CATALOG DOCUMENTATION
NATIONAL COASTAL ASSESSMENT- NORTHEAST DATABASE
YEARS 2000-2006
SEDIMENT CHARACTERISTICS DATA: "SEDGRAIN"

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 CHARACTERISTICS DATA

1.2 Authors of the Catalog entry
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1.3 Catalog revision date
October 2009

1.4 Dataset name
SEDGRAIN

1.5 Task Group
National Coastal Assessment-Northeast

1.6 Dataset identification code
005

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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3. DATASET ABSTRACT

3.1 Abstract of the Dataset

The SEDGRAIN data file reports the grain size and total organic carbon (TOC), collected the 2000-2006 NCA program. Data for the states from ME to VA are included here. One record is presented per sampling event.

3.2 Keywords for the Dataset

Percent sand, silt-clay, TOC, Total Organic Carbon

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 SEDGRAIN data file is to report the grain size and percent total organic carbon (TOC) in estuarine sediment collected in 2000-2006.

4.3 Dataset Background Discussion

The grain size 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.

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.

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, MA, and CT 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 records by ST_COOP, Analyte, and year

ST_COOP	PARAM	2000	2001	2002	2003	2004	2005	2006	Grand Total
ME	SAND	26	44	22	29	29	21	23	194
	SILTCLAY	26	44	22	29	29	21	23	194
	TOC	26	45	22	29	23	22	23	190
	MOISTURE	26	43						69
NH	SAND	34	36	19	23	21	18	22	173
	SILTCLAY	34	36	19	23	21	18	22	173
	TOC	33	35	18	23	16	18	22	165
	MOISTURE	33	33						66
MA	SAND	36	46		17	21	23	25	168
	SILTCLAY	36	46		17	21	23	25	168
	TOC	34	38		13	15	22	25	147
	MOISTURE	36	46						82
RI	SAND	34	34		17	15	25	25	150
	SILTCLAY	34	34		17	15	25	25	150
	TOC	21	33		17	18	25	25	139
	MOISTURE	34	34						68
CT	SAND	20	36	13	11	17	8	30	135
	SILTCLAY	20	36	13	11	17	8	30	135
	TOC	26			11	16	6	32	91
NY	SAND	27	30	44	21	17	25		164
	SILTCLAY	27	30	44	21	17	25		164
	TOC	27	31	44	23	22	25		172
NJ-C	SAND	26	40	30	22	31			149
	SILTCLAY	26	40	30	22	31			149

	TOC	23	39	27	22	28			139
	MOISTURE	26	40						66
NJ	SAND						7	46	53
	SILTCLAY						7	46	53
	TOC						14	46	60
NJ-DB	SAND	28	31	35	29	33			156
	SILTCLAY	28	31	35	29	33			156
	TOC	23	31	36	29	29			148
	MOISTURE	28	27						55
DB	SAND						20	28	48
	SILTCLAY						20	28	48
	TOC						20	28	48
DE	SAND	17	20	19	19	2			77
	SILTCLAY	17	20	19	19	2			77
	TOC	11	21	19	19	20			90
	MOISTURE	17	17						34
DI	SAND						25	25	50
	SILTCLAY						25	25	50
	TOC						25	25	50
MD	TOC						23	25	48
VA	SAND						50	50	100
	SILTCLAY						50	50	100
	TOC						50	50	100
Grand Total		920	1147	530	562	559	694	849	5261

Samples collected in 2000-2006 were analyzed by a variety of state and national-contract analytical labs, identified by the parameter LABCODE. The Table below lists the number of records analyzed by the indicated labs by ST_COOP and year. While some indications of minor systematic laboratory biases may be evident for some analytes and labs, the biases were not considered great enough to exclude the results from the database. The parameter LABCODE can be used to more carefully examine the results for laboratory bias. Addresses of the participating labs follow the Table.

