

US EPA ARCHIVE DOCUMENT

CATALOG DOCUMENTATION
REGIONAL ENVIRONMENTAL MONITORING AND ASSESSMENT PROGRAM - REGION 10
1994-1995 WASHINGTON/OREGON COASTAL STREAMS AND YAKIMA RIVER BASIN STREAMS
VALIDATED WATER CHEMISTRY DATA

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1. DATA SET IDENTIFICATION

1.1 Title of Catalog Document

Regional Environmental Monitoring and Assessment Program - Region 10
1994-1995 Washington/Oregon Coastal Streams and Yakima Basin Streams
Validated Water Chemistry Data Set

1.2 Authors of the Catalog Entry

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

1.3 Catalog Revision Date

23 March 1999

1.4 Data Set Name

CHMVAL

1.5 Task Group

Region 10

1.6 Data Set Identification Code

00004

1.7 Version

001

1.8 Requested Acknowledgment

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 Regional EMAP program, it has not been subjected to Agency review, and therefore does not necessarily reflect the views of the Agency and no official endorsement should be inferred."

2. INVESTIGATOR INFORMATION

2.1 Principal Investigators

Gretchen Hayslip
U.S. EPA Region 10

Glenn Merritt
Washington State Department of Ecology

Rick Hafele
Oregon Department of Environmental Quality

2.2 Investigation Participant - Sample Collection

U.S. Environmental Protection Agency
Office of Research and Development
Region 10
Oregon Department of Environmental Quality
Washington State Department of Ecology
Oregon State University
University of Washington
Yakama Indian Nation Environmental Protection Program

3. DATA SET ABSTRACT

3.1 Abstract of the Data Set

The CHEM data set contains the results of analysis of water chemistry for a grab samples taken at mid-channel for each stream reach. This data set also contains data from in situ measurements taken at mid-channel using field meters.

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

4. OBJECTIVES AND INTRODUCTION

4.1 Program and Project Objectives

4.1.1 Program Objective

The Regional Environmental Assessment and Monitoring Program (R-EMAP) was initiated to test the applicability of the EMAP approach to answer questions about ecological conditions at regional and local scales. Using EMAP's statistical design and indicator concepts, R-EMAP conducts projects at smaller geographic scales and in shorter time frames.

4.1.2 Project Objective

The objectives of Region 10 1994-1995 Washington/Oregon Coastal Streams and Yakima Basin Streams R-EMAP project were to:

1. Determine the ecological condition of wadeable, 1st-order through 3rd-order streams of the Coast Range Ecoregion and the Yakima River Basin (Columbia Basin Ecoregion).
2. Determine the relationship between the ecological condition of these streams and the predominant land used of the watersheds.
3. Provide the states of Washington and Oregon with information that would assist in the development of water quality biological criteria using indices based on fish/amphibian and invertebrate taxa assemblage information.
4. Determine the applicability of EMAP-derived methods for assessments of ecological condition within streams in the states of Washington and Oregon.

4.2 Data Set Objective

The primary function of the stream water chemistry samples is to determine acid-base status, trophic condition (nutrient status), chemical stressors, and classification of water chemistry type.

4.3 Data Set Background Discussion

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 selection 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 sample of water from each stream reach for the purpose of chemical analysis.

5.1.2 Sample Collection Methods Summary

A series of grab samples was taken below the surface using a 500 ml beaker and composited into a single 4-L bulk water sample. Sampling was conducted according to protocols identified in Chaloud and Peck (1994) and Hayslip et al. (1994).

5.1.3 Sampling Start Date

May 1994

May 1995

5.1.4 Sampling End Date

Oct 1994

Sept 1995

5.1.5 Platform

NA

5.1.6 Sampling Equipment

500 ml plastic beaker, 4-L Cubitainer, 250 ml plastic beakers, 250 ml rinse bottle filled with deionized water, rinse/test 125 ml bottles of quality control check (QCC) solution, thermometer, pH meter, dissolved oxygen (DO) meter, conductivity meter

5.1.7 Manufacturer of Sampling Equipment

NA

5.1.8 Key Variables

NA

5.1.9 Sampling Method Calibration

See Chaloud and Peck (1994) and Hayslip et al. (1994).

