

Chesapeake Bay Maryland (CBM) NERR Water Quality Metadata
March 2002-December 2002
Latest Update: December 12, 2003

I. Data Set and Research Descriptors

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2. Entry verification

Raw data were uploaded from the YSI 6000UPG and YSI 6600 data loggers to a PC, graphs were produced and data were visually examined after each deployment using the EcoWatch software. Data files were then exported from the EcoWatch format into Excel (for Windows 2000) files, where the headers, footers, and inappropriate spaces were removed. Raw data was archived, plotted and suspect data (outliers) or trends noted initially to verify accurate instrument operation for service as needed prior to redeployment. Janet Barnes and Ned Burger were responsible for these tasks.

Data from each deployment was processed initially using macros in the CDMO

cdmomac3.xls program. Steps in the program include procedures which allow users to automatically format column widths to the correct number of decimal places based on YSI sensor specifications. It also allows users to QA/QC each data logger generated file for missing data points, fill all cells that do not contain data with periods, and find all data points that fall outside the range of what the data logger is designed to measure (outliers). The CDMO import.xls macro allows PC users with 30-minute data to automatically create a monthly Excel file from a two-week deployment and insert periods for missing data. In addition, in November 1999 a graphing capability was added to this macro allowing users to produce single parameter and missing data point graphs on a monthly basis.

Raw data from successive deployments were merged using the CDMO import.xls macros to produce monthly files. Resulting monthly Excel files at each site (eg. JB0302.xls) consist of continuous data for all variables measured, with a period (.) to denote any missing data. At this point, these data have not been modified except for replacement of missing entries with a period. Data were then processed using the CDMO cdmomac3.xls macros as an initial step in QA/QC procedures to identify outliers, defined simply as values outside the respective sensor specifications. Results are retained as monthly Excel files for each site (eg. JB0302outliers.xls).

The final data processing involved identification and documentation of data points judged to be anomalous (suspect) or erroneous due to extreme natural events or equipment malfunctions using various procedures including recommendations from CDMO Operations Manual Appendix B, YSI 6000 Data Review and Editing Protocol. Anomalous data were retained in cases where no definite reason for deletion was found. Periods during which data were found to result from equipment malfunctions, failure, tampering or exposure to air by low tides were identified, times with causes or related observations documented below and respective data removed or deleted. These resulting edited data and

documentation (metadata) were archived, formatted in comma delimited file format and submitted to the CDMO for further QA/QC. Ned Burger was responsible for these tasks.

3. Research Objectives

The purpose of the monitoring program at CBM NERR is to conform to the NERR SWMP monitoring program looking at trends in water quality over both temporal and spatial scales. Observed effects of water quality, habitats and living resources in the river channel site and the nearby emergent tidal fresh marshes are being studied using various comparative field sampling methods with the backdrop of long term high resolution data from two representative fixed monitoring sites. Water quality measurements were taken every 30 minutes from 19 March through 16 December 2002 at both the Patuxent River Park (PR) and Jug Bay Wetlands Sanctuary (JB) sites that conform to seasonal measurements collected each year since 1995.

4. Research methods (YSI data loggers)

Data loggers and methods of deployments were replaced and upgraded during 2002 after tests of existing YSI 6000 data loggers and consultation with YSI technicians determined new data loggers with upgraded sensor packages to be more cost effective. Existing YSI 6000 instruments, some with failing or missing components, were initially deployed from March through August, when replacement dataloggers were received and put into service. Deployment methods conformed with those initiated in 1995, placing each data logger inside a 4" diameter PVC pipe that was cut in half to expose the sensors. The PVC sleeve was suspended inside a galvanized wire crab pot or muskrat trap using rubber shock cords to position dataloggers horizontally with sensors 6 - 10 centimeters above the channel bottom. At each site, the enclosure was locked to a pier. Measurements for temperature, specific conductivity, salinity, percent oxygen saturation, dissolved oxygen, water level, pH and turbidity were recorded every 30 minutes. After deployments ranging from one to three weeks,

depending on biofouling intensity (temperature dependent), data loggers were replaced with newly serviced instruments. Post deployment data was collected, data downloaded, archived, then examined visually. Efforts were made to relate sensor conditions to any apparent outliers or anomalies (eg. battery charge status, or normal DO data at the beginning of a deployment may be distinguished from erroneous data resulting from a known malfunction, such as a punctured DO membrane due to crabs). Data loggers and sensors were cleaned, serviced and calibrated according to the methods described in the YSI Operating Manual and SWMP Operating Procedures. Laboratory calibration procedures were carried out in accordance with the YSI operating manual methods. Standards for pH, conductivity and turbidity were purchased from YSI. Data were reviewed and edited according to the YSI Data Review and Editing Protocol in Appendix B of the CDMO manual. After cleaning the data loggers, the dissolved oxygen (DO) membrane were replaced and allowed to stretch for 24 hours before calibration begins. The pH, conductivity, depth, and turbidity sensors were calibrated, using the following standards: 2-point pH 4 and 7, conductivity standard of 1.000 mS/cm, depth in the air, and 2-point turbidity standards of 0 (distilled water) and 100 NTU for the 6026 turbidity sensor on the old YSI 6000 sondes; 123 NTU for the 6136 turbidity probe on the new 6600 EDS sondes first deployed 23 August 2003. The DO sensor was calibrated in air following YSI procedures. Several quality assurance checks were used to determine if the sensor readings drifted significantly during deployment. Post-deployment measurements of all the parameters except turbidity were recorded before cleaning the data loggers. Sensors were immersed in the appropriate standard solutions (i.e., pH) and readings recorded. Turbidity was post calibrated after the sonde was cleaned to insure the accuracy of the standard.

