

US EPA ARCHIVE DOCUMENT

CATALOG DOCUMENTATION  
MAIA-ESTUARIES SUMMARY DATABASE  
1998 STATIONS  
FISH SPECIES COUNT DATA: "FISHSPEC"

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**1. DATASET IDENTIFICATION**

1.1 Title of Catalog document  
MAIA-Estuaries Summary Database  
1998 Stations  
Fish Count Data by Station

1.2 Authors of the Catalog entry  
John Kiddon, U.S. EPA NHEERL-AED  
Harry Buffum, OAO Corp.

1.3 Catalog revision date  
July 30, 2000

1.4 Dataset name  
FISHSPEC

1.5 Task Group  
MAIA Estuaries

1.6 Data Set Identification Code  
013

1.7 Version  
001

**1.8 Request for Acknowledgment**

EMAP requests that all individuals who download EMAP data acknowledge the source of these data in any reports, papers, or presentations. If you publish these data, please include a statement similar to: "Some or all of the data described in this article were produced by the U. S. Environmental Protection Agency through its Environmental Monitoring and Assessment Program (EMAP)".

## 2. INVESTIGATOR INFORMATION (for full addresses see Section 13)

### 2.1 Principal Investigators

John Paul, U.S. Environmental Protection Agency, NHEERL-Atlantic Ecology Division (AED)  
Charles Strobel, U.S. Environmental Protection Agency, NHEERL-Atlantic Ecology Division (AED)

### 2.2 Sample Collection Investigators

Charles Strobel, U.S. Environmental Protection Agency, NHEERL-Atlantic Ecology Division (AED)  
Carl Zimmerman, National Park Service (NPS)

### 2.3 Sample Processing Investigators

Not applicable

## 3. DATASET ABSTRACT

### 3.1 Abstract of the Dataset

The FISHSPEC data file contains the following information for each fish species collected in standard trawl: event and trawl identifiers, a species taxonomic code, and the number of individuals and average fork length of each species caught per standard trawl. There is one record for each species caught per standard trawl at a station.

### 3.2 Keywords for the Data Set

Species abundance, average fork length (mm) per species

## 4. OBJECTIVES AND INTRODUCTION

### 4.1 Program Objective

The main objectives of the MAIA-Estuarines program are: (1) to evaluate the ecological condition of the Mid-Atlantic estuaries by measuring key properties of the water, sediment, and the community of organisms; (2) to focus attention on small estuaries in order to develop better monitoring approaches for these critical systems; and (3) to develop partnerships among federal and state environmental organizations.

The Environmental Monitoring and Assessment Program (EMAP) is an EPA research and monitoring program designed to provide unbiased assessments of the condition of selected resources over a wide region. A key feature of the program is a probabilistic sampling strategy that randomly selects sampling sites and assigns weighting factors based on area to all measured results. EMAP's strategy was adopted by the Mid-Atlantic Integrated Assessment (MAIA) program, which was designed to assess the conditions of the estuaries, forests, streams and lakes, and agricultural lands in the eight-state Mid-Atlantic region. This file contains data measured in MAIA estuaries during the summer of 1998. Samples were collected for water and sediment analyses primarily in 1997, with a few additional sites sampled in 1998. Fish samples were collected only in 1998. Several estuaries were designated as intensive sites and were sampled in greater detail (see STATIONS file).

The partners in MAIA-Estuarines program are: (1) The U.S. Environmental Protection Agency (USEPA), including both the Atlantic Ecology Division (AED) and the Gulf Ecology Division (GED); (2) National Park Service (NPS) under their project "Maryland Coastal Bays Monitoring"; (3) National Oceanographic and Atmospheric Administration (NOAA) which conducted sampling both in the Delaware Bay (DB) under their "National Status and Trends Program" and in the Carolinian Province (CP); and (4) The Chesapeake Bay Program (CBP), which is a consortium of federal, state, and local governments and nongovernmental organizations. Each partner was responsible for collecting, processing, and reviewing data. The USEPA Atlantic Ecology Division was responsible for final

assembly and review of all data. Laboratories contracted to process samples are specified by the parameter LABCODE included in all data files (Section 4.4). Details regarding use of partner and LABCODE information are presented in the EVENTS metadata file.

