

Chesapeake Bay Maryland (CBM) NERR Water Quality Metadata
April-September, 1996
Latest Update: August 13, 2002

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 prolonged 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 Georges 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 have 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, column format, range of measurements, units (for YSI)

YSI 6000 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			

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 (.).

April 1996

PR: High DO spike due to redeployment on 4/19/96 12:00

May 1996

PR: High DO spike due to redeployment on 5/10/96 14:00

JB: Negative depth data was recorded during the following times:

Date	Time	Depth
05/11/96	19:30:00	-0.01
05/11/96	20:00:00	-0.03
05/11/96	20:30:00	-0.04
05/12/96	06:30:00	-0.01
05/12/96	07:00:00	-0.01
05/12/96	07:30:00	-0.01
05/12/96	08:00:00	-0.02
05/12/96	08:30:00	-0.02
05/12/96	09:00:00	-0.01
05/12/96	09:30:00	-0.01
05/12/96	10:00:00	-0.01
05/12/96	10:30:00	-0.01
05/12/96	15:00:00	-0.01
05/12/96	15:30:00	-0.02
05/12/96	16:00:00	-0.02
05/12/96	16:30:00	-0.02
05/12/96	17:00:00	-0.02
05/12/96	17:30:00	-0.02
05/12/96	18:00:00	-0.02
05/12/96	18:30:00	-0.01
05/12/96	19:00:00	-0.01

pH probe failed 5/16/96 15:00:00 to 5/30/96 15:00:00.

June 1996

PR: pH probe failed 6/20/96 15:00:00 to 6/22/96 07:30:00. pH probe failed 6/27/96 14:30:00 to 6/30/96 23:30:00.

JB: Negative depth data was recorded during the following times:

Date	Time	Depth
06/12/96	20:30:00	-0.01
06/12/96	21:00:00	-0.01
06/12/96	21:30:00	-0.02
06/12/96	22:00:00	-0.02

pH probe failed 6/10/96 13:00:00 to 6/20/96 13:30:00.

July 1996

PR: pH probe failed 7/1/96 00:00:00 to 7/10/96 16:30:00. D.O. data removed due to negative values 7/10/96 17:30:00 to 7/25/96 12:30:00. D.O. data removed due to negative values 7/25/96 15:30:00 to 7/26/96 21:00:00. D.O. data removed due to negative values 7/27/96 04:30:00 to 7/27/96 21:00:00. D.O. data removed due to negative values 7/28/96 06:30:00 to 7/28/96 11:30:00. D.O. data removed

due to negative values 7/29/96 07:00:00 to 7/29/96 11:30:00, 23:00:00.

D.O. data

removed due to negative values 7/30/96 09:30:00 to 7/30/96 13:00:00. D.O. data

removed due to negative values 7/30/96 22:30:00 to 7/31/96 02:00:00. D.O. data

removed due to negative values 7/31/96 11:30:00. D.O. data removed due to negative values 7/31/96 22:00:00 to 7/31/96 23:30:00.

JB: pH probe failed 7/15/96 09:30:00 to 7/25/96 14:00:00

August 1996

PR: Negative DO data removed 8/1/96 00:00-8/2/96 16:00. Negative DO removed

8/22/96 02:00. pH probe failed 8/28/96 17:00:00 to 8/31/96 23:30:00.

JB: D.O. data removed due to possible membrane puncture from 8/5/96 09:30:00 to 8/15/96

18:00:00. pH probe failed 8/15/96 18:30:00 to 8/18/96 15:30:00. Negative DO

data deleted the following times: 8/2/96 15:30-8/15/96 14:00, 8/20/96 00:30,

06:00-07:30, 11:00, 14:00, 8/21/96 02:30-03:00, 8/23/96 06:30-07:00, 18:30-

20:00, 8/24/96 07:30-08:00, 19:00-21:00, 8/25/96 08:30-09:00, 8/28/96 22:00,

8/28/96 23:00-8/29/96 00:30, 8/29/96 15:00-15:30, 16:30-17:00, 8/30/96 00:00,

22:30-8/31/96 02:30.

September 1996

PR: pH probe failed 9/1/96 00:00:00 to 9/1/96 11:00:00. pH probe failed 9/7/96

15:30:00 to 9/11/96 17:00:00.

JB: D.O. data removed due to negative values 9/1/96 01:30-02:00, and 23:30:00 to

9/11/96 18:00:00.

