

US EPA ARCHIVE DOCUMENT

CATALOG DOCUMENTATION  
NATIONAL COASTAL ASSESSMENT- NORTHEAST DATABASE  
YEAR 2000 STATIONS  
WATER COLUMN NUTRIENTS DATA: "NUTRNTS"

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1. DATASET IDENTIFICATION

1.1 Title of Catalog document

National Coastal Assessment-Northeast Region Database  
Year 2000 Stations  
Water Column Nutrients Data

1.2 Authors of the Catalog entry

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

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)

### 2.1 Principal Investigators

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### 2.2 Sample Collection Investigators

Donald Cobb, U.S. EPA NHEERL-AED

### 2.3 Sample Processing Investigators

Not Applicable

## 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 2000. 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 2000 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 2000 in northeastern coastal region, Maine through Delaware.

A two-year sampling design was employed for 2000-2001 NCA program in the Northeast. Analysts may therefore wish to consider the two years of data together.

Samples collected in 2000 were analyzed by one of several analytical labs, identified by the parameter LABCODE in Section 4.4. Participating labs in 2000 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 =NY\_NYC: (NY city analyses only) New York City Department of Environmental Protection, Flushing, NY 11373

LABCODE = CT-ERI: (CT analyses only) Environmental Research Institute, University of Connecticut, Storrs, CT 06269-5210.

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

LABCODE = MA: (MA analyses only) Dept Environmental, Earth and Ocean Sciences, Univ of Massachusetts, 100 Morrissey Blvd, Boston MA, 02125

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.

Field replicate samples (i.e., samples taken from separate casts) were collected at about 10% of stations for quality assurance purposes. The parameter REP\_NUM indicates whether the sample is the original—and often only—sample (REP\_NUM = 1) or a replicate field sample (REP\_NUM = 2). When expressing estuarine condition (e.g., by calculating weighted averages), the user may wish to disregard results from replicate samples to avoid "double counting". Note that replicate samples from the same cast were also generally collected as a backup in case of loss and for use in laboratory QA procedures. Results from such "laboratory splits" are not included in this summary database, but are available from the Data Access Contact Personnel (Section 10.3).

#### 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)

REP Replicate Sample Number

1 Original sample  
 2 Replicate sample (field replicate)

LABCODE Laboratory responsible for processing of samples

CT-ERI CT state lab  
 MA MA state lab  
 NJ NJ state lab  
 NY-SUFF NY state labs  
 NY-NYC NY city 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 / Field Sampling

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

7 July 2000

#### 5.1.4 Ending Sampling Dates

20 October 2000

#### 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). NH<sub>4</sub>, PO<sub>4</sub>, NO<sub>2</sub>, NO<sub>3</sub>, 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 efficiency. 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
REP	Num	4	Replicate Sample Number
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	0.001	0.687	mg/L
NO23	Diss Nitrite and Nitrate as N	0.0001	0.0002	3.26	mg/L
NO2	Dissolved Nitrite as N	0.0001	0.0001	0.13	mg/L
PO4F	Dissolved Phosphate as P	0.001	0.001	0.233	mg/L
CHLA	Chlorophyll a	0.01	0.09	84.0	ug/L
TSS	Total Suspended Solids	0.1	0.72	149	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	REP	ANALYTE	CONC	UNITS	QACODE	MDL	LABCODE
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7.2.2 Example Data Records

STATION	STAT_ALT	EVNTDATE	LAYER	REP	ANALYTE	CONC	UNITS	QACODE	MDL	LABCODE
CT00-0001	A	8/17/00	Mid	1	NH4	0.9	mg/l	.		CT
CT00-0001	A	8/17/00	Mid	1	CHLA	0.9	ug/l	.		CT
CT00-0001	A	8/17/00	Mid	1	NO2	2.1	mg/l	.		CT

8. GEOGRAPHIC AND SPATIAL INFORMATION

8.1 Minimum Longitude (Westernmost)

-75.7737 decimal degrees

8.2 Maximum Longitude (Easternmost)

-67.0939 decimal degrees

8.3 Minimum Latitude (Southernmost)

38.4521 decimal degrees

8.4 Maximum Latitude (Northernmost)

44.9456 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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401-782-3034, 401-782-3030 (FAX), [kiddon.john@epa.gov](mailto:kiddon.john@epa.gov)

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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
deg C	degrees Centigrade
EMAP	Environmental Monitoring and Assessment Program
EPA	Environmental Protection Agency
m	Meter
mg/L	Milligram per Liter
ug/L	Microgram per Liter

NCA National Coastal Assessment  
NHEERL National Health and Environmental Effects Research Laboratory  
QA/QC Quality Assurance/Quality Control  
WWW World Wide Web

13. PERSONNEL INFORMATION

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