5. Site location and character

The Chesapeake Bay Maryland NERR has three components in Maryland's portion of

Chesapeake Bay. Monie Bay is a mesohaline region on the lower Eastern Shore; Otter Point Creek is a tidal freshwater river and marsh system; and Jug Bay is part of the freshwater portion of the Patuxent River. Both data loggers during 2002 were within the Jug Bay component.

Patuxent River Park (PR) 38 deg 46' 23.5" N, 76 deg 42' 32.5" W Site PR is located in the upper tidal headwaters of the Patuxent River, Maryland. PR is along the mainstem of the Patuxent River, which is approximately 50m wide at this point along the river. The PR site sits adjacent to a boat launch at Jackson Landing, located on the Prince Georges County side of the river at Patuxent River Park. The actual sonde was deployed horizontally in a retro-fitted crab pot and sits roughly .25m off the bottom sediments. In October 2002, the sonde was placed vertically in a perforated PVC pipe for easier access and protection. Sediments at the site are extremely fine and easily resuspended. Average depth at this site is roughly 2 meters. Salinities at this site rarely exceed 1ppt. Because this site is located along the main channel of the Patuxent River, water quality at this site represents the general quality of water flowing along the main portion of the river. The Patuxent River watershed is an increasingly urbanized watershed, however there are extensive riparian buffers along the portion of the river that flows through the site. However, the PR site is approximately 3km downstream of a large wastewater treatment plant that discharges directly into the Western Branch tributary of the Patuxent River. The PR site is roughly 1.5km downstream of the confluence of the Western Branch tributary and the Patuxent River mainstem. The tidal range at this site is roughly 0.5m.

Jug Bay (JB) 38 deg 46' 50.6" N, 76 deg 42' 29.1" W Site JB is located in a shallow tidal creek adjacent to the Patuxent River. The site is slightly upstream (roughly 0.3km) from the PR site but sits in a shallow creek that is tidally infiltrated by a backwater marsh adjacent to the Patuxent River mainstem. At low tide, this backwater marsh becomes a large mud flat with very little standing water. The creek ranges in width between 2m to 5m at the

site and average depth at the site is 0.75m. Because of the shallow nature of this site, the sonde is periodically exposed at very low tides. Sediments at this site are extremely fine and flocculant. The sonde is deployed horizontally in a retro-fitted cage, similar to site PR. Because of the shallowness of the tidal creek, coupled with the dramatic daily changes in the depth and width of the stream, deployments at this site have presented some problems. These problems include periodic exposure of the sonde, very high turbidity and sedimentation rates associated with tidal infiltration and resuspension, which have caused severe fouling of the probes at this site. Water quality at the site represents extreme shallow water habitats. Thus it is not uncommon to see very large fluctuations in temperature and dissolved oxygen at this site ranging from complete anoxia to full saturation, due in part to the shallow nature of the site and the effects of marsh processes on water quality. Salinities at this site rarely exceed 1 ppt. Tidal range at this site is roughly 0.5m.

6. Data collection period

Data collection using sondes at Jug Bay Wetlands Sanctuary (JB) and Patuxent River Park (PR) did not begin until March 19, 2002 and continued through December 16, 2002. Because instruments can be trapped and damaged by ice formation in the lower salinity and upper Chesapeake Bay tributaries, which occurs periodically from November through March, deployments have been limited to ice-free months, therefore data is not available for January and February 2002 due to ice cover.

Datalogger deployments:

BEGAN	ENDED
JB Jug Bay Site	
03/19/02 15:30:00	04/03/02 17:00:00
04/03/02 17:30:00	04/19/02 17:00:00
04/19/02 17:30:00	05/03/02 17:30:00
05/03/02 18:00:00	05/15/02 11:30:00
05/15/02 12:00:00	05/29/02 10:30:00
05/29/02 11:00:00	06/12/02 12:30:00
06/12/02 13:00:00	06/28/02 10:00:00
06/28/02 10:30:00	07/09/02 10:30:00
07/09/02 11:00:00	07/18/02 19:30:00
07/18/02 20:00:00	08/01/02 13:00:00
08/01/02 13:30:00	08/07/02 10:00:00

