

US EPA ARCHIVE DOCUMENT

CATALOG DOCUMENTATION  
NATIONAL COASTAL ASSESSMENT DATABASE  
NORTHEAST REGION 2000-2006  
SEDIMENT GRAIN COMPOSITION DATA

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1. DATASET IDENTIFICATION
    - 1.1 Title of Catalog document  
National Coastal Assessment Database  
Northeast Region 2000-2006  
Sediment Grain Composition Data
    - 1.2 Authors of the Catalog entry  
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    - 1.3 Catalog revision date  
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Sediment Grain Composition Data
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National Coastal Assessment-Northeast
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## 3. DATASET ABSTRACT

### 3.1 Abstract of the Dataset

The Sediment Grain Composition Data report the grain size, total organic carbon (TOC), and percent moisture of sediments collected in Northeast estuaries sampled during the 2000-06 NCA northeast program. Percent moisture was measured in 2000-01. One record is presented per sampling event. These measurements were made on the same sediments collected for sediment chemistry measurements.

### 3.2 Keywords for the Dataset

Percent sand, percent silt-clay, TOC, total organic carbon, percent moisture

## 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 objective of the Sediment Grain Composition Data is to characterize the grain size, percent total organic carbon (TOC), and percent moisture in sediment collected in 2000-06 in estuaries of the northeast.

### 4.3 Dataset Background Discussion

The grain size, moisture content, and total organic carbon content of sediments are properties that may affect the sediment's ability to bind chemical contaminants. Sediment characteristics were measured on the same grabs used to measure chemical and toxicological properties of the sediments, and can therefore be used to help interpret those results.

The grain-size parameters, sand and silt/clay, show a strong correlation between size and composition. Particles larger than 63 microns are defined to be sand, while particles smaller than 63 microns are considered to be silt-clay; however, the mineralogical composition of the sediment particles was not analyzed directly.

#### 4.4 Summary of Dataset Parameters

The Sediment Grain Composition Data report grain size, percent total organic carbon (TOC), and percent moisture in estuarine sediment collected in 2000-06.

### 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<sup>2</sup> 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.

##### 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 m<sup>2</sup>, 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.

#### 5.1.12 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

Sediment samples were analyzed to measure the sediment grain size (reported as either < 63 microns or > 63 microns), the percent total organic carbon (TOC), and percent moisture (2000-01).

#### 5.2.2 Sample Processing: Methods Summary

For the grain size analysis, sediments were homogenized and diluted to a suspended slurry with the aid of chemical dispersant, and the suspension passed through a 63 micron sieve. The fine fraction passing through the sieve (<63 micron) and the coarse fraction retained on the filter (>63 micron) were separately dried and weighed. A small correction to the weight was applied to account for the salt and dispersant residue remaining after evaporation. Silt/clay was calculated as the salt-free weight of the fine fraction divided by the combined fine plus coarse salt-free weights (the result expressed as a percentage). Sand was calculated as 100% minus Silt/clay. For the moisture analysis, the sediments were homogenized and dried, and percent moisture was calculated from the loss in weight after correcting for salt remaining after evaporation.

For the percent total organic carbon (TOC) analysis, sediment samples were acidified by immersion in 10% HCl to remove inorganic carbonate materials. The dried sediments were oxidized in a muffle furnace at 950 deg C in pure O<sub>2</sub>. The evolved CO<sub>2</sub> gas was integrated, compared to standard curves, and reported as percent organic carbon based on dry weight.

#### 5.2.3 Sample Processing: Calibration

The apparatus for TOC measurements was calibrated by combusting standard reference materials, in accordance with standard laboratory procedures.

#### 5.2.4 Sample Processing: Quality Control

Replicate analyses are performed on 10% of samples. Standard materials are included with each batch of TOC analyses.

5.2.5 Sample Processing: References

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.

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.

5.2.6 Sample Processing: Alternate Methods  
Not Applicable

6. DATA ANALYSIS AND MANIPULATIONS

6.1 Name of New or Modified Values  
Not applicable

6.2 Description of Data Manipulation  
Not applicable

7. DATA DESCRIPTION

7.1 Description of Parameters

7.1.1 Components of the Dataset

Attribute Name	Format	Description
Data Group	VARCHAR2(4)	Data Group Conducting Sampling
Sampling Year	NUMBER(4.0)	Year During Which Data Were Collected
Station Name	VARCHAR2(20)	The Station Identifier
Sampling Collection Date	DATE	Date of Sample Collection
Silt/clay (%)	NUMBER(5.1)	Silt/Clay (%) in Sample
Sand (%)	NUMBER(5.1)	Sand (%) in Sample
Silt (%)	NUMBER(5.1)	Silt (%) in Sample
Clay (%)	NUMBER(5.1)	Clay (%) in Sample
Moisture (%)	NUMBER(5.1)	Sediment Moisture Content(%)
TOC	NUMBER(6.3)	Total Organic Carbon
TOC Units	VARCHAR2(15)	Total Organic Carbon units

7.1.2 Precision of Reported Values

Sand, Silt/clay, Moisture and TOC are reported as percentages to 0.01%. Values are reliable to no more than three significant digits; however more significant digits may be reported in the data set.

7.1.3 Minimum Value in Dataset

SAND	0.0%
SILT/CLAY	0.02%
MOISTURE	6.2%
TOC	0.0%

7.1.4 Maximum Value in Dataset

SAND	99.98%
SILT/CLAY	99.98%
MOISTURE	91.5%
TOC	100.00%

## 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, Silt/clay (%), Sand (%),  
Moisture (%), TOC, TOC Units

### 7.2.2 Example Data Records

National Coastal Assessment-Northeast/Connecticut, 2000, CT00-0001-A,  
17-AUG-2000, 41.151, -73.22, , , 2.69, %

National Coastal Assessment-Northeast/Connecticut, 2000, CT00-0007-A,  
10-AUG-2000, 41.298, -73.066, , , 0.55, %

National Coastal Assessment-Northeast/New Jersey/Delaware Bay, 2000,  
DE00-0037-A, 28-SEP-2000, 39.225, -75.401, 35.4, 64.7, 40.7, 0.91, %

National Coastal Assessment-Northeast/New Jersey/Delaware Bay, 2000,  
DE00-0039-A, 09-OCT-2000, 39.063, -75.381, 71.6, 28.4, 52.2, 1.7, %

## 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

Measure replicate grain size of samples to within a precision of 10%.

### 9.2 Data Quality Assurance Procedures

### 9.3 Actual Measurement Quality

## 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

Salonen, K. 1979. A versatile method for the rapid and accurate determination of carbon by high temperature combustion. *Limnol. Oceanogr.* 24:1770-183.

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.

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

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