

Chesapeake Bay Maryland (CBM) NERR Water Quality Metadata
January 2000-September 2000
Latest Update: June 30, 2021

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.

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. A difference 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 is secured is 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, pH, temperature, turbidity and water level are recorded. Within 14 days of deployment, the data is downloaded and either new calibrated probes are installed 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 of missing data. Calibration procedures are carried out according to the methods described in the YSI Operating Manual.

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 are within the Jug Bay component.

1) Patuxent River Park (PR) - (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 (JB) - (38 deg 46' 00" N, 76 deg 42' 30" W) is on the Anne Arundel County side of the River directly across from PR. The data logger is in a shallow tidal marsh creek that is approximately 5 meters wide. Wide temperature fluctuations are normal at this site. Salinity rarely reaches above 1 ppt.

6. Data collection period

Data loggers initiated collection in January 2000 and continued through the middle of September of 2000, at Jug Bay Wetlands Sanctuary (JB) only. Data loggers initiated collection in March 2000 and continued until the beginning of

September of 2000, at Patuxent River Park (PR).

Datalogger deployments:

Jug Bay 2000:

1/4 -1/18

3/6-3/20

3/20-4/3

4/3-4/17

5/8-5/22

5/25-6/8

6/8-6/22

6/26-7/10

7/10-7/24

7/24-8/7

8/21-9/1

9/1-9/15

9/15-9/29

Patuxent River 2000:

3/20-4/3

4/3-4/17

5/25-6/8

6/8-6/22

6/26-7/10

7/10-7/24

7/24-8/7

8/21-9/1

9/1-9/15

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 JB.

II. Physical Structure Descriptors

8. Variable name, range of measurements,

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			
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)
 Suspect and outlier data from any measurement collected was replaced with a period (.). This is in accordance with the QA/QC procedure. Outliers were removed throughout the 2000 time period and are believed to be the result of internal datasonde error.

Jug Bay anomalies:

JB:
 January
 Datasonde deployment begins 1/4/00 at 14:00:00.
 Negative depth 1/13/00 20:00:00 possibly due to low tide.
 Data missing 1/15/00 9:00:00 - 9:30:00 due to internal malfunction.
 All parameters are suspect on 1/15/00 10:00:00 - 1/18/00 11:30:00 following sonde malfunction.
 DO data declines rapidly from 1/16/00 15:30:00 - 1/18/00 11:30:00. Data suspect.

JB:
 February
 None

JB:

March

Datasonde deployed 3/6/00 14:00:00.

High DO events throughout beginning of month are unexplained: 3/7/00,
3/8/00,
3/10/00; data retained.

The following are negative depth data that occurred during this month:

Date	Time	Depth
3/8/2000	14:30:00	-0.01
3/9/2000	1:00:00	-0.01
3/9/2000	1:30:00	-0.02
3/9/2000	2:00:00	-0.04
3/9/2000	2:30:00	-0.01
3/9/2000	14:00:00	-0.02
3/11/2000	15:30:00	-0.01
3/11/2000	16:00:00	-0.02
3/25/2000	2:30:00	-0.01
3/25/2000	3:00:00	-0.02
3/25/2000	3:30:00	-0.03
3/25/2000	15:00:00	-0.03
3/25/2000	15:30:00	-0.04
3/26/2000	2:30:00	-0.04
3/26/2000	3:00:00	-0.08
3/26/2000	3:30:00	-0.1
3/26/2000	4:00:00	-0.11
3/26/2000	4:30:00	-0.11
3/26/2000	5:00:00	-0.03
3/26/2000	13:30:00	-0.05
3/26/2000	14:00:00	-0.1
3/26/2000	14:30:00	-0.12
3/26/2000	15:00:00	-0.14
3/26/2000	15:30:00	-0.15
3/26/2000	16:00:00	-0.16
3/26/2000	16:30:00	-0.16
3/26/2000	17:00:00	-0.16
3/26/2000	17:30:00	-0.16
3/26/2000	18:00:00	-0.13
3/27/2000	1:30:00	-0.01
3/27/2000	2:00:00	-0.05
3/27/2000	2:30:00	-0.1
3/27/2000	3:00:00	-0.13
3/27/2000	3:30:00	-0.15
3/27/2000	4:00:00	-0.16
3/27/2000	4:30:00	-0.17
3/27/2000	5:00:00	-0.17
3/27/2000	5:30:00	-0.11
3/28/2000	5:00:00	-0.04
3/28/2000	5:30:00	-0.07
3/28/2000	6:00:00	-0.07
3/28/2000	18:00:00	-0.03
3/28/2000	18:30:00	-0.03
3/29/2000	6:00:00	-0.02
3/29/2000	6:30:00	-0.04
3/29/2000	7:00:00	-0.04

