CATALOG DOCUMENTATION
NATIONAL COASTAL ASSESSMENT- NORTHEAST DATABASE
YEARS 2000-2006
SEDIMENT TOXICITY DATA: "SEDTOX"

TABLE OF CONTENTS

1. DATASET IDENTIFICATION
2. INVESTIGATOR INFORMATION
3. DATASET ABSTRACT
4. OBJECTIVES AND INTRODUCTION
5. DATA ACQUISITION AND PROCESSING METHODS
6. DATA MANIPULATIONS
7. DATA DESCRIPTION
8. GEOGRAPHIC AND SPATIAL INFORMATION
9. QUALITY CONTROL AND QUALITY ASSURANCE
10. DATA ACCESS AND DISTRIBUTION
11. REFERENCES
12. TABLE OF ACRONYMS
13. PERSONNEL INFORMATION

1. DATASET IDENTIFICATION

1.1 Title of Catalog document
National Coastal Assessment-Northeast Region Database
Years 2000-2006
SEDIMENT - TOXICITY DATA

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

1.3 Catalog revision date
October 2009

1.4 Dataset name
SEDTOX

1.5 Task Group
National Coastal Assessment-Northeast

1.6 Dataset identification code
006

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 (NCA Northeast Region)

Donald Cobb, U.S. EPA NHEERL-AED
Walter Galloway, U.S. EPA NHEERL-AED
Stephen Hale, U.S. EPA NHEERL-AED
John Kiddon, U.S. EPA NHEERL-AED
Charles Strobel, U.S. EPA NHEERL-AED
Henry Walker, U.S. EPA NHEERL-AED

2.2 Sample Collection Investigators

Donald Cobb, U.S. EPA NHEERL-AED

2.3 Sample Processing Investigators

John Macauley, U.S. EPA NHEERL-GED

3. DATASET ABSTRACT

3.1 Abstract of the Dataset

The SEDTOX data file reports results, statistical significance, and biological significance of the sediment toxicity test performed in the National Coastal Assessment (Northeast component) during the summer of 2000-2006. Toxicity was determined by exposing the marine amphipod *Ampelisca abdita* to whole sediment samples in static ten-day toxicity tests. One record is presented per sampling event.

3.2 Keywords for the Dataset

Sediment toxicity, *Ampelisca abdita,* amphipod

4. OBJECTIVES AND INTRODUCTION

4.1 Program Objective

The National Coastal Assessment (NCA) is a national monitoring and assessment program with the primary goal of providing a consistent evaluation of the estuarine condition in U.S. estuaries. It is an initiative of the Environmental Monitoring and Assessment Program (EMAP), and is a partnership of several federal and state environmental agencies, including: EPA's Regions, Office of Research and Development, and Office of Water; state environmental protection agencies in the 24 marine coastal states and Puerto Rico; and the United States Geological Survey (USGS) and the National Oceanic and Atmospheric Agency (NOAA). The NCA program was initiated in 2000 and completed in 2006.

Stations were randomly selected using EMAP's probabilistic sampling framework and were sampled once during a summer index period (June to October). A consistent suite of indicators was used to measure conditions in the water, sediment, and in benthic and fish communities. The measured data may be used by the states to meet their reporting requirements under the Clean Water Act, Section 305(b). The data were also used to generate a series of national reports characterizing the condition of the Nation's estuaries http://www.epa.gov/nccr/.

4.2 Dataset Objective

The purpose of the SEDTOX data file is to report the results, statistical

significance, and biological significance of the sediment toxicity test (*Ampelisca* mortality assay).

4.3 Background Discussion

The toxicity of sediments was evaluated by measuring the survival rate of the marine amphipod *Ampelisca abdita* exposed to whole sediments in static 10-day laboratory tests. The tests were run at 20 °C and 30 ppt salinity. Sediments were considered to be toxic if the survival rate of the amphipods relative to a control (designated by the parameter SRVPCCON) was less than 80%. The parameter SRVPC_SG specifies whether the measured survival rate was statistically distinct from a control group. The parameter ATOX_SIG signifies the biological significance of the result, denoting toxicity as <80% or <60% if the result is statistically distinct from control group and survival rate is <80% or <60%. ATOX_SIG is set to NT (not toxic) if the survival rate is >= 80% or result is not statistically distinct from control group.

The Table below indicates the number of records reporting analyte results by ST_COOP and year. This Table can be used to identify systematic absences of data collection by coops. (Some absent blocks reflect coop name changes in 2005/6; essentially ST_COOP NJ-C = NJ, NJ-DB = DB, and DE = DI in the Table below. See the metadata file for STATIONS for discussion of the ST_COOP parameter). Note that RI and MA did not collect data in 2002. Only 2005/06 data for MD and VA are contained in this database; contact John Macauley (Section 13) for information regarding earlier data for these states.

