (MG/L) FORM 11
K98	Num	8	F8.4	POTASSIUM (UEQ/L)
K11F	Char	12		FLAG FOR K11
LABNA02	Char	30		LABORATORY FOR ANALYSIS FORM 2
LAKE_ID	Char	7		LAKE IDENTIFICATION NUMBER
LAKNA1D	Char	30		LAKE NAME FORM 1D
LAT99	Char	10		LATITUDE
LATDD99	Num	8	F8.4	LATITUDE (DECIMAL DEGREES)
LKID99	Char	7		ERLD-UMD ID/ALSC WSHED-POND ID
LKNAM99	Char	30		LAKE NAME
LKSIZ99	Num	8	F8.2	LAKE SURFACE AREA (HA)
LKSIZX99	Num	8	F8.2	LAKE SURFACE AREA (HA) - ALSC
LKVOL99	Num	8	F8.3	CALC LAKE VOL (10 ** 6 CUM)
LKVOLX99	Num	8	F8.3	DIG. LAKE VOL (10 ** 6 CUM) - ALSC

(Continued)

Table 4-1. (Continued)

Variable	Type	Length	Format	SAS Label
LNGDD99	Num	8	F8.4	LONGITUDE (DECIMAL DEGREES)
LONG99	Char	11		LONGITUDE
MAPBG99	Char	25		MAP SHEET NAME (1:250,000 SCALE)
MAPSM99	Char	40		MAP SHEET NAME, 15 OR 7.5 QUAD
MG11	Num	8	F8.3	MAGNESIUM (MG/L) FORM 11
MG98	Num	8	F8.4	MAGNESIUM (UEQ/L)
MG11F	Char	12		FLAG FOR MG11
MN11	Num	8	F8.3	MANGANESE (UG/L) FORM 11
MN11F	Char	12		FLAG FOR MN11
NA1l	Num	8	F8.3	SODIUM (MG/L) FORM 11
NA98	Num	8	F8.4	SODIUM (UEQ/L)
NA11F	Char	12		FLAG FOR NA11
NH411	Num	8	F8.3	AMMONIUM ION (MG/L) FORM 11
NH498	Num	8	F8.4	AMMONIUM (UEQ/L)
NH411F	Char	12		FLAG FOR NH411
NO311	Num	8	F8.4	NITRATE ION (MG/L) FORM 11
NO398	Num	8	F8.4	NITRATE (UEQ/L)
NO311F	Char	12		FLAG FOR NO31 1
NO3DP99	Num	8	F8.2	NITRATE DEPOSITION (G/M ** 2/YR)
ORGIO98	Num	8	F8.4	ORGANIC ANION (UEQ/L)
PH02	Num	8	F8.2	STATION PH FORM 2
PH0151D	Num	8	F8.2	PH AT 1.5 M FORM 1D
PH0151DF	Char	12		FLAG FOR PH015ID
PH02F	Char	12		FLAG FOR PH02
PHAC11	Num	8	F8.2	ACIDITY INITIAL PH FORM 11
PHAC11F	Char	12		FLAG FOR PHAC11
PHAL11	Num	8	F8.2	ALKALINITY INITIAL PH FORM 11
PHAL11F	Char	12		FLAG FOR PHAL11
PHEQ11	Num	8	F8.2	AIR-EQUILIBRATED PH FORM 11
PHEQ11F	Char	12		FLAG FOR PHEQ11
PH_601D	Num	8	F8.2	PH AT 0.6 * DEPTH FORM 1D
PH_B1D	Num	8	F8.2	PH AT BOTTOM-1.5 M FORM 1D
PRCIP99	Num	8	F8.3	PRECIPITATION (M/YR)
PREC1D	Char	5		PRECIPITATION FORM 1D
PTL11	Num	8	F8.4	TOTAL PHOSPHORUS (UG/L) FORM 11
PTL11F	Char	12		FLAG FOR PTL11
RGSPC99	Char	16		REG SPEC LTM NRC DEW DER SAMPLE CLASS
RPREC1D	Char	8		RATE OF PRECIPITATION FORM 1D
RT99	Num	8	F8.3	RESIDENCE TIME (YR)
RTX99	Num	8	8.3	RESIDENCE TIME (YR)-ALSC
RUNIN99	Num	8	F8.	ANNUAL RUNOFF INCHES FROM DIGIT MAP
RUNOF99	Num	8	F8.3	SURFACE WATER RUNOFF (M/YR)
RUNOFX99	Num	8	8.3	SURFACE WATER RUNOFF (M/YR)-ALSC
SAM CD02	Char	10		SAMPLE CODE FORM 2
SAM_ID	Num	8	F8.	SAMPLE IDENTIFICATION NUMBER
SAMID11F	Char	12		FLAG FOR SAM ID FORM 11
SBRGN99	Char	1		NSWS SUBREGION

(Continued)

Table 4-1. (Continued)

Variable	Type	Length	Format	SAS Label
SECDI1D	Num	8	F8.1	SECCHI DEPTH:DISAPPEAR (M) FORM 1D
SECME98	Num	8	8.1	MEAN:SECCHI DISK DISAPPEAR, REAPPEAR (M)
SECRE1D	Num	8	F8.1	SECCHI DEPTH:REAPPEAR (M) FORM 1D
SIO211	Num	8	F8.3	SILICA (MG /L) FORM 11
SIO211F	Char	12		FLAG FOR SIO211
SITETYP	Char	9		SAMPLING SITE OR TYPE CODE
SO411	Num	8	F8.3	SULFATE ION (MG/L) FORM 11
SO498	Num	8	F8.4	SULFATE (UEQ/L)
SO411F	Char	12		FLAG FOR SO411
SO4DP99	Num	8	F8.2	SULFATE DEPOSITION (G/M ** 2/YR)
SOBC98	Num	8	F8.4	SUM OF BASE CATIONS (UEQ/L)
SPLCD02	Char	1		SPLIT/SAMPLE CODE TO LAS VEGAS FORM 2
ST99	Char	2		STATE (TWO-LETTER ABBREV)
STRAT99	Char	3		NSWS STRATA
T04051D	Num	8	F8.1	TEMPERATURE AT 4 OR 5 M (DEGC) FORM 1D
T06101D	Num	8	F8.1	TEMPERATURE AT 6 OR 10 M (DEGC) FORM 1D
T08151D	Num	8	F8.1	TEMPERATURE AT 8 OR 15 M (DEGC) FORM 1D
T10201D	Num	8	F8.1	TEMPERATURE AT 10 OR 20 M (DEGC) FORM 1D
T12251D	Num	8	F8.1	TEMPERATURE AT 12 OR 25 M (DEGC) FORM 1D
T14301D	Num	8	F8.1	TEMPERATURE AT 14 OR 30 M (DEGC) FORM 1D
T16351D	Num	8	F8.1	TEMPERATURE AT 16 OR 35 M (DEGC) FORM 1D
T18401D	Num	8	F8.1	TEMPERATURE AT 18 OR 40 M (DEGC) FORM 1D
T20451D	Num	8	F8.1	TEMPERATURE AT 20 OR 45 M (DEGC) FORM 1D
TIMRE1D	Num	8	TIME5.	TIME RECEIVED (24H) HH:MM FORM 1D
TIMSM1D	Num	3	TIME5.	TIME SAMPLED (24H) HH:MM FORM 1D
TM0151D	Num	8	F8.1	TEMPERATURE (DEGC) AT 1.5 M FORM 1D
TMP6O1D	Num	8	F8.1	TEMPERATURE AT 0.6 * DEPTH (DEGC) FORM 1D
TMPA1D	Num	8	F8	AIR TEMPERATURE (DECG) FORM ID
TMPD11D	Num	8	F8.1	TEMP DIF 1.5 M-BOTTOM (DEGC) FORM ID
TMPD21D	Num	8	F8.1	TEMP DIF 1.5 M-0.6 * DEPTH (DEGC) FORM 1D
TMP_B1D	Num	8	F8.1	TEMP AT BOTTOM-i .5 M (DEGC) FORM 1D
TUR02	Num	8	F8.2	TURBIDITY (NTU) FORM2
TUR02F	Char	12		FLAG FOR TUR02
TXX501D	Num	8	F8.1	TEMPERATURE AT 50 M (DEGC) FORM 1D
VISIT1D	Char	12		VISIT FORM ID
WALA99	Num	8	F8.2	WATERSHED AREA/LAKE AREA
WALAX99	Num	8	8.2	WATERSHED AREA/LAKE AREA-ALSC
WDIR1D	Char	3		ESTIMATED WIND DIRECTION FORM 1D
WSDIS99	Char	8		D)WELL I)ND L)OG M)INE R)OAD S)TOCK
WSHED99	Num	8	F8.3	WATERSHED AREA (HA)
WSHEDX99	Num	8	8.3	WATERSHED AREA (HA)-ALSC
WSOTH99	Char	25		DISTURB W/I 100 M-OTHER
WSPD1D	Char	8		ESTIMATED WIND SPEED FORM 1D
WT1M99	Num	8	8.3	MODIFIED PHASE I WEIGHT
WT10_99	Num	8	8.3	ORIGINAL PHASE I WEIGHT
WT2C99	Num	8	8.4	CONDITIONAL PHASE II WEIGHT
WT2T99	Num	8	8.3	TOTAL PHASE II WEIGHT

Table 4-2. Variables in the Reduced Validated Summer Seasonal (SUSVBM01) Data Set

Variable	Type	Length	Format	SAS Label
ACCES1D	Char	3		ACCESS FORM 1D
ACCO11	Num	8	F8.1	CO2-ACIDITY (UEQ/L) FORM 11
ACCO11F	Char	12		FLAG FOR ACCOl 1
ALD02	Num	8	F8.4	PCV ALUMINUM DISSOLVED (UG/L) FORM 2
ALD02F	Char	12		FLAG FOR ALD02
ALDI98	Num	8	F8.4	LABILE MONOMERIC AL (UG/L)
ALEX11	Num	8	F8.4	ALUMINUM-EXTRACTABLE (UG/L) FORM 11
ALEX11F	Char	12		FLAG FOR ALEX11
ALKA11	Num	8	F8.1	ALKALINITY (UEQ/L) FORM 11
ALKA11F	Char	12		FLAG FOR ALKA11
ALO_02	Num	8	F8.4	PCV ALUMINUM ORGANIC (UG/L) FORM 2
ALO_02F	Char	12		FLAG FOR ALO_02
ALTLT11	Num	8	F8.4	TOTAL ALUMINUM (UG/L) FORM 11
ALTL11F	Char	12		FLAG FOR ALTL11
ANCAT98	Num	8	F8.4	CATIONS/ANIONS RATIO
ANDEF98	Num	8	F8.4	CATSUM-ANSUM (UEQ/L)
ANSUM98	Num	8	F8.4	SUM OF ANIONS (UEQ/L)
BAT_ID	Num	8	F8.	BATCH IDENTIFICATION NUMBER
BNSTR99	Num	8	F8.	POPULATION SIZE BY STRATA
C0051D	Num	8	F8.	CONDUCTIVITY AT 0.5 M (US/CM) FORM 1D
C0051DT	Char	6		TAG FOR C0051D
C051D	Num	8	F8.	CONDUCTIVITY AT 1.5 M (US/CM) FORM 1D
C0151DF	Char	12		FLAG FOR C0151D
C0251D	Num	8	F8.	CONDUCTIVITY AT 2.5 M (US/CM) FORM 1D
C0251DT	Char	6		TAG FOR C0251D
C0351D	Num	8	F8.	CONDUCTIVITY AT 3.5 M (US/CM) FORM 1D
C0451D	Num	8	F8.	CONDUCTIVITY AT 4.5 M (US/CM) FORM 1D
C0551D	Num	8	F8.	CONDUCTIVITY AT 5.5 M (US/CM) FORM 1D
C0651D	Num	8	F8.	CONDUCTIVITY AT 6.5 M (US/CM) FORM 1D
C0751D	Num	8	F8.	CONDUCTIVITY AT 7.5 M (US/CM) FORM 1D
C085lD	Num	8	F8.	CONDUCTIVITY AT 8.5 M (US/CM) FORM 1D
C0951D	Num	8	F8.	CONDUCTIVITY AT 9.5 M (US/CM) FORM 1D
C1051D	Num	8	F8.	CONDUCTIVITY AT 10.5 M (US/CM) FORM 1D
C1251D	Num	8	F8.	CONDUCTIVITY AT 12.5 M (US/CM) FORM 1D
C1451D	Num	8	F8.	CONDUCTIVITY AT 14.5 M (US/CM) FORM 1D
C1651D	Num	8	F8.	CONDUCTIVITYAT 16.5 M (US/CM) FORM 1D
C1851D	Num	8	F8.	CONDUCTIVITY AT 18.5 M (US/CM) FORM 1D
C2051D	Num	8	F8.	CONDUCTIVITY AT 20.5 M (US/CM) FORM 1D
C2251D	Num	8	F8.	CONDUCTIVITY AT 22.5 M (US/CM) FORM 1D
C2451D	Num	8	F8.	CONDUCTIVITY AT 24.5 M (US/CM) FORM 1D
C2651D	Num	8	F8.	CONDUCTIVITY AT 26.5 M (US/CM) FORM 1D
C2851D	Num	8	F8.	CONDUCTIVITY AT 28.5 M (US/CM) FORM 1D
C3051D	Num	8	F8.	CONDUCTIVITY AT 30.5 M (US/CM) FORM 1D
C3251D	Num	8	F8.	CONDUCTIVITY AT 32.5 M (US/CM) FORM 1D
C3451D	Num	8	F8.	CONDUCTIVITY AT 34.5 M (US/CM) FORM 1D

C3651D	Num	8	F8.	CONDUCTIVITY AT 36.5 M (US/CM) FORM 1D
C3851D	Num	8	F8.	CONDUCTIVITY AT 38.5 M (US/CM) FORM 1D

(Continued)

Table 4-2. (Continued)

Variable	Type	Length	Format	SAS Label
CA11	Num	8	F8.3	CALCIUM (MG/L) FORM 11
CA98	Num	8	F8.4	CALCIUM (UEQ/L)
CA11F	Char	12		FLAG FOR CAl 1
CATSU98	Num	8	F8.4	SUM OF CATIONS (UEQ/L)
CHLOD D	Num	8	F8.1	CHLOROPHYLL VOLUME H2O D (ML) FORM 1D
CHLOR1D	Num	8	F8.1	CHLOROPHYLL VOLUME H2O R (ML) FORM 1D
CL11	Num	8	F8.3	CHLORIDE ION (MG/L) FORM 11
CL98	Num	8	F8.4	CHLORIDE (UEQ/L)
CL11F	Char	12		FLAG FOR CL11
CLSTR99	Num	8	F8.	PHASE II CLUSTER (1, 2 or 3)
CNTY99	Char	5		FIPS CODE (ST, COUNTY)
CO398	Num	8	F8.4	CARBONATE ALKALINITY (UEQ/L)
COLOR02	Num	8	F8.	COLOR (PCU) FORM 2
COLOR02F	Char	12		FLAG FOR COLOR02
COMNT1DA	Char	200		FIRST PART COMMENTS FORM 1D
COMNT1DB	Char	200		SECOND PART COMMENTS FORM1D
CONCA98	Num	8	F8.4	CALCULATED CONDUCTIVITY (US/CM)
COND11	Num	8	F8.l	CONDUCTIVITY (US/CM) FORM 11
COND11F	Char	12		FLAG FOR COND11
CONMH1D	Num	8	F8.	CONDUCTIVITY AT MID-HYP (US/CM) FORM 1D
CONMH1DF	Char	12		FLAG FOR CONMH1D
CONMM1D	Num	8	F8.	CONDUCTIVITY AT MID-MET (US/CM) FORM 1D
CONMM1DT	Char	6		TAG FOR CONMMlD
CONTH1D	Num	8	F8.	CONDUCTIVITY AT TOP-HYP (US/CM) FORM 1D
CON_B1D	Num	8	F8.	CONDUCTIVITY AT BTM-l .5 M (US/CM) FORM 1D
CRWIDl D	Char	20		FIELD CREW ID FORM 1D
DATSH02	Num	8	DATE7.	DATE SHIPPED FORM 2
DATSMP	Num	8	DATE7.	DATE SAMPLED
DIC02	Num	8	F8.3	DIC (MG/L) FORM 2
DIC02F	Char	12		FLAG FOR DIC02
DICE11	Num	8	F8.3	DIC-EQUIL (MG/L) FORM 11
DICE11F	Char	12		FLAG FOR DICE11
DICI11	Num	8	F8.3	DIC-INIT (MG/L) FORM 11
DICI11F	Char	12		FLAG FOR DICI11
DISM99	Num	8	F8.	DISTANCE FROM COAST (MILES)
DOC11	Num	8	F8.2	DOC (MG/L) FORM 11
DOC11F	Char	12		FLAG FOR DOC11
DOFIAlD	Num	8	F8.2	D.O. FINAL ACTUAL CALIB VALUE FORM 1D
DOFIT1D	Num	8	F8.2	D.O. FINAL THEOR CALIB VALUE FORM 1D
DOINT1D	Num	8	F8.2	D.O. INITIAL THEOR CALIB VALUE FORM 1D
DOMH1D	Num	8	F8.2	DISSOLVED OXYGEN AT MID-HYP FORM 1D
DOMM1D	Num	8	F8.2	DISSOLVED OXYGEN AT MID-MET FORM 1D
DOTH1D	Num	8	F8.2	DISSOLVED OXYGEN AT TOP-HYP FORM 1D
DOTH1DT	Char	6		TAG FOR DOTH1D

DO_051D	Num	8	F8.2	DISSOLVED OXYGEN AT 0.5 M FORM 1D
DO_051DT	Char	6		TAG FOR D_015D
DO_151D	Num	8	F8.2	DISSOLVED OXYGEN (MG/L) 1.5 M FORM 1D

(Continued)

Table ~2. (Continued)

Variable	Type	Length	Format	SAS Label
DO_B1D	Num	8	F8.2	DISOXYGEN (MG/L) BOTTOM-1..5 M FORM 1D
DPMH1D	Num	8	F8.1	DEPTH AT MID-HYP (M) FORM 1D
DPMM1D	Num	8	F8.1	DEPTH AT MID-MET (M) FORM 1D
DPMM1DT	Char	6		TAG FOR DPMM1D
DPSCB1D	Num	8	F8.1	DEPTH SAMPLE COLL BTM-1.5M (M) FORM 1D
DPSCM1D	Num	8	F8.1	DEPTH SAMPLE COLL MID-HYP (M) FORM 1D
DPSIT1D	Num	8	F8.1	SITE DEPTH (M) FORM 1D
DPSITX1D	Num	8	F8.1	MAXIMUM LAKE DEPTH (M)-ALSC
DPTH1D	Num	8	F8.1	DEPTH AT TOP-HYP (M) FORM 1D
DP_B1D	Num	8	F8.1	DEPTH AT BTM-1.5 M (M) FORM 1D
ELEV99	Num	8	F8.1	LAKE ELEVATION (M)
ELEVX99	Num	8	F8.1	LAKE ELEVATION (M)-ALSC
FE11	Num	8	F8.3	IRON (UG/L) FORM 11
FE11F	Char	12		FLAG FOR FE11
FTL11	Num	8	F8.4	FLUORIDE (MG/L) FORM 11
FTL98	Num	8	F8.4	FLUORIDE (UEQ/L)
FTL11F	Char	12		FLAG FOR FTL11
H98	Num	8	F8.4	HYDROGEN FROM PHAC11 (UEQ/L)
HCO398	Num	8	F8.4	HCO3 (UEQ/L)
HDEP99	Num	8	F8.3	HYDROGEN ION DEPOSITION (G/M ** 2/YR)
HYDID1D	Char	4		HYDROLAB METER IDENTIFIER CODE FORM ID
HYTYP99	Char	9		HYDROLOGIC TYPE
INOUT99	Char	6		PRESENCE/ABSENCE OF INLETS/OUTLETS
K11	Num	8	F8.3	POTASSIUM (MG/L) FORM 11
K98	Num	8	F8.4	POTASSIUM (UEQ/L)
K11F	Char	12		FLAG FOR K11
LABNA02	Char	30		LABORATORY FOR ANALYSIS FORM 2
LAKE_ID	Char	7		LAKE IDENTIFICATION NUMBER
LAKNA1D	Char	30		LAKE NAME FORM 1D
LAT99	Char	10		LATITUDE
LATDD99	Num	8	F8.4	LATITUDE (DECIMAL DEGREES)
LKID99	Char	7		ERLD-UMD ID/ALSC WSHED-POND ID
LKNAM99	Char	30		LAKE NAME
LKSIZ99	Num	8	F8.2	LAKE SURFACE AREA (HA)
LKSIZX99	Num	8	F8.2	LAKE SURFACE AREA (HA)-ALSC
LKVOL99	Num	8	F8.3	CALC LAKE VOL (10 ** 6 CUM)
LKVOLX99	Num	8	F8.3	DIG. LAKE VOL (10 ** 6 CUM)-ALSC
LNGDD99	Num	8	F8.4	LONGITUDE (DECIMAL DEGREES)
LONG99	Char	11		LONGITUDE
MAPBG99	Char	25		MAP SHEET NAME (1:250,000 SCALE)
MAPSM99	Char	40		MAP SHEET NAME, 15 OR 7.5 QUAD
MG11	Num	8	F8.3	MAGNESIUM (MG/L) FORM 11
VMG98	Num	8	F8.4	MAGNESIUM (UEQ/L)

MG11F	Char	12		FLAG FOR MG11
MN11	Num	8	F8.3	MANGANESE (UG/L) FORM 11
MN11F	Char	12		FLAG FOR MN11
NA11	Num	8	F8.3	SODIUM (MG/L) FORM 11

(Continued)

Table 4-2. (Continued)

