

US EPA ARCHIVE DOCUMENT

CATALOG DOCUMENTATION
EMAP SURFACE WATERS PROGRAM LEVEL DATABASE
1997-1998 Mid-Atlantic Integrated Assessment Program
Validated Water Chemistry

TABLE OF CONTENTS

1. DATA SET IDENTIFICATION
2. INVESTIGATOR INFORMATION
3. DATA SET ABSTRACT
4. OBJECTIVES AND INTRODUCTION
5. DATA ACQUISITION AND PROCESSING METHODS
6. DATA MANIPULATIONS
7. DATA DESCRIPTION
8. GEOGRAPHIC AND SPATIAL INFORMATION
9. QUALITY CONTROL / QUALITY ASSURANCE
10. DATA ACCESS
11. REFERENCES
12. TABLE OF ACRONYMS
13. PERSONNEL INFORMATION

1. DATA SET IDENTIFICATION

1.1 Title of Catalog Document

1997-1998 Mid-Atlantic Integrated Assessment Program
Validated Water Chemistry

1.2 Authors of the Catalog Entry

U.S. EPA NHEERL Western Ecology Division
Corvallis, OR

1.3 Catalog Revision Date

August 2000

1.4 Data Set Name

CHEM

1.5 Task Group

Surface Waters

1.6 Data Set Identification Code

133

1.7 Version

001

1.8 Requested Acknowledgement

These data were produced as part of the U.S. EPA's Environmental Monitoring and Assessment Program (EMAP). If you publish these data or use them for analyses in publication, EPA requires a standard statement for work it has supported:

"Although the data described in this article have been funded wholly or in part by the U.S. Environmental Protection Agency through its EMAP Surface Waters Program, it has not been subjected to Agency review, and therefore does not necessarily reflect the views of the Agency and no official endorsement of the conclusions should be inferred."

2. INVESTIGATOR INFORMATION

2.1 Principal Investigator

Dr. John Stoddard
U.S. Environmental Protection Agency
NHEERL Western Ecology Division
200 S.W. 35th Street
Corvallis, OR 97333

2.2 Investigation Participants - Sample Collection

Oregon State University
State of West Virginia
State of Maryland
University of Maryland
U.S. Environmental Protection Agency
Office of Research and Development
Region III

3. DATA SET ABSTRACT

3.1 Abstract of the Data Set

The data set contains the results of analysis of chemistry from a water column sample taken during the sample visit.

3.2 Keywords for the Data Set

Aluminum, alkalinity, acid neutralizing capacity, calcium, carbonate, color, specific conductance, dissolved inorganic carbon, dissolved organic carbon, bicarbonate, potassium, magnesium, ammonium, sodium, nitrate, total nitrogen, pH, total phosphorus, silica, total suspended solids, turbidity, absorbance, chlorophyll a, water chemistry, eutrophication

4. OBJECTIVES AND INTRODUCTION

4.1 Program Objective

In 1997 and 1998 the Ecological Monitoring and Assessment Program (EMAP) Surface Waters Program became a collaborator in the Mid-Atlantic Integrated Assessment (MAIA) project, which is attempting to produce an assessment of the condition of surface water and estuarine resources. The MAIA project represents a follow-up to the MAHA study, with an expanded geographic scope (southern New York to northern North Carolina, with more sites located in the Piedmont and Coastal Plain regions) and a different index period (July-September).

4.2 Data Set Objective

This data set is part of a demonstration project to evaluate approaches to monitoring streams in EMAP. The data set contains the results of analysis of chemistry from a water column sample taken during the sample visit.

4.3 Data Set Background Discussion

The primary function of the stream water chemistry samples is to determine acid-base status, trophic state, and classification of water chemistry type. Water chemistry in streams is analyzed for two purposes. First, to understand the chemical habitat within which biota must exist so that we can understand the biological potential of the system and second, to evaluate the chemical quality of the water for the purposes of determining the potential stresses to which the biota are exposed.

