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National Surface Water Survey: Eastern Lake Survey-Phase I, Data Base Dictionary

MARTIN MARIETTA

Paul Kanciruk
Meriln Gentry
Raymond McCord
Les Hook
Joseph Eilers
Mary D. Best

Environmental Sciences Division
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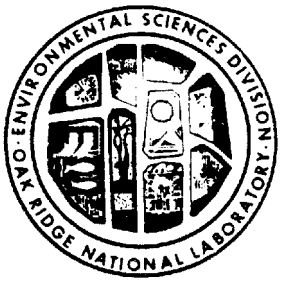

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ENVIRONMENTAL SCIENCES DIVISION

NATIONAL SURFACE WATER SURVEY: EASTERN LAKE SURVEY-PHASE I, DATA BASE DICTIONARY

Paul Kanciruk,[1] Merilyn Gentry,[2]
Raymond McCord,[2] Les Hook,[2]
Joseph Ejiers,[3] and Mary D. Best[4]

Environmental Sciences Division
Publication No. 2778

[1]Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN 37831

[2]Science Applications International Corporation, 800 Oak Ridge Turnpike, Oak Ridge, TN 37831

[3]Northrop Services, Inc., 200 SW 35th Street, Corvallis, OR 9~333

[4]Lockheed-EMSCO, Inc., 1050 E. Flamingo Rd., Las Vegas, NV 98109

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*These documents fully describe the purpose, design, and results of the U.S. EPA Eastern Lake Survey-Phase I.

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ABSTRACT

Kanciruk, Paul, Merilyn Gentry, Raymond McCord, Les Hook, Joseph Ellers, and Mary 0. Best. 1986. National Surface Water Survey: Eastern Lake Survey-Phase I, Data Base Dictionary. ORNL/TM-10153. Oak Ridge National Laboratory, Oak Ridge, Tennessee. 102 pp.

The Eastern Lake Survey-Phase I (ELS-I), conducted in the fall of 1984, was the first part of a long-term effort by the U.S. Environmental Protection Agency known as the National Surface Water Survey. It was designed to synoptically quantify the surface water quality of the United States in areas expected to exhibit low buffering capacity. This effort was in support of the National Acid Precipitation Assessment Program.

The survey involved a three-month field effort in which 1612 probability sample lakes and 186 special interest lakes In the northeast, southeast, and upper midwest regions of the United States were sampled. The data base supporting this effort was designed and data management was Implemented by the Environmental Sciences Division of the Oak Ridge National Laboratory.

This document provides the information necessary for researchers to transfer the ELS-I data base accurately to their own computer systems. A data dictionary, this document also includes complete descriptions of the variables in the data base and of the data set formats.

Keywords: National Lake Survey; NSWS; Eastern Lake Survey; Water Quality; Acidic Deposition; Acid Rain; EPA; Research Data Management.

1. INTRODUCTION

This data dictionary describes the U.S. Environmental Protection Agency's (EPA's) Eastern Lake Survey-Phase I (ELS-I) data base. A description of the purpose, design, and results of the survey is contained in the three-volume report on the ELS-I (Linthurst et al. 1986, Overton et al., 1986, and Kanciruk et al. 1986). Table 1 summarizes the information collected during this survey.

This dictionary doses not report the results of the survey, nor does it describe its purpose, design, or protocols. The function of the data base dictionary is to provide data managers and programmers with the information necessary to correctly transfer the ELS-I data to their worn computer systems.

Table 1. Summary of information collected during the U.S. EPA Eastern Lake Survey-Phase 1[a]

Geographic information

County
Elevation
Lake area
Lake ID
Lake name
Latitude
Longitude
State
USGS map names
Watershed area

Collected on the lake

Air temperature
Conductance
Depth
Number of inlets/outlets
pH
Secchi disk transparency
Secchi disk transparency
Water temperature

Measured in the field laboratory

Color
Dissolved inorganic carbon
pH
Turbidity

Measured in the analytical 1aboratory

Acid neutralizing capacity
Air-equilibrated pH
Ammonium
Calcium
Chloride
CO_2 acidity
CO_3 alkalinity
Conductance
Dissolved inorganic carbon
Dissolved organic carbon
Extractable aluminum
Fluoride
Initial titration pH
Iron
Magnesium
Manganese
Mineral acidity
Nitrate
Phosphorus
Potassium
Silica
Sodium
Sulfate
Total aluminum

Calculated or interpo1ated

Anion deficit
Biocarbonate ion
Calculated conductance
Carbonate ion
Conductance
Deposition $(H^+,\ N0_3^-,\ S0_4^{-2})$
Distance from ocean
Estimated hydraulic residence time
Lake volume
Organic anions
Precipitation
Runoff
Sum of anions
Sum of base cations
Sum of cations
Sum of cations/sum of anions
Watershed:lake area ratio

[a]For a complete list of variables, see Sections 4 and 5. For a description of the survey purpose, design and results, see the related documents listed on p. iii of this report.

2. DATA BASE DESIGN

The ELS-I data base was developed at the Oak Ridge National Laboratory (ORNL) on tandem IBM* 3033 mainframe computers using the SAS† statistical software system. The data were entered into a series of relational (tabular) SAS files which, after error checking and validation, were merged to create the data sets distributed for public use. A complete description of data base design and implementation is presented in Kanciruk, Olson, and McCord (1986).

There were two working data sets (1 and 2) used internally to verify and validate the ELS-I data base. These are not distributed. There are three distributed ELS-I data sets (Table 2), data set 3 (the validated data set), data set 4 (the final data set), and a subset of data set 4, distributed on IBM personal computer (PC) format disks. Data sets 3 and 4 are distributed on magnetic tape in both SAS and card-image formats. Data sets 3 and 4 have similar sets of variables, but duplicate lake samples (collected for quality assurance purposes) are Identified separately only In data set 3. In data set 4 and the PC data set the duplicate samples were averaged, and only the average value was reported for each lake; additionally, some missing data were substituted with estimates based upon duplicate analyses (Eilers et al. 1986). For example, If the pH meter was inoperative in the helicopter and this pH measurement was missing, the value was substituted based on the pH measurement taken at the field laboratory.

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* IBM Is the registered trademark of International Business Machines Corporation, Boca Raton, Florida 33432.

† SAS is the registered trademark of SAS Institute Inc., Cary, North Carolina 27511.

Table 2. Characteristics of data sets 3 and 4 and the PC data set

Characteristic	Data set 3 (validated)	Data set 4 (final)	PC data set (final)
Format, media	SAS or card image, 9 track magtape	SAS or card image, 9 track magtape	Card image, IBM PC disks
Number of files	1	1	4
File names[a]	ELSI . SAS (D53) (SAS format) ELSI . DS3C (Card format)	ELSI.SAS(DS4) (SAS format) ELSI . 054C (Card format)	ELS-I.RGl (Reg. 1) ELS-I.RG2 (Reg. 2) ELS-I.RG3 (Reg. 3) ELS-I.5PC (Special)
Approximate size in Mbytes	4.9	2.6	0.6 (total)
Number of observations	1922	1798	1798
Number of variables	254	150	47
Duplicate lake samples	Retained	Averaged	Averaged
Number of observations per lake	1 or 2	1	1
Tags present	Yes	No	No
Flags present	Yes	Yes	No
Missing data	Not substituted	Substituted when possible[b]	Substituted when possible[b]
Missing value representation[c]	-999 if numeric, space if character	-999 if numeric, space if character	-999 if numeric, space if character
Unique key	LAKE_ID with SAMCOD	LAKE_ID	LAKE_ID

[a] Magnetic tape files may or may not be named. PC data files are always named.
[b] Eilers et al. (1986).
[c] Missing value representation is for card-image files only. Standard SAS notation for missing values is used in the SAS files.

Data set 4 was used for analyzing and reporting results in Linthurst et al. (1986), Overton et al. (1986), and Kanciruk et al. (1986). Data set 3 is useful when the researcher desires unaveraged, unsubstituted data. In data set 3, LAKE_ID concatenated with SAMCOD is the unique record Identifier. Data set 4 or the PC data set is more appropriate for general analysis, with LAKE_ID being the unique record identifier. The PC data set (four files - one for probability sample lakes in each region and one for all special lakes) is smaller and duplicates information presented in the tables in Kanciruk et al. (1986).

3. DATA TAGS AND FLAGS

In addition to the ELS-I analytic and descriptive variables, some variables are designated as “tag”or “flags”. These variables are data qualifiers that provide additional information for an individual value. Tags are one-letter codes contained in a variable that were used to qualify data as they were recorded on the field or laboratory data forms. For example, if a pH reading was not acceptable because the pH meter was slow to stabilize, or was erratic, and a second attempt was necessary, then the pH was recorded with a tag, “B”, to associate this information specifically with this variable. Tag variable names have the same name as the variable they qualify, but with the suffix "T". A list of tag codes is given in Table 3. Tags are provided only in data set 3.

Flags are two-character codes (Table 4) which also qualify data. Flags were not entered by the observer taking the measurement, but were entered during the data verification and validation process. For flag variable names, an “F” was appended to the name of the variable being qualified.

Both tags and flags can contain multiple, concatenated codes. Variables which are tags or flags are included in the list of variables presented in Sect. 4. The use of tags and flags during the ELS-I is described in Kanciruk, Olson, and McCord (1986). Analytical quality assurance (QA) and validation procedures[1] including QA flagging, are provided in Best et al. (1986), Drouse et al. (1986), and Eilers et al. (1986).

Table 3. Tag code definitions, U.S. EPA Eastern Lake Survey-Phase I

Tag code	Definition[a]
A	Instrument unstable.
B	Redone, first reading not acceptable.
C	Instruments and sampling gear not vertical in water column.
D	Slow stabilization.
E	HYDROLAB cable too short.
F	Results outside of criteria with consent of the quality assurance manager.
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.
R	Results from reanalysis.
S	Contamination suspected.
T	Leaking container.
U	Results not required by procedure; unnecessary.
X	User-defined on the field form (defined in variable TAG_X).
Y	User-defined on the field form (defined in variable TAG_Y).
Z	User-defined on the field form (defined in variable TAG_Z).
<	Measurements taken at <1.5 m.

[a]For a description of the analytical quality assurance verification process, see Best et al. (1986) and Drouse et al. (1986).

Note: Tags are included only in data set 3.

Table 4. Flag code definitions, U.S. EPA Eastern Lake Survey-Phase I

Flag code	Definition[a]
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 nitrate contamination.
A2	Anion/cation percent ion balance difference was outside of criteria due to anion (other than nitrate) 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, Hillman et al. 1986).
A5	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.
B0	External (field) blank was above expected criteria. (For pH, DIC, DOC, conductance, alkalinity, and acidity determinations where the blank was above expected criteria).
Bl	Internal (laboratory) blank was greater than twice the required detection limit. (This flag used for pH, DIC, DOC, conductance, alkalinity, and acidity determinations where the blank was above expected criteria).

Table 4. (continued)

Flag code	Definition[a]
B2	External (field) blank was above expected criteria and contributed more than 20% to sample values which were greater than ten times the required detection limit. (Flag not used for pH, DIC, DOC, acidity, or alkalinity determinations.)
B3	Internal (laboratory) blank was more than twice the required detection limit and contributed more than 10% to the sample concentrations which were greater than ten times the required detection limit. (Flag not used for pH, DIC, DOC_1 acidity, or alkalinity determinations.)
B4	Potential negative sample bias based on internal (laboratory) blank data.
B5	Potential negative sample bias based on external (field) blank data.
C0	Percent conductance difference was outside of criteria due to an unknown cause (possible analytical error; ion concentration too high).
Cl	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, Hillman et al. 1986).
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 protolyte anions (does not fit Oliver Model, Hillman et al. 1986).
C8	Percent conductance difference was outside of criteria due to possible analytical error; cation concentration too low.

Table 4. (continued)

Flag code	Definition[a]
C9	Percent conductance difference was outside of criteria due to possible analytical error; cation concentration too high.
D0	External (field) duplicate precision exceeded the maximum expected percent relative standard deviation, but either the routine or the duplicate concentration was greater than ten times the required detection limit.
D2	External (field) duplicate precision exceeded the maximum expected percent relative standard deviation, and both the routine and the duplicate sample concentrations were greater than ten times the required detection limit.
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.
F0	Percent conductance difference exceeded criteria when HYDROLAB conductivity value was substituted.
Fl	Protolyte analysis program indicated field pH problem when HYDROLAB pH value was substituted.
F2	Protolyte analysis program indicated unexplained field pH/DIC problem when HYDROLAB pH value was substituted.
H0	The maximum holding time criteria were not met.
N5	$N0_3$ data obtained from analysis of aliquot 5.
P0	Field problem; station pH.
P1	Field problem; station DIC.
P2	Field problem; unexplained (pH/DIC).
P3	Laboratory problem; initial alkalinity pH.

Table 4. (continued)

Flag code	Definition[a]
P4	Laboratory problem; initial acidity pH.
P5	Laboratory problem; unexplained, initial pH (acidity/alkalinity).
P6	Laboratory problem; initial DIC.
P7	Laboratory problem; air-equilibrated pHIDIC.
P8	Laboratory problem; unexplained, initial pHIDIC.
P9	Laboratory problem; alkalinity determination.
U0	Known error based on relationships with other variables and/or impossible values; substitutions were made in data set 4.
Ul	Value is a substitution, original value was missing.
U2	Value is a substitution, original value was considered to be in error.
V0	Data value represents the average from a duplicate split and measurement of the lake sample.
Vl	Data value Is from the duplicate sample and is not averaged because the regular sample had "WO" flag limitations.
W0	Data value has possible measurement error, based on relationships with other variables, has QA violations, or is outside of QA windows for acceptable data.
Z0	Original value was less than zero and has been replaced with zero.
Zl	Value was less than the "system decision limit (nonparametric)."

[a]For a description of the analytical quality assurance verification process and validation methods, see Best et al. (1986), Drouse et al. (19B6), and Eilers et al. (1986).

4. LIST OF VARIABLES

Table 5 lists the 254 variables in data set 3. It is alphabetized by variable name and provides variable type (numeric or character), length (in bytes, as structured in SAS), format (if any) and the SAS label. Table 6 provides this information for the 150 variables in data set 4, and Table 7 describes the 47 variables in the PC data set. Units of measure are defined in Sect. 5.

Variable labels are printed as they appear in the SAS data sets. To assure accuracy, these lists are unedited file transfers from the mainframe computer. The use of all capital letters and “UEQ/L” for "μeq/l" and "US" for "μs/cm" are some unavoidable constraints on the aesthetics of table presentation imposed by limitations of the mainframe computer character set.

To avoid confusion, it is recommended that programmers loading data into their local software systems retain original variable names and labels when possible.

Table 5. List of variables, data set 3, U.S. EPA Eastern Lake Survey-Phase I

Variable	Type	Length	SAS label[a]
ACCO11	NUMERIC	8	ACIDITY-C02 (UEQ/L)
ACCO1lF	CHARACTER	12	FLAG FOR ACC011
ACCO11T	CHARACTER	6	TAG FOR ACC011
ACM11	NUMERIC	8	ACIDITY-MINERAL (UEQ/L)
ACM11T	CHARACTER	6	TAG FOR ACM11
AIRTMP	NUMERIC	8	AIR TEMP (DEG C)
ALEX11	NUMERIC	8	EXT. ALUMINUM (UG/L)
ALEX11F	CHARACTER	12	FLAG FOR ALEX1l
ALKA11	NUMERIC	8	ALKALINITY (UEQ/L)
ALKA11F	CHARACTER	12	FLAG FOR ALKA11
ALKA11T	CHARACTER	6	TAG FOR ALKA11
ALKC11	NUMERIC	8	ALKALINITY-C03 (UEQ/L)
ALKC11T	CHARACTER	6	TAG FOR ALKC11
ALTL11	NUMERIC	8	TOTAL ALUMINUM (UG/L)
ALTL11F	CHARACTER	12	FLAG FOR ALTL11
ALTL11T	CHARACTER	6	TAG FOR ALTL11
ANCAT	NUMERIC	8	CATSUM/ANSUM
ANDEF	NUMERIC	8	CATSUM - ANSUM (UEQ/L)
ANSUM	NUMERIC	8	SUM OF ANIONS (UEQ/L)
ANSUMF	CHARACTER	12	FLAG FOR ANSUM
BAT_ID	CHARACTER	6	BATCH ID
BAT_IDT	CHARACTER	6	TAG FOR BAT_ID
BNSTAR	NUMERIC	8	POPULATION SIZE BY STRATA
CATSUM	NUMERIC	8	SUM OF CATIONS (UEQ/L)
CATSUMF	CHARACTER	12	FLAG FOR CATSUM
CA11	NUMERIC	8	CALCIUM (MG/L)
CA11F	CHARACTER	12	FLAG FOR CA11
CA11T	CHARACTER	6	TAG FOR CA11
CA16	NUMERIC	8	CALCIUM (UEQ/L)
CL11	NUMERIC	8	CHLORIDE (MG/L)
CL11F	CHARACTER	12	FLAG FOR CL11
CL11T	CHARACTER	6	TAG FOR CL11
CL16	NUMERIC	8	CHLORIDE (UEQ/L)
COLVAL	NUMERIC	8	COLOR (PCU)
COLVALF	CHARACTER	6	FLAG FOR COLVAL
COLVALT	CHARACTER	6	TAG FOR COLVAL
COMMNT	CHARACTER	150	COMMENT FROM FORM 2
COM01	CHARACTER	120	COMMENT FORM 01
CON_B	NUMERIC	8	CONDUCTIVITY AT BOTTOM-l.5M (US)
CON_BT	CHARACTER	6	TAG FOR CON_B
CON_1	NUMERIC	8	CONDUCTIVITY AT 4 OR 5 M (US)
CON_10	NUMERIC	8	CONDUCTIVITY AT 50 M (US)
CON_2	NUMERIC	8	CONDUCTIVITY AT 6 OR 10 M (US)

Table 5. (continued)

Variable	Type	Length	SAS label[a]
CON_3	NUMERIC	8	CONDUCTIVITY AT 8 OR 15 M (US)
CON_4	NUMERIC	8	CONDUCTIVITY AT 10 OR 20 M (US)
CON_5	NUMERIC	8	CONDUCTIVITY AT 12 OR 25 M (US)
CON_6	NUMERIC	8	CONDUCTIVITY AT 14 OR 30 M (US)
CON_60	NUMERIC	8	CONDUCTIVITY AT .6*DEPTH (US)
CON_60T	CHARACTER	6	TAG FOR CON_60
CON_7	NUMERIC	8	CONDUCTIVITY AT 16 OR 35 M (US)
CON_8	NUMERIC	8	CONDUCTIVITY AT 18 OR 40 M (US)
CON_9	NUMERIC	8	CONDUCTIVITY AT 20 OR 45 M (US)
CONCAL	NUMERIC	8	CALC. SP. COND. (US)
CONCALF	CHARACTER	20	FLAG FOR CONCAL
COND11	NUMERIC	8	CONDUCTIVITY-ANAL LAB (US)
COND11F	CHARACTER	12	FLAG FOR COND11
COND11T	CHARACTER	6	TAG FOR COND11
CONFI	NUMERIC	8	CONDUCTIVITY FINAL CALIB (US)
CONFIT	CHARACTER	6	TAG FOR CONFI
CONIN	NUMERIC	8	CONDUCTIVITY INITIAL CALIB (US)
CONTOP	CHARACTER	8	CONDUCTIVITY AT SURFACE (l.5M) (US)
CONTOPF	CHARACTER	6	FLAG FOR CONTOP
CONTOPT	CHARACTER	6	TAG FOR CONTOP
COUNTY	CHARACTER	5	FIPS CODE(ST,COUNTY)
C0316	NUMERIC	8	CARBONATE ALKALINITY (UEQ/L)
C0316F	CHARACTER	12	FLAG FOR C0316
CRW_ID	CHARACTER	6	CREW ID FORM 1
DATADD	NUMERIC	8	DATE ADDED TO RAW DATASET
DATENT	NUMERIC	8	DATE ENTERED FORM 1
DATRE	NUMERIC	8	DATE REENTERED FORM 1
DATREC	NUMERIC	8	DATE RECEIVED BY ORNL FORM 1
DATSHP	NUMERIC	8	DATE SHIPPED FORM 2
DATSMP	NUMERIC	8	DATE SAMPLED FORM 1
DICE11	NUMERIC	8	EQUIL DIC-ANAL LAB (MG/L)
DICE11F	CHARACTER	12	FLAG FOR DICE11
DICE11T	CHARACTER	6	TAG FOR DICE11
DICI11	NUMERIC	8	INITIAL DIC-ANAL LAB (MG/L)
DICI11F	CHARACTER	12	FLAG FOR DICI11
DICI11T	CHARACTER	6	TAG FOR DICI11
DICQCS	NUMERIC	8	DIC QCCS - FIELD LAB (MG/L)
DICQCST	CHARACTER	6	TAG FOR DICOCS
DICVAL	NUMERIC	8	DIC - FIELD LAB (MG/L)
DICVALF	CHARACTER	6	FLAG FOR DICVAL
DICVALT	CHARACTER	6	TAG FOR DICVAL
DISM	NUMERIC	8	DISTANCE FROM COAST (KM)

Table 5. (continued)

