CATALOG DOCUMENTATION
EMAP-ESTUARIES PROVINCE LEVEL DATABASE
CAROLINIAN PROVINCE 1995
TISSUE CHEMISTRY DATA

TABLE OF CONTENTS

1. DATA SET IDENTIFICATION

1.1 Title of Catalog Document

EMAP-Estuaries Province Level Database
Carolinian Province
Tissue Chemistry Data

1.2 Authors of the Catalog entry

Timothy R. Snoots,
Dr. Jeffrey L. Hyland

1.3 Catalog Revision Date

April 6, 1998

1.4 Data Set Name

CP_TSU_D.DAT

1.5 Task Group

Estuaries

1.6 Data set identification codes

18

1.7 Version

001

1.8 Requested Acknowledgment

If you plan to publish these data in any way, 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-Estuaries 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 Investigator

J. Hyland (NOAA/NOS/NCCOS/CCMA) - Carolinian Province Manager
A. Ringwood (SCDNR) - Lead P.I. for SC/GA region team
C. Hackney (UNC-W) - Lead P.I. for NC region team
G. McRae, G. Nelson, J. McKenna, J. Landsberg (FLDEP) - Lead P.I.s for FL region team (depending on year)

2.2 Investigation Participant - Sample Collection

Field Sample Collection

T. Alphin, S. Bowen, C. Byrum, D. Dye, A. Gospodarek, J. Grace, J. Grimley, C. Hackney, C. Powell, C. Preziosi, H. Riley, S. Roberts, M. Smith, K. Stokesbury, D. Tremain, T. Wheeler (UNC-W); S. Ross (NCNERR); M. Armstrong-Taylor, J. Jones, M. Levinson, P. Powers, A. Ringwood, T. Snoots, G. Steele (SCDNR); L. Balthis, T. Herrlinger, C. Keppler, M. Wert (UC); D. Adams, K. Amendola, D. Cook, C. Harnden, B. Heagey, J. Mckenna, G. Nelson, C. Nowicki, R. Paperno, B. Rosenblatt, M. Wessel (FLDEP); J. Hyland, S. Kokkinakis (NOAA/NOS/ORCA)

Field Training and Coordination

S. Kokkinakis (NOAA/NOS/ORCA); J. Macauley (EPA-GED); T. Heitmuller (USGS-GB); D. Keith (EPA-AED)

2.3 Sampling Processing - Principal Investigator

Program Management and Coordination

J. Hyland, A. Robertson (NOAA/NOS/NCCOS/CCMA); K. Summers (EPA);
F. Holland, A. Ringwood (SCDNR); C. Hackney,
T. Wheeler (UNC-W); S. Ross (NCNERR);
J. Landsberg, J. McKenna, G. McRae, G. Nelson,
R. Paperno (FLDEP)

Contaminant Analyses

P. Boothe, J. Brooks, G. Denoux, B. Presley,
T. Wade (TAMU/GERG)

QA/QC

T. Heitmuller (USGS-GB), S. Kokkinakis (NOAA/NOS/ORCA)

Data Management and Statistical Support

T. Snoots, F. Holland, R. VanDolah (SCDNR); L. Balthis,
T. Herrlinger (UC); J. Rosen, L. Zimmerman (TPMC);
S. Rathbun (UGA); M. Adams, L. Harwell (JCWS);
V. Engle (EPA-GED); Z. Malaeb (USGS-GB);
S. Hale (EPA-AED); K. Summers (EPA); T. Wilson (CU)

3. DATA SET ABSTRACT

3.1 Abstract of the Data set

The CP_TSU_D.DAT data set reports a suite of chemical contaminant concentrations measured in the edible tissues of four commercially and recreationally important species [white shrimp (Penaeus setiferus) , blue crab (Callinectes sapidus), Atlantic croaker (Micropogonias undulatus), and spot (Leiostomus xanthurus)]. The samples were collected in demersal trawls at selected degraded and undegraded sites (a subset of 13 base stations and one supplemental site in Shipyard Creek, SC) in the Carolinian Province in 1995.

A minimum of three specimens of each species was combined into a single composite sample for each station. Wherever possible, animals of similar harvestable sizes were used to generate the sample composites. The edible parts used to form the composites consisted of fish fillets, shrimp tails, and the body-cavity meat of crabs.

A total of 15 inorganic metals, 4 butyltins, 44 polynuclear aromatic hydrocarbons (PAHs), 18 polychlorinated biphenyls (PCBs), and 24 pesticides were measured in each of the crustacean samples. The same analytes, with the exception of PAHs, were measured in the fish samples (note that fish are known to metabolize PAHs).