#### 4.2 Data Set Objective

The objective of the FISHSPEC file is to report the abundance and average fork length of all species collected in standard trawls conducted in the 1998 MAIA sampling season.

#### 4.3 Background Discussion

The MAIA program conducted regular fish surveys during the summer of 1998 to characterize the structure and health of the fish communities. The stations sampled were selected according to the probabilistic design described in Section 4.1. These stations were not identical with the stations sampled for water and sediment quality analyses conducted primarily in 1997; therefore, it is not possible to directly compare these different analyses station by station. However, it is statistically valid to compare results among *classes* of estuaries, e.g., large versus small estuaries, Delaware Estuary versus Chesapeake Estuary, etc.

The information collected in the fish surveys are reported in five data files. FTRAWL includes the number of unique species and the number of fish per standard trawl. FISHSPEC contains the number of fish per species and their average fork length per standard trawl. FISHPATH specifies the frequency and location of pathologies observed in a ship-board inspection, and FSH\_SPLN lists the percent macrophage aggregates observed in a histopathology examination. TISSCHEM reports the concentrations of over 100 chemical analytes measured in composites samples of summer flounder or blue crabs collected at a station. The lookup table FTAXON lists the common and scientific names of all fish identified in the MAIA program. Standard trawls of uniform speed and duration were employed when conducting the fish surveys characterizing the community structure at a site. Additional nonstandard trawls were performed to catch fish for chemical or pathology analyses if sufficient numbers of fish were not available from the standard trawl. Fish from the auxiliary trawls were not included in the standardized counts used to describe community structure.

The structure and health of fish communities are important indicators of the overall ecological condition of an estuary. Ecologists describe the community structure of an estuary by reporting the identity and abundance of fish collected in a standard trawl at a site. Ecologists look for unusually rapid changes in community structure, e.g., a diminished presence of sensitive species or an overabundance of opportunistic species, or larger than average incidence of pathologies such as lesions or ulcers in fish.

#### 4.4 Summary of Data Set Parameters

|           |                                                                         |
|-----------|-------------------------------------------------------------------------|
| *STATION  | Station identifier                                                      |
| *EVNTDATE | Date of sampling event                                                  |
| *FTRAWLID | Trawl identifier                                                        |
| *TAX_CODE | Taxonomic code                                                          |
| TAX_CNT   | Number of individual fish of indicated species per trawl                |
| AVG_LEN   | Average fork length (mm) of a representative number of fish per species |
| YEAR      | Year of sampling                                                        |

\* denotes parameters that should be used as key fields when merging data files

### 5. DATA ACQUISITION AND PROCESSING METHODS

#### 5.1 Data Acquisition / Field Sampling

The sample collection methods used by USEPA field crews are described here. Significant variations by other MAIA partners are noted in Section 5.1.12. Details regarding MAIA partners are reported in the EVENTS data file.

#### 5.1.1 Sampling Objective

To collect a representative sample of fish at a station using a standard trawl. Additional nonstandard trawls were conducted when necessary to collect enough fish for histopathology analyses.

#### 5.1.2 Sample Collection and Ship-Board Processing: Methods Summary

The fish trawl was conducted using a funnel-shaped net that filters fish from the near bottom waters. Fish were herded into the net by ground wire and an overhanging panel. Standard trawls were  $10 \pm 2$  minutes in duration with a towing speed of 2-3 knots through the water against the prevailing current (1-3 knots relative to the bottom). An auxiliary, nonstandard trawl was performed to collect fish of four target species if an insufficient quantity were obtained in the standard trawl. The target species were spot (*Leiostomus xanthurus*), white perch (*Morone americana*), summer flounder (*Paralichthys dentatus*), and weakfish (*Cynoscion regalis*). Fish from the auxiliary trawls were used for pathology analyses only, and were not included in the standardized survey counts used to characterize the fish community structure.

All fish in the standard trawls were identified and counted on board ship immediately following the trawl. The scientific and common names used in the identification are contained in the FTAXON file. Fork lengths (mm) were measured on the first 30 individuals of each species or on all fish of a species if fewer than 30 individuals were collected. These measurements were used to calculate the average length of a species, and the measured fish were saved for further inspection and possible archival (see Section 5.1.2 in the FISHPATH file). Unmeasured fish were discarded. The number of fish per species and their average fork lengths are reported in this file. Further processing of the fish was conducted as is described in other fish files.