Variable	Type	Length	SAS label[a]
DOC11	NUMERIC	8	DOC-ANAL LAB (MG/L)
DOC11F	CHARACTER	12	FLAG FOR DOC11
DOC11T	CHARACTER	6	TAG FOR DOC11
DDP_B	NUMERIC	8	DEPTH AT BOTTOM-l.5M (M)
DP_BT	CHARACTER	6	TAG FOR DP_B
DP_CAT	NUMERIC	8	DEPTH CATEGORY 4= <20M 5= >20M
DP_TOP	NUMERIC	8	DEPTH AT SURFACE (l.5M) (M)
DP_TOPT	CHARACTER	6	TAG FOR DP_TOP
DP_60	NUMERIC	8	DEPTH .6*BOTTOM (M)
DP_60T	CHARACTER	6	TAG FOR DP_60
ELEV	NUMERIC	8	LAKE ELEVATION (M)
FE11	NUMERIC	8	IRON (UG/L)
FE11F	CHARACTER	12	FLAG FOR FE11
FE11T	CHARACTER	6	TAG FOR FE11
FTL11	NUMERIC	8	FLUORIDE (MG/L)
FTL11F	CHARACTER	12	FLAG FOR FTL11
FTL16	NUMERIC	8	FLUORIDE (UEQ/L)
HC0316	NUMERIC	8	HCO3 (UEQ/L)
HCO316F	CHARACTER	12	FLAG FOR HC0316
HDEP	NUMERIC	8	HYDROGEN ION DEPOSITION (G/M**2/YR)
HYD_ID	CHARACTER	2	HYDROLAB ID FORM 1
HYDROTYP	CHARACTER	9	HYDROLOGIC TYPE
H16	NUMERIC	8	HYDRONIUM FROM PHAC (UEQ/L)
H16F	CHARACTER	12	FLAG FOR H16
IN_OUT	CHARACTER	6	PRESENCE/ABSENCE OF INLETS/OUTLETS
INLETS	NUMERIC	8	INLETS (#)
INLETST	CHARACTER	6	TAG FOR INLETS
K11	NUMERIC	6	TAG FOR INLETS
K11F	CHARACTER	12	FLAG FOR K11
K11T	CHARACTER	6	TAG FOR K11
K16	NUMERIC	8	POTASSIUM (UEQ/L)
LABNAM	CHARACTER	30	LABORATORY FOR ANALYSIS
LAKE_ID	CHARACTER	7	LAKE ID
LAKE_SIZ	NUMERIC	4	LAKE SURFACE AREA (HA)
LAKE_VOL	NUMERIC	8	CALC LAKE VOL (10**6 CU M)
LAKEIDl	CHARACTER	7	ERLD-UMD ID/ALSC WSHED-POND ID
LAKEIDl T	CHARACTER	4	TAG FOR LAKEID1
LAKENAME	CHARACTER	30	LAKE NAME
LAT	CHARACTER	10	LATITUDE
LAT_DD	NUMERIC	4	LATITUDE (DECIMAL DEGREES)
LONG	CHARACTER	11	LONGITUDE
LONG_DD	NUMERIC	4	LONGITUDE (DECIMAL DEGREES)

Table 5. (continued)

Variable	Type	Length	SAS labe[la]
MAP_BIG	CHARACTER	25	MAP SHEET NAME (1:250,000 SCALE)
MAP_SML	CHARACTER	40	MAP SHEET NAME, 15 OR 7.5 QUAD
MG11	NUMERIC	8	MAGNESIUM (MG/L)
MG11F	CHARACTER	12	FLAG FOR MG11
MG11T	CHARACTER	6	TAG FOR MG11
MG16	NUMERIC	8	MAGNESIUM (UEQ/L)
MN11	NUMERIC	8	MANGANESE (UG/L)
MN1lF	CHARACTER	12	FLAG FOR MN11
MN11T	CHARACTER	6	TAG FOR MN11
NA11	NUMERIC	8	SODIUM (MG/L)
NA11F	CHARACTER	12	FLAG FOR NA11
NA11T	CHARACTER	6	TAG FOR NA11
NA16	NUMERIC	8	SODIUM (UEQ/L)
NH411	NUMERIC	8	AMMONIUM (MG/L)
NH411F	CHARACTER	12	FLAG FOR NH411
NH416	NUMERIC	8	AMMONIUM (UEQ/L)
NO3DEP	NUMERIC	8	NITRATE DEPOSITION (G/M**2/YR)
NO311	NUMERIC	8	NITRATE (MG/L)
NO311F	CHARACTER	12	FLAG FOR N0311
NO311T	CHARACTER	6	TAG FOR N0311
No316	NUMERIC	8	NITRATE (UEQ/L)
NUSAM	NUMERIC	8	NUMBER OF SAMPLES IN THE BATCH
ORGION	NUMERIC	8	ORGANIC ANION (UEQ/L)
ORGIDNF	CHARACTER	12	FLAG FOR ORGION
OUTLET	NUMERIC	8	OUTLETS (#)
PH_B	NUMERIC	8	PH AT BOTTOM-l.5M
PH_BT	CHARACTER	6	TAG FOR PH_B
PH_TOP	NUMERIC	8	PH AT SURFACE (l.5M)
PH_TOPF	CHARACTER	6	.FLAG FOR PH_TOP
PH_TOPT	CHARACTER	6	TAG FOR PH_TOP
PH_60	NUMERIC	8	PH AT .6*DEPTH
PH_60T	CHARACTER	6	TAG FOR PH_60
PHAC11	NUMERIC	8	PH-ACIDITY INITIAL
PHAC11F	CHARACTER	12	FLAG FOR PHAC11
PHAC11T	CHARACTER	6	TAG FOR PHAC11
PHAL11	NUMERIC	8	PH-ALKALINITY INITIAL
PHAL11F	CHARACTER	12	FLAG FOR PHAL11
PHAL11T	CHARACTER	6	TAG FOR PHAL11
PHEQl1	NUMERIC	8	PH-AIR EQUILIBRATED
PHEQ11F	CHARACTER	12	FLAG FOR PHEQ11
PHFIQl	NUMERIC	8	PH FINAL CALIB
PHFIQl T	CHARACTER	6	TAG FOR PHFI01

Table 5. (continued)

Variable	Type	Length	SAS label[a]
PHIN0l	NUMERIC	8	PH INITIAL CALIB
PHIN0lT	CHARACTER	6	TAG FOR PHIN0l
PHSTQC	NUMERIC	8	PH QCCS - FIELD LAB
PHSTVL	NUMERIC	8	PH - FIELD LAB
PHSTVLF	CHARACTER	6	FLAG FOR PHSTVL
PHSTVLT	CHARACTER	6	TAG FOR PHSTVL
PHTAZ1	CHARACTER	3	AZIMUTH OF 1ST PHOTO (DEG)
PHTAZ2	CHARACTER	3	AZIMUTH OF 2ND PHOTO (DEG)
PHTLAP	CHARACTER	2	FRAME NUMBER FOR LAPCARD
PHTNU1	CHARACTER	2	FRAME NUMBER OF PHOTO 1
PHTNU2	CHARACTER	2	FRAME NUMBER OF PHOTO 2
PRECIP	NUMERIC	8	PRECIPITATION (M/YR)
PTL11	NUMERIC	8	TOTAL PHOSPHORUS (UG/L)
PTL11F	CHARACTER	12	FLAG FOR PTL11
PTL11T	CHARACTER	6	TAG FOR PTL11
REG_SPC	CHARACTER	16	REG SPEC UM NRC DEW DER SAMPLE CLASS
REGION	CHARACTER	1	NSWS REGION
RT	NUMERIC	8	RESIDENCE TIME (YR)
RUNIN	NUMERIC	8	ANNUAL RUNOFF INCHES FROM DIGIT MAP
RUNOFF	NUMERIC	8	SURFACE WATER RUNOFF (M/YR)
SAM_ID	CHARACTER	6	SAMPLE ID
SAM_IDF	CHARACTER	12	FLAG FOR SAM_ID
SAM_lDT	CHARACTER	6	TAG FOR SAM_ID
SAMCOD	CHARACTER	8	SAMPLE CODE
SECDIS	NUMERIC	8	SECCHI DISAPPEAR DEPTH (M)
SECDISF	CHARACTER	6	FLAG FOR SECDIS
SECDIST	CHARACTER	6	TAG FOR SECDIS
SECMEAN	NUMERIC	8	SECCHI, MEAN DEPTH (M)
SECREA	NUMERIC	8	SECCHI REAPPEAR DEPTH (M)
SECREAF	CHARACTER	6	FLAG FOR SECREA
SECREAT	CHARACTER	6	TAG FOR SECREA
SIO211	NUMERIC	8	SILICA (MG/L)
SIO211F	CHARACTER	12	FLAG FOR SI0211
SIO211T	CHARACTER	6	TAG FOR SI0211
SITDPF	NUMERIC	8	SITE DEPTH (FT)
SITDPM	NUMERIC	8	SITE DEPTH (M)
SITDPMT	CHARACTER	6	TAG FOR SITDPM
SOBC	NUMERIC	8	SUM OF BASE CATIONS (UEQ/L)
SOBCF	CHARACTER	12	FLAG FOR SOBC
SO4DEP	NUMERIC	8	SULFATE DEPOSITION (G/M**2/YR)
SO411	NUMERIC	8	SULFATE (MG/L)
SO411F	CHARACTER	12	FLAG FOR S0411

Table 5. (continued)

Variable	Type	Length	SAS labela
SO411T	CHARACTER	6	TAG FOR S0411
SO416	NUMERIC	8	SULFATE (UEQ/L)
SPLCOD	CHARACTER	4	SPLIT CODES
ST	CHARACTER	2	STATE (TWO-LETTER ABBREV)
STA_ID	CHARACTER	6	STATION ID FORM 2
STRAT	CHARACTER	6	STRATIFICATION(NONE,WEAK,STRONG)
STRATA	CHARACTER	3	NSWS STRATA
SUB_RGN	CHARACTER	1	NSWS SUBREGION
TAG_X	CHARACTER	40	MEANING OF TAG X FORM 1
TAG_Y	CHARACTER	20	MEANING FOR TAG Y FORM 1
TAG_Z	CHARACTER	20	MEANING FOR TAG Z FORM 1
TIMSMP	NUMERIC	8	TIME SAMPLED (24 H) HH:MM
TMP_B	NUMERIC	8	TEMPERATURE AT BOTTOM-l.5M (DEG C)
TMP_BT	CHARACTER	6	TAG FOR TMP_B
TMP_1	NUMERIC	8	TEMPERATURE AT 4 OR 5 M (DEG C)
TMP_10	NUMERIC	8	TEMPERATURE AT 50 M (DEG C)
TMP_2	NUMERIC	8	TEMPERATURE AT 6 OR 10 M (DEG C)
TMP_3	NUMERIC	8	TEMPERATURE AT 8 OR 15 M (DEG C)
TMP_4	NUMERIC	8	TEMPERATURE AT 10 OR 20 M (DEG C)
TMP_5	NUMERIC	8	TEMPERATURE AT 12 OR 25 M (DEG C)
TMP_6	NUMERIC	8	TEMPERATURE AT 14 OR 30 M (DEG C)
TMP_60	NUMERIC	8	TEMPERATURE AT .6*DEPTH (DEG C)
TMP_60T	CHARACTER	6	TAG FOR TMP_60
TMP_7	NUMERIC	8	TEMPERATURE AT 16 OR 35 M (DEG C)
TMP_8	NUMERIC	8	TEMPERATURE AT 18 OR 40 M (DEG C)
TMP_9	NUMERIC	8	TEMPERATURE AT 20 OR 45 M (DEG C)
TMPDFl	NUMERIC	8	TEMP DIF TOP-BOTTOM (DEG C)
TMPDFl T	CHARACTER	6	TAG FOR TMPDFl
TMPDF2	NUMERIC	6	TEMP DIF T0P-.6*DEPTH (DEG C)
TMPDF2T	CHARACTER	6	TAG FOR TMPDF2
TMPTOP	NUMERIC	8	TEMPERATURE AT SURFACE (l.5M) (DEG C)
TMPTOPT	CHARACTER	6	TAG FOR TMPTOP
TURQCS	NUMERIC	8	TURBIDITY QCCS - FIELD LAB (NTU)
TURVAL	NUMERIC	8	TURBIDITY - FIELD LAB (NTU)
TURVALF	CHARACTER	6	FLAG FOR TURVAL
TURVALT	CHARACTER	6	TAG FOR TURVAL
WALA	NUMERIC	8	WATERSHED AREA/LAKE AREA
WEIGHTl	NUMERIC	8	POP. EXTRAPOLATION FACTOR
WS_DIS	CHARACTER	8	D)WELL I)ND L)OG M)INE R)OAD S)TOCK
WS_0TH	CHARACTER	25	DISTURB W/I lOOM - OTHER
WSHED	NUMERIC	8	WATERSHED AREA (HA)

[a]Labels are provided only in the SAS-formatted version of data set 3.

Table 6. List of variables, data set 4, U.S. EPA Eastern Lake Survey-Phase I

Variable	Type	Length	SAS label[a]
AIRTMP	NUMERIC	8	AIR TEMP (DEG C)
ALEX11	NUMERIC	8	EXT. ALUMINUM (UG/L)
NALEX11F	CHARACTER	12	FLAG FOR ALEX11
ALKA11	NUMERIC	8	ALKALINITY (UEQ/L)
ALKA11F	CHARACTER	12	FLAG FOR ALKA11
AUL11	NUMERIC	8	TOTAL ALUMINUM (UG/L)
ALTL11F	CHARACTER	12	FLAG FOR AUL11
ANCAT	NUMERIC	8	CATSUM/ANSUM
ANDEF	NUMERIC	8	CATSUM - ANSUM (UEQ/L)
ANSUM	NUMERIC	8	SUM OF ANIONS (UEQ/L)
ANSUMF	CHARACTER	18	FLAG FOR ANSUM
BAT_ID	CHARACTER	6	BATCH ID
BAT_IDF	CHARACTER	6	FLAG FOR BAT_ID
BNSTAR	NUMERIC	8	POPULATION SIZE BY STRATA
CATSUM	NUMERIC	8	SUM OF CATIONS (UEQ/L)
CATSUMF	CHARACTER	18	FLAG FOR CATSUM
CA11	NUMERIC	8	CALCIUM (MG/L)
CA11F	CHARACTER	12	FLAG FOR CA11
CA16	NUMERIC	8	CALCIUM (UEQ/L)
CL11	NUMERIC	8	CHLORIDE (MG/L)
CL11F	CHARACTER	12	FLAG FOR CL11
CL16	NUMERIC	8	CHLORIDE (UEQ/L)
COLVAL	NUMERIC	8	COLOR (PCU)
COLVALF	CHARACTER	6	FLAG FOR COLVAL
CON_B	NUMERIC	8	SP. COND.(LOWER HYDROLAB SAMPLE) $_1$(US)
CON_60	NUMERIC	8	CONDUCTIVITY AT .6*DEPTH (US)
CONCAL	NUMERIC	8	CALC. SP. COND. ((US)
CONCALF	CHARACTER	18	FLAG FOR CONCAL
COND11	NUMERIC	8	CONDUCTIVITY-ANAL LAB (US)
COND11F	CHARACTER	12	FLAG FOR COND11
CONTOP	NUMERIC	8	SP. COND.(UPPER HYDROLAB SAMPLE),(US)
CONTOPF	CHARACTER	6	FLAG FOR CONTOP
COUNTY	CHARACTER	5	FIPS CODE(ST,COUNTY)
CO316	NUMERIC	8	CARBONATE ALKALINITY (UEQ/L)
CO316F	CHARACTER	12	FLAG FOR C0316
DATSMP	NUMERIC	8	DATE SAMPLED FORM 1
DIC11	NUMERIC	8	EQUIL DIC-ANAL LAB (MG/L)
DICE11F	CHARACTER	12	FLAG FOR DICE11
DICI11	NUMERIC	8	INITIAL DIC-ANAL LAB (MG/L)
DICI11F	CHARACTER	12	FLAG FOR DICI11
DICVAL	NUMERIC	8	DIC - FIELD LAB (MG/L)
DICVALF	CHARACTER	6	FLAG FOR DICVAL
DISM	NUMERIC	8	DISTANCE FROM COAST (KM)

Table 6. (continued)

Variable	Type	Length	SAS label[a]
DOC11	NUMERIC	8	DOC-ANAL LAB (MG/L)
DOC11F	CHARACTER	12	FLAG FOR DOC11
DP_B	NUMERIC	8	DEPTH AT BOTTOM-l.5M (M)
DP_TOP	NUMERIC	8	DEPTH AT SURFACE (1.5M) (M)
DP_60	NUMERIC	8	DEPTH .6*BOTTOM (M)
ELEV	NUMERIC	8	LAKE ELEVATION (M)
FE11	NUMERIC	8	IRON (UG/L)
FE11F	CHARACTER	12	FLAG FOR FE11
FTL11	NUMERIC	8	FLUORIDE (MG/L)
FTL11F	CHARACTER	12	FLAG FOR FTL11
FTL16	NUMERIC	8	FLUORIDE (UEQ/L)
HC0316	NUMERIC	8	HC03 (UEQ/L)
HC0316F	CHARACTER	12	FLAG FOR HC0316
HDEP	NUMERIC	8	HYDROGEN ION DEPOSITION (G/M**2/YR)
HYD_ID	CHARACTER	2	HYDROLAB ID FORM 1
HYDROTYP	CHARACTER	9	HYDROLOGIC TYPE
H16	NUMERIC	8	HYDROGEN (UEQ/L) FROM PHAC
H16F	CHARACTER	12	FLAG FOR H16
IN_OUT	CHARACTER	6	PRESENCE/ABSENCE OF INLETS/OUTLETS
INLETS	NUMERIC	8	INLETS (#)
K11	NUMERIC	8	POTASSIUM (MG/L)
K11F	CHARACTER	12	FLAG FOR K11
K16	NUMERIC	8	POTASSIUM (UEQ/L)
LABNAM	CHARACTER	30	LABORATORY FOR ANALYSIS
LAKE_ID	CHARACTER	7	LAKE ID
LAKE_SIZ	NUMERIC	4	LAKE SURFACE AREA (HA)
LAKE_VOL	NUMERIC	8	CALC LAKE VOL (10**6 CU M)
LAKEIDl	CHARACTER	7	ERLD-UMD ID/ALSC WSHED-POND ID
LAKEID1T	CHARACTER	4	TAG FOR LAKEIDl
LAKENAME	CHARACTER	30	LAKE NAME
LAT	CHARACTER	10	LATITUDE
LAT_DD	NUMERIC	4	LATITUDE (DECIMAL DEGREES)
LONG	CHARACTER	11	LONGITUDE
LONG_DD	NUMERIC	4	LONGITUDE (DECIMAL DEGREES)
MAP_BIG	CHARACTER	25	MAP SHEET NAME (1:250,000 SCALE)
MAP_SML	CHARACTER	40	MAP SHEET NAME, 15 OR 7.5 QUAD
MG11	NUMERIC	8	MAGNESIUM (MG/L)
MG11F	CHARACTER	12	FLAG FOR MG11
MG16	NUMERIC	8	MAGNESIUM (UEQ/L)
MN11	NUMERIC	8	MANGANESE (UG/L)
MN11F	CHARACTER	12	FLAG FOR MN11
NA11	NUMERIC	8	SODIUM (MG/L)

Table 6. (Continued)

Variable	Type	Length	SAS label[a]
NA11 F	CHARACTER	12	FLAG FOR NA11
NA16	NUMERIC	8	SODIUM (UEQ/L)
NH411	NUMERIC	8	AMMONIUM (MG/L)
NH411F	CHARACTER	12	FLAG FOR NH411
NH416	NUMERIC	8	AMMONIUM (UEQ/L)
N03DEP	NUMERIC	8	NITRATE DEPOSITION (G/M**2/YR)
NO311	NUMERIC	8	NITRATE (MG/L)
NO311F	CHARACTER	14	FLAG FOR N0311
NO316	NUMERIC	8	NITRATE (UEQ/L)
ORGION	NUMERIC	8	ORGANIC ANION (UEQ/L)
ORGIONF	CHARACTER	18	FLAG FOR ORGION
OUTLET	NUMERIC	8	OUTLETS (#)
PH_B	NUMERIC	8	PH AT BOTTOM-l.5M
PH_TOP	NUMERIC	8	PH AT SURFACE (1.5M)
PH_TOPF	CHARACTER	6	FLAG FOR PH_TOP
PH_60	NUMERIC	8	PH AT .6*DEPTH
PHAC11	NUMERIC	8	PH-ACIDITY INITIAL
PHACl1F	CHARACTER	12	FLAG FOR PHA11
PHAL11	NUMERIC	8	PH-ALKALINITY INITIAL
PHAL11F	CHARACTER	12	FLAG FOR PHAL11
PHEQ11	NUMERIC	8	PH-AIR EQUILIBRATED
PHEQ11F	CHARACTER	12	FLAG FOR PHEQ11
PHSTVL	NUMERIC	8	PH - FIELD LAB
PHSTVLF	CHARACTER	6	FLAG FOR PHSTVL
PRECIP	NUMERIC	8	PRECIPITATION (M/YR)
PTL11	NUMERIC	8	TOTAL PHOSPHORUS (UG/L)
PTL11F	CHARACTER	12	FLAG FOR PTL11
REG_SPC	CHARACTER	16	REG SPEC UM NRC DEW DER SAMPLE CLASS
REGION	CHARACTER	1	NSWS REGION
RT	NUMERIC	8	RESIDENCE TIME (YR)
RUNIN	NUMERIC	8	ANNUAL RUNOFF INCHES FROM DIGIT MAP
RUNOFF	NUMERIC	8	SURFACE WATER RUNOFF
SAM_ID	CHARACTER	6	SAMPLE ID
SAM_IDF	CHARACTER	6	FLAG FOR SAM_ID
SECDIS	NUMERIC	8	SECCHI DISAPPEAR DEPTH (M)
SECMEAN	NUMERIC	8	SECCHI, MEAN DEPTH (M)
SECREA	NUMERIC	8	SECCHI REAPPEAR DEPTH (M)
SI0211	NUMERIC	8	SILICA (MG/L)
SI0211F	CHARACTER	12	FLAG FOR SI0211
SITDPM	NUMERIC	8	SITE DEPTH (M)
SOBC	NUMERIC	8	SUM OF BASE CATIONS (UEQ/L)
SOBCF	CHARACTER	18	FLAG FOR SOBC