08/07/02	10:30:00	08/13/02	10:00:00
08/13/02	10:30:00	08/23/02	10:30:00
08/23/02	11:00:00	08/30/02	10:30:00
08/30/02	11:00:00	09/05/02	11:30:00
09/05/02	12:30:00	09/12/02	12:30:00
09/12/02	13:00:00	10/01/02	13:30:00
10/01/02	14:00:00	10/25/02	18:00:00
10/25/02	18:30:00	11/14/02	13:00:00
11/14/02	13:30:00	12/16/02	17:30:00

PR Patuxent River Park (Jackson Landing)

03/19/02	17:00:00	04/03/02	18:00:00
04/03/02	18:30:00	04/19/02	18:00:00
04/19/02	18:30:00	05/03/02	16:30:00
05/03/02	17:00:00	05/15/02	09:00:00
05/15/02	09:30:00	05/29/02	09:00:00
05/29/02	09:30:00	06/12/02	11:30:00
06/12/02	12:00:00	06/28/02	09:00:00
06/28/02	09:30:00	07/09/02	09:30:00
07/09/02	10:00:00	07/18/02	18:00:00
07/18/02	19:00:00	08/01/02	12:00:00
08/01/02	12:30:00	08/07/02	09:00:00
08/07/02	09:30:00	08/13/02	09:00:00
08/13/02	09:30:00	08/23/02	09:30:00
08/23/02	10:00:00	08/30/02	09:30:00
08/30/02	10:00:00	09/05/02	11:00:00
09/05/02	11:30:00	09/12/02	11:30:00
09/12/02	12:00:00	10/01/02	10:30:00
10/01/02	11:00:00	10/25/02	17:00:00
10/25/02	17:30:00	11/14/02	15:00:00
11/14/02	15:30:00	12/16/02	17:00:00

7. Distribution

NOAA/ERD retains the right to analyze, synthesize and publish summaries of the NERRS System-wide Monitoring Program data. The PI retains the right to be fully credited for having collected and processed the data. Following academic courtesy standards, the PI and NERR site where the data were collected will be contacted and fully acknowledged in any subsequent publications in which any part of the data are used. Manuscripts resulting from this NOAA/OCRM supported research that are produced for publication in open literature, including refereed scientific journals, will acknowledge that the research was conducted under an award from the Estuarine Reserves Division, Office of Ocean and Coastal Resource Management, National Ocean Service, National Oceanic and Atmospheric Administration. The data set enclosed within this package/transmission is only as good as the quality assurance and quality

control procedures outlined by the enclosed metadata reporting statement. The user bears all responsibility for its subsequent use/misuse in any further analyses or comparisons. The Federal government does not assume liability to the Recipient or third persons, nor will the Federal government reimburse or indemnify the Recipient for its liability due to any losses resulting in any way from the use of this data.

NERR water quality data and metadata can be obtained from the Research Coordinator at the individual NERR site (please see Section 2.2-1 Principal investigators and contact persons), from the Data Manager at the Centralized Data Management Office (please see personnel directory under the general information link on the CDMO home page) and online at the CDMO home page <http://cdmo.baruch.sc.edu/>. Data are available in text tab-delimited format, Microsoft Excel spreadsheet format and comma-delimited format.

8. Associated researchers and projects

The Jug Bay Wetlands Sanctuary staff has been collecting weekly to monthly temperature, salinity, dissolved oxygen, and nutrient samples at the same location as the data logger at JB.

II. Physical Structure Descriptors

9. Variable name, range of measurements,

YSI 6000 datalogger/ YSI 6600 datalogger

Variable	Range of Measurements	Resolution	
Accuracy			
Date	1-12, 1-31, 00-99 (Mo,Day,Yr)	1 mo, 1 day, 1 yr	NA
Time	0-24, 0-60, 0-60 (Hr,Min,Sec)	1 hr, 1 min, 1 s	NA
Temp	-5 to 45 (c)	0.01 C	+/-
0.15C			
Sp COND	0-100 (mS/cm)	0.01mS/cm	+/-0.5%
Of			
reading + 0.001mS/Cm			
Salinity	0-70 Parts per thousand (ppt)	0.01 ppt	+/- 1%
of			
Reading or 0.1 ppt, (whichever is greater)			
DO	0-200 (% air saturation)	0.1% @air sat	+/-2%
@air			
Saturation			
DO	200-500 (% air saturation	0.1% @ air sat	+/- 6%
@			
Saturation			
DO	0-20 (mg/l)	0.01 mg/l	+/-
0.2mg/l			

DO	20-50 (mg/l)	0.01 mg/l	+/-
0.6mg/l			
Depth (shallow)	0-9.1 (m)	0.001m	+/-
0.018m			
PH	2-14 units	0.01 units	+/-
0.2units			
Turb	0-1000 NTU	0.1 NTU	+/- 5%
of			
Reading or 2 NTU (whichever is greater)			

Data columns are separated by tabs. Each file contains a two line column header at the top of the page which identifies measurements and units for each column.

