

US EPA ARCHIVE DOCUMENT

CATALOG DOCUMENTATION
NATIONAL COASTAL ASSESSMENT- NORTHEAST DATABASE
YEAR 2001 STATIONS
STATION LOCATION DATA: "STATIONS"

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1. DATASET IDENTIFICATION

1.1 Title of Catalog document

National Coastal Assessment-Northeast Region Database
Year 2001 Stations
Station Location Data

1.2 Authors of the Catalog entry

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1.3 Catalog revision date

October, 2003

1.4 Dataset name

STATIONS

1.5 Task Group

National Coastal Assessment-Northeast

1.6 Dataset identification code

001

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 STATIONS data file reports information regarding stations sampled during 2001 in the National Coastal Assessment in the Northeast Region. Each record reports the planned location of the station (latitude and longitude); various descriptions of the jurisdiction of the station's location (name of state, stratum, and estuary containing the station); identification of the cooperative responsible for sampling; the local identification code assigned to the station; and the area represented by the station and stratum (used as weighting factors during analysis). Weighting factors are presented in two forms: 1) based on state boundaries, and therefore useful for state analyses such as the Clean Water Act 305b report; and 2) based on stratum boundaries, thus useful for use in regional analyses. One record is presented per station.

3.2 Keywords for the Dataset

Latitude, longitude, estuary name, state, cooperative, stratum, weighting factor, area.

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

To report information about station locations and weighting factors used during data analysis.

4.3 Dataset Background Discussion

The station locations (STA_LAT and STA_LNG) presented in this datafile are the *planned* latitude and longitude values designated by program designers. The *actual* latitudes and longitudes, which may differ slightly from the planned values, are reported as EVNT_LAT and EVNT_LNG in the EVENTS datafile. Generally, the user may find the actual location more useful during data analysis.

The parameter ST_COOP identifies the state-cooperative responsible for the administration of the NCA program in the Northeast. Generally, the jurisdiction of the cooperatives reflect state boundaries; however, in several incidences, a state-cooperative sampled stations a in neighboring state's waters (see table below). Station Ids reflect the station's location, rather than the cooperative's identity. Use the parameter STATE to identify all stations located within a state's boundaries.

ST_COOP	Description	Organizations responsible for sampling
ME	Maine	Casco Bay Project/U of Southern Maine
NH	New Hampshire	Jackson Estuarine Lab/UNH
MA	Massachusetts	MA Coastal Zone Mgt. U. of Massachusetts/Boston, Dartmouth
MA-FSH	Massachusetts Fish	Mass. Marine Fisheries (2000 only)
RI	Rhode Island	Roger Williams University (in 2000) University of Rhode Island (in 2001)
RI-FSH	Rhode Island Fish Survey	Roger Williams University (2000 only)
CT	Connecticut	Connecticut DEP
CT-FSH	Connecticut Fish Survey	Connecticut DEP
NY	New York	MSRC, Stonybrook University Suffolk County Dep. Health Services NYC DEP Town of Hempstead
NJ-DB	New Jersey-Delaware Bay	New Jersey Marine Sciences Consortium
NJ-C	New Jersey Coast	New Jersey Marine Sciences Consortium
DE	Delaware Inland Bays	Delaware DNR

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. NCA and State planners divided Northeast estuaries into 24 "strata" based on watershed boundaries and state jurisdiction (see table below). Each stratum was overlain by an imaginary grid of hexagons for the purpose of selecting stations. A primary station location and two alternate

locations were selected at random in the water portion of each hex (alternate sites were specified in case the original location could not be sampled). On average, each stratum contains about 25 hexes (stations). By design, stations within a stratum were grouped with respect to state-cooperative boundaries. An alternate stratification based on state boundaries is described below. The area of the water in a hex is reported for each station (parameter = AREA) for use as a weighting factor during analysis. The entire estuarine area of the stratum is reported for each stratum in the parameter ST_AREA. We describe below how AREA and ST_AREA may be used in analyses. The first table below lists the strata based on ST_COOP jurisdiction; the following table lists strata based on state boundaries. The number of stations in each year of the two-year program are also listed.