Table 6. (continued)

Variable	Type	Length	SAS label[a]
SO4DEP	NUMERIC	8	SULFATE DEPOSITION (G/M**2/YR)
SO411	NUMERIC	8	SULFATE (MG/L)
SO411F	CHARACTER	12	FLAG FOR SO411
SO416	NUMERIC	8	SULFATE (UEQ/L)
ST	CHARACTER	2	STATE (TWO-LETTER ABBREV)
STA_ID	CHARACTER	6	STATION ID FORM 2
STRAT	CHARACTER	6	STRATIFICATION(NONE,WEAK,STRONG)
STRATA	CHARACTER	3	NSWS STRATA
SUB_RGN	CHARACTER	I	NSWS SUBREGION
TIMSMP	NUMERIC	8	TIME SAMPLED (24 H) HH:MM
TMP_B	NUMERIC	8	TEMPERATURE AT BOTTOM-l.5M (DEG C)
TMP_60	NUMERIC	8	TEMPERATURE AT .6*DEPTH (DEG C)
TMPDFl	NUMERIC	B	TEMP DIF TOP-BOTTOM (DEG C)
TMPDF2	NUMERIC	8	TEMP DIF T0P~.6*DEPTH (DEG C)
TMPTOP	NUMERIC	8	TEMPERATURE AT SURFACE (l.5M) (DEG C)
TURVAL	NUMERIC	8	TURBIDITY - FIELD LAB (NTU)
TURVALF	CHARACTER	6	FLAG FOR TURVAL
WALA	NUMERIC	B	WATERSHED AREA/LAKE AREA
WEIGHT1	NUMERIC	8	POP. EXTRAPOLATION FACTOR
WS_DIS	CHARACTER	8	D)WELL I)ND L)OG M)INE R)OAD S)TOCK
WS_OTH	CHARACTER	25	DISTURB W/I lOOM - OTHER
WSHED	NUMERIC	B	WATERSHED AREA (HA)

[a]Labels are provided only in the SAS-formatted version of data set 4.

Table 7. List of variables, PC data set (all files),
U.S. EPA Eastern Lake Survey-Phase I

Variable	Type	Width[a]	Label[b]
ALEX11	NUMERIC	5.1	EXT. ALUMINUM (UG/L)
ALKA11	NUMERIC	6.1	ALKALINITY (UEQ/L)
AUL11	NUMERIC	6.1	TOTAL ALUMINUM (UG/L)
ANC AT	NUMERIC	4.2	CATSUM/ANSUM
ANSUM	NUMERIC	6.1	SUM OF ANIONS (UEQ/L)
BNSTAR	NUMERIC	4.0	POPULATION SIZE BY STRATA
CATSUM	NUMERIC	6.1	SUM OF CATIONS (UEQ/L)
CAl6	NUMERlC	6.1	CALCIUM (UEQ/L)
CL16	NUMERIC	6.1	CHLORIDE (UEQ/L)
COLVAL	NUMERIC	4.0	COLOR (PCU)
CONCAL	NUMERIC	5.1	CALC. SP. COND. (US)
COND11	NUMERIC	5.1	CONDUCTIVITY-ANAL LAB (US)
DATSMP	CHARACTER	7	DATE SAMPLED FORM 1
DICE11	NUMERIC	5.2	EQUIL DIC_ANAL LAB (MG/L)
DICVAL	NUMERIC	5.2	DIC - FIELD LAB (MG/L)
DOC11	NUMERIC	5.2	DOC-ANAL LAB (MG/L)
ELEV	NUMERIC	4.0	LAKE ELEVATION (M)
FE11	NUMERIC	6.1	IRON (UG/L)
FTL16	NUMERIC	4.1	FLUORIDE (UEQ/L)
HCO316	NUMERIC	6.1	HCO3 (UEQ/L)
HYOROTYP	CHARACTER	9	DRAINAGE, SEEPAGE, CLOSED, RESERVOIR
K16	NUMERIC	5.1	POTASSIUM (UEQ/L)
LAKE_ID	CHARACTER	7	LAKE ID
LAKENAME	CHARACTER	26	LAKE NAME
LAKE_SIZ	NUMERIC	6.0	LAKE SURFACE AREA (HA)
LAT	CHARACTER	10	LATITUDE
LONG	CHARACTER	10	LONGITUDE
MG16	NUMERIC	6.1	MAGNESIUM (MG/L)
MN11	NUMERIC	6.1	MANGANESE (UG/L)
NA16	NUMERIC	6.1	SODIUM (UEQ/L)
NH416	NUMERIC	4.1	AMMONIUM (UEQ/L)
NO316	NUMERIC	5.1	NITRATE (UEQ/L)
PHEQ11	NUMERIC	4.2	PH-AIR EQUILIBRATED
PHSTVL	NUMERIC	4.2	PH - FIELD LAB
PTL11	NUMERIC	5.1	TOTAL PHOSPHORUS (UG/L)
REG_SPC	CHARACTER	16	REG SPEC UM NRC DEW DER SAMPLE CLASS
SECMEAN	NUMERIC	4.1	SECCHI, MEAN DEPTH (M)
SIO211	NUMERIC	5.2	SILICA (MG/L)

Table 7. (continued)

Variable	Type	Width[a]	Label[b]
SITDMP	NUMERIC	5.1	SITE DEPTH (M)
SO416	NUMERIC	6.1	SULFATE (UEQ/L)
ST	CHARACTER	2	STATE (TWO_LETTER ABBREV)
STRAT	CHARACTER	6	STRATIFICATION (NONE, WEAK, STRONG)
TMPTOP	NUMERIC	4.1	TEMPERATURE AT SURFACE
TURVAL	NUMERIC	5.1	TURBIDITY - FIELD LAB (NTU)
WALA	NUMERIC	7.1	WATERSHED AREA/LAKE AREA
WEIGHT1	NUMERIC	6.3	POPULATION EXTRAPOLATION FACTOR
WSHED	NUMERIC	6.0	WATERSHED AREA (HA)

[a]Width for character fields is the integer field width. The width for numberic fields is in W.D. format, where W = the total field width (decimal point included) and D = the number of decimal places.

[b]Labels are not provided in the PC data sets but are given here for completeness.

5. DEFINITION OF VARIABLES

Table 8 provides units of measure and extended definitions for variables contained in data sets 3 and 4 and the PC data set. Variable tags and flags are not included because their definitions would invariably be just "tag (or flag) for variable X." A full description of data collected and ELS-I protocol is provided In Linthurst et al. (1986). In situ measurements are outlined in Hiliman et al. (1986) and Morris et al. (1986). EPA methods are from U.S. EPA (1983), and U.S. Geological Survey (USGS) methods are from Skougstad et al. (1979).

Conventions used in the computer-coded equations are as follows:

*	represents multiplication
**	represents exponentiation, and
/	represents division.

Table 8. Definition of variables, U.S. EPA Eastern Lake Survey-Phase I

Name	Units	Definition
ACCO11	μeq/L	Carbon dioxide acidity (or base neutralizing capacity) is the measured acidity in a sample due to dissolved $C0_2$, hydronium, and hydroxide. Determined in the analytical laboratory using base titration and Gran analysis. Used in conjunction with alkalinity to refine alkalinity and acidity calculations.
ACM11	μeq/L	Mineral acidity (negative alkalinity), calculated in the analytical laboratory using the first Gran function Iteration on a data pair (NaOH volume, calculated pH) for which the calculated pH was less than 5.
AIRTMP	°C	Air temperature measured from the helicopter with a thermometer.
ALEX11	μg/L	Extractable aluminum is an estimate of monomeric aluminum complexes (Al^{+3}). Aluminum in an unacidified, filtered sample was complexed with 8-hydroxyquinoline and extracted with methyl-isobutyl ketone (MIBK) in the field laboratory. The extract was analyzed in the analytical laboratory using the method described in Hulman et al. (1986).
ALKA11	μeq/L	Acid neutralizing capacity is a measure of the amount of acid necessary to neutralize the bicarbonate, carbonate, alumino-hydroxy complexes, and other bases in a sample. Determined in the analytical laboratory in an unfiltered, unacidified aliquot, using acidimetric titration and modified Gran analysis (Hulman et al. 1986; Kramer 1984).
ALKC11	μeq/L	Carbonate alkalinity, corresponds to the point in an acidimetric titration curve where hydroxyl (OH^-) and carbonate $(C0\bar{3})$ were neutralized (V2), but before the point where the bicarbonate $(HC0\bar{3})$ was neutralized (V1).

Table 8. (continued)

Name	Units	Definition
ALTL11	μg/L	Total aluminum, measured in the analytical laboratory In an unfiltered, acidified (HNO_3) aliquot, using EPA method 202.2 (AAS_1 atomic absorption spectroscopy, graphite furnace).
AN CAT		Ratio of measured cations to measured anions: ANCAT = CATSUM/ANSUM.
ANDEF	μeq/L	Anion deficit is the measured cations minus the measured anions: ANDEF CATSUM - ANSUM.
ANSUM	μeq/L	Sum of major anion concentrations: ANSUM = CLl6 + FTLl6 + N0316 + HC0316 + C0316 + S0416.
BAT_ID		Batch Identification number, lake and quality assurance samples processed and analyzed together on the same day and in the same field laboratory were given common batch numbers.
BNSTAR		Number of lakes identified In a stratum (see STRATA) from the USGS 1:250,000 scale maps. Lakes to be sampled were randomly selected to represent this frame population.
CA11	mg/L	Dissolved calcium, measured in the analytical laboratory In filtered, acidified (HNO_3) aliquot (EPA method 215.1, AAS, flame).
CA16	μeq/L	Dissolved calcium: CAl6 = CAll*49.90 μeq/mg.
CATSUM	μeq/L	Summation of major cation concentrations: CATSUM = CAl6 + MGl6 + NAl6 + K16 + NH416 + H16.
CL11	mg/L	Chloride ion, measured in the analytical laboratory in a filtered, unacidified aliquot (ASTM 1984; O'Dell et al. 1984; ion chromatographic method).
CL16	μEq/L	Chloride ion: CL16 = Cl11*28.21 μeq/mg.

Table 8. (continued)

Name	Units	Definition
C0316	μeq/L	Carbonate, an estimate (Butler 1982) of: $$CO_3^{-2} = \frac{4.996 \ x \ [DIC \ mg/L] \ x \ K_1K_2}{[H^+]^2 \ + \ [H^+]K_1 \ + \ K_1K_2}$$ which is coded as: C0316 = 60009*(DICI11/12O11)*ALPHA2*33.33; where: ALPHA2 = Kl*K2/ ((10**(~PHAC11))**2 + (10**-PHAC11)*K1 + K1*K2). where: K1 = 4.3*l0**~7, and K2 = 5.61*lO**-11.
COLVAL	PCU	True color measured in the field laboratory by first centrifuging the sample to remove particles, then using an HACH Model CO-1 Comparator (EPA method 110.2, modified).
COMMNT		Comment from field laboratory.
COM01		Comment from lake sampling crew.
	Field specific conductance	The following measurements of conductance were made with the HYOROLAB probe from the helicopter (CONTOP thru CONFI). These are not in alphabetical order, but ordered as usually measured. Measurements paralleled field temperature measurements.
CONTOP	μS/cm	Conductance at surface (usually 1.5 m below the surface).
CON_B	μS/cm	Conductance at SITDPM - 1.5 m.

Table 8. (continued)

	Name	Units	Definition
	CON_60	μS/cm	Conductance at O.6*SITOPM. Measurement taken when TMPDFl > 4°C.
		Profile measurements	
			Specific conductance profile measurements were taken when TMPDF ≥ 4° C. Profile measurement depths were determined by maximum lake depth measured (SITDPM). If SITDPM ≤ 20 m, profile measurements were taken at 4 m, and at 2 m increments to the bottom. If SITDPM > 20 m, the profile was taken at 5 m, and at 5 m increments to the bottom.
	CON_1	μS/cm	Conductance at 4 m (SITDPM ≤20) or 5 m (SITDPM >20).
	CON_2	μS/cm	Conductance at 6 m (SITDPM ≤20) or 10 m (SITDPM >20).
I	CON_3	μS/cm	Conductance at 8 m (or 15 m (SITDPM ≤20). SITDPM >20)
I	CON_4	μS/cm	Conductance at 10 m (SITDPM ≤20) or 20 m (SITDPM >20).
	CON_5	μS/cm	Conductance at 12 m (SITDPM ≤20) or 25 m (SITDPM >20).
	CON_6	μS/cm	Conductance at 14 m (SITDPM ≤20) or 30 m (SITDPM >20).
	CON_7	μS/cm	Conductance at 16 m (SITDPM ≤20) or 35 m (SITDPM >20).
	CON_8	μS/cm	Conductance at 18 m (SITDPM ≤20) or 40 m (SITDPM >20).
	CON_9	μS/cm	Conductance at 20 m (SITDPM ≤20) or 45 m (SITDPM >20).
	CON_10	μS/cm	Conductance at 50 m.

Table 8. (continued)

Name	Units	Definition
CONIN	μS/cm	Initial conductance values, obtained from Initial analysis of a 50 μS/cm QC check sample used to verify HYDROLAB calibration.
CONFI	μS/cm	Final conductance values, obtained from final analysis of a 50 μS/cm QC check sample used to verify HYDROLAB calibration (see CONIN).
CONCAL	μS/cm	Calculated conductance$_1$ sum of the products of ion concentration times equivalent conductance. The cations summed were Ca^{+2}, Mg^{+2}, Na^{+}, K^{+}, NH_4^{+}, and H^{+} The anions summed were SO_4^{-2}, HCO_3^{-2}, $C1^{-}$, NO_3^{-}, F^{-}, CO_3^{-2}, and OH^{-}. coded as: CONCAL = [(CAl6*59.47) + (MGl6*53.0) + (K16*73.48) + (NA16*50.08) + (NH416*73.5) + (H16*349.65) + (SO416*80.0) + (HC0316*44.5) + (CL16*76.31) + (NO316*71.42) + (F16*55.4) + (CO316*69.3) + (OH*198) 1/1000. This calculation converts μeq/L to μS/cm.
COND11	μS/cm	Specific conductance, measured In the analytical laboratory using a conductivity cell (EPA method 120.1).
COUNTY		Federal Information Processing Standard (FIPS 1979) state and county code.
CRW_ID		Lake sampling crew ID number.
DATADD		Date of completion of data management quality assurance procedures and the observation was added to data set 1 (the raw data set). DDMMMYY format.
DATENT		Date of first entry of lake sampling field data into data set 1 (the raw data set). DDMMMYY format.
DATRE		Date of second entry of lake sampling field data (all data were double entered) into data set 1 (the raw data set). DDMMMYY format.

Table 8. (continued)

	Name	Units	Definition
	DATREC		Date lake sampling field data were received by ORNL. OOMMMYY format.
	DATSHP		Date samples were shipped from field laboratories to the analytical laboratories. ODMMMYY format.
	DATSMP		Date lake was sampled. ODMMMYY format.
	DICE11	mg/L	Air-equilibrated dissolved inorganic carbon, measured in the analytical laboratory in an unfiltered, unacidified aliquot bubbled with 300 ppm $C0_2$, drawn into a syringe, filtered, and analyzed without exposure to the atmosphere (EPA method 415.2 modified, infrared spectrophotometric detector).
:~	DICI11	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).
	DICQCS	mg/L	Dissolved inorganic carbon (DIC) QC check sample (field laboratory). DIC was measured in the field laboratory on a 2.0 mg/L sodium carbonate solution using a flame ionization detector. The check sample was measured before the first sample measurement and after every eight samples.
	DICVAL	μg/L	Dissolved inorganic carbon, measured in the field 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).
	DISM	km	Distance of the lake from the Atlantic Ocean. A calculated variable for lakes within 150km from the coast line (otherwise this value is missing).

Table 8. (continued)

Name	Units	Definition
DOC11	mg/L	Dissolved organic carbon, measured In the analytical laboratory in a filtered, acidified (H_2SO_4) aliquot (EPA method 415.2, infrared spectrophotometric detector).
DP_B	m	Depth at which bottom temperature and conductance were measured: DP_B SITDPM - 1.5.
DP_CAT		Lake depth category, 4 (if SITDPM ≤ 20 m) or 5 (if SITDPM > 20 m).
DP_TOP	m	Depth of surface water sample, usually 1.5 m.
DP_60	m	Sixty percent of site depth: DP_60 = 0.6*SITDPM.
ELEV	m	Lake elevation, taken from USGS topographic maps.
FE11	μg/L	Dissolved iron, measured in the analytical laboratory in a filtered, acidified (HNO_3) al iquot (EPA method 236.1, AAS, flame).
FTL11	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).
FTL16	μeq/L	Total dissolved fluoride: FTL16= FTL11*52.64 μeq/mg.
H16	μeq/L	Hydrogen Ion concentration: H16 = lO**(-PHAC11)*l0**6.
HCO316	μeq/L	Bicarbonate, an estimate (Butler 1982) of: $HC0_3^- = \frac{5.080\ x\ [DIC\ mg/L]\ x\ [H^+]K_1}{[H^+]^2\ +\ [H^+]K_1\ +\ K_1K_2}$ which is coded as: HC0316 = 61017*(DICI11/12011)* LPHAl*16.39; where ALPHA1 = ((10**(-PHAC11))*Kl)/ ((10**(~PHAC11))**2 + (10**-PHAC11)*Ki1+ K1*K2); where K1 = 4.3*1O**~7, and K2 = 5.61*10**-11

Table 8. (continued)

Name	Units	Definition
HDEP	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 PREC1P), interpolating values for 3.75 minute latitude/longitude cells, and multiplying these paired cell values.
HYD_ID		Identification number for the HYDROLAB meter used for field measurements.
HYDROTYP		Hydrologic type, defined from geographic data. Classes are: CLOSED DRAINAGE RESERVOIR SEE PAGE
INLETS		Number of lake inlets as observed from the helicopter.
IN_OUT		Presence and/or absence of inlets and outlets, as determined from topographic maps: I/O = both; NI/O = outlets only; I/NO = inlets only; NI/NO = neither; RES = Reservoirs.
K11	mg/L	Dissolved potassium, measured in the analytical laboratory In a filtered, acidified (HNO_3) aliquot (EPA method 258.1, AAS, flame).
K16	μeq/L	Dissolved potassium: K16 = K11*~5.57 μeq/mg.
LABNAM		Name of the analytical laboratory which performed the analytical analyses. The four laboratories were Global Geochemistry Corporation (GLOBAL); U.S. Geological Survey (USGS); Versar, Inc. (VERSAR); Environmental Monitoring Services, Inc. (EMSI).

Table 8. (continued)

Name	Units	Definition
LAKE_ID		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 the assigned lake number. The first three characters also designate the stratum (see STRATA). LAKE_ID is unique for every record in data set 4 and the PC data set, but is repeated In data set 3 for those lakes which were sampled twice for quality assurance purposes.
LAKE_SIZ	ha	Lake surface area, measured using an electronic planimeter on USGS topographic maps.
LAKE_VOL	$10^6 m^3$	Estimated lake volume: LAKE_VOL = ((LAKE~SIZ*lO**4)*SITDPM*O.464)/10**6.
LAKEID1		ELS-I LAKE_ID cross reference with EPA Environmental Research Laboratory, Duluth, University of Minnesota, Duluth study lakes Identification code or the Adirondack Lake Survey Corporation (ALSC) ponds identification code. Either the ERLD_UMD or ALSC ID number is in this field (else missing).
LAKENAME		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 data base as the lake name.
LAT	deg	Latitude taken from the USGS topographic maps in DD-MM-SS (degrees-mlnutes-seconds) format.
LAT_ DD	deg	Latitude expressed as degrees and decimal degrees in DD.DDDD format.
LONG	deg	Longitude as read from the USGS topographic maps in DDD-MM-SS format.
LONG_DD	deg	Longitude expressed as degrees and decimal degrees in DDD.DDDD format.
MAP_BIG		Name of the 1:250,000 scale USGS topographic map on which the lake is located.