10. Coded variable indicator and variable code definitions
 Site definitions: PR = Patuxent River Park; JB = Jug Bay Wetlands Sanctuary

11. Data anomalies (suspect data)
 Any data outliers detected using CDMO macros and any data deletions are detailed below. Suspect and outlier data were detected and considered for deletion from the edited data using combination of methods, including graphics and CDMO macros. All outliers are detailed below. Any data determined to be due to instrument errors or malfunctions were retained in raw data. Missing data and any intended deletions from edited data were replaced with a period (.) in accordance with CDMO QA/QC guidelines and detailed below. According to the CDMO Operations Manual Version 3.0, depth measurements taken with the non-vented level probe can be influenced by up to 0.39 m (1.3 ft) during some low-pressure hurricane events. Specific dates and time ranges of potentially influenced data are listed with each respective month.

Jug Bay
 Sonde deployment at the Jug Bay site began 3/19/02 at 15:30:00.
 Positioning the muskrat trap that housed the sonde deployed adjacent to the weather station dock was problematic due to limited total water depth in the marsh inlet. After the first week of deployment, the sonde was observed out of the water on retrieval 25 March at low tide (mean tide range 1.9 meter).

Consequently, a pole was used in all subsequent deployments to reposition the trap in the deepest point of the channel. Although the fresh tidal characteristics of this site made detection of sonde exposure difficult, unusual coinciding patterns in specific conductivity (*observations < 0.01 detailed below), dissolved oxygen and low depth measurements indicate that there were periodic observations throughout the year during extremely low tides that the sonde was out of the water which affected all variables measured, noted below.

Typical patterns were resumed as tidal heights increased. Due to lack of turbidity sensors on the YSI 6000 instruments, there were no turbidity observations at Jug Bay from 3/19/2002 through 8/23/2002 10:30. The new YSI 6600 put into service at 11:00 on 8/23/2002 included a full suite of sensors which included turbidity.

March 2002

Depth Outliers

03/23/2002	19:00:00	-0.01
03/24/2002	18:00:00	0.00
03/24/2002	18:30:00	-0.01
03/24/2002	19:00:00	-0.01
03/24/2002	19:30:00	-0.02
03/24/2002	20:00:00	-0.02
03/24/2002	20:30:00	-0.02
03/24/2002	21:00:00	-0.02
03/24/2002	21:30:00	-0.02
03/24/2002	22:00:00	-0.02

Sonde out of water for modification of trap - All parameters are suspect and deleted 03/25/2002 15:30:00.

April 2002

PH missing from 04/03 17:30.00 through 04/19/02 17:00.00

Depth Outliers

04/01/2002	01:00:00	-0.02
04/01/2002	01:30:00	-0.04
04/01/2002	02:00:00	-0.05
04/01/2002	02:30:00	-0.05
04/01/2002	03:00:00	-0.05
04/01/2002	13:30:00	-0.01
04/01/2002	14:00:00	-0.01
04/01/2002	14:30:00	-0.02
04/01/2002	15:00:00	-0.02
04/01/2002	15:30:00	-0.03

04/01/2002	16:00:00	-0.03
04/01/2002	16:30:00	-0.01
04/29/2002	00:30:00	0.00
04/29/2002	01:00:00	-0.02
04/29/2002	01:30:00	-0.03
04/29/2002	02:00:00	-0.04

Specific Conductivity Anomalies*

04/03/2002 18:00:00 through 22:30:00 (000.01)

May 2002

pH for the following dates and times were deleted due to probes possibly out of water.

05/11/2002 13:00:00
 05/14/2002 15:00:00
 05/22/2002 07:30:00 through 09:00:00
 05/25/2002 11:30:00

The lowest water levels of the 2002 field season were observed at low tides from

May 11 through May 15, which may have temporarily exposed sensors to air in at the shallow Jug Bay site.

Depth Outliers

Specific Conductivity Anomalies*

05/13/2002	00:30:00	-0.01
05/13/2002	01:00:00	-0.01
05/13/2002	12:00:00	-0.02
05/13/2002	12:30:00	-0.02
05/13/2002	23:00:00	-0.02
05/13/2002	23:30:00	-0.04
05/14/2002	00:00:00	-0.05
05/14/2002	00:30:00	-0.06
05/14/2002	01:00:00	-0.07
05/14/2002	01:30:00	-0.07
05/14/2002	02:00:00	-0.07
05/14/2002	11:00:00	-0.03
05/14/2002	11:30:00	-0.05
05/14/2002	12:00:00	-0.06
05/14/2002	12:30:00	-0.06
05/14/2002	13:00:00	-0.07
05/14/2002	13:30:00	-0.07
05/14/2002	14:00:00	-0.07
05/14/2002	14:30:00	-0.09
05/14/2002	15:00:00	-0.09
05/14/2002	15:30:00	-0.09
05/14/2002	16:00:00	-0.11

05/14/2002	12:00:00	000.01
05/14/2002	12:30:00	000.01
05/14/2002	13:00:00	000.01
05/14/2002	13:30:00	000.00
05/14/2002	14:00:00	000.00
05/14/2002	14:30:00	000.00
05/14/2002	15:00:00	000.00
05/14/2002	15:30:00	000.00
05/14/2002	16:00:00	000.00

