CATALOG DOCUMENTATION
MAIA-ESTUARIES SUMMARY DATABASE
1998 STATIONS
FISH TISSUE CHEMISTRY: “TISSCHEM”

**TABLE OF CONTENTS**



## 1. DATASET IDENTIFICATION

1.1 Title of Catalog document
MAIA-Estuaries Summary Database
1998 Stations
Fish Tissue Chemistry by Station

1.2 Authors of the Catalog entry
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1.3 Catalog revision date
July 30, 2000

1.4 Dataset name
TISSCHEM

1.5 Task Group
MAIA Estuaries

1.6 Dataset identification code
016

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)

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## 3. DATA SET ABSTRACT

3.1 Abstract of the Data Set
The TISSCHEM data set contains the results of chemical analyses performed on blue crabs (*Callinectes sapidus*) and summer flounder (*Paralichthys dentatus*) collected during the 1998 MAIA field season. Composite samples were prepared from 2 to 10 crabs or fish collected at a station, and chemical analyses were performed separately on the edible tissue (fillets or crab meat) and inedible material (carcasses). Whole-body concentrations of the analytes were then computed as mass-weighted means of the edible and inedible results. Each record also lists the station identifier; organism and tissue type; the number, mean weight, and length of individuals contributing to the composite samples; and the percentages of moisture and lipids in the tissue. Concentrations are reported on a wet-weight basis. There is one record for each analyte measured per tissue type (edible, inedible, and whole-body; crab or flounder) at a station.

3.2 Keywords for the Data Set
Chemical contaminants in tissue, metals, polynuclear aromatic hydrocarbons, PAH, polychlorinated biphenyls, PCB, organochlorine pesticides, DDT

## 4. OBJECTIVES AND INTRODUCTION

4.1 Program Objective
The main objectives of the MAIA-Estuaries 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-Estuaries 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 TISSCHEM file is to report the concentrations of organic and metallic contaminants in the tissue of blue crabs (*Callinectes sapidus*) and summer flounder (*Paralichthys dentatus*) collected during the 1998 MAIA field 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 suite of analytes measured are similar to the metallic and organic contaminants measured by NOAA’s National Status and Trends program. The tissue samples are processed to provide measurements of total concentrations of metals, and measurements of polynuclear aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and organochlorine pesticides. The concentrations are measured separately on composite samples of both edible and inedible tissue, and the concentration in the whole-body is then calculated from those measurements.

The concentration of an analyte is reported in one of four formats in this file (see Table below). **(1)** If the concentration is larger than the method detection level (MDL), the measured value is reported directly in the CONC field. **(2)** If the concentration is smaller than the MDL and is considered to be undetectable, the value is reported as zero in the CONC field and the method detection limit is reported in the MDL field. In these cases, it is clear that the concentration of the analyte is small (approximately zero), although some users may prefer to substitute a finite value for the zero entry, *e.g.*, the MDL value, half the MDL value, *etc*. To facilitate this substitution, these ‘non-detects’ are flagged with a QACODE of CHM-A. **(3)** If the measured concentration is smaller than the MDL, but is clearly detectable (a common occurrence in organic analyses), the best estimate of the concentration is reported in the CONC field, the QACODE is set to CHM-B, and the MDL is listed for

reference. In these cases the user can be confident that the analyte is present, but there is a high degree of uncertainty in the reported concentration. **(4)** Finally, records flagged with CHM-C indicate that the concentration value is highly uncertain because an interference was noted in the blank analysis performed with the sample. Caution is advised in interpreting these results. Note that for the calculated values of whole-body concentrations of an analyte (see Section 6.2), no MDL value is reported for cases where the edible and inedible results had different QACODEs. These cases are highlighted with a QACODE = CHM-D; the user should examine those records individually if estimates of MDLs are needed. To summarize:

| QACODE | INTERPRETATION | CONC reported | MDL reported |
|---|---|---|---|
| <none> | result is detectable and > MDL | as measured | <none> |
| CHM-A | result is < MDL and undetectable | zero | MDL is listed |
| CHM-B | result is < MDL but detectable | best estimate | MDL is listed |
| CHM-C | result may be affected by interference | best estimate | MDL is listed |
| CHM-D | user should decide MDL value | calculated; see Section 6.2 | <none> |

