CATALOG DOCUMENTATION
NATIONAL COASTAL ASSESSMENT- NORTHEAST DATABASE
YEAR 2002 STATIONS
WATER COLUMN NUTRIENTS DATA: "NUTRNTS"

TABLE OF CONTENTS

1. DATASET IDENTIFICATION

1.1 Title of Catalog document
National Coastal Assessment-Northeast Region Database
Year 2002 Stations
Water Column Nutrients Data

1.2 Authors of the Catalog entry
John Kiddon, U.S. EPA NHEERL-AED
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1.3 Catalog revision date
April 2008

1.4 Dataset name
NUTRNTS

1.5 Task Group
National Coastal Assessment-Northeast

1.6 Dataset identification code
004

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

Donald Cobb, U.S. EPA NHEERL-AED

2.3 Sample Processing Investigators

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3. DATASET ABSTRACT

3.1 Abstract of the Dataset

The NUTRNTS data file reports the concentrations of nutrients and related parameters measured in the National Coastal Assessment during the summer of 2002. Included is information regarding ammonium, nitrate and nitrite, nitrite, orthophosphate, chlorophyll *a*, and total suspended solids. Results are reported for three water layers—surface, mid-depth, and bottom, except for shallow stations (< 2m), in which case a single mid-depth measurement is reported. Only data for the northeastern states (ME through DE) are included here. One record is presented for each analyte measured per level per sampling event.

3.2 Keywords for the Dataset

Ammonium, nitrate, nitrite, orthophosphate, total suspended solids, chlorophyll *a*

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 was initially also known as the Coastal 2000 Program.

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 will also be used to generate a series of national reports characterizing the condition of the Nation's estuaries.

4.2 Dataset Objective

The NUTRNTS file reports the concentrations of nutrients and related parameters measured in 2002 in the surface, mid-depth, and bottom layers of the water column in Northeast U.S. estuaries.

4.3 Background Discussion

Parameters contained in NUTRNTS data file are listed in Section 4.4. This section provides background information on several of these parameters. The information here pertains to data collected in 2002 in northeastern coastal region, Maine through Delaware.

Massachusetts did not participate in the NCA program in 2002. Rhode Island conducted fish trawls only in 2002; no nutrient parameters were measured. Connecticut visited only the in-shore stations planned for sampling in 2002; no nutrient parameters were measured.

Samples collected in 2002 were analyzed by one of several analytical labs, identified by the parameter LABCODE in Section 4.4. Participating labs in 2002 were:

LABCODE = NAT-ERI: Environmental Research Institute, University of Connecticut, Storrs, CT 06269-5210.

LABCODE = NAT-GED: (Chlorophyll analyses only) USEPA Gulf Ecology Division, 1 Sabine Island Drive, Gulf Breeze, FL 32561

LABCODE =NY_SUFF: (NY analyses only) Suffolk County Dept of Health Services, Hauppaug, NY 11788

LABCODE = NJ: (NJ analyses only) New Jersey Department of Environmental Protection, Trenton, NJ 08625

LABCODE = DE: (DE analyses only) Delaware Department of Natural Resources & Environ Control, 89 Kings Highway, Dover, DE 19901

Water samples were generally collected in the surface mid-depth, and bottom water layers, However, at some shallow stations (<2 m), water was collected at mid-depth only. Results from these shallow stations are designated by the parameter LAYER = "Single." Users may wish to include these single-layer data with surface and/or bottom-layer data during analysis.

Some of the measured values in this file are smaller than the Method Detection Limit (MDL). Such 'non-detects' are reported as zero in this

file, and the record is highlighted with the parameter QACODE = NUT-A. The user may wish to substitute values other than zero for the result, e.g., set the non-detect value to the MDL value, half the MDL value, etc.

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

PARAMETER	LABEL	
*STATION	Station Identifier	
*STAT_ALT	Station Location Alternates	
	A = As originally planned	
	B = First alternate	
	C = Second alternate	
*EVNTDATE	Event Date	
LAYER	Water layer sampled for nutrients	
	Bottom	Bottom layer measurement
	Mid	Mid-water measurement
	Surface	Surface layer measurement
	Single	Single measurement only (in shallow water)
LABCODE	Laboratory responsible for processing of samples	
	DE	DE state lab
	NJ	NJ state lab
	NY-SUFF	NY state labs
	NAT-ERI	National contract lab
	NAT-GED	National contract lab (chlorophyll only)
ANALYTE	Analyte Code	
	NH4	Dissolved Ammonia (mg/L as N)
	NO23	Diss Nitrite and Nitrate (mg/L as N)
	NO2	Dissolved Nitrite (mg/L as N)
	PO4F	Dissolved Orthophosphate (mg/L as P)
	TSS	Total Suspended Solids (mg/L)
	CHLA	Chlorophyll *a* (ug/L)
CONC	Concentration	
UNITS	Unit of Measure	

QACODE	QA Qualifier Code	
	NUT_A	Concentration below detection limit; CONC reported as zero
MDL	Method Detection Limit	

5. DATA ACQUISITION AND PROCESSING METHODS

5.1 Data Acquisition

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. Details regarding NCA partners are reported in the STATIONS data file.

5.1.1 Sampling Objective

Seawater was collected and filtered for use in the measurement of nutrient, phytoplankton and total suspended solids concentrations. Samples were collected in the surface, mid, and bottom water layers, except at some shallow stations (water depth < 2m) where a single mid-depth sample was taken.

5.1.2 Sample Collection: Methods Summary

A seawater sample was collected from surface, mid-depth, and bottom water layers with a 5L Go-Flo® sampling bottle. At some shallow locations (water depth < 2m) only one mid-depth water sample was taken. Duplicate water samples from the same cast were filtered aboard ship with 0.7-micron glass-fiber filter pads (not all duplicates were analyzed), and both the filtered water and filter were immediately frozen. Replicate field samples were also taken from separate casts at approximately 10% of the stations to evaluate the repeatability of the sampling procedure.