4.4 Summary of Data Set Parameters

Water chemistry parameters are reported for one sample taken at the midpoint of the selected stream reach. These include: aluminum, alkalinity, acid neutralizing capacity, calcium, carbonate, color, specific conductance, dissolved inorganic carbon, dissolved organic carbon, bicarbonate, potassium, magnesium, ammonium, sodium, nitrate, total nitrogen, pH, total phosphorus, silica, total suspended solids, and turbidity.

5. DATA ACQUISITION AND PROCESSING METHODS

5.1 Data Acquisition

5.1.1 Sampling Objective

To obtain a grab sample of stream water for the purposes of chemical analysis.

5.1.2 Sample Collection Methods Summary

A grab sample was taken below the surface using a 500 ml beaker and then transferred to a 4-L Cubitainer according to the protocols identified in Lazorchak et. al (1998). Stream water stored in Cubitainers was used to measure major cations and anions, nutrients, turbidity, and color. Sealed syringe samples are analyzed for pH, dissolved inorganic carbon, and monomeric aluminum species (believed to be toxic to fish under acidic conditions. Water samples are collected in sealed syringe to minimize contact with the atmosphere; the pH, dissolved inorganic carbon, and aluminum present in the water sample will all change if the stream water equilibrates with atmospheric carbon dioxide.

5.1.3 Sampling Start Date

May 1997

5.1.4 Sampling End Date

September 1998

5.1.5 Platform

NA

5.1.6 Sampling Gear

A 500 ml beaker was used to fill a 4-L Cubitainer from mid stream.

5.1.7 Manufacturer of Instruments

NA

5.1.8 Key Variables

NA

5.1.9 Sampling Method Calibration

NA

5.1.10 Sample Collection Quality Control

See Lazorchak, et al. 1998.

5.1.11 Sample Collection Method Reference

Chaloud, D.J. and D.V. Peck. 1994. Environmental Monitoring and Assessment Program: Integrated Quality Assurance Project Plan for the Surface Waters Resource Group, 1994 Activities. EPA 600/X-91/080, Rev. 2.00 U.S. Environmental Protection Agency, Las Vegas, Nevada.

Lazorchak, J.M., Klemm, D.J., and Peck D.V. (editors). 1998. Environmental Monitoring and Assessment Program- Surface Waters: Field Operations and Methods for Measuring the Ecological Condition of Wadeable Streams. EPA/620/R-94/004F. U.S. Environmental Protection Agency, Washington, D.C.

5.1.12 Sample Collection Method Deviations

NA

5.2 Data Preparation and Sample Design

5.2.1 Sample Processing Objective

See Lazorchak, et al. (1998) and Chaloud and Peck (1994).

5.2.2 Sample Processing Methods Summary

See Lazorchak, et al. (1998) and Chaloud and Peck (1994).

5.2.3 Sample Processing Method Calibration

See Lazorchak, et al. (1998) and Chaloud and Peck (1994).

5.2.4 Sample Processing Quality Control

See Lazorchak, et al. (1998) and Chaloud and Peck (1994).

5.2.5 Sample Processing Method Reference

See Lazorchak, et al. (1998) and Chaloud and Peck (1994).

6. DATA MANIPULATIONS

6.1 Name of New or Modified Values

None

6.2 Data Manipulation Description

See Chaloud and Peck (1994).