#### 5.1.3 Beginning Sampling Date

13 July 1998

#### 5.1.4 Ending Sampling Date

14 October 1998

#### 5.1.5 Sampling Platform

All program partners collected samples from various gasoline or diesel powered boats, 25 to 27 feet in length.

#### 5.1.6 Sampling Equipment

The trawl net is a funnel-shaped high-rise sampling trawl. The net includes a 16 meter tow line, a chain sweep, 5 cm mesh wings, and a 2.5 cm cod end.

#### 5.1.7 Manufacturer of Sampling Equipment

Not applicable

#### 5.1.8 Key Variables

Species identification information, abundance, mean length

#### 5.1.9 Sample Collection: Calibration

The sampling gear does not require calibration.

#### 5.1.10 Sample Collection: Quality Control

A trawl was considered void if one or more of the following conditions occurred:

1. Trawl could not be completed because of boat malfunction, vessel traffic, or major disruption of gear (trawls aborted after a minimum of 8 minutes were acceptable if the net was retrieved in a standard manner)
2. Boat speed exceeded the prescribed range
3. The cod-end became untied

4. The trawl continued for more than 12 minutes or less than 8 minutes
5. The net was filled with mud or debris
6. A portion of the catch was lost prior to processing
7. The tow wire, bridle, head rope, foot rope, or up and down lines became separated
8. The net was torn in a way that significantly altered the efficiency of the net

If a successful trawl could not be performed within 1½ hours, the site was considered unsampleable. Quality assurance audits were performed to verify the identification and measurement techniques of the field crew. Sample and composite identification numbers were verified during field QA audits. The receiving laboratory verified frozen field samples received against packing invoice, and the samples were stored in a freezer at -20 degrees C until analyzed.

#### 5.1.11 Sample Collection: References

Strobel, C.J. 1998. Environmental Monitoring and Assessment Program - Mid-Atlantic Integrated Assessment. Estuaries Component, Field Operations and Safety Manual. USEPA, Office of Research and Development, NHEERL-AED, Narragansett, RI. July 1998.

#### 5.1.12 Sample Collection: Alternate Methods

Not applicable

### 5.2 Data Preparation and Sample Processing

All parameters reported in this file were measured aboard ship immediately following the trawl (see Section 5.1).

#### 5.2.1 Sample Processing Objective

Not applicable

#### 5.2.2 Sample Processing: Methods Summary

Not applicable

#### 5.2.3 Sample Processing: Calibration

Not applicable

#### 5.2.4 Sample Processing: Quality Control

Not applicable

#### 5.2.5 Sample Processing: References

Not applicable

#### 5.2.6 Sample Processing: Alternate Methods

Not applicable

## 6. DATA ANALYSIS AND MANIPULATIONS

### 6.1 Name of New or Modified Values

Not applicable

### 6.2 Data Manipulation Description

Not applicable

## 7. DATA DESCRIPTION

### 7.1 Description of Parameters

#### 7.1.1 Components of the Data Set

| PARAMETER | TYPE | LENGTH | LABEL                                                    |
|-----------|------|--------|----------------------------------------------------------|
| STATION   | Char | 10     | Station name                                             |
| EVNTDATE  | Num  | 8      | Event date                                               |
| FTRAWLID  | Char | 5      | Trawl Identifier                                         |
| TAX_CODE  | Num  | 8      | Taxonomic code                                           |
| TAX_CNT   | Num  | 8      | Number of individual fish of indicated species per trawl |
| AVG_LEN   | Num  | 8      | Average fork length (mm) of indicated species.           |
| YEAR      | Char | 4      | Year of sampling                                         |

#### 7.1.2 Precision of Reported Values

As indicated in Sections 7.1.3 and 7.1.4.