Variable	Type	Length	Format	SAS Label
NA98	Num	8	F8.4	SODIUM (UEQ/L)
NA11F	Char	12		FLAG FOR NA11
NH411	Num	8	F8.3	AMMONIUM ION (MG/L) FORM 11
NH498	Num	8	F8.4	AMMONIUM (UEQ/L)
NH411F	Char	12		FLAG FOR NH411
NO311	Num	8	F8.4	NITRATE ION (MG/L) FORM 11
NO398	Num	8	F8.4	NITRATE (UEQ/L)
NO311F	Char	12		FLAG FOR NO311
NO3DP99	Num	8	F8.2	NITRATE DEPOSITION (G/M ** 2/YR)
ORGIO98	Num	8	F8.4	ORGANIC ANION (UEQ/L)
PH02	Num	8	F8.2	STATION PH FORM 2
PH0051D	Num	8	F8.2	PH AT 0.5 M FORM 1D
PH0151D	Num	8	F8.2	PH AT 1.5M FORM 1D
PH02F	Char	12		FLAG FOR PH02
PHAC11	Num	8	F8.2	ACIDITY INITIAL PH FORM 11
PHAC11F	Char	12		FLAG FOR PHAC11
PHAL11	Num	8	F8.2	ALKALINITY INITIAL PH FORM 11
PHAL11F	Char	12		FLAG FOR PHAL11
PHEQ11	Num	8	F8.2	AIR-EQUILIBRATED PH FORM 11
PHEQ11F	Char	12		FLAG FOR PHEQ11
PHMH1D	Num	8	F8.2	PH AT MID-HYP FORM 1D
PHMM1D	Num	8	F8.2	PH AT MID-MET FORM 1D
PHTH1D	Num	8	F8.2	PH AT TOP-HYP FORM 1D
PH_B1D	Num	8	F8.2	PH AT BTM-1.5 M FORM 1D
PRCIP99	Num	8	FB.3	PRECIPITATION (M/YR)
PREC1D	Char	5		PRECIPITATION FORM 1D
PRECOlD	Char	7		PRECIPITATION OBS (PR EV/CURRENT) FORM 1D
PTL11	Num	8	F8.4	TOTAL PHOSPHORUS (UG/L) FORM 11
PTL11F	Char	12		FLAG FOR PTL11
RGSPC99	Char	16		REG SPEC LTM NRC DEW DER SAMPLE CLASS
RPREC1D	Char	8		RATE OF PRECIPITATION FORM 1D
RT99	Num	8	F8.3	RESIDENCE TIME (YR)
RTX99	Num	8	F8.3	RESIDENCE TIME (YR)-ALSC
RUNIN99	Num	8	F8.	ANNUAL RUNOFF INCHES FROM DIGIT MAP
RUNOF99	Num	8	F8.3	SURFACE WATER RUNOFF (M/YR)
RUNOFX99	Num	8	F8.3	SURFACE WATER RUNOFF (M/YR)-ALSC
SAMBL1D	Num	8	F8.	SAMPLE ID FOR BLANK FORM 1D
SAMBT1D	Num	8	F8.	SAMPLE ID BTM-1.5 M (6H21) FORM 1D
SAMCD02	Char	10		SAMPLE CODE FORM 2
SAMD11D	Num	8	F8.	SAMPLE ID DUPLICATE 1 FORM 1D
SAMD21D	Num	8	F8.	SAMPLE ID DUPLICATE 2 FORM 1D
SAMID11F	Char	12		FLAG FOR SAM ID FORM 11

SAMMH1D	Num	8	F8.	SAMPLE ID MlD-HYP (6H11) FORM 1D
SAMSF1D	Num	8	F8.	SAMPLE ID SFC-1.5 M (6E11) FORM 1D
SAM_ ID	Num	8	F8.	SAMPLE IDENTIFICATION NUMBER
SBRGN99	Char	1		NSWS SUBREGION
SCBLK1D	Char	1		BLANK SAMPLE COLLECTED (Y OR N) FORM 1D

(Continued)

Table 4-2. (Continued)

Variable	Type	Length	Format	SAS Label
SCD151D	Char	1		DUPLICATE SAMP COLL AT 1.5 M FORM 1D
SCDBT1D	Char	1		DUPLICATE SAMP COLL AT BTM-1.5 M FORM 1D
SCDMH1D	Char	1		DUPLICATE SAMP COLL AT MID-HYP FORM 1D
SCR151D	Char	1		ROUTINE SAMP COLL AT 1.5 M FORM 1D
SCRBT1D	Char	1		ROUTINE SAMP COLL AT BTM-1.5 M FORM 1D
SCRMH1D	Char	1		ROUTINE SAMP COLL AT MID-HYP FORM 1D
SECDI1D	Num	8	F8.1	SECCHI DEPTH:DISAPPEAR (M) FORM 1D
SECDV1D	Char	1		SECCHI DEPTH Y=VISIBLE TO BOTTOM FORM 1D
SECME98	Num	8	F8.1	MEAN:SECCHI DISK DISAPPEAR, REAPPEAR (M)
SECRElD	Num	8	F8.1	SECCHI DEPTH:REAPPEAR (M) FORM 1D
SIO211	Num	8	F8.3	SILICA (MG/L) FORM 11
SIO211F	Char	12		FLAG FOR SIO211
SITETYP	Char	9		SAMPLING SITE OR TYPE CODE
SMSTR1D	Num	8	F8.	SAMPLE ID IN SUBSET TRIPLICATE FORM 1D
SMTR1D	Num	8	F8.	SAMPLE ID TRIPLICATE FORM 1D
SO411	Num	8	F8.3	SULFATE ION (MG/L) FORM 11
SO498	Num	8	F8.4	SULFATE (UEQ/L)
SO411F	Char	12		FLAG FOR SO411
SO4DP99	Num	8	F8.2	SULFATE DEPOSITION (G/M ** 2/YR)
SOBC98	Num	8	F8.4	SUM OF BASE CATIONS (UEQ/L)
SPLCD02	Char	12		SPLIT/SAMPLE CODE TO LAS VEGAS FORM 2
ST99	Char	2		STATE (TWO-LETTER ABBREV)
STRAT99	Char	3		NSWS STRATA
SUBID1D	Num	8	F8.	BATCH ID FOR SUBSET BATCH FORM 1D
T0051D	Num	8	F8.1	TEMPERATURE AT 0.5 M (DEGC) FORM 1D
T0151D	Num	8	F8.1	TEMPERATURE AT 1.5 M (DEGC) FORM 1D
T0251D	Num	8	F8.1	TEMPERATURE AT 2.5 M (DEGC) FORM 1D
T0351D	Num	8	F8.1	TEMPERATURE AT 3.5 M (DEGC) FORM 1D
T0451D	Num	8	F8.1	TEMPERATURE AT 4.5 M (DEGC) FORM 1D
T0551D	Num	8	F8.1	TEMPERATURE AT 5.5 M (DEGC) FORM 1D
T0651D	Num	8	F8.1	TEMPERATURE AT 6.5 M (DEGC) FORM 1D
T0751D	Num	8	F8.1	TEMPERATURE AT 7.5 M (DEGC) FORM 1D
T0851D	Num	8	F8.1	TEMPERATURE AT 8.5 M (DEGC) FORM 1D
T0951D	Num	8	F8.1	TEMPERATURE AT 9.5 M (DEGC) FORM 1D
T1051D	Num	8	F8.1	TEMPERATURE AT 10.5 M (DEGC) FORM 1D
T1251D	Num	8	F8.1	TEMPERATURE AT 12.5 M (DEGC) FORM 1D
T1451D	Num	8	F8.1	TEMPERATURE AT 14.5 M (DEGC) FORM 1D
T1651D	Num	8	F8.1	TEMPERATURE AT 16.5 M (DEGC) FORM 1D
T1851D	Num	8	F8.1	TEMPERATURE AT 18.5 M (DEGC) FORM 1D
T2051D	Num	8	F8.1	TEMPERATURE AT 20.5 M (DEGC) FORM 1D
T2251D	Num	8	F8.1	TEMPERATURE AT 22.5 M (DEGC) FORM 1D
T2451D	Num	8	F8.1	TEMPERATURE AT 24.5 M (DEGC) FORM 1D

T2651D	Num	8	F8.1	TEMPERATURE AT 26.5 M (DEGC) FORM 1D
T2851D	Num	8	F8.1	TEMPERATURE AT 28.5 M (DEGC) FORM 1D
T3051D	Num	8	F8.1	TEMPERATURE AT 30.5 M (DEGC) FORM 1D
T3251D	Num	8	F8.1	TEMPERATURE AT 32.5 M (DEGC)FORM 1D
T3451D	Num	8	F8.1	TEMPERATURE AT 34.5 M (DEGC)FORM 1D

(Continued)

Table 4-2. (Continued)

Variable	Type	Length	Format	SAS Label
T3651D	Num	8	F8.1	TEMPERATURE AT 36.5 M (DEGC) FORM 1D
T3851D	Num	8	F8.1	TEMPERATURE AT 38.5 M (DEGC) FORM 1D
TIMSM1D	Num	8	TIMES.	TIME SAMPLED (24H) HH:MM FORM 1D
TMPA1D	Num	8	F8.	AIR TEMPERATURE (DEGC) FORM 1D
TMPMH1D	Num	8	F8.1	TEMPERATURE AT MID-HYP (DEGC) FORM 1D
TMPMM1D	Num	8	F8.1	TEMPERATURE AT MID-MET (DEGC) FORM 1D
TMPTH1D	Num	8	F8.1	TEMPERATURE AT TOP-HYP (DEGC) FORM 1D
TM_ B1D	Num	8	F8.1	TEMPERATURE AT BTM-1.5 M (DEGC) FORM 1D
TUR02	Num	8	F8.2	TURBIDITY (NTU) FORM 2
TUR02F	Char	12		FLAG FOR TUR02
WALA99	Num	8	F8.2	WATERSHED AREA/LAKE AREA
WALAX99	Num	8	F8.2	WATERSHED AREA/LAKE AREA-ALSC
WDIR1D	Char	3		ESTIMATED WIND DIRECTION FORM 1D
WSDIS99	Char	8		D)WELL I)ND L)OG M)INE R)OAD S)TOCK
WSHED99	Num	8	F8.3	WATERSHED AREA (HA)
WSHEDX99	Num	8	F8.3	WATERSHED AREA (HA)-ALSC
WSOTH99	Char	25		DISTURB W/I 100 M-OTHER
WSPD1D	Char	8		ESTIMATED WIND SPEED FORM 1D
WT1M99	Num	8	F8.3	MODIFIED PHASE I WEIGHT
WT1O_99	Num	8	F8.3	ORIGINAL PHASE I WEIGHT
WT2C99	Num	8	F8.4	CONDITIONAL PHASE II WEIGHT
WT2T99	Num	8	F8.3	TOTAL PHASE II WEIGHT

Table 4-3. Variables in the Reduced Validated Fall Seasonal (FASVBM01) Data Set

Variable	Type	Length	Format	SAS Label
ACCES1D	Char	3		ACCESS FORM 1D
ACCO11	Num	8	F8.1	CO2-ACIDITY (UEQ/L) FORM 11
ACCO11F	Char	12		FLAG FOR ACCOl 1
ALD02	Num	8	F8.4	PCV ALUMINUM DISSOLVED (UG/L) FORM 2
ALD02F	Char	12		FLAG FQR ALD02
ALDI98	Num	8	F8.4	LABILE MONOMERIC AL (UG/L)
ALEX11	Num	8	F8.4	ALUMINUM-EXTRACTABLE (UG/L) FORM 11
ALEX11F	Char	12		FLAG FOR ALEX11
ALKA11	Num	8	F8.1	ALKALINITY (UEQ/L) FORM 11
ALKA11F	Char	12		FLAG FOR ALKA11
ALO_02	Num	8	F8.4	PCV ALUMINUM ORGANIC (UG/L) FORM 2
ALO_02F	Char	12		FLAG FOR ALO_02
ALTLT11	Num	8	F8.4	TOTAL ALUMINUM (UG/L) FORM 11
ALTL11F	Char	12		FLAG FOR ALTL11
ANCAT98	Num	8	F8.4	CATIONS/ANIONS RATIO
ANDEF98	Num	8	F8.4	CATSUM-ANSUM (UEQ/L)
ANSUM98	Num	8	F8.4	SUM OF ANIONS (UEQ/L)
BAT_ID	Num	8	F8.	BATCH IDENTIFICATION NUMBER
BNSTR99	Num	8	F8.	POPULATION SIZE BY STRATA
C0151D	Num	8	F8.	CONDUCTIVITY (US/CM) AT 1.5 M FORM 1D
C0151DF	Char	12		FLAG FOR C0151D
C04051D	Num	8	F8.	CONDUCTIVITY AT 4 OR 5 M (US/CM) FORM 1D
C06101D	Num	8	F8.	CONDUCTIVITY AT 6 OR 10 M (US/CM) FORM 1D
C08151D	Num	8	F8.	CONDUCTIVITY AT 8 OR 15 M (US/CM) FORM 1D
C10201D	Num	8	F8.	CONDUCTIVITY AT 10 OR 20 M (US/CM) FORM 1D
C12251 D	Num	8	F8.	CONDUCTIVITY AT 12 OR 25 M (US/CM) FORM 1D
C14301D	Num	8	F8.	CONDUCTIVITY AT 14 OR 30 M (US/CM) FORM 1D
C16351 D	Num	8	F8.	CONDUCTIVITY AT 16 OR 35 M (US/CM) FORM 1D
C18401D	Num	8	F8.	CONDUCTIVITY AT 18 OR 40 M (US/CM) FORM 1D
C20451D	Num	8	F8.	CONDUCTIVITY AT 20 OR 45 M (US/CM) FORM 1D
CA11	Num	8	F8.3	CALCIUM (MG/L) FORM 11
CA98	Num	8	F8.4	CALCIUM (UEQ/L)
CA11F	Char	12		FLAG FOR CA11
CATSU98	Num	8	F8.4	SUM OF CATIONS (UEQ/L)
CL11	Num	8	F8.3	CHLORIDE ION (MG/L) FORM 11
CL98	Num	8	F8.4	CHLORIDE (UEQ/L)
CL11F	Char	12		FLAG FOR CL11
CLSTR99	Num	8	F8.	PHASE II CLUSTER (1, 2 or 3)
CNTY99	Char	5		FIPS CODE (ST, COUNTY)
CO398	Num	8	F8.4	CARBONATE ALKALINITY (UEQ/L)
COLOR02	Num	8	F8.	COLOR (PCU) FORM 2
COLOR02F	Char	12		FLAG FOR COLOR02
COMNTA1D	Char	150		FIRST PART OF COMMENTS FORM 1D
COMNTB1D	Char	150		SECOND PART OF COMMENTS FORM 1D
CON601D	Num	8	F8.	CONDUCTIVITY AT 0.6 * DEPTH (US/CM) FORM 1D
CONCA98	Num	8	F8.4	CALCULATED CONDUCTIVITY (US/CM)
COND11	Num	8	F8.1	CONDUCTIVITY (US/CM) FORM 11

(Continued)

Table 4-3. (Continued)

Variable	Type	Length	Format	SAS Label
COND11F	Char	12		FLAG FQR COND11
CON_B1D	Num	8	F8.	CONDUCT AT BOTTOM-1.5 M (US/CM) FORM 1D
CXX501D	Num	8	F8.	CONDUCTIVITY AT 50 M (US/CM) FORM 1D
DATSH02	Num	8	DATE7.	DATE SHIPPED FORM 2
DATSMP	Num	8	DATE7.	DATE SAMPLED
DIC02	Num	8	F8.3	DIC (MG/L) FORM 2
DIC02F	Char	12		FLAG FOR DIC02
DICE11	Num	8	F8.3	DIC-EQUIL (MG/L) FORM 11
DICE11F	Char	12		FLAG FOR DICE11
DICI11	Num	8	F8.3	DID-INIT (MG/L) FORM 11
DICI11F	Char	12		FLAG FOR DICI11
DISM99	Num	8	F8.	DISTANCE FROM COAST (MILES)
DOC11	Num	8	F8.2	DOC (MG/L) FORM 11
DOC11F	Char	12		FLAG FOR DOC11
DO_151D	Num	8	F8.2	DISSOLVED OXYGEN (MG/L) 1.5 M FORM 1D
DO_601D	Num	8	F8.2	DISSOLVED OXYGEN AT 0.6 * DEPTH FORM 1D
DO_B1D	Num	8	F8.2	DIS OXYGEN (MG/L) BOTTOM-1.5 M FORM 1D
DPCAT1D	Num	8	F8.	DEPTH CATEGORY 4 = <20 M 5 = >20 M FORM 1D
DPSIT1D	Num	8	F8.1	SITE DEPTH (M) FORM 1D
DPSITX1D	Num	8	F8.1	MAXIMUM LAKE DEPTH (M)-ALSC
DP_601D	Num	8	F8.1	DEPTH 0.6 * BOTTOM (M) FORM 1D
DP_B1D	Num	8	F8.1	DEPTH AT BOTTOM-1.5 M (M) FORM 1D
ELEV99	Num	8	F8.1	LAKE ELEVATION (M)
ELEVX99	Num	8	F8. 1	LAKE ELEVATlON (M)-ALSC
FE11	Num	8	F8.3	IRON (UG/L) FORM 11
FE11F	Char	12		FLAG FOR FE11
FTL11	Num	8	F8.4	FLUORIDE (MG/L) FORM 11
FTL98	Num	8	F8.4	FLUORIDE (UEQ/L)
FTL11F	Char	12		FLAG FOR FTL11
H98	Num	8	F8.4	HYDROGEN FROM PHAC11 (UEQ/L)
HCO398	Num	8	F8.4	HCO3 (UEQ/L)
HDEP99	Num	8	F8.3	HYDROGEN ION DEPOSITION (G/M ** 2/YR)
HYDID1D	Char	4		HYDROLAB METER IDENTIFIER CODE FORM 1D
HYTYP99	Char	9		HYDROLOGIC TYPE
INOUT99	Char	6		PRESENCE/ABSENCE OF INLETS/OUTLETS
K11	Num	8	F8.3	POTASSIUM (MG/L) FORM 11
K98	Num	8	F8.4	POTASSIUM (UEQ/L)
K11F	Char	12		FLAG FOR K11
LABNA02	Char	30		LABORATORY FOR ANALYSIS FORM 2
LAKE_ID	Char	7		LAKE IDENTIFICATION NUMBER
LAKNA1D	Char	30		LAKE NAME FORM 1D
LAT99	Char	10		LATITUDE
LATDD99	Num	8	F8.4	LATITUDE (DECIMAL DEGREES)
LKID99	Char	7		ERLD-UMD ID/ALSC WSHED-POND ID
LKNAM99	Char	30		LAKE NAME
LKSIZ99	Num	8	F8.2	LAKE SURFACE AREA (HA)
LKSIZX99	Num	8	F8.2	LAKE SURFACE AREA (HA)-ALSC

(Continued)

Table 4-3. (Continued)

Variable	Type	Length	Format	SAS Label
LKVOL99	Num	8	F8.3	CALC LAKE VOL (10 ** 6 CUM)
LKVOLX99	Num	8	F8.3	DIG. LAKE VOL (10 ** 6 CUM)-ALSC
LNGDD99	Num	8	F8.4	LONGITUDE (DECIMAL DEGREES)
LONG99	Char	11		LONGITUDE
MAPBG99	Char	25		MAP SHEET NAME (1:250,000 SCALE)
MAPSM99	Char	40		MAP SHEET NAME, 15 OR 7.5 QUAD
MG11	Num	8	F8.3	MAGNESIUM (MG/L) FORM 11
MG98	Num	8	F8.4	MAGNESIUM (UEQ/L)
MG11F	Char	12		FLAG FOR MG11
MN11	Num	8	F8.3	MANGANESE (UG/L) FORM 11
MN11F	Char	12		FLAG FOR MN11
NA11	Num	8	F8.3	SODIUM (MG/L) FORM 11
NA98	Num	8	F8.4	SODIUM (UEQ/L)
NA11F	Char	12		FLAG FOR NA11
NH411	Num	8	F8.3	AMMONIUM ION (MG/L) FORM 11
NH498	Num	8	F8.4	AMMONIUM (UEQ/L)
NH411F	Char	12		FLAG FOR NH411
NO311	Num	8	F8.4	NITRATE ION (MG/L) FORM 11
NO398	Num	8	F8.4	NITRATE (UEQ/L)
NO311F	Char	12		FLAG FOR NO311
NO3DP99	Num	8	F8.2	NITRATE DEPOSITION (G/M ** 2/YR)
NVLAK1D	Char	1		NON-VARIABILITY LAKE (Y OR N) FORM 1D
OBSID1D	Char	6		OBSERVER ID NUMBER FORM 1D
ORGIO98	Num	8	F8.4	ORGANIC ANION (UEQ/L)
PH0151D	Num	8	F8.2	PH AT 1.5 M FORM 1D
PH0151DF	Char	12		FLAG FOR PH0151D
PH02	Num	8	F8.2	STATION PH FORM 2
PH02F	Char	12		FLAG FOR PH02
PHAC11	Num	8	F8.2	ACIDITY INITIAL PH FORM 11
PHAC11F	Char	12		FLAG FOR PHAC11
PHAL11	Num	8	F8.2	ALKALINITY INITIAL PH FORM 11
PHAL11F	Char	12		FLAG FOR PHALl 1
PHEQ11	Num	8	F8.2	AIR-EQUILIBRATED PH FORM 11
PHEQ11F	Char	1		FLAG FOR PHEQ11
PH_601D	Num	8	F8.2	PH AT 0.6 * DEPTH FORM 1D
PH_BlD	Num	8	F8.2	PH AT BOTTOM-1.5 M FORM 1D
PRCIP99	Num	8	F8.3	PRECIPITATION (M/YR)
PREC1D	Char	5		PRECIPITATION FORM 1D
PRECOlD	Char	7		PRECIPITATION OBS (PRE/CURRENT) FORM 1D
PTL11	Num	8	F8.4	TOTAL PHOSPHORUS (UG/L) FORM 11
PTL11F	Char	12		FLAG FOR PTL11
RGSPC99	Char	16		REG SPEC LTM NRC DEW DER SAMPLE CLASS
RPREC1D	Char	8		RATE OF PRECIPITATION FORM 1D
RT99	Num	8	F8.3	RESIDENCE TIME (YR)
RTX99	Num	8	F8.3	RESIDENCE TIME (YR)-ALSC

RUNIN99	Num	8	F8.	ANNUAL RUNOFF INCHES FROM DIGIT MAP
RUNOF99	Num	8	F8.3	SURFACE WATER RUNOFF (M/YR)

Table 4-3. (Continued)

