

US EPA ARCHIVE DOCUMENT

**CATALOG DOCUMENTATION
EMAP SURFACE WATERS PROGRAM LEVEL DATABASE
1993-1996 MID-ATLANTIC STREAMS DATA
Fish Metrics Data**

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1. DATA SET IDENTIFICATION

1.1 Title of Catalog Document
EMAP Surface Waters Stream Database
1993-1996 Mid-Atlantic Streams
Stream Fish Metrics Data Summarized by Stream

1.2 Authors of the Catalog Entry
U.S. EPA NHEERL Western Ecology Division
Corvallis, OR

1.3 Catalog Revision Date
January 1999

1.4 Data Set Name
FISHMET

1.5 Task Group
Surface Waters

1.6 Data Set Identification Code
0124

1.7 Version
002

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 EMAP Surface Waters Program, it has not been subjected to Agency review, and therefore does not necessarily reflect the view of the Agency and no official endorsement of the conclusions should be inferred."

2.0 INVESTIGATOR INFORMATION

2.1 Principal Investigator

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2.2 Investigation Participant- Sample Collection

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State of Pennsylvania
University of Maine
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U.S. Environmental Protection Agency
Office of Research and Development
Region III

3.0 DATA SET ABSTRACT

3.1 Abstract of the Data Set

The primary function of the stream fish data are to provide a snapshot of the fish assemblage present in the stream at the time of sampling. The fish community represents an integral component of stream biological integrity and represents a snapshot of a publicly visible reflection of stream quality.

3.2 Keywords for the Data Set

Fish assemblage, fish community, fish species identification

4.0 OBJECTIVES AND INTRODUCTION

4.1 Program Objectives

The Environmental Monitoring and Assessment Program (EMAP) was designed to periodically estimate the status and trends of the Nation's ecological resources on a regional basis. EMAP provides a strategy to identify and bound the extent, magnitude and location of environmental degradation and improvement on a regional scale based on a probability-based statistical survey design.

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 multi-habitat sample of the fish assemblage taken during spring low-flow.

4.3 Data Set Background Discussion

The fish community within a stream is an integral component of stream biological integrity and represents a publicly visible reflection of stream quality. This data set contains a list of metrics derived from the species composition within the stream at the time of sampling. The metrics summarize the species relative abundance information by collapsing it into a series of metrics representing trophic guilds, habitat preferences, tolerance capacities and measures of biodiversity.

4.4 Summary of Data Set Parameters

Fish Assemblage metrics include counts of individuals and species collected which can be grouped into several functional classifications, as well as percent of species collected in the same classifications. The classifications include feeding functions such as insectivores and piscivores, species similarities such as minnow species, native/non-native classification, and pollution tolerance or intolerance.

5. DATA ACQUISITION AND PROCESSING METHODS

5.1 Data Acquisition

5.1.1 Sampling Objective

To obtain a sample of the fish assemblage within a stream during a two month sampling window from April through mid-June.

5.1.2 Sample Collection Methods Summary

The assemblage was sampled using single pass with a backpack electrofishing unit distributed in multiple habitats throughout the stream.

5.1.3 Sampling Start Date

April 1993

5.1.4 Sampling End Date

September 1996

5.1.5 Platform

5.1.6 Sampling Gear

Backpack electrofishing unit

5.1.7 Manufacturer of Instruments

5.1.8 Key Variables

5.1.9 Sampling Method Calibration

5.1.10 Sample Collection Quality Control

See Lazorchak, et al. 1998.

5.1.11 Sample Collection Method Reference

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.

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.

5.1.12 Sample Collection Method Deviations

5.2 Data Preparation and Sample Processing

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	Parameter Label
-----	----	----	-----
ALIEN	Num	8	Nonindigenous individuals IBI metric (value 0-10)
AREA_WS	Num	8	Watershed area
BENTHIC	Num	8	Benthic species IBI metric (value 0-10)
COLUMN	Num	8	Water column species IBI metric (value 0-10)
GRAVEL	Num	8	Simple lithophil IBI metric (value 0-10)
HERBIV	Num	8	Herbivore IBI metric (value 0-10)
IBI	Num	8	Fish Index of Biotic Integrity

