Chesapeake Bay Maryland (CBM) NERR Water Quality Metadata
July-November, 1995
Latest Update: July 26, 2000

I. Data Set and Research Descriptors

1. Principle investigator(s) and contact persons
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2. Entry verification
The data are uploaded to a PC from the YSI 6000UPG data logger and graphs are produced and quickly examined using the PC6000 software. Data files are then exported from the PC6000 format into Excel (for Windows NT 3.1) files where the headers, footers, and inappropriate spaces are removed. Plots of the data are made and suspect data (outliers) are dealt with accordingly. Removed data points and missing data are replaced with a periods (.). Edited files are merged to contain one full month for each data logger. Data is then QA/QC'd using the cdmomac(ro)3.xls macros and Appendix B., YSI 6000 Data Review and Editing Protocol. Dave Nemazie was responsible for data management.

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. Differences in how marshes can change water quality is being studied by comparing a marsh creek site to a river channel site. Measurements are taken every 30 minutes over a 5-14 day period at both the Patuxent River Park (PR) and Jug Bay Wetlands Sanctuary (JB) sites.

4. Research methods (YSI data loggers)
Each YSI data logger is laid down on a 4" diameter PVC pipe that has been cut in half. The PVC is nailed to a 4"x4" block of wood which secured to a crab pot. The crab pot with the data logger in it sits on the bottom at both sites. At

each site, the crab pot is locked to a pier. The YSI probes sit approximately 6-10 centimeters above the sediment. Every 30 minutes up to a two-week period, measurements for specific conductivity, salinity, percent saturation, dissolved oxygen, temperature and water level are recorded. Within 14 days of deployment, the data is downloaded and either new calibrated probes or a new YSI unit with calibrated probes are placed at each site. At times, however, probes and/or units could not be replaced resulting in prolong periods (up to 5 days) of missing data. Calibration procedures are carried out according to the methods described in the YSI Operating Manual. All calibration standards are purchased from scientific warehouses.

5. Site location and character

The Chesapeake Bay NERR - Maryland has three components in Maryland's portion of the 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 are within the Jug Bay component.

1) Patuxent River Park (PRP) - (38 deg 46' 00" N, 76 deg 42' 30" W) is on the Prince Goerges County side of the River. The data logger is on the flank of the River channel off of Jackson Landing. The Patuxent is approximately 50 meters wide at Jackson Landing. High sedimentation rates have led to a very soft bottom at this point in the Patuxent River. Salinity rarely reaches above 1 ppt.

2) Jug Bay Wetlands Sanctuary (JBWS) - (38 deg 46' 00" N, 76 deg 42' 30" W) is on the Anne Arundal County side of the River directly across from PRP. The data logger is in a shallow tidal marsh creek that is approximately 5 meters wide. Wide temperature fluctuations are normal at this site.

6. Data collection period

Data loggers were placed in the water in early July and removed in late November just after ice began to form at both sites.

7. 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 JBWS. In addition a graduate student has measured Denitrification rates while another student has compared dissolved oxygen measurements using various techniques at the JBWS site.

II. Physical Structure Descriptors

8. Variable sequence, range of measurements, units, resolution, and accuracy:

YSI 6000 datalogger

Variable Name	Range of Measurements	Resolution	Accuracy
Date	1-12, 1-31, 00-99	1 month, 1 day, 1 year	NA
Time	0-24, 0-60, 0-60	1 hr, 1 min, 1 s	NA
Temp	-5 to 45 (0 C)	0.01 C	+/-0.15 C
SpCOND	0-100 (mS/cm)	0.01 mS/cm	+/-0.5% of reading+ 0.001 mS/cm
Salinity	0-70 (ppt)	0.01 ppt	+/- 1.0% of reading or 0.1 ppt, (whichever is greater)
DOsat	0-200 (% air Sat)	0.1% @air sat	+/-2% @air sat.
DOsat	200-500 (% air Sat)	0.1% @air sat	+/-6% @air sat.
Domg	0-20 (mg/l)	0.01 mg/l	+/-0.2 mg/l
DOmg	20-50 (mg/l)	0.01 mg/l	+/-0.6 mg/l
Depth (shallow)	0-9.1 (m)	0.001 m	+/-0.018 m
pH	2-14 (units)	0.01 units	+/-0.2 units

9. Coded variable indicator and variable code definitions

Site definitions: PR = Patuxent River Park; JB = Jug Bay Wetlands Sanctuary

10. Data anomalies (suspect data)

Suspect data from any one measurement and data collected at the same time are removed and replaced with a period (.).

July 1995

PR: anomalous data removed 7/6/95 15:30:00 because instrument was out of the water. Instrument logged the following date/times twice but with different values: 7/28/95 13:00:00-13:30:00. The first set of duplicated data was deleted.

JB: anomalous data removed 7/24/95 07:30:00 to 08:00:00, 12:00:00 to 18:00:00,

and 7/25/95 12:30:00 to 7/28/95 10:00:00 due to repeating data which was a
result of instrument running in both unattended and discrete mode.