The CP_CHM_A.DAT data set reports full descriptive analyte names for each of the ANAL codes used to represent analytes in the

CP_TSU_D.DAT data set.

The following reports are products of these and other data collected during the 1995 Sampling period in the Carolinian Province. These reports may contain additional information and summary statistics that are not contained in this data set catalog or its respective data sets. We therefore recommend referring to them when using these data.

Hyland, J.L., L. Balthis, C.T. Hackney, G. McRae, A.H. Ringwood, T.R. Snoots, R.F. Van Dolah, and T.L. Wade. 1998. Environmental quality of estuaries of the Carolinian Province: 1995. Annual statistical summary for the 1995 EMAP-Estuaries Demonstration Project in the Carolinian Province. NOAA Technical Memorandum NOS ORCA 123 NOAA/NOS, Office of Ocean Resources Conservation and Assessment, Silver Spring, MD. 143 p.

GERG. 1997. Carolinian Province EMAP project, 1995 tissue samples. Analytical report No. 6AO81-A. Texas A&M University - Geochemical and Environmental Research Group, College Station, TX.

At this time, the CP_TSU_D.DAT data set only reports data from Carolinian Province stations sampled in 1995. In 1997, samples of fish, crustaceans, and shellfish were collected at a select group of known degraded and undegraded stations. Results from tissue analyses of these samples will be added to the CP_TSU_D.DAT data set as soon as they are available.

3.2 Keywords for the Data Set

Tissue contaminants, tissue chemistry, DDT, inorganic analytes, organic analytes, PAH, PCB, pesticides, TOC, trace metals, butyltin, EMAP Carolinian Province

4. OBJECTIVES AND INTRODUCTION

4.1 Program Objective

EMAP has three primary objectives:

1. To estimate the current status, extent, changes, and trends in indicators of the Nation's ecological resources on a regional basis;

2. To monitor indicators of pollutant exposure and habitat condition, and to seek correlative relationships between human-induced stresses and ecological condition that identify possible causes of adverse effects; and

3. To provide periodic statistical summaries and interpretive reports on ecological status and trends to the EPA Administrator and to the public.

4.2 Data Set Objective

The objective of the CP_TSU_D.DAT data set is to report the results of contaminant analyses in the edible tissues of fish and crustaceans at select stations sampled in the Carolinian Province in 1995 and 1997.

4.3 Data Set Background Information

The CP_TSU_D.DAT data set reports a suite of organic and metal contaminants measured in the edible tissues of four commercially and recreationally important species [white shrimp (Penaeus setiferus) , blue crab (Callinectes sapidus), Atlantic croaker (Micropogonias undulatus), and spot (Leiostomus xanthurus)].

The samples were collected in demersal trawls at selected degraded and undegraded sites (a subset of 13 base stations and one supplemental site in Shipyard Creek, S.C.). Degraded stations were those with >= 3 contaminants in excess of ERL/TEL values, or >= 1 contaminant in excess of ER-M/PEL values. Samples of fishes and invertebrates were collected at each station with a 4.9-m otter trawl (2.5-cm mesh cod end) towed against the tidal currents.

A minimum of three specimens of each species was combined into a single composite sample for each station. Wherever possible, animals of similar harvestable sizes were used to generate the sample composites. The edible parts used to form the composites consisted of fish fillets, shrimp tails, and the body-cavity meat of crabs.

All contaminant analyses were performed at Texas A&M University. Wet/dry weight ratio, lipid content, and contaminant concentrations were determined for each of the composited tissue samples. A total of 15 inorganic metals, 4 butyltins, 44 polynuclear aromatic hydrocarbons (PAHs), 18 polychlorinated biphenyls (PCBs), and 24 pesticides were measured in each of the crustacean samples. The same analytes, with the exception of PAHs, were measured in the fish samples (note that fish are known to metabolize PAHs). The table below summarizes the measurement units, target detection limits, analytical methods, and protocol references for each of the analyte groups.

Summary of analytical methods for the analysis of contaminants in biological tissues.

Analyte	Target DL	Units	Method	Reference
Fe, Zn	50	µg/g	INAA	Taylor and Presley 1993
Mn, Cu	5.0	µg/g	FAA	Taylor and Presley 1993
Al	10	µg/g	GFAA	Taylor and Presley 1993
Pb	0.1	µg/g	GFAA	Taylor and Presley 1993
Cr	0.1	µg/g	INAA	Taylor and Presley 1993
As	2.0	µg/g	INAA	Taylor and Presley 1993
Ni	0.5	µg/g	GFAA	Taylor and Presley 1993
Cd	0.2	µg/g	GFAA	Taylor and Presley 1993
Sb	0.2	µg/g	INAA	Taylor and Presley 1993
Se	1.0	µg/g	INAA	Taylor and Presley 1993

Summary of analytical methods for the analysis of contaminants in biological tissues, continued.

