

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
SHORT LIST OF BEST PHYSICAL HABITAT METRICS 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
Short List of Best Physical Habitat Metrics 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

HABBEST

1.5 Task Group

Region 10

1.6 Data Set Identification Code

00002

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

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U.S. EPA Region 10

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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 HABBEST data set contains a selected subset of metrics calculated from the raw physical habitat data collected at each stream sampled.

3.2 Keywords for the Data Set

habitat, cover, large woody debris, pools, riffles, residual pools, instream cover, riparian habitat, riparian zone

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 habitat data set is to describe the physical habitat quality within the stream and near-shore riparian zone. This information is used to help establish the "expectations" of the biological quality of the stream and to evaluate the extent to which human activity has disturbed habitat and thus impacted stream biota.

4.3 Data Set Background Discussion

Habitat in streams is analyzed for two purposes. First, to understand the physical habitat within which biota must exist so that we can understand the biological potential of the system and second, to evaluate the physical habitat quality of the stream for the purpose of determining the potential stresses to which the biota are exposed.

4.4 Summary of Data Set Parameters

The physical habitat parameters include percentages and total counts of various in-channel and riparian features, such as substrate size,

water flow types, fish cover, channel sinuosity, riparian vegetation types, canopy density, and proximity of human influence features.

5. DATA ACQUISITION AND PROCESSING METHODS

5.1 Data Acquisition

5.1.1 Sampling Objective

To obtain a quantitative description of stream physical habitat for the during the specified sampling window.

5.1.2 Sample Collection Methods Summary

Quantitative habitat information was collected at eleven transects along each sampling reach - according to the protocols identified in Hayslip et al. (1994) and Klemm and Lazorchak (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

surveyors rod, clinometer, spherical canopy densiometer, bearing compass, colored plastic flagging, fiberglass tape and reek (50 m metric), meter stick, hoop (24 inches by 24 inches with a one inch grid)

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.

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Kaufmann, P.R. (editor). 1993. Physical Habitat. Pages 59-69 in R.M. Hughes, editor. Stream Indicator and Design Workshop. EPA/600/R-93/138. U.S. Environmental Protection Agency, Corvallis, OR.

Klemm, D.J. and J.M. Lazorchak (editors). 1994. EMAP Surface Waters 1994 Streams Pilot Field Operations and Methods Manual. EPA/620/R-94/004. U.S. Environmental Protection Agency, Office of Research and Development.

Cincinnati, OH.

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			Parameter	
	SAS Name	Type	Len	Format	Label
67	DATE_COL	Num	8	DATE	Date sample Collected
69	LAT_DD	Num	8		Latitude (decimal degrees)
68	LON_DD	Num	8		Longitude (decimal degrees)
35	LSUB_DMM	Num	8		log10(est geom mean substr dia) unitless
38	MAXDEP	Num	8		maximum depth in any pool in reach in cm
16	PCAN_C	Num	8		frac of reach with coniferous dom canopy
48	PCT_BDRK	Num	8		%substrate thats rough or smooth bedrock
47	PCT_BIGR	Num	8		%substrate larger than fine gravel
63	PCT_DRS	Num	8		percent of reach with dry/submerged flow
59	PCT_FA	Num	8		percent of reach with falls