5.1.10 Sample Collection Quality Control

Chaloud, D.J. and D.V. Peck. 1994. Environmental Monitoring and Assessment Program - Surface Waters: 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, Office of Research and Development, Las Vegas, NV 89193.

Hayslip, G. A. (editor). 1993. EPA Region 10 In-stream Biological Monitoring Handbook (for wadeable streams in the Pacific Northwest). EPA-910/9-92-013. U. S. Environmental Protection Agency - Region 10, Environmental Services Division, Seattle, WA 98101.

Merritt, G.D. 1994. Biological Assessment of wadeable Streams in the Coast Range Ecoregion and the Yakima River Basin: Final Quality Assurance Project Plan. Washington State Department of Ecology, Environmental Investigations and Laboratory Services, Olympia, WA, 15 pp.

5.1.11 Sample Collection Method Reference

Hayslip, G. A. (editor). 1993. EPA Region 10 In-stream Biological Monitoring Handbook (for wadeable streams in the Pacific Northwest). EPA-910/9-92-013. U. S. Environmental Protection Agency - Region 10, Environmental Services Division, Seattle, WA 98101.

Hayslip, G., D.J. Klemm, J.M. Lazorchak. 1994. Environmental Monitoring and Assessment Program Surface Waters and Region 10 Regional Environmental Monitoring and Assessment Program: 1994 Pilot Field Operations and Methods Manual for Streams on the Coast Range Ecoregion of Oregon and Washington and the Yakima River Basin. Office of Research and Development, U.S. Environmental Protection Agency, Cincinnati, OH.

Lazorchak, J.M., D.J. Klemm, and D.V. Peck. (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.

Oregon Department of Environmental Quality. 1993. DEQ Laboratory Field Sampling Reference Guide. Oregon Department of Environmental Quality, Portland, OR. 29 p.

Washington Department of Ecology. 1993. Field Sampling and Measurement Protocols for the Watershed Assessment Section. Washington State Department of Ecology, Olympia, WA.

5.1.12 Sample Collection Method Deviations

NA

5.2 Data Preparation and Sample Processing

5.2.1 Sample Processing Objective

See Hayslip et al. (1994) and Hayslip (1993).

5.2.2 Sample Processing Methods Summary

See Hayslip et al. (1994) and Hayslip (1993).

5.2.3 Sample Processing Method Calibration

See Hayslip et al. (1994) and Hayslip (1993).

5.2.4 Sample Processing Quality Control

See Chaloud and Peck (1994), Merritt (1994), and Hayslip (1993).

5.2.5 Sample Processing Method Reference

See Hayslip et al. (1994) and Hayslip (1993).

