

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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U.S. Fish and Wildlife Service
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 |
| NSESOXX | 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 (km ²) |
| 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 |
| NSESOXX | 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 |
| NSESOXX | 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 |

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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