Analyte	Target DL	Units	Method	Reference
Sn	0.05	µg/g	GFAA	Taylor and Presley 1993
Ag	0.01	µg/g	INAA	Taylor and Presley 1993
Hg	0.01	µg/g	CVAA	Taylor and Presley 1993
Butyltins	10	ng Sn/g	GC/FPD	Wade et al. 1990
PAHs	20	ng/g	GC/MS-SIM	Wade et al. 1993, 1994
Pesticides	2.0	ng/g	GC/ECD	Wade et al. 1993, 1994
PCBs	2.0	ng/g	GC/ECD	Wade et al. 1993, 1994

Notes:
* Target detection limits based on sample size of 0.2 g (dry wt.) for metals and 10 g (wet wt.) for organics.
* Units are on a dry weight basis
* GC/ECD = Gas Chromatography/Electron Capture Detection
* GC/MS-SIM = GC/Mass Spectroscopy - Selective Ion Monitoring Mode
* CVAA = Cold Vapor Atomic Absorption
* GFAA = Graphite Furnace Atomic Absorption
* FAA = Flame Atomic Absorption
* GC/FPD = GC/Flame Photometric Detection
* INAA = Instrumental Neutron Activation Analysis
* Butyltins: mono-, di-, tri-, tetra-
* PAHs: 44 parent compounds & alkylated homologues, Tot. PAHs
* Pesticides: DDD (2,4'& 4,4'), DDE (2,4' & 4,4'), DDT(2,4' & 4,4'), Total DDD/DDE/DDT, aldrin, chlordane (alpha-, gamma-, oxy-), dieldrin, heptachlor, heptachlor epoxide, hexachlorobenzene, BHC (or HCH; alpha-, beta-, gamma-, delta-), mirex, trans- & cis-nonachlor, endrin, endosulfan, toxaphene
* PCBs: Congener Nos. 8, 18, 28, 44, 52, 66, 101, 105, 188/108/149, 128, 138, 153, 170, 180, 187/182/159, 195, 206, 209, Tot. PCBs

4.4 Summary of Data Set Parameters

A code for each compound is given under the variable ANAL. Concentrations are reported in dry weight, in the variable CONC. The units of the results reported in CONC are reported in the variable called UNIT. Quality Assurance/Quality Control issues are coded and reported in the variable called QA. QA code descriptions are given in section 5.2.4 (Sample Processing Quality Control) of this file. Method detection limits for each analysis are reported in the variable DETLMT. The variable ORGANISM reports the common name of the fish or crustacean species which the sample came from.

4.5 Year-Specific Information about Data

5. DATA ACQUISITION AND PROCESSING METHODS

5.1 Data Acquisition

5.1.1 Sampling Objective

Collect samples of edible tissues of commercially and recreationally important species suitable for the analysis of organic and inorganic compounds at selected degraded and undegraded sites.

5.1.2 Sample Collection Method Summary

Samples of fishes and invertebrates were collected at each station with a 4.9-m otter trawl (2.5-cm mesh cod end) towed against the tidal currents. Specimens to be analyzed for contaminants were immediately wrapped in clean aluminum foil, sealed in plastic storage bags, and placed on ice in the field. Samples were then frozen upon return to the lab.

5.1.3 Beginning Sampling Dates

05 July 1995

5.1.4 Ending Sampling Dates

14 September 1995

5.1.5 Platform

Samples were collected from various gasoline or diesel powered boats equipped with at least the following equipment: "A" frame boom or davit, winch, LORAN-C or GPS for location, and a depth finder.

5.1.6 Sampling Equipment

4.9-m otter trawl with 2.5 cm mesh wings

5.1.7 Manufacturer of Sampling Equipment

Glavin Trawl Manufacturing Company
117 Oak Street
Biloxi, Mississippi 39530

5.1.8 Key Variables

5.1.9 Sample Collection Method Calibration

The sampling gear did not require any calibration. It did however required inspection for tears resulting from underwater obstructions, twisting during deployment, and any material caught in the trawl that may have reduced the trawls effectiveness or resulted in a loss of catch.

5.1.10 Sample Collection Quality Control

Several quality control measures were incorporated. Field technicians were trained to follow Standard Operating Procedures to insure the collection of representative, and high quality samples. To help assure that the biota were identified accurately, all field crews had at least one member on board familiar with the species that were likely to be caught in bottom trawls. In addition, species identifications were validated in the laboratory by examination of voucher specimens collected for each species encountered in the field.