6. DATA MANIPULATIONS

6.1 Name of New or Modified Values

NA

6.2 Data Manipulation Description

NA

6.3 Data Manipulation Description

NA

7. DATA DESCRIPTION

7.1 Description of Parameters

| # | Parameter Data | | | Format | Parameter Label |
|----|----------------|------|-----|--------|-----------------------------------|
| | SAS Name | Type | Len | | |
| 4 | ALK | Num | 8 | F | Total Alkalinity (ueq/L) |
| 29 | ALKF | Char | 8 | | Flag For ALK |
| 5 | BOD_5 | Num | 8 | | 5 Day BOD (mg/L) |
| 30 | BOD_5F | Char | 8 | | Flag for BOD_5 |
| 6 | CA | Num | 8 | | Calcium (ueq/L) |
| 45 | CAF | Char | 16 | | Flag for CA |
| 7 | CL | Num | 8 | F | Chloride (ueq/L) |
| 42 | CLF | Char | 16 | | Flag For CL |
| 8 | COND | Num | 8 | F | Stream Conductivity (uS/cm) |
| 31 | CONDF | Char | 8 | | Flag For COND |
| 48 | DATECOL | Char | 12 | \$ | Date sample Collected |
| 2 | DATE_COL | Num | 8 | DATE | Date sample Collected |
| 9 | DO | Num | 8 | F | Stream Dissolved Oxygen (mg/L) |
| 10 | DOC | Num | 8 | F | Dissolved Organic Carbon (mg/L) |
| 32 | DOCF | Char | 8 | | Flag For DOC |
| 11 | DO_SAT | Num | 8 | | Diss. Oxygen % Saturation |
| 33 | FLOWF | Char | 8 | | Flag for FLOW_CFS |
| 12 | FLOW_CFS | Num | 8 | F | Instantaneous Discharge (cfs) |
| 13 | HARDNESS | Num | 8 | | Hardness - Total Dissolved (mg/L) |
| 14 | K | Num | 8 | | Potassium (ueq/L) |
| 46 | KF | Char | 16 | | Flag for K |
| 56 | LAT_DD | Num | 8 | | Latitude (decimal degrees) |
| 55 | LON_DD | Num | 8 | | Longitude (decimal degrees) |
| 15 | MG | Num | 8 | | Magnesium (ueq/L) |
| 43 | MGF | Char | 16 | | Flag for MG |
| 16 | NA | Num | 8 | | Sodium (ueq/L) |
| 44 | NAF | Char | 16 | | Flag for NA |
| 17 | NH4 | Num | 8 | F | Ammonium (ueq/L) |
| 34 | NH4F | Char | 8 | | Flag For NH4 |
| 18 | NO3 | Num | 8 | F | Nitrate (ueq/L) |
| 47 | NO3F | Char | 8 | | Flag For NO3 |
| 51 | NTL | Num | 8 | F | Total Nitrogen (ug/L) |
| 52 | NTLF | Char | 8 | | NTL_F |
| 3 | OR_ID | Char | 6 | \$ | OR REMAP/DEQ STORET Stream ID |
| 20 | PH | Num | 8 | F | Stream pH |
| 35 | PHF | Char | 8 | | Flag For PH |
| 21 | PO4 | Num | 8 | | Orthophosphate (ug/L-P) |
| 36 | PO4F | Char | 8 | | Flag for PO4 |
| 22 | PTL | Num | 8 | F | Total Phosphorous (ug/L) |
| 37 | PTLF | Char | 8 | | Flag For PTL |
| 54 | SAMPLED | Char | 30 | | Site Sampled Code |
| 23 | SO4 | Num | 8 | F | Sulfate (ueq/L) |
| 41 | SO4F | Char | 16 | | Flag For SO4 |
| 19 | SOBC | Num | 8 | | Sum of Base Cations (ueq/L) |
| 1 | STRM_ID | Char | 7 | \$ | REMAP Stream Identifier |
| 24 | TEMPSTRM | Num | 8 | F | Stream Temperature (oC) |
| 25 | TKN | Num | 8 | | Total Kjeldahl Nitrogen (ug/L) |
| 38 | TKNF | Char | 8 | | Flag For TKN |

| | | | | |
|----|----------|------|-----|-------------------------------|
| 26 | TOC | Num | 8 | Total Organic Carbon (mg/L) |
| 39 | TOCF | Char | 8 | Flag for TOC |
| 49 | TSS | Num | 8 F | Total Suspended Solids (mg/L) |
| 50 | TSSF | Char | 8 | TSS_F |
| 27 | TURB | Num | 8 | Turbidity (FTU) |
| 40 | TURBF | Char | 8 | Flag For TURB |
| 28 | VISIT_NO | Num | 8 F | Sample Visit Number |
| 53 | YEAR | Num | 8 | |

7.1.1 Precision to which values are reported

7.1.2 Minimum Value in Data Set

| Name | Min |
|----------|--------------|
| ----- | |
| ALK | 79.52836 |
| BOD_5 | 0.1 |
| CA | 64.87 |
| CL | 0.84618 |
| COND | 18 |
| DATE_COL | 05/16/1994 |
| DO | 1.1 |
| DOC | 0.5 |
| DO_SAT | 1 |
| FLOW_CFS | 0 |
| HARDNESS | 5 |
| K | 6.39425 |
| LAT_DD | 42.1114 |
| LON_DD | -124.5862217 |
| MG | 41.144 |
| NA | 130.494 |
| NH4 | 0.71393 |
| NO3 | 0.71393 |
| NTL | 10 |
| PH | 5.52 |
| PO4 | 2.5 |
| PTL | 5 |
| SO4 | 5.205 |
| SOBC | 242.9 |
| TEMPSTRM | 4.8 |
| TKN | 30 |
| TOC | 0.25 |
| TSS | 1 |
| TURB | 0.5 |
| VISIT_NO | 1 |
| YEAR | 1994 |