7. DATA DESCRIPTION

7.1 Description of Parameters

Parameter SAS Name	Data Type	Len	Format	Parameter Label
-----	-----	-----	-----	-----
ALKCALC	Num	8		Calculated Alkalinity (ueq/L)
ALTD	Num	8		Total Dissolved Aluminum (ug/L)
ALTDF	Char	5		Flag for ALTD
ANC	Num	8		Gran ANC (ueq/L)
ANCF	Char	29		Flag for ANC
ANDEF	Num	8		Anion Deficit [C-A] (ueq/L)
ANSUM	Num	8		Sum of Anions (ueq/L)
ANSUM2	Num	8		Sum of Anions using ANC (ueq/L)
BALANCE	Num	8		Ion Balance [C-A]/[C+A/2] (%)
BALANCE2	Num	8		Ion Balance using ANC (%)
CA	Num	8		Calcium (ueq/L)
CAF	Char	8		Flag for CA
CATSUM	Num	8		Sum of Cations (ueq/L)
CL	Num	8		Chloride (ueq/L)
CLF	Char	8		Flag for CL
CO3	Num	8		Calculated Carbonate (ueq/L)
COM_FLD	Char	80		Field Sampling Comment
COM_LAB	Char	80		Comments on Chemical Lab Analysis
COND	Num	8		Conductivity (uS)
CONDF	Char	8		Flag for COND
CONDHO	Num	8		Debye-Huckel-Onsager Calc. Cond. (uS/cm)
DATE_COL	Num	8	MMDDYY	Date Sample Collected
DAY_SHIP	Num	8		Days from Sampling to Lab Receipt
DIC	Num	8		Dissolved Inorganic Carbon (mg/L)
DICF	Char	8		Flag for DIC
DOC	Num	8		Dissolved Organic Carbon (mg/L)
DOCF	Char	8		Flag for DOC
FE	Num	8		Dissolved Fe (mg/L)
FEF	Char	8		Flag for FE
H	Num	8		H+ from PHSTVL (ueq/L)
HCO3	Num	8		Calculated Bicarbonate (ueq/L)
IONSTR	Num	8		Ionic Strength (M)
K	Num	8		Potassium (ueq/L)
KF	Char	8		Flag for K
LAT_DD	Num	8		X-Site Latitude (decimal degrees)
LON_DD	Num	8		X-Site Longitude (decimal degrees)
MG	Num	8		Magnesium (ueq/L)
MGF	Char	8		Flag for MG
NA	Num	8		Sodium (ueq/L)
NAF	Char	8		Flag for NA
NH4	Num	8		Ammonium (ueq/L)
NH4F	Char	8		Flag for NH4
NH4ION	Num	8		Calculated NH4+ protolyte (ueq/L)
NO3	Num	8		Nitrate (ueq/L)
NO3F	Char	8		Flag for NO3
NTL	Num	8		Total Nitrogen (ug/L)

7.1 Description of Parameters, continued

NTLF	Char	8		Flag for NTL
OH	Num	8		Hydroxide from PHSTVL (ueq/L)
ORGION	Num	8		Est. Organic Anion (ueq/L)
PHSTVL	Num	8		Closed Headspace pH
PHSTVLF	Char	8		Flag for PHSTVL
PTL	Num	8		Total Phosphorus (ug/L)
PTLF	Char	8		Flag for PTL
SAMPLED	Char	30		Site Sampled Code
SIO2	Num	8		Silica (mg/L SiO2)
SIO2F	Char	8		Flag for SIO2
SO4	Num	8		Sulfate (ueq/L)
SO4F	Char	8		Flag for SO4
SOBC	Num	8		Sum of Base Cations (ueq/L)
STRM_ID	Char	14	\$CHAR	EMAP Stream Identifier
TEAM_ID	Char	1		Sampling crew ID
TRANSECT	Char	3		Transect Where Sample Collected
VISIT_NO	Num	8		Within Year Site Visit Number
YEAR	Num	8		Year Sampled
ZN	Num	8		Dissolved Zinc (mg/L)
ZNF	Char	8		Flag for ZN