August 1995
PR: instrument out of water due to low tide 8/9/95 09:00:30 to 11:00:30; data
removed. Erroneous (high) DOmg/L data removed 8/19/95 09:00:30 to
09:30:30.

JB: Negative depth value on 8/4/95 07:00:00

September 1995
PR:
JB: instrument out of water due to low tide from 9/1/95 15:30:00 to 17:30:00;
data removed. Instrument out of water due to low tide 9/2/95 4:30:00 to 06:00:00
and from 16:30:00 to 18:00:00; data removed.

October 1995
PR:
JB:

November 1995
PR:
JB: Data deleted due to instrument logging error 11/9/95 13:30:00-14:00:00.
removed due to ice 11/27/95 13:00:00.

December 1995
PR:
JB:

11. Missing data

*Note: No turbidity probes were installed on the YSI instruments for the 1995
year.

July 1995
PR: data logger was not deployed until 7/6/95 15:00:00. anomalous data removed
7/6/95 15:30:00 because instrument was out of the water. pH meter not installed
until 7/18/95 18:30:00. data logger removed for calibration 7/18/95 17:30:00-
18:00:00. Instrument logged the following date/times twice but with different
values: 7/28/95 13:00:00-13:30:00. The first set of duplicated data was deleted.

JB: data logger was not deployed until 7/7/95 14:00:00. Data logger removed for
calibration 7/10/95 14:00:00.data logger removed for calibration 7/18/95 14:04:25. data logger removed for calibration 7/21/95 06:47:12 to 07:17:11.
anomalous data removed 7/24/95 07:30:00 to 08:00:00, 12:00:00 to 18:00:00, and
7/25/95 12:30:00 to 7/28/95 10:00:00 due to repeating data which was a result of
instrument running in both unattended and discrete mode.

August 1995
PR: data logger removed for calibration 8/1/95 13:30:00. data logger removed for
calibration 8/8/95 12:00:00 to 12:30:00. instrument out of water due to low tide
8/9/95 09:00:30 to 11:00:30; data removed. data logger removed for calibration
8/16/95 07:00:30. Erroneous (high) DOmg/L data removed 8/19/95 09:00:30 to
09:30:30. removed for calibration 8/20/95 08:30:30. Data logger was removed for
calibration 8/24/95 13:00:30-13:30:30.

JB: data logger removed for calibration 8/1/95 07:00:00 and 8/9/95 08:00:00.
data logger removed for calibration 8/24/95 11:30:00 – 12:00:00.

September 1995
PR: data logger removed for calibration 9/1/95 09:00:00-09:30:00. data logger
removed for calibration 9/8/95 12:30:00. data logger removed for calibration and
low battery 9/18/95 05:30:00 to 12:30:00. data logger removed for calibration
9/28/95 13:00:00 to 17:00:00.

JB: data logger removed for calibration 9/1/95 00:00:00 to 10:30:00. instrument
out of water due to low tide from 9/1/95 15:30:00 to 17:30:00; data removed.
Instrument out of water due to low tide 9/2/95 4:30:00 to 06:00:00 and from
16:30:00 to 18:00:00; data removed. No data due to low battery on 9/11/95
09:00:00-10:30:00. Data missing due to low battery on 9/18/95 03:00:00-09:30:00. Data logger removed for calibration 9/18/95 10:30:00 and 9/28/95
11:30:00-17:30:00.

October 1995
PR: data logger removed for servicing 10/8/95 17:30:00 to 10/13/95 13:30:00.

data logger removed for servicing 10/27/95 14:30:00 to 10/31/95 23:30:00.

JB: data logger removed for servicing 10/8/95 18:00:00 to 10/13/95 13:30:00.
data logger removed for servicing 10/27/95 14:30:00 to 10/31/95 23:30:00.

November 1995
PR: still out for servicing from October until 11/1/95 11:00:00. Data logger
removed for calibration 11/9/95 12:30:00. removed due to ice 11/27/95 14:00:00
to 11/30/95 23:30:00.

JB: still out for servicing from October until 11/1/95 12:30:00. data logger
removed for calibration 11/21/95 14:00:00. Data deleted due to instrument
logging error 11/9/95 13:30:00-14:00:00. removed due to ice 11/27/95 13:00:00.

December 1995
PR: Not deployed due to ice.

JB: Not deployed due to ice.

12. Other Remarks

The following times were off due to instrument/battery error:

Jug Bay:
7/10/95 14:34:25-7/18/95 14:04:25 time was off 4 min 25 sec
7/18/95 14:47:12-7/21/95 07:17:11 time was off 2 min 12 sec

Patuxent River:
7/6/95 00:00:05-7/10/95 16:30:05 time was off by 5 sec
8/8/95 13:00:30-8/24/95 13:30:30 time was off by 30 sec