Table 8. (continued)

Name	Units	Definition
MAP_SML		Name of the 15 minute or 7.5 minute scale USGS topographic map on which the lake is located.
MG11	mg/L	Dissolved magnesium, measured in the analytical laboratory in a filtered, acidified (HNO_3) aliquot (EPA method 242.1, AAS, flame).
MG16	μeq/L	Dissolved magnesium: MG16 = MG11*B.2.26 μeq/mg.
MN11	μg/L	Dissolved manganese, measured In the analytical laboratory in a filtered, acidified (HNO_3) aliquot (EPA method 243.1, AAS, flame).
NA11	mg/L	Dissolved sodium, measured in the analytical laboratory In a filtered, acidified (HNO_3) aliquot (EPA method 273.1, AAS, flame).
NA16	μeq/L	Dissolved sodium: NA16 = NA11*43.50 μeq/mg.
NH411	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).
NH416	μeq/L	Ammonium ion: NH416 = NH411*55.44 μeq/mg.
NO3DEP	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 PRECIP), interpolating values for 3.75 minute latitude/longitude cells, and multiplying these paired cell values.
NO311	mg/L	Nitrate ion, measured in the analytical laboratory in a filtered, unacidified aliquot (ASTM 1984; O'Dell et al. 1984; ion chromatography).
NO316	μeq/L	Nitrate ion: NO316 = NO311*16.13 μeq/mg.
NUSAM		Number of samples in a batch and processed by the field laboratory during a sampling day (see BAT_ID).

Table 8. (continued)

Name	Units	Definition
ORGION	μeq/L	Estimate of the organic anion concentration: ORGION = K*CT/(K + (10**(~PHAC11))); where: K = lO**(-PK); CT = DOC11*10; and PK = 0.96 + 0.9*PHAC11 - 0.039*PHAC1l**2.
OUTLET		Number of lake outlets as observed from the helicopter.
	Field pH measurements	
		The following measurements were made from the helicopter with the HYOROLAB probe (PH_TOP through PHFIOl). They are listed in the usual order of sampling. Measurements of pH paralleled field temperature measurements.
PH_TOP	pH	pH measurement at surface (usually 1.5 m below the surface)
PH_B	pH	pH at SITDPM - 1.5 M
PH_60	pH	pH at O.6*SITDPM
PHIN01	pH	Initial measurement of a pH 3.91 QC check sample, used to calibrate the HYDROLAB.
PHFI01	pH	Final measurement of a pH 3.91 QC check sample, used to calibrate the HYOROLAB.
	Laboratory PH measurements	
PHA11	pH	Initial pH from the acidity titration, measured in the analytical laboratory. A sample from an unfiltered, unacidified aliquot was placed into a $C0_2$ free titration vessel and stirred. The pH was measured with an electrode (without exposure to the atmosphere) before addition of base titrant.
PHAL11	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 $C0_2$ free) and stirred. The pH was measured with an electrode before the first addition of acid titrant.

Table 8. (continued)

Name	Units	Definition
PHEQ11	pH	Air-equilibrated laboratory in an bubbled with 300 electrode). pH, measured in the analytical unfiltered, unacidified aliquot ppm $C0_2$. (EPA method 150.1,
PHSTQC	pH	Measurement of a pH 4.0 QC check sample, used by the field laboratory to calibrate closed system pH measurements.
PHSTVL	pH	Closed system pH, measured In the field laboratory using an ORION Model 611 meter and an ORION ROSS combination pH electrode on a syringe sample unexposed to the atmosphere (EPA method 150.1).
PHTAZ1	deg	Azimuth of first photo taken of the lake by field crew.
PHTAZ2	deg	Azimuth of second photo taken of the lake by field crew.
PHTLAP		Frame number for lapcard photo Identification with lake ID.
PHTNU1		Frame number of first photo.
PHTNU2		Frame number of second photo.
PRECIP	m	Annual precipitation. For Region 1, derived from 30-year precipitation norm values (1951-1980) for 500 stations (National Climate Center, NOAA). For Regions 2 and 3, derived from the 1980-1982 Acid Deposition System data (Watson and Olsen ~984) for 162 stations. 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.

Table 8. (continued)

Name	Units	Definition
PTL11	μg/L	Total phosphorous, measured In the analytical laboratory in an unfiltered, acidified (H_2SO_4) aliquot, using either of two automated, colorimetric phosphomolybdate methods: for normal phosphorus levels, using a 15mm absorption cell; for low levels, a preliminary method using 50mm absorption cell was employed (USGS method 1-4600-78).
REGION		Region is a major area of the conterminous United States where a substantial number of lakes with alkalinity <400 11eq/L can be found. For the ELS-I there are three regions, 1 (Northeast), 2 (Upper Midwest), and 3 (Southeast).
REG_SPC		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 DER = suggested by the state of Florida
RT	yr	Estimated hydraulic residence time, defined as years required to replace the volume of the lake. Calculated only for drainage lakes and reservoirs (see HYDROTYP). $RT = \frac{\text{LA x site depth}}{\text{runoff x (watershed area - LA)+(precip x LA)}}$ where LA = lake area. coded as: RT = ((LAKE_SIZ*10**4)*(SITDPM*0.464))/ (((RUNIN*2.54*10**-2)*((WSHED*10**4) - (LAKE_SIZ*10**4))) + ((LAKE_SIZ*l0**4)*(PRECIP))).
RUNIN	in/yr	Surface water runoff interpolated from USGS map (Busby 1966).

Table 8. (continued)

Name	Units	Definition
RUNOFF	rn/yr	Surface water runoff interpolated from USGS map (Busby 1966). RUNOFF = RUNIN*0.025 m/in.
SAM_ID		Identifies individual samples within a batch (see BAT~ID). In combination BAT_ID and SAM_ID are the unique sample identifiers.
SAMCOD		Sample code indicating the type of sample: R = routine sample D = duplicate sample
SECDIS	m	Secchi disk disappearance depth.
SECMEAN	m	Mean of Secchi disk disappearance and reappearance depths. SECMEAN is the lake depth if the disk was visible on the lake bottom.
SECREA	m	Secchi disk reappearance depth.
SIO211	mg/L	Silica, measured in the analytical lab in an unfiltered aliquot (USGS method 1-2700-78, colorimetric, molybdate blue, automated method).
SITDPF	ft	Sampling site depth, measured using a depth sounder or weighted line. Not necessarily maximum lake depth.
SITDPM	m	Sampling site depth, measured using a depth sounder or weighted line. Not necessarily maximum lake depth.
SO4DEP	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 measured in precipitation and the precipitation volumes (see PRECIP), Interpolating values for 3.75 minute latitude/longitude cells, and multiplying these paired cell values.
SO411	mg/L	Sulfate ion, measured in the analytical laboratory In a filtered, unacidified aliquot (ASTM 1984; O'Dell et al. 1984; ion chromatographic methods).
SO416	μeq/L	Sulfate ion: SO416 = SO411*20,20.82 μeq/mg.

Table 8. (continued)

Name	Units	Definition
SOBC	μeq/L	Sum of base cations: SOBC = NA16 + K16 + CAl6 + Mgl6.
SPLCOD		Split code, indicates that duplicate sample aliquots were sent to cooperating analytical laboratories, where: E = U.S. EPA Environmental Research Laboratory at Corvallis, C = Canada, and N = Norway.
ST		State: standard two character postal abbreviation.
STA_ID		Station ID of the field laboratory where lake samples were processed. STA_ID codes: 1 = Bangor, ME 2 = Lake Placid, NY 3 = Lexington, MA 4 = Pocono, PA 5 = Rhinelander, WI 6 Duluth, MI 7 = Asheville, NC 8 = Gainesville, FL
STRAT		Thermal stratification status: MIXED = Lakes where the difference between top temperature and bottom temperature (TMPDF1) was <4°C. WEAK = Lakes where the temperature difference between top and bottom (TMPDF1) was ≥4°C and the difference between top and the 60% depth temperature (TMPDF2) was <40E. STRONG = Lakes with a temperature difference ≥4°C between the top temperature (TMPTOP) and the temperature at 60% of lake depth (TMP_60).
STRATA		Strata, a subpopulation of lakes within a geographic area defined before sampling by the expected alkalinity of surface waters within a subregion and within a region.

Table 8. (continued)

Name	Units	Definition
SUB_RGN		Subregions are areas within each region that are similar in water quality, physiography, vegetation, climate, and soil. The ELS-I used a letter A-E concatenated with the region number as subregion identifier. The 11 subregions in the ELS-I were: Region 1 Northeast lA: Adirondacks lB: Poconos/ Catskills 1C: Central New England 1D: Southern New England lE: Maine Region 2 Upper Midwest 2A: Northeastern Minnesota 2B: Upper Peninsula of Michigan 2C: Northcentral Wisconsin 2D: Upper Great Lakes Region 3 Southeast 3A: Southern Blue Ridge 3B: Florida
TAG_X		Meaning of the user-defined tag 'X' reported on the field form.
TAG_Y		Meaning of the user-defined tag 'Y' reported on the field form.
TAG_Z		Meaning of the user-defined tag 'Z' reported on the field form
TIMSMP		Time lake was sampled in HH:MM format (24 H).
		Field temperature measurement: The following temperature measurements (TMPTOP to TMP_10) were made from the helicopter with the HYDROLAB probe. They are not in alphabetical order, but ordered as usually measured. Comparisons of top and bottom temperatures determined the need to take profile measurements.

Table 8. (continued)

Name	Units	Definition
TMPTOP	°C	Lake water temperature at surface (1.5 m).
TMP_B	°C	Temperature at SITDPM - 1.5 m.
TMPDFl	°C	Difference between top and bottom temperatures: TMPDFl = TMPTOP - TMP_B.
TMP_60	°C	Temperature at O.6*SITOPM. Measurement taken if TMPDFl ≥4°C.
TMPDF2	°C	Difference between temperature at top and temperature at 0.6*SITDPM: TMPDF2 = TMPTOP - TMP_60.
	Profile measurements	
		Temperature profile measurements were taken when TMPDF2 ≥ 4°C. Profile measurement depths were determined by maximum lake depth measured (SITDPM). If SITDPM ≤ 20 m, profile measurements were taken at 4 m and at 2 m increments to the bottom. If SITDPM > 20 m, the profile was taken at 5 m and at 5 m increments to a maximum depth of 50 m.
TMP_1	°C	Temperature at 4 m (SITDPM ≤20) or at 5 m (SITDPM >20).
TMP_2	°C	Temperature at 6 m (SITDPM ≤20) or at 10 m (SITDPM >20).
TMP_3	°C	Temperature at 8 m (SITDPM ≤20) or at 15 m (SITDPM >20).
TMP_4	°C	Temperature at 10 m (SITDPM ≤20) or at 20 m (SITDPM >20).
TMP_5	°C	Temperature at 12 m (SITDPM ≤20) or at 25 m (SITDPM >20).
TMP_6	°C	Temperature at 14 m (SITDPM ≤20) or at 30 m (SITDPM >20).
TMP_7	°C	Temperature at 16 m (SITDPM ≤20) or at 35 m (SITDPM >20).

Table 8. (continued)

Name	Units	Definition
TMP_8	°C	Temperature at 18 m (SITDPM ≤20) or at 40 m (SITDPM >20).
TMP_9	°C	Temperature at 20 m (SITDPM ≤20) or at 45 m (SITDPM >20).
TMP_10	°C	Temperature at 50 m.
TURQCS	NTU	Turbidity, measured by the field laboratory on a 5.0 NTU QC check sample used to verify nephelometer calibration. Values for the check sample were recorded before and after eight sample measurements.
TURVAL	NTU	Turbidity, measured in the unfiltered sample in the field laboratory using a MONITEK model 21 nephelometer, reported in nephelometric turbidity units (EPA method 180.1).
WALA		Ratio of watershed area to lake area. Watershed area Includes lake area.
WEIGHTl		Stratum specific population expansion factor, equal to the inverse of a sample lake's inclusion probability.
WSHED	ha	Watershed area, the geographic area from which surface water drains into a particular lake, as determined using an electronic planirneter on USGS topographic maps. Lake area was included in watershed area.
WS_DIS		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
WS_OTH		Other disturbances of the natural environment in a watershed within 100 m of the shore as noted by field crew. The "other" disturbances were specified

in WS_OTH.

6.CARD-IMAGE FORMAT DEFINITION

ELS-I data sets 3 and 4 are provided as both SAS-formatted files and as card-image flies. The PC data set is provided in card-image format only. The formats for the card-image files for all data sets are presented in Tables 9, 10, and 11. Table 11 provides the card-image format used for all PC data set files. There are four data set

files - ELS-I.RGl, ELS-I.RG2, ELS-I.RG3, and ELS-I.SPC. provide information for Regions 1, 2, 3, and the special interest lakes, respectively.

Most numeric variables were transferred to the card-image files for data sets 3 and 4 in 9.4 format (total length 9, Including decimal point, with 4 decimals), regardless of their original formats (however$_1$ WSHED is in 9.2; LAKE~SIZ, WALA, ANDEF, and ALKC11 are all in 9.3 format). The column "Dec" in Tables 9 and 10 indicates the original number of digits to the right of the decimal point in the SAS data sets. This value should be used as a part of the input format to prevent the generation of overly significant data on other computer systems.

Dates are in DDMMMYY format, and times are in HH:MM format (24-h clock) for all data sets.

The two comment variables in data set 3 (COMMNT and COM01) were split into two parts each because of their respective lengths (COMMNTl, COMMNT2, and COM011, COM012). Therefore, the card-image form of data set 3 has 256 (not 254) variables.

Note that missing numeric variables are represented as -999. These values must be removed before analysis.

Table 9. Card-image format definition, data set 3, U.S. EPA Eastern Lake Survey~-Phase I

Card No.[a]	Variable	Label	Variable type	Variable width[b]	Dec[c]	Column start	Column end	Card No.
1	CONCALF	FLAG FOR CONCAL	CHAR	20		1	20	1
1	LAKEID	LAKE ID	CHAR	7		22	28	1
1	DATREC	DATE RECEIVED BY ORNL FORM 1	CHAR	7		30	36	1
1	DATENT	DATE ENTERED FORM 1	CHAR	7		38	44	1
1	DATADD	DATE ADDED TO RAW DATASET	CHAR	7		46	52	1
1	DATRE	DATE REENTERED FORM 1	CHAR	7		54	60	1
1	DATSMP	DATE SAMPLED FORM 1	CHAR	7		62	68	1
1	TIMSMP	TIME SAMPLED (24 H) HH:MM	CHAR	5		70	74	1
2	HYDID	HYDROLAB ID FORM 1	CHAR	2		1	2	2
2	PHIN0l	PH INITIAL CALIB	NUM	9.4	2	4	12	2
2	PHIN01T	TAG FOR PHIN01	CHAR	6		14	19	2
2	PHFI01	PH FINAL CALIB	NUM	9.4	2	21	29	2
2	PHF01lT	TAG FOR PHFI01	CHAR	6		31	36	2
2	CONIN	CONDUCTIVITY INITIAL CALIB (US)	NUM	9.4	0	38	46	2
2	CONFI	CONDUCTIVITY FINAL CALIB (US)	NUM	9.4	0	48	56	2
2	CONFIT	TAG FOR CONFI	CHAR	6		58	63	2
2	PHTLAP	FRAME NUMBER FOR LAPCARD	CHAR	2		65	66	2
2	PHTNU1	FRAME NUMBER OF PHOTO 1	CHAR	2		68	69	2
2	PHTNU2	FRAME NUMBER OF PHOTO 2	CHAR	2		71	72	2
3	PHTAZ1	AZIMUTH OF 1ST PHOTO (DEG)	CHAR	3		1	3	3
3	PHTAZ2	AZIMUTH OF 2ND PHOTO (DEG)	CHAR	3		5	7	3
3	SITDPM	SITE DEPTH (M)	NUM	9.4	2	9	7	3
3	SITDPMT	TAG FOR SITDPM	CHAR	6		19	24	3
3	AIRTMP	AIR TEMP (DEG C)	NUM	9.4	1	26	34	3
3	SITDPF	SITE DEPTH (FT)	NUM	9.4	1	36	44	3
3	SECDIS	SECCHI DISAPPEAR DEPTH (M)	NUM	9.4	1	46	54	3
3	SECDISF	FLAG FOR SECDIS	CHAR	6		56	61	3
3	SECDIST	TAG FOR SECDIS	CHAR	6		63	68	3
4	SECREA	SECCHI REAPPEAR DEPTH (M)	NUM	9.4	1	1	9	4
4	SECREAF	FLAG FOR SECREA	CHAR	6		11	16	4
4	SECREAT	TAG FOR SECREA	CHAR	6		18	23	4
4	DPTOP	DEPTH AT SURFACE (l.5M) (M)	NUM	9.4	1	25	33	4
4	DPTOPT	TAG FOR DPTOP	CHAR	6		35	40	4
4	DPB	DEPTH AT BOTTOM-1.5M (M)	NUM	9.4	1	42	50	4
4	DPBT	TAG FOR DPB	CHAR	6		52	57	4
4	TMPTOP	TEMPERATURE AT SURFACE (1.5M) (DEG C)	NUM	9.4	1	59	67	4
4	TMPTOPT	TAG FOR TMPTOP	CHAR	6		69	74	4
5	TMPB	TEMPERATURE AT BOTTOM-1.5M (DEG C)	NUM	9.4	1	1	9	5
5	TMPBT	TAG FOR TMPB	CHAR	6		11	16	5
5	CONTOP	CONDUCTIVITY AT SURFACE (1.5M) (US)	NUM	9.4	0	18	26	5
5	CONTOPF	FLAG FOR CONTOP	CHAR	6		28	33	5
5	CONTOPT	TAG FOR CONTOP	CHAR	6		35	40	5
5	CONB	CONDUCTIVITY AT BOTTOM-1.5M (US)	NUM	9.4	0	42	50	5
5	CONBT	TAG FOR CONB	CHAR	6		52	57	5
5	PHTOP	PH AT SURFACE (1.5M)	NUM	9.4	2	59	67	5
5	PHTOPF	FLAG FOR PHTOP	CHAR	6		69	74	5

Table 9. (continued)

Card No.[a]	Variable	Label	Variable type	Variable width	Dec[c]	Column start	Column end	Card No.
6	PHTOPT	TAG FOR PHTOP	CHAR	6		1	6	6
6	PHB	PH AT BOTTOM-1.5M	NUM	9.4	2	8	16	6
6	PHBT	TAG FOR PHB	CHAR	6		18	23	6
6	TMPDFl	TEMP DIF TOP-80TTOM (DEG C)	NUM	9.4	1	25	33	6
6	TMPDFlT	TAG FOR TMPDF1	CHAR	6		35	40	6
6	DP60	DEPTH .6*BOTTOM (M)	NUM	9.4	1	42	50	6
6	DP60T	TAG FOR DP60	CHAR	6		52	57	6
6	TMP60	TEMPERATURE AT .6*DEPTH (DEG C)	NUM	9.4	1	59	67	6
6	TMP60T	TAG FOR TMP60	CHAR	6		69	74	6
7	CON60	CONDUCTIVITY AT .6*DEPTH (US)	NUM	9.4	0	1	9	7
7	CON60T	TAG FOR CON60	CHAR	6		11	16	7
7	PH60	PH AT .6*DEPTH	NUM	9.4	2	18	26	7
7	PH60T	TAG FOR PH60	CHAR	6		28	33	7
7	TMPDF2	TEMP DIF TOP-. 6*DEPTH (DEG C)	NUM	9.4	1	35	43	7
7	TMPDF2T	TAG FOR TMPDF2	CHAR	6		45	50	7
7	OUTLET	OUTLETS (#)	NUM	9.4	0	52	60	7
7	INLETS	INLETS (#)	NUM	9.4	0	62	70	7
8	INLETST	TAG FOR INLETS	CHAR	6		1	6	8
8	DPCAT	DEPTH CATEGORY 4=<2OM 5=>2OM	NUM	9.4	0	8	16	8
8	TMPl	TEMPERATURE AT 4 OR 5 M (DEG C)	NUM	9.4	1	18	26	8
8	TMP2	TEMPERATURE AT 6 OR 10 M (DEG C)	NUM	9.4	1	28	36	8
8	TMP3	TEMPERATURE AT 8 OR 15 M (DEG C)	NUM	9.4		38	46	8
8	TMP4	TEMPERATURE AT 10 OR 20 M (DEG C)	NUM	9.4		48	56	8
8	TMP5	TEMPERATURE AT 12 OR 25 M (DEG C)	NUM	9.4	1	58	66	8
9	TMP6	TEMPERATURE AT 14 OR 30M (DEG C)	NUM	9.4	1	1	9	9
9	TMP7	TEMPERATURE AT 16 OR 35M (DEG C)	NUM	9.4	1	11	19	9
9	TMP8	TEMPERATURE AT 18 OR 40M (DEG C)	NUM	9.4	1	21	29	9
9	TMP9	TEMPERATURE AT 20 OR 45 M (DEG C)	NUM	9.4	1	31	39	9
9	TMPIO	TEMPERATURE AT 50 M (DEG C)	NUM	9.4		41	49	9
9	CONl	CONDUCTIVITY AT 4 OR 5 M (US)	NUM	9.4	0	51	59	9
9	CON2	CONDUCTIVITY AT 6 OR 10 M (US)	NUM	9.4	0	61	69	9
10	CON3	CONDUCTIVITY AT 8 OR 15 M (US)	NUM	9.4	0	1	9	10
10	CON4	CONDUCTIVITY AT 10 OR 20 M (US)	NUM	9.4	0	11	19	10
10	CON5	CONDUCTIVITY AT 12 OR 25 M (US)	NUM	9.4	0	21	29	10
10	CON6	CONDUCTIVITY AT 14 OR 30 M (US)	NUM	9.4	0	31	39	10
10	CON7	CONDUCTIVITY AT 16 OR 35 M (US)	NUM	9.4	0	41	49	10
10	CON8	CONDUCTIVITY AT 18 OR 40 M (US)	NUM	9.4	0	51	59	10
10	CON9	CONDUCTIVITY AT 20 OR 45 M (US)	NUM	9.4	0	61	69	10
11	CONlO	CONDUCTIVITY AT 50 M (US)	NUM	9.4	0	1	9	11
11	TAGX	MEANING OF TAG x FORM 1	CHAR	40		11	50	11
11	TAGY	MEANING FOR TAG Y FORM 1	CHAR	20		52	71	11