#### 7.1.3 Minimum Value in Dataset

|         |    |
|---------|----|
| TAX_CNT | 1  |
| MN_LEN  | 25 |

#### 7.1.4 Maximum Value in Dataset

|         |     |
|---------|-----|
| TAX_CNT | 619 |
| MN_LEN  | 860 |

### 7.2 Data Record Example

#### 7.2.1 Column Names for Example Records

STATION EVNTDATE FTRAWLID TAX\_CODE TAX\_CNT AVG\_LEN YEAR

#### 7.2.2 Example Data Records

| STATION   | EVNTDATE | FTRAWLID | TAX_CODE | TAX_CNT | AVG_LEN | YEAR |
|-----------|----------|----------|----------|---------|---------|------|
| MA98-0056 | 8/11/98  | 5265300  | GYMNMICA | 1       | 300     | 1998 |
| MA98-0073 | 08/22/98 | 5257300  | MOROSAXA | 2       | 109     | 1998 |
| MA98-0231 | 8/10/98  | 5264300  | SYMPPLAG | 1       | 109     | 1998 |
| MA98-0437 | 9/5/98   | 5251300  | CYNOREGA | 1       | 108     | 1998 |

## 8. GEOGRAPHIC AND SPATIAL INFORMATION

### 8.1 Minimum Longitude (Westernmost)

-77.4339 decimal degrees

### 8.2 Maximum Longitude (Easternmost)

-74.7230 decimal degrees

### 8.3 Minimum Latitude (Southernmost)

34.8702 decimal degrees

### 8.4 Maximum Latitude (Northernmost)

40.1470 decimal degrees

#### 8.5 Name of Region

MAIA estuary region, consisting of Delaware Bay, Chesapeake Bay, the Delmarva coastal bays, Albemarle-Pamlico Sound, and contiguous estuaries.

### 9. QUALITY CONTROL AND QUALITY ASSURANCE

#### 9.1 Measurement Quality Objectives

Measurement quality objectives are outlined in the EMAP VA Province Quality Assurance Project Plans (Valente et al., 1990, Valente and Schoenherr, 1991, Valente et al., 1992, Valente and Strobel, 1993). Accuracy and completeness goals are:

|                      |                   |                       |
|----------------------|-------------------|-----------------------|
| Counting             | 90% accuracy goal | 90% completeness goal |
| Taxon Identification | 90% accuracy goal | 90% completeness goal |

#### 9.2 Data Quality Assurance Procedures

One record for each standard and nonstandard trawl performed at each station is kept. Inspection of the sampling gear for tears or improper assemblage is done at the beginning of every trawl event.

### 10. DATA ACCESS

#### 10.1 Data Access Procedures

Data can be downloaded from the web

#### 10.2 Data Access Restrictions

None

#### 10.3 Data Access Contact Persons

John Paul, Principal Investigator  
U.S. EPA NHEERL-AED  
401-782-3037, 401-782-3099 (FAX), paul.john@epa.gov

Harry Buffum, Data Manager/ MAIA-Estuaries  
U.S. EPA NHEERL-AED  
401-782-3183, 401-782-3030 (FAX), buffum.harry@epa.gov

#### 10.4 Dataset Format

ASCII (CSV) and SAS Export files

#### 10.5 Information Concerning Anonymous FTP

Not available

#### 10.6 Information Concerning WWW

See Section 10.1 for WWW access

#### 10.7 EMAP CD-ROM Containing the Dataset

Data not available on CD-ROM

### 11. REFERENCES

Holland, A.F., ed. 1990. Near Coastal Program Plan for 1990: Estuaries. EPA 600/4-90/033. U.S. EPA, Office of Research and Development, NHEERL-AED, Narragansett, RI. November 1990.

Kokkinakis, S.A., Hyland, J.L., and Robertson, A. 1994. Carolinian Demonstration Project - 1994 Field Operations Manual. Joint National Status and Trends/Environmental Monitoring and Assessment Program. NOAA/NOS/ORCA, Silver Spring, MD.

Strobel, C.J. 1998. Environmental Monitoring and Assessment Program - Mid-Atlantic Integrated Assessment. Estuaries Component, Field Operations and Safety Manual. U.S. EPA, Office of Research and Development, NHEERL-AED, Narragansett, RI. Forthcoming.