7.1.6 Precision to which values are reported

7.1.7 Minimum Value in Data Set

Name	Min

ALKCALC	-758.56
ALTD	5
ANC	-891
ANDEF	-913.68
ANSUM	148.01
ANSUM2	147
BALANCE	-19.32
BALANCE2	-19
CA	34.431
CATSUM	134.31
CL	9.815688
CO3	0
COND	16.8
CONDHO	20.01
DATE_COL	05/20/1997
DAY_SHIP	1
DIC	0.18
DOC	0.43
FE	0
H	0.001
HCO3	0.011
IONSTR	0
K	4.0155262
LAT_DD	35.182938
LON_DD	-83.555659

7.1.7 Minimum Value in Data Set, continued

MG	29.788256
NA	11.65735948
NH4	0
NH4ION	0
NO3	0.499751
NTL	15
OH	0
ORGION	2.18
PHSTVL	3.05
PTL	0
SIO2	0.165
SO4	18.36324
SOBC	132.79
VISIT_NO	0
YEAR	1997
ZN	0

7.1.7 Maximum Value in Data Set

Name	Max

ALKCALC	4875.27
ALTD	5982
ANC	5602.23
ANDEF	2272.44
ANSUM	39032.2
ANSUM2	39621.65
BALANCE	32.39
BALANCE2	27.95
CA	11133.2888
CATSUM	41304.64
CL	6470.653842
CO3	280.437
COND	3590
CONDHO	3419.12
DATE_COL	09/30/1998
DAY_SHIP	26
DIC	61.9
DOC	32.6
FE	16.91
H	891.251
HCO3	4857.927
IONSTR	0.103
K	409.7627086
LAT_DD	42.567163
LON_DD	-74.688136
MG	7217.151328
NA	27664.47996
NH4	229.88546
NH4ION	228.91
NO3	1102.093741
NTL	16000
OH	13.804

7.1.7 Maximum Value in Data Set, continued

ORGION 318.12
 PHSTVL 9.14
 PTL 983.981
 SIO2 44.122
 SO4 28569.24564
 SOBC 41303.34
 VISIT_NO 3
 YEAR 1998
 ZN 0.24

7.2.1 Column Names for Example Records

"ALKCALC", "ALTD", "ALTDF", "ANC", "ANCF", "ANDEF", "ANSUM", "ANSUM2", "BALANCE",
 "BALANCE2", "CA", "CAF", "CATSUM", "CL", "CLF", "CO3", "COM_FLD", "COM_LAB", "COND", "CONDF",
 "CONDHO", "DATE_COL", "DAY_SHIP", "DIC", "DICF", "DOC", "DOCF", "FE", "FEF", "H", "HCO3",
 "IONSTR", "K", "KF", "LAT_DD", "LON_DD", "MG", "MGF", "NA", "NAF", "NH4", "NH4F", "NH4ION",
 "NO3", "NO3F", "NTL", "NTLF", "OH", "ORGION", "PHSTVL", "PHSTVLF", "PTL", "PTLF",
 "SAMPLED", "SIO2", "SIO2F", "SO4", "SO4F", "SOBC", "STRM_ID", "TEAM_ID", "TRANSECT",
 "VISIT_NO", "YEAR", "ZN", "ZNF"

7.2.2 Example Data Records

2135.29,5,"BH695",2240.0,"",232.9,2501.08,2605.68,4.45,2.4,1740.6,"H477",
 2733.97,58.5,"H249",6.608,"","ALTD done on filtered/unacidified aliquot",250,
 "",259.3,09/08/1997,2,27.34,"H16",2.71,"H50",0.031,"H330",0.03,2128.528,0.007,
 91.3,"H466",38.247943,-81.886602,705.5,"H469",195.9,"H465",0.7,"H62",0.7,5.0,
 "",234,"H225",0.331,26.83,7.52,"",3,"H225","Yes",7.88,"H117",302.1,"H249",
 2733.24,"MAIA97-001","4","F",1,1997,0.017,"H486"