60	PCT_FAST	Num	8	percent of reach with fast water types
41	PCT_FN	Num	8	% of reach substrate that is fines
44	PCT_HP	Num	8	% of reach substrate that is hardpan
49	PCT_ORG	Num	8	%substrate thats wood or organic matter
62	PCT_POOL	Num	8	percent of reach with pools
43	PCT_RC	Num	8	% of reach substrate that is ??? bedrock
42	PCT_SA	Num	8	% of reach substrate that is sand
45	PCT_SAFN	Num	8	%substrate classified as sand or fines
46	PCT_SFGF	Num	8	%substrate smaller than coarse gravel
61	PCT_SLOW	Num	8	percent of reach with slow water types
40	RPA100R	Num	8	area per 100 m of reach in m^2
37	RPD75	Num	8	number of pools deeper than 75 cm
66	SAMPLED	Char	30	Site Sampled Code
54	SDDEPTH	Num	8	stdev of depth
58	SDWXD	Num	8	stdev of product: wetted width * depth
52	SINU	Num	8	ratio of dogs to crows distances
1	STRM_ID	Char	5	\$ individual site identification
50	V1W_MSQ	Num	8	Volume per m2 of wet class 1 lwd
51	V4W_MSQ	Num	8	Volume per m2 of wet class 4 lwd
2	VISIT_NO	Num	8	F visit number-within year
34	W1H_PIPE	Num	8	weighted sum of fracs of reach w pipes
33	W1H_WALL	Num	8	waited sum of fracs of reach w riprap
32	W1_HAG	Num	8	weighted sum of fracs of all ag noted
30	W1_HALL	Num	8	weighted sum of fracs of all dist. noted
31	W1_HNOAG	Num	8	weighted sum of fracs of all non-ag seen
39	XAR	Num	8	mean pool area, in m^2
6	XBKF_H	Num	8	the mean, MAXBHT
5	XBKF_W	Num	8	the mean, SUMBWID
3	XBK_A	Num	8	the mean, ANGLE
12	XC	Num	8	frac of reach covered by canopy
17	XCDENBK	Num	8	mean of %canopy cover at LF & RT banks
18	XCDENMID	Num	8	mean of %canopy cover midstream
10	XCL	Num	8	frac of reach covered by big tree canopy
15	XCMGW	Num	8	frac of reach covered by any woody veg
14	XCMW	Num	8	frac of reach covered by large woody veg
53	XDEPTH	Num	8	mean depth
65	XEMBED	Num	8	mean substrate embeddedness
19	XFC_ALG	Num	8	fraction of reach area covered by algal
27	XFC_ALL	Num	8	frac of reach area with any but algae
20	XFC_AQM	Num	8	frac of reach area covered by macrophyte
29	XFC_BIG	Num	8	frac of reach area covered by large obj.
22	XFC_BRS	Num	8	fraction of reach area covered by brush
26	XFC_HUM	Num	8	frac of reach area covered by structures
21	XFC_LWD	Num	8	fraction of reach area covered by lwd
28	XFC_NAT	Num	8	frac of reach area covered by nat. obj.
23	XFC_OHV	Num	8	frac of reach area covered by overhang
25	XFC_RCK	Num	8	frac of reach area covered by boulder
24	XFC_UCB	Num	8	frac of reach area covered by undercut
13	XG	Num	8	frac of reach covered by groundcover
11	XGB	Num	8	frac of reach without ground cover
7	XINC_H	Num	8	the mean, MAXINCIS
8	XPCM	Num	8	frac with both canopy and understory
9	XPCMG	Num	8	frac with all three veg classes present

36	XSLOPE	Num	8	mean slope of entire reach
4	XUN	Num	8	the mean, UNDERCUT
57	XWD_RAT	Num	8	mean ratio: wetted width/depth
55	XWIDTH	Num	8	mean wetted width
56	XWXD	Num	8	mean product: wetted width * depth
64	YEAR	Num	4	Sample Year

7.1.1 Precision to which values are reported

Data were reported to the number of decimal places noted in 7.1.

