CATALOG DOCUMENTATION
EMAP-ESTUARIES PROGRAM LEVEL DATABASE
EMAP-WEST 1999-2006
STATION LOCATION AND VISIT DATA

TABLE OF CONTENTS

1. DATA SET IDENTIFICATION

1.1 Title of Catalog document
National Coastal Assessment Database
1999-2006 EMAP-West
Station Location and Visit Data

1.2 Authors of the Catalog entry
Larry Cooper
Southern California Coastal Water Resources Project

1.3 Catalog revision date
8 September 2011

1.4 Data set name
Station Location and Visit Information

1.5 Task Group
EMAP-West

1.6 Data set identification code
1, 2

1.7 Version
1

1.8 Requested Acknowledgment
If you plan to publish these data in any way, EPA requires a standard statement for work it has supported: "Although the data described in this article have been funded wholly or in part by the U. S. Environmental Protection Agency through its EMAP-National Coastal Assessment Program, it has not been subjected to Agency review, and therefore does not necessarily reflect the views of the Agency and no official endorsement should be inferred."

2. INVESTIGATOR INFORMATION

2.1 Principal Investigator
States of California, Oregon and Washington
Moss Landing Marine Lab (California)
Oregon Department of Environmental Quality
Washington Department of Ecology (Washington)
National Oceanic and Atmospheric Administration

2.2 Investigation Participant-Sample Collection
NA

3. DATA SET ABSTRACT

3.1 Abstract of the Data Set
The Station Location data present a record of where samples were taken at stations during the 1999 through 2006 projects on the West Coast of the United States. The latitude and longitudes reported are the actual locations that were visited. Visit information includes the date and number of the sampling visit and the water depth at the time of the visit. The two (2) character mailing code for the State inside whose geopolitical boundaries the station lies is

reported. The Estuary defines the specific river, bay, creek or other small water body in which the station is located.

3.2 Keywords for the Data Set
Estuary, latitude, longitude, state, station location, EPA region, depth

4. OBJECTIVES AND INTRODUCTION
4.1 Program Objective
EPA's National Coastal Assessment (NCA), is a five-year effort led by EPA's Office of Research and Development to evaluate the assessment methods it has developed to advance the science of ecosystem condition monitoring. C2000 represents the current state of evolution of EPA's Environmental Monitoring and Assessment Program (EMAP). EMAP was originally designed to provide a quantitative assessment of the regional extent of environmental problems by measuring status and change in selected indicators of ecological condition. EMAP provides a strategy to identify and bound the extent, magnitude and location of environmental degradation and improvement on a regional scale.

4.2 Data Set Objective
The objective of the sampling design is to provide a statistically defensible strategy for collecting information about selected indicators of ecological condition and their variability. The design is flexible to allow alternative future uses.

4.3 Data Set Background Discussion
The EMAP-Estuaries sampling design on which C2000 is based combines the strengths of systematic and random sampling with our understanding of estuarine systems. It provides a design that will allow probability-based estimates of the status of the Nation's estuarine systems, the variability associated with that status, its spatial and temporal components, and the temporal trends associated with changes in these systems. The Coastal 2000 sampling design is based on a single, annual sampling season of each station during the Index Period. The design differs from previous EMAP designs in that existing monitoring programs were incorporated where appropriate. 'Biased' programs, such as those designed to evaluate the effects of a treatment plant, would NOT be appropriate for inclusion. Working with the states, the C2000 design team was able to identify a large number of sites that are currently being monitored and meet the criteria for being unbiased in their location. Many were randomly located in the original monitoring design.

C2000 will attempt to assess the condition of the Nation's estuarine waters through statistically valid subsampling. Whereas the original EMAP effort was conducted primarily by EPA and contract staff, C2000 is being implemented in partnership with the 24 coastal states. This partnership recognizes that each of these entities plays an important role in estuarine monitoring. Wherever possible, existing state monitoring programs are being incorporated into the C2000 design. This provides for the maximum utilization of a limited budget, and the flexibility of allowing states to often maintain historical sampling designs. Many of these state programs have been in existence for many years, providing a basis for possible C2000 trends analyses. Each state will conduct the survey and assess the condition of their coastal resources independently. These estimates will then be aggregated to assess the condition at EPA Regional, biogeographical, and National levels. Through this partnership EPA hopes to build infrastructure within the coastal states to improve, and make more inter-comparable, the multitude of estuarine monitoring programs throughout the country.