Field site audits were conducted during sampling seasons by the QA Officer to determine compliance with the Quality Assurance Plan and Field Operations Manual.

See: Hyland et al. (1998),
Kokkinakis et al. (1994a)

5.1.11 Sample Collection Method References

See: Hyland et al. (1998),
Kokkinakis et al. (1994b)

5.1.12 Sample Collection Method Deviations

None

5.2 Data Preparation and Sample Processing

5.2.1 Sample Processing Objective

Process tissue samples for characterization of contaminants in commercially and recreationally valuable fish and crustacean species.

5.2.2 Sample Processing Methods Summary

5.2.2.1 Field Summary

NA

5.2.2.2 Laboratory Summary

A minimum of three specimens of each species was combined into a single composite sample for each station. Wherever possible, animals of similar harvestable sizes were used to generate the sample composites. The edible parts used to form the composites consisted of fish fillets, shrimp tails, and the body-cavity meat of crabs.

Also see section 4.3 (Data Set Background Information), and GERG (1997) for additional laboratory processing methods.

5.2.3 Sample Processing Method Calibration

See: GERG (1997)

5.2.4 Sample Processing Quality Control

Quality control procedures for the analysis of contaminants in tissue consisted of: (1) participation in a series of intercalibration exercises (minimum of two intercalibrations per year for metals and one intercalibrations per year for organics); (2) continuous checks on analytical precision and accuracy from the analysis of Standard Reference Materials (SRMs) with each batch of samples; (3) initial and ongoing instrument calibration checks (ongoing checks performed minimally at the middle and end of each sample batch); (4) analysis of laboratory reagent blanks (one with each sample batch or at least a 10% frequency); (5) analysis of laboratory fortified sample matrix spikes and laboratory fortified sample matrix duplicates; (6) analysis of sample duplicates in ~ 10% of the samples; and (7) analysis of internal surrogate and injection standards with each sample. With respect to the analysis of SRMs, if analytical results deviated by more than (20% from the certified values for metals, or by more than (30% for the organics in the SRM, then a re-analysis of those samples was required. SRM NIST 1974a (mussel tissue) was used for the analysis of organics. SRM NIST 1566a (oyster tissue), SRM NRCC DOLT2 (dogfish liver tissue), and SRM NRCC DORM2 (dogfish muscle tissue) were used for the analysis of inorganics. These procedures are consistent with the general quality control requirements of both EMAP-E (Heitmuller and Valente 1993, see Table 5-4 therein) and the NOAA National Status and Trends Program (Lauenstein and Cantillo 1993).

The following QA codes, stored under the variable QA, flag QA issues in the tissue chemistry data set. Note that all values reported in the CP_TSU_D.DAT data set that do not have any QA codes assigned, met all QA/QC guidelines and are acceptable without further qualification.

QA	Description
ND	Non Detect - Indicates that the concentration of an analyte was too low to detect. In these cases, the QA code of "ND" is used, and the concentration is reported as 0. Although the actual concentration is unknown (but likely very low to none), reporting a concentration of 0 serves as a place holder.
J	Just Detected - Indicates that an analyte was detected in the sample, but at a concentration below the method detection limit for the sample. In these cases, you can be confident that the analyte is present in the sample, but there is a high degree of uncertainty in the reported

QA	Description, continued
	concentration. Therefore, values flagged with the "J" QA code should be considered estimates only, and used with discretion.
I	Matrix Interference - Indicates that the reported concentration is questionable due to interference from other compounds in the sample. Therefore, values flagged with the "M" QA code should be used with discretion.
Q	QA problem - Indicates cases where required quality assurance guidelines were not met by the lab. If no concentration is reported, then the QC problem was judged to be severe enough to invalidate the result for that analyte. If however a concentration is reported for an analyte with a "Q" code, then the overall data quality was judged to be reliable enough to be used with discretion.

See: Hyland et al. (1998),
Kokkinakis et al. (1994a),
GERG (1997)

5.2.5 Sample Processing Method Reference

See: Hyland et al. (1998),
Kokkinakis et al. (1994b),
Section 4.3 (Data Set Background Information),
Standard Operating Procedures of the Geochemical and Environmental Research Group of Texas A&M University,
GERG (1997)

5.2.6 Sample Processing Method Deviations

See: GERG (1997)

6. DATA ANALYSIS AND MANIPULATIONS

6.1 Name of New or Modified Value

The following analytes (ANAL codes) were not measured directly. These values are summary values calculated from the concentrations of several individually measured analytes: TOT_PAH, CHLORDAN, CHLD_FDA, TOT_ALKA, TOT_BHC, TOT_PCB, TOT_DDT, DDD_FDA, DDE_FDA, DDT_FDA, HEPT_FDA. The summed analytes CHLD_FDA, DDD_FDA, DDE_FDA, DDT_FDA, and HEPT_FDA were calculated specifically to allow comparisons to corresponding FDA tissue guidelines (i.e., "Action Levels").