Variable	Type	Length	Format	SAS Label
RUNOFX99	Num	8	F8.3	SURFACE WATER RUNOFF (M/YR)-ALSC
SAMBL1D	Num	8	F8.	SAMPLE ID FOR BLANK FORM 1D
SAMCD02	Char	10		SAMPLE CODE FORM 2
SAMDP1D	Num	8	F8.	SAMPLE ID DUPLICATE FORM 1D
SAMID11F	Char	12		FLAG FOR SAM ID FORM 11
SAMRT1D	Num	8	F8.	SAMPLE ID ROUTINE FORM 1D
SAM_ID	Num	8	F8.	SAMPLE IDENTIFICATION NUMBER
SBRGN99	Char	1		NSWS SUBREGION
SCBLK1D	Char	1		BLANK SAMPLE COLLECTED AT 1.5 M FORM 1D
SCD151D	Char	1		DUPLICATE SAMPLE COLL AT 1.5 M FORM 1D
SCR151D	Char	1		ROUTINE SAMPLE COLL AT 1.5 M FORM 1D
SECDI1D	Num	8	F8.1	SECCHI DEPTH:DISAPPEAR (M) FORM 1D
SECDV1D	Char	1		SECCHI DEPTH Y=VISIBLE TO BOTTOM FORM 1D
SECME98	Num	8	F8.1	MEAN:SECCHI DISK DISAPPEAR, REAPPEAR (M)
SECRElD	Num	8	F8.1	SECCHI DEPTH:REAPPEAR (M) FORM 1D
SIO211	Num	8	F8.3	SILICA (MG/L) FORM 11
SIO211F	Char	12		FLAG FOR SIO211
SITETYP	Char	9		SAMPLING SITE OR TYPE CODE
SO411	Num	8	F8.3	SULFATE ION (MG/L) FORM 11
SO498	Num	8	F8.4	SULFATE (UEQ/L)
SO411F	Char	12		FLAG FOR SO411
SO4DP99	Num	8	F8.2	SULFATE DEPOSITION (G/M ** 2/YR)
SOBC98	Num	8	F8.4	SUM OF BASE CATIONS (UEQ/L)
SPRID1D	Char	6		SAMPLER ID NUMBER FORM 1D
ST99	Char	2		STATE (IWO-LETTER ABBREV)
STRAT99	Char	3		NSWS STRATA
T04051D	Num	8	F8.1	TEMPERATURE AT 4 OR 5 M (DEGC) FORM 1D
T06101D	Num	8	F8.1	TEMPERATURE AT 6 OR 10 M (DEGC) FORM 1D
T08151 D	Num	8	F8.1	TEMPERATURE AT 8 OR 15 M (DEGC) FORM 1D
T10201 D	Num	8	F8.1	TEMPERATURE AT 10 OR 20 M (DEGC) FORM 1D
T12251D	Num	8	F8.1	TEMPERATURE AT 12 OR 25 M (DEGC) FORM 1D
T14301D	Num	8	F8.1	TEMPERATURE AT 14 OR 30 M (DEGC) FORM 1D
T16351D	Num	8	F8.1	TEMPERATURE AT 16 OR 35 M (DEGC) FORM 1D
T18401D	Num	8	F8.1	TEMPERATURE AT 18 OR 40 M (DEGC) FORM 1D
T20451D	Num	8	F8.1	TEMPERATURE AT 20 OR 45 M (DEGC) FORM 1D
TIMSM1D	Num	8	TIMES.	TIME SAMPLED (24H) HH:MM FORM 1D
TM0151D	Num	8	F8.1	TEMPERATURE (DEGC) AT 1.5 M FORM 1D
TM P601D	Num	8	F8.1	TEMPERATURE AT 0.6 * DEPTH (DEGC) FORM 1D
TMPA1D	Num	8	F8.	AIR TEMPERATURE (DEGC) FORM 1D
TMPD11D	Num	8	F8.1	TEMP DIF 1.5 M-BOTTOM (DEGC) FORM 1D
TMPD21D	Num	8	F8.1	TEMP DIF 1.5 M-0.6 * DEPTH (DEGC) FORM 1D
TMP_B1D	Num	8	F8.1	TEMP AT BOTTOM-1.5 M (DEGC) FORM 1D
TUR02	Num	8	F8.2	TURBIDITY (NTU) FORM 2

TUR02F	Char	12		FLAG FOR TUR02
TXX501D	Num	8	F8.1	TEMPERATURE AT 50 M (DEGC) FORM 1D
VISIT1D	Num	8	F8.	VISIT FORM 1D
WALA99	Num	8	F8.2	WATERSHED AREA/LAKE AREA

(Continued)

Table 4-3. (Continued)

Variable	Type	Length	Format	SAS Label
WALAX99	Num	8	F8~2	WATERSHED AREA/LAKE AREA-ALSC
WDIR1D	Char	3		ESTIMATED WIND DIRECTION FORM 1D
WSDIS99	Char	8		D)WELL I)ND L)OG M)INE R)OAD S)TOCK
WSHED99	Num	8	F8.3	WATERSHED AREA (HA)
WSHEDX99	Num	8	F8.3	WATERSHED AREA (HA)-ALSC
WSOTH99	Char	25		DISTURB W/1 100 M-OTHER
WSPD1D	Char	8		ESTIMATED WIND SPEED FORM 1D
WT1M99	Num	8	F8.3	MODIFIED PHASE I WEIGHT
WT1O_99	Num	8	F8.3	ORIGINAL PHASE I WEIGHT
WT2C99	Num	8	F8.4	CONDITIONAL PHASE II WEIGHT
WT2T99	Num	8	F8.3	TOTAL PHASE II WEIGHT

SECTION 5
DEFINITIONS OF VARIABLES

Table 5-1 provides units of measure and extended definitions for variables in the reduced validated (DS3B) and final (DS4A) ELS-II data sets. The seasonal surveys in which each variable appears are indicated under the following headings:

- SPS Spring Seasonal Survey
- SUS Summer Seasonal Survey
- FAS Fall Seasonal Survey

Table 5-1 also provides the name of the corresponding variable in the ELS-I database, as documented in the ELS-I data dictionary (Kanciruk et al., 1986). Tag and flag variables (coded as varT or varF) are not included in Table 5-1, as their definitions would always be "tag (or flag) for variable X" (see Section 6). In situ measurements are described by Kerfoot and Faber (1986) and Bonoff and Groeger (1986). EPA methods are from EPA (1983,1987). Processing laboratory operations and methods are described in Arent et al. (1988).

DROP CODE VARIABLE

A drop code variable (DRPCDE) has been added to each enhanced seasonal data set to facilitate making population estimates. Using this variable, it is possible to eliminate different subsets of lakes in the database that are not used in making population estimates. The DRPCDE variable is numeric, with the following values:

- 0 = ELS-II target population sample
- 1 = Non-ELS-I index location (fall variability study)
- 2 = Hypolimnion or bottom water sample (summer data)
- 3 = Non-ELS-II target lake

This variable is useful because the ELS-II database contains data for lakes that are not among the 145 target ELS-II lakes used to make estimates of the 3,993 lakes in the ELS-II target population. Nontarget lakes have been assigned a DRPCDE value of 3. The summer data set contains hypolimnetic data for stratified lakes. In the ELS, index samples were defined as epilimnetic samples, so hypolimnetic data were not used as index values. Some lakes in the fall data set were visited two additional times, at independently selected points believed to be the deepest part of the lake, to examine within-season and site selection variability. The lake visit marked with SITETYP = 'V2' or SITETYP = 'NV' (nonvariability lake) was made to the site on the lake where the ELS-I sample was collected and is considered to be the "fall index sample" for seasonal comparisons. Other fall visits were not used to make ELS-II seasonal population estimates and thus were assigned a DRPCDE=1. In three lakes (1A1-008, 1A1-070, 1A3-046), a SITETYP = 'V2' sample was not collected, thus the visit with SITETYP = 'Vi' was considered to be the fall index sample and has a DRPCDE=0. Thus, to get the 145 target ELS-II lake index samples for each seasonal data set, it is necessary to exclude all observations with a DRPCDE > 0.

Table 5-1. Definition of Variables, U.S. EPA Eastern Lake Survey - Phase II

Variable Name	Phase I Name	SPS	SUS	FAS	Units	Definition
ACCES1D			X	X		Mode by which lake was accessed: H = helicopter, D = direct vehicle, W = wilderness.
ACCOl1	ACCOl1	X	X	X	μeq/L	Carbon dioxide acidity (or base neutralizing capacity) is the measured acidity in a sample due to dissolved CO_2, hydronium, and other acids. Measured in the analytical laboratory using base titration and Gran analysis.
ALD02		X	X	X	μg/L	Total monomeric aluminum as determined by pyrocatechol violet (PCV) colorimetry in the processing laboratory.
ALDI98		X	X	X	μg/L	Inorganic (labile) monomeric aluminum, determined by difference: ALDI98 = ALD02 - ALO_02.
ALEX11	ALEX11	X	X	X	μg/L	Extractable aluminum (an estimate of monomeric aluminum complexes) determined by complexation with 8-hydroxyquinoline and extraction with methyl-isobutyl ketone (MIBK) in the processing laboratory. The extract was then analyzed in the analytical laboratory using the method described by Hillman et al. (1986).
ALKAl1	ALKAl 1	X	X	X	μeq/L	Acid neutralizing capacity is a measure of the amount of acid necessary to neutralize the carbonate species, hydroxide, and other bases in a sample. Determined in the analytical laboratory in an unfiltered, unacidified aliquot, using acidimetric titration and modified Gran analysis (Hiliman et al., 1986; Kramer, 1984).
ALO_02		X	X	X	μg/L	Organic (nonexchangeable) monomericaluminum as determined by pyrocatechol violet (PCV) colorimetry and the use of a strong cation exchange column in the processing laboratory.
ALTL11	ALTL11	X	X	X	μg/L	Total aluminum, measured in the analytical laboratory in an unfiltered, acidified (HNO_3) aliquot, using EPA method 202.2 (AAS, atomic absorption spectroscopy, graphite furnace).
ANCAT98	ANCAT	X	X	X		Ratio of measured cations to measured anions: ANCAT98 = CATSU98/ANSUM98

(Continued)

Table 5-1. (Continued)

Variable Name	Phase I Name	SPS	SUS	FAS	Units	Definition
ANDEF98	ANDEF	X	X	X	μeq/L	Anion deficit is the measured cations minus the measured anions: ANDEF98 = CATSU98 - ANSUM98.
ANSUM98	ANSUM	X	X	X	μeq/L	Sum of major anion concentrations: ANSUM98 CL98 + FTL98 + N0398 + HC0398 + C0398 + S0498.
BAT_ID	BAT_ID	X	X	X		Batch identification number; lakewater and QA samples processed and analyzed together were given common batch numbers. Numeric variable in ELS-II, character variable in ELS-I.
BNSTR99	BNSTAR	X	X	X		Number of lakes identified in the ELS-I stratum (see STRAT99) from the USGS 1:250,000-scale maps. Lakes to be sampled were randomly selected to represent this frame population. <u>Profile Measurements</u> Specific conductance profile measurements were taken when TMPD21D > 4^0C. Profile measurement depths were determined by maximum lake depth measured (DPSIT1D). For the spring and fall surveys, if DPSIT1D < 20 m, profile measurements were taken at 4 m, and at 2-m increments to the bottom. If DPSIT1D > 20 m, the profile was taken at 5 m, and at 5-m increments to the bottom. For the summer survey, measurements were taken at 0.5 m and at 1-m increments to 10.5 m, there after at 2-m increments to 38.5 m.
C0051D				X	μS/cm	Conductivity at 0.5 m.
C0151D		X	X	X	μS/cm	Conductivity at 1.5 m.
C0251D			X		μS/cm	Conductivity at 2.5 m.
C0351D			X		μS/cm	Conductivity at 3.5 m.
C04051D	CON_1	X		X	μS/cm	Conductivity at 4 m (DPSIT1D < 20) or 5 m (DPSIT1D > 20).
C0451D			X		μS/cm	Conductivity at 4.5 m.
C0551D			X		μS/cm	Conductivity at 5.5 m.

(Continued)

Table 5-1. (Continued)

Variable Name	Phase I Name	SPS	SUS	FAS	Units	Definition
C06101D	CON_2	X		X	μS/cm	Conductivity at 6 m (DPSIT1D < 20) or 10 m (DPCSI1D > 20).
C0651D			X		μS/cm	Conductivity at 6.5 m.
C0751D			X		μS/cm	Conductivity at 7.5 m.
C08151D	CON_3	X		X	μS/cm	Conductivity at 8 m (DPSIT1D < 20) or 15 m (DPCSI1D > 20).
C0851D			X		μS/cm	Conductivity at 8.5 m.
C0951D			X		μS/cm	Conductivity at 9.5 m.
C10201D	CON_4	X		X	μS/cm	Conductivity at 10 m (DPSIT1D< 20) or 20 m (DPSIT1D > 20).
C1051D				X	μS/cm	Conductivity at 10.5 m.
C12251D	CON_5	X		X	μS/cm	Conductivity at 12 m (DPSITlD < 20) or 25 m (DPSIT1D > 20).
C1251D			X		μS/cm	Conductivity at 12.5 m.
C14301D	CON_6	X		X	μS/cm	Conductivity at 14 m (DPSIT1D < 20) or 30 m (DPSIT1D > 20).
C1451D				X	μS/cm	Conductivity at 14.5 m.
C16351D	CON_7	X		X	μS/cm	Conductivity at 16 m (DPSIT1 D < 20) or 35 m (DPSIT1D > 20).
C1651D			X		μS/cm	Conductivity at 16.5 m.
C18401D	CON_8	X		X	μS/cm	Conductivity at 18 m (DPSIT1D< 20) or 40 m (DPSIT1D > 20)
C1851D			X		μS/cm	Conductivity at 18.5 m.
C20451 D	CON_9	X		X	μS/cm	Conductivity at 20 m (DPSIT1D < 20) or 45 m (DPSIT1D > 20).
C2051D			X		μS/cm	Conductivity at 20.5 m.
C2251D			X		μS/cm	Conductivity at 22.5 m.
C2451D			X		μS/cm	Conductivity at 24.5 m.
C2651D			X		μS/cm	Conductivity at 26.5 m.

(Continued)

Table 5-1. (Continued)

Variable Name	Phase I Name	SPS	SUS	FAS	Units	Definition
C2851D			X		μS/cm	Conductivity at 28.5 m.
C3051D			X		μS/cm	Conductivity at 30.5 m.
C3251D			X		μS/cm	Conductivity at 32.5 m.
C3451D			X		μS/cm	Conductivity at 34.5 m.
C3851D			X		μS/cm	Conductivity at 36.5 m.
C3851D			X		μS/cm	Conductivity at 38.5 m.
CXX501D	CON_10	X		X	μS/cm	Conductivity at 50 m.
CA11	CA11	X	X	X	mg/L in	Dissolved calcium, measured in the analytical laboratory filtered, acidified (HNO_3) aliquot (EPA method 215.1, AAS, flame).
CA98	Cal6	X	X	X	μeq/L	Dissolved calcium: CA98 = CAll * 49.90 μeq/mg.
CATSU98	CATSUM	X	X	X	μeq/L	Summation of major cation concentrations: CATSU98 = CA98 + MG98 + NA98 + K98 + NH498 + H98.
CHLOD1D			X		mL	Volume of duplicate sample for chlorophyll analysis.
CHLOR1D			X		mL	Volume replicate sample for chlorophyll analysis.
CL11	CL11	X	X	X	mg/L	Chloride ion, measured in the analytical laboratory by ion chromatography in a filtered, unacidified aliquot (ASTM, 1984; O'Dell et al., 1984).
CL98	CL16	X	X	X	μeq/L	Chloride ion: CL98 = CL11 * 28.21 μeq/mg.
CLSTR99		X	X	X		Phase II cluster: 1, 2 or 3.
CNTY99	COUNTY	X	X	X		Federal Information Processing Standard (USDC, 1979) state and county code.
CO398	CO31 6	X	X	X	μeq/L	Carbonate, an estimate (Butler, 1982) of: $CO_3^{2-} = \frac{4.996 \times [DIC\ mg/L] \times K_1K_2}{[H^+]^2 + \{H^+]K_1 + K_1K_2}$

Table 5-1. (Continued)

Variable Name	Phase I Name	SPS	SUS	FAS	Units	Definition
						which is coded as: CO398 = 60009* (DICIl1/12011)*ALPHA2*33.33 Where: ALPHA2 = K1* K2/((10**(-PHAC11)) **2 + (10**-PHAC11)*K1 + K1*K2); and K1 = 4.3 x 10^{-7}, and K2 = 5.61 x 10^{-11}.
COLOR02	COLVAL	X	X	X	PCU	True color measured in the processing laboratory by first centrifuging the sample to remove particles, then using a HACH Model CO-1 Comparator (EPA method 110.2, modified).
COMNT1DA	COMMNT		X			Comment from Form 1D, first part.
COMNT1DB	COMMNT		X			Comment from Form 1D, second part.
COMNTA1D	COMMNT			X		Comment from Form 1D, first part.
COMNTB1D	COMMNT			X		Comment from Form 1D, second part.
CON601D	CON_60	X		X	μS/cm	Conductivity at 0.6 * site depth (DPSIT1D).
CONCA98	CONCAL	X	X	X	μS/cm	Calculated conductance, sum of the products of ion concentration times equivalent conductance. Coded as: CONCA98 = [(CA98*59.47) + (MG98*53.0) +(K98*73.48) + (NA95*50.08) + (NH498*73.5) + (H98*349.65) + (SO498*80.0) + (HCO398*44.5) + (CL98*76.31) + (NO398*71 .42) + (FTL98*55.4) + (CO398*69.3) + (OH*198)J/1000. This calculation converts μeq/L to μS/cm.
COND11	COND11	X	X	X	μS/cm	Specific conductance, measured in the analytical laboratory using a conductivity cell (EPA method 120.1).
CONMH1D			X		μS/cm	Conductivity at the mid-hypolimnetic depth.
CONMM1D			X		μS/cm	Conductivity at the mid-metalimnetic depth.
CONTH1D			X		μS/cm	Conductivity at the top-hypolimnetic depth.
CON_B1D		X	X	X	μS/cm	Conductivity at bottom - 1.5 m.

CRWID1D	CRW_ID		X			Lake sampling crew identification number.

(Continued)

Table 5-1. (Continued)

Variable Name	Phase I Name	SPS	SUS	FAS	Units	Definition
DATSH02	DATSHP	X	X	X		Date samples were shipped from processing laboratories to the analytical laboratories.
DATSH1D	DATSHP	X				Date samples were shipped from processing laboratory to the analytical laboratories.
DATSMP	DATSMP	X	X	X		Date lake was sampled.
DIC02	DICVAL	X	X	X	mg/L	Dissolved inorganic carbon, measured in the processing laboratory on a sample drawn directly into a syringe from the Van Dorn water sampler, filtered, and analyzed without exposure to the atmosphere, using a DOHRMANN DC-80 carbon analyzer with infrared spectrophotometric detector (EPA method 415.2, modified).
DICE11	DICE11	X	X	X	mg/L	Air-equilibrated dissolved inorganic carbon, measured in the analytical laboratory in an unfiltered, unacidified aliquot bubbled with 300 ppm CO_2, drawn into a syringe, filtered, and atmosphere analyzed without exposure to the (EPA method 415.2 modified, infrared spectro-photometric detector).
DICI11	DICI11	X	X	X	mg/L	Dissolved inorganic carbon, measured in the analytical laboratory in an unfiltered, unacidified aliquot. The sample was drawn into a syringe, filtered, and analyzed without exposure to the atmosphere (EPA method 415.2 modified, infrared spectrophotometric detector).
DISM99	DISM	X	X	X	miles	Distance of the lake from the Atlantic Ocean. A calculated variable for lakes within 125 miles from the coastline (otherwise value is missing). Note that the units are in miles. DISM units were incorrectly labeled as km in ELS-I.
DOC11	DOC11	X	X	X	mg/L	Dissolved organic carbon, measured in the analytical laboratory in a filtered, acidified (H_2S0_4) aliquot (EPA method 415.2, infrared spectrophotometric detector).

Table 5-1. (Continued)

Variable Name	Phase I Name	SPS	SUS	FAS	Units	Definition
DOFIAlD			X			Dissolved oxygen final actual calibration value form 1D.
DOFIT1D			X			Dissolved oxygen final theoretical calibration value form 1D.
DOINT1D			X			Dissolved oxygen initial theoretical calibration value form 1D.
DOMH1D			X			Dissolved oxygen at the mid-hypolimnetic depth.
DOMM1D			X			Dissolved oxygen at the mid-metalimnetic depth.
DOTH1D			X			Dissolved oxygen at the top-hypolimnetic depth.
DO_051D			X			Dissolved oxygen at 0.5 m.
DO_151D		X	X	X		Dissolved oxygen at 1.5 m.
DO_601D		X		X		Dissolved oxygen at 0.6* depth.
DO_B1D		X	X	X		Dissolved oxygen at bottom - 1.5 m.
DPCAT1D	DP_ CAT	X	X	X		Lake depth category, 4 (if DPSIT1D ≤ 20 m) or 5 (if DPSIT1D > 20m).
DPMH1D			X		m	Mid-hypolimnetic depth.
DPMM1D			X		m	Mid-metalimnetic depth.
DPSCB1D			X		m	Depth sample collected at bottom - 1.5 m.
DPSCM1D			X		m	Depth sample collected at mid-hypolimnetic depth (m).
DPSITID	SITDPM	X	X	X		Sampling site depth, measured using a depth sounder or weighted line. Not necessarily maximum lake depth.
DPSITX1D		X	X	X	m	Maximum lake depth from ALSC bathymetry.
DPTH1D			X		m	Top hypolimnetic depth.