Stations stratified by ST_COOP		Number of stations by year		
ST_COOP	STRATA	2000	2001	Total
CT	CT Coastal	9	10	19
	Long Island Sound	20	29	49
CT-FSH	LIS Fish	19	12	31
DE	DE Inland Bays	18	17	35
	DE Inland Bays (Augmented)		4	4
MA	Buzzards Bay	7	8	15
	Buzzards Bay (Augmented)		13	13
	Cape Cod	12	11	23
	Remaining MA	16	16	32
	Salem Sound	3	4	7
MA-FSH	MA Fish	28		28
ME	Casco Bay	7	7	14
	Casco Bay (Augmented)		14	14
	Cobscook Bay	1	2	3
	ME Northern Coast	9	17	26
	Penobscot Bay	12	12	24
NH	New Hampshire	41	41	82
NJ-C	Barneгат Bay (Augmented)		11	11
	NJ Coastal	22	23	45
	NJ Harbor	8	6	14
NJ-DB	DE Estuary East Side	6	6	12
	DE Estuary Small Systems	15	15	30
	DE Estuary West Side	5	5	10
	Delaware River	11	11	22
NY	Hudson River	2	3	5
	NY Harbor	6	7	13
	NY Small Systems	9	9	18
	Southern Long Island	13	17	30
RI	Narragansett Bay	28	28	56
	RI South Coast	7	7	14
RI-FSH	RI Fish	10		10
Total		344	365	709

The stratification scheme described above is useful when performing regional analyses involving the estuarine systems, but may be less convenient for states wishing to evaluate the condition of waters solely

within state boundaries. This is so because a single stratum may fall across state lines. For instance, the Narragansett Bay stratum has stations in both Rhode Island and Massachusetts. Therefore, the original strata were also partitioned (when necessary) to reflect state boundaries. For example, the original Narragansett Bay stratum was partitioned into two sub-strata: Narragansett Bay-RI and Narragansett Bay-MA. [Note that hexes straddling a state border were assigned to one state or the other based on the actual station location (EVNT_LAT and EVNT_LNG), and the recalculated station area is equivalent to that state's portion of water in the hex. While the other state's condition is not reported directly for border hexes, it is rigorously represented as described below.] The names of these alternate strata are listed in the parameter SUBSTRATA, and new station and stratum areas are reported in SUBAREA and SUBST_AR. We describe below how SUBAREA and SUBST_AR may be used in state analyses. The following table lists this alternate stratification scheme, organized by state. In summary, analysts wishing to perform an analysis based on a single state's data should use the parameters SUBSTRATA, SUBAREA, and SUBST_AR.

Stations stratified by State		Number of stations by year		
STATE	SUBSTRATA	2000	2001	Total
CT	CT Coastal	10	12	22
	LI Sound - CT	11	15	26
	LI Sound Fish - CT	8	12	20
DE	DE Inland Bays	18	17	35
	DE Inland Bays (Augmented)		4	4
	Delaware Bay - DE	11	11	22
MA	Delaware Bay - DE Coastal	5	9	14
	Buzzards Bay	7	8	15
	Buzzards Bay (Augmented)		13	13
	Cape Cod	12	11	23
	MA Coastal (AP)	7	8	15
	MA Coastal (VP)	9	8	17
	MA Fish	28		28
	Narragansett Bay - MA	4	4	8
	Salem Sound	3	4	7
	ME	Casco Bay	7	7
Casco Bay (Augmented)			14	14
Cobscook Bay		1	2	3
ME Coastal North		9	17	26
Penobscot Bay		12	12	24
Portsmouth/Piscataqua - ME		7	13	20
NH	NH Coastal	20	19	39
	Portsmouth/Piscataqua - NH	14	9	23
NJ	Barnegat Bay (Augmented)		11	11
	Delaware Bay - NJ	6	6	12
	Delaware Bay - NJ Coastal	9	5	14
	Delaware River - NJ	5	4	9
	NJ Coastal	22	23	45
NY	NJ Harbor	8	6	14
	Hudson River - NY	2	3	5
	LI Sound - NY	9	14	23