4.4 Summary of Data Set Parameters

| | |
|---|---|
| *STATION | Station identifier |
| *EVNTDATE | Date of sampling event |
| *SAMPLEID | Sample identifier |
| *TAX_CODE | Taxonomic code of organisms analyzed |
| | CALLSAPI *Callinectes sapidus* (blue crab) |
| | PARADENT *Paralichthys dentatus* (summer flounder) |
| TISSUTYP | Tissue type code |
| | CE crab edible |
| | CI crab inedible |
| | CW crab whole-body |
| | FE flounder edible |
| | FI flounder inedible |
| | FW flounder whole-body |
| NUM_HOM | Number of individuals in homogenate |
| MN_WGHT | Mean wet weight of tissue (edible, inedible or whole-body) in the homogenate (g) |
| MN_SIZE | Mean fork length of fish or width of crabs included in the homogenate (mm) |
| PCTMOIST | Percent moisture of tissue (edible, inedible or whole-body) in the homogenate |
| PCTLIPID | Percent lipid of tissue (edible, inedible or whole-body) in the homogenate |
| ANALYTE | Code for analyte measured |
| CONC | Concentration of analyte in sample |
| CHMUNITS | Concentration units of measure |
| MDL | Method detection limit |
| QACODE | QA code (see Section 4.3) |
| LABCODE | Code for processing laboratory |
| 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 EPA-ORD field crews (PARTNER=AED and GED) will be described here. Any significant variations by other MAIA partners are noted in Section 5.1.12.

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 ± 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 chemical or pathology analyses only, and were not included in the standardized survey counts used to characterize the fish community structure.

The data reported in the TISSCHEM file pertain to summer flounder and collected in both standard and nonstandard trawls. All fish in the standard trawls were identified and counted on board ship immediately following the trawl. Fork lengths were measured on the first 30 individuals of each species or on all fish if fewer than 30 individuals of a species were collected. At the same time, a visual inspection for obvious signs of pathology was conducted on all fish measured for length. If insufficient numbers of the target species were collected in the standard trawl, an auxiliary trawl was performed and fish of the target species were measured and inspected. The spleens of the target fish were processed as described in FSH_SPLN. All blue crabs (*Callinectes sapidus*) and summer flounder (*Paralichthys dentatus*) collected in the trawls were further processed as follows. The carapace widths of the crabs and flounder lengths were measured to the nearest mm. The crabs and flounder were tagged and frozen individually, then combined into groups of 2-10 crabs or fish for later processing into composite samples. Each group was assigned a composite ID number (SAMPLEID) and sent to the analytical lab for chemical analysis.

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

Not applicable

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

The processing methods used by USEPA contracts will be described here (LABCODE = CHM-1). Any significant variations by other MAIA partners are noted in Section 5.2.6.

5.2.1 Sample Processing Objective

Measure the concentration of chemical contaminants (total metals, PAHs, PCBs, and pesticides) in composite samples of edible and inedible tissue from blue crab and summer flounder.

5.2.2 Sample Processing: Methods Summary

Frozen specimens of blue crab (*Callinectes sapidus*) and summer flounder (*Paralichthys dentatus*) were received at the analytical laboratory, each individually identified. The organisms had been grouped on board ship into separate packages of 2 -10 crabs or fish, with each group identified by a composite identifier (SAMPLEID). All organisms sharing a common SAMPLEID were divided into edible tissue (flounder fillet or crab meat) and the remaining inedible carcass. The tissues were then separately homogenized and distributed for chemical analysis. One hundred tissue samples were analyzed for PAHs by GC/MS-SIM, and pesticides and PCBs by GC/ECD at B&B Laboratories in College Station, Texas. One hundred samples were analyzed for metals and mercury at Skidway Institute of Oceanography in Savannah, Georgia. Results are reported on a wet-weight basis.

5.2.3 Sample Processing Method: Calibration

The analytical instruments were calibrated by standard laboratory procedures including: constructing calibration curves, running blank and spiked quality control samples, and analyzing standard reference materials.

5.2.4 Sample Processing: Quality Control

Each batch of samples was accompanied by QC analyses consisting of method blanks, matrix spikes, matrix spike duplicates, and standard reference materials (SRMs). In total, approximately 5% of all analyses were QC analyses. Processing quality was considered acceptable if the following criteria were met: blanks were less than three times the minimum detection limit; accuracy, as determined by analysis of certified reference materials, was within 30% for organic analytes and within 15% for inorganic analytes; and precision, as determined by replicate analyses, was within 30% for organic analytes and within 15% for inorganic analytes. Additional specifications and guidelines are presented in Valente and Strobel (1993).