Table 5-1. (Continued)

Variable Name	Phase I Name	SPS	SUS	FAS	Units	Definition
DP_601D	DP_60	X		X	m	Sixty percent of site depth: 0.6 * DPSIT1D.
DP_B1D	DP_B	X	X	X	m	Depth at which bottom temperature/conductance was measured: DP_B = DPSIT1D - 1.5 m.
DRPCDE		X	X	X		Drop code variable used to exclude nontarget observations. Coded as: 0=ELS-II target population sample, 1 = non-ELS-I index location (Fall Variability Study), 2=hypolimnion or bottom water sample (summer data), 3=non- ELS-II target lake. Only present in the enhanced (final) seasonal data sets.
ELEV99	ELEV	X	X	X	m	Lake elevation, taken from USGS topographic maps (Subregion 1 D values revised from those in ELS-I).
ELEVX99		X	X	X	m	Lake elevation from ALSC data.
FE11	FE11	X	X	X	μg/L	Dissolved iron, measured in the analytical laboratory in a filtered, acidified (HNO_3) aliquot (EPA method 236.1, AAS, flame).
FTL11	FTL11	X	X	X	mg/L	Total dissolved fluoride, measured in the analytical laboratory in a filtered, unacidified aliquot, analyzed using an ion-selective electrode (ISE, EPA method 340.2, modified).
FTL98	FTL16	X	X	X	μeq/L	Total dissolved fluoride: FTL98 = FTL1 1*52.64 μeq/mg.
H98	H16	X	X	X	μeq/L	Hydrogen ion concentration: coded as H98 = (10**(-PHAC11))*1000000.
HCO398	HCO316	X	X	X	μeq/L	Bicarbonate, an estimate (Butler, 1982) of: $HCO_{3\sim} = \frac{5.080 \times [DIC mg/L] \times [H+]K_1}{[H^+]^2 + [H^+]K_1 + K_1K_2}$ which is coded as: HCO398 = 61017 * (DICIl1/12011) * ALPHAl * 16.39; where ALPHA1 = ((10**(-PHAC11))*K1)/((10** (-PHAC11))**2 + (10**-PHAC11)*K1 + K1* K2); and K1 = 4.3x $10^{-7,}$ and K2 = 5.61 x 10^{-11}.

(Continued)

Table 5-1. (Continued)

Variable Name	Phase I Name	SPS	SUS	FAS	Units	Definition
HDEP99	HDEP	X	X	X	g/m^2	Average annual wet hydrogen ion deposition, derived from 1980-1982 Acid Deposition System data (Watson and Olsen, 1984). Deposition values for lakes were assigned by contouring both the hydrogen ion concentrations measured in precipitation and the precipitation volumes (see PRCIP99), interpolating values for 3.75 minute latitudel/longitude cells, and multiplying these paired cell values.
HYDID1D	HYD_ID	X	X	X		Identification number for the HYDROLAB meter used for field measurements
HYTYP99	HYDROTYP	X	X	X		Hydrologic lake type, defined from geographic data. Classes are: CLOSED, DRAINAGE, RESERVOIR, and SEEPAGE
INOUT99	IN_OUT	X	X	X		Presence and/or absence of inlets and outlets, as determined from topographic maps: I/O = inlets and outlets present; NI/O = no inlets, outlets present; I/NO = inlets present, no outlets; NI/NO no inlets or outlets; RES = reservoir.
K11	K11	X	X	X	mg/L	Dissolved potassium, measured in the analytical laboratory in a filtered, acidified (HNO_3) aliquot (EPA method 258.1,AAS, flame).
K98	K16	X	X	X	μeq/L	Dissolved potassium: K98 = Ki 1*25.57 μeq/mg.
LABNA02	LABNAM	X	X	X		Name of the analytical laboratory that performed the analytical analyses.
LAKE ID	LAKE_ID	X	X	X		Seven-character unique identification code assigned to each lake. The first character represents the region (1, 2, or 3); the second character, the subregion; the third character, the alkalinity map class; a dash; and the last three digits are the assigned lake number. The first three characters also designate the stratum (see STRAT99).

(Continued)

Table 5-1. (Continued)

Variable Name	Phase I Name	SPS	SUS	FAS	Units	Definition
LAKNA1D	LAKENAME	X	X	X		Lake name taken from USGS topographic maps. When a number of small lakes were identified by only one name on the map, another qualifier was added to the name, such as "southern," to identify the lake. Where no name was listed, "(NO NAME)" was entered into the database as the lake name.
LAT99	LAT	X	X	X		Latitude taken from the USGS topographic maps in DD-MM-SS (degrees-minutes-seconds) format.
LATDD99	LAT_DD	X	X	X	deg	Latitude expressed as degrees and decimal degrees in DD.DDDD format.
LKID99	LAKEID1	X	X	X		ELS LAKE_ID cross reference with Adirondack Lake Survey Corporation (ALSC) ponds identification code (else missing).
LKNAM99		X	X	X		Lake name taken from USGS topographic maps. When a number of small lakes were identified by only one name on the map, another qualifier was added to the name, such as "southern," to identify the lake. Where no name was listed, "(NO NAME)" was entered into the database as the lake name.
LKSIZ99	LAKE_SIZ	X	X	X	ha	Lake surface area, measured using an electronic planimeter on USGS topographic maps.
LKSIZX99		X	X	X	ha	Lake surface area from ALSC bathymetry.
LKVOL99	LAKE_VOL	X	X	X	$10^6 m^3$	Estimated lake volume: LKVOLO9 = ((LKSIZ99*10**4)*DPSIT1D*0.464)/10**6.
LKVOLX99		X	X	X	10^6 m^3	Lake volume from ALSC bathymetry.
LNGDD99	LONG_DD	X	X	X	deg	Longitude expressed as degrees and decimal degrees in DDD.DDDD format.
LONG99	LONG	X	X	X		Longitude as read from the USGS topographic maps, in DDD-MM-SS format.
MAPBG99	MAP_BIG	X	X	X		Name of the 1:250,000 USGS topographic map on which the lake is located.

(Continued)

Table 5-1. (Continued)

Variable Name	Phase I Name	SPS	SUS	FAS	Units	Definition
MAPSM99	MAP_SML	X	X	X		Name of the 15 minute or 7.5 minute USGS topographic map on which the lake is located.
MG11	MG11	X	X	X	mg/L	Dissolved magnesium, measured in the analytical laboratory in a filtered, acidified (HNO3) aliquot (EPA method 242.1, AAS, flame).
MG98	MG16	X	X	X	μeq/L	Dissolved magnesium: MG98 = MG11*82.26 μeq/mg.
MN11	MN11	X	X	X	μg/L	Dissolved manganese, measured in the analytical laboratory in a filtered, acidified (HNO_3) aliquot (EPA method 243.1, AAS, flame).
NA11	NA11	X	X	X	mg/L	Dissolved sodium, measured in the analytical laboratory in a filtered, acidified (HNO_3) aliquot (EPA method 273.1,AAS, flame).
NA98	NA16	X	X	X	μeq/L	Dissolved sodium: NA98 = NAl 1*43.50 μeq/mg.
NH411	NH411	X	X	X	mg/L	Ammonium ion, measured in the analytical laboratory in a sample from the filtered, acidified (H_2SO_4) aliquot (EPA method 350.1, colorimetric, automated).
NH498	NH416	X	X	X	μeq/L	Ammonium ion: NH498 = NH41 1*55.44 μeq/mg.
NO311	NO311	X	X	X	mg/L	Nitrate ion, measured in the analytical laboratory by ion chromatography in a filtered, unacidified aliquot (ASTM, 1984; O'Dell et al., 1984).
NO398	NO316	X	X	X	μeq/L	Nitrate ion: N0398 = N0311*16.13 μeq/mg.
NO3DP99	NO3DEP	X	X	X	g/m^2	Average annual nitrate ion deposition, derived from 1980-1982 Acid Deposition System data (Watson and Olsen, 1984). Lake deposition values were assigned by contouring both the nitrate ion concentrations measured in precipitation and the precipitation volumes (see PRCIP99), interpolating values for 3.75 minute latitude/longitude cells, and multiplying these paired cell values.
NVLAK1D				X		Non-Fall Variability Study lake OR N).

(Continued)

Table 5-1. (Continued)

Variable Name	Phase I Name	SPS	SUS	FAS	Units	Definition
OBSID1D				X		Identification number of the observer.
ORG1O98	ORGION	X	X	X	μeq/L	Estimate of the organic anion concentration: ORG1O98 = K*CT/(K + (10**(-PHAC11))); where: K = 10**(-Pk); CT = DOC11*10; and PK = 0.96 + 0.9*PHAC11 - 0.039*PHAC11 **2.
PH0051D			X		pH	pH measurement at 0.5 m.
PH0151D		X	X	X	pH	pH measurement at 1.5 m.
PH02		X	X	X	pH	pH measured in the processing laboratory on a sample drawn directly into a syringe from the Van Dorn water sampler, analyzed without exposure to the atmosphere. PH02 is the pH variable used to make ELS-II population estimates.
PHAC11	PHAC11	X	X	X	pH	Initial pH from the acidity titration, measured in the analytical laboratory. A sample from an unfiltered, unacidified aliquot was placed into a CO_2 free titration vessel and stirred. The pH was measured with an electrode (without exposure to the atmosphere) before addition of base titrant.
PHAL11	PHAL11	X	X	X	pH	Initial pH from the alkalinity titration, measured in the analytical laboratory. A sample from the unfiltered, unacidified aliquot was placed into a titration vessel (not CO_2 free) and stirred. The pH was measured with an electrode before the first addition of acid titrant.
PHEQ11	PH EQ11	X	X	X	pH	Air-equilibrated pH, measured in the analytical laboratory in an unfiltered, unacidified aliquot bubbled with 300 ppm CO_2. (EPA method 150.1, electrode).
PHMH1D			X		pH	pH at mid-hypolimnetic depth.
PHMM1D			X		pH	pH at mid-metalimnetic depth.
PHTH1D			X		pH	pH at top-hypolimnetic depth.
PH_601D	PH_60	X		X	pH	pH at 0.6 * DPSIT1D.

(Continued)

Table 5-1. (Continued)

Variable Name	Phase I Name	SPS	SUS	FAS	Units	Definition
PH_B1D	PH_B	X	X	X	pH	pH at DPSIT1D - 1.5 m.
PRCIP99	PRECIP	X	X	X	m/yr	Annual precipitation. For ELS Region 1, derived from 30-year precipitation norm values (1951-1980) for 500 stations (National Climate Center, NOAA). Values were assigned for each lake by contouring the precipitation volume data and interpolating values for 3.75 minute latitude/longitude cells. Precipitation cell values were used to weight the H^+, SO_4^{2-}, and NO_3 concentrations in precipitation samples.
PREC1D		X	X	X		Observed precipitation: none, rain, snow or sleet.
PRECOlD			X	X		'Previous' or 'current' observed precipitation (see PREC1D).
PYLl 1	PTL11	X	X	X	μg/L	Total phosphorous, measured in the analytical laboratory in an unfiltered, acidified (H_2SO_4) aliquot, using either of two automated, colormetric phosphomolybdate methods: for normal phosphorus levels, using a 15-mm absorption cell; for low levels, a preliminary method using 50-mm absorption cell was employed (USGS method 1-4600-78).
RGSPC99	REG_SPC	X	X	X		Reason for lake being sampled: REGULAR = part of the probability sample. REG/SPC/XXX = part of the probability sample, but also identified as being of special interest. SPC/XXX = of special interest only. The 'XXX' gives the reason for the special interest: XXX codes: LTM = an EPA long-term monitoring lake NRC = suggested by the National Research Council DEW = suggested by the state of New Jersey
RPREC1D		X	X	X		Rate of observed precipitation: light, moderate, or heavy.

(Continued)

Table 5-1. (Continued)

Variable Name	Phase I Name	SPS	SUS	FAS	Units	Definition
RT99	RT	X	X	X	yr	Estimated hydraulic residence time, defined as years required to replace the volume of the lake. Calculated only or drainage lakes and reservoirs (see HYTYP99). RT99 - $\frac{\text{LA x site depth}}{\text{runoff x (WSA - LA) + (precip x LA)}}$ where: WSA = watershed area; LA = lake area. Coded as: RT99 = ((LKSIZ99*10**4) * (DPSIT1D*0.464))/(((RUNIN99*2.54* 10**-2) * ((WSHED99*10**4) - (LKSIZ99*10**4))) + ((LKSIZ99*1 0**4)*(PRCIP99))).
RTX99		X	X	X	yr	Residence time from ALSC bathymetry.
RUNIN99	RUNIN	X	X	X	in/yr	Surface water runoff interpolated from USGS map.
RUNOF99	RUNOFF	X	X	X	m/yr	Surface water runoff interpolated from USGS map (Busby, 1966). RUNOF99 = RUNIN99* 0.025 rn/in.
RUNOFX99		X	X	X	rn/yr	Surface water runoff from ALSC data.
SAMBL1D			X	X		Identification number for blank sample.
SAMBT1D			X			Identification number for blank sample at bottom - 1.5 rn.
SAMCD02	SAMCOD	X	X	X		Sample code indicating the type of sample: R = routine sample, D = duplicate sample, TD = processing lab duplicate, B = deionized water blank, S = lab split.
SAMD11D			X			First duplicate sample identification number (see SAM_ID).
SAMD21D			X			Second duplicate sample identification number (see SAM_ID).

(Continue)

Table 5-1. (Continued)

Variable Name	Phase I Name	SPS	SUS	FAS	Units	Definition
SAMDP1D				X		Duplicate sample identification number (see SAM_ID).
SAMMH1D			X			Sample ID mid-hypolimnetic depth (6H11)
SAMRT1D				X		Routine sample identification number (see SAM_ID).
SAMSF1D			X			Sample ID surface - 1.5 m (6E11)
SAM_ID	SAM_ID	X	X	X		Identifies individual samples within a batch (see BAT_ID). In combination, BAT_ID and SAM_ID are the unique sample identifiers.
SBRGN99	SUB_RGN	X	X	X		Subregions are areas within each region that are similar in water quality, physiography, vegetation, climate, and soil. The ELS-II used a letter A-E concatenated with the region number (All data from ELS region 1) as the subregion identifier. The 5 subregions in the ELS-II were: lA: Adirondacks lB: Poconos/Catskills 1C: Central New England 1D: Southern New England lE: Maine
SCBLK1D			X	X		'Y' or 'N' indicating whether a blank samp!e was collected.
SCD151D			X	X		Duplicate sample collected at 1.5 m form 1D.
SCDBT1D			X			Duplicate sample collected at bottom - 1.5 m.
SCDM1 D			X			Duplicate sample collected at mid-hypolimnetic depth.
SCR151D			X	X		Routine sample collected at 1.5 m.
SCRBT1D			X			Routine sample collected at 1.5 m. Routine sample collected at bottom - 1.5 m.
SCRMH1D			X			Routine sample collected at mid-hypolimnetic depth.

(Continued)

Table 5-1. (Continued)

Variable Name	Phase I Name	SPS	SUS	FAS	Units	Definition
SECDI1D	SECDIS	X	X	X	rn	Secchi disk disappearance depth.
SECDV1D		X	X			'Y' indicates Secchi disk was visible to lake bottom.
SECME98	SECMEAN	X	X	X	rn	Mean of Secchi disk disappearance and reappearance depths. SECME98 is the lake depth if the disk was visible on the lake bottom.
SECRElD	SECREA	X	X	X	rn	Secchi disk reappearance depth.
SIO211	SIO211	X	X	X	rng/L	Silica, measured in the analytical laboratory in an unfiltered aliquot (USGS method 1-2700-78, colorimetric, molybdate blue, automated method).
SITETYP		X	X	X		Sampling site or type code. In summer: E= epilimnion (0.5 or 1.5 m depth), H=mid-hypolimnion, BTM=bottom (1.5 m above lake bottom). In fall: Vi first visit Fall Variability Study, V2 = second visit Fall Variability Study (sample taken at ELS-l location), V3=third visit Fall Variability Study, NV = non-fall variability site (only one fall visit). In spring: value is missing (all samples from epilimnion).
SMSTR1D			X			Sample identification number for subset triplicate.
SMTRD			X			Sample identification number for triplicate.
SO411	SO411	X	X	X	mg/L	Sulfate ion, measured in the analytical laboratory by ion chromatography in a filtered, unacidified aliquot (ASTM, 1984; O'Dell et al., 1984).
SO498	SO416	X	X	X	μeq/L	Sulfate ion: SO498 = SO411*20.82 μeq/mg.
SO4DP99	SO4DEP	X	X	X	g/m^2	Average annual sulfate ion deposition, derived from 1980-1982 Acid Deposition System data (Watson and Olsen, 1984). Lake deposition values were assigned by contouring both the sulfate ion concentrations

(Continued)

Table 5-1. (Continued)

Variable Name	Phase I Name	SPS	SUS	FAS	Units	Definition
						measured in precipitation and the precipitation volumes (see PRCIP99), interpolating values for 3.75 minute latitude/longitude cells, and multiplying these paired cell values.
SOBC98	SOBC	X	X	X	μeq/L	Sum of base cations: 50BC98 = NA98 + K98 + CA98 + MG98.
SPLCD02	SPLCOD	X	X			Split code, indicates that duplicate sample aliquots were sent to cooperating analytical laboratories.
SPRID1D				X		Identification number of the individual doing the sampling.
ST99	ST	X	X	X		State: standard two-character U.S. Postal Service abbreviation.
STRAT99	STRAT	X	X	X		ELS-I sampling strata ID code. ELS region, subregion, and expected alkalinity map class were used as stratification factors in ELS-I. Coded as a concatenation of the ELS subregion (SBRGN99) and alkalinity map class (1, 2, or 3).
SUBID1D			X			Identification number for the subset batch.
T0051D			X		°C	Temperature at 0.5 m.
T0151D			X		°C	Temperature at 1.5 m.
TM0151D		X		X	°C	Temperature at 1.5 m.
T0251D			X		°C	Temperature at 2.5 m.
T0351D			X		°C	Temperature at 3.5 m.
T04051D	TMP_1		X	X	°C	Temperature at 4 or 5
T0451D			X		°C	Temperature at 4.5 m.
T0551D			X		°C	Temperature at 5.5 m.
T06101D	TMP_2		X	X	C	Temperature at 6 or 10
T0651D			X		°C	Temperature at 6.5 m.

(Continued)

Table 5-1. (Continued)

Variable Name	Phase I Name	SPS	SUS	FAS	Units	Definition
T0751D			X		°C	Temperature at 7.5 m.
T08151D	TMP_3	X		X	°C	Temperature at 8 or 15 rn.
T0851D			X		°C	Temperature at 8.5 m.
T0951D			X		°C	Temperature at 9.5 m.
T10201D	TMP_4	X		X	°C	Temperature at 10 or 20 m.
T1051D			X		°C	Temperature at 10.5 m.
T12251D	TMP_5	X		X	°C	Temperature at 12 or 25 m.
T1251D			X		°C	Temperature at 12.5 m.
T14301D	TMP_6	X		X	°C	Temperature at 14 or 30 m.
T1451D			X		°C	Temperature at 14.5 m.
T16351D	TMP_7	X		X	°C	Temperature at 16 or 35 m.
T1651D			X		°C	Temperature at 16.5 m.
T18401D	TMP_8	X		X	°C	Temperature at 18 or 40 m.
T1851D			X		°C	Temperature at 18.5 m.
T20451D	TMP 9	X		X	°C	Temperature at 20 or 45 m.
T2051D			X		°C	Temperature at 20.5 m.
T2251D			X		°C	Temperature at 22.5 m.
T2451D			X		°C	Temperature at 24.5 m.
T2651D			X		°C	Temperature at 26.5 m.
T2851D			X		°C	Temperature at 28.5 m.
T3051D			X		°C	Temperature at 30.5 m.
T3251D			X		°C	Temperature at 32.5 m.
T3451D			X		°C	Temperature at 34.5 m.
T3651D			X		°C	Temperature at 36.5 m.
T3851D			X		°C	Temperature at 38.5 m.

(Continued)

Table 5-1. (Continued)

Variable Name	Phase I Name	SPS	SUS	FAS	Units	Definition
TXX501D	TMP 10	X		X	°C	Temperature at 50 m.
TIMRE1D		X				Time the processing laboratory received the sample in HH:MM format (24 h), form 1D.
TIMSM1D		X	X	X		Time lake was sampled, in HH:MM format (24 h).
TMP601D	TMP_60	X		X	°C	Temperature at 0.6 * DPSIT1D.
TMPA1D	AIRTMP	X	X	X	°C	Air temperature measured from the helicopter with a thermometer.
TMPD11D	TMPDF	X		X	°C	Difference between top and bottom temperatures.
TMPD21D	TMPDF2	X		X	°C	Difference between temperature at 0.6* DPSIT1D and bottom, TMPD21D = TMP601D - TMP_B1D.
TMPMH1D			X		°C	Temperature at mid-hypolimnetic depth.
TMPMM1D			X		°C	Temperature at mid-metalimnetic depth.
TMPTH1D			X		°C	Temperature at top-hypolimnetic depth.
TMP_B1D	TMP_B	X	X	X	°C	Temperature at DPSIT1D - 1.5 m.
TUR02	TURVAL	X	X	X	NTU	Turbidity, measured in the processing laboratory using a MONITEK model 21nephelometer, reported in nephelometric turbidity units (EPA method 180.1).
VISIT1D		X		X		Number of lake visit.
WALA99	WALA	X	X	X		Ratio of watershed area to lake area. Watershed area includes lake area.
WALAX99		X	X	X		Ratio of watershed area to lake area from ALSC bathymetric data.
WDIR1D		X	X	X		Estimated wind direction; N, NE, SE, S, SW, W or NW.

(Continued)

Table 5-1. (Continued)

Variable Name	Phase I Name	SPS	SUS	FAS	Units	Definition
WSDIS99	WS_DIS	X	X	X		Disturbances of the natural environment in a watershed within 100 m of the shore as noted by field crew, where: D=dwellings, L=logging, R=roads, I = industry, M=mining, S=livestock.
WSHED99	WSHED	X	X	X	ha	Watershed area, the geographic area from which surface water drains into a particular lake, as determined using an electronic planimeter on USGS topographic maps. Lake area was included in watershed area.
WSHEDX99		X	X	X	ha	Watershed area from ALSC data.
WSOTH99	WS_OTH	X	X	X		Disturbances of the natural environment in a watershed within 100 m of the shore, other than those described by WSDIS99, noted by field crew.
WSPD1D		X	X	X		Estimated wind speed; no wind, light, moderate, or strong.
WT1M99		X	X	X		Modified (final) ELS-I sample weighting factor. Used to make ELS-I population estimates and in ELS-II population variance estimates.
WT1O_99		X	X	X		Original (at time of ELS-II site selection) ELS-I sample weighting factor. Used in calculating the final ELS-II sample weighting factor and in ELS-II population variance estimates.
WT2C99		X	X	X		Conditional ELS-II inclusion weighting factor. Used in calculating the final ELS-II sample weighting factor and in ELS-II population variance estimates.
WT2T99		X	X	X		ELS-II sample weighting factor used in making population estimates; calculated as WT2T99= WT1O_99*WT2C99. The weighting factor indicates how many lakes in the ELS-II target population are represented by the sample lake.