	LI Sound Fish - NY	11		11
	NY Coastal - N Long Island	10	9	19
	NY Coastal - S Long Island	13	17	30
	NY Harbor	6	7	13
PA	Delaware Bay - PA Coastal	1	1	2
	Delaware River - PA		1	1
RI	Narragansett Bay - RI	24	24	48
	RI Fish	10		10
	RI South Coast	5	5	10
Total		344	365	709

Two earlier EMAP programs have monitored conditions in the Northeast estuaries: the EMAP-Virginian Province study (1990-93) and the Mid-Atlantic Integrated Assessment or MAIA (1997-98). A user wishing to compare NCA data with these earlier programs can generally identify equivalent regions or estuarine systems based on the descriptive parameters (STRATA, SUBSTRATA, ESTUARY and PROVINCE). Caution is urged because the name designations are not always precise. For example, a few stations in the stratum "Delaware River" are actually located in Delaware Bay. To maintain consistency with the definition used in the earlier programs, "Long Island Sound" may be identified with the combination of four NCA strata: Long Island Sound, CT Coastal, NY Small Systems, and LIS Fish. Likewise, "Delaware Estuary" may be identified with the combination of four strata: DE Estuary East Side, DE Estuary West Side, DE Estuary Small Systems, and Delaware River.

The parameter SYSTEM identifies the estuarine system or region encompassing a station. Generally, the system boundaries are the same as those used in previous EMAP programs; thereby providing continuity when performing analyses. For instance, the SYSTEM named Long Island Sound consists of the Sound proper in addition to all small estuaries along its shores. In some cases, however, the SYSTEM name is merely a convenient collection of regionally associated stations, e.g., Maine Coast, New Jersey Coast, etc. All stations are assigned to one or another of the 19 SYSTEM designations. Please note that the categories defined by this parameter do not necessarily reflect the stratification scheme specified by NCA managers. Rather, the SYSTEM names are intended to be descriptive indicators of location. The following Table lists the SYSTEM names, arranged north to south. The estuaries incorporated into each system and the number of stations visited in each year are also indicated.

Count of STATION	SYSTEM	ESTUARY	YEAR		Total
			2000	2001	
Cobscook Bay		Cobscook Bay		1	1
		East Bay	1		1
		Whiting Bay		1	1
Penobscot Bay		Blue Hill Bay	1	2	3
		Blue Hill Harbor		1	1
		East Penobscot Bay	1	2	3
		Eggemoggin Reach	1		1
		Jericho Bay	1	1	2
		Penobscot River	1	1	2

	Seal Harbor #2 (Muscle Ridge Channel)	1		1
	Searsport Harbor/Long Cove		1	1
	Union River Bay	2	1	3
	West Penobscot Bay	4	3	7
Maine Coast	Englishman Bay		1	1
	Flanders Bay		1	1
	Frenchman Bay	1		1
	Hockomock Bay		1	1
	Kennebec River		1	1
	Lubec Channel		1	1
	Machias Bay	1		1
	Machias River		1	1
	Medomak River		1	1
	Meduncook River		1	1
	Moose Cove	1		1
	Muscongus Sound	1		1
	Narraguagus Bay	2		2
	Saco Bay		3	3
	Scarborough River		1	1
	Sheepscot River	1		1
	Sheepscott Bay	1		1
	Southwest Bay		1	1
	St. Croix River		2	2
	St. George River	1		1
	Sullivan Harbor		1	1
	Wells Embayment		1	1
Casco Bay	Casco Bay	2	2	4
	Casco Bay NEP		14	14
	Cousins Island Sound		2	2
	Diamond Island Roads		1	1
	Harpswell Sound	1		1
	Harraseeket River	1		1
	Luckse Sound	1		1
	New Meadows River	1	2	3
	Portland Harbor	1		1
	SYSTEM		ESTUARY	2000
				2001
				Total
Great Bay Region	Great Bay	11	12	23
	Hampton River/Hampton Harbor	4	4	8
	Little Bay	2	1	3
	Little Harbor	3	2	5
	Piscataqua River	14	16	30
	Portsmouth Harbor	7	6	13
MA North Coast	Beverly Harbor		1	1
	Boston Inner Harbor	1	1	2
	Broad Sound	1		1
	Dorchester Bay		1	1
	Essex Bay	1		1