3/29/2000	16:30:00	-0.01
3/29/2000	17:00:00	-0.05
3/29/2000	17:30:00	-0.07
3/29/2000	18:00:00	-0.09
3/29/2000	18:30:00	-0.1
3/29/2000	19:00:00	-0.1
3/29/2000	19:30:00	-0.1
3/29/2000	20:00:00	-0.08
3/30/2000	5:30:00	-0.02
3/30/2000	6:00:00	-0.05
3/30/2000	6:30:00	-0.06
3/30/2000	7:00:00	-0.07
3/30/2000	7:30:00	-0.08
3/30/2000	8:00:00	-0.07
3/30/2000	18:30:00	-0.01
3/30/2000	19:00:00	-0.04
3/30/2000	19:30:00	-0.06
3/30/2000	20:00:00	-0.04
3/31/2000	9:00:00	-0.01
3/31/2000	9:30:00	-0.02
3/31/2000	10:00:00	-0.02

JB:

April

Suspect data from 4/9/00 22:00:00 - 4/10/00 05:30:00 - very low depth and DO

data; data retained.

The following are negative depth data that occurred during this month:

Date	Time	Depth
4/2/2000	22:30:00	-0.01
4/2/2000	23:00:00	-0.03
4/2/2000	23:30:00	-0.03
4/3/2000	9:30:00	-0.03
4/3/2000	10:00:00	-0.05
4/3/2000	10:30:00	-0.06
4/3/2000	11:00:00	-0.07
4/3/2000	11:30:00	-0.16
4/6/2000	13:00:00	-0.02
4/6/2000	13:30:00	-0.02

JB:

May

The following are negative depth data that occurred during this month:

Date	Time	Depth
5/8/2000	14:00:00	-0.03
5/8/2000	15:00:00	-0.01
5/8/2000	15:30:00	-0.04
5/8/2000	16:00:00	-0.06
5/8/2000	16:30:00	-0.02
5/9/2000	2:30:00	-0.04
5/9/2000	3:00:00	-0.08
5/9/2000	3:30:00	-0.1
5/9/2000	4:00:00	-0.12
5/9/2000	4:30:00	-0.12

5/9/2000	5:00:00	-0.05
5/9/2000	15:30:00	-0.01
5/9/2000	16:00:00	-0.05
5/9/2000	16:30:00	-0.07
5/9/2000	17:00:00	-0.09
5/9/2000	17:30:00	-0.06
5/10/2000	3:00:00	-0.05
5/10/2000	3:30:00	-0.09
5/10/2000	4:00:00	-0.11
5/10/2000	4:30:00	-0.13
5/10/2000	5:00:00	-0.14
5/10/2000	5:30:00	-0.12
5/10/2000	17:00:00	-0.03
5/10/2000	17:30:00	-0.07
5/10/2000	18:00:00	-0.09
5/10/2000	18:30:00	-0.09
5/10/2000	19:00:00	-0.03
5/11/2000	4:00:00	-0.02
5/11/2000	4:30:00	-0.04
5/11/2000	5:00:00	-0.06
5/11/2000	5:30:00	-0.07
5/11/2000	6:00:00	-0.07
5/11/2000	6:30:00	-0.08
5/11/2000	7:00:00	-0.07
5/11/2000	7:30:00	-0.05
5/11/2000	17:00:00	-0.02
5/11/2000	17:30:00	-0.04
5/11/2000	18:00:00	-0.05
5/11/2000	18:30:00	-0.01
5/12/2000	20:00:00	-0.01
5/13/2000	7:30:00	-0.01
5/13/2000	8:00:00	-0.03
5/13/2000	8:30:00	-0.02
5/14/2000	21:30:00	-0.01
5/19/2000	0:30:00	-0.01
5/19/2000	1:00:00	-0.01
5/19/2000	12:00:00	-0.02
5/19/2000	12:30:00	-0.03
5/19/2000	13:00:00	-0.04
5/19/2000	13:30:00	-0.04
5/19/2000	14:00:00	-0.04
5/19/2000	14:30:00	-0.03
5/19/2000	23:00:00	-0.02
5/19/2000	23:30:00	-0.03
5/20/2000	0:00:00	-0.03
5/20/2000	0:30:00	-0.04
5/20/2000	1:00:00	-0.05
5/20/2000	1:30:00	-0.03

JB:

June

Suspect DO data deleted from 6/26/00 16:30:00 - 06/30/00 23:30:00. DO was very

low; possible DO probe failure or membrane puncture.

JB:

July

All DO data for the entire month is suspect and very low.