Table 9. (continued)

Card No.[a]	Variable	Label	Variable type	Variable width[b]	Dec[c]	Column start	Column end	Card No.
\12	TAGZ	MEANING FOR TAG Z FORM 1	CHAR	2		01	20	12
12	BAT ID	BATCH ID	CHAR	6		29	34	12
12	SAMID	SAMPLE ID	CHAR	6		36	41	12
12	CRWID	CREW ID FORM 1	CHAR	6		43	48	12
12	ANCAT	CAT IONS/ANIONS	NUM	9.4	4	50	58	12
12	HYDROTYP	HYDROLOGIC TYPE	CHAR	9		60	68	12
13	LAKENAME	LAKE NAME	CHAR	30		1	30	13
13	ST	STATE (TWO-LETTER ABBREV)	CHAR	2		32	33	13
13	WSHED	WATERSHED AREA (SQ. KM)	NUM	9.2	2	35	43	13
13	ELEV	LAKE ELEVATION (M)	NUM	9.4	1	45	53	13
13	LAKESIZ	LAKE SURFACE AREA (HA)	NUM	9.3	2	55	63	13
13	INOUT	PRESENCE/ABSENCE OF INLETS/OUTLETS	CHAR	6		65	70	13
14	LATOD	LATITUDE (DECIMAL DEGREES)	NUM	9.4	5	12	20	14
14	LONGDD	LONGITUDE (DECIMAL DEGREES)	NUM	9.4	5	22	30	14
14	REGION	NSWS REGION	CHAR	1		32	32	14
14	SUBRGN	NSWS SUBREGION	CHAR	1		34	34	14
14	MAPBIG	MAP SHEET NAME (1:25,OOO SCALE)	CHAR	25		36	60	14
15	MAPSML	MAP SHEET NAME, 15 OR 7.5 QUAD	CHAR	40		1	40	15
15	LAT	LATITUDE	CHAR	10		42	51	15
15	LONG	LONGITUDE	CHAR	11		53	63	15
15	STRATA	NSWS STRATA	CHAR	3		65	67	15
15	COUNTY	FIPS CODE(ST,COUNTY)	CHAR	5		69	73	15
16	LAKEIDl	ERLD-UMD ID/ALSC WSHED-POND ID	CHAR	7		1	7	16
16	LAKEID1T	TAG FOR LAKEIDl	CHAR	4		9	12	16
16	DISM	DISTANCE FROM COAST (KM)	NUM	9.4	0	14	22	16
16	HDEP	HYDROGEN ION DEPOSITION (G/M**2/YR)	NUM	9.4	3	24	32	16
16	NO3DEP	NITRATE DEPOSITION (G/M**2/YR)	NUM	9.4	2	34	42	16
16	SO4DEP	SULFATE DEPOSITION (G/M**2/YR)	NUM	9.4	2	44	52	16
16	PRECIP	PRECIPITATION (M/YR)	NUM	9.4	3	54	62	16
16	WALA	WATERSHED AREA/LAKE AREA	NUM	9.3	2	64	72	16
17	REGSPC	REG SPEC LTM NRC DEW DER SAMPLE CLASS	CHAR	16		1	16	17
17	WSOTH	DISTURB W/I l00M - OTHER	CHAR	25		18	42	17
17	RUNIN	ANNUAL RUNOFF INCHES FROM DIGIT MAP	NUM	9.4	O	44	52	17
17	WEIGHTl	POP. EXTRAPOLATION FACTOR	NUM	9.4	4	54	62	17
17	RT	RESIDENCE TIME (YR)	NUM	9.4	3	64	72	17
18	RUNOFF	SURFACE WATER RUNOFF (M/YR)	NUM	9.4	4	1	9	18
18	LAKEVOL	CALC LAKE VOL (10**6 CU M)	NUM	9.4	3	11	19	18
18	SECMEAN	SECCHI, MEAN DEPTH (M)	NUM	9.4	2	21	29	18
18	STRAT	STRATIFICATION(NONE,WEAK,STRONG)	CHAR	6		31	36	18
18	WSDIS	D)WELL I)ND L)OG M)INE R)OAD S)TOCK	CHAR	8		38	45	18
18	BNSTAR	POPULATION SIZE BY STRATA	NUM	9.4	O	47	55	18
18	BATIDT	TAG FOR BATID	CHAR	6		57	62	18

Table 9. (continued)

Card NO[a]	Variable	Label	Variable type	Variable width[b]	Dec[c]	Co1umn start	Column end	Card No.
19	LABNAM	LABORATORY FOR ANALYSIS	CHAR	3		01	30	19
19	NUSAM	NUM8ER OF SAMPLES IN THE BATCH	NUM	9.4	0	32	40	19
19	DATSHP	DATE SHIPPED FORM 2	NUM	7		42	48	19
19	STAID	STATION ID FORM 2	CHAR	6		50	55	19
19	SAMIDT	TAG FOR SAMID	CHAR	6		57	62	19
19	SAMCOD	SAMPLE CODE	CHAR	8		64	71	19
20	DICVAL	DIC - FIELD LAB (MG/L)	NUM	9.4	3	1	9	20
20	DICVALF	FLAG FOR DICVAL	CHAR	6		11	16	20
20	DICVALT	TAG FOR DICVAL	CHAR	6		18	23	20
20	DICQCS	DIC QCCS - FIELD LAB (MG/L)	NUM	9.4	3	25	33	20
20	DICQCST	TAG FOR DICQCS	CHAR	6		35	40	20
20	PHSTVL	PH - FIELD LAB	NUM	9.4	2	42	50	20
20	PHSTVLF	FLAG FOR PHSTVL	CHAR	6		52	57	20
20	PHSTVLT	TAG FOR PHSTVL	CHAR	6		59	64	20
20	PHSTQC	PH QCCS - FIELD LAB	NUM	9.4	2	66	74	20
21	TURVAL	TURBIDITY - FIELD LAB (NTU)	NUM	9.4	2	1	9	21
21	TURVALF	FLAG FOR TURVAL	CHAR	6		11	16	21
21	TURVALT	TAG FOR TURVAL	CHAR	6		18	23	21
21	TURQCS	TURBIDITY QCCS - FIELD LAB (NTU)	NUM	9.4	1	25	33	21
21	COLVAL	COLOR (PCU)	NUM	9.4	0	35	43	21
21	COLVALF	FLAG FOR COLVAL	CHAR	6		45	50	21
21	COLVALT	TAG FOR COLVAL	CHAR	6		52	57	21
21	SPLCOD	SPLIT CODES	CHAR	4		59	62	21
21	ANSUMF	FLAG FOR ANSUM	CHAR	12		64	75	21
22	CATSUMF	FLAG FOR CATSUM	CHAR	12		1	12	22
22	SOBCF	FLAG FOR SOBC	CHAR	12		14	25	22
22	ORGIONF	FLAG FOR ORGION	CHAR	12		27	38	22
22	ANSUM	SUM OF ANIONS (UEQ/L)	NUM	9.4	3	40	48	22
22	CATSUM	SUM OF CATIONS (UEQ/L)	NUM	9.4	3	50	58	22
22	SOBC	SUM OF BASE CATIONS (UEQ/L)	NUM	9.4	3	60	68	22
23	ORGION	ORGANIC ANION (UEQ/L)	NUM	9.4	3	1	9	23
23	ANDEF	CATSUM - ANSUM (UEQ/L)	NUM	9.3	3	11	19	23
23	HCO316	HCD3 (UEQ/L)	NUM	9.4	3	21	29	23
23	HCO316F	FLAG FOR HCO316	CHAR	12		31	42	23
23	CA16	CALCIUM (UEQ/L)	NUM	9.4	3	44	52	23
23	CO316	CARBONATE ALKALINITY (UEQ/L)	NUM	9.4	3	54	62	23
23	CO316F	FLAG FOR CO316	CHAR	12		64	75	23
24	CL16	CHLORIDE (UEQ/L)	NUM	9.4	3		9	24
24	MG16	MAGNESIUM (UEQ/L)	NUM	9.4	3	11	19	24
24	N0316	NITRATE (UEQ/L)	NUM	9.4	3	21	29	24
24	K16	POTASSIUM (UEQ/L)	NUM	9.4	3	31	39	24
24	NA16	SODIUM (UEQ/L)	NUM	9.4	3	41	49	24
24	S0416	SULFATE (UEQ/L)	NUM	9.4	3	51	59	24
24	FTL16	FLUORIDE (UEQ/L)	NUM	9.4	3	61	69	24

Table 9. (continued)

Card No[a]	Variable	Label	Variable type	Variable width[b]	Dec[c]	Column start	Column end	Card No.
25	NH416	AMMONIUM (UEQ/L)	NUM	9.4	3	1	9	25
25	H16	HVORONIUM FROM PHAC (UEQ/L)	NUM	9.4	3	11	19	25
25	HJ6F	FLAG FOR H16	CHAR	12		21	32	25
25	SAMIDF	FLAG FOR SAMID	CHAR	12		34	45	25
25	CA11	CALCIUM (MG/L)	NUM	9.4	3	41	55	25
25	CA11F	FLAG FOR CA11	CHAR	12		57	68	25
25	CA11T	TAG FOR CA11	CHAR	6		70	75	25
26	MG11	MAGNESIUM (MG/L)	NUM	9.4	3	1	9	26
26	MG1IF	FLAG FOR MG11	CHAR	12		11	22	26
26	MG11T	TAG FOR MG11	CHAR	6		24	29	26
26	K11	POTASSIUM (MG/L)	NUM	9.4	3	31	39	26
26	K11F	FLAG FOR K11	CHAR	12		41	52	26
26	K1lT	TAG FOR K11	CHAR	6		54	59	26
26	NA11	SODIUM (MG/L)	NUM	9.4	3	61	69	26
27	NA11F	FLAG FOR NA11	CHAR	12		1	12	27
27	NA1lT	TAG FOR NA11	CHAR	6		14	19	27
27	MN11	MANGANESE (UG/L)	NUM	9.4	0	21	29	27
27	MN11F	FLAG FOR MN11	CHAR	12		31	42	27
27	MN1lT	TAG FOR Mnl1	CHAR	6		44	49	27
27	FE11	IRON (UG/L)	NUM	9.4	0	51	59	27
27	FE1lF	FLAG FOR FE11	CHAR	12		61	72	27
28	FE11T	TAG FOR FE11	CHAR	6		1	6	28
28	ALEX11	EXT. ALUMINUM (UG/L)	NUM	9.4	0	8	16	28
28	ALEX11F	FLAG FOR ALEX11	CHAR	12		18	29	28
28	CL11	CHLORIDE (MG/L)	NUM	9.4	3	31	39	28
28	CL11F	FLAG FOR CL11	CHAR	12		41	52	28
28	CL11T	TAG FOR CL11	CHAR	6		54	59	28
28	SO411	SULFATE (MG/L)	NUM	9.4	3	61	69	28
29	SO411F	FLAG FOR SO411	CHAR	12		1	12	29
29	SO411T	TAG FOR SO411	CHAR	6		14	19	29
29	NO311	NITRATE (MG/L)	NUM	9.4	3	21	29	29
29	NO311F	FLAG FOR NO311	CHAR	12		31	42	29
29	NO311T	TAG FOR NO311	CHAR	6		44	49	29
29	SIO211	SILICA (MG/L)	NUM	9.4	3	51	59	29
29	SIO211F	FLAG FOR SIO211	CHAR	12		61	72	29
30	SIO211T	TAG FOR SIO211	CHAR	6		1	6	30
30	FTLl1	FLUORIDE (MG/L)	NUM	9.4	4	8	16	30
30	FTL11F	FLAG FOR FTL11	CHAR	12		18	29	30
30	DOC11	DOC-ANAL LAB (MG/L)	NUM	9.4	3	31	39	30
30	DOC11F	FLAG FOR DOC11	CHAR	12		41	52	30
30	DOC11T	TAG FOR DOC11	CHAR	6		54	59	30
30	NH4l1	AMMONIUM (MG/L)	NUM	9.4	3	61	69	30

Table 9. (continued)

Card No.[a]	Variable	Label	Variable type	Variable width[b]	Dec[c]	Column start	Column end	Card No.
31	NH4l1F	FLAG FOR NH411	CHAR	12		1	12	31
31	PHEQl1	PH-AIR EQUILIBRATED	NUN	9.4	2	14	22	31
31	PHEQ11F	FLAG FOR PHEQ11	CHAR	12		24	35	31
31	PHAL11	PH-ALKALINITY INITIAL	NUN	9.4	2	37	45	31
31	PHAL11F	FLAG FOR PHAL11	CHAR	12		47	58	31
31	PHAL11T	TAG FOR PHAL11	CHAR	6		60	65	31
31	PHAC11	PH-ACIDITY INITIAL	NUN	9.4	2	67	75	31
32	PHAC11F	FLAG FOR PHAC11	CHAR	12		1	12	32
32	PHAC11T	TAG FOR PHAC11	CHAR	6		14	19	32
32	ACCO11	ACIDITY-CO2 (UEQ/L)	NUM	9.4	2	21	29	32
32	ACCO11F	FLAG FOR ACCO11	CHAR	12		31	42	32
32	ACCO11T	TAG FOR ACCO11	CHAR	6		44	49	32
32	ACM11	ACIDITY-MINERAL (UEQ/L)	NUM	9.4	2	51	59	32
32	ACM11T	TAG FOR ACM11	CHAR	6		61	66	32
33	ALKA11	ALKALINITY (UEQ/L)	NUM	9.4	1	1	9	33
33	ALKA11F	FLAG FOR ALKA11	CHAR	12		11	22	33
33	ALKA11T	TAG FOR ALKA11	CHAR	6		24	29	33
33	ALKC11	ALKALINITY-CO3 (UEQ/L)	NUM	9.3	1	31	39	33
33	ALKC11T	TAG FOR ALKC11	CHAR	6		41	46	33
33	COND11	CONDUCTIVITY-ANAL LAB (US)	NUM	9.4	1	48	56	33
33	COND11F	FLAG FOR COND11	CHAR	12		58	69	33
34	COND11T	TAG FOR COND11	CHAR	6		1	6	34
34	DICE11	EQUIL DIC-ANAL LAB (MG/L)	NUM	9.4	3	8	16	34
34	DICE11F	FLAG FOR DICE11	CHAR	12		18	29	34
34	DICE11T	TAG FOR DICE11	CHAR	6		31	36	34
34	DICI11	INITIAL DIC-ANAL LAB (MG/L)	NUN	9.4	3	38	46	34
34	DICI11F	FLAG FOR DICI11	CHAR	12		48	59	34
34	DICI11T	TAG FOR DICI11	CHAR	6		61	66	34
35	PTL11	TOTAL PHOSPHORUS (UG/L)	NUN	9.4	1	1	9	35
35	PTL11F	FLAG FOR PTL11	CHAR	12		11	22	35
35	PTL11T	TAG FOR PTL11	CHAR	6		24	29	35
35	ALTL1l	TOTAL ALUMINUM (UG/L)	NUN	9.4	1	31	39	35
35	ALTL11F	FLAG FOR AUL11	CHAR	12		41	52	35
35	ALTL11T	TAG FOR ALTL1l	CHAR	6		54	59	35
35	CONCAL	CALC. SP. COND. (US)	NUN	9.4	3	61	69	35
36	COMD11	COMMENT FORM 0l PT 1	CHAR	75		1	75	36
37	COM012	COMMENT FORM 0l PT 2	CHAR	45		1	45	37
38	COMMNT1	COMMENT FROM FORM 02 PT 1	CHAR	75		1	75	38
39	COMMNT2	COMMENT FROM FORM 02 PT 2	CHAR	75		1	75	39

[a]Card No. is a variable on each record in columns 79-80.

[b]width for CHAR (character) fields is the integer field width. The width for NUM (numeric) fields is in W.D format, where W = the total field width (decimal point included) and D = the number of decimal places. For example, 34.78 is in 5.2 format.

[c]Dec is the number of decimal places with which the original data were reported.

Table 10. Card-image format definition, data set 4, U.S. EPA Eastern Lake Survey-Phase I

Card NO.[a]	Variable	Label	Variable type	Variable width[b]	Dec[c]	Column start	Column end	Card No.
1	LAKEID	LAKE ID	CHAR	7		1	7	1
1	DATSMP	DATE SAMPLED FORM 1	CHAR	7		9	15	1
1	TIMSMP	TIME SAMPLED (24 H) HH:MM	CHAR	5		17	21	1
I	HYDID	HYDROLAB ID FORM 1	CHAR	2		23	24	1
1	WSOTH	DISTURB W/I lOOM - OTHER	CHAR	25		26	50	1
1	SITDPM	SITE DEPTH (M)	NUM	9.4	2	52	60	1
1	AIRTMP	AIR TEMP (DEG C)	NUM	9.4	1		6270	1
2	SECDIS	SECCHI DISAPPEAR DEPTH (M)	NUM	9.4	1	1	9	2
2	SECREA	SECCHI REAPPEAR DEPTH (M)	NUM	9.4	1	11	19	2
2	DPTOP	DEPTH AT SURFACE (l.5M) (M)	NUM	9.4	1	21	29	2
2	DPB	DEPTH AT BOTTOM-l.5M (M)	NUM	9.4	1	31	39	2
2	TMPTOP	TEMPERATURE AT SURFACE (1.5M) (DEG C)	NUM	9.4	1	41	49	2
2	TMPB	TEMPERATURE AT BOTTOM-1.5M (DEG C)	NUM	9.4	1	51	59	2
2	CONTOP	SP. COND.(UPPER HYDROLAB SAMPLE) (US)	NUM	9.4	0		6669	2
3	CONTOPF	FLAG FOR CONTOP	CHAR	6		1	6	3
	CONB	SP. COND.(LOWER HYDROLAB SAMPLE),(US)	NUM	9.4	0	8	16	3
3	PHTOP	PH AT SURFACE (l.5M)	NUM	9.4	2	18	26	3
3	PHTOPF	FLAG FOR PHTOP	CHAR	6		28	33	3
3	PHB	PH AT BOTTOM-l.5M	NUM	9.4	2	35	43	3
3	TMPDFl	TEMP DIF TOP-BOTTOM (DEG C)	NUM	9.4	1	45	53	3
3	DP6O	DEPTH .6*BOTTOM (M)	NUM	9.4	1	55	63	3
3	TMP6O	TEMPERATURE AT .6*DEPTH (DEG C)	NUM	9.4	1	65	73	3
4	CON60	CONDUCTIVITY AT .6*DEPTH (US)	NUM	9.4	0	1	9	4
4	PH6O	PH AT .6*DEPTH	NUM	9.4	2	11	19	4
4	TMPDF2	TEMP DIF TOP-. 6*DEPTH (DEG C)	NUM	9.4	1	21	29	4
4	OUTLET	OUTLETS (#)	NUM	9.4	0	31	39	4
4	INLETS	INLETS (#)	NUM	9.4	0	41	49	4
4	BATID	BATCH ID	CHAR	6		51	56	4
4	SAMID	SAMPLE ID	CHAR	6		58	63	4
4	BATIDF	FLAG FOR BATID	CHAR	6		65	70	4
5	STAID	STATION ID FORM 2	CHAR	6		1	6	5
5	SAMIDF	FLAG FOR SAMID	CHAR	6		8	13	5
5	DICVAL	DIC - FIELD LAB (MG/L)	NUM	9.4	4	15	23	5
5	DICVALF	FLAG FOR DICVAL	CHAR	6		25	30	5
5	PHSTVL	PH - FIELD LAB	NUM	9.4	3	32	40	5
5	PHSTVLF	FLAG FOR PHSTVL	CHAR	6		42	47	5
5	TURVAL	TURBIDITY - FIELD LAB (NTU)	NUM	9.4	3	49	57	5
5	TURVALF	FLAG FOR TURVAL	CHAR	6		59	64	5
5	COLVAL	COLOR (PCU)	NUM	9.4	1	66	74	5
6	COLVALF	FLAG FOR COLVAL	CHAR	6		1	6	6
6	ANLSUMF	FLAG FOR ASSUM	CHAR	18		8	25	6
6	CATSUMF	FLAG FOR CATSUM	CHAR	18		27	44	6
6	CONCALF	FLAG FOR CONCAL	CHAR	18		46	63	6
7	SOBCF	FLAG FOR SOBC	CHAR	18		1	18	7
7	ORGIONF	FLAG FOR ORGION	CHAR	18		20	37	7
7	ANSUM	SUM OF ANIONS (UEQ/L)	NUM	9.4	3	39	47	7
7	CATSUM	SUM OF CATIONS (UEQ/L)	NUM	9.4	3	49	57	7
7	SOBC	SUM OF BASE CATIONS (UEQ/L)	NUM	9.4	4	59	67	7