7.1 Description of Parameters, continued

INTOL	Num	8	Intolerant IBI metric (value 0-10)
INVERT	Num	8	Invertivore IBI metric (value 0-10)
LWSKM2	Num	8	Log10 watershed area (km2)
MAXBHAB	Num	8	Maximum benthic species richness (calculated)
MAXCOLU	Num	8	Maximum water column sp. richness (calculated)
MAXINTOL	Num	8	Maximum intolerant species richness (calculated)
MAXNSP	Num	8	Maximum native species richness (calculated)
MAXNFAM	Num	8	Maximum native family richness (calculated)
MAXREPRO	Num	8	Maximum number of reproductive guilds
MAXTROPH	Num	8	Maximum number of trophic guilds
NALIEN	Num	8	Calculated adjustment value proportion of aliens
NATFAM	Num	8	Native family IBI metric (value 0-10)
NATIVFAM	Num	8	Number of families represented
NATSP	Num	8	Native species IBI metric (value 0-10)
NATSP100	Num	8	Native fish richness per 100 individuals
NINDIV	Num	8	Abundance IBI metric (value 0-10)
NOMNI_H	Num	8	Calculated adjustment value proportion omnivore-herbivores
NPTOLE	Num	8	Calculated adjustment value proportion of tolerants
NREPROS	Num	8	Number of reproductive guilds
NSANGU	Num	8	number of anguilla species
NSATHER	Num	8	number of atherin species
NSBHAB	Num	8	number of benthic habitat species
NSCATO	Num	8	number of sucker species
NSCENT	Num	8	number of sunfish species
NSCOLU	Num	8	number of water column species
NSCOTT	Num	8	number of sculpin species
NSCYPR	Num	8	number of minnow species
NSDART	Num	8	number of darter species
NSDRUMX	Num	8	number of drum species
NSES0XX	Num	8	number of esox species
NSFUND	Num	8	number of fundelis species
NSGAMB	Num	8	number of gambusia species
NSICTA	Num	8	number of nonmissing values, ICTA
NSINTOL	Num	8	number of intolerant species
NSLAMP	Num	8	number of lamprey species
NSLUNK	Num	8	number of charismatic megafauna
NSPERCO	Num	8	number of percopsis species
NSPPER	Num	8	number of perch species
NSSALM	Num	8	number of salmon species
NSUMBR	Num	8	number of umbridae species
NTROPH	Num	8	number of trophic guilds
NUMFISH	Num	8	number of individuals in sample
NUMNATSP	Num	8	number of native species
NUMSPEC	Num	8	Total number of fish species
OMNI	Num	8	Omnivore IBI metric
PATNG	Num	8	prop. of indiv. as attacher non-guarder
PBCLN	Num	8	prop. of indiv. as bc spwn clear substr.
PBCST	Num	8	prop. of indiv. as broadcast spawners
PBENT	Num	8	prop. of fish as benthic insectivores
PBENTSP	Num	8	prop. of benthic hab. sp. in native sp.

7.1 Description of Parameters, continued

PCARN	Num	8	prop. of piscivore-invertivores (includes invertivore-piscivores + piscivores)
PCGBU	Num	8	prop. of indiv. as clear gravel buryers
PCOLSP	Num	8	prop. of column sp. in native sp.
PEXOT	Num	8	prop. of individuals as introduced
PGRAVEL	Num	8	prop. of simple lithophils
PHERB	Num	8	prop. of individuals as herbivores
PINSE	Num	8	prop. of indiv. as native insectivores
PINVERT	Num	8	prop. of invertivores
PISCINV	Num	8	Piscivore-invertivore IBI metric (value 0-10)
PLUNKSP	Num	8	prop. of lunker sp. to native sp.
PMACRO	Num	8	prop. of macro-omnivores
PMICRO	Num	8	prop. of micro-omnivores
PNEST	Num	8	prop. of indiv. as nest associates
PNTGU	Num	8	prop. of indiv. as nester guarder
POMNI_H	Num	8	prop. of omnivore-herbivores (microomnivores + macroomnivores + herbivores)
PPISC	Num	8	prop. of individuals as carnivores
PPISCINV	Num	8	prop. of piscivore-insectivores
PTOLE	Num	8	prop. of individuals as tolerant
PTREPRO	Num	8	prop. of tolerant reproductive guild individuals
REPRO	Num	8	Reproductive guild IBI metric (value 0-10)
SAMPLED	Char	30	Site Sampled Code
SQRTAREA	Num	8	Square root of watershed area (km2)
STRM_ID	Char	6	Stream ID
TOLREPR	Num	8	Tolerant reproductive IBI metric (not included in IBI)
TOLRNT	Num	8	Tolerant individual IBI metric (value 0-10)
TROPH	Num	8	Trophic guild IBI metric (value 0-10)
VISIT_NO	Num	8	Visit Number
YEAR	Num	8	Sample Year

