CATALOG DOCUMENTATION
NATIONAL COASTAL ASSESSMENT- NORTHEAST DATABASE
YEARS 2000-2006
WATER QUALITY - PHYSICAL DATA: "WATRPHYS"

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1. DATASET IDENTIFICATION

1.1 Title of Catalog document
National Coastal Assessment-Northeast Region Database
Years 2000-2006
Water Quality - Physical Data

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

1.4 Dataset name
WATRPHYS

1.5 Task Group
National Coastal Assessment-Northeast

1.6 Dataset identification code
003

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

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3. DATASET ABSTRACT

3.1 Abstract of the Dataset

The WATRPHYS data file reports physical water quality parameters measured in the National Coastal Assessment during the summer of 2000-2006. Included is information regarding dissolved oxygen, pH, conductivity, salinity, temperature and Secchi depth. Generally, all parameters were measured in both the surface and bottom layers of the water column. At some shallow stations (designated with a QACODE = WTR-A), measurements were performed at only one intermediate water depth and values reported identically in both surface-layer and bottom-layer parameters. Only data for the northeastern states (ME through VA) are included here. One record is presented per sampling event.

3.2 Keywords for the Dataset

Temperature, dissolved oxygen, pH, depth, conductivity, salinity, Secchi depth

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 WATRPHYS data file is to report values of physical water quality parameters, measured during 2000-2006, in the surface and bottom water layers of Northeastern U.S. estuaries

4.3 Dataset Background Discussion

The physical water quality parameters contained in this file include dissolved oxygen, pH, salinity, temperature and Secchi depth. A continuous profile of these parameters (including conductivity but excluding Secchi depth) is measured with a CTD lowered and raised through the water column. Only the surface and bottom measurements are reported in this summary database; however the entire profiles are available from the Data Access Contact Persons (Section 10.3). At some shallow stations (designated with a QACODE = WTR-A), measurements were performed only at one intermediate water depth and values reported identically in both surface-layer and bottom-layer parameters.

The bottom-layer measures represent the deepest water that could be measured. At some very deep stations (over 25 meters), these measures may not be from near the bottom, due to instrumental limitations.

Secchi depth is a measure of water clarity. It is the depth at which a standard Secchi disk disappears from view. If the Secchi disc hit the bottom, the reading may be inaccurate (the true Secchi depth may have been deeper.) In this case, the parameter SECC_BOT is set to "Y".

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 Coded (A, B or C)
*EVNTDATE	Event date
SL_TEMP	Water temperature (deg. C) in the surface layer
SL_SAL	Salinity (ppt) in the surface layer
SL_OXY	Dissolved oxygen concentration (mg/L) in the surface layer
SL_PH	pH in the surface layer
BL_TEMP	Water temperature (deg. C) in the bottom layer
BL_SAL	Salinity (ppt) in the bottom layer
BL_OXY	Dissolved oxygen concentration (mg/L) in the bottom layer
BL_PH	pH in the bottom layer
SECCHI_D	Secchi depth (meters)
SECC_BOT	Secchi on bottom (may indicate inaccurate measurement)
SL_DEPTH	Depth at which surface measurements were measured

BL_DEPTH	Depth at which bottom measurements were measured	
QACODE	QACODE	
	<blank>	No qualification.
	WTR-A	Indicates shallow stations (<2m) which were sampled only at mid-depth. Parameter values are reported identically in both the surface and bottom layer.
	WTR-B	Dissolved oxygen data are suspect due to QA/QC failure during period of sampling.

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

Obtain *in situ* measurements of temperature, salinity, conductivity, dissolved oxygen, pH and secchi depth in the surface and bottom layers of estuaries in Northeastern U.S. states during the 2000-2006 NCA program.

5.1.2 Sample Collection: Methods Summary

Temperature, salinity, conductivity, dissolved oxygen, and pH were measured with a Hydrolab Datasonde or similar instrument, and water clarity was measured using a Secchi disk. The Hydrolab was lowered through the water column, and parameter values were recorded every meter for the first five meters and every two meters thereafter, including a value one meter above the bottom. Only the parameter values measured one meter below the surface and one meter above the bottom are reported in this data file. At some shallow stations (water depth less than 2m), measurements were performed at only one intermediate water depth and the values reported identically in both surface-layer and bottom-layer parameters.

5.1.3 Beginning Sampling Dates

10 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

Hydrolab DataSonde 3 multi-probe data logging units were used. The software program Procomm was used to set up and download profile logging runs to a laptop computer. A YSI dissolved oxygen meter (Model M58) was used to check the Hydrolab DO and temperature readings. Hand-held refractometers were used to QC the Hydrolab salinity measurements. A 20 cm diameter Secchi disk was used with a line marked in 0.2 m intervals.

5.1.7 Manufacturer of Sampling Equipment

Data logger: Hydrolab Corp., Austin, TX.
Dissolved Oxygen probe: YSI Inc.

5.1.8 Key Variables
Not applicable

5.1.9 Sample Collection: Calibration
Calibration of the Hydrolab dissolved oxygen sensor was performed using the air calibration method as described by the manufacturer. The pH probe was calibrated using pH 7 and 10 standard buffer solutions. The salinity sensor was calibrated against a standard whose salinity was measured by a laboratory salinometer (Guildline AutoSal Model 8400) calibrated with IAPSO Standard Seawater ("Copenhagen water"). The salinity measurements were also checked in the field against a hand-held refractometer as a rough check. The YSI dissolved oxygen meters were calibrated immediately prior to each station using the water-saturated air calibration procedure recommended by the manufacturer. The refractometers were calibrated using deionized water and a higher salinity standard traceable to "Copenhagen water".