Table 10. (continued)

Card No.[a]	Variable	Label	Variable type	Variable width[b]	Dec[c]	Column start	Column end	Card No.
8	ORGION	ORGANIC ANION (UEQ/L)	NUM	9.4	4	1	9	8
8	ANDEF	CATSUN - ANSUM (UEQ/L)	NUM	9.3	4	11	19	8
8	HCO316	HCO3 (UEQ/L)	NUM	9.4	4	21	29	8
8	HCO316F	FLAG FOR HCO316	CHAR	12		31	42	8
8	CA16	CALCIUM (UEQ/L)	NUM	9.4	4	44	52	8
8	CO316	CARBONATE ALKALINITY (UEQ/L)	NUM	9.4	4	54	62	8
8	CO316F	FLAG FOR CO316	CHAR	12		64	75	8
9	Cl116	CHLORIDE (UEQ/L)	NUM	9.4	4	1	9	9
9	MG16	MAGNESIUM (UEQ/L)	NUM	9.4	4	11	19	9
9	N0316	NITRATE (UEQ/L)	NUM	9.4	4	21	29	9
9	K16	POTASSIUM (UEQ/L)	NUM	9.4	4	31	39	9
9	NA16	SODIUM (UEQ/L)	NUM	9.4	4	41	49	9
9	SO416	SULFATE (UEQ/L)	NUM	9.4	4	51	59	9
9	FTL16	FLUORIDE (UEQ/L)	NUM	9.4	4	61	69	9
10	NH416	AMMONIUM (UEQ/L)	NUM	9.4	4	1	9	10
10	H16	HYDROGEN (UEQ/L) FROM PHAC	NUM	9.4	4	11	19	10
10	H16F	FLAG FOR H16	CHAR	12		21	32	10
10	NO311F	FLAG FOR NO311	CHAR	14		34	47	10
11	LABNAM	LABORATORY FOR ANALYSIS	CHAR	30		1	30	11
11	CA11	CALCIUM (MG/L)	NUM	9.4	4	32	40	11
11	CA11F	FLAG FOR CA11	CHAR	12		42	53	11
11	MG1l	MAGNESIUM (MG/L)	NUM	9.4	4	55	63	11
12	MG11F	FLAG FOR MG11	CHAR	12		1	12	12
12	K11	POTASSIUM (MG/L)	NUM	9.4	4	14	22	12
12	K11F	FLAG FOR K11	CHAR	12		24	35	12
12	NA11	SODIUM (MG/L)	NUM	9.4	4	37	45	12
12	NA1lF	FLAG FOR NA11	CHAR	12		47	58	12
12	MN1	MANGANESE (UG/L)	NUM	9.4	1	60	68	12
13	MN11F	FLAG FOR MN11	CHAR	12		1	12	13
13	FE11	IRON (UG/L)	NUM	9.4	1	14	22	13
13	FE11F	FLAG FOR FE11	CHAR	12		24	35	13
13	ALEX11	EXT. ALUMINUM (UGIL)	NUM	9.4	2	37	45	13
13	ALEXi11F	FLAG FOR ALEX11	CHAR	12		47	58	13
13	CL11	CHLORIDE (MG/L)	NUM	9.4	4	60	68	13
14	CL11F	FLAG FOR CL11	CHAR	12		1	12	14
14	SO411	SULFATE (MG/L)	NUM	9.4	4	14	22	14
14	SO411F	FLAG FOR SO411	CHAR	12		24	35	14
14	NO311	NITRATE (MG/L)	NUM	9.4	4	37	45	14
14	SIO211	SILICA (MG/L)	NUM	9.4	4	41	55	14
14	SIO211F	FLAG FOR SIO211	CHAR	12		57	68	14
15	FTT11	FLUORIDE (MG/I)	NUM	9.4	4	1	9	15
15	FTL11F	FLAG FOR FTL11	CHAR	12		11	22	15
15	DOC11	DOC-ANAL LAB (MG/L)	NUM	9.4	4	24	32	15
15	DOC11F	FLAG FOR DOC11	CHAR	12		34	45	15
15	NH411	AMMONIUN (MG/I)	NUM	9.4	4	47	55	15
15	NH411F	FLAG FOR NH411	CHAR	12		57	68	15

Table 10. (continued)

Card No.[a]	Variable	Label	Variable type	Variable width [b]	Dec[c]	Column start	Column end	Card No.
16	PHEQ11	PH-AIR EQUILIBRATED	NUM	9.4	3	1	9	16
16	PHE11F	FLAG FOR PHEQ11	CHAR	12		11	22	16
16	PHAL11	PH-ALKALINITY INITIAL	NUM	9.4	3	24	32	16
16	PHA11F	FLAG FOR PHAL11	CHAR	12		34	45	16
16	PHAC11	PH-ACIDITY INITIAL	NUM	9.4	3	47	55	16
16	PHAC11F	FLAG FOR PHAC11	CHAR	12		57	68	16
17	ALKA11	ALKALINITY (UEQ/L)	NUM	9.4	3	1	9	17
17	ALKA11F	FLAG FOR ALKA11	CHAR	12		11	22	17
17	COND11	CONDUCTIVITY-ANAL LAB (US)	NUM	9.4	2	24	32	17
17	COND11F	FLAG FOR COND11	CHAR	12		34	45	17
17	DICE11	EQUIL DIC-ANAL LAB (MG/L)	NUM	9.4	4	47	55	17
17	DICE11F	FLAG FOR DICE11	CHAR	12		51	68	17
18	DICI11	INITIAL DIC-ANAL LAB (MG/L)	NUM	9.4	4	1	9	18
18	DICI11F	FLAG FOR DICI11	CHAR	12		11	22	18
18	PTL11	TOTAL PHOSPHORUS (UGIL)	NUM	9.4	2	24	32	18
18	PTL11F	FLAG FOR PTL11	CHAR	12		34	45	18
18	ALTL11	TOTAL ALUMINUM (UG/L)	NUM	9.4	2	47	55	18
18	ALTL1lF	FLAG FOR ALTL11	CHAR	12		57	68	18
19	CONCAL	CALC. SP. COND. (US)	NUM	9.4	3	1	9	19
19	COUNTY	FIPS CODE(ST,COUNTY)	CHAR	5		11	15	19
19	LAKEID1	ERLD-AMD ID/ALSC WSHED-POND ID	CHAR	7		17	23	19
19	LAKEID1T	TAG FOR LAKEID1	CHAR	4		25	28	19
19	DISM	DISTANCE FROM COAST (KM)	NUM	9.4	0	30	38	19
19	LAKENAME	LAKE NAME	CHAR	30		40	69	19
19	ST	STATE (TWO-LETTER ABBREV)	CHAR	2		71	72	19
20	WSHED	WATERSHED AREA (HA)	NUM	9.2	2	1	9	20
20	ELEV	LAKE ELEVATION (M)	NUM	9.4	1	11	19	20
20	LAKESIZ	LAKE SURFACE AREA (HA)	NUM	9.3	3	21	29	20
20	INOUT	PRESENCE/ABSENCE OF INLETS/OUTLETS	CHAR	6		31	36	20
20	LATDD	LATITUDE (DECIMAL DEGREES)	NUM	9.4	4	49	57	20
20	LONG DD	LONGITUDE (DECIMAL DEGREES)	NUM	9.4	4	59	67	20
20	SUBRGN	NSWS SUBREGION	CHAR	1		69	69	20
21	MAPBIG	MAP SHEET NAME (1:250,000 SCALE)	CHAR	25		1	21	21
21	MAPSML	MAP SHEET NAME, 15 OR 7.5 QUAD	CHAR	40		27	66	21
22	LAT	LATITUDE	CHAR	10		1	10	22
22	LONG	LONGITUDE	CHAR	11		12	22	22
22	STRATA	NSWS STRATA	CHAR	3		24	26	22
22	HDEP	HYDROGEN ION DEPOSITION (G/M**2/YR)	NUM	9.4	3	28	36	22
22	NO3DEP	NITRATE DEPOSITION (G/M**2/YR)	NUM	9.4	2	38	46	22
22	SO4DEP	SULFATE DEPOSITION (G/M**2/YR)	NUM	9.4	2	48	56	22
22	PRECIP	PRECIPITATION (M/YR)	NUM	9.4	3	58	66	22

Table 10 (continued)

Card No.[a]	Variable	Label	Variable type	Variable width[b]	Dec[c]	Column start	Column end	Card No.
23	RUNIN	ANNUAL RUNOFF INCHES FROM DIGIT MAP	NUM	9.4	0	1	9	23
	23	WEIGHTl POP. EXTRAPOLATION FACTOR	NUM	9.4	4	11	19	23
	23RT	RESIDENCE TIME (YR)	NUM	9.4	3	21	29	23
23	RUNOFF	SURFACE WATER RUNOFF (N/YR)	NUM	9.4	3	31	39	23
23	LAKEVOL	CALC LAKE VOL (l0**6 CU M)	NUM	9.4	3	41	49	23
23	WALA	WATERSHED AREA/LAKE AREA	NUM	9.3	3	51	59	23
23	SECMEAN	SECCHI, MEAN DEPTH (N)	NUM	9.4	2	61	69	23
24	STRAT	STRATIFICATION(NONE,WEAK,STRONG)	CHAR	6		1	6	24
24	WSDIS	D)WELL I)ND L)OG N)INE R)OAD S)TOCK	CHAR	8		8	15	24
24	REGSPC	REG SPEC LTN NRC DEW DER SAMPLE CLASS	CHAR	16		17	32	24
24	REGION	NSWS REGION	CHAR	1		34	34	24
24	BNSTAR	POPULATION SIZE BY STRATA	NUM	9.4	0	36	44	24
24	ANCAT	CATIONS/ANIONS	NUM	9.4	4	46	54	24
24	HYDROTYP	HYDROLOGIC TYPE	CHAR	9		56	64	24

[a]Card No. is a variable on each record in columns 79-80.

[b]width for CHAR (character) fields is the integer field width. The width for NUN (numeric) fields is in W.D 5.2 format, where W = the total field width (decima1 point included) and D = number of decimal places. For example, 34.78 is in 5.2 format.

[c]Dec is the number of decimal places with which the original data were reported.

Table 11 Card-image format definition, PC data set, U.S. EPA Eastern Lake Survey-Phase I

Card No.[a]	Variable	Label	Variable type	Variable width[b]	Column start	Column end	Card No.
1	LAKE ID	LAKE ID	CHAR	7	1	7	1
1	LAKENAME	LAKE NAME	CHAR	26	9	34	1
1	LAT	LATITUDE	CHAR	10	36	45	1
1	LONG	LONGITUDE	CHAR	10	46	56	1
1	ST	STATE (TWO LETTER ABBREV)	CHAR	2	58	59	1
1	ELEV	LAKE ELEVATION (N)	NUM	4.0	61	64	1
1	LAKE SIZ	LAKE SURFACE AREA (HA)	NUM	6.0	66	71	1
1	WSHED	WATERSHED AREA (HA)	NUM	6.0	73	78	1
2	WALA	WATERSHED AREA/LAKE AREA	NUM	7.1	1	7	2
2	HYDROTYP	DRAINAGE, SEEPAGE, CLOSED, RESERVOIR	CHAR	9	9	17	2
2	TMPTOP	TEMPERATURE AT SURFACE	NUM	6.1	19	24	2
2	STRAT	STRATIFICATION (NONE, WEAK, STRONG)	CHAR	6	26	31	2
2	SITDPM	SITE DEPTH (N)	NUM	5.1	33	37	2
2	SECMEAN	SECCHI, MEAN DEPTH (N)	NUM	6.1	39	44	2
2	TURVAL	TURBIDITY - FIELD LAB (NTU)	NUM	5.1	46	50	2
2	COLVAL	COLOR (PCU)	NUM	4.0	52	55	2
2	FE11	IRON (UGIL)	NUM	6.1	57	62	2
2	ANSUM	SUN OF ANIONS (UEQ/L)	NUM	6.1	64	69	2
2	CATSUN	SUN OF CATIONS (UEQ/L)	NUM	6.1	71	76	2
3	ANCAT	CAT SUN/ANSUM	NUM	4.2	1	**4**	3
3	PHEQ1l	PH~IR EQUILIBRATED	NUM	4.2	6	9	3
3	PHSTVL	PH - FIELD LAB	NUM	4.2	11	14	3
3	ALKA11	ALKALINITY (UEQ/L)	NUM	6.1	16	21	3
3	COND11	CONDUCTIVITY~AL LAB (US)	NUM	5.1	23	27	3
3	CONCAL	CALC. SP. COND. (US)	NUM	5.1	29	33	3
3	DICE11	EQUIL DIC ANAL LAB (NG/L)	NUM	5.2	35	39	3
3	DICVAL	DIC - FIELD LAB (MG/L)	NUM	5.2	41	45	3
3	DOC11	DOC-ANAL LAB (MG/L)	NUM	5.2	47	51	3
3	ALEX11	EXT. ALUMINUM (UG/L)	NUM	5.1	53	57	3
3	ALTL11	TOTAL ALUMINUM (UGIL)	NUM	6.1	59	64	3
3	CA16	CALCIUM (UEQ/L)	NUM	6.1	66	71	3
3	NG16	MAGNESIUM (MG/L)	NUM	6.1	73	78	3
4	NA16	SODIUM (UEQ/L)	NUM	6.1	1	6	4
4	K16	POTASSIUM (UEQ/L)	NUM	5.1	8	12	4
4	NH416	AMMONIUN (UEQ/L)	NUM	4.1	14	11	4
4	SO416	SULFATE (UEQ/L)	NUM	6.1	19	24	4
4	HC0316	HC03 (UEQ/L)	NUM	6.1	26	31	4
4	CL16	CHLORIDE (UEQ/L)	NUM	6.1	33	38	4
4	ND316	NITRATE (UEQ/L)	NUM	5.1	40	44	4
4	FTL16	FLUORIDE (UEQ/L)	NUM	4.1	46	49	4
4	PTL11	TOTAL PHOSPHORUS (UG/L)	NUM	5.1	51	55	4
4	SIO211	SILICA (MG/L)	NUM	5.2	57	61	4
4	REG_SPC	REG SPEC LTM NRC DEW DER SAMPLE CLASS	CHAR	16	63	78	4
5	MN11	MANGANESE (UG/L)	NUM	6.1	1	6	5
5	DATSMP	DATE SAMPLED FORM 1	CHAR	7	8	14	5
5	WEIGHT1	POPULATION EXTRAPOLATION FACTOR	NUM	6.3	16	21	5
5	BNSTAR	POPULATION SIZE BY STRATA	NUM	4.0	23	26	5

note: Card number is a variable on each 80 co1umn record. For cards 1-4, it is in column 80, and in column 28 for card 5.
format for CHAR (character) fields is the integer field width. The width for NUN (numeric) fields is in W.D format, where W = the total field width and D = the number of decimal places. For examp1e, 34.78 is in 5.2 format. Numeric values are reported to their original accuracy and therefore a "Dec" value (as in Tables 9 and 10) is not reported here.

7. DATA TRANSPORT VERIFICATION

The ELS-I data sets can be read as fully formatted SAS data sets or as card-image files (Sect. 6). Regardless, users should Verify that the data have been correctly transported to their systems by generating some or all of the statistics presented in Tables 12, 13 or 14-17. These statistics were generated in SAS (PROC MEANS), but can be duplicated in other statistical packages or languages. If the statistics generated by the user differ from those presented here, the data sets may have been corrupted in transport. Note that missing values in the card-image data sets are represented as -999. These values must be removed before generating the summary statistics to check data transport.

Tables 18-20 are card image printouts of the first five lakes in data sets 3 and 4 and the PC data set (file ELS-I.RGl). They can be used to check data formats for those using the card-image version.

These statistics are presented only as a tool to ensure proper reading of the data sets. They are not to be construed as summarizing the ELS-I results.

Table 12. Characteristics of numeric variables, data set 3, U.S. EPA Eastern Lake Survey-Phase I

Variable	N	Mean	Standard deviation	Min	Max
ACC01	1912	41.47062	73.52104	-743.00000	1605.000
ACM1l	334	90.34781	278.50100	0.00000	2068.950
AIRTMP	1919	9.21496	6.98776	-10.00000	27.000
ALEXl1	1920	16.86948	35.12652	-9.40000	446.000
ALKA11	1922	269.22739	453.86112	-209.12000	4046.600
ALKC11	704	-35.89423	145.14583	-2850.45000	659.400
ALTL11	1921	80.21609	149.10288	-2.00000	5100.000
ANCAT	1920	1.17503	0.32886	.03240	5.409
ANDEF	1920	35.77778	133.91637	-3880.40013	1738.560
ANSUM	1920	486.25823	619.03406	24.17000	5329.890
BNSTAR	1922	907.33611	1205.98069	19.00000	6332.000
CA11	1922	4.89993	6.62840	0.18700	60.940
CA16	1922	244.50655	330.75733	9.33100	3040.906
CATSUM	1920	522.03607	609.37942	53.80000	5396.040
CL11	1922	4.19715	8.33956	0.00600	94.700
CL16	1922	118.40152	235.25899	0.16900	2671.487
C0316	1920	1.45003	5.87867	0.00000	93.421
COLVAL	1919	38.99635	37.81260	0.00000	345.000
CONCAL	1920	59.88313	70.75693	7.23299	666.886
COND11	1922	58.97764	103.56276	7.80000	3613.300
CONFI	1695	49.91976	6.40529	33.00000	76.000
CONIN	1720	52.30465	5.30272	38.00000	72.000
CONTOP	1921	58.74128	61.05095	0.00000	486.000
CON_1	48	41.64583	41.85410	13.00000	272.000
CON_10	2	26.00000	8.48528	20.00000	32.000
CON_2	48	41.68750	42.43802	13.00000	275.000
CON_3	48	43.31250	43.82953	17.00000	282.000
CON_4	41	39.75610	29.27096	16.00000	148.000
CON_5	32	35.09375	22.22228	17.00000	132.000
CON_6	21	38.42857	26.74616	13.00000	134.000
CON_60	114	46.09649	46.66601	8.00000	286.000
CON_7	10	27.90000	15.09562	13.00000	67.000
CON_8	5	24.40000	4.61519	20.00000	31.000
CON_9	4	24.25000	5.31507	20.00000	31.000
CON_B	1188	55.38889	62.08917	0.00000	623.000
DICE11	1922	3.01296	5.09113	-0.15000	46.908
DICI11	1922	3.41214	5.18873	0.14800	49.834
DICQCS	472	2.07942	0.07944	1.82900	2.322
DICVAL	1919	3.51185	5.18560	0.15800	48.990
DISM	648	36.27623	24.37521	1.00000	121.000
DOC11	1922	5.95128	4.74350	0.00000	48.220

Table 12 (continued)

Variable	N	Mean	Standard deviation	Min	Max
DP_60	115	12.39913	9.78350	4.00000	78.000
DP_B	1191	7.95827	7.33872	1.50000	58.500
DP_CAT	51	4.56863	0.50020	4.00000	5.000
DP_TOP	1922	1.35021	0.35169	0.00000	2.000
ELEV	1922	352.97086	212.00840	1.50000	1582.000
FE11	1922	109.11134	188.54109	-34.00000	2638.000
FTL11	1922	0.04922	0.04862	0.00100	0.590
FTL16	1922	2.59093	2.55929	0.05300	31.068
H16	1920	2.26214	9.24127	0.00000	154.880
HC0316	1920	240.52848	420.84902	0.05200	4051.282
HDEP	1922	0.03330	0.01674	0.00700	0.088
INLETS	1418	1.42666	5.33883	0.00000	168.000
Kl1	1922	0.86590	1.55452	0.00400	24.980
K16	1922	22.14093	39.74911	0.10200	638.739
LAKE_SIZ	1921	191.20969	2265.97715	0.90000	89357.750
LAKE_VOL	1921	22.28651	286.38913	0.00500	8458.247
LAT_DD	1922	42.76948	5.30628	27.20833	48.575
LONG_DD	1922	80.24077	8.35985	67.17276	94.067
Mg11	1922	1.54992	2.39174	0.10200	29.750
MG16	1922	127.49657	196.74490	8.39100	2447.235
MN11	1922	27.05307	76.29103	-20.00000	2030.000
NA11	1922	2.86096	4.68958	0.06000	53.990
NA16	1922	124.45172	203.99664	2.61000	2348.565
NH41l	1922	0.05092	0.09733	-0.06000	1.630
NH416	1922	2.82280	5.39616	-3.32600	90.367
NO311	1922	0.20088	1.02687	-0.10600	30.600
NO316	1922	3.24028	16.56341	-1.71000	493.578
NO3DEP	1922	1.14727	0.29448	0.62000	2.070
NUSAM	1922	20.61915	4.02085	6.00000	30.000
ORGION	1920	55.55495	40.27825	0.00000	261.967
OUTLET	1475	0.73085	0.55139	0.00000	5.000
PHAC11	1920	6.63927	0.81980	3.81000	8.820
PHAL11	1922	6.59499	0.81339	3.80000	8.780
PHEQ11	1922	7.07354	0.97158	3.82000	8.930
PHFI01	1690	3.92820	0.17577	3.18000	5.900
PHIN0l	1720	3.92978	0.06564	3.63000	4.190
PHSTQC	562	4.02747	0.02385	3.95000	4.100
PHSTVL	1921	6.62114	0.82653	3.81000	9.360
PH_60	113	6.16159	0.65213	4.62000	8.110
PH_8	1183	6.38929	0.77132	3.99000	8.840