7.1.1 Precision to which values are reported

7.1.2 Minimum Value in Data Set

Name	Min

ALIEN	0
AREA_WS	3.42
BENTHIC	0
COLUMN	0
GRAVEL	0
HERBIV	.
IBI	0
INTOL	0
INVERT	0
LWSKM2	-1.465973894
MAXBHAB	-1.431716942
MAXCOLU	-0.529930071
MAXINTOL	-0.565021568

7.1.2 Minimum Value in Data Set, continued

MAXNFAM	-0.271024711
MAXNSP	-2.315302519
MAXREPRO	0.7144129265
MAXTROPH	0.2720974408
NALIEN	0.05
NATFAM	0
NATIVFAM	0
NATSP	0
NATSP100	1
NINDIV	0
NOMNI_H	0
NPTOLE	0
NREPROS	0
NSANGU	0
NSATHER	0
NSBHAB	0
NSCATO	0
NSCENT	0
NSCOLU	0
NSCOTT	0
NSCYPR	0
NSDART	0
NSDRUMX	0
NSES0XX	0
NSFUND	0
NSGAMB	0
NSICTA	0
NSINTOL	0
NSLAMP	0
NSLUNK	0
NSPERCO	0
NSPPER	0
NSSALM	0
NSUMBR	0
NTROPH	0
NUMFISH	0
NUMNATSP	0
NUMSPEC	0
OMNI	0
PATNG	0
PBCLN	0
PBCST	0
PBENT	0
PBENTSP	0
PCARN	0
PCGBU	0
PCOLSP	0
PEXOT	0
PGRAVEL	0
PHERB	0
PINSE	0
PINVERT	0

7.1.2 Minimum Value in Data Set, continued

PISCINV	0
PLUNKSP	0
PMACRO	0
PMICRO	0
PNEST	0
PNTGU	0
POMNI_H	0
PPISC	0
PPISCINV	0
PTOLE	0
PTREPRO	0
REPRO	0
SQRTAREA	0.1849324201
TOLREPR	.
TOLRNT	0
TROPH	0
VISIT_NO	1
YEAR	1993

7.1.3 Maximum Value in Data Set

Name	Max

ALIEN	10
AREA_WS	59445.7
BENTHIC	10
COLUMN	10
GRAVEL	10
HERBIV	.
IBI	90.108081494
INTOL	10
INVERT	10
LWSKM2	2.7741204454
MAXBHAB	13
MAXCOLU	10
MAXINTOL	4
MAXNFAM	9
MAXNSP	25
MAXREPRO	4
MAXTROPH	6
NALIEN	1
NATFAM	10
NATIVFAM	9
NATSP	10
NATSP100	16.437368226
NINDIV	10
NOMNI_H	1
NPTOLE	1
NREPROS	4
NSANGU	1
NSATHER	1
NSBHAB	15

7.1.3 Maximum Value in Data Set, continued

NSCATO	6
NSCENT	3
NSCOLU	12
NSCOTT	2
NSCYPR	13
NSDART	6
NSDRUMX	1
NSES0XX	1
NSFUND	1
NSGAMB	1
NSICTA	2
NSINTOL	6
NSLAMP	2
NSLUNK	8
NSPERCO	1
NSPPER	1
NSSALM	1
NSUMBR	1
NTROPH	6
NUMFISH	1838
NUMNATSP	25
NUMSPEC	28
OMNI	10
PATNG	0.7454890788
PBCLN	0.8757062147
PBCST	0.935483871
PBENT	0.9788359788
PBENTSP	1
PCARN	1
PCGBU	1
PCOLSP	1
PEXOT	0.95
PGRAVEL	1
PHERB	0.7345588235
PINSE	0.95
PINVERT	0.9788359788
PISCINV	10
PLUNKSP	1
PMACRO	0.8757062147
PMICRO	1
PNEST	0.7333333333
PNTGU	1
POMNI_H	1
PPISC	0.2592592593
PPISCINV	1
PTOLE	1
PTREPRO	1
REPRO	10
SQRTAREA	24.38148888
TOLREPR	.
TOLRNT	10
TROPH	10