5.2.5 Sample Processing: References

U.S. EPA. 1995. Environmental Monitoring and assessment Program (EMAP): Laboratory Methods Manual-Estuaries, Volume 1: Biological and Physical Analyses. U.S. Environmental Protection Agency, Office of Research and Development, Narragansett, RI. EPA/620/R-95/008.

5.2.6 Sample Processing: Alternate Methods

Not applicable

## 6. DATA ANALYSIS AND MANIPULATIONS

6.1 Name of New or Modified Values

The parameters were calculated rather then measured for whole-body tissues (see Section 6.2). Records associated with whole-body results are designated by codes FW or CW in the parameter TISSUTYP.

6.2 Data Manipulation Description

The "whole-body" values are calculated as mass-weighted means of the edible and inedible results. The weighting factors are calculated as: F(edible) = edible_weight / total_weight and F(inedible = inedible_weight / total_weight. Total_weight is the sum of the edible and inedible weights reported in the parameter MN_WGHT. The weighted mean of a parameter (P) in the whole body is then calculated as: P(whole) = P(edible)*F(edible) + P(inedible)*F(inedible). Whole-body results were calculated for three parameters: CONC, PCTMOIST, and PCTLIPID. Method detection limits (MDLs) were reported as described in Section 4.3.

Three parameters are calculated as summations of other measured values. TOTCHL total chlorodane is calculated as the sum of heptachlor, heptachlor-epoxide, ocychlorodane, alpha-chlorodane, gamma-chlorodane, trans-nonachlor, and cis-nonachlor. TOTDDT is calculated as the sum of all six DDD, DDE or DDT parameters. TOTPAH is the sum of all PAH parameters. Note that TOTPCB is a measured value rather than the sum of other measured values.

## 7. DATA DESCRIPTION

7.1 Description of Parameters

7.1.1 Components of the Data Set (see Section 7.1.3 for a complete list of analytes)

| Variable | Type | Length | Label |
|---|---|---|---|
| STATION | Char | 10 | Station name |
| EVNTDATE | Num | 8 | Date of sampling |
| SAMPLEID | Num | 8 | Sample identifier |
| TAX_CODE | Char | 8 | Taxonomic code |
| TISSUTYP | Char | 4 | Tissue type code |
| NUM_HOM | Num | 8 | Number of individuals in homogenate |
| MN_WGHT | Num | 8 | Mean weight of animals in homogenate |
| MN_SIZE | Num | 8 | Mean animal length/width in homogenate |
| PCTMOIST | Num | 8 | Percent moisture of tissue |
| PCTLIPID | Num | 8 | Percent lipid content of tissue |
| ANALYTE | Char | 8 | Code for analyte measured |
| CONC | Num | 8 | Concentration of analyte in sample |
| CHMUNITS | Char | 6 | Concentration units of measure |
| MDL | Num | 8 | Method detection limit |
| QACODE | Char | 5 | QA code |

| | | | |
|---|---|---|---|
| LABCODE | Char | 5 | Code for processing laboratory |
| YEAR | Num | 8 | Year of sampling |

7.1.2 Precision of Measured Values

The precision of the measured values are as listed in this section. The calculated values (see Section 6.2) are generally reported with an order of magnitude higher precision than the measured data. Due to formatting restrictions, all values in the database are reported to three decimal places regardless of the actual precision. All values have been rounded to no more than three significant digits.

| | | |
|---|---|---|
| Metals | from 0.001 to 0.1 ug/g, as indicated in Section 7.1.3 | |
| PAHs | 0.01 | ng/g |
| PCBs | 0.01 | ng/g |
| Pesticides | 0.01 | ng/g |

