CATALOG DOCUMENTATION
NATIONAL COASTAL ASSESSMENT DATABASE
NORTHEAST REGION 2000-2006
BENTHIC GRAB INFORMATION
BENTHIC REPLICATE ABUNDANCE DATA
BENTHIC SUMMARY DATA

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1. DATASET IDENTIFICATION

1.1 Title of Catalog document

National Coastal Assessment Database
Northeast Region 2000-2006
Benthic Replicate Abundance Data
Benthic Grab Information by Replicate
Benthic Summary Data by Station

1.2 Authors of the Catalog entry

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1.3 Catalog revision date

June 2010

1.4 Dataset names

Benthic Grab Information by Replicate
Benthic Replicate Abundance
Benthic Summary Data by Station

1.5 Task Group

National Coastal Assessment-Northeast

1.6 Dataset identification codes

004, 012, 013

1.7 Version

001

1.8 Request for Acknowledgment

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

Protection Agency through its Environmental Monitoring and Assessment Program (EMAP)".

2. INVESTIGATOR INFORMATION

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2.3 Sample Processing Investigators

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3. DATASET ABSTRACT

3.1 Abstract of the Dataset

The Benthic Grab Information, the Benthic Replicate Abundance data, the Benthic Summary Data by station characterize the benthic grab data from samples collected in NCA Estuaries in the Northeast Region in 2000-06. For Benthic Grab Information, one record is presented for each grab collected at a station. The size of the grab sampler used to collect the sediment is reported, as well as the size of the area sampled. The Benthic Replicate Abundance data report the abundance of each benthic taxon found in grab, including the taxonomic name. The Benthic Summary Data reports summary data for each station, including total number of taxa and infauna taxa identified, total abundance of all organisms and total abundance of infaunal organisms.

3.2 Keywords for the Dataset

Benthic species, taxa, invertebrates, community composition, infaunal counts

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

Identify characteristic macroinvertebrate organisms found in benthic grabs collected in estuaries of northeastern United States. Characterize macroinvertebrate communities found in benthic grabs collected in estuaries of northeastern United States.

4.3 Dataset Background Discussion

These data report the Latin name and abundance for each taxon identified in a grab. These data were provided by the contract laboratory performing the analysis.

Different grab samplers were used by NCA partners. Young-modified Van Veen grab samplers, with a sampling area of 0.04 m2, were used by CT, DE, MA, NH, RI, and ME from 2000-06. NJ-Coastal and NJ-Delaware Bay used either a Ponar sampler (0.04 m2) or a Smith McIntyre sampler (0.1 m2) at stations. NY used either a Young-modified Van Veen grab sampler (0.04 m2) or a Smith McIntyre sampler (0.1 m2) from 2000-06.

4.4 Summary of Dataset Parameters

These data were collected to characterize the populations of benthic macro-invertebrates identified in grabs collected in estuaries in the northeast U.S.

5. DATA ACQUISITION AND PROCESSING METHODS

5.1 Data Acquisition / Field Sampling

The sample collection methods used by USEPA trained field crews will be described here. Any significant variations by NCA partners are noted in Section 5.1.12.

5.1.1 Sampling Objective

Benthic grab samples were collected for the identification and enumeration of benthic organisms. Additional sediment sub-samples were collected for the analysis of sediment chemical constituents, sediment grain-size analyses, and toxicity testing.

5.1.2 Sample Collection: Methods Summary

One 'grab' sample was collected from each station using a Young-modified Van Veen grab sampler. The grabs were nominally 440 cm2 in area and 10 cm deep. A sub-sample 2.5 cm in diameter and the depth of the grab was taken from each grab for grain-size analysis. The remaining sediments were live-sieved in the field with a 0.5 mm mesh screen. Organisms retained on the screen were placed in plastic containers and fixed in 10% buffered formalin with rose bengal stain for preservation.

5.1.3 Beginning Sampling Dates

7 July 2000
25 June 2001
2 May 2002
1 May 2003
16 April 2004
20 June 2005
1 June 2006

5.1.4 Ending Sampling Dates

20 October 2000
31 October 2001

31 October 2002
7 November 2003
4 November 2004
22 November 2005
24 November 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: Calibration
The sampling gear does not require any 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.

5.1.12 Sample Collection: Alternate Methods
Different grab samplers were used by NCA partners. Young-modified Van Veen grab samplers, with a sampling area of 0.04 m2, were used by CT, DE, MA, NH, RI, and ME from 2000-06. NJ-Coastal and NJ-Delaware Bay used either a Ponar sampler (0.04 m2) or a Smith McIntyre sampler (0.1 m2) at stations. NY used either a Young-modified Van Veen grab sampler (0.04 m2) or a Smith McIntyre sampler (0.1 m2) in 2000 and 2002-06. No benthic samples were reported for NY in 2001.

5.2 Data Preparation and Sample Processing
5.2.1 Sample Processing Objective
To identify and count all infaunal and epifaunal organisms present in benthic grab samples.

