CATALOG DOCUMENTATION
NATIONAL COASTAL ASSESSMENT DATABASE
2003 NEW YORK/NEW JERSEY HARBOR SYSTEM
SEDIMENT TOXICITY TEST DATA BY STATION

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1. DATA SET IDENTIFICATION

1.1 Title of Catalog document

National Coastal Assessment Database
2003 New York/New Jersey Harbor System
Sediment Toxicity Test Data by Station

1.2 Author of the Catalog entry

Melissa Hughes, Raytheon

1.3 Catalog revision date

June 15, 2012

1.4 Data set name

Sediment Toxicity Test Data by Station

1.5 Task Group

Regional Environmental Monitoring and Assessment Program

1.6 Data set identification code

NA

1.7 Version

NA

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

Ms. Darvene A. Adams
U.S. Environmental Protection Agency - Region II

2.2. Investigation Participant

Ms. Sandi Robinson
U.S. Environmental Protection Agency - ORD/NHEERL/AED

3. DATA SET ABSTRACT

3.1 Abstract of the Data Set

The Sediment Toxicity Test Data Set reports mean results from tests conducted using the tube-dwelling amphipod, Ampelisca abdita. The samples were taken in the New York/New Jersey Harbor region. Five replicate 10-day, static, non-renewal toxicity tests were compared to results of a control test. Test results are also reported for 100% Elutriate test using Lytechinus variegatus to measure % survival.

3.2 Keywords for the Data Set

sediment toxicity test, amphipod, Ampelisca abdita, Lytechinus variegatus

4. OBJECTIVES AND INTRODUCTION

4.1 Program Objective

The project was designed to support resource management decisions related to pollution control and remediation throughout the New York/ New Jersey (NY/NJ) Harbor and Bight Apex and to assist the New York-New Jersey Harbor Estuary Program (HEP) in developing a contaminant monitoring strategy to be included in the Comprehensive Conservation and Management Plan (CCMP) for the NY/NJ Harbor system.

4.2 Data Set Objective

To provide an overview of the effect of sediment contamination on the benthos in the NY/NJ harbor region.

4.3 Data Set Background Discussion

The New York/New Jersey Harbor System has been susceptible to toxic contamination due to surrounding land uses. Harbor sediments are contaminant reservoirs functioning as a secondary source of these land use contaminants. Contaminated sediments pose a substantial threat to Harbor resources and are a management challenge. The ecological significance of contaminant levels documented from purely chemical surveys is unknown in the absence of biological communities, e.g., benthos, being exposed to these materials. Areas with high contaminant levels, but where biological availability and toxicity are low may be addressed best with management strategies different than those appropriate for areas where significant impacts to biota are evident.

4.4 Summary of Data Set Parameters

Toxicity Test data set values were based on calculations performed on replicate test results.

5. DATA ACQUISITION AND PROCESSING METHODS

5.1 Data Acquisition

5.1.1 Sampling Objective

Collect sediment grab samples suitable for conducting sediment toxicity tests using the amphipod Ampelisca abdita.

5.1.2 Sample Collection Methods Summary
The grab sampler was lowered through the water column; the grab penetrated the sediment by gravity releasing a trigger allowing the jaws to close. When the grab was pulled from the sediment using the winch, the jaws closed, encapsulating the sediment sample.

Multiple grabs were required to collect enough volume for analysis. Overlying water was carefully drained. The remaining top 2 cm of sediment from each grab was removed using stainless steel spoons. A composite of all grabs was homogenized in a glass bowl for 10 minutes. A subsample was removed for toxicity tests and transferred to a sample container that was stored on ice.

5.1.3 Sampling Start Date
July 1, 2003

5.1.4 Sampling End Date
September 25, 2003

5.1.5 Platform
Sampling occurred from U.S.EPA research vessel, R/V CLEAN WATERS.

5.1.6 Sampling Gear
A 0.04-m2, stainless steel, Young-modified Van Veen Grab sampler was used to collect sediment grabs. This grab sampled an area of 440 cm2 and a maximum depth of penetration in the sediment of 10 cm.

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

5.1.8 Key Variables
No data were recorded at the time of sample collection.

5.1.9 Collection Method Calibration
The sampling gear did not require any calibration. It required inspection for deformities incurred due to mishandling or impact on rocky substrates.