7.1.3 Minimum Value in Dataset

| ANALYTE | NAME | MIN | MAX | UNITS |
|---|---|---|---|---|
| Total metals | | | | |
| AG | Silver | 0.001 | 0.71 | ug/g |
| AL | Aluminum | 0.2 | 160 | ug/g |
| AS | Arsenic | 0.38 | 5.47 | ug/g |
| CD | Cadmium | 0.001 | 1.68 | ug/g |
| CR | Chromium | 0.02 | 1.68 | ug/g |
| CU | Copper | 0.06 | 44.9 | ug/g |
| FE | Iron | 0.5 | 1700 | ug/g |
| HG | Mercury | 0.005 | 0.10 | ug/g |
| MN | Manganese | 0.02 | 82.0 | ug/g |
| NI | Nickel | 0.01 | 12.8 | ug/g |
| PB | Lead | 0.001 | 0.34 | ug/g |
| SB | Antimony | 0.001 | 0.030 | ug/g |
| SE | Selenium | 0.34 | 1.89 | ug/g |
| SN | Tin | 0.001 | 6.24 | ug/g |
| TL | Thallium | 0.001 | 0.004 | ug/g |
| ZN | Zinc | 2.8 | 56.7 | ug/g |
| Polynuclear aromatic hydrocarbons | | | | |
| ACENTHE | Acenaphthene | 0.02 | 1.6 | ng/g |
| ACENTHY | Acenaphthlylene | 0.04 | 0.8 | ng/g |
| ANTHRA | Anthracene | 0.01 | 1.2 | ng/g |
| BENANTH | Benz(a)anthracene | 0.01 | 0.9 | ng/g |
| BENAPY | Benz(a)pyrene | 0.01 | 2.4 | ng/g |
| BENEPY | Benz(e)pyrene | 0.02 | 1.0 | ng/g |
| BENZOBFL | Benzo(b)fluoranthene | 0.02 | 1.7 | ng/g |
| BENZOKFL | Benzo(k)fluoranthene | 0.02 | 0.7 | ng/g |
| BENZOP | Benzo(g,h,i)perylene | 0.02 | 5.4 | ng/g |
| BIPHENYL | Biphenyl | 0.40 | 2.6 | ng/g |
| C1CHRYS | C1_Chrysene | 0.04 | 2.1 | ng/g |
| C1DIBEN | C1_Dibenzothiophene | 0.10 | 5.5 | ng/g |
| C1FLPY | C1_Fluoranthene/Pyrene | 0.04 | 2.4 | ng/g |
| C1FLUOR | C1_Fluoranthene/Anthracene | 0.10 | 4.3 | ng/g |
| C1NAPH | C1_Napthalene | 1.10 | 13.7 | ng/g |
| C1PHAN | C1_Phenanthrene/Anthracene | 0.20 | 5.5 | ng/g |
| C2CHRYS | C2_Chrysene | 0.10 | 9.1 | ng/g |
| C2DIBEN | C2_Dibenzothiophene | 0.10 | 6.8 | ng/g |

| | | | | |
|---|---|---|---|---|
| C2FLUOR | C2_Fluoranthene/Anthracene | 0.30 | 7.0 | ng/g |
| C2NAPH | C2_Napthalene | 0.50 | 5.1 | ng/g |
| C2PHAN | C2_Phenanthrene/Anthracene | 0.10 | 4.4 | ng/g |
| C3CHRYS | C3_Chrysene | 0.08 | 9.1 | ng/g |
| C3DIBEN | C3_Dibenzothiophene | 0.10 | 6.6 | ng/g |
| C3FLUOR | C3_Fluoranthene/Anthracene | 0.30 | 7.6 | ng/g |
| C3NAPH | C3_Napthalene | 0.40 | 3.4 | ng/g |
| C3PHAN | C3_Phenanthrene/Anthracene | 0.10 | 4.0 | ng/g |
| C4CHRYS | C4_Chrysene | 0.05 | 0.9 | ng/g |
| C4NAPH | C4_Napthalene | 0.30 | 5.1 | ng/g |
| C4PHAN | C4_Phenanthrene/Anthracene | 0.04 | 5.4 | ng/g |
| CHRYSENE | Chrysene | 0.01 | 1.5 | ng/g |
| DIBENZ | Dibenz(a,h)anthracene | 0.01 | 1.5 | ng/g |
| DIMETH | 2,6-dimethylnaphthalene | 0.10 | 1.5 | ng/g |
| FLUORANT | Fluoranthene | 0.08 | 2.3 | ng/g |
| FLUORENE | Fluorene | 0.10 | 1.7 | ng/g |
| INDENO | Indeno (1,2,3-c,d) pyrene | 0.02 | 3.9 | ng/g |
| MENAP1 | 1-methylnaphthalene | 0.40 | 4.9 | ng/g |
| MENAP2 | 2-methylnaphthalene | 0.60 | 8.8 | ng/g |
| MEPHEN1 | 1-methylphenanthrene | 0.02 | 1.4 | ng/g |
| NAPH | Naphthalene | 1.60 | 12.6 | ng/g |
| PERYLENE | Perylene | 0.02 | 2.8 | ng/g |
| PHENANTH | Phenanthrene | 0.20 | 3.1 | ng/g |
| PYRENE | Pyrene | 0.02 | 2.6 | ng/g |
| TRIMETH | 2,3,5-trimethylnaphthalene | 0.10 | 0.7 | ng/g |
| TOTPAH | Total PAH | 11.3 | 73.4 | ng/g |