	Mullica River	2	4	6
	Navesink River	2	1	3
	Reed/Abescon Bays	2	2	4
	Shark River	1	2	3
	Shrewsbury River		1	1
	Toms River	1	1	2
Delaware Bay	Alloway Creek	1		1
	Appoquinimink River		1	1
	Broadkill River	1		1
	C&D Canal	1	1	2
	Cape May Canal	2		2
	Cedar Swamp	1		1
	Christina River	1	2	3
	Cohansey River	2		2
	Delaware Bay	14	12	26
	Dennis Creek	1		1
	Duck Creek		1	1
	Leipsic River	1	1	2
	Mannington Meadow	1		1
	Maurice River	2	2	4
	Mispyllion River		1	1
	Murderkill River		1	1
	Nantuxent Creek		2	2
	St. Jones River		1	1
	Stow Creek		1	1
	West / East Creeks		1	1
DE Inland Bays	Assawoman & Isle Of Wight Bays	1		1
	Indian River Bay	4	5	9
	Little Assawoman Bay	1	3	4
	Nanticoke River	5	4	9
	Pepper Creek	2	1	3
	Rehobeth Bay	5	8	13
Total		344	365	709

Calculations using station areas and stratum areas. The following is a brief description of how an analyst might use station area (AREA or SUBAREA) and stratum area (ST_AREA or SUBST_AR) to estimate estuarine condition in a region or state. For example, we may wish to calculate the percent of estuarine area with dissolved oxygen (DO) concentration less than 5 mg/L. We consider two cases: calculating condition within a single stratum, and determining the condition over multiple strata. The percent of degraded area in a single stratum is calculated simply by 1) summing the station area (AREA or SUBAREA) for stations in the stratum with DO < 5 mg/L; then 2) dividing by the sum of all station areas contributing data in the stratum, i.e., excluding any stations with missing data. Thus, we may find that, based on *stations with data*, 30% of estuarine area has DO < 5

mg/L and 70% has DO \geq 5 mg/L. We may then assume that area with missing data has an identical distribution of condition; therefore, we report that 30% of the *entire stratum* area has DO $<$ 5 mg/L. That is, we use an estimate based on a sub-population of data (stations with data) to estimate the condition of the entire stratum. Note that the stratum area (ST_AREA or SUBST_AR) is not required in this calculation if we wish to express the extent of impaired area in relative terms (i.e., expressed as percent).

To estimate the condition for a region comprised of several strata, the calculate a weighted average of conditions in each stratum, using weighting factors that are proportional to stratum areas: 1) calculate the percent impairment for each stratum in the region (as described above); 2) multiply each estimate by the associated stratum area; and 3) sum these products and divide by the sum of stratum areas. This calculation yields the percent area in the region with impaired condition.

The parameter STA_ALT indicates whether the station location was the original site, first alternate, or second alternate by "A", "B", or "C", respectively. The user may wish to adjust the magnitude of the weighting factor (station areas) based on the value of STA_ALT, for example, by multiplying the weighting factor by 0.5 or 0.33 if sampling crews had to sample at the first or second alternate location, respectively. Such an adjustment reflects the fact that the station did not represent the entire area originally assigned to the station.

4.4 Summary of Dataset Parameters

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

*STATION	Station name
*STAT_ALT	Alternate site code (A, B, or C)
ESTUARY	Estuary name
STA_LAT	Latitude (decimal degrees, datum NAD83)
STA_LNG	Longitude (decimal degrees, datum NAD83)
ST_COOP	State cooperative agreement responsible for sampling
LOCAL_ID	Station identifier used by state
STATE	State jurisdiction of station
PROVINCE	Bio-geographical province containing station (AP or VP)
SYSTEM	Estuarine system or region name
STRATA	Original stratum name: regional stratification scheme
AREA	Station area (km ²): regional stratification scheme
ST_AREA	Stratum area (km ²): regional stratification scheme
SUBSTRAT	Alternate stratum name: state stratification scheme
SUBAREA	Alternate station area (km ²): state stratification scheme
SUBST_AR	Alternate stratum area (km ²): state stratification scheme

5. DATA ACQUISITION AND PROCESSING METHODS

5.1 Data Acquisition / Field Sampling

Data in this data file were not acquired in the field or in laboratories; rather values were assigned by NCA program planners.