4.4 Summary of Data Set Parameters
Station location data set values were based on the geographic location of the station, independent of the station visit.

5. DATA ACQUISITION AND PROCESSING METHODS
5.1 Data Acquisition
5.1.1 Sampling Objective
The navigation goal was to be within a 120 ft (1999-2000) or within a 100 ft (2001-2006) radius of the assigned latitude and longitude of a sampling site.

5.1.2 Sample Collection Methods Summary
The randomly selected Western Pilot sampling locations will be provided to the field crews as coordinates of latitude/longitude in degrees-minutes, expressed to the nearest 0.01 minute (i.e., 00 deg 00.00'). The crews will use GPS to locate the site. The acceptable tolerance goal for siting is that the sampling station be established within 0.02' (+-120 ft) of the given coordinates. This reflects the accuracy expected from a properly functioning GPS unit of the caliber that will used for the study. The GPS's performance should be verified on a daily basis. Field crews will strictly adhere to the above guidelines for siting the station, unless there are substantiated reasons that prevent sampling within that defined area.

All stations were visited by small boat whenever possible. If the depth of the station was to shallow to accommodate a small boat, and the station was sampleable, a beach seine was used to

collect the trawl sample and a hand grab device was used to collect the sediment sample. WA: walked into several stations that were inaccessible by boat.

5.1.3 Sampling Start Date
1999: 17 July 1999
2000: 6 June 2000
2001: 17 July 2001
2002: 31 May 2002
2003: 1 June 2003
2004: 3 June 2004
2005: 7 July 2005
2006: 6 June 2006

5.1.4 Sampling End Date
1999: 14 October 1999
2000: 8 October 2000
2001: 18 September 2001
2002: 12 November 2002
2003: 4 June 2004
2004: 26 October 2004
2005: 30 September 2005
2006: 27 September 2006

5.1.5 Platform
Small boat whenever possible or walk in.

5.1.6 Sampling Equipment
Station locations in 1999-2000 were determined using a GPS and are accurate within a radius of 120 ft. North American Datum of 1983 was used. Station locations in 2002-2006 were determined using a GPS and are accurate within a radius of 100 ft. North American Datum of 1983 was used.

5.1.7 Manufacturer of Sampling Equipment
NA

5.1.8 Key Variables
The latitude and longitude of the station location were determined at the time of sampling. According to EPA Locational Policy: 1. Latitude is always presented before longitude; 2. Latitude and longitude are recorded as decimal degrees. The specific method of determining the latitude and longitude was GPS.

5.1.9 Sampling Method Calibration
NA

5.1.10 Sample Collection Quality Control
NA

5.1.11 Sample Collection Method Reference
U.S. Environmental Protection Agency. 2001. Environmental Monitoring and Assessment Program (EMAP) National Coastal Assessment: Field Operations Manual. Office of Research and Development, National Health and Environmental Effects Research Laboratory, Gulf Ecology Division, Gulf Breeze, FL. EPA/620/R-01/003.

5.2 Data Preparation and Sample Processing
Not applicable

6. DATA MANIPULATIONS
Most values in the Stations data set were assigned, based on geographic location. Areas were calculated.

6.1 Name of new or modified values
Station Area

6.2 Data Manipulation Description
The statistical area for stations were calculated.

6.3 Data Manipulation Examples
Not applicable

7. DATA DESCRIPTION
7.1 Description of Parameters
7.1.1 Parameter Name
7.1.1.1 Station location information

Attribute Name	Format	Description
Province	VARCHAR2(4)	Large biogeographic area in which sampling occurred
Resource Name	VARCHAR2(20)	Program conducting sampling
Data Group	VARCHAR2(4)	Data group (project) conducting sampling
Sampling Year	NUMBER(4.0)	Year during which data were collected
EPA Region	VARCHAR2(2)	EPA Region code of station location
State	VARCHAR2(2)	Code for state
Water Body System	VARCHAR2(6)	Large water body code of station location
Estuary Name	VARCHAR2(50)	Small water body where station located
Station Name	VARCHAR2(20)	The station identifier
Latitude Decimal Degrees	NUMBER(9.3)	Station location-decimal degrees of latitude
Longitude Decimal Degrees	NUMBER(9.3)	Station location-decimal degrees of longitude
Station Statistical Area	NUMBER(7.2)	Statistical area (sq. km.) of station
Water Body Strata	VARCHAR2(6)	Design strata:large/small/tidal river
Sample Collection Code	VARCHAR2(18)	Station class-determines sampling regime
Local Station Name	VARCHAR2(20)	Station as identified by project