A spike in Specific Conductivity and depth occurred on 9/6/96 22:00 through 9/7/96

03:30 possibly due to the instrument being out of water.

11. Missing data

*Note: No turbidity probes were installed on the YSI instruments during the 1996 year.

April 1996

PR: data logger was not deployed until 4/19/96 12:00:00.

JB: data logger was not deployed until 4/19/96 12:00:00.

May 1996

JB: pH probe failed 5/16/96 15:00:00 to 5/30/96 15:00:00. removed for calibration 5/30/96 12:00:00 to 5/31/96 23:30:00.

June 1996

PR: data loggers not deployed for servicing 6/4/96 14:00:00-6/10/96 13:00:00. pH

probe failed 6/20/96 15:00:00 to 6/22/96 07:30:00. removed for calibration

6/27/96 14:00:00. pH probe failed 6/27/96 14:30:00 to 6/30/96 23:30:00.

JB: removed for calibration 6/1/96 00:00:00 to 6/7/96 12:30:00. pH probe failed

6/10/96 13:00:00 to 6/20/96 13:30:00. No data due to instrument swap 6/27/96

15:00:00.

July 1996

PR: pH probe failed 7/1/96 00:00:00 to 7/10/96 16:30:00. removed for calibration

7/10/96 17:00:00. D.O. data removed due to negative values 7/10/96 17:30:00 to

7/25/96 12:30:00. removed for calibration 7/25/96 13:00:00. D.O. data removed

due to negative values 7/25/96 15:30:00 to 7/26/96 21:00:00. D.O. data removed

due to negative values 7/27/96 04:30:00 to 7/27/96 21:00:00. D.O. data removed

due to negative values 7/28/96 06:30:00 to 7/28/96 11:30:00. D.O. data removed

due to negative values 7/29/96 07:00:00 to 7/29/96 11:30:00, 23:00:00. D.O. data

removed due to negative values 7/30/96 09:30:00 to 7/30/96 13:00:00. D.O. data

removed due to negative values 7/30/96 22:30:00 to 7/31/96 02:00:00. D.O. data

removed due to negative values 7/31/96 11:30:00. D.O. data removed due to negative values 7/31/96 22:00:00 to 7/31/96 23:30:00.

JB: No data due to instrument swap 7/10/96 14:30:00-16:00:00. pH probe failed

7/15/96 09:30:00 to 7/25/96 14:00:00

August 1996

PR: Negative DO data removed 8/1/96 00:00-8/2/96 16:00. removed for calibration

8/2/96 16:30:00 to 8/5/96 07:30:00. Negative DO removed 8/22/96 02:00. removed

for calibration 8/22/96 07:30:00. pH probe failed 8/28/96 17:00:00 to 8/31/96

23:30:00.

JB: removed for calibration 8/2/96 15:00:00 to 8/5/96 09:00:00. No data 8/22/96 08:30

due to retrieval and deployment of new instrument. D.O. data

removed due to negative values 8/5/96 09:30:00 to 8/15/96 18:00:00. pH probe

failed 8/15/96 18:30:00 to 8/18/96 15:30:00. Missing times due to low battery
8/29/96 15:00:00-15:30:00, 8/29/96 16:30:00-17:00:00, 8/30/96 16:00:00, 18:00:00, 8/31/96 17:00:00-18:00:00. Negative DO data deleted the following times: 8/2/96 15:30-8/15/96 14:00, 8/20/96 00:30, 06:00-07:30, 11:00, 14:00, 8/21/96 02:30-03:00, 8/23/96 06:30-07:00, 18:30-20:00, 8/24/96 07:30-08:00, 19:00-21:00, 8/25/96 08:30-09:00, 8/28/96 22:00, 8/28/96 23:00-8/29/96 00:30, 8/29/96 15:00-15:30, 16:30-17:00, 8/30/96 00:00, 22:30-8/31/96 02:30.

September 1996

PR: pH probe failed 9/1/96 00:00:00 to 9/1/96 11:00:00. pH probe failed 9/7/96 15:30:00 to 9/11/96 17:00:00. removed for calibration 9/11/96 17:30:00 to 9/20/96 14:30:00. removed for the year 9/26/96 17:30:00.
JB: D.O. data removed due to negative values 9/1/96 01:30-02:00, and 23:30:00 to 9/11/96 18:00:00. Missing times due to low battery 9/1 19:00-19:30, 9/9/96 18:00-19:00, 9/10 16:00-18:30. removed for the year 9/11/96 18:30:00.