7.1.3 Maximum Value in Data Set

| Name | Max |
|----------|------------|
| ALK | 4815.662 |
| BOD_5 | 8.8 |
| CA | 1996 |
| CL | 2820.6 |
| COND | 600 |
| DATE_COL | 09/29/1995 |
| DO | 12.15 |
| DOC | 13 |
| DO_SAT | 113 |
| FLOW_CFS | 445.825 |
| HARDNESS | 140 |
| K | 71.6156 |
| LAT_DD | 48.1784 |
| LON_DD | -119.5619 |
| MG | 789.9648 |
| NA | 1652.924 |
| NH4 | 128.5074 |
| NO3 | 167.05962 |
| NTL | 3270 |
| PH | 8.58 |
| PO4 | 130 |
| PTL | 580 |
| SO4 | 782.832 |
| SOBC | 4456.24 |
| TEMPSTRM | 25.3 |
| TKN | 3200 |
| TOC | 18 |
| TSS | 81 |
| TURB | 178 |
| VISIT_NO | 3 |
| YEAR | 1995 |

7.2 Data Record Example

7.2.1 Column Names for Example Records

"ALK", "ALKF", "BOD_5", "BOD_5F", "CA", "CAF", "CL", "CLF", "COND", "CONDF", "DATECOL", "DATE_COL", "DO", "DOC", "DOCF", "DO_SAT", "FLOWF", "FLOW_CFS", "HARDNESS", "K", "KF", "LAT_DD", "LON_DD", "MG", "MGF", "NA", "NAF", "NH4", "NH4F", "NO3", "NO3F", "NTL", "NTLF", "OR_ID", "PH", "PHF", "PO4", "PO4F", "PTL", "PTLF", "SAMPLED", "SO4", "SO4F", "SOBC", "STRM_ID", "TEMPSTRM", "TKN", "TKNF", "TOC", "TOCF", "TSS", "TSSF", "TURB", "TURBF", "VISIT_NO", "YEAR"

7.2.2 Example Data Records

379.658, "J", 2.1, " ", 279.44, " ", " ", " ", 75.000, " ", " ", " ", 21JUL1995, 7.700, 3.000, " ", 75, " ", " ", " ", 20.4616, " ", 45.991677169, -122.8964313, 181.0336, " ", 252.2884, " ", 1.428, " ", 17.848, " ", " ", " ", 405270, 7.400, " ", 30, "J", 40.000, " ", "Yes", " ", " ", 733.22, "OR001S", 14.000, 200, " ", 3, " ", " ", " ", 3, "J", 1, 1995

479.568,"J",2.1," ",269.46," ",112.824," ",79.000," "," ",06SEP1995,9.100,
3.000," ",88," ",.,22,30.6924," ",45.991677169,-122.8964313,181.0336," ",
260.988," ",0.714,"K",78.532," ",.,," ",405270",6.900," ",20," ",60.000," ",
"Yes",79.116,"J",742.17,"OR001S",14.500,700," ",3," ",.,," ",10," ",2,1995

399.640,"J",.,," ",214.57," ",115.645," ",59.000," "," ",14SEP1995,10.000,
0.500,"K",98," ",6.000,17,30.6924," ",44.138895486,-123.4394569,115.2032," ",
217.49," ",2.142," ",7.853," ",.,," ",405271",7.700," ",10," ",30.000," ",
"Yes",70.788,"J",577.96,"OR003S",14.000,200," ",0.25,"K",.,," ",5," ",1,1995

8. GEOGRAPHIC AND SPATIAL INFORMATION

8.1 Minimum Longitude

-124 Degrees 35 Minutes 10 Seconds West (-124.5862217 Decimal Degrees)

8.2 Maximum Longitude

-119 Degrees 33 Minutes 42 Seconds West (-119.5619 Decimal Degrees)

8.3 Minimum Latitude

42 Degrees 6 Minutes 41 Seconds North (42.1114 Decimal Degrees)

8.4 Maximum Latitude

48 Degrees 10 Minutes 42 Seconds North (48.1784 Decimal Degrees)

8.5 Name of Area or Region

EPA Region 10

The sampling area included the Coast Range Ecoregion and the Yakima River Basin (Columbia Basin Ecoregion).