5.1.10 Sample Collection Quality Control
A successful grab had relatively level, intact sediment over the entire area of the grab and a sediment depth at the center of at least 5 centimeters. Unacceptable grabs included those with grossly slumped surfaces and those completely filled to the top, where the sediment was in direct contact with the hinged top.

Care was taken to avoid sediment that had touched the surface of the grab and to use only samples with undisturbed surfaces. Clean stainless steel spoons and glass mixing bowls were used to prevent accidental contamination. The van Veen Grab was rinsed with ambient seawater between grabs at a station and thoroughly cleaned with detergent and water between stations.

5.1.11 Sample Collection Method Reference
Reifsteck, D.M., C.J. Strobel and D.J. Keith. 1993. Environmental Monitoring and Assessment Program - Near Coastal Component: 1993 Virginian Province Field Operations and Safety Manual. U.S. EPA NHEERL-AED. Narragansett, RI.

5.2 Data Preparation and Sample Processing

5.2.1 Sample Processing Objective

Process sediment samples suitable for conducting sediment toxicity tests.

5.2.2 Sample Processing Methods Summary

Control sediment was press-sieved through a 0.5 mm mesh stainless steel sieve to remove resident amphipods and debris. Test sediment was press-sieved through a 2.0 mm sieve to remove large debris and predaceous organisms. If amphipods were present, the test sediments were press-sieved through a 10 mm stainless steel sieve. Organisms were acclimated at 20 deg C and 30 ppt salinity prior to testing.

For each toxicity test, 200 ml of composited, press-sieved sample were placed in 1 L glass test chambers and covered with 600 ml of seawater. Five replicate test chambers were used for each sample. Each replicate contained 20 organisms.

Post-test enumeration of amphipods was performed without knowledge of sample identity to prevent bias. If less than 20 amphipods were found, the test sediment was stored in the dark for up to 48 hours to encourage emergence of any remaining amphipods.

5.2.3 Sample Processing Method Calibration

The laboratories conducting the tests (USEPA Region 2 Bioassay Laboratory, Edison, NJ and SAIC, Narr., RI) participated in an interlaboratory comparison exercise.

5.2.4 Sample Processing Quality Control

Sodium dodecyl sulfate (SDS) was used as a reference toxicant to evaluate the sensitivity of each batch of amphipods.

5.2.5 Sample Processing Method Reference

ASTM. 1991. Standard guide for conducting 10-day static Sediment toxicity tests with marine and estuarine amphipods, E1367-91. American Society for Testing Materials, Phil., PA.

ASTM. 1992. Standard guide for conducting 10-day static Sediment toxicity tests with marine and estuarine amphipods, E1367-92. American Society for Testing Materials, Phil., PA.

U.S. EPA. 1993. EMAP Laboratory Methods Manual: Estuaries. U.S. Environmental Protection Agency, Office of Research and Development, Environmental Monitoring Systems Laboratory, Cincinnati, OH.

6. DATA MANIPULATIONS

6.1 Name of new or modified values

Result Unit Measured - Ampelisca survival (mean) as % of control

6.2 Data Manipulation Description

NA

6.3 Data Manipulation Examples

NA

7. DATA DESCRIPTION

7.1 Description of Parameters

Attribute Name	Format	Description
Data Group	VARCHAR2(4)	Data group conducting sampling
Sampling Year	NUMBER(4.0)	Data collection year
Station Name	VARCHAR2(20)	The station identifier
Sampling Collection Date	DATE	Date of sample collection
Latitude Decimal Degrees	NUMBER(9.3)	Decimal degrees of latitude
Longitude Decimal Degrees	NUMBER(9.3)	Decimal degrees (-) of longitude
Toxicity Test Type	VARCHAR2(10)	Type of test: sediment, Microtox
Test Species	VARCHAR2(30)	Species (latin name) used in test
Result Unit Measured	VARCHAR2(40)	Unit of result (growth/survival)
Result Value	NUMBER(8.3)	Test result value
Test Status	VARCHAR2(40)	Difference from control value
P Value	NUMBER(4.2)	Test P value

7.1.6 Precision to which values are reported

The precision is indicated by the attribute format reported under 7.1

7.1.7 Minimum value in data set

Result unit measured	Result value
Ampelisca survival (mean) as % of Control	1.1

7.1.8 Maximum value in Data Set

Result unit measured	Result value
Ampelisca survival (mean) as % of Control	102.2