Count of results by ST_COOP, Analyte, and year

Count of STATION	Year							
ST_COOP	2000	2001	2002	2003	2004	2005	2006	Grand Total
ME	26	43	22	28	19	22	19	179
NH	34	36	20	23	18	16	22	169
MA	36	47		16	20	20	22	161
RI	34	35		17	18	25	23	152
CT	27	37	10	11	21	3	30	139
NY	26	31	41	23	21	25	23	190
NJ-C	26	40	30	22	28			146
NJ						16	45	61
NJ-DB	28	31	32	29	32			152
DB						20	25	45
DE	17	21	20	19	20			97
DI						25	25	50
MD						19	25	44
VA						50	48	98
Grand Total	254	321	175	188	197	241	307	1683

All samples were tested for toxicity at the national contract laboratory:

TRAC Laboratories Inc
14 S 2nd St
Pensacola, FL 32507

4.4 Summary of Dataset Parameters

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

NAME	LABEL
*STATION	Coastal 2000 Station Name
*STAT_ALT	Alternate Site Code (A,B,C)
*EVNTDATE	Event Date
SRVPCCON	Ampelisca Survival as % of Control
SRVPC_SG	Statistical Significance (p < 0.05) Yes or No
ATOX_SIG	Ampelisca Toxicity Test Significance < 80% < 60% NT (not toxic)
LABCODE	Lab/Contract Identifier NAT (national contract lab)
QACODE	Qa Qualifier Code <blank> No qualification

5. DATA ACQUISITION AND PROCESSING METHODS

5.1 Data Acquisition / Field Sampling

5.1.1 Sampling Objective

Sediment was collected for use in measuring physical, chemical, and toxicological characteristics. Separate sediment grabs were taken for benthic macrofaunal analysis.

5.1.2 Sample Collection: Methods Summary

Sediment was collected with a 0.04-m^2 Young-modified Van-Veen grab or similar sampler. Only the top two centimeters of a grab were retained for physical, chemical, and toxicological analyses. A sufficient number of grabs were processed to provide three liters of the 2-cm composite material. The composite was homogenized and separated into two fractions for storage until analysis. One fraction was frozen and used in the measurement of total organic carbon (TOC) and concentrations of chemical contaminants. The second fraction was chilled but not frozen during storage, and was used for grain-size and toxicity analyses. Separate sediment grabs were taken for benthic macro faunal analysis. This file describes the toxicological analysis, i.e., the amphipod mortality assay.

5.1.3 Beginning Sampling Dates

7 July 2000

5.1.4 Ending Sampling Dates

4 October 2006

5.1.5 Sampling Platform
Samples were collected from gasoline or diesel powered boats, 18 to 133 feet in length.

5.1.6 Sampling Equipment
A 1/25 m2, stainless steel (coated with Kynar), Young-modified Van Veen grab sampler was used to collect sediments.

5.1.7 Manufacturer of Sampling Equipment
Young's Welding, Sandwich, MA

5.1.8 Key Variables
Not applicable

5.1.9 Sample Collection: Methods Calibration
The sampling gear does not require calibration, although it was inspected regularly for damage by mishandling or impact on rocky substrates.

5.1.10 Sample Collection: Quality Control
Care was taken to minimize disturbance to the sediment grabs. Grabs that were incomplete, slumped, less than 7 cm in depth, or comprised chiefly of shelly substrates were discarded. The chance of sampling the same location was minimized by repositioning the boat five meters downstream after three sampling attempts.

5.1.11 Sample Collection: References Strobel, C.J. 2000. Environmental Monitoring and Assessment Program: Coastal 2000 - Northeast component: field operations manual. Narragansett (RI): U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Atlantic Ecology Division. Report nr EPA/620/R-00/002. 68 p.

5.1.11 Sample Collection: Alternate Methods
Different grab samplers used by NCA partners include the Smith-MacIntyre and Ponar grab samplers.

5.2 Data Preparation and Sample Processing

5.2.1 Sample Processing Objective
Determine the toxicity of sediment samples using a 10-day *Ampelisca abdita* mortality assay performed on whole sediments.

