

DRAFT CATALOG DOCUMENTATION
NATIONAL COASTAL ASSESSMENT- NORTHEAST DATABASE
YEAR 2000 STATIONS
SEDIMENT CHARACTERISTICS DATA: "SEDGRAIN"

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1. DATASET IDENTIFICATION

1.1 Title of Catalog document

National Coastal Assessment-Northeast Region Database
Year 2000 Stations
SEDIMENT CHARACTERISTICS DATA

1.2 Authors of the Catalog entry

John Kiddon, U.S. EPA NHEERL-AED
Harry Buffum, CSC Corp.

1.3 Catalog revision date

1.4 Dataset name

SEDGRAIN

1.5 Task Group

National Coastal Assessment-Northeast

1.6 Dataset identification code

007

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)

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2.2 Sample Collection Investigators

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2.3 Sample Processing Investigators

Not applicable

3. DATASET ABSTRACT

3.1 Abstract of the Dataset

The SEDGRAIN data file reports the grain size, total organic carbon (TOC), and moisture content of sediments collected in Northeast estuaries sampled during the summer of 2000. Grain size is reported as percent silt/clay or percent sand, representing particles that are less than 63 microns or greater than 63 microns, respectively. One record is presented for each sampling event. These measurements were performed on the same sediment samples used to measure the chemical and toxicological properties of the sediments, and are therefore complementary to the data contained in SEDCHEM and SEDTOX files.

3.2 Keywords for the Dataset

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

4. OBJECTIVES AND INTRODUCTION

4.1 Program Objective

The Coastal 2000 Initiative is a national EMAP effort. In Coastal 2000 we are demonstrating a consistent, integrated, probabilistic monitoring effort that will produce a national assessment of the condition of the U.S. marine estuaries. We partnered with EPA Regions, EPA's Office of Water, state resource/protection agencies in the 24 marine coastal states and Puerto Rico, USGS, and NOAA to conduct the sampling of estuaries during the late summer months of 2000 and 2001. A minimum of 50 sampling locations in each state have been established within EMAP's probabilistic sampling framework. From this we will develop a national report on the condition of the Nations's estuaries, as well as reports on the condition of the estuaries in each of the individual states and Puerto Rico. In 2002 we are beginning our assessment of the condition of the near-shore coastal environments to complement EPA's ongoing efforts to improve beach monitoring.

4.2 Dataset Objective

The objective of the SEDGRAIN data file is to report the grain size, total organic carbon (TOC), and moisture concentrations in sediment samples. These measurements complement the measurements of chemical contaminants and

toxicity performed on the same sediment samples.

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. The SEDGRAIN data 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.

Notes: (1) The grain-size parameters are labeled SAND and SILTCLAY because of the 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

*STATION	Station name
*STAT_ALT	Alternate Site Code (A,B,C)
*EVNTDATE	Event date
SAND	Grain size of sediment particles, reported as the percent of sediment dry weight that is composed of particles <i>larger</i> than 63 microns.
SILTCLAY	Grain size of sediment particles, reported as the percent of sediment dry weight that is composed of particles <i>smaller</i> than 63 microns.
MOISTURE	Moisture content in sediment sample (%).
TOC	Total organic carbon content in sediment sample (%).
LABCODE	A code identifying the group responsible for processing of samples: EPA USEPA for grain size; A.D. Little for TOC and Moisture: CT No grain size or moisture; CT Cooperative agreement for TOC NY No grain size or moisture; NY Cooperative agreement for TOC

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

5. DATA ACQUISITION AND PROCESSING METHODS

5.1 Data Acquisition / Field Sampling

The sample collection methods used by USEPA field crews are described here. Significant variations by NCA partners are noted in Section 5.1.12. Details regarding NCA partners are reported in the EVENTS data file.

5.1.1 Sampling Objective

Sediment sub-samples were collected for the measurement of grain size, moisture content, and total organic carbon content. The sub-samples were prepared from a homogenate of the upper two-centimeters of sediment grabs. The remaining portions of the grabs were used for chemical and toxicological analysis.

5.1.2 Sample Collection: Methods Summary

Multiple sediment grabs were collected from each site using a Young-modified Van Veen grab or similar sampler. The primary purpose of these

grabs was to characterize the chemical and toxicological properties of the sediment. Each grab was nominally 440 cm² in area and up to 10 cm in depth, but only the top two-centimeter layer of a grab was retained for the analyses described here. A sufficient number of grabs were processed to provide three liters of sediment. The sediment composite was homogenized and separated into two fractions for storage until analysis. One fraction was frozen and used in the analysis of TOC, percent moisture and the measurement of the chemical contaminants. The second fraction was chilled but never frozen during storage, and was used for grain-size and toxicity analyses.