7.2 Data Record Example

7.2.1 Column Names for Example Records

Data Group,Sampling Year,Station Name,Sampling Collection Date,
Latitude Decimal Degrees,Longitude Decimal Degrees,
Toxicity Test Type,Test Species,Result Unit Measured,Result Value,
Test Status, P Value

7.2.2 Example Data Records

R-EMAP Region 2 2003,2003,JB301,7/31/2003,40.629,-73.759,Sediment,
Ampelisca abdita,Mean survival as % of control,72.528,Significant,0.05
R-EMAP Region 2 2003,2003,JB301,8/1/2003,40.629,-73.759,100% Elutriate,
Lytechinus variegatus,Survival (%),84,Not significant,0.05

8. GEOGRAPHIC AND SPATIAL INFORMATION

8.1 Minimum Longitude

-74 Degrees 17.4 Minutes 48.00 Decimal Seconds

8.2 Maximum Longitude

-73 Degrees 45 Minutes 0.54 Decimal Seconds

8.3 Minimum Latitude

40 Degrees 25.2 Minutes 36.00 Decimal Seconds

8.4 Maximum Latitude

40 Degrees 51.6 Minutes 42.00 Decimal Seconds

8.5 Name of area or region

New York/New Jersey Harbor System:
Four sub-basins were sampled in the New York/New Jersey Harbor, including: Upper Harbor, Newark Bay, Lower Harbor (includes Raritan and Sandy Hook Bays) and Jamaica Bay. For purposes of this study, the region includes the lower portions of the Hudson, Passaic, Harlem, Hackensack and Raritan Rivers, upstream to a near-bottom salinity of 15 ppt, the East River to Long Island Sound and Lower Harbor to the Atlantic Ocean.

9. QUALITY CONTROL AND QUALITY ASSURANCE

9.1 Data Quality Objectives

Quality assurance goals were developed and followed for each QA sample type and for each analysis.

9.2 Quality Assurance/Quality Control Procedures

Minimum control survival for satisfying test performance criteria was 90%. Final organism counts were confirmed by a second scientist.

Control sediment from the U.S. Army Corps of Engineers Long Island Sound (LIS) reference station was tested along with the Harbor samples. Reference toxicant testing using phenol was conducted with each set of sediment assays.

9.3 Quality Assessment Results

The in-house QC measures met the requirements established in the QA Plan.

9.4 Unassessed Errors

NA

10. DATA ACCESS

10.1 Data Access Procedures

Data can be downloaded from the WWW server.

10.2 Data Access Restrictions

Data can only be accessed from the WWW server.

10.3 Data Access Contact Persons

Ms. Darvene A. Adams
U.S. EPA Region II

10.4 Data Set Format

Tab-delimited

10.5 Information Concerning Anonymous FTP

Data cannot be accessed via ftp.

10.6 Information Concerning WWW

Data can be downloaded from the WWW servers.

10.7 EMAP CD-ROM Containing the Data Set

Data are not available on CD-ROM

11. REFERENCES

Adams, D. 1998. Quality Assurance Project Plan for Environmental Monitoring, "A 5-year Revisit of Sediment Quality in the NY/NJ Harbor." U.S. Environmental Protection Agency, Region 2, Edison, NJ.

Adams, Darvene and Sandra Benyi. 2003. Final Report: Sediment Quality of the NY/NJ Harbor System-A 5-Year Revisit. EPA/902-R-03-002. USEPA-Region 2, Division of Science and Assessment. Edison, NJ. December 2003.

ASTM. 1991. Standard guide for conducting 10-day static Sediment toxicity tests with marine and estuarine amphipods, E1367-91. American Society for Testing Materials, Phil., PA.

ASTM. 1992. Standard guide for conducting 10-day static Sediment toxicity tests with marine and estuarine amphipods, E1367-92. American Society for Testing Materials, Phil., PA.

Reifsteck, D.M., C.J. Strobel and D.J. Keith. 1993. Environmental Monitoring and Assessment Program - Near Coastal Component: 1993 Virginian Province Field Operations and Safety Manual. U.S. EPA NHEERL-AED. Narragansett, RI.

US EPA. 1993. EMAP Laboratory Methods Manual: Estuaries. US Environmental Protection Agency, Office of Research and Development, Environmental Monitoring Systems Laboratory, Cincinnati, OH. Cincinnati, OH.

12. TABLE OF ACRONYMS

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