7.1.2 Minimum Value in Data Set

Name	Min

DATE_COL	05/16/1994
LAT_DD	42.1114
LON_DD	-124.5862217
LSUB_DMM	-2.454616
MAXDEP	7.2783964164
PCAN_C	0
PCT_BDRK	0
PCT_BIGR	0
PCT_DRS	0
PCT_FA	0
PCT_FAST	0
PCT_FN	0
PCT_HP	0
PCT_ORG	0
PCT_POOL	0
PCT_RC	0
PCT_SA	0
PCT_SAFN	0
PCT_SFGF	0
PCT_SLOW	0
RPA100R	0.2256191655
RPD75	0
SDDEPTH	0
SDWXD	0
SINU	1.1143309139
V1W_MSQ	0
V4W_MSQ	0
VISIT_NO	1
W1H_PIPE	0
W1H_WALL	0
W1_HAG	0
W1_HALL	0
W1_HNOAG	0
XAR	0.0260743385
XBKF_H	0.0427272727
XBKF_W	0.8375
XBK_A	11.5
XC	0

XCDENBK 22.459893048
 XCDENMID 7.2192513369
 XCL 0
 XCMGW 0.0166666667
 XCMW 0.0125
 XDEPTH 0
 XEMBED .
 XFC_ALG 0
 XFC_ALL 0.1045454545
 XFC_AQM 0
 XFC_BIG 0.0071428571
 XFC_BRS 0
 XFC_HUM 0
 XFC_LWD 0
 XFC_NAT 0.1
 XFC_OHV 0
 XFC_RCK 0
 XFC_UCB 0
 XG 0.0875
 XGB 0
 XINC_H 0.0833333333
 XPCM 0
 XPCMG 0
 XSLOPE 0
 XUN 0
 XWD_RAT 6.0407470184
 XWIDTH 0
 XWXD 0
 YEAR 1994

7.1.3 Maximum Value in Data Set

Name	Max
DATE_COL	09/29/1995
LAT_DD	48.1784
LON_DD	-119.5619
LSUB_DMM	3.1765825636
MAXDEP	376.93
PCAN_C	1
PCT_BDRK	69.090909091
PCT_BIGR	94.545454545
PCT_DRS	100
PCT_FA	5.3333333333
PCT_FAST	98.98989899
PCT_FN	100
PCT_HP	0
PCT_ORG	30
PCT_POOL	96.644295302
PCT_RC	9.0909090909
PCT_SA	92
PCT_SAFN	100
PCT_SFGF	100

PCT_SLOW 100
RPA100R 74.120130221
RPD75 9
SDDEPTH 86.903022114
SDWXD 24.35621908
SINU 72.393163573
V1W_MSQ 4.9217079111
V4W_MSQ 2.6558486364
VISIT_NO 3
W1H_PIPE 0.5
W1H_WALL 0.75
W1_HAG 2.1111416667
W1_HALL 5.7223166667
W1_HNOAG 4.236175
XAR 32.942280098
XBKF_H 2.0447248639
XBKF_W 48.1
XBK_A 105.09090909
XC 0.95208333333
XCDENBK 100
XCENMID 100
XCL 0.6729166667
XCMGW 1.80625
XCMW 1.50833333333
XDEPTH 139.81
XEMBED .
XFC_ALG 0.575
XFC_ALL 1.4790909091
XFC_AQM 0.5113636364
XFC_BIG 1.0677272727
XFC_BRS 0.5477272727
XFC_HUM 0.25
XFC_LWD 0.575
XFC_NAT 1.475
XFC_OHV 0.7068181818
XFC_RCK 0.875
XFC_UCB 0.2454545455
XG 1.0854166667
XGB 0.825
XINC_H 5.3166666667
XPCM 1
XPCMG 1
XSLOPE 22.35
XUN 0.325
XWD_RAT 104.13986499
XWIDTH 30.4
XWXD 19.5288
YEAR 1995