Polychlorinated biphenyls

| | | | | |
|---|---|---|---|---|
| PCB101 | 2,2',4,5,5'-pentachlorobiphenyl | 0.04 | 8.3 | ng/g |
| PCB105 | 2,3,3',4,4'-pentachlorobiphenyl | 0.02 | 6.5 | ng/g |
| PCB118 | 2,3',4,4',5-pentachlorobiphenyl | 0.10 | 22.6 | ng/g |
| PCB128 | 2,2',3,3',4,4'-hexachlorobiphenyl | 0.01 | 4.3 | ng/g |
| PCB138 | 2,2',3,4,4',5'-hexachlorobiphenyl | 0.20 | 48.0 | ng/g |
| PCB153 | 2,2',4,4',5,5'-hexachlorobiphenyl | 0.10 | 40.5 | ng/g |
| PCB170 | 2,2',3,3',4,4',5-heptachlorobiphenyl | 0.10 | 16.4 | ng/g |
| PCB18 | 2,2',5-trichlorobiphenyl | 0.02 | 0.9 | ng/g |
| PCB180 | 2,2',3,4,4',5,5'-heptachlorobiphenyl | 0.10 | 69.4 | ng/g |
| PCB187 | 2,2',3,4',5,5',6-heptachlorobiphenyl | 0.03 | 19.2 | ng/g |
| PCB195 | 2,2',3,3',4,4',5,6-octachlorobiphenyl | 0.01 | 16.2 | ng/g |
| PCB201 | 2,2',3,3',4,5',6,6'-octachlorobiphenyl | 0.01 | 2.4 | ng/g |
| PCB206 | 2,2',3,3',4,4',5,5',6-nonachlorobiphenyl | 0.01 | 29.2 | ng/g |
| PCB209 | decachlorobiphenyl | 0.01 | 32.8 | ng/g |
| PCB28 | 2,4,4'-trichlorobiphenyl | 0.01 | 2.4 | ng/g |
| PCB29 | 2,4,5-trichlorobiphenyl | 0.002 | 0.8 | ng/g |
| PCB44 | 2,2',3,5'-tetrachlorobiphenyl | 0.01 | 1.4 | ng/g |
| PCB52 | 2,2',5,5'-tetrachlorobiphenyl | 0.04 | 2.0 | ng/g |
| PCB66 | 2,3',4,4'-tetrachlorobiphenyl | 0.03 | 6.5 | ng/g |
| PCB8 | 2,4'-dichlorobiphenyl | 0.10 | 0.2 | ng/g |
| PCB87 | 2,2',3,4,5',-pentachlorobiphenyl | 0.010 | 1.4 | ng/g |
| TOTPCB | Total PCB | 5.3 | 611 | ng/g |

Pesticides

| | | | | |
|---|---|---|---|---|
| ABHC | alpha-Hexachlorohexane | 0.10 | 1.70 | ng/g |
| ALDRIN | Aldrin | 0.002 | 0.90 | ng/g |
| BBHC | beta-Hexachlorohexane | 0.04 | 0.50 | ng/g |