SECTION 6
DATA TAGS AND FLAGS

Some variables in the ELS-Il databases are designated as "tags" or "flags," that is, they provide information that qualifies individual values. Tags and flags are present only in the validated (DS3B) data set. Tags are one-letter codes that qualify data as recorded on the field or laboratory data forms. Tag variable names have the same name as the variable they qualify, but with the suffix 'T". For example, the variable MN11 has a tag variable designated MN11T. A list of the tag codes and their definitions is given in Table 6-1. Flags are two-character codes that were entered during the data verification and validation processes. Flag variable names have the same name as the variable qualified but with the suffix "F". For example, MN11 has a flag variable designated MN11 F. A list of the flag codes and their definitions is given in Table 6-2. Both tags and flags can contain multiple codes. If a variable has multiple codes, the codes are concatenated (no blank spaces) in alphabetic order.

NOTE: With three exceptions, flags and tags in the ELS-II data sets apply only to values BEFORE reverification and the special data assessment. Data values were changed in the reverification process and thus the flags and tags may no longer apply to all of the values in the database. Only the U0 and Ul flags (validation outliers), and X flags are completely correct.

The old flags and tags have been kept in the database because they may be of some use in interpreting suspect data points. All changes made in the database during the reverification process are documented in Appendix A of the ELS-II QA report (Mitchell-Hall et al., 1989).

Table 6-1. Tag Code Definitions, U.S. EPA Eastern Lake Survey - II

Code	Definition
A	Instrument unstable.
B	Redone, first reading not acceptable.
C	Instruments and sampling gear not vertical in water column.
D	Slow stabilization.
E	Sample destroyed during shipment.
F	Results outside of quality assurance criteria, with consent of the quality assurance manager.
G	Atypical result; already reanalyzed and confirmed by the laboratory manager.
H	Holding time exceeded quality assurance criteria; form 19 only.
J	Results not available; insufficient sample volume shipped to the analytical laboratory from the field.
K	Results not available; entire aliquot not shipped.
L	Results not available due to interference.
M	Results not available; sample lost or destroyed by analytical laboratory.
N	Not required.
P	Results outside of quality assurance criteria, but insufficient volume for reanalysis.
0	Results outside of quality assurance criteria.
R	Results from reanalysis.
S	Contamination suspected.
T	Leaking container.
U	Results not required by procedure; unnecessary.
V	Anion-cation balance (% ion balance difference) outside criteria due to high DOC.
W	Percent difference (%D) calculation (Form 14) outside criteria due to high DOC.
X	Available for miscellaneous comments in the field only.
Y	Available for miscellaneous comments in the field only.
Z	Available for miscellaneous comments in the field only.

Table 6-2. Flag Code Definitions, U.S. EPA Eastern Lake Survey Phase II

Code	Definition
A0	Anion/cation percent ion balance difference was outside of criteria due to unknown cause.
Al	Anion/cation percent ion balance difference was outside of criteria due to other anion/cation not considered in calculation.
A2	Anion/cation percent ion balance difference was outside of criteria due to anion contamination.
A3	Anion/cation percent ion balance difference was outside of criteria due to cation contamination.
A4	Anion/cation percent ion balance difference was outside of criteria due to unmeasured organic protolytes (fits Oliver Model).
AS	Anion/cation percent ion balance difference was outside of criteria due to possible analytical error; anion concentration too high.
A6	Anion/cation percent ion balance difference was outside of criteria due to possible analytical error; cation concentration too low.
A7	Anion/cation percent ion balance difference was outside of criteria due to possible analytical error; anion concentration too low.
A8	Anion/cation percent ion balance difference was outside of criteria due to possible analytical error; cation concentration too high.
A9	Anion/cation percent ion balance difference was outside of criteria due to possible analytical error; alkalinity measurement.
BO	External (field) blank was above expected criteria. (For pH, DIC, DOC, specific conductance, ANC, and BNC determinations where the blank was above expected criteria).
B1	Internal (laboratory) blank was greater than the criteria for pH, DIC, DOC, and specific conductance.
B2	External (field) blank was above expected criteria and contributed more than 20% to sample concentrations. (Flag not used for pH, DIC, DOC, specific conductance, acidity, and alkalinity determinations.)
B3	Internal (laboratory) blank was more than twice the required detection limit and contributed more than 10% to the sample concentrations. (Flag not used for pH, DIC, DOC, specific conductance, acidity or alkalinity determinations.)
Be	Potential negative sample bias based on internal (laboratory) blank data.

(Continued)

Table 6-2. (Continued)

Code	Definition
B5	Potential negative sample bias based on external (field) blank data.
C0	Percent conductance difference was outside of criteria due to an unknown cause.
C1	Percent conductance difference was outside of criteria due to possible analytical error; anion concentration too high.
C2	Percent conductance difference was outside of criteria due to anion contamination.
C3	Percent conductance difference was outside of criteria due to cation contamination.
C4	Percent conductance difference was outside of criteria due to unmeasured organic anions (fits Oliver Model).
C5	Percent conductance difference was outside of criteria due to possible analytical error in conductivity measurement.
C6	Percent conductance difference was outside of criteria due to possible analytical error; anion concentration too low.
C7	Percent conductance difference was outside of criteria due to unmeasured anions/cations; anions/cations not considered in calculation (does not fit Oliver Model).
C8	Percent conductance difference was outside of criteria due to possible analytical error; cation concentration too low.
C9	Percent conductance difference was outside of criteria due to possible analytical error; cation concentration too high.
D1	External (field) duplicate precision exceeded the maximum expected percent relative standard deviation but either the routine or the duplicate concentration was greater th ten times the required detection limit.
D2	External (field) duplicate precision exceeded the system precision (the P_{95} of a standard normal distribution based on known audit concentrations).
D3	Internal (laboratory) duplicate precision exceeded the maximum required percent relative standard deviation, and both the routine and duplicate sample concentrations were greater than ten times the required detection limit.
FO	Percent conductance difference exceeded criteria when in-situ field conductivity value y substituted.
Fl	Hillman/Krammer protolyte analysis program indicated field pH problem when streamside pH value was substituted.

(Continued)

Table 6-2. (Continued)

Code	Definition
F2	Hillman/Kramrner protolyte analysis program indicated unexplained field pH/DIC problem when streamside pH value was substituted.
F3	Hillman/Krammer protolyte analysis program indicated field problem; mobile processing laboratory pH.
F4	Hillman/Krammer protolyte analysis program indicated field problem; mobile processing laboratory DIC.
F5	Hillman/Krammer protolyte analysis program indicated field problem; unexplained (pH/DIC).
F6	Percent conductance difference exceeded criteria when mobile processing laboratory conductivity value was substituted.
H0	The maximum holding time criteria were not met.
L1	Instrumental detection limit exceeded required detection limit and form 11 sample concentrations were less than ten times the instrumental detection limit.
N0	Audit sample value exceeded upper control limit.
N1	Audit sample value below control limit.
N2	Audit sample exceeded control limits due to suspect audit sample preparation.
P0	Laboratory problem; initial alkalinity pH.
P1	Laboratory problem; initial acidity pH.
P2	Laboratory problem; unexplained, initial alkalinity/acidity pH.
P3	Laboratory problem; initial DIC.
P4	Laboratory problem; air equilibrated pH/DIC.
P5	Laboratory problem; unexplained, initial pH/DIC.
P6	Laboratory problem; alkalinity determination.
P7	Laboratory problem; acidity determination.
Ql	Quality control check sample was above contractual criteria.
Q2	Quality control check sample was below contractual criteria.
Q3	Insufficient number of quality control check samples were measured.

(Continued)

Table 6-2. (Continued)

Code	Definition
Q4	No quality control check sample was performed.
Q5	Detection limit quality control check sample was not two to three times the contract required detection limit and the measured value was outside twenty percent of the theoretical concentration.
U0	Known error based on relationships with other variables and/or impossible values or value is missing; substitution was made in Enhanced (Final) data sets.
Ul	Known error based on relationships with other variables, impossible value, or value is missing; data was deleted from the final data set and was not used in any of the calculations that created the final data set. The data was NOT substituted in the final set because an alternate sample was available (routine or duplicate) or the data was needed to make population estimates (summer hypolimnion sample, alternate visit in ti Fall Variability Study, or nontarget lake).
V0	Data value represents the average from the duplicate and routine measurement of the lake sample.
W0	Data value has possible measurement error, based on relationships with other variables.
X0	Invalid but confirmed databased on quality assurance review. These data should not I included in any statistical review.
Xl	ALEX greater than ALTL where ALEX is greater than or equal to 0.015 mg/L and ALEX is greater than ALTL by 0.010 mg/L.
X2	Invalid but confirmed data; potential aliquot switch.
X3	Invalid but confirmed data; potential gross aliquot or parameter contamination.
X4	Invalid but confirmed data; potential sample switch.
X8	Suspect or potential aliquot contamination.
Z0	Original value was less than zero and has been replaced with zero.

SECTION 7
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APPENDIX A

ANCILLARY ELS-II DATA SETS

Other information was collected as part of ELS-II activities in addition to the data in the three seasonal ELS-II data sets described in the main body of this report. These data, found in the following data tiles, include zooplankton species abundance, chlorophyll concentrations, and bathymetry.

File Name	Contents	n	Number of Variables
BATHYM	Bathymetric data	129	14
SUSZOOP	Summer 1986 Zooplankton data	491	144
SUSCHLA	Summer 1986 Chlorophyll data	221	26

These data sets are discussed in detail in the following subsections.

A.1 BATHYMETRIC DATA

A detailed bathymetric survey was conducted on 126 of the 145 ELS-II target lakes and 3 special- interest lakes. Transects were made across the lake and depths were recorded using a Lowrance X-15A depth chart recorder. Lake outlines were scaled up from 7.5 minute USGS maps using a zoom transfer scope. From these depth tracings and map outlines, a bathymetric map was constructed for each lake. These bathymetric maps were then used to quantify the variables in data set BATHYM given in Table A-1. Field surveys were performed by the Adirondack Lake Survey Corporation (ALSC) and SUNY Oswego. Data reduction was done by the ALSC. Note that some of these variables (surface area, watershed area, residence time) are present in the seasonal chemistry data sets based on map measurement during ELS-l. The variables in the BATHYM data set represent more detailed measurements made during the ELS-II bathymetric analyses.

A.2 SUMMER ZOOPLANKTON DATA

As part of the summer ELS-II data collection effort, zooplankton species abundance was analyzed at the index location in the deepest part of the lake. Three zooplankton tows were collected from this location using an 80-μm mesh Wisconsin bucket net, pulled vertically from 1 m above the lake bottom to the lake surface at a constant rate. These samples were preserved in a jar with buffered, sugar formalin and analyzed at the Academy of Natural Sciences of Philadelphia. Each jar was first examined for taxonomic composition to generate a comprehensive species list for each lake. Total abundance was determined on the entire jar if overall densities were less than 300 individuals. Otherwise, the counts were made from subsamples from the jar using a funnel splitter. In about 15% of the samples, replicate splits were counted.

Details of the analyses and data interpretation can be found in Tessier and Horwitz (1988,1990).

The data file with these data (SUSZOOP) contains the following variables:

Variable Name	Definition
LAKE_ID	Lake identification code
JARID	A two-digit code identifying the sample. The first digit (1, 2, or 3) identifies the tow number. The second digit (0 or 1) indicates the sample replicate number (some samples were counted twice).
Rdxxxx	Abundance of species xxxx in number of individuals per meter of net tow. In cases where the species was identified in the initial taxonomic examination but was not abundant enough to be counted after subsampling, the abundance was arbitrarily set to 0.01 individuals/meter tow. The zooplankton species names associated with each four-digit code number (xxxx) are given in Table A-2 and Appendix VI of Tessier and Horwitz (1988). There are 142 species represented by RDxxxx variables in file SUSZOOP.

A.3 CHLOROPHYLL DATA

As part of the summer seasonal sampling, samples were collected for chlorophyll analysis. Water from the epilimnion taken from the same Van Dorn sample as the ELS-II water chemistry sample was filtered through a 0.8-pm pore size polycarbonate filter. The filter was placed in an opaque centrifuge tube and transported frozen to the analysis laboratory. The filter was analyzed for chlorophyll-a, chlorophyll-b, and degradation products by spectrophotometry, fluorometry, and HPLC. The analytical methodology is described in Section 12 of the EPA Acidic Deposition Analytical Methods Manual (EPA, 1987). Variable listing and definitions for the SUSCHLA data set are given in Table A-3. Note that this data has been verified but not validated or enhanced.

Table A-1. Listing and Definition of Variables in ELS-II Data Set BATHYM

Variable Name	Definition
FRATE	Flushing rate in years, calculated as (watershed area*runoff)/lake volume.
LAKE ID	ELS Lake identification code.
LAT_DD	Latitude in decimal degrees.
LITTAREA	Littoral zone area in hectares, defined as the area of the lake with water less than 10 feet deep.
LONG_DD	Longitude in decimal degrees.
MAXDPM	Maximum lake depth in meters.
MEANDPM	Mean lake depth in meters, calculated as lake volume/lake area.
RUNOFF	Mean annual runoff in cm/yr.
SAREA	Lake surface area in ha, measured by planimetry.
SHORLN	Shoreline length in kilometers, calculated by summing the distances between the x,y coordinate pairs along the shoreline contour.
SHRDEV	Index of shoreline development, calculated as, shoreline length / $(2(\pi * \text{lake area})^{0.5})$. This is Indicative of the deviation of the lake shoreline from a perfect circle (SHRDEV- 1 for a perfect circle).
VOLDV	Lake volume development, calculated as 3*mean depth/max depth. This is indicative of the deviation of the lake volume from an inverted cone (VOLDV= 1 for a perfect inverted cone).
VOLUME	Lake volume in 106 cubic meters
WAREA	Watershed Area in hectares, measured by planimetry.

Table A-2. Species Code Numbers for Zooplankton Data in ELS-II Data Set SUSZOOP

Species Code	Species Name
	ROTIFERA
1000	Keratella earlinae
1001	K. chochlearis hispida
1002	Keratella crassa
1003	Keratella taurocephala
1004	K. cochlearis-cochlearis
1005	Keratella hieratis
1006	Keratella irregularis
1007	Keratella ticinersis
1008	Keratella c. robusta
1009	Keratella serrulata
1010	Kellicottia longispina
1011	Kellicottia bostoniensis
1030	Notholca labis
1031	Notholca squemula
1040	Brachionus urceolaris
1041	Brachionus quadridentatus
1050	Euchlanis dilatata
1051	Euchlanis petlucida
1060	Platyias petulus
1070	Mytilina spp.
1101	Lecane luna
1102	Lecane flexilis
1103	Lecane mira
1104	Lecane tudicola
1105	Lecane ungulata
1110	Monostyla lunaris
1400	Trichocerca multicrinis
1401	Trichocerca cylindrica
1402	Trichocerca pusillainis
1403	Trichocerca porcellus
1404	Trichocerca similis
1405	Trichocerca rousseleti
1406	Trichocerca lata
1407	Trichocerca elongata
1500	Gastropus hyptopus
1501	Gastropus stylifer
1510	Ascomorpha ovalis
1511	Ascomorpha saltans
1512	Ascomorpha ecaudis
1800	Asplanchna priodonta
1809	Asptanchna sp.
1900	Polyarthra vulgaris
1901	Polyarthra euryptera
1902	Polyarthra remata
1903	Polyarthra major
1904	Polyarthra dolichoptera

(Continued)

Table A-2. (Continued)

Species Code	Species Name
1910	Synchaeta pectinata

1911	Synchaeta kitti
1912	Synchaeta oblonga
1921	Ploesoma truncatum
1922	Ploesoma lenticularie
1923	Ploesoma hudsoni
1924	Ploesoma triacanthum
2100	Filina sp.
2101	Filinia terminalis
2102	Filinia longiseta
2200	Hexarthra mira
2300	Conochilus unicornis
2301	Conochilus hippocrepis
2310	Conochiloides dossarius
2311	Conochiloides natans
3100	Colfotheca pelagica
3101	Collotheca mutabilis
3300	Unidentified rotifera
	CLADOCORA
4100	Leptodora kindtii
5101	Diaphanosoma birgei
5102	Diaphanosoma brachyurum
5110	Sida crystallina
5201	Holopedium gibberum
5301	Bosmina longirostris
5310	Eubosmina hegmanni
5311	Eubosmina tubican
5312	Eubosmina longispina
5501	Chydorus brevalibris
5502	Chydorus sphaericus
5509	Chydorus sp.
5510	Alona setulosa
5511	Alona guttata
5512	Alona circumfimbrata
5513	Alona barbula
5519	Alona sp.
5520	Alonella acutirostris
5530	Kurzia laissium
5540	Acroperus harpae
5550	Eurycercus lamellatus
5560	Graptoleberis testudinaria
5600	Polyphemus pediculum
5701	Daphnia catawba
5702	Daphnia galeata mandotae
5703	Daphnia rosea
5704	Daphnia ambigua

(Continued)

Table A-2. (Continued)

Species Code	Species Name
5705	Daphnia pulex
5706	Daphnia parvula
5707	Daphnia schodleri
5708	Daphnia retrocurva
5709	Daphnia longiremis
5710	Daphnia dubia
5801	Scapholeberis mucronata
5802	Ceriodaphnia reticulata
5803	Ceriodaphnia lacustris
804	C. aftinia dubia
5805	Ceriodaphnia quadrangula
5809	Ceriodaphnia sp.
	COPEPODA
6300	Epischura lacustris
6301	Epischura nordenskioldi
6309	Epischura sp.
6401	Aglaodiaptomus Jeptopus
6402	A. spatulocrenatus
6411	Leptodiaptomus minutus
6412	Leptodiaptomus sicilis
6421	S. oregonensis
6422	Skistodiaptomus reighardi
6423	Skistodiaptomus pygmasus
6429	Skistodiaptomus sp.
6431	Onychodiaptomus birgei
6500	Unknown sp. calanoida
7100	Tropocyclops sp. 1
7101	Mesocyclops edax
7110	Tropocyclops sp. 2
7111	T. prasinus - mexicanus
7112	Tropocyclops prasinus
7121	Cyclops scutiger
7122	Cyclops sternus strenuus
7123	Cyclops vernalis
7124	C. bicuspidatus thomasi
7129	Cyclops sp.
7131	Orthocyclops modestus
7141	Eucyclops speratus
7142	Eucyclops agilus
7143	Eucyclops prionophonis
7144	Ectocyclops phaleratus
7160	Macrocyclops albidus
7200	Unknown sp. cyclopoida
7500	Ergasilus chautauquansis
8000	Nauplii

(Continued)

Table A-2. (Continued)

Species Code	Species Name

	MISCELLANEOUS
9100	Chaoborus punctipennis
9101	Chaoborus americanus
9102	Chaoborus flavicans
9199	Chaoborus sp.
9200	Mites 1
9201	Mites 2
9300	Ostracoda

Table A-3. Listing and Definition of Variables in ELS-II Data Set SUSCHLA

Variable Name	Definition
BATCH_ID	Batch identification code.
CHLA_AC	Chlorophyll-*a* concentration based on HPLC peak area (μg/L).
CHLA_AR	HPLC chlornphyll-*a* peak area.
CHLA_HC	Chlorophyll-*a* concentration based on HPLC peak height (μg/L).
CHLA_HT	HPLC chlorophyll-*a* peak height.
CHLB_AR	Chlorophyll-*b* HPLC peak area.
CHLB_HT	Chlorophyll-*b* HPLC peak height.
DAT_ANAL	Date analyzed.
DG_AR	Degradation products peak area.
DG_HT	Degradation products peak height.
FLU_CHL	ChIorophyll-*a* concentration from fluorometry (μg/L).
FLU_DIL	Dilution factor for fluorometry measurement.
FLU_SCL	Fluorometer scale.
FLU_STD	Fluorescence standard (measured).
FLU_VAL	Fluorescence value.
LAKE_ID	ELS-II Lake identification code.
SAM_ID	Sample identification code.
SAM_TYPE	Sample type (A = audit, R = routine lakewater sample, D = duplicate, T = triplicate) "L" code indicates a laboratory duplicate or triplicate.
SAM_VOL	Sample volume (mL)
SQL_VOL	Solvent volume (mL).
SPCCHLA	Chlorophyll-*a* concentration from spectrophotometry (μg/L).
SPC_CHLB	Chlorophyll-*b* concentration from spectrophotometry (μ/L).
SPECFILE	Spectrophotometry file number.
SPEC_650	Spectrophotometry absorbance at 650 nm.
SPEC_665	Spectrophotornetry absorbance at 665 nm.
SPEC_700	Spectrophotometry absorbance at 700 nm.

APPENDIX B
ASCII VERSIONS OF ELS-II DATA SETS

The enhanced versions of the three seasonal chemistry data sets (SPSFIM01, SUSFIM0l, and FASFIM0I) and the three auxiliary data sets (BATHYM, SUSZOOP, and SUSCHLA) are available as ASCII data sets. ASCII data are provided as 80-column card-image files. Card image format definitions for these six ASCII data sets are given in Tables B-1 through B6. For all data lines, columns 79-80 contain the card number. Variable widths were transferred to the card image files using the formats in the SAS data sets. Dates are in DDMMMYY format and times are in HH:MM (24-hour clock) for all ASCII data sets. **Missing numeric variables are represented as -999.** These values should be removed prior to any data analysis. An example card image listing from Data File FASFIM0l .DAT is shown in Table B-7. All ASCII data sets have the same name as the equivalent SAS data set, but with a .DAT extension.