6.2 Data Manipulation Description

TOT_PAH = Total PAHs

Sum of 38 PAHs (not including perylene)
[ACENTHE, ACENTHY, ANTHRA, BENANTH, BENAPY, BENEPY, BENZOBFL, BENZOKFL, BGHIPERY, BIPHENYL, C1CHRYSN, C1DIBENZ, C1FLUORA, C1FLUORE, C1NAPH, C1PHENAN, C2CHRYSN, C2DIBENZ, C2FLUORE, C2NAPH, C2PHENAN, C3CHRYSN, C3DIBENZ, C3FLUORE, C3NAPH, C3PHENAN, C4CHRYSN, C4NAPH, C4PHENAN, CHRYSENE, DIBENZAH, DIBENZO, FLUORANT, FLUORENE, INDENO, NAPH, PHENANTH, PYRENE]

CHLORDAN = Total Chlordane

Sum of Alpha-, Gamma-, and Oxy- chlordane
[ALPHACHL, GAMMACHL, OXYCHL]

CHLD_FDA = Sum Chlordanes (includes 4 of the 9 analytes that FDA includes in its calculation of summed chlordane).

Sum of Alpha chlordane (= cis-chlordane), cis-Nonachlor, trans-Nonachlor, and Oxychlordane
[ALPHACHL,CISNONA,TRANNONA,OXYCHL]

HEPT_FDA = Heptachlor and Heptachlor Epoxide

Sum of Heptachlor and Heptachlor Epoxide
[HEPTACHL,HEPTAEPO]

TOT_ALKA = Total Alkanes

Sum of 27 Aliphatic Hydrocarbons
[C10_ALKA, C11_ALKA, C12_ALKA, C13_ALKA, C14_ALKA, C15_ALKA, C16_ALKA, C17_ALKA, C18_ALKA, C19_ALKA, C20_ALKA, C21_ALKA, C22_ALKA, C23_ALKA, C24_ALKA, C25_ALKA, C26_ALKA, C27_ALKA, C28_ALKA, C29_ALKA, C30_ALKA, C31_ALKA, C32_ALKA, C33_ALKA, C34_ALKA, PHYTANE, PRISTANE]

TOT_BHC = Total BHC

Sum of Alpha BHC, Beta BHC, Delta BHC, and Gamma BHC (lindane)
[ALPHABHC, BETABHC, DELTABHC, LINDANE]

TOT_DDT = Total DDTs

Sum of 2,4'DDD, 4,4'DDD, 2,4'DDE, 4,4'DDE, 2,4'DDT, and 4,4'DDT
[DDD_24, DDD_44, DDE_24, DDE_44, DDT_24, DDT_44]

DDD_FDA = Sum DDD

Sum of 2,4'DDD and 4,4'DDD
[DDD_24, DDD_44

6.2 Data Manipulation Description, continued

DDE_FDA = Sum DDE

Sum of 2,4'DDE and 4,4'DDE
[DDE_24, DDE_44

DDT_FDA = Sum DDT

Sum of 2,4'DDT and 4,4'DDT
[DDT_24, DDT_44

TOT_PCB = Total PCBs

(Sum of (18 PCB congeners - any interferences) * 2.19) + 2.19
[PCB8, PCB18, PCB28, PCB44, PCB52, PCB66, PCB101,
PCB105, PCB118, PCB128, PCB138, PCB153, PCB170, PCB180,
PCB187, PCB195, PCB206, PCB209]

6.3 Data Manipulation Examples

7. DATA DESCRIPTION

7.1 Description of Parameters

Variable	Type	Format	Label
STA_NAME	Char	7.	Carolinian Province Sampling Station
DATE	Num	YYMMDD6.	Trawl Date
ORGANISM	Char	12.	Organism - Tissue Sampled From
ANAL	Char	8.	EMAP Carolinian Prov. Off. Analyte Code
CONC	Num	12.4	Analyte concentration result
UNIT	Char	8.	Units associated with CONC results
QA	Char	2.	Analyses QA qualifier code
DETLMT	Num	12.4	Sample specific method detection limit

Note the conventions used in the Format column above:

For character (Char) variables, the number given is the maximum width (number of characters) for that variable.