5.2 Data Preparation and Sample Processing

No analytical processing was involved with the STATIONS parameters

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

PARAMETER	TYPE	LENGTH	LABEL
STATION	Char	10	NCA station name
STAT_ALT	Char	1	Alternate site code (A, B, C)
STATE	Char	2	State where station is located
ESTUARY	Char	40	Estuary name
PROVINCE	Char	2	Province name
STA_LAT	Num	8.4	Latitude (decimal degrees, datum
STA_LNG	Num	8.4	Longitude (decimal degrees, datum
ST_COOP	Char	6	State Cooperative Agreement
LOCAL_ID	Char	8	Station identifier used by state
STRATA	Char	20	Stratum name (regional scheme)
SYSTEM	Char	20	Estuarine system or region name
AREA	Num	8.3	Station area (regional scheme)
ST_AREA	Num	8.3	Stratum area (regional scheme)
SUBSTRAT	Char	20	Stratum name (state scheme)
SUBAREA	Num	8.3	Station area (state scheme)
SUBST_AR	Num	8.3	Stratum area (state scheme)

7.1.2 Precision of Reported Values

STA_LAT and STA_LNG are reported to 0.0001 decimal degree units. AREA, SUB AREA, ST_AREA, and SUBST_AR are reported to three significant digits.

7.1.3 Minimum Value in Dataset

Name	Min

STA_LAT	38.4739

```

STA_LNG      -75.6977
AREA         0.0001
SUBAREA      0.0001
ST_AREA      49.8
SUBST_AR     2.39
    
```

7.1.4 Maximum Value in Dataset

```

Name          Max
-----
STA_LAT       45.1848
STA_LNG       -66.9798
AREA          198
SUBAREA       198
ST_AREA       3130
SUBST_AR      1690
    
```

7.2 Data Record Example

STATION	STAT_ALT	STATE	ESTUARY	STA_LAT	STA_LNG	PROVINCE	ST_COOP
CT01-0002	A	CT	Housatonic River	41.1757	-73.1230	VP	CT
CT01-0004	B	CT	New Haven Harbor	41.2476	-72.9273	VP	CT
CT01-0006	A	CT	Housatonic River	41.3088	-73.0774	VP	CT

SYSTEM	STRATA	AREA	ST_AREA	SUBSTRAT	SUBAREA	SUBST_AR
LI Sound	CT Coastal	1.82	84.4	CT Coastal	1.82	84.4
LI Sound	CT Coastal	23.8	84.4	CT Coastal	23.8	84.4
LI Sound	CT Coastal	0.171	84.4	CT Coastal	0.171	84.4

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 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 Measure Quality Objective

Not applicable

9.2 Data Quality Assurance Procedures

Not applicable

9.3 Actual Measurement Quality

Not applicable

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

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12. TABLE OF ACRONYMS

AED	Atlantic Ecology Division
DE	Delaware
CSC	Computer Sciences Corporation
CT	Connecticut
EMAP	Environmental Monitoring and Assessment Program
EPA	Environmental Protection Agency
MAIA	Mid-Atlantic Integrated Assessment
MA	Massachusetts
ME	Maine
km ²	Square kilometers
NCA	National Coastal Assessment
NH	New Hampshire
NHEERL	National Health and Environmental Effects Research Laboratory
NJ	New Jersey
NY	New York
NYC	New York City
PA	Pennsylvania
QA/QC	Quality Assurance/Quality Control
RI	Rhode Island
UNH	University of New Hampshire
WWW	World Wide Web

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