05/14/2002	23:00:00	000.01
05/14/2002	23:30:00	000.01
05/15/2002	00:00:00	000.01

05/15/2002	00:30:00	-0.05	05/15/2002	00:30:00	000.01
05/15/2002	01:00:00	-0.02	05/15/2002	01:00:00	000.01
05/15/2002	01:30:00	-0.03	05/15/2002	01:30:00	000.01
05/15/2002	02:00:00	0.00	05/15/2002	02:00:00	000.01
05/15/2002	02:30:00	-0.02	5/15/2002	02:30:00	000.01
05/15/2002	03:00:00	-0.01	05/15/2002	03:00:00	000.01

05/15/2002	11:30:00	000.01
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05/19/2002	15:00:00	000.01
05/19/2002	15:30:00	000.00
05/19/2002	16:00:00	000.00
05/19/2002	16:30:00	000.00
05/19/2002	17:00:00	000.00

05/20/2002	16:30:00	000.01
05/20/2002	17:00:00	000.01
05/20/2002	17:30:00	000.01
05/20/2002	18:00:00	000.01
05/20/2002	18:30:00	000.01
05/20/2002	19:00:00	000.01
05/20/2002	19:30:00	000.01

05/21/2002	05:30:00	000.01
05/21/2002	06:00:00	000.01
05/21/2002	06:30:00	000.01
05/21/2002	07:00:00	000.01

05/21/2002	07:30:00	000.01
05/21/2002	18:00:00	000.01
05/21/2002	18:30:00	000.01
05/21/2002	19:00:00	000.01
05/21/2002	19:30:00	000.01
05/21/2002	20:00:00	000.01
05/21/2002	20:30:00	000.01

05/22/2002	06:30:00	000.01
05/22/2002	07:00:00	000.01
05/22/2002	07:30:00	000.01
05/22/2002	08:00:00	000.01
05/22/2002	08:30:00	000.01
05/22/2002	09:00:00	000.00
05/22/2002	09:30:00	000.00

05/22/2002	19:00:00	000.01
05/22/2002	19:30:00	000.01
05/22/2002	20:00:00	000.01
05/22/2002	20:30:00	000.01
05/22/2002	21:00:00	000.01
05/22/2002	21:30:00	000.01

05/23/2002	08:30:00	000.01
05/23/2002	09:00:00	000.01
05/23/2002	09:30:00	000.01

05/23/2002 10:00:00 000.01

June 2002

Depth Outliers

06/01/2002	16:00:00	-0.03
06/01/2002	16:30:00	-0.04
06/01/2002	17:00:00	-0.05
06/01/2002	17:30:00	-0.06
06/01/2002	18:00:00	-0.04
06/02/2002	04:30:00	-0.02
06/02/2002	17:00:00	0.00
06/02/2002	17:30:00	-0.01
06/02/2002	18:00:00	-0.01
06/02/2002	18:30:00	0.00

Negative DO suspect for the following dates and times dues to probe likely being

exposed to anoxic conditions and may have been poisoned resulting in negative DO

values. However, following the anoxic event, DO responds properly and values

appear to be accurate. Data retained.

06/03/2002	05:00:00	-000.5
06/03/2002	05:30:00	-000.4
06/03/2002	06:00:00	-000.7
06/03/2002	07:00:00	-000.2
06/03/2002	07:30:00	-000.4
06/06/2002	19:00:00	-001.5
06/06/2002	19:30:00	-001.2
06/06/2002	20:00:00	-001.1
06/06/2002	20:30:00	-001.0
06/06/2002	21:00:00	-001.0
06/06/2002	21:30:00	-001.3
06/06/2002	22:00:00	-001.1
06/06/2002	22:30:00	-001.0
06/06/2002	23:00:00	-000.9
06/07/2002	07:30:00	-001.1
06/07/2002	08:00:00	-000.9
06/07/2002	08:30:00	-001.1
06/07/2002	09:00:00	-001.0
06/07/2002	09:30:00	-000.8
06/07/2002	10:00:00	-000.8
06/07/2002	10:30:00	-000.8
06/07/2002	11:00:00	-000.7
06/07/2002	11:30:00	-000.7
06/07/2002	19:30:00	-000.1
06/07/2002	20:00:00	-000.1
06/07/2002	20:30:00	-000.1
06/07/2002	21:00:00	-000.7
06/07/2002	21:30:00	-000.8
06/07/2002	22:00:00	-001.1
06/09/2002	23:00:00	-000.4
06/09/2002	23:30:00	-000.6

06/10/2002	00:00:00	-000.5
06/10/2002	22:00:00	-001.0
06/10/2002	22:30:00	-001.1
06/10/2002	23:00:00	-001.1
06/10/2002	23:30:00	-001.1
06/11/2002	00:00:00	-001.1
06/11/2002	00:30:00	-001.0
06/11/2002	01:00:00	-000.3
06/12/2002	00:00:00	-001.2
06/12/2002	00:30:00	-001.1
06/12/2002	01:00:00	-000.7

July 2002

No anomalies to report.