Suspect DO data deleted from 07/01/00 00:00:00 - 07/10/00 15:00:00,
07/10/00

17:00:00 - 07/24/00 13:00:00 and 07/24/00 14:30:00 - 07/31/00 23:30:00.

DO was

very low during all deployments for the month; possible DO probe failure
or

membrane puncture.

JB:

August

Suspect DO data deleted from 08/01/00 00:00:00 - 08/07/00 14:30:00. DO
was very

low and negative during first deployment of the month; possible DO probe
failure

or membrane puncture.

JB:

September

Suspect DO data deleted from 09/01/00 12:30:00 - 09/05/00 13:00:00. DO
was very

low and negative during first deployment of the month; possible DO probe
failure

or membrane puncture.

The following are negative depth data that occurred during this month:

Date	Time	Depth
9/16/2000	0:30:00	-0.02
9/16/2000	1:00:00	-0.05
9/16/2000	1:30:00	-0.06
9/16/2000	2:00:00	-0.07
9/16/2000	2:30:00	-0.08
9/16/2000	3:00:00	-0.08
9/16/2000	3:30:00	-0.02
9/16/2000	12:30:00	-0.02
9/16/2000	13:00:00	-0.02
9/16/2000	13:30:00	-0.03
9/16/2000	14:00:00	-0.04
9/16/2000	14:30:00	-0.04
9/16/2000	15:00:00	-0.03
9/19/2000	3:00:00	-0.02
9/19/2000	3:30:00	-0.03
9/19/2000	4:00:00	-0.04
9/19/2000	4:30:00	-0.04
9/19/2000	5:00:00	-0.05
9/19/2000	5:30:00	-0.01
9/19/2000	14:30:00	-0.04
9/19/2000	15:00:00	-0.06
9/19/2000	15:30:00	-0.07
9/19/2000	16:00:00	-0.08

9/19/2000	16:30:00	-0.05
9/20/2000	4:00:00	-0.01
9/20/2000	4:30:00	-0.04
9/20/2000	5:00:00	-0.05
9/20/2000	5:30:00	-0.06
9/20/2000	6:00:00	-0.06
9/20/2000	6:30:00	-0.03
9/20/2000	16:30:00	-0.02
9/20/2000	17:00:00	-0.01
9/20/2000	17:30:00	-0.02
9/20/2000	18:00:00	-0.04
9/20/2000	18:30:00	-0.05
9/21/2000	5:00:00	-0.02
9/21/2000	5:30:00	-0.05
9/21/2000	6:00:00	-0.05
9/21/2000	6:30:00	-0.06
9/21/2000	7:00:00	-0.03
9/21/2000	18:00:00	-0.01
9/21/2000	18:30:00	-0.03
9/21/2000	19:00:00	-0.04
9/21/2000	19:30:00	-0.05
9/21/2000	20:00:00	-0.05
9/21/2000	20:30:00	-0.02
9/23/2000	21:00:00	-0.02
9/23/2000	21:30:00	-0.03
9/23/2000	22:00:00	-0.01
9/24/2000	22:30:00	-0.04
9/24/2000	23:00:00	-0.05
9/25/2000	11:00:00	-0.01
9/25/2000	11:30:00	-0.01

Patuxent River Anomalies:

PR:

March

None

PR:

April

None

PR:

May

None

PR:

June

No data 6/12/00 19:00:00 - due to instrument malfunction.

No data 6/13/00 05:00:00 - 05:30:00, 6/22/00 19:00:00 - 9/26/00 18:00:00,
and

9/27/00 00:30:00 - 01:30:00 due to internal malfunction.

Depressed DO possibly due to a prolonged anoxic event - may be suspect
data:

6/15/00 07:30:00 - 06/22/00 18:30:00; data retained.

PR:

July

No data 7/10/00 17:30:00 - 7/24/00 15:30:00 due to internal malfunction.

Depressed DO possibly due to a prolonged anoxic event - may be suspect data:

7/4/00- 7/10/00; data retained.

DO membrane was punctured causing a disregard of DO variables 7/27/00 0:00:00 -

7/31/00 23:30:00. Data was deleted.

PR:

August

DO membrane was punctured causing a disregard of DO variables 8/1/00 00:00:00 -

8/31/00 23:30:00. Data was deleted.

PR:

September

DO membrane was punctured causing a disregard of DO variables 9/1/00 14:30:00 -

9/15/00 14:30:00. Data was deleted

12. Missing data

Note: there were no turbidity probes deployed for the entire year at either

site; additionally the pH probe was not operable at Patuxent River Park (PR).

Jug Bay missing data:

JB:

January

Data missing 1/15/00 9:00:00 - 9:30:00 due to internal malfunction

Datasonde removed for calibration 1/18/00 12:00:00 and not reinitiated until

3/6/00 at 13:30:00 due to icy conditions prohibiting deployment.