7.2 Data Record Example

7.2.1 Column Names for Example Records

"DATE_COL", "LAT_DD", "LON_DD", "LSUB_DMM", "MAXDEP", "PCAN_C", "PCT_BDRK",
 "PCT_BIGR", "PCT_DRS", "PCT_FA", "PCT_FAST", "PCT_FN", "PCT_HP", "PCT_ORG",
 "PCT_POOL", "PCT_RC", "PCT_SA", "PCT_SAFN", "PCT_SFGF", "PCT_SLOW", "RPA100R",
 "RPD75", "SAMPLED", "SDDEPTH", "SDWXD", "SINU", "STRM_ID", "V1W_MSQ", "V4W_MSQ",
 "VISIT_NO", "W1H_PIPE", "W1H_WALL", "W1_HAG", "W1_HALL", "W1_HNOAG", "XAR",
 "XBKF_H", "XBKF_W", "XBK_A", "XC", "XCDENBK", "XCDENMID", "XCL", "XCMGW", "XCMW",
 "XDEPTH", "XEMBED", "XFC_ALG", "XFC_ALL", "XFC_AQM", "XFC_BIG", "XFC_BRS",
 "XFC_HUM", "XFC_LWD", "XFC_NAT", "XFC_OHV", "XFC_RCK", "XFC_UCB", "XG", "XGB",
 "XINC_H", "XPCM", "XPCMG", "XSLOPE", "XUN", "XWD_RAT", "XWIDTH", "XWXD", "YEAR"

7.2.2 Example Data Records

21JUL1995,45.991677169,-122.8964313,0.6407865652,43.342222222,0.0833333333,
 0,21.818181818,16.666666667,0,30,5.4545454545,0,3.6363636364,53.333333333,
 0,32.727272727,38.181818182,61.818181818,53.333333333,8.665562963,0,"Yes",
 11.487031887,0.3391209578,1.5496150061,"OR001",0.0437326608,0.021025641,1,
 0.0833333333,0.0833333333,0.1111166667,1.9583666667,1.84725,0.5415976852,
 0.4875,3.6636363636,58.75,0.51875,98.663101604,97.994652406,0.2145833333,
 1.0145833333,0.8708333333,10.966666667,,0,0.5340909091,0.0454545455,
 0.2840909091,0.1068181818,0,0.1636363636,0.5340909091,0.1431818182,
 0.0363636364,0.0840909091,0.3583333333,0.0791666667,0.6375,1,1,
 1.1777777778,0.125,14.829102428,1.586,0.32432,1995

06SEP1995,45.991677169,-122.8964313,0.9006281321,46.488333333,0,0,
 49.090909091,0,0,39.333333333,20,0,3.6363636364,34.666666667,0,10.909090909,
 30.909090909,47.272727273,60.666666667,11.605436998,0,"Yes",12.063888466,
 0.6358907051,1.5349629272,"OR001",0.1539221077,0.0868980527,2,0,0,0,
 2.0834166667,2.0834166667,0.9162187103,0.6,4.6363636364,52.916666667,0.4,
 98.663101604,97.058823529,0.1520833333,1.5,1.05,17.113333333,,0,
 0.7363636364,0,0.1431818182,0.1,0,0.0795454545,0.7363636364,0.4931818182,
 0.0318181818,0.0318181818,0.9708333333,0.05,0.8416666667,1,1,1.1944444444,
 0.0333333333,17.199603175,2.91,0.8141,1995

14SEP1995,44.138895486,-123.4394569,-0.64440256,139.044444444,0.0833333333,
 0,9.0909090909,0,0,36,29.090909091,0,10.909090909,20,0,7.2727272727,
 36.363636364,36.363636364,64,14.230959084,1,"Yes",28.876959464,2.5034777699,
 1.1648259585,"OR003",0.0063096276,0.0039219493,1,0,0,0,0.3055666667,
 0.3055666667,3.5577397711,0.975,15.881818182,41.25,0.73125,94.411764706,
 65.77540107,0.3791666667,1.3583333333,1.225,33.4,,0,0.3818181818,
 0.0590909091,0.1659090909,0.1340909091,0,0.1295454545,0.3818181818,
 0.0818181818,0.0227272727,0.0136363636,0.80625,0.025,1.85,1,1,1.1111111111,
 0.05,65.947389447,12.62,3.7915,1995

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

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Data Librarian EMAP-Information Management
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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.

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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.

12. TABLE OF ACRONYMS

13. PERSONNEL INFORMATION

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