August 2002

No Turbidity recorded until 08/23/02 11:00.00 when new instruments were deployed.

Turbidity Outliers

08/28/2002	20:00:00	1296
08/28/2002	21:00:00	1289
08/29/2002	03:30:00	1276
08/29/2002	05:30:00	1276
08/29/2002	11:30:00	1287
08/29/2002	22:00:00	1298
08/30/2002	05:30:00	1280

September 2002

All data deleted 09/05/2002 12:00:00 due to datalogger being out of water.

Turbidity Outliers

09/23/2002	18:00:00	1159
09/25/2002	02:00:00	1404
09/26/2002	00:30:00	1192
09/26/2002	12:00:00	1048
09/26/2002	14:30:00	1122
09/26/2002	16:30:00	1067
09/27/2002	02:00:00	1414
09/29/2002	09:30:00	1495
09/29/2002	11:00:00	1557
09/29/2002	17:30:00	1575
09/30/2002	02:30:00	1545
09/30/2002	05:30:00	1521

October 2002

Turbidity Outliers

10/13/2002	14:30:00	1318
10/13/2002	22:00:00	1059
10/14/2002	17:00:00	1758
10/14/2002	18:30:00	1679
10/14/2002	19:00:00	1456

10/14/2002	23:30:00	1230
10/17/2002	06:00:00	1689
10/17/2002	15:00:00	1727
10/17/2002	16:30:00	1719
10/19/2002	01:00:00	1145
10/21/2002	04:00:00	1692
10/21/2002	05:30:00	1691
10/21/2002	08:00:00	1676
10/21/2002	11:00:00	1686
10/21/2002	12:30:00	1660
10/21/2002	13:30:00	1725
10/21/2002	14:00:00	1432
10/21/2002	16:00:00	1280
10/21/2002	17:30:00	1731
10/21/2002	23:30:00	1521
10/22/2002	10:30:00	1626
10/22/2002	13:00:00	1684
10/22/2002	14:30:00	1748
10/22/2002	20:00:00	1718
10/22/2002	23:30:00	1368
10/23/2002	05:00:00	1330
10/23/2002	13:00:00	1408
10/23/2002	14:30:00	1062
10/23/2002	20:00:00	1242
10/23/2002	22:30:00	1244
10/24/2002	05:30:00	1266
10/24/2002	06:30:00	1050
10/24/2002	07:30:00	1681
10/24/2002	11:00:00	1361
10/24/2002	12:00:00	1061
10/24/2002	13:00:00	1679
10/24/2002	14:30:00	1167
10/24/2002	15:30:00	1544
10/24/2002	16:30:00	1080
10/24/2002	18:00:00	1021
10/24/2002	20:00:00	1105
10/24/2002	21:00:00	1054
10/24/2002	22:00:00	1323
10/24/2002	23:30:00	1296
10/25/2002	00:00:00	1104
10/25/2002	01:30:00	1583
10/25/2002	03:30:00	1635
10/25/2002	05:00:00	1645
10/25/2002	05:30:00	1620
10/25/2002	07:00:00	1658
10/25/2002	08:30:00	1655
10/25/2002	09:00:00	1649
10/25/2002	09:30:00	1652
10/25/2002	10:30:00	1184
10/25/2002	11:30:00	1282
10/25/2002	13:00:00	1610
10/25/2002	15:00:00	1616
10/25/2002	16:30:00	1320
10/25/2002	17:00:00	1681

November 2002

Turbidity Outliers

11/27/2002 18:30:00 2022

11/30/2002 02:00:00 1007

December 2002

No problems noted in December.

Deployment for this site for 2002 ended December 16 @ 17:30:00.

Patuxent River Park

The sonde was deployed at the Patuxent River Park site beginning 3/19/02 at

17:00:00 adjacent to the floating dock used by Park staff. The YSI 6000 instrument was fastened horizontally inside a weighted crab pot with sensors

positioned 6 inches above the bottom sediments in 5 feet of water (MLW).

This

deployment method was replaced on 27 October 2002 with a protective PVC pipe

enclosure affixed vertically to the dock piling for protection and security.

The 4-inch diameter stand-pipe enclosure was abundantly perforated with 5.1 cm

diameter holes to allow water to circulate freely, followed by dewaxing and

applications of underwater bonding and ablative anti-fouling paint to resist

marine biofouling. Only one of the two YSI 6000 instruments deployed at the Patuxent River Park site was equipped with a turbidity sensor, therefore

turbidity measurements were present on alternating deployments from 3/19/2002

through 8/23/2002 at 09:30. The new YSI 6600's put into service at 10:00 on

8/23/2002 included a full suite of sensors which included turbidity.