5.2.2 Sample Processing: Methods Summary
All taxa in a grab sample were sorted by a technician and then identified and counted by a skilled taxonomist. Only organisms larger than 0.5 mm were processed; therefore groups such as turbellarian

flatworms, nematodes, ostracods, harpacticoid copepods and foraminifera were excluded from the identification process.

5.2.3 Sample Processing: Calibration
Not applicable

5.2.4 Sample Processing: Quality Control
A minimum of 10% of all samples sorted by each technician were resorted to monitor performance and provide feedback to maintain acceptable standards. Only skilled taxonomists conducted the organism identification. A minimum of 10% of samples were re-checked by other qualified taxonomists for accuracy in identification and enumeration. Species lists from different labs were cross-checked. Inconsistencies in nomenclature were corrected as necessary.

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. Narragansett (RI): U.S. Environmental Protection Agency, Office of Research and Development, 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
Total abundance and number of taxa by station

6.2 Data Manipulation Description
Abundance and number of taxon were summed by station.

7. DATA DESCRIPTION

7.1 Description of Parameters

7.1.1 Components of the Dataset

7.1.1.1 Benthic Grab Information by Replicate

Attribute Name	Format	Description
Data Group	VARCHAR2(4)	Data group conducting sampling
Sampling Year	NUMBER(4.0)	Year of data collection
Station Name	VARCHAR2(20)	The station identifier
Sampling Collection Date	DATE	Date of sample collection
Grab Replicate Number	NUMBER(2.0)	Benthic grab replicate number
Siltclay (%)	NUMBER(6.3)	Silt-clay content (%)
Moisture (%)	NUMBER(5.2)	Moisture content (%)
Penetration Depth (mm)	NUMBER(4.0)	Depth of grab penetration (mm)
Area	NUMBER(8.2)	Area sampled by benthic grab
Area Units	VARCHAR2(15)	Units of area sampled
Collection Gear	VARCHAR2(240)	Name of benthic sampling gear

7.1.1.2 Benthic Replicate Abundance Data

Attribute Name	Format	Description
Data Group	VARCHAR2(4)	Data group conducting sampling
Sampling Year	NUMBER(4.0)	Year of data collection
Station Name	VARCHAR2(20)	The station identifier

Sampling Collection Date	DATE	Date of sample collection
Replicate Number	NUMBER(2.0)	Benthic grab replicate number
Latin Name	VARCHAR2(78)	Latin name of the taxon
Replicate Abundance (#)	NUMBER(6.0)	Organisms (#) of the taxon in grab
Sieve Size (mm)	NUMBER(5.2)	Sieve size used for sample

7.1.1.3 Benthic Grab Summary Data

Attribute Name	Format	Description
Data Group Code	VARCHAR2(4)	Data Group Conducting Sampling
Sampling Year	NUMBER(4.0)	Year of data collection
Station Name	VARCHAR2(20)	The Station Identifier
Sampling Collection Date	DATE	Date of Sample Collection
Grab Total Count	NUMBER(2.0)	Total Grabs (#) in Summary Data
Taxa Total Count	NUMBER(5.0)	Total # Benthic Taxa: 'n' Grabs
Infaunal Taxa Total Count	NUMBER(4.0)	Total # Infaunal Taxa: 'n' Grabs
Epifaunal Taxa Total Count	NUMBER(4.0)	Total # Epifaunal Taxa: 'n' Grabs
Taxa Mean Count	NUMBER(7.2)	Mean # Benthic Taxa: 'n' Grabs
Infaunal Taxa Mean Count	NUMBER(7.2)	Mean # Infaunal Taxa: 'n' Grabs
Epifaunal Taxa Mean Count	NUMBER(7.2)	Mean # Epifaunal Taxa: 'n' Grabs
Total Abundance	NUMBER(5.0)	Total # Organisms: 'n' Grabs
Infaunal Total Abundance	NUMBER(5.0)	Total # Infaunal Organisms: 'n' Grabs
Epifaunal Total Abundance	NUMBER(5.0)	Total # Epifaunal Organisms: 'n' Grabs
Mean Abundance	NUMBER(7.2)	Mean # Organisms: 'n' Grabs
Infaunal Mean Abundance	NUMBER(7.2)	Mean # Infaunal Organisms: 'n' Grabs
Epifaunal Mean Abundance	NUMBER(7.2)	Mean # Epifaunal Organisms: 'n' Grabs
Mean Biomass (g)	NUMBER(6.4)	Mean Biomass (g): 'n' Grabs, all Taxa
Total Biomass (g)	NUMBER(6.4)	Total Biomass (g): 'n' Grabs, all Taxa
Mean Siltclay (%)	NUMBER(6.3)	Mean Silt/Clay Content (%): 'n' Cores
Mean Moisture (%)	NUMBER(5.2)	Mean Moisture Content (%): 'n' Cores
Mean Grab Penetration Depth (mm)	NUMBER(4.0)	Grab Penetration: Mean Depth (mm)
H' Diversity Index	NUMBER(8.2)	Mean infaunal H prime diversity per grab