5.1.10 Sample Collection: Quality Control
Surface values of temperature, salinity and dissolved oxygen measured by the Hydrolab were routinely compared with independent measurements performed on a bucket of surface water (see Section 5.1.2). The Hydrolab values were considered acceptable if the following criteria were met: the two temperature values agree to within two degrees Celsius, salinity values agree to within three ppt, and dissolved oxygen values agree to within 0.5 mg/L. The Secchi depth values were measured by different crew members until values agreed within 0.1 meter.

5.1.11 Sample Collection: References
Strobel, C.J. 2000. Coastal 2000-Northeast Component: Field Operations Manual U. S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Atlantic Ecology Division, Narragansett, RI. EPA/620/R-00/002.

5.1.12 Sample Collection: Alternate Methods
Consult the STATIONS data file for cooperative agreement code (ST_COOP) The different partners used the following equipment:

ST_COOP	Water Profile Equipment (if known)
CT	Sea-bird SBE-19
CT-FSH	Hydrolab Datasonde; Sea-bird SBE-19
DB	
DE	Hydrolab Datasonde
DI	Hydrolab Datasonde
MA	Hydrolab Datasonde; Quanta
MD	
ME	Hydrolab Datasonde
NH	YSI model 6600_M
NJ	Hydrolab Datasonde
NJ-C	Hydrolab Datasonde
NJ-DB	Hydrolab Datasonde
NY	YSI model 6600_M; YSI 85; Seabird model 25
RI	Hydrolab Datasonde

RI-FSH Hydrolab Datasonde
VA

5.2 Data Preparation and Sample Processing
No analytical processing was involved for the WATRPHYS parameters.

5.2.1 Sample Processing Objective
Not applicable

5.2.2 Sample Processing: Methods Summary
Not applicable

5.2.3 Sample Processing: Calibration
Not applicable

5.2.4 Sample Processing: Quality Control
Not applicable

5.2.5 Sample Processing: References
Not applicable

5.2.6 Sample Processing: Alternate Methods
Not applicable

6. DATA ANALYSIS AND MANIPULATIONS

6.1 Name of New or Modified Value
Surface and Bottom Measurements

6.2 Data Manipulation Description
Surface and bottom measurements were extracted from continuous water profile data files by (1) sorting all records from the same water profile by depth; (2) selecting the first (minimum depth) record for all surface values; (3) selecting the last (maximum depth) for all bottom measures

7. DATA DESCRIPTION

7.1 Description of Parameters

7.1.1 Components of the Dataset

SL_DEPTH	NUM	8	Depth of Surface Measurements (m)
STATION	Char	10	Station Name
STAT_ALT	Char	1	Alternate Site Code (A, B, or C)
EVNTDATE	Num	8	Event Date
SL_TEMP	Num	8	Surface Temperature (deg. C)
SL_SAL	Num	8	Surface Salinity (ppt)
SL_OXY	Num	8	Surface Dissolved Oxygen (mg/L)
SL_PH	Num	8	Surface Layer-pH (pH units)
BL_DEPTH	NUM	8	Depth of Bottom Measurements (m)
BL_TEMP	Num	8	Bottom Temperature (deg. C)
BL_SAL	Num	8	Bottom Salinity (ppt)

BL_OXY	Num	8	Bottom Dissolved Oxygen (mg/L)
BL_PH	Num	8	Bottom Layer-pH (pH units)
SECCHI_D	Num	8	Secchi Depth (m)
SECC_BOT	Num	8	Secchi on Bottom (1 = yes)
QACODE	Char	5	QA Qualifier

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	MIN	MAX
evntdate	Event Date	7/10/2000	10/5/2006
sl_temp	Surface Temperature from CTD (deg. C)	6.9	34.5
sl_sal	Surface Salinity from CTD (ppt)	0	34.79
sl_oxy	Surface Dissolved Oxygen from CTD (mg/L)	0.35	16.4
sl_ph	Surface pH (pH units)	4.03	9.5
sl_depth	Surface Reading Depth (m)	0	2.6
bl_temp	Bottom Temperature from CTD (deg. C)	4.55	34.6
bl_sal	Bottom Salinity from CTD (ppt)	0	34.8
bl_oxy	Bottom Dissolved Oxygen from CTD (mg/L)	0	15.57
bl_ph	Bottom pH (pH units)	0	9.5
bl_depth	Bottom Reading Depth (m)	0	49.5
secchi_d	Secchi Depth (me)	0.1	9.5

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 sl_temp sl_sal   sl_oxy  sl_ph   sl_depth
bl_temp  bl_sal   bl_oxy   bl_ph    bl_depth  secchi_d secc_bot qacode
```

7.2.2 Example Data Records

station	stat_alt	evntdate	sl_temp	sl_sal	sl_oxy	sl_ph	sl_depth
CT03-0021	A	8/20/2003	23.52	26.28	7.49		1.8
CT03-0034	A	8/27/2003	21.59	27.91	5.07		2
CT03-0035	A	8/27/2003	22	27.73	5.93		1.8

bl_temp	bl_sal	bl_oxy	bl_ph	bl_depth	secchi_d	secc_bot	qacode
19.74	27.43	1.11		14.2			
21.2	27.91	4.43		10.2			
20.74	27.82	3.19		11.4			

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 area or 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% in the water physical parameters. Reference: 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.

9.2 Data Quality Assurance Procedures
The data were reviewed to assure consistency among partners regarding sampling procedures, reporting format, *etc*. All measurements were performed in the field.

9.3 Actual Measurement Quality
No field replicates were measured for these parameters

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
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

13. PERSONNEL INFORMATION

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