March

Turbidity Outliers

03/23/2002 08:00:00 1342

03/30/2002 18:00:00 1371

April 2002

Turbidity Missing 04/03/02 18:30:00 to 04/19/02 18:00:00

May 2002

Turbidity Outlier

05/17/2002 15:30:00 1160

Turbidity Missing 05/03/02 17:00:00 to 05/15/02 09:00:00
05/29/02 09:30:00 to 05/31/02 23:30:00
pH was deleted 05/03 17:00:00 to 05/15 09:00:00 due to probe failure.

June 2002

Turbidity Outliers

06/23/2002	03:00:00	1439
06/23/2002	14:00:00	1073
06/23/2002	14:30:00	1400
06/23/2002	15:00:00	1122
06/23/2002	15:30:00	1446
06/23/2002	21:00:00	1421
06/23/2002	21:30:00	1033
06/23/2002	22:00:00	1393
06/23/2002	23:00:00	1441
06/24/2002	00:00:00	1443
06/24/2002	07:30:00	1447
06/24/2002	16:00:00	1430
06/25/2002	15:00:00	1456
06/26/2002	01:00:00	1032
06/26/2002	18:30:00	1459
06/27/2002	09:30:00	1456
06/27/2002	10:00:00	1449
06/27/2002	23:30:00	1041
06/28/2002	02:00:00	1082

Turbidity Missing 06/01/02 00:00:00 to 06/12/02 11:30:00
Turbidity Missing 06/28/02 09:30:00 to 06/30/02 23:30:00

Internal Error: missing data, possible intermittent power failure, sonde
returned to YSI for repair

06/02/02	02:30	
06/02/02	14:30	
06/02/02	15:00	
06/04/02	02:00	
06/05/02	19:00	
06/28/02	12:30	
06/28/02	15:00	
06/28/02	16:30	to 06/28/02 20:30
06/29/02	02:30	
06/29/02	06:30	
06/29/02	12:30	
06/29/02	13:00	
06/29/02	14:30	
06/29/02	17:30	to 06/29/02 19:30
06/29/02	21:30	to 06/29/02 22:30
06/30/02	00:30	
06/30/02	09:30	
06/30/02	14:30	
06/30/02	16:00	
06/30/02	17:30	
06/30/02	18:30	
06/30/02	21:30	
06/30/02	23:00	

06/30/02 23:30

July 2002

Depth Outliers - depth only removed

07/02/2002	16:30:00	3.97
07/02/2002	17:00:00	3.92
07/02/2002	17:30:00	4.09
07/02/2002	18:00:00	4.04
07/02/2002	18:30:00	3.91
07/02/2002	19:00:00	4.06
07/02/2002	19:30:00	3.91
07/02/2002	20:00:00	3.61

Turbidity Outliers

07/09/2002	12:00:00	1107
07/12/2002	11:00:00	1459

Internal Error: missing data, possible intermittent power failure, sonde returned to YSI for repair

07/01/02	00:00	to	07/01/02	02:00
07/01/02	05:00			
07/01/02	12:00	to	07/01/02	13:00
07/01/02	14:00			
07/01/02	17:30			
07/01/02	04:30			
07/01/02	21:30	to	07/01/02	22:30
07/02/02	00:00			
07/02/02	10:30			
07/02/02	12:00			
07/02/02	13:30			
07/02/02	15:00	to	07/02/02	16:00
07/02/02	20:30	to	07/02/02	21:30
07/02/02	22:30	to	07/03/02	03:00
07/03/02	07:00			
07/03/02	07:30			
07/03/02	09:00	to	07/09/02	09:30
07/18/02	18:30			

Turbidity Missing	07/01/02	00:00:00	to	07/09/02	09:30:00
Turbidity Missing	07/18/02	19:00:00	to	07/31/02	23:30:00

August 2002

Turbidity Outliers

08/03/2002	10:00:00	2431
08/05/2002	05:00:00	2431
08/05/2002	10:30:00	2417
08/14/2002	11:30:00	1201
08/16/2002	08:30:00	1196
08/25/2002	19:30:00	1159
08/28/2002	17:00:00	1124

Factory upgraded YSI 6000 without depth sensor used on alternating deployments

Depth Missing 08/01/02 12:30:00 to 08/07/02 09:00:00
Depth Missing 08/13/02 09:30:00 to 08/23/02 09:30:00

Turbidity Missing 08/01/02 00:00:00 to 08/01/02 12:00:00
Turbidity Missing 08/07/02 09:30:00 to 08/13/02 09:00:00

DO data deleted for the following dates and times due to punctured membrane.
08/11/2002 07:00:00 to 08/13/2002 09:00:00

All DO data suspect for deployment 08/13/02 through 08/23/02 due to small hole found in membrane during maintenance of sonde.