Table B-1. Card-Image Format Definition, ELS-II Data Set SPSFIM01

Card #	Variable Name	Var. Type	Format	Start Col.	End Col.	Label	Card #
I	ACCOl 1	Num	8.1	1	8	CO2-ACIDITY (UEQ/L) FORM 11	1
I	ALD02	Num	8.4	10	18	PCV ALUMINUM DISSOLVED (UG/L) FORM 2	1
1	ALDI98	Num	8.4	20	28	LABILE MONOMERIC AL (UG/L)	1
1	ALEX11	Num	8.4	30	38	ALUMINUM-EXTRACTABLE (UG/L) FORM 11	1
I	ALKA11	Num	8.1	40	48	ALKAUNITY (UEQ/L) FORM 11	1
1	ALO_02	Num	8.4	50	58	PCV ALUMINUM ORGANIC (UG/L) FORM 2	1
1	ALTL11	Num	8.4	60	68	TOTAL ALUMINUM (UG/L) FQRM 11	1
I	ANCAT98	Num	6.4	70	78	CATIONS/ANIONS RATIO	1
2	ANDEF98	Num	8.4	1	8	CATSUM-ANSUM (UEQ/L)	2
2	ANSUM98	Num	8.4	10	18	SUM OF ANIONS (UEQ/L)	2
2	BNSTR99	Num	8.0	20	28	POPULATION SIZE BY STRATA	2
2	C0151D	Num	8.0	30	38	CONDUCTIVITY (US/CM) AT 1.5M FORM 1D	2
2	C04051 D	Num	8.0	40	48	CONDUCTIVITY AT 4 OR 5 M (US/CM) FORM 1D	2
2	C06101D	Num	8.0	50	58	CONDUCTIVITY AT 6 OR lOM (US/CM) FORM 1D	2
2	C08151D	Num	8.0	80	68	CONDUCTIVITY AT 8 OR 1.5M (US/CM) FORM 1D	2
2	C10201D	Num	8.0	70	78	CONDUCTIVITY AT 10 OR 20M (USICM) FORM 1D	2
3	C12251D	Num	8.0	1	8	CONDUCTIVITY AT 12 OR 25M (US/CM) FORM 1D	3
3	Cl430ID	Num	8.0	10	18	CONDUCTIVITY AT 14 OR 30M (US/CM) FORM 1D	3
3	C16351D	Num	8.0	20	28	CONDUCTIVITY AT 16 OR 35M (US/CM) FORM 1D	3
3	C18401D	Num	8.0	30	38	CONDUCTIVITY AT 18 OR 40M (US/CM) FORM 1D	3
3	C20451D	Num	8.0	40	48	CONDUCTIVITY AT 20 OR 45M (US/CM) FORM 1D	3
3	CA11	Num	8.3	50	58	CALCIUM (MG/L) FORM 11	3
3	CA98	Num	8.4	60	68	CALCIUM (UEQ/L)	3
3	CAT8U98	Num	8.4	70	78	SUM OF CATIONS (UEQ/L)	3
4	CL11	Num	8.3	1	8	CHLORIDE ION (MG/L) FORM 11	4
4	CL98	Num	8.4	10	18	CHLORIDE (UEQ/L)	4
4	CLSTR99	Num	8.0	20	28	PHASE II CLUSTER (1,2 or 3)	4
4	CNTY99	Char	5.0	30	34	FIPS CODE(ST,COUNTY)	4
4	CO398	Num	8.4	36	44	CARBONATE ALKAUNITY (UEQ/L)	4
4	COLOR02	Num	8.0	48	54	COLOR (PCU) FORM 2	4
4	CON601D	Num	8.0	56	64	CONDUCTIVITY AT 0.6*DEPTH(US/CM) FORM 1D	4
4	COND11	Num	8.1	66	74	CONDUCTIVITY (US/CM) FORM 11	4
5	CON_BID	Num	8.0	1	8	CONDUCT AT BOTTM-1.5M (US/CM) FORM 1D	5
5	CXX501D	Num	8.0	10	18	CONDUCTIVITY AT 50 M (US/CM) FORM 1D	5
5	DATSMP	Num	7.0	20	27	DATE SAMPLED	5
5	DIC02	Num	8.3	29	37	DIC (MG/L) FORM 2	5
5	DICE11	Num	8.3	39	47	DIC-EQUIL (MG/L) FORM 11	5
5	DICI11	Num	8.3	49	57	DIC-INIT (MG/L) FORM 11	5
5	DISM99	Num	8.0	59	87	DISTANCE FROM COAST (MILES)	5
5	DOC11	Num	8.2	69	77	DOC (MG/L) FORM 11	5
6	DO_l5lD	Num	8.2	1	8	DISSOLVED OXYGEN (MG/L) 1.5M FORM 1D	6
6	DO_601D	Num	8.2	10	18	DISSOLVED OXYGEN AT 0.6*DEPTH FORM 1D	6
6	DO_B1D	Num	8.2	20	28	DIS OXYGEN (MG/L) BOTTOM-1.5M FORM 1D	6
6	DPCAT1D	Num	8.1	30	38	DEPTH CATEGORY 4= <20M 5=>20M FORM 1D	6
6	DPSIT1D	Num	8.0	40	48	SITE DEPTH (M) FORM 1D	6
6	DPSITX1D	Num	8.1	50	58	MAXIMUM LAKE DEPTH (M) - ALSC	6
6	DP_60lD	Num	8.1	60	88	DEPTH 0.6*BOTTOM (M) FORM 1D	6
6	DP_B1D	Num	8.1	70	78	DEPTH AT BOTTOM-l.5M (M) FORM 1D	6

Table B-1. (Continued)

Card #	Variable Narne	Var. Type	Format	Start Col.	End Col.	Label	Card #
7	DRPCDE	Num	8.0	1	8	Drop code for population estimates	7
7	ELEV99	Num	8.1	10	18	LAKE ELEVATION (M)	7
7	ELEVX99	Num	8.1	20	28	LAKE ELEVATION (M) - ALSC	7
7	FE11	Num	8.3	30	38	IRON (UGIL) FORM 11	7
7	FTL11	Num	8.4	40	48	FLUORIDE (MG/L) FORM 11	7
7	FTL98	Num	8.4	50	58	FLUORIDE (UEQ/L)	7
7	H98	Num	8.4	80	68	HYDROGEN FROM PHAC11 (UEQ/L)	7
7	HCO398	Num	8.4	10	78	HCO3 (UEQ/L)	7
8	HDEP99	Num	8.3	1	8	HYDROGEN ION DEPOSITION (G/M**2/YR)	8
8	HYDID1D	Char	4.0	10	13	HYDROLAB METER IDENTIFIER CODE FORM 1D	8
8	HYTYP99	Char	9.0	15	23	HYDROLOGIC TYPE	8
8	INOUT99	Char	8.0	25	30	PRESENSE/ABSENCE OF INLETS/OUTLETS	8
8	K11	Num	8.3	32	40	POTASSIUM (MG/L) FORM 11	8
8	K98	Num	8.4	42	50	POTASSIUM (UEQ/L)	8
9	LABNA02	Char	30.0	1	31	LABORATORY FOR ANALYSIS FORM 2	9
9	LAKE_ID	Char	7.0	33	39	LAKE IDENTIFICATION NUMBER	9
9	LAT99	Char	10.0	41	50	ATITUDE	9
9	LATDD99	Num	8.4	52	80	LATITUDE (DECIMAL DEGREES)	9
9	LKID99	Char	7.0	62	68	ERLD-UMD ID/ALSC WSHED-POND ID	9
10	LKNAM99	Char	30.0	1	31	LAKE NAME	10
10	LKSIZ99	Num	8.2	33	41	LAKE SURFACE AREA (HA)	10
10	LKSIZX99	Num	8.2	43	51	LAKE SURFACE AREA (HA) - ALSC	10
10	LKVOL99	Num	8.3	53	61	CALC LAKE VOL (1 0**6 CU M)	10
10	LKV0LX99	Num	8.3	83	71	DIG. LAKE VOL (10**6 CU M) -ALSC	10
11	LNGDD99	Num	8.4	1	8	LONGITUDE (DECIMAL DEGREES)	11
11	LONG99	Char	11.0	10	20	LONGITUDE	11
11	MAPBG99	Char	25.0	22	48	MAP SHEET NAME (1:250,000 SCALE)	11
12	MAPSM99	Char	40.0	1	41	MAP SHEET NAME, 15 OR 7.5 QUAD	12
12	MG11	Num	8.3	43	51	MAGNESIUM (MG/L) FORM 11	12
12	MG98	Num	8.4	53	61	MAGNESIUM (UEQ/L)	12
12	MN11	Num	8.3	83	71	MANGANESE (UG/L) FORM 11	12
13	NA11	Num	8.3	1	8	SODIUM (MG/L) FORM 11	13
13	NA98	Num	8.4	10	18	SODIUM (UEQ/L)	13
13	NH411	Num	8.3	20	28	AMMONIUM ION (MG/L) FORM 11	13
13	NH498	Num	8.4	30	38	AMMONIUM (UEQ/L)	13
13	NO311	Num	8.4	40	48	NITRATE ION (MG/L) FORM 11	13
13	NO398	Num	8.4	50	58	NITRATE (UEQ/L)	13
13	NO3DDP99	Num	8.2	80	68	NITRATE DEPOSITION (G/M**2~R)	13
13	ORGIO98	Num	8.4	70	78	ORGANIC ANION (UEQ/L)	13
14	PH0151D	Num	8.2	1	8	PH AT 1.5M FORM 1D	14
14	PH02	Num	8.2	10	18	STATION PH FORM 2	14
14	PHAC11	Num	8.2	20	28	ACIDITY IN~AL PH FORM 11	14
14	PHAL11	Num	8.2	30	38	ALKAUNITY INITIAL PH FORM 11	14
14	PHEQ11	Num	8.2	40	48	AIR-EQUILIBRATED PH FORM 11	14
14	PH601D	Num	8.2	50	58	PH AT 0.6*DEPTH FORM 1D	14
14	PH_B1D	Num	8.2	80	68	PH AT BOTTOM-1.5M FORM lD	14
14	PRCI99	Num	8.3	70	78	PRECIPITATION (M/YR)	14

Table B-1. (Continued)

Card #	Variable Name	Var. Type	Format	Start Col.	End Col.	Label	Card #
15	PREC1D	Char	5.0	1	6	PRECIPITATION FORM 1D	15
15	PTL11	Num	8.4	8	16	TOTAL PHOSPHORUS (UG/L) FORM 11	15
15	RGSPC99	Char	16.0	18	33	REG SPEC LTM NRC DEW DER SAMPLE CLASS	15
15	RPREC1D	Char	8.0	35	42	RATE OF PRECIPITATION FORM 1D	15
15	RT99	Num	8.3	44	52	RESIDENCE TIME (YR)	15
15	RTX99	Num	8.3	54	62	RESIDENCE TIME (YR) - ALSC	15
15	RUNIN99	Num	8.0	64	72	ANNUAL RUNOFF INCHES FROM DIGIT MAP	15
16	RUNOF99	Num	8.3	1	8	SURFACE WATER RUNOFF (M/YR)	16
16	RUNOFX99	Num	8.3	10	18	SURFACE WATER RUNOFF (M/YR) - ALSC	16
16	SBRGN99	Char	1.0	20	20	NSWS SUBREGION	16
16	SECDI1D	Num	8.1	22	30	SECCHI DEPTH: DISAPPEAR (M) FORM 1D	16
16	SECME98	Num	8.1	32	40	MEAN: SECCHI DISK DISAPPEAR, REAPPEAR (M)	16
16	SECRElD	Num	8.1	42	50	SECCHI DEPTH: REAPPEAR (M) FORM 1D	16
16	SIO211	Num	8.3	52	80	SILICA (MG/L) FORM 11	16
16	SITETYP	Char	9.0	62	70	SAMPLING SITE OR TYPE CODE	16
17	SO411	Num	8.3	1	8	SULFATE ION (MG/L) FORM 11	17
17	SO498	Num	8.4	10	18	SULFATE (UEQ/L)	17
17	SO4DP99	Num	8.2	20	28	SULFATE DEPOSITION (G/M**2/YR)	17
17	SOBC98	Num	8.4	30	38	SUM OF BASE CATIONS (UEQ/L)	17
17	SPLCD02	Char	1.0	40	40	SPLIT/SAMPLE CODE TO LAS VEGAS FORM 2	17
17	ST99	Char	2.0	42	43	STATE (TWO-LETTER ABBREV)	17
17	STRAT99	Char	3.0	45	47	NSWS STRATA	17
17	T04051D	Num	8.1	49	57	TEMPERATURE AT 4 OR 5 M (DEG C) FORM 1D	17
17	T06101D	Num	8.1	59	67	TEMPERATURE AT 6 OR 10 M (DEG C) FORM 1D	17
17	T08151D	Num	8.1	69	77	TEMPERATURE AT 8 OR 15 M (DEG C) FORM 1D	17
18	T10201D	Num	8.1	1	8	TEMPERATURE AT 10 OR 20M (DEG C) FORM 1D	18
18	T12251D	Num	8.1	10	18	TEMPERATURE AT 12 OR 25M (DEG C) FORM 1D	18
18	T14301D	Num	8.1	20	28	TEMPERATURE AT 14 OR 30M (DEG C) FORM 1D	18
18	T16351D	Num	8.1	30	38	TEMPERATURE AT 16 OR 35M (DEG C) FORM 1D	18
18	T18401D	Num	8.1	40	48	TEMPERATURE AT 18 OR 40M (DEG C) FORM 1D	18
18	T20451D	Num	8.1	50	58	TEMPERATURE AT 20 OR 45M (DEG C) FORM 1D	18
18	TIMSM1D	Num	5.0	80	65	TIME SAMPLED (24 H) HH:MM FORM 1D	18
18	TM0151D	Num	8.1	67	75	TEMPERATURE (DEG C) AT 1.5M FORM 1D	18
19	TMP601D	Num	8.1	1	8	TEMPERATURE AT 0.6*DEPTH (DEG C) FORM 1D	19
19	TMPA1D	Num	8.0	10	18	AIR TEMPERATURE (DEC G) FORM 1D	19
19	TMPD11D	Num	8.1	20	28	TEMP DIF 1.5M-BOTTOM (DEG C) FORM 1D	19
19	TMPD21D	Num	8.1	30	38	TEMP DIF 1.5M-0.6*DEPTH (DEG C) FORM 1D	19
19	TMP_B1D	Num	8.1	40	48	TEMP AT BOTTOM-1.5M (DEG C) FORM 1D	19
19	TUR02	Num	8.2	50	58	TURBIDITY (NTU) FORM 2	19
19	TXX501D	Num	8.1	60	68	TEMPERATURE AT 50 M (DEG C) FORM 1D	19
20	VISIT1D	Char	12.0	1	13	VISIT FORM 1D	20
20	WALA99	Num	8.2	15	23	WATERSHED AREA/LAKE AREA	20
20	WALAX99	Num	8.2	25	33	WATERSHED AREA/LAKE AREA - ALSC	20
20	WDIR1D	Char	3.0	35	37	ESTIMATED WIND DIRECTION FORM 1D	20
20	WSDIS99	Char	8.0	39	46	D)WELL I)ND L)OG M)INE R)OAD S)TOCK	20
20	WSHED99	Num	8.3	48	56	WATERSHED AREA (HA)	20
20	WSHEDX99	Num	8.3	58	66	WATERSHED AREA (HA) - ALSC	20
21	WSOTH99	Char	25.0	1	26	DISTURB W/I lOOM - OTHER	21
21	WSPD1D	Char	8.0	28	35	ESTIMATED WIND SPEED FORM 1D	21
21	WT1M99	Num	8.3	37	45	MODIFIED PHASE I WEIGHT	21
21	WT1O_99	Num	8.3	47	55	ORIGINAL PHASE I WEIGHT	21
21	WT2C99	Num	8.4	57	65	CONDITIONAL PHASE II WEIGHT	21
21	WT2T99	Num	8.3	67	75	TOTAL PHASE II WEIGHT	21

Table B-2. Card-Image Format Definition, ELS-II Data Set SUSFIM0l

Card #	Variable Name	Var. Type	Formal	Start Col.	End Col.	Label	Card #
1	ACCES1D	Char	3.0	1	4	ACCESS FORM 1D	1
1	ACCO11	Num	8.1	6	14	CO2-ACIDITY (UEQ/L) FORM 11	1
1	ALD02	Num	8.4	16	24	PCV ALUMINUM DISSOLVED (UG/L) FORM 2	1
1	ALDI98	Num	8.4	26	34	LABILE MONOMERIC AL (UG/L)	1
1	ALEX11	Num	8.4	36	44	ALUMINUM-EXTRACTABLE (UG/L) FORM 11	1
1	ALKA11	Num	8.1	46	54	ALKAUNITY (UEQ/L) FORM 11	1
1	ALO_02	Num	8.4	56	64	PCV ALUMINUM ORGANIC (UG/L) FORM 2	1
1	ALTL11	Num	8.4	66	74	TOTAL ALUMINUM (UG/L) FORM 11	1
2	ANCAT98	Num	8.4	1	8	CATIONS/ANIONS RATIO	2
2	ANDEF98	Num	8.4	10	18	CATSUM - ANSUM (UEQ/L)	2
2	ANSUM98	Num	8.4	20	28	SUM OF ANIONS (UEQ/L)	2
2	BNSTR99	Num	8.0	30	38	POPULATION SIZE BY STRATA	2
2	C0051D	Num	8.0	40	48	CONDUCTIVITY AT 0.5 M (US/CM) FORM 1D	2
2	C0151D	Num	8.0	50	58	CONDUCTIVITY AT 1.5 M (US/CM) FORM 1D	2
2	C0251D	Num	8.0	80	68	CONDUCTIVITY AT 2.5 M (US/CM) FORM 1D	2
2	C0351D	Num	8.0	70	78	CONDUCTIVITY AT 3.5 M (US/CM) FORM 1D	2
3	C0451D	Num	8.0	1	8	CONDUCTIVITY AT 4.5 M (US/CM) FORM 1D	3
3	C0551D	Num	8.0	10	18	CONDUCTIVITY AT 5.5 M (US/CM) FORM 1D	3
3	C0651D	Num	8.0	20	28	CONDUCTIVITY AT 6.5 M (US/CM) FORM 1D	3
3	C0751D	Num	8.0	30	38	CONDUCTIVITY AT 7.5 M (US/CM) FORM 1D	3
3	C0851D	Num	8.0	40	48	CONDUCTIVITY AT 8.5 M (US/CM) FORM 1D	3
3	C0951D	Num	8.0	50	58	CONDUCTIVITY AT 9.5 M (US/CM) FORM 1D	3
3	C1051D	Num	8.0	60	68	CONDUCTIVITY AT 10.5 M (US/CM) FORM 1D	3
3	C1251D	Num	8.0	70	78	CONDUCTIVITY AT 12.5 M (US/CM) FORM 1D	3
4	C1451D	Num	8.0	1	8	CONDUCTIVITY AT 14.5 M (US/CM) FORM 1D	4
4	C1651D	Num	8.0	10	18	CONDUCTIVITY AT 16.5 M (US/CM) FORM 1D	4
4	C1851D	Num	8.0	20	28	CONDUCTIVITY AT 18.5 M (US/CM) FORM 1D	4
4	C205ID	Num	8.0	30	38	CONDUCTIVITY AT 20.5 M (US/CM) FORM 1D	4
4	C2251D	Num	8.0	40	48	CONDUCTIVITY AT 22.5 M (US/CM) FORM 1D	4
4	C2451D	Num	8.0	50	58	CONDUCTIVITY AT 24.5 M (US/CM) FORM 1D	4
4	C2651D	Num	8.0	80	68	CONDUCTIVITY AT 26.5 M (US/CM) FORM 1D	4
4	C2851D	Num	8.0	70	78	CONDUCTIVITY AT 28.5 M (US/CM) FORM 1D	4
5	C3051D	Num	8.0	1	8	CONDUCTIVITY AT 30.5 M (US/CM) FORM 1D	5
5	C3251D	Num	8.0	10	18	CONDUCTIVITY AT 32.5 M (US/CM) FORM 1D	5
5	C3451D	Num	8.0	20	28	CONDUCTIVITY AT 34.5 M (US/CM) FORM 1D	5
5	C3651D	Num	8.0	30	38	CONDUCTIVITY AT 38.5 M (US/CM) FORM 1D	5
5	C3851D	Num	8.0	40	48	CONDUCTIVITY AT 38.5 M (US/CM) FORM 1D	5
5	CA11	Num	8.3	50	58	CALCIUM (MG/L) FORM 11	5
5	CA98	Num	8.4	80	68	CALCIUM (UEQ/L)	5
5	CATSU98	Num	8.4	70	78	SUM OF CATIONS (UEQ/L)	5
6	CHLOD1D	Num	8.1	1	8	CHLOROPHYLL VOLUME H20 D (ML) FORM 1D	6
6	CHLOR1D	Num	8.1	10	18	CHLOROPHYLL VOLUME H20 R (ML) FORM 1D	6
6	CL11	Num	8.3	20	28	CHLORIDE ION (MG/L) FORM 11	6
6	CL98	Num	8.4	30	38	CHLORIDE (UEQ/L)	6
6	CLSTR99	Num	8.0	40	48	PHASE II CLUSTER (1,2 or 3)	6
6	CNTY99	Char	5.0	50	54	FIPS CODE(ST,COUNTY)	6
6	CO398	Num	8.4	58	64	CARBONATE ALKAUNITY (UEQ/L)	6
6	COLOR02	Num	8.0	66	74	COLOR (PCU) FORM 2	6
7	COND11	Num	8.1	1	8	CONDUCTIVITY (US/CM) FORM 11	7
7	CONMH1D	Num	8.0	10	18	CONDUCTIVITY AT MID-HYP (US/CM) FORM 1D	7
7	CONMM1D	Num	8.0	20	28	CONDUCTIVITY AT MID-MET (US/CM) FORM 1D	7
7	CONTH1D	Num	8.0	30	38	CONDUCTIVITY AT TOP-HYP (US/CM) FORM 1D	7
7	CON_B1D	Num	8.0	40	48	CONDUCTIVITY AT BTM-1 .5M (US/CM) FORM 1D	7
7	CRWID1D	Char	20.0	50	69	FIELD CREW ID FORM 1D	7
7	DATSMP	Num	7.0	71	78	DATE SAMPLED	7

Table B-2. (Continued)