5.2.2 Sample Processing: Methods Summary
In the 10-day *Ampelisca abdita* assay, amphipods were exposed to sediments for 10 days under static conditions following EMAP procedures (EPA 1994, 1995). Sediment samples were stored in the dark at 4 °C prior to analysis. Control sediments were obtained from a clean site in Perdido Bay. Each sediment sample was passed through a 1 mm mesh to remove resident organisms, pebbles, *etc.*, and was stirred to homogenize. Five replicate tests were performed with each field sample along with a test using the control sediment (clean sediment from Perdido Bay). For each test, 200 mL of sediment sample were placed in a glass container and covered with 600 mL of clean, filtered water (maintained at 20 °C, a salinity of 30ppt, and a dissolved oxygen concentration >60% of saturation). Total ammonia concentration was measured colorimetrically on filtered pore water taken from a sixth replicate. For concentrations

greater than 20 mg/L, the sediment was flushed until ammonia levels fell below 20 mg/L. Twenty juvenile amphipods (between 0.7 and 1.5 mm in length) were added to each test chamber for a ten-day exposure. The surviving amphipods were counted, and the results reported as the average number of amphipods surviving in the sample tests divided by the number of amphipods surviving in the control sediment, expressed as a percent. Lower values of this result indicate higher toxicity. The result was considered to be statistically significant if sample and control values were distinct with a p-value ≤ 0.05 in a one-tailed t-test. The assay was taken to indicate toxicity if the survival rate was less than 80% of the control and the test was statistically significant.

5.2.3 Sample Processing: Methods Calibration

Not applicable

5.2.4 Sample Processing: Quality Control

Positive controls for the amphipod assays were performed as follows. Representative amphipods were routinely tested for response by determining the LC50 concentration of the reference toxicant sodium dodecyl sulfate. The amphipods were considered viable if the measured LC50 fell within the 95% confidence interval of previous QC checks. Each batch of assays was also accompanied by a negative control assay, which was identical to the routine procedures but the amphipods were exposed to sediments that were certified as clean. Five replicates were included in the control run. Batch results were accepted if the mean survival was equal to or greater than 85% and survival in the individual replicate chambers was not less than 80% (ASTM 1993).

5.2.5 Sample Processing: References

U.S. EPA. 1994. Methods for Assessing the Toxicity of Sediment-Associated Contaminants with Estuarine and Marine Amphipods. Narragansett, RI: U.S. Environmental Protection Agency, Office of Research and Development. EPA/600/R-94/025.

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

6. DATA ANALYSIS AND MANIPULATIONS

6.1 Name of New or Modified Values

Not applicable

6.2 Data Manipulation: Description

SRVPCCON (survival as percent of control; result for amphipod survival assay) was calculated as the average number of amphipods surviving in the five replicate sample tests divided by the number of amphipods surviving in the control sediment, expressed as a percent.

SRVPC_P (statistical significance of amphipod survival result) is reported as 'Yes' if SRVPCCON is statistically significant as indicated by a p-value less than 0.05 in Dunnett's multiple range test, and 'No' if otherwise.

ATOX_SIG (biological significance of amphipod survival result) is reported as '< 60% ' if SRVPCCON is less than 60% and SRVPC_P is 'Y' (this indicates high toxicity); as '<80%' if SRVPCCON is less then 80% but greater then 60% and SRVPC_P is 'Y' (this indicates biologically significant toxicity); and otherwise as 'NT' (non-toxic).

7. DATA DESCRIPTION

7.1 Description of Parameters

7.1.1 Components of the Dataset

NAME	TYPE	LENGTH	LABEL
STATION	Char	9	Coastal 2000 Station Name
STAT_ALT	Char	1	Alternate Site Code (A,B,C)
EVNTDATE	Num	8	Event Date
SRVPCCON	Num	8	Ampelisca Survival as % of Control
SRVPC_SG	Char	3	Statistical Significance (p<.05)
ATOX_SIG	Char	4	Ampelisca Toxicity Test Significance
LABCODE	Char	7	Lab/Contract Identifier
QACODE	Char	7	Qa Qualifier Code

7.1.2 Precision of Reported Values

The values are reliable to no more than three significant digits; however more significant digits may be reported in the dataset because of formatting restrictions.

PARAMETER	LABEL	MIN	MAX
SRVPCCON	Ampelisca Survival as % of Control	1.1	105

7.1.3 Minimum Value in Dataset

See Section 7.1.2

7.1.4 Maximum Value in Dataset

See Section 7.1.2

7.2 Data Record Example

7.2.1 Column Names for Example Records

STATION STAT_ALT EVNTDATE SRVPCCON SRVPC_SG ATOX_SIG LABCODE QACODE

7.2.2 Examples of Data Records

station	stat_alt	evntdate	srvpccon	srvpc_sg	atox_sig	labcode	qacode
CT03-0021	A	8/20/2003	96.9	NO	NT	NAT_TRC	
CT03-0034	A	8/27/2003	93.7	NO	NT	NAT_TRC	
CT03-0035	A	8/27/2003	90.5	YES	NT	NAT_TRC	

8. GEOGRAPHIC AND SPATIAL INFORMATION

8.1 Minimum Longitude (Westernmost)
-77.304 decimal degrees

8.2 Maximum Longitude (Easternmost)
-66.946 decimal degrees

8.3 Minimum Latitude (Southernmost)
36.564 decimal degrees

8.4 Maximum Latitude (Northernmost)
45.1848 decimal degrees

8.5 Name of area or region
The National Coastal Assessment Northeast Region covers the northeastern US coastline from Maine to Delaware.