For numeric (Num) variables, the format is given in W.D format, where W = maximum width (number of characters) for the number (including all digits and the decimal point), and D = number of digits to the right of the decimal point.

7.1.6 Precision to which values are reported

Variables CONC, and DETLMT are reported to 0.0001 units. However, the precision of the values reported are analyte dependent as follows:

Analyte Type	Precision
Aromatic HCs	0.1
Aliphatic HCs	0.1
Pesticides	0.01
PCBs	0.01
Butyltins	0.01
Trace Metals	
Ag	0.01
Al	1
Cd	0.001
Cu	0.01
Mn	0.1
Ni	0.01
Pb	0.01
Se	0.1
Sn	0.01
Zn	1
As	0.1
Cr	0.01
Fe	1
Sb	0.01
Hg	0.01

Also note that the following QA codes associated with some observations may effect precision:

ND (Non Detect) - Indicates that the concentration of an analyte was too low to detect. In these cases the concentration is reported as 0. Although the actual concentration is unknown (but likely very low to none), reporting a concentration of 0 serves as a place holder.

J (Just Detected) - Indicates that an analyte was detected in the sample, but at a concentration below the method detection limit for the sample. In these cases, you can be confident that the analyte is present in the sample, but there is a high degree of uncertainty in the reported concentration. Therefore, values flagged with the "J" QA code should be considered estimates only, and used with discretion.

7.1.7 Minimum Value in Data Set

Variable	Minimum
CONC	0.0000
DETLMT	0.0076

7.1.8 Maximum Value in Data Set

Variable	Maximum
CONC	802.2000
DETLMT	193.6508

7.2 Data Record Example

7.2.1 Column Names for Example Records

```
STA_NAME;DATE;ORGANISM;ANAL;CONC;UNIT;QA;DETLMT
```

7.2.2 Example Data Records

```
CP95114;950720;CROAKER;AG;0.0000;ppm;ND;0.2802
CP95114;950720;CROAKER;AL;7.7000;ppm;J;117.8744
CP95114;950720;CROAKER;ALDRIN;0.0000;ng/g;ND;1.0400
CP95114;950720;CROAKER;ALPHABHC;0.0000;ng/g;ND;0.4700
CP95114;950720;CROAKER;ALPHACHL;5.8100;ng/g; ;0.3800
CP95114;950720;CROAKER;AS;1.7000;ppm; ;0.4751
CP95114;950720;CROAKER;BETABHC;1.5800;ng/g; ;0.8900
CP95114;950720;CROAKER;CD;0.5030;ppm; ;0.0077
CP95114;950720;CROAKER;CHLD_FDA;22.8300;ng/g; ;.
CP95114;950720;CROAKER;CHLORDAN;10.8500;ng/g; ;.
```

8. GEOGRAPHIC AND SPATIAL INFORMATION

8.1 Minimum Longitude

-81 Degrees, 43.38 Minutes West Longitude

8.2 Maximum Longitude

-80 Degrees, 10.55 Minutes West Longitude

8.3 Minimum Latitude

27 Degrees, 12.07 Minutes North Latitude

8.4 Maximum Latitude

30 Degrees, 34.75 Minutes North Latitude

8.5 Name of area or region

Coastal distribution of sampling is along the southeastern US from Cape Henry, VA, through St. Lucie Inlet, FL. States represented: Virginia, North Carolina, South Carolina, Georgia, and Florida.

9. QUALITY CONTROL/QUALITY ASSURANCE

9.1 Measurement Quality Objectives

See: Hyland et al. (1998),
Kokkinakis et al. (1994a)

9.2 Quality Assurance/Control Methods

See section 5.2.4 (Sample Processing Quality Control) above,
GERG (1997)

9.3 Quality Assessment Results

Unless flagged by one of the QA codes defined in section 5.2.4 (Sample Processing Quality Control), or specifically mentioned in GERG (1997), all data reported in the CP_TSU_D.DAT data set met the QA/QC guidelines given above and are acceptable without further qualification.

10. DATA ACCESS

10.1 Data Access Procedures

Data can be downloaded from the WWW site.

10.2 Data Access Restrictions

Data can only be accessed from the WWW site.