9. QUALITY CONTROL / QUALITY ASSURANCE

9.1 Data Quality Objectives

See Chaloud and Peck (1994), Merritt (1994), and Hayslip (1993).

9.2 Quality Assurance Procedures

See Chaloud and Peck (1994), Merritt (1994), and Hayslip (1993).

9.3 Unassessed Errors

NA

10. DATA ACCESS

10.1 Data Access Procedures

Data can be downloaded from the WWW site or contact personnel listed in Section 10.3.

10.2 Data Access Restrictions

Data can only be accessed from the WWW server.

10.3 Data Access Contact Persons

Gretchen Hayslip
Environmental Services Division
Region 10
U.S. Environmental Protection Agency
1200 Sixth Avenue, ES-097
Seattle, WA 98101
206-553-1685
206-553-0119 (FAX)
hayslip.gretchen@epamail.epa.gov

Data Librarian EMAP-Information Management
U.S. EPA NHEERL-AED
401-782-3184
401-782-3030 (FAX)
hughes.melissa@epa.gov

10.4 Data Set Format

Data files are in ASCII comma-delimited format.

10.5 Information Concerning Anonymous FTP

Data cannot be accessed via ftp.

10.6 Information Concerning WWW

Data can be downloaded from the WWW site.

10.7 EMAP CD-ROM Containing the Data

Data are not available on CD-ROM.

11. REFERENCES

Chaloud, D.J. and D.V. Peck. 1994. Environmental Monitoring and Assessment Program - Surface Waters: 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, Office of Research and Development, Las Vegas, NV 89193.

Hayslip, G. A. (editor). 1993. EPA Region 10 In-stream Biological Monitoring Handbook (for wadeable streams in the Pacific Northwest). EPA-910/9-92-013. U. S. Environmental Protection Agency - Region 10, Environmental Services Division, Seattle, WA 98101.

Hayslip, G., D.J. Klemm, J.M. Lazorchak. 1994. Environmental Monitoring and Assessment Program Surface Waters and Region 10 Regional Environmental Monitoring and Assessment Program: 1994 Pilot Field Operations and Methods Manual for Streams on the Coast Range Ecoregion of Oregon and Washington and the Yakima River Basin. Office of Research and Development, U.S. Environmental Protection Agency, Cincinnati, OH.

Lazorchak, J.M., D.J. Klemm, and D.V. Peck. (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.

Merritt, G.D. 1994. Biological Assessment of wadeable Streams in the Coast Range Ecoregion and the Yakima River Basin: Final Quality Assurance Project Plan. Washington State Department of Ecology, Environmental Investigations and Laboratory Services, Olympia, WA, 15 pp.

Oregon Department of Environmental Quality. 1993. DEQ Laboratory Field Sampling Reference Guide. Oregon Department of Environmental Quality, Portland, OR. 29 pp.

Washington Department of Ecology. 1993. Field Sampling and Measurement Protocols for the Watershed Assessment Section. Washington State Department of Ecology, Olympia, WA.

12. TABLE OF ACRONYMS

13. PERSONNEL INFORMATION

Project Manager
Gretchen Hayslip
Environmental Services Division
Region 10
U.S. Environmental Protection Agency
1200 Sixth Avenue, ES-097
Seattle, WA 98101
206-553-1685
206-553-0119 (FAX)
hayslip.gretchen@epamail.epa.gov

R-EMAP Project Leader for Washington State
Glenn Merritt
Washington State Department of Ecology
Watershed Assessments Section
300 Desmond Drive, P.O. Box 47710
Olympia, WA 98504-7710
206-407-6777
206-407-6884 (FAX)

R-EMAP Project Leader for Oregon
Rick Hafele
Oregon Department of Environmental Quality
811 SW 6th Avenue
Portland, OR 97204-1390
503-229-5983
503-229-6124 (FAX)
rick.hafele@state.or.us

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)
davep@mail.cor.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@mail.cor.epa.gov