September 2002

DO concentration and DO charge appeared abnormal, tear observed in membrane

DO deleted 09/11/02 11:30:00 to 09/12/02 11:30:00
DO deleted 09/24/02 18:30:00 to 10/01/02 10:30:00

Turbidity Outliers

09/03/2002	22:30:00	1215
09/19/2002	10:30:00	1025
09/19/2002	14:00:00	1308
09/20/2002	08:30:00	1301
09/25/2002	17:30:00	1083
09/26/2002	07:00:00	1244
09/28/2002	19:00:00	1253
09/28/2002	20:30:00	1058
09/28/2002	22:30:00	1178
09/29/2002	01:30:00	1273
09/29/2002	19:00:00	1282
09/30/2002	05:00:00	1251
09/30/2002	06:30:00	1266
09/30/2002	09:30:00	1260
09/30/2002	15:30:00	1282

October 2002

DO concentration and DO charge appeared abnormal, tear observed in membrane

DO deleted 09/24/02 18:30:00 to 10/01/02 10:30:00

November 2002

No problems noted

December 2002

Depth Outliers

12/01/2002	08:00:00	-0.05
12/01/2002	08:30:00	-0.04
12/01/2002	09:00:00	-0.04
12/01/2002	09:30:00	-0.03

Depth appeared abnormal, all other parameters appear normal
Depth deleted 12/03/02 11:00:00 to 12/03/02 13:30:00
Depth deleted 12/03/02 21:00:00 to 12/04/02 00:00:00

Deployment Ended for season - no data after 12/16/02 17:00:00

All Data missing 12/16/02 17:30:00 to 12/31/02 23:30:00

12) Missing data

Missing data are denoted by a period in the data set. Data are missing due to equipment failure where no probes were deployed, maintenance/calibration of equipment, elimination of obvious outliers or elimination of data due to calibration problems (both pre and post). For more details on deleted data, see the Data Anomalies Section. To find out more details about missing data, contact the Research Coordinator at the site submitting the data.

Jug Bay

Due to lack of turbidity sensors on the YSI 6000 instruments, there were no turbidity observations at Jug Bay from 3/19/2002 through 8/23/2002 10:30. The new YSI 6600 put into service at 11:00 on 8/23/2002 included a full suite of sensors which included turbidity.

Patuxent River Park

Only one of the two YSI 6000 instruments deployed at the Patuxent River Park site was equipped with a turbidity sensor, therefore turbidity measurements were present on alternating deployments from 3/19/2002 through 8/23/2002 at 09:30. The new YSI 6600's put into service at 10:00 on 8/23/2002 included a full suite of sensors which included turbidity.

13) Post Deployment Information

End of deployment Post-calibration Readings in Standard Solutions:
na = no data available for that particular standard

JB:

Date	SpCond ms/cm Std:1	DO Air Sat Std: 100%	pH Std:7.0	Turb NTU Std: 0.0	Depth m Std:0.000
04/04/02	0.014	97	7.03	na	-0.045
04/20/02	0.000	80	na	na	-0.400
05/04/02	0.973	99	7.20	na	0.124

05/15/02	0.960	89	7.07	na	0.089
05/29/02	0.976	100	7.20	na	0.050
06/12/02	0.980	100	7.03	na	-0.125
06/28/02	0.976	96	7.16	na	0.010
06/28/02	0.963	100	7.23	-1.0	0.014
07/09/02	0.970	78	5.37	na	0.020
07/19/02	1.005	100	7.15	3.1	-0.071
08/01/02	1.010	95	7.21	na	0.122
08/07/02	0.997	99	7.06	3.3	na
08/13/02	0.990	78	7.03	na	0.000
08/23/02	1.041	121	7.10	na	na
08/30/02	1.005	100	7.07	2.3	0.051
09/05/02	0.994	102	7.14	2.0	-0.070
09/12/02	na	5*	7.10	-0.4	-0.008
10/01/02	na	29*	na	na	na
10/25/02	na	114	na	na	na
11/14/02	na	114	na	na	na
12/16/02	na	117	na	na	na

* = DO membrane torn

PRP: Date	SpCond ms/cm Std:1	DO Air Sat Std: 100%	pH Std:7.0	Turb NTU Std: 0.0	Depth m Std:0.000
04/04/02	0.955	101	7.10	0.4	-0.045
04/20/02	na	na	na	na	na
05/04/02	0.951	101	7.10	0.4	0.112
05/15/02	0.970	101	na	na	0.061
05/29/02	0.980	99	7.20	6.0	0.061
06/12/02	0.990	95	6.98	na	-0.154
06/28/02	0.980	99	7.05	na	0.023
07/08/02	0.974	98	7.04	na	-0.074
07/19/02	0.974	98	7.04	na	-0.074
08/01/02	1.020	104	6.98	na	-0.091
08/07/02	0.986	98	7.05	na	0.042
08/13/02	0.990	99	7.00	na	-0.015
08/23/02	0.997	98	7.10	na	-0.042
08/30/02	1.011	100	7.03	2.3	0.101
09/05/02	1.007	102	7.01	6.0	-0.068
09/12/02	na	101	7.14	-0.8	-0.006
10/01/02	na	112	na	na	na
10/25/02	na	110	na	na	na
11/14/02	na	128	na	na	na
12/16/02	na	115	na	na	na

14) Other Remarks/Notes