10.3 Data Access Contact Persons

For programmatic/policy matters, contact:
Dr. Jeffrey L. Hyland
NOAA/NOS National Centers for Coastal Ocean Science
Center for Coastal Monitoring and Assessment - Charleston Lab
217 Fort Johnson Rd. (P.O. Box 12559)
Charleston, SC 29422-2559
(843)762-5415 (Tel.)
(843)762-5110 (FAX)
jeff.hyland@noaa.gov (e-mail)

For data-related questions, contact:
Dr. W. Leonard Balthis
NOAA/NOS National Centers for Coastal Ocean Science
Center for Coastal Monitoring and Assessment - Charleston Lab
217 Fort Johnson Rd. (P.O. Box 12559)
Charleston, SC 29422-2559
(843)762-5652 (Tel.)
(843)762-5110 (FAX)
len.balthis@noaa.gov (e-mail)

Data Librarian, EMAP-Estuaries
Melissa M. Hughes
OAO Corporation
U.S. EPA NHEERL-AED
27 Tarzwell Drive
Narragansett, RI 02882-1197
(401) 782-3184 (Tel.)
(401) 782-3030 (FAX)
hughes.melissa@epa.gov (e-mail)

10.4 Data file Format

Delimited ASCII Text

10.5 Information Concerning Anonymous FTP

Not accessible

10.6 Information Concerning Gopher and WWW

Data can be downloaded from the WWW.

10.7 EMAP CD-ROM Containing the Data file

Data not available on CD-ROM.

11. REFERENCES

GERG. 1997. Carolinian Province EMAP project, 1995 tissue samples. Analytical report No. 6A081-A. Texas A&M University - Geochemical and Environmental Research Group, College Station, TX.

Heitmuller, P.T. and R. Valente. 1993. EMAP - Estuaries Louisianian Province - 1993 Quality Assurance Project Plan. U.S. EPA Environmental Research Laboratory, Gulf Breeze, FL.

Hyland, J.L., T.J. Herrlinger, T.R. Snoots, A.H. Ringwood, R.F. Van Dolah, C.T. Hackney, G.A. Nelson, J.S. Rosen, and S.A. Kokkinakis. 1996. Environmental quality of estuaries of the Carolinian Province: 1994. Annual statistical summary for the 1994 EMAP-Estuaries Demonstration Project in the Carolinian Province. NOAA Technical Memorandum NOS ORCA 97. NOAA/NOS, Office of Ocean Resources Conservation and Assessment, Silver Spring, MD. 102 p.

Hyland, J.L., L. Balthis, C.T. Hackney, G. McRae, A.H. Ringwood, T.R. Snoots, R.F. Van Dolah, and T.L. Wade. 1998. Environmental quality of estuaries of the Carolinian Province: 1995. Annual statistical summary for the 1995 EMAP-Estuaries Demonstration Project in the Carolinian Province. NOAA Technical Memorandum NOS ORCA 123 NOAA/NOS, Office of Ocean Resources Conservation and Assessment, Silver Spring, MD.

Kokkinakis, S.A., C. Mageau, and A. Robertson. 1994a. Carolinian Demonstration Project - 1994 Quality Assurance Project Plan. Joint National Status and Trends/Environmental Monitoring and Assessment Program. NOAA/NOS/ORCA, Silver Spring, MD.

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

Lauenstein, G.G. and A.Y. Cantillo (eds.). 1993. Sampling and analytical methods of the National Status and Trends Programs, National Benthic Surveillance and Mussel Watch Projects, 1984-1992. NOAA Technical Memorandum, NOS ORCA 71.

Salonen, K. 1979. A versatile method for the rapid and accurate determination of carbon by high temperature combustion. Limnol. Oceanogr., 24: 177-183.

Strobel, C.J., S.J. Benyi, D.J. Keith, H.W. Buffum, and E.A. Petrocelli. 1994. Statistical summary: EMAP - Estuaries Virginian Province - 1992. U.S. EPA Office of Research and Development, Environmental Research Laboratory, Narragansett, RI. EPA/620/R-94/019.

Summers, J.K., J.M. Macauley, P.T. Heitmuller, V.D. Engle, A.M. Adams, and G.T. Brooks. 1993. Annual statistical summary: EMAP - Estuaries Louisianian Province - 1991. U.S. EPA Office of Research and Development, Environmental Research Laboratory, Gulf Breeze, FL. EPA/600/R-93/001.

Taylor, B.J. and B.J. Presley. 1993. GERG trace element quantification techniques. In: G.G. Lauenstein and A.Y. Cantillo (eds.). Sampling and analytical methods of the National Status and Trends Programs, National Benthic Surveillance and Mussel Watch Projects, 1984-1992. NOAA Technical Memorandum, NOS ORCA 71.

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.