Strobel, C.J. 1998. Mid Atlantic Integrated Assessment / Environmental Monitoring and Assessment Program - Estuaries: Virginian Province Quality Assurance Project Plan. U.S. EPA, Office of Research and Development, NHEERL-AED, Narragansett, RI. June 1998.

## 12. TABLE OF ACRONYMS

|                |                                                               |
|----------------|---------------------------------------------------------------|
| AED            | Atlantic Ecology Division                                     |
| EMAP           | Environmental Monitoring and Assessment Program               |
| EPA            | U.S. Environmental Protection Agency                          |
| RTP            | Research Triangle Park, NC                                    |
| FTP            | File Transfer Protocol                                        |
| GED            | Gulf Ecology Division                                         |
| m <sup>2</sup> | Square meters                                                 |
| NHEERL         | National Health and Environmental Effects Research Laboratory |
| NOAA           | National Oceanic and Atmospheric Administration               |
| ORD            | Office of Research and Development                            |
| QA/QC          | Quality Assurance/Quality Control                             |
| WWW            | World Wide Web                                                |

## 13. PERSONNEL INFORMATION

Harry Buffum, Database Manager, OAO Corp.  
U.S. Environmental Protection Agency, NHEERL-AED  
27 Tarzwell Drive, Narragansett, RI 02882-1197  
401-782-3183, 401-782-3030 (FAX), [buffum.harry@epa.gov](mailto:buffum.harry@epa.gov)

Don Cobb, Chemist  
U.S. Environmental Protection Agency, NHEERL-AED  
27 Tarzwell Drive, Narragansett, RI 02882-1197  
401-782-9616, 401-782-3030 (FAX), [cobb.donald@epa.gov](mailto:cobb.donald@epa.gov)

Steve Hale, EMAP Information Manager  
U.S. Environmental Protection Agency, NHEERL-AED  
27 Tarzwell Drive, Narragansett, RI 02882-1197  
401-782-3048, 401-782-3030 (FAX), [hale.stephen@epa.gov](mailto:hale.stephen@epa.gov)

Melissa M. Hughes, Data Librarian, EMAP-Estuaries  
OAO Corp., U.S. EPA NHEERL-AED  
27 Tarzwell Drive, Narragansett, RI 02882-1197  
401-782-3184, 401-782-3030 (FAX), [hughes.melissa@epa.gov](mailto:hughes.melissa@epa.gov)

John Kiddon, AED Oceanographer  
U.S. Environmental Protection Agency, NHEERL-AED  
27 Tarzwell Drive, Narragansett, RI 02882-1197  
401-782-3044, 401-782-3030 (FAX), [kiddon.john@epa.gov](mailto:kiddon.john@epa.gov)

Joe LiVolsi, AED QA Officer  
U.S. Environmental Protection Agency, NHEERL-AED  
27 Tarzwell Drive, Narragansett, RI 02882-1197  
401-782-3163, 401-782-3030 (FAX), [livolsi.joseph@epa.gov](mailto:livolsi.joseph@epa.gov)

John Macauley, Sample Processing Coordinator  
U.S. Environmental Protection Agency, NHEERL-Gulf Ecology Division (GED)  
One Sabine Island Drive, Gulf Breeze, FL 32561  
850-934-9200, 850-934-9201 (FAX), [macauley.john@epa.gov](mailto:macauley.john@epa.gov)

John Paul, Principal Investigator  
U.S. Environmental Protection Agency, NHEERL-AED  
27 Tarzwell Drive, Narragansett, RI 02882-1197  
401-782-3037, 401-782-3099 (FAX), [paul.john@epa.gov](mailto:paul.john@epa.gov)

Charles J. Strobel, Field Coordinator  
U.S. Environmental Protection Agency, NHEERL-AED  
27 Tarzwell Drive, Narragansett, RI 02882-1197  
401-782-3180, 401-782-3030 (FAX), [strobel.charles@epa.gov](mailto:strobel.charles@epa.gov)

Carl S. Zimmerman, Chief, Division of Resource Management  
Assateague Island National Seashore  
7206 National Seashore Lane, Berlin, MD 21811  
410-641-1443 x213, 410-641-1099 (FAX), [carl\\_zimmerman@nps.gov](mailto:carl_zimmerman@nps.gov)