Count of nutrient records by ST_COOP, LABCODE, and Year

Count of RESULT		year							
ST_COOP	LABCODE	2000	2001	2002	2003	2004	2005	2006	Grand Total
ME	NAT	104	176	66	87	81	64	69	647
NH	NAT	134	140	56	69	58	54	66	577
MA	NAT	142	176		47	57	68	75	565
RI	NAT	123	135		51	48	75	75	507
CT	CT	66	72	26					164
	NY				3	3	4		10
	NAT				30	47	18	92	187
NY	NY	81	91	132	65	56	75		500

NJ-C	NAT	101	159	87	66	90			503
NJ	NAT						28	138	166
NJ-DB	NAT	107	120	106	87	95			515
DB	NAT						60	84	144
DE	NAT	62	78	57	57	24			278
DI	NAT						75	75	150
MD	NAT						23	25	48
VA	VA						150	150	300
Grand Total		920	1147	530	562	559	694	849	5261

Addresses of analysis laboratories participating in Northeast NCA program:

LABCODE = CT: Environmental Research Institute, University of Connecticut, Storrs, CT 06269-5210w

LABCODE = NY: Marine Sciences Research Center (MSRC), State University of New York at Stony Brook, NY

LABCODE = VA: Water Chemistry Laboratory, Old Dominion University, NORFOLK, VA 23529

LABCODE = NAT: B&B Laboratories, 1902 Pinon. College Station, TX, 77845-5816

NCA planners provide two alternate locations for a station location in the event that the original location cannot be sampled. The parameter STA_ALT indicates whether the station location was the original site, first alternate, or second alternate—STA_ALT = "A", "B", or "C", respectively. Also refer to discussion in the STATIONS metadata file regarding use of this parameter during analysis of the data.

4.4 Summary of Dataset Parameters

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

*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 *larger* than 63 microns.
SILTCLAY	Grain size of sediment particles, reported as the percent of sediment dry weight that is composed of particles *smaller* than 63 microns.
TOC	Total organic carbon content in sediment sample (%).
LABCODE	A code identifying the analytical laboratory: CT State lab for CT NY State lab for NY VA State lab for VA NAT National contract lab for other Northeast states

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 macrofaunal analysis.

5.1.3 Beginning Sampling Dates

7 July 2000

5.1.4 Ending Sampling Dates

5 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.

5.1.12 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 $\geq$ 63 microns)and the percent total organic carbon (TOC) in sediments collected in the 2001 NCA program (northeastern states).

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 ($\geq$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.

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 $^{\circ}$C in pure O2. The evolved $CO2_2$ gas was integrated, compared to standard curves, and reported as percent organic carbon based on dry weight.

The procedures for these analyses are those developed for the EMAP-Estuaries program and described in "EMAP-Estuaries Laboratory Methods Manual Volume 1- Biological and Physical Analyses" (U.S. EPA, 1995).

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

NAME	TYPE	LENGTH	LABEL
STATION	Char	9	Station Identifier
STAT_ALT	Char	1	Station Location (A, B or C)
EVNTDATE	Num	8	Event Date
SILTCLAY	Num	8	Silt/Clay Content (%)
SAND	Num	8	Sand Content (%)
TOC	Num	8	Total Organic Carbon (%)
LABCODE	Char	3	Contract/Lab Identifier

7.1.2 Precision of Reported Values
SAND, SILTCLAY 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%
SILTCLAY	0.02%
TOC	0%

7.1.4 Maximum Value in Dataset

SAND	99.98%
SILTCLAY	99.98%
TOC	100%

7.2 Data Record Example

7.2.1 Column Names for Example Records

STATION	STAT_ALT	EVNTDATE	SILTCLAY	SAND	TOC	LABCODE

7.2.2 Example Data Records

station	stat_alt	evntdate	siltclay	sand	toc	labcode
CT03-0021	A	8/20/2003	80.2	19.8	2.75	NAT_B&B
CT03-0034	A	8/27/2003	78.2	21.8	1.54	NAT_B&B
CT03-0035	A	8/27/2003	13.15	86.85	0.26	NAT_B&B

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 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 USEPA 2001).

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
http://www.epa.gov/emap/nca/html/regions/index.html

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

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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