| | | | | |
|---|---|---|---|---|
| CHLPYRIF | Chlorpyrifos | 0.01 | 0.80 | ng/g |
| CISCHL | alpha-Chlordane | 0.01 | 2.30 | ng/g |
| CNONCHL | Cis-Nonachlor | 0.01 | 4.00 | ng/g |
| DBHC | delta-Hexachlorohexane | 0.004 | 0.80 | ng/g |
| DIBEN | Dibenzothiophene | 0.02 | 1.40 | ng/g |
| DIELDRIN | Dieldrin | 0.05 | 10.2 | ng/g |
| ENDOSUI | Endosulfan I | 0.00 | 0.00 | ng/g |
| ENDOSUII | Endosulfan II | 0.03 | 1.29 | ng/g |
| ENDRIN | Endrin | 0.001 | 0.60 | ng/g |
| G_CHLOR | Gamma-Chlordane | 0.01 | 1.80 | ng/g |
| HEPTACHL | Heptachlor | 0.01 | 0.70 | ng/g |
| HEPTAEPO | Heptachlor epoxide | 0.04 | 15.9 | ng/g |
| HEXACHL | Hexachlorobenzene | 0.03 | 1.70 | ng/g |
| LINDANE | Lindane (gamma-BHC) | 0.02 | 3.40 | ng/g |
| MIREX | Mirex | 0.01 | 0.70 | ng/g |
| OPDDD | 2,4'-DDD | 0.03 | 8.40 | ng/g |
| OPDDE | 2,4'-DDE | 0.01 | 1.60 | ng/g |
| OPDDT | 2,4'-DDT | 0.01 | 2.90 | ng/g |
| OXYCHL | Oxychlordane | 0.04 | 11.0 | ng/g |
| PPDDD | 4,4'-DDD | 0.10 | 71.6 | ng/g |
| PPDDE | 4,4'-DDE | 0.10 | 157 | ng/g |
| PPDDT | 4,4'-DDT | 0.004 | 2.40 | ng/g |
| TNONCHL | Trans-Nonachlor | 0.03 | 7.70 | ng/g |
| TOTCHL | Total Chlorodane | 0.20 | 30.1 | ng/g |
| TOTDDT | Total DDT | 0.30 | 243 | ng/g |
| | | | | |
| NUM_HOM | Number individuals in homogenate | 2 | 10 | |
| MN_WGHT | Mean weight | 7.46 | 884 | g |
| MN_SIZE | Mean length or width | 112 | 441 | mm |
| PCTMOIST | Percent moisture | 68 | 94 | % |
| PCTLIPID | Percent lipid | 0.10 | 7.30 | % |

7.1.4 Maximum Value in Dataset
See Section 7.1.3

7.2 Data Record Example

7.2.1 Column Names for Example Records

STATION EVNTDATE SAMPLEID TAX_CODE TISSUTYP NUM_HOM MN_WGHT MN_SIZE

PCTMOIST PCTLIPID ANALYTE CONC CHMUNITS MDL QACODE LABCODE YEAR

7.2.2 Example Data Records

| STATION | EVNTDATE | SAMPLEID | TAX_CODE | TISSUTYP | NUM_HOM | MN_WGHT | MN_SIZE |
|---|---|---|---|---|---|---|---|
| MA98-0002 | 10/8/98 | 5244100 | PARADENT | FW | 3 | 393 | 335 |
| MA98-0002 | 10/8/98 | 5244100 | PARADENT | FE | 3 | 70.1 | 335 |
| MA98-0002 | 10/8/98 | 5244100 | PARADENT | FI | 3 | 323 | 335 |
| MA98-0003 | 10/6/98 | 5130120 | CALLSAPI | CW | 6 | 40.9 | 132 |
| MA98-0003 | 10/6/98 | 5130120 | CALLSAPI | CE | 6 | 24.2 | 132 |
| MA98-0003 | 10/6/98 | 5130120 | CALLSAPI | CI | 6 | 16.7 | 132 |

| PCTMOIST | PCTLIPID | ANALYTE | CONC | CHMUNITS | MDL | QACODE | LABCODE | YEAR |
|---|---|---|---|---|---|---|---|---|
| 87 | 0.51 | NI | . | ug/g | 0.013 | CHM-A | TIS-1 | 1998 |
| 78 | 0.10 | NI | . | ug/g | 0.013 | CHM-A | TIS-1 | 1998 |
| 89 | 0.60 | NI | . | ug/g | 0.013 | CHM-A | TIS-1 | 1998 |
| 82 | 1.16 | TRIMETH | 0.20 | ng/g | 0.40 | CHM-B | TIS-1 | 1998 |
| 82 | 0.43 | TRIMETH | 0.20 | ng/g | 0.40 | CHM-B | TIS-1 | 1998 |
| 82 | 2.21 | TRIMETH | 0.20 | ng/g | 0.40 | CHM-B | TIS-1 | 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 Provonce 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
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10.4 Dataset Format
ASCII (CSV) and SAS Export files

10.5 Information Concerning Anonymous FTP
Not available

10.6 Information Concerning WWW
No gopher access, see Section 10.1 for WWW access

10.7 EMAP CD-ROM Containing the Dataset
Data not available on CD-ROM

## 11. REFERENCES

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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 |
| m2 | 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

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