

US EPA ARCHIVE DOCUMENT

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

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1. DATASET IDENTIFICATION

1.1 Title of Catalog document

National Coastal Assessment-Northeast Region Database
Year 2000 Stations
Water Quality - Physical Data

1.2 Authors of the Catalog entry

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1.3 Catalog revision date

December 29, 2003

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)

2.1 Principal Investigators

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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 WATRPYS data file reports physical water quality parameters measured in the National Coastal Assessment during the summer of 2000. 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 DE) 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 five-year NCA program was initiated in 2000, and is 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 objective of the WATRPHYS data file is to report values of physical water quality parameters, measured during 2000, in the surface and bottom water layers of Northeastern U.S. estuaries

4.3 Dataset Background Discussion

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.

This database contains data collected in 2000 from the Northeast component of the NCA, measured in the estuaries of the states Maine through Delaware. Nine federal-state cooperative agreements were formed to conduct the NCA program in Northeast U.S., as designated by the parameter ST_COOP (see Section 4.4). Samples collected by the ST_COOP were analyzed either by a national lab under contract to the EPA or by in-state labs, as designated by the parameter LABCODE (see Section 4.4).

The physical water quality parameters contained in this file include dissolved oxygen, pH, conductivity, salinity, temperature and Secchi depth. A continuous profile of these parameters (except 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.

If the Secchi disc hit the bottom, the reading may have been inaccurate (the true Secchi depth may have been deeper), and the parameter SECC_BOT is set to "1".

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 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

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

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
CT	Sea-bird SBE-19
CT-FSH	Sea-bird SBE-19
DE	Hydrolab Datasonde
MA	Hydrolab Datasonde; Quanta
MA-FSH	Hydrolab Datasonde
ME	Hydrolab Datasonde
NH	YSI model 6600_M
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

For ST_COOP=CT (Connecticut, Long Island Sound) and CT-FSH (Connecticut, LIS Fish Survey): no pH or Secchi depth measurements were performed.

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_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)
SL_DEPTH	NUM	8	Depth of Surface Measurements (m)
BL_DEPTH	NUM	8	Depth of Bottom Measurements (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	PRECISION	MIN	MAX	UNITS
SECCHI_D	0.1	0.1	8.0	meter
SL_TEMP	0.01	11.3	26.8	deg C
SL_SAL	0.01	0.02	34.8	ppt
SL_OXY	0.01	3.35	15.8	mg/L
SL_PH	0.01	5.94	9.36	pH unit
BL_TEMP	0.01	8.50	26.8	deg C
BL_SAL	0.01	0.02	34.8	ppt
BL_OXY	0.01	0.25	15.6	mg/L
BL_PH	0.01	5.90	9.34	pH unit
SL_DEPTH	0.1	0.1	2.4	meter
SL_DEPTH	0.1	0.1	44.5	meter

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
BL_TEMP  BL_SAL   BL_OXY   BL_PH   SECCHI_D SECC_BOT QACODE
```

7.2.2 Example Data Records

STATION	STAT_ALT	EVNTDATE	SL_TEMP	SL_SAL	SL_OXY	SL_PH
CT00-0001	A	8/17/00	21.42	25.44	4.73	.
CT00-0003	A	8/4/00	21.96	0.1	7.68	.
CT00-0007	A	8/10/00	22.43	0.11	7.72	.
CT00-0009	A	8/29/00	22.85	5.57	8.65	.
CT00-0011	B	9/1/00	22.01	27.93	7.5	.
CT00-0013	B	8/29/00	23.39	0.06	9.14	.

BL_TEMP	BL_SAL	BL_OXY	BL_PH	SECCHI_D	SECC_BOT	QACODE
21.36	25.56	4.77	.	1.5		
20.78	0.1	7.2	.	.		
22.12	0.11	5.74	.	1.6		
22.49	9.75	8.21	.	1.4		
20.12	30.23	7.24	.	2.5		
23.38	0.06	9.15	.	1.4		

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 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
CSC	Computer Sciences Corporation
deg C	degrees Centigrade
EMAP	Environmental Monitoring and Assessment Program
EPA	Environmental Protection Agency
mg/L	Milligram per Liter
NCA	National Coastal Assessment
NHEERL	National Health and Environmental Effects Research Laboratory
ppt	parts per thousand
QA/QC	Quality Assurance/Quality Control
WWW	World Wide Web

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