February

No data entire month due to ice.

March

No data collected 3/1/00 00:00:00 - 3/6/00 13:30:00 due to calibration and maintenance.

No data collected 3/20/00 13:00:00 - 13:30:00 due to calibration and maintenance.

April

No data collected 4/3/00 11:30:00 - 12:00:00 due to calibration and maintenance.

Datasonde removed for calibration and maintenance 4/17/00 13:00:00 - 4/30/00

23:30:00.

May

No data collected 5/1/00 00:00:00 - 5/8/00 13:30:00 due to calibration and maintenance.

No data collected 5/22/00 14:30:00 - 5/25/00 15:00:00 due to calibration and maintenance.

June

No data collected 6/8/00 15:30:00 - 17:00:00 due to calibration and maintenance.

No data collected 6/22/00 18:00:00 - 6/26/00 16:00:00 due to calibration and maintenance.

Suspect DO data deleted from 6/26/00 16:30:00 - 06/30/00 23:30:00. DO was very low; possible DO probe failure or membrane puncture.

July

Suspect DO data deleted from 07/01/00 00:00:00 - 07/10/00 15:00:00, 07/10/00

17:00:00 - 07/24/00 13:00:00 and 07/24/00 14:30:00 - 07/31/00 23:30:00.

DO was

very low during all deployments for the month; possible DO probe failure or

membrane puncture.

No data collected 7/10/00 15:30:00 - 16:30:00 due to calibration and maintenance.

No data collected 7/24/00 13:30:00 - 14:00:00 due to calibration and maintenance.

August

Suspect DO data deleted from 08/01/00 00:00:00 - 08/07/00 14:30:00. DO was very

low and negative during first deployment of the month; possible DO probe failure

or membrane puncture.

No data collected 8/7/00 15:00:00 - 8/21/00 14:30:00 due to calibration and maintenance.

September

Suspect DO data deleted from 09/01/00 12:30:00 - 09/05/00 13:00:00. DO was very

low and negative during first deployment of the month; possible DO probe failure

or membrane puncture.

No data collected 9/1/00 12:30:00, 9/15/00 13:30:00 - 16:00:00, and 9/29/00

17:00:00 - 9/30/00

23:30:00 due to calibration and maintenance.

October

No data collected entire month.

November

No data collected entire month.

December

No data collected entire month.

Patuxent River missing data:

PR:

January

No data collected entire month.

February

No data collected entire month.

March

No data 3/01/00 00:00:00 - 3/20/00 14:30:00 due to maintenance and calibration down time.

April

No data 4/3/00 13:00:00 - 4/30/00 23:30:00 due to calibration and maintenance.

May

No data 05/01/00 00:00:00 - 05/25/00 15:30:00 due to maintenance required for water-logging of the internal chamber.

June

No data 6/8/00 16:30:00 - 18:00:00 due to calibration and maintenance.

No data 6/12/00 19:00:00 - due to instrument malfunction.

No data 6/13/00 05:00:00 - 05:30:00, 6/22/00 19:00:00 - 9/26/00 18:00:00, and

9/27/00 00:30:00 - 01:30:00 due to internal malfunction.

July

No data 7/10/00 17:30:00 - 7/24/00 15:30:00 due to internal malfunction.

DO membrane was punctured causing a disregard of DO variables 7/27/00 0:00:00 -

7/31/00 23:30:00. Data was deleted.

August

DO membrane was punctured causing a disregard of DO variables 8/1/00 00:00:00 -

8/31/00 23:30:00. Data was deleted.

No data 8/7/00 16:30:00 - 8/21/00 16:00:00 due to calibration and maintenance.

September

No data 9/1/00 14:00:00 due to calibration and maintenance.

No data 9/15/00 15:00:00 - 9/30/00 23:30:00 due to calibration and maintenance.
DO membrane was punctured causing a disregard of DO variables 9/1/00 14:30:00 -
9/15/00 14:30:00. Data was deleted.

October
No data collected entire month.

November
No data collected entire month.

December
No data collected entire month.

On 09/12/2020 this dataset was updated to include embedded QAQC flags for anomalous/suspect data. System-wide monitoring data beginning in 2007 were processed to allow for QAQC flags and codes to be embedded in the data files rather than detailed in the metadata alone (as in the anomalous/suspect, deleted, and missing data sections above). Prior to 2006, rejected data were deleted from the dataset so they are unavailable to be used at all, but suspect data were only noted in the metadata document. Suspect data flags <1> were embedded retroactively in order to allow suspect data to be easily identified and filtered from the dataset if desired for analysis and reporting purposes. No other flags or codes were embedded in the dataset and users should still refer to the detailed explanations above for more information.