7.1.1.2 Sampling visit information

Attribute Name	Format	Description
Data Group	VARCHAR2(4)	Data group (project) conducting sampling
Sampling Year	NUMBER(4.0)	Year during which data were collected
Station Name	VARCHAR2(20)	The station identifier
Sampling Collection Date	DATE	Date of sample collection
Visit Number	NUMBER(2.0)	Number of visit to this station
Station Depth	NUMBER(5.1)	Depth of water at station at time of sampling
Depth Units	VARCHAR2(15)	Units of depth

7.1.6 Precision to which values are reported

Station Depth	0.1 meters
Latitude/Longitude	0.00001 deg

7.1.7 Minimum value in data set/7.1.8 Maximum value in data set
Station Depth 0.2 m - 990 m

7.2 Data Record Example
7.2.1 Column Names for Example Records
7.2.1.1 Station location information

Province	Resource Name	Data Group	Sampling Year	EPA Region
State	Water Body System	Estuary Name	Station Name	Latitude Decimal Degrees
Longitude Decimal Degrees		Station Statistical Area		Water Body Strata
Station Class		EMAP Station Name		Local station name

7.2.1.2 Sampling visit information

Data Group	Sampling Year	Station Name	Sampling Collection Date
Visit Number	Station Depth	Depth Units	

7.2.2 Example Data Records
7.2.2.1 Station location

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Province,Resource Name,Data Group,Sampling Year,EPA Region,State,Water Body System,
Estuary Name,Station Name,Latitude Decimal Degrees,Longitude Decimal Degrees,
Station Statistical Area,Water Body Strata,Station Class,Local Station Name

Californian,Estuaries,EMAP-West/Moss Landing Marine Lab,1999,9,CA,Not assigned,
Big Lagoon,CA99-0001,41.161,-124.116,5.53,Unknown,Not categorized,CA3001
Californian,Estuaries,EMAP-West/Moss Landing Marine Lab,1999,9,CA,Not assigned,
Arcata Bay,CA99-0002,40.845,-124.102,33.05,Unknown,Not categorized,CA3002
Californian,Estuaries,EMAP-West/Moss Landing Marine Lab,1999,9,CA,Not assigned,
Arcata Bay,CA99-0003,40.824,-124.141,33.05,Unknown,Not categorized,CA3003
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7.2.2.2 Sampling visit information
Data Group,Sampling Year,Station Name,Sampling Collection Date,Latitude Decimal Degrees,
Longitude Decimal Degrees,Visit Number,Station Depth,Depth Units

EMAP-West/Moss Landing Marine Lab,1999,CA99-0001,04-AUG-1999,41.161,-124.116,1,0.5,m
EMAP-West/Moss Landing Marine Lab,1999,CA99-0002,04-AUG-1999,40.845,-124.102,1,3.5,m
EMAP-West/Moss Landing Marine Lab,1999,CA99-0003,04-AUG-1999,40.824,-124.141,1,1.1,m

8. GEOGRAPHIC AND SPATIAL INFORMATION
8.1 Minimum Longitude
1999: -124.706
2000: -124.045
2001: -124.400
2002: -124.538
2003: -125.016
2004: -124.400
2005: -124.300
2006: -124.637

8.2 Maximum Longitude
1999: -117.129
2000: -121.834
2001: -121.816
2002: -117.107
2003: -117.116
2004: -117.100
2005: -117.100
2006: -117.125

8.3 Minimum Latitude
1999: 32.6387
2000: 37.4108
2001: 37.441
2002: 32.557
2003: 32.551
2004: 32.600
2005: 32.600
2006: 32.633

8.4 Maximum Latitude
1999: 48.3199
2000: 48.9842
2001: 46.000
2002: 48.970
2003: 48.315
2004: 49.000
2005: 48.900
2006: 48.384

8.5 Name of area or region
EMAP-West Stations were located in estuaries along the West Coast of the United States in Washington, Oregon and California. The area includes parts of the Columbian and Californian biogeographical provinces.