5.1.3 Beginning Sampling Dates

25 June 2002

5.1.4 Ending Sampling Dates

31 October 2002

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

5 L Go-Flo® sampling bottle

5.1.7 Manufacturer of Sampling Equipment

Not applicable

5.1.8 Key Variables

Not applicable

5.1.9 Sample Collection: Calibration

The sampling gear does not require calibration

5.1.10 Sample Collection: Quality Control

Duplicate field samples from independent casts were taken, representing about 10% of all events. All parameters were measured on these duplicates, and the measurement precision is reported in Section 9.3.

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. 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.

5.1.12 Sample Collection: Alternate Methods

Not Applicable

5.2 Data Preparation and Sample Processing

The processing procedures of the core NCA water parameters described here are the methods of the national contract laboratory (see Section 4.3). Any significant variations in procedures used by other state labs are noted in Section 5.1.12.

5.2.1 Sample Processing Objective

Water samples were analyzed to measure the concentrations of water column nutrients, total suspended solids and phytoplankton pigments.

5.2.2 Sample Processing: Methods Summary

Filters and filtrate were delivered frozen from sampling locations following a filtration operation using a 0.7 micron glass-fiber filter (see Section 5.1.2). NH4, PO4, NO23, NO2, and Si were measured by analyzing filtered water with a segmented continuous flow analyzer. Chlorophyll *a* pigments were extracted from filter with 90% acetone and

measured without acidification, using the Weshmeyer method. TSS was measured by drying the filter at 103 to 105 °C followed by weighing.

5.2.3 Sample Processing: Calibration

Standard laboratory procedures were followed to assure analytical instruments were calibrated.

5.2.4 Sample Processing: Quality Control

Approximately 5% of all filtered water samples were reanalyzed by the analytical laboratory to determine analytical repeatability of the analytical procedure. Another 5% of dissolved water samples were spiked with a known quantity of constituent and reanalyzed as a test for recovery efficience. For particulate constituents, 10% of all samples were reanalyzed (particulate samples cannot be spiked). Processing quality was considered acceptable if duplicate analyses were consistent within 10% and spiked analyses were as expected within 15%.

5.2.5 Sample Processing: References

D'Elia, C.F., Connor, E.E., Kaumeyer, N.L., Keefe, C.W., Wood, K.V., and Zimmermann, C.F. (1997). Nutrient Analytical Services Laboratory Standard Operating Procedures. Technical Report Series 158-97. Chesapeake Biological Laboratory, University of Maryland Center for Environmental Science, Solomons, MD: 77 pp.

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.

Welschmeyer, N.A. 1994. Fluorometer analysis of chlorophyll *a* in the presence of chlorophyll *b* and pheopigments. Limnology and Oceanography 39:1985-1992.

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

Analyte concentrations smaller than the method detection limit were reported as zero (see Section 4.3).

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
LAYER	Char	8	Water Layer of Nutrients Sample
ANALYTE	Char	5	Analyte Code
CONC	Num	8	Concentration
UNITS	Char	10	Unit of Measure
QACODE	Char	5	QA Qualifier Code
MDL	Num	8	Method Detection Limit
LABCODE	Char	5	Lab identifier

7.1.2 Precision of Reported Values

The values are accurate to no more than three significant digits; however more significant digits may be reported in the dataset because of formatting restrictions.

Parameter	Description	Precision	Min	Max	units
REP_NUM	Replicate Sample Number		1	2	mg/L
NH4	Dissolved Ammonia as N	0.001	0.004	2.28	mg/L
NO23	Diss Nitrite and Nitrate as N	0.0001	0.002	4.61	mg/L
NO2	Dissolved Nitrite as N	0.0001	0.001	0.131	mg/L
PO4F	Dissolved Phosphate as P	0.001	0.003	0.493	mg/L
CHLA	Chlorophyll *a*	0.01	0.12	95.0	ug/L
TSS	Total Suspended Solids	0.1	1.0	272	mg/L

7.1.3 Minimum Value in Dataset

See Section 7.1.2

7.1.4 Maximum Value in Dataset

See Section 7.1.2

7.2 Data Record Example

7.2.1 Column Names for Example Records

station	stat_alt	evntdate	layer	ANALYTE	CONC	UNITS	QACODE	MDL	LABCODE

7.2.2 Example Data Records

station	stat_alt	evntdate	layer	ANALYTE	CONC	UNITS	QACODE	MDL	LABCODE
DE02-0009	A	10/2/2002	Single	CHLA	43	ug/L		1	DE
DE02-0009	A	10/2/2002	Single	NH4	0.261	mg/L		0.005	DE
DE02-0009	A	10/2/2002	Single	NO2	0.029	mg/L		0.003	DE

8. GEOGRAPHIC AND SPATIAL INFORMATION

8.1 Minimum Longitude (Westernmost)

-75.6977 decimal degrees

8.2 Maximum Longitude (Easternmost)

-67.0482 decimal degrees

8.3 Minimum Latitude (Southernmost)

38.4739 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

The measurement quality objectives of the EMAP-Estuaries program specify accuracy and precision requirements of 10% for measured analytes See U.S. EPA for details.

9.2 Data Quality Assurance Procedures

QA procedures included running blanks, spiked samples, and standard reference materials with each batch of samples. Any batch failing to meet the specifications presented in Section 9.1 was reanalyzed or rejected.

9.3 Actual Measurement Quality

All of the data reported in this data file met the QA specifications listed in Section 9.1.

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

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
CSC	Computer Sciences Corporation
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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