.,31,"H741",1485.0,"
 ",.,.,1917.01,.,1.02,1170.3,"H474",1956.4,112.5,"H293",.,,"",
 "",192,"",.,07/12/1997,3,.,,"S",2.66,"H18",0.039,"H382",0.027,.,.,58.0,"H472",
 38.550017,-82.144807,419.4,"H475",305.8,"H475",2.9,"",2.8,8.6,"H16",395,"H276",
 0.372,26.36,7.57,"",42,"H276","Yes",5.36,"H176",311.0,"H293",1953.57,
 "MAIA97-002","4","F",1,1997,0.025,"H543"

747.43,13,"H707",786.6,"H8",105.73,1297.47,1336.61,3.91,2.43,773.5,"H475",
 1403.2,253.8,"H261",4.813,"",,"",142,"",141.55,08/27/1997,2,9.23,"H28",2.57,"H61",
 0.044,"H342",0.014,741.987,0.003,47.9,"H474",39.067885,-81.388766,285.2,"H474",
 293.8,"H471",2.9,"",2.76,15.7,"H13",433,"H237",0.692,25.55,7.84,"",32,"H237",
 "Yes",5.10,"H129",280.4,"H261",1400.42,"MAIA97-003","5","K",1,1997,0.006,"H498"

8. GEOGRAPHIC AND SPATIAL INFORMATION

8.1 Minimum Longitude

-83 Degrees 33 Minutes 20 Seconds West (-83.555659 Decimal Degrees)

8.2 Maximum Longitude

-74 Degrees 41 Minutes 17 Seconds West (-74.688136 Decimal Degrees)

8.3 Minimum Latitude

35 Degrees 10 Minutes 58 Seconds North (35.182938 Decimal Degrees)

8.4 Maximum Latitude

42 Degrees 34 Minutes 1 Seconds North (42.567163 Decimal Degrees)

8.5 Name of Area or Region

Mid Atlantic: EPA Region III which includes Delaware, Maryland, New York, Virginia, and West Virginia

9. QUALITY CONTROL / QUALITY ASSURANCE

9.1 Data Quality Objectives

See Chaloud and Peck (1994).

9.2 Quality Assurance Procedures

See Chaloud and Peck (1994).

9.3 Unassessed Errors

NA

10. DATA ACCESS

10.1 Data Access Procedures

10.2 Data Access Restrictions

10.3 Data Access Contact Persons

10.4 Data Set Format

10.5 Information Concerning Anonymous FTP

10.6 Information Concerning WWW

10.7 EMAP CD-ROM Containing the Data

11. REFERENCES

Chaloud, D.J. and D.V. Peck. 1994. Environmental Monitoring and Assessment Program: Integrated Quality Assurance Project Plan for the Surface Waters Resource Group, 1994 Activities. EPA 600/X-91/080, Rev. 2.00 U.S. Environmental Protection Agency, Las Vegas, Nevada.

Lazorchak, J.M., Klemm, D.J., and Peck D.V. (editors). 1998. Environmental Monitoring and Assessment Program- Surface Waters: Field Operations and Methods for Measuring the Ecological Condition of Wadeable Streams. EPA/620/R-94/004F. U.S. Environmental Protection Agency, Washington, D.C.

12. TABLE OF ACRONYMS

13. PERSONNEL INFORMATION

Project Manager

Dr. John Stoddard

U.S. Environmental Protection Agency

NHEERL Western Ecology Division

200 S.W. 35th Street

Corvallis, OR 97333

541-754-4441

541-754-4716(FAX)

stoddard.john@epa.gov

Quality Assurance Officer

Dave Peck

U.S. Environmental Protection Agency

NHEERL Western Ecology Division

200 S.W. 35th Street

Corvallis, OR 97333

541-754-4426

541-754-4716(FAX)

peck.david@epa.gov

Information Management, EMAP-Surface Waters

Marlys Cappaert

OAO c/o U.S. Environmental Protection Agency

NHEERL Western Ecology Division

200 S.W. 35th Street

Corvallis, OR 97333

541-754-4467

541-754-4716(FAX)

cappaert.marlys@epa.gov