9. QUALITY CONTROL AND QUALITY ASSURANCE

9.1 Data Quality Objectives
The acceptable tolerance goal for siting is that the sampling station be established within 0.02'(+-100-120 ft) of the given coordinates.

9.2 Data Quality Assurance Procedures
Because EMAP's probabilistic sampling design is so unbiased, potentially, some of the generated sites can fall in locations that are not amenable to sampling (e.g., shallow conditions, inaccessible, rocky bottom, etc.). Upfront planning by the field team can help resolve these potential problems before they are encountered on the actual day of sampling. Coordinates of the random locations are made available to the teams months in advance of the field monitoring in order that they have adequate opportunity to formulate logistical plans. The reasonable first step is to plot the given sites on NOAA nautical charts to ascertain the spatial distribution of the sites, then reconnoiter (on paper) the charted locations for obvious problem situations (e.g., water depth, hazards to navigation, etc.). If suspect sites are encountered in this exercise, it is suggested that a field reconnaissance be conducted well ahead of the

scheduled sampling to determine actual conditions at the site. If an intended site location presents an obvious problem, the situation must be reported to the State Implementation Team Chair and EPA Regional Coordinator, who, in turn, will discuss the specifics with EPA's Project Officer for the WPCM for resolution options. Depending on the nature of the situation, the EPA Project Officer may elect to relocate the site within an acceptable range of the original location, or the site may be dropped from the sampling. Decisions on this level (i.e., significant changes to the sampling design) are to be made only by the EPA Project Officer, not by the field teams.

Field teams, however, will have a limited degree of onsite flexibility to relocate sampling sites when confronted with unexpected obstacles or impediments associated with locating within the +-0.02' guideline. If for good reason (e.g., danger or risk to crew, excessive rocky or shelly bottom, currents, man-made obstructions), the crew chief may move the station up to +-0.05' (300 ft) of the intended sampling station; every effort must be made to relocate to an area that appears similar in character to that of the intended site. For example, if the intended site was in the channel of a stream, then the relocation should be as near to that situation as possible; it should not be relocated alongside the stream bank. When it is necessary to relocate the site >0.02', the reason for shift must be documented in the field record. Any site relocation that exceeds 0.05' (300 ft) will be flagged and reviewed before any data collected from the station are acceptable for inclusion to the study database.

While 0.02 nm is the target criteria for accuracy in siting the station, the crew will be granted a buffer zone of up to 0.05 nm from the intended position in the event that there are mitigating circumstances to justify exercising that allowance (e.g., currents, obstacles, boat traffic, etc). This buffer zone will be used only for those situations when locating within the 0.02-nm goal is not feasible. In cases where the vessel cannot navigate to within 0.05 nm of the intended site (e.g., the site is actually landlocked or the depth too shallow), the crew will record the station as unsampleable and referred the situation to the senior field coordinator. The field coordinator who should review the circumstances and make the final decision to sample or not. The occurrence of situations like that cropping up unexpectedly in the field would be less likely if suspect areas were reconnoitered prior to the monitoring window.

10. DATA ACCESS

10.1 Data Access Procedures

Data can be downloaded from the WWW server at: http://www.epa.gov/emap/nca/html/data/

10.2 Data Access Restrictions

NA

10.3 Data Access Contact Persons

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(401) 782-3184 (Tel.)
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10.4 Data Set Format

Data can be downloaded in Tab delimited format from the web application:
http://www.epa.gov/emap/nca/html/data/

10.5 Information Concerning Anonymous FTP

NA

10.6 Information Concerning WWW

Data can be downloaded from an application on the WWW server:
http://www.epa.gov/emap/nca/html/data/

10.7 EMAP CD-ROM Containing the Data Set

Data not available on CD-ROM.

11. REFERENCES

U.S. Environmental Protection Agency. 2001. Environmental Monitoring and Assessment Program (EMAP) National Coastal Assessment: Quality Assurance Project Plan 2001-2004. Office of Research and Development, National Health and Environmental Effects Research Laboratory, Gulf Ecology Division, Gulf Breeze, FL. EPA/620/R-01/002.

U.S. Environmental Protection Agency. 2001. Environmental Monitoring and Assessment Program (EMAP) National Coastal Assessment: Field Operations Manual. Office of Research and Development, National Health and Environmental Effects Research Laboratory, Gulf Ecology Division, Gulf Breeze, FL. EPA/620/R-01/003.

12. TABLE OF ACRONYMS

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