Wade, T.L., J.M. Brooks, M.C. Kennicutt II, T.J. McDonald, J.L. Sericano, and T.J. Jackson. 1993. GERG trace organics contaminant analytical techniques. In: G.G. Lauenstein and A.Y. Cantillo (eds.). Sampling and analytical methods of the National Status and Trends Programs, National Benthic Surveillance and Mussel Watch Projects, 1984-1992. NOAA Technical Memorandum, NOS ORCA 71.

Wade, T.L., B. Garcia-Romero, and J.M. Brooks. 1990. Butyltin in sediments and bivalves from U.S. coastal areas. Chemosphere, 20: 647-662.

Wade, T.L., D.J. Velinsky, E. Reinharz, and C.E. Schekat. 1994. Tidal river sediments in the Washington, D.C. area. II. Distribution and sources of organic contaminants. Estuaries, 17: 321-333.

12. TABLE OF ACRONYMS

C	Degrees Celsius
cc	Cubic centimeters
cm2	Square centimeters
CMBAD	Coastal Monitoring and Bioeffects Assessment Division
CU	Clemson University
EMAP	Environmental Monitoring and Assessment Program
EPA	U.S. Environmental Protection Agency
EPA-AED	EPA-Atlantic Ecology Division
EPA-GED	EPA-Gulf Ecology Division
EPA-RTP	EPA-Research Triangle Park, NC
FLDEP	Florida Dept. of Environmental Protection
FMRI	Florida Marine Research Institute
FTP	File Transfer Protocol
GIS	Geographical Information System
JCWS	Johnson Controls Word Services
km2	Square kilometers
m2	Square meters
mg/L	Milligrams per liter
mS/cm	MilliSiemens per centimeter (equiv. to milliohms/cm)
MRRI	Marine Resources Research Institute
NCNERR	North Carolina National Estuarine Research Reserve
NCSU	North Carolina State University, NC
NA	Not Applicable
ng/g	Nanograms per gram
NOAA	National Oceanic and Atmospheric Administration
NOS	National Ocean Service
ORCA	Office of Ocean Resources Conservation and Assessment
QA/QC	Quality Assurance/Quality Control
ppb	Parts per billion (equiv. to ng/g)
ppm	Parts per million (equiv. to ug/g)
ppt	Parts per thousand
SAIC	Science Applications International Corporation
SCDNR	South Carolina Dept. of Natural Resources
TOC	Total Organic Carbon
TAMU/GERG	Texas A&M University, Geochemical and Environmental Research Group
TPMC	Technology Planning and Management Corporation
µg/g	Micrograms per gram
um	Micrometers
UC	University of Charleston, SC
UGA	University of Georgia, GA
UNC-W	University of North Carolina - Wilmington, NC
USGS-GB	US Geological Survey - Gulf Breeze, FL
wt.	Weight
WWW	World Wide Web -Internet

13. PERSONNEL INFORMATION

Dr. Courtney T. Hackney
University of North Carolina - Wilmington,
Wilmington, NC

Melissa M. Hughes
Data Librarian, EMAP-Estuaries
OAO Corporation
U.S. EPA NHEERL-AED
27 Tarzwell Drive
Narragansett, RI 02882-1197
(401) 782-3184 (Tel.)
(401) 782-3030 (FAX)
hughes.melissa@epa.gov (e-mail)

For programmatic/policy matters, contact:
Dr. Jeffrey L. Hyland
NOAA/NOS National Centers for Coastal Ocean Science
Center for Coastal Monitoring and Assessment - Charleston Lab
219 Fort Johnson Rd.
Charleston, SC 29412-9110
(843)762-8652 (Tel.)
(843)762-8700 (FAX)
jeff.hyland@noaa.gov (e-mail)

For data-related questions, contact:
Dr. W. Leonard Balthis
NOAA/NOS National Centers for Coastal Ocean Science
Center for Coastal Monitoring and Assessment - Charleston Lab
219 Fort Johnson Rd.
Charleston, SC 29412-9110
(843)762-8654 (Tel.)
(843)762-8700 (FAX)
len.balthis@noaa.gov (e-mail)

Jan Landsberg
Florida Dept. of Environmental Protection
Florida Marine Research Institute
St. Petersburg, FL

James McKenna
Florida Dept. of Environmental Protection
Florida Marine Research Institute
St. Petersburg, FL

Dr. Gil McRae
Florida Dept. of Environmental Protection
Florida Marine Research Institute
St. Petersburg, FL

Gary A. Nelson
Florida Dept. of Environmental Protection
Florida Marine Research Institute
St. Petersburg, FL

Dr. Amy H. Ringwood
South Carolina Dept. of Natural Resources,
Marine Resources Research Institute
Charleston, SC