Card #	Variable Name	Var. Type	Format	Start Col.	End Col.	Label	Card #
8	DIC02	Num	8.3	1	8	DIC (MG/L) FORM 2	8
8	DICE11	Num	8.3	10	18	DIC-EQUIL (MG/L) FORM 11	8
8	DICI11	Num	8.3	20	28	DIC-INIT (MG/L) FORM 11	8
8	DISM99	Num	8.0	30	38	DISTANCE FROM COAST (MILES)	8
8	DOC11	Num	8.2	40	48	DOC (MG/L) FORM 11	8
8	DOMH1D	Num	8.2	50	58	DISSOLVED OXYGEN AT MID-HYP FORM 1D	8
8	DOMMID	Num	8.2	80	68	DISSOLVED OXYGEN AT MID-MET FORM 1D	8
8	DOTH1D	Num	8.2	70	78	DISSOLVED OXYGEN AT TOP-HYP FORM 1D	8
9	DO_051D	Num	8.2	1	8	DISSOLVED OXYGEN AT 0.5 M FORM 1D	9
9	DO_151D	Num	8.2	10	18	DISSOLVED OXYGEN (MG/L) 1.5M FORM 1D	9
9	DO_B1D	Num	8.2	20	28	DIS OXYGEN (MG/L) BOTTOM-1.5M FORM 1D	9
9	DPMH1D	Num	8.1	30	38	DEPTH AT MID-HYP (M) FORM 1D	9
9	DPMM1D	Num	8.1	40	48	DEPTH AT MID-MET (M) FORM 1D	9
9	DPSCB1D	Num	8.1	50	58	DEPTH SAMPLE COLL BTM-1.5M (M) FORM 1D	9
9	DPSCM1D	Num	8.1	80	68	DEPTH SAMPLE COLL MID-HYP (M) FORM 1D	9
9	DPSIT1D	Num	8.1	70	78	SITE DEPTH (M) FORM 1D	9
10	DPSITX1D	Num	11.5	1	12	MAXIMUM LAKE DEPTH (M) - ALSC	10
10	DPTH1D	Num	8.1	14	22	DEPTH AT TOP-HYP (M) FORM 1D	10
10	DP_B1D	Num	8.1	24	32	DEPTH AT BTM-1.5M (M) FORM 1D	10
10	DRPCDE	Num	8.0	34	42	Drop code for population estimates	10
10	ELEV99	Num	8.1	44	52	LAKE ELEVATION (M)	10
10	ELEVX99	Num	6.1	54	62	LAKE ELEVATION (M) - ALSC	10
10	FE11	Num	8.3	64	72	IRON (UG/L) FORM 11	10
11	FTL11	Num	8.4	1	8	FLUORIDE (MG/L) FORM 11	11
11	FTL98	Num	8.4	10	18	FLUORIDE (UEQ/L)	11
11	H98	Num	8.4	20	28	HYDROGEN FROM PHAC11 (UEQ/L)	11
11	HCO398	Num	8.4	30	38	HCO3 (UEQ/L)	11
11	HDEP99	Num	8.3	40	48	HYDROGEN ION DEPOSITION (G/M**2/YR)	11
11	HYDIDlD	Char	4.0	50	53	HYDROLAB METER IDENTIFIER CODE FORM 1D	11
11	HYTYP99	Char	9.0	55	63	HYDROLOGIC TYPE	11
11	INOUT99	Char	6.0	65	70	PRESENSE/ABSENCE OF INLETS/OUTLETS	11
12	K11	Num	8.3	1	8	POTASSIUM (MG/L) FORM 11	12
12	K98	Num	8.4	10	18	POTASSIUM (UEQ/L)	12
12	LABNA02	Char	30.0	20	49	LABORATORY FOR ANALYSIS FORM 2	12
12	LAKE_ID	Char	10.0	51	60	LAKE ID	12
12	LAT99	Char	10.0	62	71	LATITUDE	12
13	LATDD99	Num	8.4	1	8	LATITUDE (DECIMAL DEGREES)	13
13	LKID99	Char	7.0	10	16	ERLO-UMD ID/ALSC WSHED-POND ID	13
13	LKNAM99	Char	30.0	18	47	LAKE NAME	13
13	LKSIZ99	Num	8.2	49	57	LAKE SURFACE AREA (HA)	13
13	LKS1ZX99	Num	11.5	59	69	LAKE SURFACE AREA (HA) - ALSC	13
14	LKVOL99	Num	8.3	1	8	CALC LAKE VOL (10**6 CU M)	14
14	LKVOLX99	Nurn	11.5	10	20	DIG. LAKE VOL (10**6 CU M) -ALSC	14
14	LNGDD99	Num	8.4	22	30	LONGITUDE (DECIMAL DEGREES)	14
14	LONG99	Char	11.0	32	42	LONGITUDE	14
14	MAPBG99	Char	25.0	44	68	MAP SHEET NAME (1:250,000 SCALE)	14
15	MAPSM99	Char	40.0	1	41	MAP SHEET NAME, 15 OR 7.5 QUAD	15
15	MG11	Num	8.3	43	51	MAGNESIUM (MG/L) FORM 11	15
15	MG98	Num	8.4	53	61	MAGNESIUM (UEQ/L)	15
15	MN11	Num	8.3	63	71	MANGANESE (UG/L) FORM 11	15

Table B-2. (Continued)

Card #	Variable Name	Var. Type	Format	Start Col.	End Col.	Label	Card #
16	NA11	Num	8.3	1	8	SODIUM (MG/L) FORM 11	16
16	NA98	Num	8.4	10	18	SODIUM (UEQ/L)	16
16	NH411	Num	8.3	20	28	AMMONIUM ION (MG/L) FORM 11	16
16	NH498	Num	8.4	30	38	AMMONIUM(UEQ/L)	16
16	NO311	Num	8.4	40	48	NITRATE ION (MG/L) FORM 11	16
16	NO398	Num	8.4	50	58	NITRATE (UEQ/L)	16
16	NO3DP99	Num	8.2	80	68	NITRATE DEPOSITION (G/M**2/YR)	16
16	ORGIO98	Num	8.4	70	78	ORGANIC ANION (UQ/L)	16
17	PH0051D	Num	8.2	1	8	PH AT 0.5M FORM 1D	17
17	PH0151D	Num	8.2	10	18	PH AT I.5M FORM 1D	17
17	PH02	Num	8.2	20	28	STATION PH FORM 2	17
17	PHA11	Num	8.2	30	38	ACIDITY INITIAL PH FORM 11	17
17	PHAL11	Num	8.2	40	48	ALKAUNTY INITIAL PH FORM 11	17
17	PHEQ11	Num	8.2	50	58	AIR-EQUILIBRATED PH FORM 11	17
17	PHMH1D	Num	8.2	60	68	PH AT MID-HYP FORM 1D	17
17	PHMM1D	Num	8.2	70	78	PH AT MID-MET FORM 1D	17
18	PHTH1D	Num	8.2	1	8	PH AT TOP-HYP FORM 1D	18
18	PH_B1D	Num	8.2	10	18	PH AT BTM-1.5M FORM 1D	18
18	PRCIP99	Num	8.3	20	28	PRECIPITATION (M/YR)	18
18	PREC1D	Char	5.0	30	34	PRECIPITATION FORM 1D	18
18	PRECO1D	Char	7.0	38	42	PRECIPITATION OBS (PREV/CURRENT) FORM 1D	18
18	PTL11	Num	8.4	44	52	TOTAL PHOSPHORUS (UG/L) FORM 11	18
18	RGSPC99	Char	16.0	54	69	REG SPEC LTM NRC DEW DER SAMPLE CLASS	18
18	RPREC1D	Char	8.0	71	78	RATE OF PRECIPITATION FORM 1D	18
19	RT99	Num	8.3	1	8	RESIDENCE TIME (YR)	19
19	RTX99	Num	8.3	10	18	RESIDENCE TIME (YR) - ALSC	19
19	RUNIN99	Num	8.0	20	28	ANNUAL RUNOFF INCHES FROM DIGIT MAP	19
19	RUNOF99	Num	8.3	30	38	SURFACE WATER RUNOFF (M/YR)	19
19	RUNOFX99	Num	8.3	40	48	SURFACE WATER RUNOFF (M/YR) - ALSC	19
19	SBRGN99	Char	1.0	50	50	NSWS SUBREGION	19
19	SECDI1D	Num	8.1	52	80	SECCHI DEPTH: DISAPPEAR (M) FORM 1D	19
19	SECOV1D	Char	1.0	62	62	SECCHI DEPTH Y=VISIBLE TO BOTTOM FORM 1D	19
19	SECME98	Num	8.1	64	72	MEAN: SECHI DISK DISAPPEAR REAPPEAR (M)	19
20	SECRElD	Num	8.1	1	8	SECCHI DEPTH: REAPPEAR (M) FORM 1D	20
20	SIO211	Num	8.3	10	18	SILICA (MG/L) FORM 11	20
20	SITETYP	Char	9.0	20	28	SAMPUNG SITE OR TYPE CODE	20
20	SO411	Num	8.3	30	38	SULFATE ION (MG/L) FORM 11	20
20	SO498	Num	8.4	40	48	SULFATE (UEQ/L)	20
20	SO4DP99	Num	8.2	50	58	SULFATE DEPOSITION (G/M**2/YR)	20
20	SOBC98	Num	8.4	80	68	SUM OF BASE CATIONS (UEQ/L)	20
21	SPLCD02	Char	12.0	1	13	SPLIT/SAMPLE CODE TO LAS VEGAS FORM 2	21
21	ST99	Char	2.0	15	16	STATE (TWO-LETTER ABBREV)	21
21	STRAT99	Char	3.0	18	20	NSWS STRATA	21
21	T0051D	Num		22	30	TEMPERATURE AT 0.5 M (DEG C) FORM 1D	21
21	T0151D	Num	8.1	32	40	TEMPERATURE AT 1.5 M (DEG C) FORM 1D	21
21	T0251D	Num	8.1	42	50	TEMPERATURE AT 2.5 M (DEG C) FORM 1D	21
21	T0351D	Num	8.1	52	80	TEMPERATURE AT 3.5 M (DEG C) FORM 1D	21
21	T0451D	Num	8.1	62	70	TEMPERATURE AT 4.5 M (DEG C) FORM 1D	21
22	T0551D	Num	8.1	1	8	TEMPERATURE AT 5.5 M (DEG C) FORM 1D	22
22	T0651D	Num	8.1	10	18	TEMPERATURE AT 6.5 M (DEG C) FORM 1D	22
22	T0751D	Num	8.1	20	28	TEMPERATURE AT 7.5 M (DEG C) FORM 1D	22
22	T0851D	Num	8.1	30	38	TEMPERATURE AT 8.5 M (DEG C) FORM 1D	22
22	T0951D	Num	8.1	40	48	TEMPERATURE AT 9.5 M (DEG C) FORM 1D	22
22	T1051D	Num	8.1	50	58	TEMPERATURE AT 10.5 M (DEG C) FORM 1D	22
22	T1251D	Num	8.1	60	88	TEMPERATURE AT 12.5 M (DEG C) FORM 1D	22
22	T1451D	Num	8.1	70	78	TEMPERATURE AT 14.5 M (DEG C) FORM 1D	22

Table B-2. (Continued)

Card #	Variable Name	Var. Type	Format	Start Col.	End Col.	Label	Card #
23	T1651D	Num	8.1	1	8	TEMPERATURE AT 16.5 M (DEG C) FORM 1D	23
23	T1851D	Num	8.1	10	18	TEMPERATURE AT 18.5 M (DEG C) FORM 1D	23
23	T2051D	Num	8.1	20	28	TEMPERATURE AT 20.5 M (DEG C) FORM 1D	23
23	T2251D	Num	8.1	30	38	TEMPERATURE AT 22.5 M (DEG C) FORM 1D	23
23	T2451D	Num	8.1	40	48	TEMPERATURE AT 24.5 M (DEG C) FORM 1D	23
23	T2651D	Num	8.1	50	58	TEMPERATURE AT 26.5 M (DEG C) FORM 1D	23
23	T2851D	Num	8.1	80	68	TEMPERATURE AT 28.5 M (DEG C) FORM 1D	23
23	T3051D	Num	8.1	70	78	TEMPERATURE AT 30.5 M (DEG C) FORM 1D	23
24	T3251D	Num	8.1	1	8	TEMPERATURE AT 32.5 M (DEG C) FORM 1D	24
24	T3451D	Num	8.1	10	18	TEMPERATUREAT34.5 M (DEG C) FORM 1D	24
24	T3651D	Num	8.1	20	28	TEMPERATURE AT 36.5 M (DEG C) FORM 1D	24
24	T3851D	Num	8.1	30	38	TEMPERATURE AT 38.5 M (DEG C) FORM 1D	24
24	TIMSM1D	Num	5.0	40	45	TIME SAMPLED (24 H) HH:MM FORM 1D	24
24	TMPA1D	Num	8.0	47	55	AIR TEMPERATURE (DEG C) FORM 1D	24
24	TMPMH1D	Num	8.1	57	65	TEMPERATURE AT MID-HYP (DEG C) FORM 1D	24
24	TMPMM1D	Num	8.1	67	75	TEMPERATURE AT MID-MET (DEG C) FORM 1D	24
25	TMPTH1D	Num	8.1	1	8	TEMPERATURE AT TOP-HYP (DEG C) FORM 1D	25
25	TMP_B1D	Num	8.1	10	18	TEMPERATURE AT BTM-1.5M (DEG C) FORM 1D	25
25	TUR02	Num	8.2	20	28	TURBIDITY (NTU) FORM 2	25
25	WALA99	Num	8.2	30	38	WATERSHED AREA/LAKE AREA	25
25	WALAX99	Num	11.5	40	50	WATERSHED AREA/LAKE AREA - ALSC	25
25	WDIR1D	Char	3.0	52	54	ESTIMATED WIND DIRECTION FORM 1D	25
25	WSDIS99	Char	8.0	58	63	D)WELL I)ND L)OG M)INE R)OAD S)TOCK	25
25	WSHED99	Num	8.3	65	73	WATERSHED AREA (HA)	25
26	WSHEDX99	Num	11.5	1	12	WATERSHED AREA (HA) - ALSC	26
26	WSOTH99	Char	25.0	14	38	DISTURBW/I 100M-OTHER	26
26	WSPD1D	Char	8.0	40	47	ESTIMATED WIND SPEED FORM 1D	26
26	WT1M99	Num	8.3	49	57	MODIFIED PHASE I WEIGHT	26
26	WT1O_99	Num	8.3	59	67	ORIGINAL PHASE I WEIGHT	26
26	WT2C99	Num	8.4	69	77	CONDITIONAL PHASE II WEIGHT	26
27	WT2T99	Num	8.3	1	8	TOTAL PHASE II WEIGHT	27

Table B-3. Card-Image Format Definition, ELS-II Data Set FASFIM01

Card #	Variable Name	Var. Type	Format	Start Col.	End Col.	Label	Card #
1	ACCES1D	Char	3.0	1	4	ACCESS FORM 1D	1
1	ACCO11	Num	8.1	6	14	CO2-ACIDITY)UEQ/L) FORM 11	1
1	ALD02	Num	8.4	16	24	PCV ALUMINUM DISSOLVED (UG/L) FORM 2	1
1	ALDI98	Num	8.4	26	34	LABILE MONOMERIC AL (UG/L)	1
1	ALEX11	Num	8.4	36	44	ALUMINUM-EXTRACTABLE (UG/L) FORM 11	1
1	ALKA11	Num	8.1	46	54	ALKAUNITY (UEQ/L) FORM 11	1
1	ALO_02	Num	8.4	58	64	PCV ALUMINUM ORGANIC (UG/L) FORM 2	1
1	ALTL11	Num	8.4	66	74	TOTAL ALUMINUM (UG/L) FORM 11	1
2	ANCAT98	Num	8.4	1	8	CATIONSIANIONS RATIO	2
2	ANDEF98	Num	8.4	10	18	CATSUM - ANSUM (UEQ/L)	2
2	ANSUM98	Num	8.4	20	28	SUM OF ANIONS (UEQ/L)	2
2	BNSTR99	Num	8.0	30	38	POPULATION SIZE BY STRATA	2
2	C0151D	Num	8.0	40	48	CONDUCTIVITY (US/CM) AT 1.5M FORM 1D	2
2	C04051D	Num	8.0	50	58	CONDUCTIVITY AT 4 OR 5 M (US/CM) FORM 1D	2
2	C06101D	Num	8.0	60	68	CONDUCTIVITY AT 6 OR lOM (US/CM) FORM 1D	2
2	C08151D	Num	8.0	70	78	CONDUCTIVITY AT 8 OR 15 M (US/CM) FORM 1D	2
3	C10201D	Num	8.0	1	8	CONDUCTIVITY AT 10 OR 20M(US/CM) FORM 1D	3
3	C12251D	Num	8.0	10	18	CONDUCTIVITY AT 12 OR 25M(USICM) FORM 1D	3
3	C14301D	Num	8.0	20	28	CONDUCTIVITY AT 14 OR 30M(US/CM) FORM 1D	3
3	C16351D	Num	8.0	30	38	CONDUCTIVITY AT 16 OR 35M(USICM) FORM 1D	3
3	C18401D	Num	8.0	40	48	CONDUCTIVITY AT 18 OR 40M(US/CM) FORM 1D	3
3	C20451D	Num	8.0	50	58	CONDUCTIVITY AT 20 OR 45M(US/CM) FORM 1D	3
3	CA11	Num	8.3	60	68	CALCIUM (MG/L) FORM 11	3
3	CA98	Num	8.4	70	78	CALCIUM (UEQ/L)	3
4	CATSU98	Num	8.4	1	8	SUM OF CATIONS (UEQ/L)	4
4	CL11	Num	8.3	10	18	CHLORIDE ION (MG/L FORM 11	4
4	CL98	Num	8.4	20	28	CHLORIDE (UEQ/L)	4
4	CLSTR99	Num	8.0	30	38	PHASE II CLUSTER (1.2 or 3)	4
4	CNTY99	Char	5.0	40	44	FIPS CODE(ST,COUNTY)	4
4	CO398	Num	8.4	46	54	CARBONATE ALKAUNITY (UEQ/L)	4
4	COLOR02	Num	8.0	56	84	COLOR (PCU) FORM 2	4
4	CON601D	Num	8.0	66	74	CONDUCTIVITY AT 0.6*DEPTH(US/CM) FORM 1D	4
5	COND11	Num	8.1	1	8	CONDUCTIVITY (US/CM) FORM 11	5
5	CON_B1D	Num	8.0	10	18	CONDUCT AT BOTTOM-1.5M (US/CM) FORM 1D	5
5	CXX501D	Num	8.0	20	28	CONDUCTIVITY AT 50 M (US/CM) FORM 1D	5
5	DATSMP	Num	7.0	30	37	DATE SAMPLED	5
S	DIC02	Num	8.3	39	47	DIC (MG/L) FORM 2	5
S	DICE11	Num	8.3	49	57	DIC-EQUIL (MG/L) FORM 11	5
5	DICI11	Num	8.3	59	67	DIC-INIT (MG/L) FORM 11	5
5	DISM99	Num	8.0	69	77	DISTANCE FROM COAST (MILES)	5
6	DOC11	Num	8.2	1	8	DOC (MG/L) FORM 11	6
6	DO_151D	Num	8.2	10	18	DISSOLVED OXYGEN (MG/L) 1.5M FORM 1D	6
8	DO_601D	Num	8.2	20	28	DISSOLVED OXYGEN AT 0.6*DEPTH FORM 1D	6
8	DO_B1D	Num	8.2	30	38	DIS OXYGEN (MG/L) BOTTOM-1.5M FORM 1D	6
6	DPCAT1D	Num	8.0	40	48	DEPTH CATEGORY 4= <20M 5=>20M FORM 1D	6
6	DPSIT1D	Num	8.1	50	58	SITE DEPTH (M) FORM 1D	6
6	DPSITX1D	Num	11.5	80	70	MAXIMUM LAKE DEPTH (M) - ALSC	6
7	DP_601D	Num	8.1	1	8	DEPTH 0.6*BOTTOM (M) FORM 1D	7
7	DP_B1D	Num	8.1	10	18	DEPTH AT BOTTOM-1.5M (M) FORM 1D	7
7	DRPCDE	Num	8.0	20	28	Drop code for population estirnates	7
7	ELEV99	Num	8.1	30	38	LAKE ELEVATION (M)	7
7	ELEVX99	Num	8.1	40	48	LAKE ELEVATION (M) - ALSC	7
7	FE11	Num	8.3	50	58	IRON (UG/L) FORM 11	7
7	FTL11	Num	8.4	80	68	FLUORIDE (MG/L) FORM 11	7
7	FTL98	Num	8.4	70	78	FLUORIDE (UEQ/L)	7

Table B-3. (Continued)