Table 12. (continued)

Variable	N	Mean	Standard deviation	Min	Max
PH_TOP	1916	6.49296	0.86117	3.6000	10.460
PRECIP	1922	0.98665	0.20240	0.65400	1.959
PTL11	1921	15.06132	30.60416	-6.10000	833.000
RT	1286	1.18998	3.19160	0.00000	45.109
RUNIN	1922	16.14880	7.21895	2.00000	40.000
RUNOFF	1922	0.41018	0.18336	0.05080	1.016
SECDIS	1915	2.68366	1.68140	0.10000	11.500
SECMEAN	1916	2.60151	1.65151	0.05000	11.450
SECREA	1592	2.56231	1.63344	0.00000	11.400
SIO211	1922	2.66141	3.20768	-1.14000	22.600
SITDPF	1912	22.11145	25.32269	2.00000	391.000
SITOPM	1922	6.73852	7.71806	0.50000	119.000
SO411	1922	5.77956	8.90770	0.10000	119.000
SO416	1922	120.33034	185.45823	2.08200	2477.580
SO4DEP	1922	1.88979	0.50270	0.68000	4.170
SOBC	1922	518.59590	614.10378	33.95471	5377.569
TMPDF1	1172	1.13063	1.76898	0.00000	8.700
TMPDF2	114	3.40526	2.17251	0.00000	7.500
TMPTOP	1921	10.23550	3.96171	0.70000	21.900
TMP_1	48	11.58750	1.67873	8.50000	16.700
TMP_10	2	10.75000	6.43467	6.20000	15.300
TMP_2	48	10.51250	2.49080	5.20000	16.700
TMP_3	48	7.97292	3.06752	4.30000	16.700
TMP_4	41	7.20244	3.04043	4.10000	16.700
TMP_5	32	6.71250	3.01745	4.00000	16.700
TMP_6	21	6.54762	3.29509	3.90000	16.600
TMP_60	114	8.89737	2.66855	4.00000	15.300
TMP_7	10	7.60000	4.32563	3.90000	16.300
TMP_8	5	9.58000	5.04450	5.60000	16.000
TMP_9	4	10.30000	5.32353	5.30000	15.800
TMP_B	1188	9.50480	3.83471	1.40000	21.100
TURQCS	467	4.77880	0.10864	4.50000	5.200
TURVAL	1921	1.57565	6.98437	0.00000	290.000
WALA	1898	61.54920	461.01922	1.73000	16843.710
WEIGHTl	1723	11.26258	14.37614	1.00000	82.558
WSHED	1899	5362.90868	32430.68105	5.00000	51300.000

Table 13. Characteristics of numeric variables, data set 4, U.S. EPA Eastern Lake Survey-Phase I

Variable	N	Mean	Standard deviation	Min	Max
AIRTMP	1795	9.28273	6.97854	-10.00000	27.000
ALEX1l	1798	17.16146	35.71280	0.00000	446.000
ALKAl1	1798	267.59825	453.05996	-209.12000	4046.600
ALTL1l	1798	78.81065	100.46459	0.00000	1357.400
AN CAT	1798	1.70948	0.30213	0.30780	5.078
ANDEF	1798	37.89717	67.35770	-576.70200	510.042
ANSUM	1798	488.25553	629.58124	24.17000	5986.790
BNSTAR	1798	907.95050	1206.72927	19.00000	6332.000
CA11	1798	4.89983	6.70668	0.18700	60.940
CA16	1798	244.50140	334.66356	9.33100	3040.906
CATSUM	1798	526.15266	630.20668	54.35000	5410.090
CL11	1798	4.25988	8.53221	0.04000	94.700
CL16	1798	120.17119	240.69367	1.12800	2671.487
CO316	1798	1.45091	5.95657	0.00000	93.421
COLVAL	1798	39.09399	37.99092	0.00000	345.000
CONCAL	1798	60.32693	72.95000	7.25900	667.128
CON011	1798	56.99743	64.68002	7.80000	543.000
CONTOP	1798	57.06062	58.90198	0.00000	486.000
CON_60	106	45.94340	47.64608	8.00000	286.000
CON_B	1111	54.98380	61.87565	0.00000	623.000
DICE11	1798	2.98671	5.05909	0.00000	46.908
OICI11	1798	3.38392	5.14487	0.14800	49.834
OICVAL	1798	3.45045	5.11455	0.15800	48.990
DISM	610	36.16066	24.07413	1.00000	121.000
DOC11	1798	5.93411	4.75487	0.00000	48.220
DP_60	107	12.50935	10.02531	4.00000	78.000
DP_B	1114	8.00350	7.42429	1.50000	58.500
DP_TOP	1798	1.34978	0.35176	0.00000	2.000
ELEV	1798	353.29066	213.47442	1.50000	1582.000
FE11	1798	109.91935	190.76451	0.00000	2638.000
FTL11	1798	0.04901	0.04718	0.00100	0.587
FTLl6	1798	2.57994	2.48342	0.05300	30.884
H16	1798	2.35312	9.51457	0.00150	154.882
HC0316	1798	239.49123	422.02708	0.05200	4051.282
HDEP	1798	0.03333	0.01673	0.00700	0.088
INLETS	1328	1.45934	5.50630	0.00000	168.000
K11	1798	0.87249	1.58637	0.00400	24.980
K16	1798	22.30959	40.56350	0.10200	638.739
LAKE_SIZ	1797	99.47747	2342.07629	0.90000	89357.750
LAKE_VOL	1797	23.62236	296.05535	0.00500	8458.247
LAT_DD	1798	42.73941	5.32249	27.20833	48.575
LONG_DD	1798	80.22093	8.34963	67.17276	94.067

Table 13. (continued)

Variable	N	Mean	Standard deviation	Min	Max
MG11	1798	1.57107	2.53376	0.10200	32.533
MG16	1798	129.23654	208.42700	8.39100	2676.165
MN11	1798	27.42158	76.89641	0.00000	2030.000
NA11	1798	2.86874	4.79774	0.06000	58.549
NA16	1798	124.79015	208.70151	2.61000	2546.881
NH411	1798	0.05342	0.09833	0.00000	1.630
NH416	1798	2.96167	5.45127	0.00000	90.367
NO311	1798	0.20519	1.05574	0.00000	30.600
NO316	1798	3.30977	17.02911	0.00000	493.578
NO3DEP	1798	1.14669	0.29350	0.62000	2.070
ORGION	1798	55.24876	39.99638	0.00000	261.967
OUTLET	1381	0.73135	0.54860	0.00000	5.000
PHAC11	1798	6.63092	0.82550	3.81000	8.820
PHAL11	1798	6.58711	0.81743	3.80000	8.780
PHEQ11	1798	7.06590	0.97586	3.82000	8.930
PHSTVL	1798	6.61476	0.83263	3.81000	9.360
PH_60	105	6.14790	0.65917	4.62000	8.110
PH_B	1106	6.38069	0.76725	3.99000	8.840
PRECIP	1798	0.98723	0.20298	0.65400	1.959
PTL11	1798	15.25968	31.45457	0.00000	833.000
RT	1209	1.19708	3.23114	0.00000	45.109
RUNIN	1798	16.17519	7.24359	2.00000	40.000
RUNOFF	1798	0.41085	0.18399	0.05080	1.016
SECDIS	1792	2.68214	1.68856	0.10000	11.500
SECMEAN	1793	2.59967	1.65794	0.05000	11.450
SECREA	1491	2.55641	1.63550	0.00000	11.400
SI0211	1798	2.66738	3.21926	0.00000	22.600
SITOPM	1798	6.77216	7.83774	0.50000	119.000
S0411	1798	5.82384	9.12651	0.10000	119.000
S0416	1798	121.25242	190.01401	2.08200	2477.580
SO4DEP	1798	1.89078	0.50291	0.68000	4.170
SOBC	1798	520.83780	630.33173	33.95500	5408.420
TMPOF1	1095	1.13123	1.75375	0.00000	8.700
TMPOF2	106	3.28585	2.14531	0.00000	7.500
TMPTOP	1797	10.23422	3.97149	0.70000	21.900
TMP_60	106	9.00377	2.68895	4.00000	15.300
TMP_B	1111	9.49523	3.82036	1.40000	21.100
TURVAL	1798	1.58125	7.17877	0.00000	290.000
WALA	1775	9.58885	457.98664	1.73000	16843.710
WEIGHT1	1612	11.26263	14.40741	1.00000	82.558
WSHED	1776	5461.02381	33195.60583	5.00000	551300.000

Table 14. Characteristics of numeric variables, PC data set, file ELS-I.RG1, U.S. EPA Eastern Lake Survey-Phase I

Variable	N	Mean	Standard deviation	Min	Max
ALEX11	768	16.43132	36.35289	0.00000	324.50000
ALKA11	768	246.43729	395.25058	- 45.60000	4046.60000
ALTL11	768	82.37370	91.11827	0.00000	796.80000
ANCAT	768	1.09544	0.19626	0.67592	3.68011
ANSUM	768	518.56986	577.51590	58.10000	4945.94000
CA16	768	252.80748	310.58216	19.26100	3028.43100
CATSUM	768	544.37003	575.20750	69.38000	4809.44000
CL16	768	168.70019	298.79375	4.24600	2501.32400
COLVAL	768	32.15820	27.97935	0.00000	250.00000
CONCAL	768	63.77247	66.35044	10.80478	519.10627
COND11	768	60.70167	60.82066	11.00000	453.50000
DICE11	768	2.67787	4.32100	0.04900	46.90800
DICVAL	768	3.18445	4.56360	0.20400	48.99000
DOC11	768	4.89102	2.88793	0.14000	26.38000
ELEV	768	327.07311	222.06455	1.52000	1582.00000
FE11	768	87.91081	122.56009	0.00000	1082.00000
FTL16	768	3.00737	2.78388	0.15800	30.88400
HC0316	768	219.34374	367.15718	0.30200	4051.28200
K16	768	16.26754	15.66557	0.15300	149.84000
LAKE_SIZ	768	118.99640	827.83248	3.70000	6604.29688
MG16	768	97.83916	131.05954	10.28300	1711.00800
MN11	768	33.64518	75.41905	0.00000	1191.00000
NA16	768	173.12857	260.51477	3.87200	2154.99000
NH416	768	2.88856	5.24475	0.00000	54.88600
N0316	768	2.10560	5.62028	0.00000	75.52100
PHEQ11	768	7.11684	0.83784	4.34000	8.90000
PHSTVL	768	6.68322	0.74451	4.32000	9.36000
PTL11	768	13.41374	21.50178	0.00000	376.40000
RT	678	0.47060	0.77263	0.00017	7.82332
SECMEAN	765	2.82170	1.84087	0.25000	11.45000
SI0211	768	2.27329	2.10464	0.00000	13.01900
SITDPM	768	5.81698	6.08889	0.50000	88.40000
SO416	768	124.23265	72.36926	29.08600	879.87400
TMPTOP	768	10.99831	2.32969	1.50000	20.40000
TURVAL	768	1.10473	1.46060	0.00000	17.40000
WALA	768	80.92600	647.16726	1.90000	16843.71000
WSHED	768	4086.33641	19195.40300	13.00000	229433.00000

Table 15. Characteristics of numeric variables, PC data set, file ELS-I.RG2, U.S. EPA Eastern Lake Survey-Phase I

Variable	N	Mean	Standard deviation	Min	Max
ALEX11	592	14.85726	24.06341	0.00000	213.00000
ALKA11	592	337.83703	536.37445	-48.60000	4002.00000
ALTL11	592	55.08429	71.24538	0.00000	805.00000
ANCAT	592	1.32298	0.39460	0.30782	5.07775
ANSUM	592	397.92899	573.55282	24.17000	5986.79000
CAl6	592	250.10206	341.95743	12.97400	2769.99900
CATSUM	592	455.17480	573.02890	54.35000	5410.09000
CLl6	592	26.36550	67.20984	1.12800	1006.70200
COLVAL	592	47.52956	40.07031	4.00000	345.00000
CONCAL	592	47.48514	60.55767	7.25949	667.12761
COND11	592	45.08243	53.06983	7.80000	494.00000
DICE11	592	3.70076	5.97319	0.00000	43.47000
DICVAL	592	4.16900	5.94529	0.21700	44.23000
DOC11	592	7.56780	4.31016	0.00000	28.80000
ELEV	592	417.96933	93.19639	184.40624	594.36723
FE11	592	152.76182	233.69000	0.00000	2290.00000
FTL16	592	1.95386	1.79584	0.47400	24.42500
HCO316	592	298.91267	499.35963	0.21300	3700.45800
K16	592	15.37094	12.53058	2.30100	165.18200
LAKE_SIZ	592	228.80470	3687.82072	3.80000	89357.75000
MG16	592	143.00523	210.65423	11.51600	2676.16500
MN11	592	13.28547	30.34586	0.00000	470.00000
NA16	592	42.29103	56.55044	2.61000	876.96000
NH416	592	2.88165	4.51240	0.00000	46.01500
NO316	592	1.69885	4.06693	0.00000	81.45600
PHEQ11	592	7.20709	0.96156	4.44000	8.93000
PHSTVL	592	6.66905	0.81658	4.43000	8.69000
PTL11	592	16.37500	13.02489	0.00000	146.00000
RT	271	1.33389	2.10697	0.00231	14.65093
SECMEAN	591	2.18672	1.27330	0.35000	9.05000
SIO211	592	2.60069	3.53472	0.00000	22.60000
SITDPM	592	6.63514	5.63415	0.90000	36.90000
SO416	592	66.87173	83.15468	2.08200	1917.52200
TMPTOP	591	7.50085	3.54530	0.70000	16.00000
TURVAL	592	1.22373	1.52824	0.10000	24.00000
WALA	591	27.03393	111.64595	1.73000	1687.34000
WSHED	591	1783.52453	10555.14335	10.00000	169319.00000

Table 16. Characteristics of numeric variables, PC data set, file ELS-I.RG3, U.S. EPA Eastern Lake Survey-Phase I

Variable	N	Mean	Standard deviation	Mm	Max
ALEX11	252	15.04286	37.61724	0.00000	446.00000
ALKA11	252	300.00282	513.99854	-209.12000	3639.76000
ALTL11	252	102.87659	147.01061	8.00000	1357.40000
ANC AT	252	1.10402	0.21191	0.77165	2.06647
ANSUM	252	795.15516	921.42669	53.83000	5263.49000
CA16	252	303.48070	456.72497	9.33100	3040.90600
CATSUM	252	840.54794	925.75947	69.33000	5396.04000
CLl6	252	240.83323	276.01491	15.51500	2671.48700
COLVAL	252	49.95040	56.21904	5.00000	300.00000
CONCAL	252	101.74301	113.06640	8.01816	666.88582
CORD11.	252	93.67996	96.78401	7.80000	543.00000
DICE11	252	3.70177	5.98719	0.11600	42.59000
OICVAL	252	4.10723	5.80983	0.15800	39.63000
DOC11	252	6.53758	8.52618	0.28700	48.22000
EL£V	252	198.44944	264.90799	7.00000	1103.40000
FEll	252	107.60714	263.79158	0.00000	2638.00000
FTL16	252	2.92582	2.96358	0.05300	16.16000
HC0316	252	281.83960	484.62304	0.05200	3270.17500
K16	252	65.27744	91.87338	0.10200	638.73900
LAKE_SIZ	252	448.46504	2230.58687	2.80000	21091.00000
MG16	252	245.99266	361.16737	14.88900	2447.23500
MN11	252	44.73810	146.28747	0.00000	2030.00000
NA16	252	215.43385	234.53684	16.09500	2546.88100
NH416	252	3.91381	8.30921	0.00000	90.36700
N0316	252	11.59388	42.97750	0.00000	493.57800
PHEQ11	252	6.99524	1.22004	3.82000	8.66000
PHSTVL	252	6.58583	1.02353	3.81000	8.96000
PTL11	252	22.97222	71.32378	0.00000	833.00000
RT	131	0.42241	0.58274	0.00041	3.25555
SECMEAN	251	2.28745	1.40724	0.05000	8.45000
S10211	252	4.32829	4.75184	0.00800	19.92000
SITOPM	252	9.22460	14.14498	0.90000	119.00000
S0416	252	256.31047	444.62537	3.01900	2477.58000
TMPTOP	252	14.29325	4.81251	0.90000	21.90000
TURVAL	252	4.43194	18.62202	0.10000	290.00000
WALA	231	101.77597	423.29760	1.91000	5301.14000
WSHED	231	22079.30303	81102.78478	16.00000	551300.00000

Table 17. Characteristics of numeric variables, PC data set, file ELS-I.SPC, U.S. EPA Eastern Lake Survey-Phase I

Variable	N	Mean	Standard deviation	Min	Max
ALEX11	186	30.38038	54.21199	0.00000	291.10000
ALKA11	186	87.51387	130.11197	-63.20000	990.60000
ALTL11	186	107.00941	120.98585	0.00000	685.00000
ANC AT	186	1.08956	0.24132	0.66471	2.79296
ANSUM	186	234.77613	204.32662	46.32000	5263.49000
CA16	186	112.47215	93.59672	14.47100	632.73200
CATSUM	186	250.88575	214.45812	67.19000	1430.51000
CLl6	186	54.88017	112.91371	5.07800	1063.88400
COLVAL	186	26.17473	24.50996	0.00000	150.00000
CONCAL	186	30.86082	24.36839	7.34817	180.17453
CORD11.	186	29.92661	22.64624	7.80000	169.00000
DICE11	186	1.02046	1.40585	0.00000	10.32000
OICVAL	186	1.37198	1.46852	0.20100	11.79000
DOC11	186	4.22379	3.24976	0.09000	21.3000
ELEV	186	465.47063	231.73038	13.4000	1213.00000
FEll	186	67.56720	112.44073	0.00000	1050.00000
FTL16	186	2.33915	1.82291	0.31600	11.16800
HC0316	186	76.17933	116.86902	0.62300	926.29100
K16	186	11.12719	8.08205	2.09700	91.79600
LAKE_SIZ	186	56.86865	59.05333	8.39100	422.81600
MG16	186	245.99266	361.16737	14.88900	2447.23500
MN11	186	64.96949	102.91122	3.65400	1038.78000
NA16	186	215.43385	234.53684	16.09500	2546.88100
NH416	186	2.22826	3.75044	0.00000	40.863800
NO316	186	2.18545	4.23507	0.00000	34.76000
PHEQ11	186	6.50191	0.98254	4.19000	8.66000
PHSTVL	186	6.19844	0.82480	4.18000	7.74000
PTL11	186	8.88253	10.47581	0.00000	95.00000
RT	129	0.64988	0.99895	0.00825	7.33698
SECMEAN	186	3.41989	1.79639	0.65000	10.75000
S10211	186	2.25655	2.67706	0.00000	18.50000
SITDPM	186	7.83226	7.54631	0.60000	60.00000
SO416	186	99.04769	62.00120	4.58000	699.55200
TMPTOP	186	10.26505	3.22150	2.90000	21.20000
TURVAL	186	0.82446	0.88564	0.10000	7.50000
WALA	185	22.33373	59.47057	1.79000	702.00000
WSHED	186	2183.2791	10270.65206	5.00000	120474.00000

Table 18. Card-image listing (first five lakes). data set 3.
U.S. EPA Eastern Lake Survey-Phase I