7.1.2 Precision of Reported Values

Abundance counts are reported as whole numbers

7.1.3 Minimum Value in Dataset

7.1.3.1 Benthic Replicate Abundance Data

Replicate Abundance	0

7.1.3.2 Benthic Grab Summary Data

Taxa Total Count	0
Total Abundance	84

7.1.4 Maximum Value in Dataset
7.1.4.1 Benthic Replicate Abundance Data
Replicate Taxon Abundance 21192

7.1.4.2 Benthic Grab Summary Data
Taxa Total Count 0
Total Abundance 21574

7.2 Data Record Example
7.2.1 Column Names for Example Records
7.2.1.1 Benthic Grab Information by Replicate
Data Group,Sampling Year,Station Name,Sampling Collection Date,
Latitude Decimal Degrees,Longitude Decimal Degrees,Grab Replicate Number,
Penetration Depth (mm),Area,Area Units,Collection Gear

7.2.1.2 Benthic Replicate Abundance Data
Data Group,Sampling Year,Station Name,Sampling Collection Date,
Latitude Decimal Degrees,Longitude Decimal Degrees,Replicate Number,
Latin Name,Replicate Abundance,Sieve Size (mm)

7.2.1.3 Benthic Grab Summary Data
Data Group,Sampling Year,Station Name,Sampling Collection Date,
Latitude Decimal Degrees,Longitude Decimal Degrees,Grab Total Count,
Taxa Total Count,Infaunal Taxa Total Count,Total Abundance,
Infaunal Total Abundance

7.2.2 Examples of Data Records
7.2.2.1 Benthic Grab Information by Replicate
National Coastal Assessment-Northeast/Connecticut,2000,CT00-0001-A,
17-AUG-2000,41.151,-73.22,1,100,0.04,sq. m,
1/25-m2 stainless steel Kynar-coated, Young-modified Van Veen Grab sampler
National Coastal Assessment-Northeast/Connecticut,2000,CT00-0005-A,
18-SEP-2000,41.274,-72.327,1,100,0.04,sq. m,
1/25-m2 stainless steel Kynar-coated, Young-modified Van Veen Grab sampler
National Coastal Assessment-Northeast/Connecticut,2000,CT00-0007-A,
10-AUG-2000,41.298,-73.066,1,100,0.04,sq. m,
1/25-m2 stainless steel Kynar-coated, Young-modified Van Veen Grab sampler

7.2.2.2 Benthic Replicate Abundance Data
National Coastal Assessment-Northeast/Connecticut,2000,CT00-0001-A,
17-AUG-2000,41.151,-73.22,1,Bivalvia,4,0.50
National Coastal Assessment-Northeast/Connecticut,2000,CT00-0001-A,
17-AUG-2000,41.151,-73.22,1,Cirratulidae,529,0.50
National Coastal Assessment-Northeast/Connecticut,2000,CT00-0001-A,
17-AUG-2000,41.151,-73.22,1,Corophium spp,1,0.50
National Coastal Assessment-Northeast/Connecticut,2000,CT00-0001-A,
17-AUG-2000,41.151,-73.22,1,Crepidula fornicata,4,0.50

7.2.2.3 Benthic Grab Summary Data
National Coastal Assessment-Northeast/Massachusetts,2001,BU01-0001-A,
22-AUG-2001,41.604,-70.643,1,53,53,389,389
National Coastal Assessment-Northeast/Massachusetts,2001,BU01-0007-A,
07-AUG-2001,41.695,-70.751,1,32,32,166,166
National Coastal Assessment-Northeast/Massachusetts,2001,BU01-0013-C,
22-AUG-2001,41.566,-70.651,1,53,53,395,395

8. GEOGRAPHIC AND SPATIAL INFORMATION

8.1 Minimum Longitude (Westernmost)
-77.3041 decimal degrees

8.2 Maximum Longitude (Easternmost)
-66.9562 decimal degrees

8.3 Minimum Latitude (Southernmost)
36.5637 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 Virginia.

9. QUALITY CONTROL AND QUALITY ASSURANCE

9.1 Measurement Quality Objectives
The measurement quality objectives of the EMAP-Estuaries program specifies that sorting, counting and identification procedures be accurate to within 10% (see U.S. EPA 2001).

9.2 Data Quality Assurance Procedures
A minimum of 10% of all samples processed were resorted by a second qualified technician. A minimum of 10% of all samples processed by each taxonomic technician was checked by a second senior taxonomist to verify the accuracy of species identification and enumeration.

9.3 Actual Measurement Quality
Not applicable

10. DATA ACCESS

10.1 Data Access Procedures
Data can be accessed at: http://www.epa.gov/emap/nca/html/data/

10.2 Data Access Restrictions
None

10.3 Data Access Contact Persons
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10.4 Dataset Format
Tab-delimited ASCII files

10.5 Information Concerning Anonymous FTP
Not available

10.6 Information Concerning WWW
Data can be downloaded from the WWW server.

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.

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

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