Card #	Variable Name	Var. Type	Format	Start Col.	End Col.	Label	Card #
8	H98	Num	8.4	1	8	HYDROGEN FROM PHAC11 (UEQ/L)	8
8	HCO398	Num	8.4	10	18	HCO3 (UEQ/L)	8
8	HDEP99	Num	8.3	20	28	HYDROGEN ION DEPOSITION (G/M**2/YR)	8
8	HYDID1D	Char	4.0	30	33	HYDROLAB METER IDENTIFIER CODE FORM 1D	8
8	HYTYP99	Char	9.0	35	43	HYDROLOGIC TYPE	8
8	INOUT99	Char	6.0	45	50	PRESENSE/ABSENCE OF INLETS/OUTLETS	8
8	K11	Num	8.3	52	80	POTASSIUM (MG/L) FORM 11	8
8	K98	Num	8.4	62	70	POTASSIUM (UEQ/L)	8
9	LABNA02	Char	30.0	1	31	LABORATORY FOR ANALYSIS FORM 2	9
9	LAKE_1D	Char	10.0	33	42	LAKE ID	9
9	LAT99	Char	10,0	44	53	LATITUDE	9
9	LATDD99	Num	8.4	55	63	LATITUDE (DECIMAL DEGREES)	9
9	LKID99	Char	7.0	65	71	ERLD-UMD ID/ALSC WSHED-POND ID	9
10	LKNAM99	Char	30.0	1	31	LAKENAME	10
10	LKSIZ99	Num	8.2	33	41	LAKE SURFACE AREA (HA)	10
10	LKSIZX99	Num	11.5	43	53	LAKE SURFACE AREA (HA) - ALSC	10
10	LKVOL99	Num	8.3	55	63	CALC LAKE VOL (l0**6 CU M)	10
10	LKVOLX99	Num	11.5	65	75	DIG. LAKE VOL (10**6 CU M) -ALSC	10
11	LNGDD99	Num	8.4	1	8	LONGITUDE (DECIMAL DEGREES)	11
11	LONG99	Char	11.0	10	20	LONGITUDE	11
11	MAPBG99	Char	25.0	22	46	MAP SHEET NAME (1:250,000 SCALE)	11
12	MAPSM99	Char	40.0	I	41	MAP SHEET NAME, 15 OR 7.5 QUAD	12
12	MG11	Num	8.3	43	51	MAGNESIUM (MG/L) FORM 11	12
12	MG98	Num	8.4	53	61	MAGNESIUM (UEQ/L)	12
12	MN11	Num	8.3	63	71	MANGANESE (UG/L) FORM 11	12
13	NA11	Num	8.3	1	8	SODIUM (MG/L) FORM11	13
13	NA98	Num	8.4	10	18	SODIUM (UEQ/L)	13
13	NH411	Num	8.3	20	28	AMMONIUM ION (MG/L) FORM 11	13
13	NH498	Num	8.4	30	38	AMMONIUM (Ueq/L)	13
13	NO311	Num	8.4	40	48	NITRATE ION (MG/L) FORM11	13
13	NO398	Num	8.4	50	58	NITRATE (UEQ/L)	13
13	NO3DP99	Num	8.2	80	68	NITRATE DEPOSITION (G/M**2/YR)	13
13	NVLAK1D	Char	1.0	70	70	NON-VARIABILITY LAKE (Y OR N) FORM 1D	13
13	OBSID1D	Char	6.0	72	77	OBSERVER ID NUMBER FORM 1D	13
14	ORGIO98	Num	8.4	1	8	ORGANIC ANION (UEQ/L)	14
14	PH0151D	Num	8.2	10	18	PH AT 1.5M FORM 1D	14
14	PH02	Num	8.2	20	28	STATION PH FORM 2	14
14	PHAC11	Num	8.2	30	38	ACIDITY INITIAL PH FORM 11	14
14	PHAL11	Num	8.2	40	48	ALKAUNITY INITIAL PH FORM 11	14
14	PHEQ11	Num	8.2	50	58	AIR-EQUILIBRATED PH FORM 11	14
14	PH_601D	Num	8.2	80	68	PH AT 0.6*DEPTH FORM 1D	14
14	PH_B1D	Num	8.2	70	78	PH AT BOTTOM-1.5M FORM 1D	14
15	PRCIP99	Num	8.3	1	8	PRECIPITATION (M/YR)	15
15	PREC1D	Char	5.0	10	14	PRECIPITATION FORM 1D	15
15	PRECOlD	Char	7.0	16	22	PRECIPITATION OBS (PREV/CURRENT) FORM 1D	15
15	PTL11	Num	8.4	24	32	TOTAL PHOSPHORUS (UG/L) FORM 11	15
15	RGSPC99	Char	16.0	34	49	REG SPEC LTM NRC DEW DER SAMPLE CLASS	15
15	RPREC1D	Char	8.0	51	58	RATE OF PRECIPITATION FORM 1D	15
15	RT99	Num	8.3	80	68	RESIDENCE TIME (YR)	15
15	RTX99	Num	8.3	70	78	RESIDENCE TIME (YR) - ALSC	15

Table B-3. (Continued)

Card #	Variable Name	Var. Type	Format	Start Col.	End Col.	Label	Card #
16	RUNIN99	Num	8.0	1	8	ANNUAL RUNOFF INCHES FROM DIGIT MAP	16
16	RUNOF99	Num	8.3	10	18	SURFACE WATER RUNOFF (M/YR)	16
16	RUNOFX99	Num	8.3	20	28	SURFACE WATER RUNOFF (M/YR) - ALSC	16
16	SAMRT1D	Num	8.0	30	38	SAMPLE ID ROUTINE FORM 1D	16
16	SBRGN99	Char	1.0	40	40	NSWS SUBREGION	16
16	SECDI1D	Num	8.1	42	50	SECCHI DEPTH: DISAPPEAR (M) FORM 1D	16
16	SECDV1D	Char	1.0	52	52	SECCHI DEPTH Y=VISIBLE TO BOTTOM FORM 1D	16
16	8ECME98	Num	8.1	54	62	MEAN: SECHI DISK DISAPPEAR REAPPEAR (M)	16
16	SECRElD	Num	8.1	64	72	SECCHI DEPTH: REAPPEAR (M) FORM 1D	16
17	SIO211	Num	8.3	1	8	SILICA (MG/L) FORM 11	17
17	SITETYP	Char	9.0	10	18	SAMPLING SITE OR TYPE CODE	17
17	SO411	Num	8.3	20	28	SULFATE ION (MG/L) FORM 11	17
17	SO498	Num	8.4	30	38	SULFATE (UEQ/L)	17
17	SO4DP99	Num	8.2	40	48	SULFATE DEPOSITION (G/M**2/YR)	17
17	SOBC98	Num	8.4	50	58	SUM OF BASE CATIONS (UEQ/L)	17
17	SPRID1D	Char	6.0	80	65	SAMPLER ID NUMBER FORM 1D	17
17	ST99	Char	2.0	67	68	STATE (TWO-LETTER ABBREV)	17
17	STRAT99	Char	3.0	70	72	NSWS STRATA	17
18	T04051D	Num	8.1	1	8	TEMPERATURE AT 4 OR 5 M (DEG C) FORM 1D	18
18	T06101D	Num	8.1	10	18	TEMPERATURE AT 6 OR 10 M (DEG C) FORM 1D	18
18	T08151D	Num	8.1	20	28	TEMPERATURE AT 8 OR 15 M (DEG C) FORM 1D	18
18	T10201D	Num	8.1	30	38	TEMPERATURE AT 10 OR 20M (DEG C) FORM 1D	18
18	T12251D	Num	8.1	40	48	TEMPERATURE AT 12 OR 25M (DEG C) FORM 1D	18
18	T14301D	Num	8.1	50	58	TEMPERATURE AT 14 OR 30M (DEG C) FORM 1D	18
18	T16351D	Num	8.1	80	66	TEMPERATURE AT 16 OR 35M (DEG C) FORM 1D	18
18	T18401D	Num	8.1	70	78	TEMPERATURE AT 18 OR 40M (DEG C) FORM 1D	18
19	T20451D	Num	8.1	1	8	TEMPERATURE AT 20 OR 45M (DEG C) FORM 1D	19
19	TIMSM1D	Num	5.0	10	15	TIME SAMPLED (24 H) HH:MM FORM 1D	19
19	TM0151D	Num	8.1	17	25	TEMPERATURE (DEG C) AT 1.5M FORM 1D	19
19	TMP601D	Num	8.1	27	35	TEMPERATURE AT 0.6*DEPTH (DEG C) FORM 1D	19
19	TMPA1D	Num	8.0	37	45	AIR TEMPERATURE (DEG C) FORM 1D	19
19	TMPD11D	Num	8.1	47	55	TEMP DIF 1.5M-BOTTOM (DEG C) FORM 1D	19
19	TMPD21D	Num	8.1	57	65	TEMP DIF 1.5M-0.6*DEPTH (DEG C) FORM 1D	19
19	TMP_B1D	Num	8.1	67	75	TEMP AT BOTTOM-105M (DEG C) FORM 1D	19
20	TUR02	Num	8.2	1	8	TURBIDITY (NTU) FORM 2	20
20	TXX501D	Num	8.1	10	18	TEMPERATURE AT 50 M (DEGC) FORM 1D	20
20	VISIT1D	Num	8.0	20	28	VISIT FORM 1D	20
20	WALA99	Num	8.2	30	38	WATERSHED AREA/LAKE AREA	20
20	WALAX99	Num	11.5	40	50	WATERSHED AREA/LAKE AREA - ALSC	20
20	WDIR1D	Char	3.0	52	54	ESTIMATED WIND DIRECTION FORM 1D	20
20	WSDIS99	Char	8.0	56	63	D)WELL I)ND L)OG M)INE R)OAD S)TOCK	20
20	WSHED99	Num	8.3	65	73	WATERSHED AREA (HA)	20
21	WSHEDX99	Num	11.5	1	12	WATERSHED AREA (HA)-ALSC	21
21	WSOTH99	Char	25.0	14	38	DISTURBW/I 100M-OTHER	21
21	WSPD1D	Char	8.0	40	47	ESTIMATED WIND SPEED FORM 1D	21
21	WT1M99	Num	8.3	49	57	MODIFIED PHASE I WEIGHT	21
21	WT1O_99	Num	8.3	59	67	ORIGINAL PHASE I WEIGHT	21
21	WT2C99	Num	8.4	69	77	CONDITIONAL PHASE II WEIGHT	21
22	WT2T99	Num	8.3	1	8	TOTAL PHASE II WEIGHT	22

Table B-4. Card-Image Format Definition, ELS-II Data Set BATHYM

Card #	Variable Name	Var. Type	Format	Start Col.	End Col.	Label	Card #
1	FRATE	Num	8.3	1	8	FLUSHING RATE (YRS) [WAREA*RUNOFF/VOL]	1
1	LAKE_ID	Char	7.0	10	16	LAKE ID	1
1	LAT_DD	Num	8.4	18	28	LATITUDE (DECIMAL DEGREES)	1
1	LITTAREA	Num	8.2	28	38	LITTORAL ZONE (<= 10 FT DEPTH) AREA (HA)	1
1	LONG_DD	Num	8.4	38	46	LONGITUDE (DECIMAL DEGREES)	1
1	MAXDPM	Nurn	8.1	48	56	Maximum Depth (m)	1
1	MEANDPM	Nurn	8.1	58	66	MEAN DEPTH (M) [VOL/AREA]	1
1	RUNOFF	Num	8.3	68	76	RUNOFF (CM/YR)	1
2	SAREA	Num	8.2	1	8	Lake Surface Area (ha)	2
2	SHORLN	Num	8.3	10	18	SHORELINE LENGTH (KM)	2
2	SHRDEV	Num	8.4	20	28	SHORELINE DEVELOPMENT (L/2SQRT(PI*A))	2
2	VOLDV	Num	8.4	30	38	VOLUME DEVEL. (3*MEAN DEPTH/MAX DEPTH)	2
2	VOLUME	Num	8.3	40	48	LAKE VOLUME (10**6 CUBIC METERS)	2
2	WAREA	Num	8.2	50	58	Watershed Area (ha)	2

Table B-5. Card-Image Format Definition, ELS-II Data Set SUSZOOP

Card #	Variable Name	Var. Type	Formal	Start Col.	End Col.	Label	Card #
1	JARID	Num	2.0	1	21		1
1	LAKE_ID	Char	7.0	4	10	LAKE IDENTIFICATION NUMBER	1
1	RD1000	Num	9.3	12	20		1
1	RD100l	Num	9.3	22	30		1
1	RD1002	Num	9.3	32	40		1
1	RD1003	Num	9.3	42	50		1
1	RD1004	Num	9.3	52	60		1
1	RD1005	Num	9.3	62	70		1
2	RD1008	Num	9.3	1	10		2
2	RD1007	Num	9.3	12	20		2
2	RD1008	Num	9.3	22	30		2
2	RD1009	Num	9.3	32	40		2
2	RD1010	Num	9.3	42	50		2
2	RD1011	Num	9.3	52	60		2
2	RD1030	Num	9.3	62	70		2
3	RD1031	Num	9.3	1	10		3
3	RD1040	Num	9.3	12	20		3
3	RD1041	Num	9.3	22	30		3
3	RD1050	Num	9.3	32	40		3
3	RD1051	Num	9.3	42	50		3
3	RD1060	Num	9.3	52	60		3
3	RD1070	Num	9.3	62	70		
4	RD1101	Num	9.3	1	10		4
4	RD1102	Num	9.3	12	20		4
4	RD1103	Num	9.3	22	30		4
4	RD1104	Num	9.3	32	40		4
4	RD1105	Num	9.3	42	50		4
4	RD1110	Num	9.3	52	60		4
4	RD1400	Num	9.3	62	70		4
5	RD1401	Num	9.3	1	10		5
5	RD1402	Num	9.3	12	20		5
5	RD1403	Num	9.3	22	30		5
5	RD1404	Num	9.3	32	40		5
5	RD1405	Num	9.3	42	50		5
5	RD1406	Num	9.3	52	60		5
5	R01407	Num	9.3	62	70		5
6	RD1500	Num	9.3	1	10		6
6	RD1501	Num	9.3	12	20		6
6	RD1510	Num	9.3	22	30		6
6	RD1511	Num	9.3	32	40		6
6	RD1512	Num	9.3	42	50		6
6	RD1800	Num	9.3	52	60		6
6	RD1809	Num	9.3	62	70		6
7	RD1900	Num	9.3	1	10		7
7	RD1901	Num	9.3	12	20		7
7	RD1902	Num	9.3	22	30		7
7	RD1903	Num	9.3	32	40		7
7	RD1904	Num	9.3	42	50		7
7	RD1910	Num	9.3	52	60		7
7	RD1911	Num	9.3	62	70		7

Table B-5. (Continued)

Card #	Variable Name	Var. Type	Format	Start Col..	End Col.	Label	Card #
8	RD1912	Num	9.3	1	10		8
8	RD1921	Num	9.3	12	20		8
8	RD1922	Num	9.3	22	30		8
8	RD1923	Num	9.3	32	40		8
8	RD1924	Nurn	9.3	42	50		8
8	RD2100	Num	9.3	52	60		8
8	RD2101	Nurn	9.3	62	70		8
9	RD2102	Num	9.3	1	10		9
9	RD2200	Num	9.3	12	20		9
9	RD2300	Num	9.3	22	30		9
9	RD230I	Num	9.3	32	40		9
9	RD2310	Num	9.3	42	50		9
9	RD231l	Num	9.3	52	60		9
9	RD3l00	Num	9.3	62	70		9
10	RD3101	Num	9.3	1	10		10
10	RD3300	Num	9.3	12	20		10
10	RD4100	Num	9.3	22	30		10
10	RD5lOl	Num	9.3	32	40		10
10	RD5102	Num	9.3	42	50		10
10	RD5110	Num	9.3	52	60		10
10	RD5201	Num	9.3	62	70		10
11	RD5301	Num	9.3	1	10		11
11	RD5310	Num	9.3	12	20		11
11	RD5311	Num	9.3	22	30		11
11	RD5312	Num	9.3	32	40		11
11	RD5501	Num	9.3	42	50		11
11	RD5502	Num	9.3	52	60		11
11	RD5509	Num	9.3	62	70		11
12	RD5510	Num	9.3	1	10		12
12	RD5511	Num	9.3	12	20		12
12	RD5512	Num	9.3	22	30		12
12	RD5513	Num	9.3	32	40		12
12	RD5519	Num	9.3	42	50		12
12	RD5520	Num	9.3	52	60		12
12	RD5530	Num	9.3	62	70		12
13	RD5540	Num	9.3	1	10		13
13	RD5550	Num	9.3	12	20		13
13	RD5560	Num	9.3	22	30		13
13	RD5600	Num	9.3	32	40		13
13	RD5701	Num	9.3	42	50		13
13	RD5702	Num	9.3	52	60		13
13	RD5703	Num	9.3	62	70		13
14	RD5704	Num	9.3	1	10		14
14	RD5705	Num	9.3	12	20		14
14	RD5706	Num	9.3	22	30		14
14	RD5707	Num	9.3	32	40		14
14	RD5708	Nurn	9.3	42	50		14
14	RD5709	Num	9.3	52	60		14
14	RD5710	Num	9.3	62	70		14

Table B-5. (Continued)

Card #	Variable Name	Var. Type	Formal	Start Col.	End Col.	Label	Card #
15	RD5601	Num	9.3	1	10		15
15	RD5602	Num	9.3	12	20		15
15	RD5803	Num	9.3	22	30		15
15	RD5804	Num	9.3	32	40		15
15	RD5805	Num	9.3	42	50		15
15	RD5809	Num	9.3	52	60		15
15	RD6300	Num	9.3	62	70		15
16	RD6301	Num	9.3	1	10		16
16	RD6309	Num	9.3	12	20		16
16	RD6401	Num	9.3	22	30		16
16	RD6402	Num	9.3	32	40		16
16	RD6411	Num	9.3	42	50		16
16	RD6412	Num	9.3	52	60		16
16	RD6421	Num	9.3	62	70		16
17	RD6422	Num	9.3	1	10		17
17	RD6423	Num	9.3	12	20		17
17	RD6429	Num	9.3	22	30		17
17	RD6431	Num	9.3	32	40		17
17	RD6500	Num	9.3	42	50		17
17	RD7100	Num	9.3	52	60		17
17	RD7101	Num	9.3	62	70		17
18	RD7110	Num	9.3	1	10		18
18	RD7111	Num	9.3	12	20		18
18	RD7112	Num	9.3	22	30		18
18	RD7121	Num	9.3	32	40		18
16	RD7122	Num	9.3	42	50		18
18	RD7123	Num	9.3	52	60		18
18	RD7124	Num	9.3	62	70		18
19	RD7129	Num	9.3	1	10		19
19	RD7131	Num	9.3	12	20		19
19	RD7141	Num	9.3	22	30		19
19	RD7142	Num	9.3	32	40		19
19	RD7143	Num	9.3	42	50		19
19	RD7144	Num	9.3	52	60		19
19	RD7160	Num	9.3	62	70		19
20	RD7200	Num	9.3	1	10		20
20	RD7500	Num	9.3	12	20		20
20	RD8000	Num	9.3	22	30		20
20	RD9100	Num	9.3	32	40		20
20	RD9101	Num	9.3	42	50		20
20	RD9102	Num	9.3	52	60		20
20	RD9199	Num	9.3	62	70		20
21	RD9200	Num	9.3	1	10		21
21	RD9201	Num	9.3	12	20		21
21	RD9300	Num	9.3	22	30		21

Table B-6. Card-Image Format Definition, ELS-II Data Set SUSCHLA

Card #	Variable Name	Var. Type	Format	Start Col.	End Col..	Label	Card #
I	BATCH_ID	Num	8.0	1	8	BATCH ID CODE	1
I	CHLA_AC	Num	9.3	10	18	CHLa CONC. BASED ON PEAK AREA	1
1	CHLA_AR	Num	9.3	20	28	CHLa PEAK AREA	I
I	CHLA_HC	Num	9.3	30	38	CHLa CONC. BASED ON PEAK HIGHT	1
I	CHLA_HT	Num	9.3	40	48	CHLa PEAK HEIGHT	1
1	CHLB_AR	Num	9.3	50	58	CHLb PEAK AREA	1
1	CHLB_HT	Num	9.3	60	68	CHLb PEAK HEIGHT	1
2	DAT_ANAL	Char	10.0	1	11	DATE ANALYZED	2
2	DG_AR	Num	9.3	13	21	DEGREDATION PRODUCTS PEAK AREA	2
2	DG_HT	Num	9.3	23	31	DEGREDATION PRODUCTS PEAK HEIGHT	2
2	FLU_CHL	Nurn	9.3	33	41	CONC. OF CHLa MEASURED WITH FLUOROMETER	2
2	FLU_DIL	Nurn	9.3	43	51	DILUTION FACTOR FOR FWOR. MEASUREMENT	2
2	FLU_SCL	Num	9.3	53	61	FLUOROMETER SCALE	2
2	FLU_STD	Char	2.0	63	64	FLUORESCENCE STANDARD (MEASURED)	2
2	FLU_VAL	Num	9.3	66	74	FLUORESCENCE VALUE	2
3	LAKE_ID	Char	7.0	1	8	NSWS LAKE ID CODE	3
3	SAM_ID	Nurn	8.0	10	18	SAMPLE ID CODE	3
3	SAM_TYPE	Char	4.0	20	23	SAMPLE TYPE	3
3	SAM_VOL	Num	9.3	25	33	SAMPLE VOLUME	3
3	SOLVOL	Num	9.3	35	43	SOLVENT VOLUME	3
3	SPCCHLA	Num	9.3	45	53	CONC.OF CHLA AS MEASURED WITH SPEC	3
3	SPC_CHLB	Num	9.3	55	63	CONC. OF CHLb AS MEASURED WITH SPEC	3
3	SPECFILE	Char	10.0	65	74	SPECTROPHOTOMETRY FILE	3
4	SPEC_650	Num	9.3	1	10	SPECTROPHOTOMETRY @ 650 nm	4
4	SPEC_665	Num	9.3	12	20	SPECTROPHOTOMETRY @ 665 nm	4
4	SPEC_700	Num	9.3	22	30	SPECTROPHOTOMETRY @ 700 nm	4

Table B-7. Example Card-Image Listing for One Record In Data File FASFIM0l.DAT

```
         1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890

H          28.6              63.6000     32.0000     31.7000          1.8     31.6000   140.2000  1
   1.1965    22.8711    116.3700           711           3         -999        -999        -999  2
     -999        -999        -999        -999        -999        -999       1.767     88.1730  3
139.2400       0.194      5.4730           1    36033     0.0000          25        -999         4
     17.6        -999        -999   29OCT86       0.410       0.107       0.385        -999      5
     3.60       10.80    -999.00    -999.00        -999         3.0      400000                 6
   -999.0      -999.0           1       497.1       497.0      23.000      0.0198      1.0420   7
   1.8200      6.1270       0.042 BAB DRAINAGE    I/O        0.302       7.7220                 8
VERSAR                              1A1-028       44-21' 10"N   44.3528      03-128             9
DRY CHANNEL POND                       27.10         27.70000         0.302      0.72924       10
  74.4375      74-26' 15"W  OGDENSBURG                                                          11
7.5'X15'       UPPER SARANAC LAKE                    0.242      19.9070          11.000         12
   0.497          21.6200          -0.000  -0.0000    0.0802      1.2940          1.19   N 90   13
 31.9660            5.31      5.63              5.74       5.66       5.70       -999.00   -999.00 14
   0.917       RAIN PREV              4.8000 REG/          MODERATE      0.330       1.800     15
      20          0.508     0.635                4 A    -999.0   Y                  3.0      -999.0  16
   0.844       V1                  4.920   102.4340      2.00  137.4219     84       NY 1A1        17
  -999.0         -999.0           -999.0      -999.0    -999.0      -999.0        -999.0      -999.0 18
  -999.0       10:10              8.2         -999.0         15     -999.0        -999.0      -999.0  19
    0.40         -999.0                1         7.64        7.62094 SW DR          207.000         20
  211.10000                                    MODERATE  9.633       9.633       1.2754          21
  12.285                                                                                          22
```