9. QUALITY CONTROL AND QUALITY ASSURANCE

9.1 Measurement Quality Objectives
The measurement quality objectives of the NCA program do not specify accuracy or precision requirements for toxicity measurements.

9.2 Data Quality Assurance Procedures
QA procedures include running a positive reference toxicant (sodium dodecyl sulfate) and a negative reference sample (clean sediment from Perdido Bay) See Section 5.2.4

9.3 Actual Measurement Quality
All of the data reported in this data file met the QA specifications listed in Section 5.2.4.

10. DATA ACCESS

10.1 Data Access Procedures
Data can be downloaded from the web
http://www.epa.gov/emap/nca/html/regions/index.html

10.2 Data Access Restrictions
None

10.3 Data Access Contact Persons
John Kiddon, U.S. EPA NHEERL-AED, Narragansett, RI
401-782-3034, 401-782-3030 (FAX), kiddon.john@epa.gov

Harry Buffum, Data Manager, Raytheon Corporation, Narragansett, RI
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

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

Strobel, C.J. 2000. Environmental Monitoring and Assessment Program: Coastal 2000 - Northeast component: field operations manual. Narragansett (RI): U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Atlantic Ecology Division. EPA/620/R-00/002. 68 p.

U.S. EPA. 2001. National Coastal Assessment: Field Operations Manual. U.S. Environmental Protection Agency, Office of Research and Development, National Health and Environmental Effects Research Laboratory, Gulf Ecology Division, Gulf Breeze, FL. EPA/620/R-01/003. 72 p.

U.S. EPA. 2001. Environmental Monitoring and Assessment Program (EMAP): National Coastal Assessment Quality Assurance Project Plan 2001-2004. U.S. Environmental Protection Agency, Office of Research and Development, National Health and Environmental Effects Research Laboratory, Gulf Ecology Division, Gulf Breeze, FL. EPA/620/R-01/002. 189 p./620/R-95/008.

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

12. TABLE OF ACRONYMS

AED	Atlantic Ecology Division
EMAP	Environmental Monitoring and Assessment Program
EPA	Environmental Protection Agency
NCA	National Coastal Assessment
NHEERL	National Health and Environmental Effects Research Laboratory
QA/QC	Quality Assurance/Quality Control

13. PERSONNEL INFORMATION

Chuck Audette, Database Analyst
Raytheon Corporation
27 Tarzwell Drive, Narragansett, RI 02882-1197
401-782-3092, 401-782-3030 (FAX), audette.chuck@epa.gov

Harry Buffum, Database Manager
Raytheon Corporation
27 Tarzwell Drive, Narragansett, RI 02882-1197
401-782-3183, 401-782-3030 (FAX), buffum.harry@epa.gov

Don Cobb, NCA Project Officer
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

Walter Galloway, NCA Project Officer
U.S. Environmental Protection Agency, NHEERL-AED
27 Tarzwell Drive, Narragansett, RI 02882-1197
401-782-3096, 401-782-3030 (FAX), galloway.walt@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

Melissa Hughes, Data Librarian
Raytheon Corporation
27 Tarzwell Drive, Narragansett, RI 02882-1197
401-782-3184, 401-782-3030 (FAX), hughes.melissa@epa.gov

John Kiddon, NCA Analyst and Northeast QA Manager
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

John Macauley, NCA QA Officer
U.S. Environmental Protection Agency, NHEERL-GED
1 Sabine Island Dr., Gulf Breeze, FL 32561
850-934-9353, macauley.john@epa.gov

Charlie Strobel, AED Analyst and Project Officer
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

Kevin Summers, Acting National NCA Program Director
U.S. Environmental Protection Agency, NHEERL-GED
1 Sabine Island Dr., Gulf Breeze, FL 32561
850-934-9244, summers.kevin@epa.gov

Hal Walker, Northeast NCA Program Director and Analyst
U.S. Environmental Protection Agency, NHEERL-AED
27 Tarzwell Drive, Narragansett, RI 02882-1197
401-782-3007, 401-782-3030 (FAX), walker.henry@epa.gov