5.1.3 Beginning Sampling Dates

5.1.4 Ending Sampling Dates

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 or similar 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: Collection

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. 1998. Environmental Monitoring and Assessment Program - Mid-Atlantic Integrated Assessment. Estuaries Component, Field Operations and Safety Manual. U.S. EPA, Office of Research and Development, NHEERL-AED, Narragansett, RI. July, 1998.

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

Not applicable

5.2 Data Preparation and Sample Processing

The processing methods used by USEPA contracts will be described here (LABCODE = EPA). Any significant variations by NCA partners are noted in Section 5.2.6.

5.2.1 Sample Processing Objective

Sediment samples were analyzed to measure the sediment grain size. The grain size is reported as either smaller than or larger than 63 microns. The percent total organic carbon (TOC) and percent moisture of the sediments were also measured.

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. SILTCLAY 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 SILTCLAY. See USEPA, 1998 for details. 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 °C in pure O₂. The evolved CO₂ 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

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.

Texas A & M University, Geochemical and Environmental Research Group. 1990. NOAA Status and Trends, Mussel Watch Program, Analytical Methods. Submitted to NOAA. Rockville (MD): U.S. Dept. of Commerce, National Oceanic & Atmospheric Administration, Ocean Assessment Division.

5.2.6 Sample Processing: Alternate Methods

Samples with LABCODE= CT, NY were not analyzed for grain size. (Note: several samples with LABCODE=EPA have missing values for TOC because of damaged sample jars)

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

NAME	TYPE	LENGTH	LABEL
STATION	Char	9.00	Station Identifier
STAT_ALT	Char	1.00	Station Location (A,B or C)
EVNTDATE	Num	8.00	Event Date
SILTCLAY	Num	8.00	Silt/Clay Content (%)
SAND	Num	8.00	Sand Content (%)
MOISTURE	Num	8.00	Moisture Content (%)
TOC	Num	8.00	Total Organic Carbon (%)
LABCODE	Char	3.00	Contract/Lab Identifier

7.1.2 Precision of Reported Values

SAND, SILTCLAY, 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 dataset because of formatting restrictions.

7.1.3 Minimum Value in Dataset

SAND	0.47%
SILTCLAY	0.00%
MOISTURE	16.3%
TOC	0.03%

7.1.4 Maximum Value in Dataset

SAND	100%
SILTCLAY	99.5%
MOISTURE	91.5%
TOC	13.7%

7.2 Data Record Example

7.2.1 Column Names for Example Records

STATION	STAT_ALT	EVNTDATE	SILTCLAY	SAND	MOISTURE	TOC	LABCODE
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7.2.2 Example Data Records

STATION	STAT_ALT	EVNTDATE	SILTCLAY	SAND	MOISTURE	TOC	LABCODE
CT00-0001	A	08/17/00				2.69 CT	
CT00-0007	A	08/10/00				0.55 CT	
CT00-0009	A	08/29/00				0.15 CT	

8. GEOGRAPHIC AND SPATIAL INFORMATION

8.1 Minimum Longitude (Westernmost)

-77.4339 decimal degrees

8.2 Maximum Longitude (Easternmost)

-74.7230 decimal degrees

8.3 Minimum Latitude (Southernmost)

34.8702 decimal degrees

8.4 Maximum Latitude (Northernmost)

40.1470 decimal degrees

8.5 Name of 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

Measure replicate grain size of samples to within a precision of 10% (see Valente and Strobel, 1993).

9.2 Data Quality Assurance Procedures

9.3 Actual Measurement Quality

10. DATA ACCESS

10.1 Data Access Procedures

Data can be downloaded from the web

10.2 Data Access Restrictions

None

10.3 Data Access Contact Persons

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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

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Valente, R. and Strobel, C.J. 1993. Environmental Monitoring and Assessment Program- Estuaries: 1993 Virginian Province Quality Assurance Project Plan. U.S. EPA, NHEERL-AED, Narragansett, RI. May 1993

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12. TABLE OF ACRONYMS

AED	Atlantic Ecology Division
C	Degrees Celsius
CTD	Conductivity, Temperature, and Depth
DB	Delaware Bay
DO	Dissolved Oxygen
EMAP	Environmental Monitoring and Assessment Program
EPA	U.S. Environmental Protection Agency

GED Gulf Ecology Division
 m Meter
 mg/L Milligrams per liter
 NHEERL National Health and Environmental Effects Research Laboratory
 QA/QC Quality Assurance/Quality Control
 ppt Parts per thousand
 SAV Submerged Aquatic Vegetation
 USEPA United States Environmental Protection Agency
 VER Versar, Inc.
 WWW World Wide Web

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