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BOHON5                  TE3-018         21NOV84         26NOV84         05DEC84 29NOV84         15OCT84         13:421
DD      3.9000          4.0200                  58.0000         49.0000                 2
190 090         1.8000                  18.0000 6.0000  1.20000                 3
        1.0000                  1.5000          -999.0000               10.4000         4
-999.0000               53.0000                         -999.0000       7.0700          5
        -999.0000       -999.0000                               -999.0000               -999.0000                       6
-999.0000               -999.0000               -999.0000                       1.0000          2.0000          7
        -999.0000       -999.0000       -999.0000                       -999.0000       -999.0000               -999.00008
-999.0000       -999.0000       -999.0000       -999.0000       -999.0000       -999.0000       -999.0000               9
-999.0000       -999.0000       -999.0000       -999.0000       -999.0000       -999.0000       -999.0000       -999.0000       10
-999.0000                                                                                                               11
                        1       100 01      1   1.2026              DRAINAGE                                            12
MOUNTAIN POND                           ME      442.00      368.8000        29.200          I/O                         13
POND            46.5583 69.0111 1       E   PRESQUE ISLE                                                            14
15'     MUSQUACOOK LAKES                                    46-33'30"n 69-00'40"W   1E3     23021                   15
                -999.0000       0.0300  0.8200          1.8000  1.0660          15.140                              16
REG/                                    20.0000 10.3330         0.1160                                              17
        0.5080  0.2440  1.100 MIXED             744.0000                                                            18
EMSI                    19.0000 16OCT84 1                       R                                                   19
        2.9040  1.9090                  7.4200                          4.0500                                      20
        1.2000  4.7000  40.0000                                  E       BOHON5                                      21
BO              BO      330.2900        397.2000        3963.9852                                                   22
        69.7796 66.903  244.1280        BO      279.1900        0.5220  BO                                          23
        9.2530  72.8820 0.8710  5.2420          36.6700         74.4730                 1.0480                      24
        3.1600  0.0500  BO              5.5950                                                                      25
        0.8860          0.2050                                  0.8430                                              26
                -4.0000                         68.0000                                                             27
                19.9000 0.3280                                  3.5770                                              28
                  0.0540 hON5                   2.8530                                                              29
                0.0199  7.0800                                  0.0570                                              30
                  7.6400        7.0800                          7.2800                                              31
BO                      16.500                  -999.0000       U                                                   32
  278.70000                     94.500          39.7000                                                             33
                3.0590                  3.2930                                                                      34
        3.8000 B5               64.2000                         40.6216                                             35
CT/9C                                                                                                               36
                                                                                                                    37
                                                                                                SUSPECT, DU         38
PLICATE MEASUREMENT NOT MADE.                                                                                       39
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Table 18. (continued)

```
BOHON5                  1E3-060 21NOV84      26NOV84      05DEC84          29NOV84          15OCT84          14:45  1
DD      3.9000            4.0200                58.0000      49.0000                                23 24 25       2
090 045 10.7000                   18.0000 35.0000 2.2000                                                          3
        2.0000                    1.5000                9.2000                                        11.3000    4
        10.4000           52.0000                       47.0000                                       7.1000     5
                  7.0600          0.9000                -999.0000                                     -999.0000  6
-999.0000                 -999.0000       -999.0000                      1.0000                              2.0000 7
        -999.0000         -999.0000       -999.0000     -999.0000        -999.0000        -999.0000               8
-999.0000       -999.0000         -999.0000             -999.0000        -999.0000        -999.0000  -999.0000    9
-999.0000       -999.0000         -999.0000             -999.0000        -999.0000        -999.0000  -999.0000    10
-999.0000                                                                                                         11
                                  1       100           02    1          1.2210           DRAINAGE                 12
MILLINOCKET LAKE                  ME                    17521.00         230.10000        873.800  I/O             13
LAKE                    46.3028   68.8750 1 E           PRESQUE ISLE                                               14
15'     MILLINOCKET LAKE                                                 46+8'10"N 68-52'30"W      1E3 23021      15
                -999.0000 0.0290        0.80000         1.6700           1.0440   20.050                          16
REG/                                                    20.0000          10.3330  0.5130                          17
        0.5080  43.3820         2.1000  MIXED           744.0000                                                   18
EMSI                                    19.0000         16OCT84 1              R                                  19
        2.5870                  -999.0000               7.4200                                    -999.0000      20
        0.5000                  -999.0000       45.0000                 E        BOHON5                          21
BO                                BO                    331.6100  404.9100       402.5401                       22
        66.3937  73.301 232.3610        BO              277.5440         0.6550   BO                             23
         9.3380  88.4290  1.0480               5.4210   31.1460          87.0900           1.1160                 24
        2.3280   0.0400 BO                               5.5620                                                   25
1.0750                                  0.2120                                    0.7160                         26
                          4.0000                        89.0000                                                  27
                8.9000                  0.3310                                    4.1830                         28
                          0.650 HON5                     1.9040                                                  29
                0.0212                  6.7200                                    0.0420                         30
                          7.6400                7.26000                                         7.4000         31
BO                        12.2000                       -999.0000 U                                            32
  264.3000                                79.300        40.7000                                                  33
                2.8620                          3.0530                                                         34
    6.2000 B5                             26.9000                                   41.5374                      35
CT/9C                                                                                                             36
                                                                                                                  37
                                                                                    SUSPECT, DU                   38
PLICATE MEASUREMENT NOT MADE.                                                                                     39
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Table 18. (continued)

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BOHON5                  1E3-007         21NOV84         26NOV84         05DEC84         29NOV84  15OCT84  12:47    1
JJ      3.8500          3.9500                          48.0000          42.0000                   07 08 09        2
065 330 5.200                   15.0000                 17.0000                  5.3000                           3
    5.0000                      1.5000                          3.7000                   9.6000                  4
    9.4000          49.0000                         48.0000                  7.6000                           5
                    7.5700                  0.2000          -999.0000                -999.0000                6
-999.0000           -999.0000                       -999.0000                2.0000           1.0000          7
      -999.0000     -999.0000       -999.0000       -999.0000       -999.0000 -999.0000      -999.0000       8
-999.0000           -999.0000       -999.0000       -999.0000       -999.0000 -999.0000      -999.0000       9
-999.0000           -999.0000       -999.0000       -999.0000        -999000  -999.0000      -999.0000      10
- 999.0000                                                                                                    11
                            1       100     04              1       1.0894          DRAINAGE                 12
WHEELOCK LAKE                               ME      629.00  243.5000        52.000  I/O                      13
LAKE            47.2000         68.7167 1   E   EDMUNDSTON                                                   14
15'     EAGLE LAKE                                      47-12'00"N 68-43'00"W   1E3     23003                15
                -999.0000       0.0310          0.8600          1.7700  1.1000  12.100                       16
REG/                                                            15.0000  10.3330 0.5700                      17
        0.3810  1.2550  5.1500  MIXED                           744.0000                                     18
EMSI                                            19.0000 16OCT84         1               R                    19
        4.0870          -999.0000                       7.5800                                  -999.0000    20
        0.5000          -999.0000               20.0000                         E       BOHON5               21
BO                      BO                      442.4200        481.9600        479.9240                     22
        31.9+413 39.535 365.2790        BO      356.7850        1.1550  BO                                   23
         9.1960 67.7820 001610          4.6790          50.6770         65.2710         1.3580               24
         1.9960 0.0400 BO                                       7.1500                                       25
         0.8240                         0.1830                                          1.1650               26
                        -5.0000                                                 36.0000                      27
                9.3000                  0.3260                                  3.1350                       28
                        0.0100          HON5                            2.8770                               29
                0.0258                  3.2300                                          0.0360               30
                  5.8100 UO                     7.4100                                          7.4500       31
BO                      36.5000                         -999.0000       U                                    32
398.6000                                -999.0000       U                       48.5000                      33
                4.5610 P7                               4.7560                                               34
        2.7000  B5                      45.2000                                                 50.1980      35
CT/9C                                                                                                        36
                                                                                                             37
                                                                                                SUSPECT. DU  38
PLICATE MEASUREMENT NOT MADE.                                                                                39
```

Table 18. (continued)

BONON5WO		1E3-006		21NOV84	26NOV84		05DEC84		29NOV84	15OCT84		11:15	
JJ	3.8500		3.9500		48.0000			42.0000				01 02 03	
090 140		36.9000	14.0000		121.0000		4.2000						
	3.9000		1.5000			35.4000				11.7000			
	5.1000		80.0000			57.0000				7.3500			
		6.9000		6.6000		22.1000				6.3000			
56.0000			6.9500		5.4000			1.00000				4.0000	
		5.0000	11.4000	11.4000	11.3000			10.6000		5.8000			
	5.3000	-999.0000	-999.0000		-999.0000		-999.0000		77.0000	75.0000			
	73.0000	69.0000	55.0000	55.0000	-999.0000		-999.0000		-999.0000				
-999.0000													
			1	100	05		1	1.1640	DRAINAGE				
GLAZIER LAKE					ME 133706.00	170.4000		281.600		I/O			
LAKE		47.2278	69.0000		1 E	EDMUNDSTON							
15'	ALLAGASH/ST FRANCIS						47-13'40"N 69-00'00"W			1E3	23003		
		-999.0000	0.0340		0.9700	1.8300	1.1450	474.810					
REG/						15.0000	10.3330	0.0950					
	0.3810	48.2140	44.0500	STRONG	LR		744.0000						
EMSI					19.0000	160OCT84		1		R			
	0.4600	P1UO	Y999.0000			7.5300						-999.0000	
	0.5000		-999.0000		50.0000				E	BOHON5WO			
BO			Bo		704.1200		819.5900			817.1291			
	59.7194	115.471	563.5460	BO	659.1790			2.8900 BO					
	36.1650	86.4550	6.50000		8.8980			62.5960		93.5650		1.4530	
	2.4390	0.0200	BO						13.2100				
	1.0510						0.3480					1.4390	
			3.0000							94.0000			
		17.8000					1.2820					4.4940	
			0.4030 HON5WO							3.3490			
		0.0276			6.0200							0.0440	
			8.0500			7.5500							7.6600
BO				25.9000						-999.0000 U			
	632.1000				-999.00 U					77.9000			
		6.9510				7.1300							
	0.4000 B5				39.9000							83.8261	
CT/9C													

X=UNSTABLE READING - LARGE ACTIVE ZOOPLANKTON IN SAMPLE; Y=DATA SUSPECT, DU
PLICATE MEASUREMENT NOT MADE.

Table 18. (continued)

```
BOHNON5          1E3-006 21NOV84   26NOV84   05DEC84                 29NOV84   15OCT84   11:15
                                                                                         1
        3.8500             3.9500             48.0000   42.000                 01 05 03  2
090 140 36.9000                    14.0000   121.0000    4.2000                           3
        3.9000                     1.5000             35.4000    11.7000                 4
        5.1000                   80.0000                        57.0000    7.3500        5
                6.9000             6.6000                       22.1000    6.3000        6
56.0000                  6.9500             5.4000                    1.0000    4.0000  7
                5.0000   11.4000   11.4000   11.3000             10.6000    5.8000        8
        5.3000  -999.0000-999.0000         -999.0000           -999.0000    77.0000 75.0000 9
```

Table 19. Card-image listing (first five lakes), data set 3.
U.S. EPA Eastern Lake Survey-Phase I

1Al-003		25OCT84 1051 B							7.3000	8.0000				1
	5.6000	5.4000	1.5000		7.2000		11.5000	11.3000		23.0000				
														2
		22.0000		4.5000		4.5500		0.2000		-999.0000		-999.0000		3
-999.0000	-999.0000		-999.0000		1.0000	-999.0000		210		14				4
2			0.4360		4.8000			0.4000		10.0000				5
	HON5Z1						HON5Z1							6
						154.0100		120.7700		99.3970				7
	11.3305	-33.235		0.8820 Z1					59.2810			0.0000	Z1	8
	8.0400	16.2870	9.7750		6.3410			17.4870		132.4570		2.8530		9
	5.1560	16.2181			HON5									10
EMSI							1.1880			0.1980				11
		0.2480						0.4020			33.0000			12
		13.0000 B5Z1					208.3000				0.2850			13
		6.3620					0.6060		0.8360					14
	0.0542				1.5700				0.0930					15
	4.7900				4.7300				4.7900					16
	-9.9000				23.7000		B5		0.1290	Z1				17
	0.4100				0.0000	Z0			386.6000					18
	23.8860	36043	04.504		-999.0000		HAWK POND						NY	19
	96.00		645.3000		12.800	NI/O	POND		43.9569	74.9583 A				20
UTICA					15'	BIG MOOSE								21
43-57' 25"N 74-57' 30"W			1A1			0.0430		1.2500		2.1000		0.9090		22
	30.0000	9.6330			0.6830		0.7620	0.4340		7.500		5.5000		23
MIXED		REG/					1	711.0000	0.7842	DRAINAGE				24

Table 19(continued)

	1A1-004	25OCT84	10:32 B					7.3000	5.0000			1
	6.5000	6.0000	1.5000			8.2000	12.200	12.100	26.0000			2
	20.0000	4.4600	4.4400			0.1000	-999.0000	-999.0000				3
-999.0000	-999.0000	-999.0000	-999.0000	-999.0000	210	11						4
2	0.4280	4.6700	0.2000				5.0000					5
	HON5Z1	Z1	HON5Z1									6
			125.9900		104.5500		82.3830					7
	7.3903	-21.441	0.6330	HOZ1		45.0100	0.0000	HOZ1				8
	7.5040	16.5340	8.7750		7.4410	13.3980	106.7860	2.2950				9
	1.2750	20.8930	HON5									10
EMSI			0.9020		0.2010							11
	0.2910		0.30580				52.0000					12
	30.0000	85	163.3000				0.2660					13
	5.1290		0.5440		0.3630							14
	0.0436		1.0600		0.0230	01						15
	4.6900		4.7100		4.6800							16
	-11.3000		22.7000	B5	0.1280	Z1						17
	0.3770	HOZ1	0.0000	Z0	273.1000							18
	22.0660	36043	04.500		-999.00000		EVERGREEN LAKE			NY		19
	73.00	612.7000	19.500	NI/NO	LAKE	43.9167	75.0167	A				20
UTICA			15'	NUMBER FOUR								21
43-55'00"N		75-01 '00W	lAl	0.0440		1.28002.1400		0.9060				22
	30.0000	9.6330	-999.0000	0.7620		0.6610	3.740	6.2500				23
MIXED		REG/	1	711.0000	0.8298		SEEPAGE					24

Table 19. (continued)

1A1-008		15OCT84	11:43 P		DAM AT NORTH END OF LAKE					1.5000		18.0000		1
	1.6000	-999.0000	1.5000		-999.0000			12.3000	-999.0000		32.0000			2
		-999.0000		6.3500	-999.0000			-999.0000		-999.0000		-999.0000		3
-999.0000		-999.0000		-999.0000		1.0000	1.0000	205		03				4
2		1.1390			6.5400			1.1000		30.0000				5
	HON5Zl		Z1	HON5Z1										6
38.4854		16.788	65.3980					126.9460			0.0300			7
11.3400		49.4380	1.8870		6.4180		32.8860		119.5070		2.3690			8
1.3860		0.2455		HON5Z1										10
EMSI				2.5440					0.6010					11
		0.2510				0.7560					20.0000			12
		87.0000	B5			17.3000					0.4020			13
		5.7400				0.1170		5.5580						14
	0.0450			4.0000	D2			0.0250	Z1					15
	7.0200			6.4800				6.6100						16
	71.8000			26.0000				0.7680						17
	1.2340			6.3000	B5Z1		205.5000							18
	26.0820		36041	05-667		-999.0000		CEDAR RIVER FLOW					NY	19
11914.00		640.1000264.600			I/O		UNKNOWN			43.7083		74.4750	A	20
UTICA			15'	INDIAN LAKE										21
43-42' 30"N		74-28' 30"W		1A1	0.0430		1.2300	2.0800		0.9090				22
	25.0000	9.6330		0.0250		0.650		1.8420	45.030		1.6000			23
MIXED		DR		REG/		1	711.0000		1.0837		DRAINAGE			24

Table 19. (continued)

1A1-009		30OCT84			13:49 8							1.5000					1
	1.5000		-999.0000		0.5000		-999.0000		-999.0000			-999.0000	-999.0000				2
	-999.0000		4.3300		-999.0000			-999.0000		-999.0000	-999.0000		-999.0000				3
-999.0000		-999.0000		-999.0000		1.0000		2.0000	202	09							4
2		0.4680		4.5400		0.6000						25.0000					5
	HON5Zl							HON5Z1									6
						150.2400			101.5500			68.1510					7
	27.3742		-48.688		0.6230					25.2990		0.0000					8
	7.7860	21.2230		1.9840	1.6620				19.9660			137.9120			1.9320		9
	2.4950	30.9030			HON5Z1												10
EMSI					0.5070					0.2580							11
			0.0650					4.4590				35.0000					12
			122.0000		B5			324.5000				0.2760					13
			6.6240					0.1230		1.9720							14
	0.0367				4.1600				0.0450								15
	4.5100				4.4800				4.5100								16
	-23.1000					28.2000		B5			0.1660	Z1					17
	0.5450					5.8000		Z1			638.3000						18
	26.6430	36041	07-934				-999.0000			TWIN LAKES (EASTERN)					NY		19
	129.00	812.0000					7.400	NLAKE			43.6208	74.6208	A				20
UTICA							15' WEST CANADA LAKES										21
43-371' 15"N 74-37'15"W			1A1		0.0450		1.3000	2.1800	0.9000								22
	30.0000	9.6330	0.0560		0.7620		0.0520		17.430			1.5000					23
MIXED		REG/			1711.0000			0.6759				DRAINAGE					24

Table 19. (continued)

```
1Al-009          16OCT84          12:49 B                          1.5000          12.0000                          1
        1.5000   -999.0000  0.5000          -999.0000          10.6000  -999.0000          28.0000                  2
        -999.0000          4.3300          -999.0000          -999.0000          -999.0000                        3
-999.0000          -999.0000          -999.0000          1.0000          2.0000          212          09           4
2                          0.4680          4.5400          0.6000                          25.0000                  5
                 HON5Zl                                   HON5Z1                                                   6
                                          150.2400          101.5500          68.1510                            7
        27.3742 -48.688    0.6230                          25.2990                          0.0000                 8
        7.7860   21.2230          1.9840          1.6620          19.9660 137.9120          1.9320                 9
        2.4950   30.9030                   HON5Z1                                                                 10
EMSI                                      0.5070                    0.2580                                       11
                   0.0650                                  0.4590                                    35.0000     12
                 122.0000    B5                            324.5000                    0.2760                       13
                   6.6240                                  0.1230          1.9720                                 14
        0.0367                    4.1600                                                  0.0450                   15
        4.5100                    4.4800                                  4.5100                                   16
        -23.1000                  28.2000 B5                              0.1660          Z1                       17
        0.58450                   5.8000  Z1                    638.3000                                         18
        26.6430 36041    07-934             -999.0000          TWIN LAKES (EASTERN)                        NY   19
        129.00   812.0000  7.400             NI/O     LAKE              43.6208          74.6208 A                20
UTICA                             15'       WEST CANADA  LAKES                                                    21
43-37'15"N         74-49'15"W 1A10.0450      1.3000   2.1800           0.9000                                     22
30.0000 9.6330     0.0560     0.7620         0.0520   17.430  1.5000                                             23
MIXED          REG/                         1  711.0000        0.8457  DRAINAGE                                 24
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Table 20. Card-image listing (first five lakes), PC data set,
file ELS-I.RG1, U.S. EPA Eastern Lake Survey-Phase I

```
1A1-003          HAWK POND                          43-57'25"N 74-57'30"W NY          645    13     96     1
         7.5     DRAINAGE      0.58      11.5 MIXED      7.3    5.5      0.4     10    13.0   154.0  120.8  2
0.78     4.79 4.80          -9.9    23.7  23.9    0.13 0.44    1.57     20.80   386.6  59.3          16.3          3
         17.5    6.3        5.2     132.5         0.9    8.0     9.8     2.9     0.0    0.84          REGULAR       4
         33.0    25OCT84  9.633              711 5
1A1-004 EVERGREEN LAKE                        43-55'00"N  75-01'00"W  NY  613          20     73     1
         3.7     SEEPAGE   .       12.2 MIXED             7.3     0.43    1.06    163.0  273.1  45.0   16.5   2
0.83      4.69    4.67     -11.3    22.7         22.1    0.13    0.43    1.06    163.0  273.1  45.0   16.5          3
         13.4    7.4        1.3     106.8         0.6    7.5     8.8     2.3     0.0    0.36          REGULAR       4
         52.0    25OCT84  9.633              711     5
1A1-008 CEDAR RIVER FLOW      43-42'30"N    74-28"W      NY          640    265          11914                 1
         45.0    DRAINAGE      0.02      12.3 MIXED      1.5     1.6      1.1     30    87.0  200.5  217.3  2
1.08     7.02    6.54       71.8     26.0         26.1    0.77    1.14    4.00    17.0   205.5  126.9  49.4          3
         32.9    6.4  1.4   119.5     65.4          11.3    1.9     2.4     6.3     5.56 REGULAR                  4
         20.0    15OCT84  9.633              711     5
1A1-009 TWIN LAKES (EASTERN)                  43-37' 15"N      74-37'15"W      NY     812    7      129    1
         17.4    DRAINAGE      0.05 10.6 MIXED                 1.5     1.5      0.6     25    122.0  150.2  101.5  2
0.68     4.51    4.54       -23.1    28.2         26.6    0.17    0.47    4.16    324.0  638.3  25.3   21.2          3
         20.0    1.7        2.5     137.9         0.6    7.8     2.0     1.9     5.8    1.97          REGULAR       4
         35.0    30OCT84  9.633  711 5
lAl-010 SNYDER LAKE           43-34'15"N    74-49'W NY          735     7      145                   1
         19.9    DRAINAGE      0.03 13.2     MIXED 0.9     1.0      0.4     40    249.0  146.8  124.1  2
0.85     4.42    4.36       -34.2    33.7         30.7    0.23    0.68    5.35    282.0  527.5  45.9   15.2          3
         15.8     2.8       3.7     131.9         0.5 11.1 1.6     1.7     0.1     2.68          REGULAR       4
         23.0    16OCT84  9.633  711 5
```

8. REFERENCES

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