7.1.3 Maximum Value in Data Set, continued

VISIT_NO 2
YEAR 1996

7.2 Data Record Example

7.2.1 Column Names for Example Records

"ALIEN", "AREA_WS", "BENTHIC", "COLUMN", "GRAVEL", "HERBIV", "IBI", "INTOL",
"INVERT", "LWSKM2", "MAXBHAB", "MAXCOLU", "MAXINTOL", "MAXNFAM", "MAXNSP",
"MAXREPRO", "MAXTROPH", "NALIEN", "NATFAM", "NATIVFAM", "NATSP", "NATSP100",
"NINDIV", "NOMNI_H", "NPTOLE", "NREPROS", "NSANGU", "NSATHER", "NSBHAB", "NSCATO",
"NSCENT", "NSCOLU", "NSCOTT", "NSCYPR", "NSDART", "NSDRUMX", "NSES0XX", "NSFUND",
"NSGAMB", "NSICTA", "NSINTOL", "NSLAMP", "NSLUNK", "NSPERCO", "NSPPER", "NSSALM",
"NSUMBR", "NTROPH", "NUMFISH", "NUMNATSP", "NUMSPEC", "OMNI", "PATNG", "PBCLN",
"PBCST", "PBENT", "PBENTSP", "PCARN", "PCGBU", "PCOLSP", "PEXOT", "PGRAVEL", "PHERB",
"PINSE", "PINVERT", "PISCINV", "PLUNKSP", "PMACRO", "PMICRO", "PNEST", "PNTGU",
"POMNI_H", "PPISC", "PPISCINV", "PTOLE", "PTREPRO", "REPRO", "SAMPLED", "SQRTAREA",
"STRM_ID", "TOLREPR", "TOLRNT", "TROPH", "VISIT_NO",
"YEAR"

7.2.2 Example Data Records

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.,1997.87,.,.,.,.,.,.,.,1.3005672256,.,.,.,.,.,.,.,9,.,7.9702970297,.,.,
.,2,1,0,5,1,2,6,0,1,1,0,1,0,0,2,0,0,7,0,1,0,1,5,346,11,12,.,0.0028901734,
0.1069364162,0.0260115607,0.0028901734,0.4166666667,0.0144508671,0,
0.5833333333,0.6300578035,0.1098265896,0,0.8526011561,0.8554913295,.,
0.6666666667,0.1040462428,0.0260115607,0,0.8612716763,0.1300578035,
0.0115606936,0.0028901734,0.6734104046,0.887283237,.,
"IBI not calculated",4.4697539082,"DE750S",.,.,.,1,1994

10,237.97,2.002038287,0,10,.,22.663312681,0,0,0.3765222106,4.9949094706,
5.365320465,1.4698311294,4.3086836067,9.6461821912,2.7700858304,3.7050361828,
1,2.3208944803,1,1.0366795694,.,0.06,0,0,1,0,0,1,0,0,0,0,1,0,0,0,0,0,0,0,0,
0,0,0,0,1,3,1,1,0,0,0,0,0,1,0,1,0,0,1,0,0,0,0,0,0,1,0,0,1,0,0,1,0,3.609996445,
"Yes",1.5426276284,"MD507S",.,0,2.6990289721,1,1993

0,95.53,0,0,0,.,0,0,0,-0.019860222,3.6123275448,4.0970552329,1.0320663705,
3.3234354316,7.0728674371,2.32784195,2.9664964339,.,0,0,0,.,0,.,.,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,.,.,.,0,.,.,
.,.,.,.,0,"No verts collected",0.9773944956,"MD508S",.,0,0,1,1993

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8. GEOGRAPHIC AND SPATIAL INFORMATION

8.1 Minimum Longitude

-83 Degrees 14 Minutes 39 Seconds West (-83.24444 Decimal Degrees)

8.2 Maximum Longitude

-75 Degrees 7 Minutes 17 Seconds West (-75.12139 Decimal Degrees)

8.3 Minimum Latitude

36 Degrees 33 Minutes 12 Seconds North (36.55350 Decimal Degrees)

8.4 Maximum Latitude

41 Degrees 57 Minutes 21 Seconds North (41.95601 Decimal Degrees)

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 Gopher and WWW

10.7 EMAP CD-ROM Containing the Data

11. REFERENCES

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.

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.

12. TABLE OF ACRONYMS

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