Chesapeake Bay Maryland (CBM) NERR Water Quality Metadata
July – November, 1997
Latest Update: July 27, 2000

I. Data Set and Research Descriptors

1. Principle investigator(s) and contact persons
Dave Nemazie, Research Coordinator
University of Maryland Center for Environmental Science
P.O. Box 775
Cambridge, MD 21613
Phone: 410-228-9250, ext. 615
e-mail: nemazie@ca.umces.edu

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 (PR) - (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 (JB) - (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 name, range of measurements,

Variable	Range of Measurements	Resolution	Accuracy
Date	(MMDDYY)	1-12, 1-31, 00-99	(1 day, 1 month, 1 year)
Hour	(HHMMSS)	0-24, 0-60, 0-60	(1 second, 1 minute, 1 hour)
Temp	-5 to 45 (oC)	0.1 oC	+/- 0.15 oC
SpCond	0-100 (mS/cm)	0.01 mS/cm	+/- 0.5% of reading + 0.001mS/cm
Sal	0-70 ppt	0.1 ppt	+/- 1.0% of reading or 0.1ppt, whichever is greater
DO %	0-200 (% Saturation)	0.1 % air sat	+/- 2.0 % air sat
DO %	200-500 (% Saturation)	0.1 % air sat	+/- 6.0 % air sat
DO mg/l	0-20 (mg/l)	0.01 mg/l	+/- 0.2 mg/l
DO mg/l	20-50 (mg/l)	0.01 mg/l	+/- 0.6 mg/l
Depth	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 (.).

PR: pH suspect from 7/23/97 16:00-8/22/97 15:30, 8/27/97 18:00-9/30/97 23:30 and
10/1/97 00:00-10/14/97 15:00. negative D.O. datum 10/24/97 15:30:00; negative
D.O. datum 10/28/97 08:00:00; negative D.O. datum 11/2/97 15:00:00; D.O. data
removed from 11/5/97 20:00:00 until 11/13/97 15:00:00 because it was negative;

JB:
Note: Datasonde out of water is due to low tides

High pH reading due to redeployment on 7/23/97 14:30:00;
datasonde out of water 10/24/97 03:30:00 until 10/24/97 07:30:00;
datasonde out
of water 10/24/97 18:00:00 until 10/24/97 20:00:00; datasonde out of
water
10/25/97 05:30:00 until 10/25/97 08:30:00; datasonde out of water
10/25/97
18:00:00 until 10/25/97 22:00:00; datasonde out of water 10/26/97
05:30:00 until
10/26/97 10:00:00; datasonde out of water 10/27/97 21:00:00 until
10/28/97 00:00:00; datasonde out of water 10/28/97 06:00:00 until
10/28/97
14:00:00; datasonde out of water 10/28/97 17:30:00 until 10/29/97
00:30:00;
datasonde out of water 10/29/97 07:00:00 until 10/29/97 12:00:00;
datasonde out
of water 10/29/97 20:00:00 until 10/30/97 01:00:00; datasonde out of
water
10/30/97 07:00:00 until 10/30/97 13:00:00; datasonde out of water
10/30/97
20:30:00 until 10/31/97 01:30:00; datasonde out of water 10/31/97
08:30:00 until
10/31/97 12:30:00; datasonde out of water 11/1/97 00:00:00 until 11/1/97
02:30:00; datasonde out of water 11/1/97 12:00:00 until 11/1/97 12:30:00;
datasonde out of water 11/2/97 12:00:00 until 11/2/97 14:30:00; datasonde
out of
water 11/4/97 00:00:00 until 11/4/97 03:30:00; datasonde out of water
11/4/97
11:00:00 until 11/4/97 16:00:00; datasonde out of water 11/5/97 00:00:00
until
11/5/97 04:30:00; datasonde out of water 11/5/97 12:00:00 until 11/5/97
16:30:00; datasonde out of water 11/6/97 01:00:00 until 11/6/97 05:00:00;
datasonde out of water 11/6/97 12:00:00 until 11/6/97 17:30:00; datasonde
out of
water 11/7/97 01:00:00 until 11/7/97 05:00:00; datasonde out of water
11/9/97
19:30:00 until 11/9/97 20:30:00; datasonde out of water 11/10/97 07:00:00
until
11/10/97 08:00:00; datasonde out of water 11/10/97 18:30:00 until
11/10/97
21:00:00; datasonde out of water 11/11/97 07:00:00 until 11/11/97
10:00:00;
datasonde out of water 11/11/97 18:30:00 until 11/11/97 22:30:00;
datasonde out
of water 11/12/97 07:00:00 until 11/12/97 11:30:00; datasonde out of
water
11/12/97 19:00:00 until 11/13/97 00:00:00; datasonde out of water
11/13/97
07:00:00 until 11/13/97 12:00:00;

11. Missing data
*Note: No turbidity probes were deployed for the year 1997

PR: Datasonde first enters water on 7/23/97 16:00:00 with failed DO probe and no
turbidity probe; datasonde removed for calibration 8/22/97 16:00:00 until 8/27/97 17:30:00; datasonde removed for calibration 9/10/97 18:00:00 until
9/15/97 13:30:00; datasonde removed for calibration 10/14/97 15:30:00 until
10/23/97 14:30:00; negative D.O. datum 10/24/97 15:30:00; negative D.O. datum
10/28/97 08:00:00; negative D.O. datum 11/2/97 15:00:00; D.O. data removed from
11/5/97 20:00:00 until 11/13/97 15:00:00 because it was negative; datasonde
removed 11/13/97 15:30 for the year.

JB:
Note: Datasonde out of water is due to low tides.
Datasonde first enters water on 7/23/97 14:30:00 with failed DO probe and no
turbidity probe; datasonde removed for calibration 8/22/97 15:00:00 until 9/4/97
13:30:00; datasonde removed for calibration 9/23/97 14:00:00 until 10/23/97
19:30:00; datasonde out of water 10/24/97 03:30:00 until 10/24/97 07:30:00;
datasonde out of water 10/24/97 18:00:00 until 10/24/97 20:00:00; datasonde out
of water 10/25/97 05:30:00 until 10/25/97 08:30:00; datasonde out of water
10/25/97 18:00:00 until 10/25/97 22:00:00; datasonde out of water 10/26/97
05:30:00 until 10/26/97 10:00:00; datasonde out of water 10/27/97 21:00:00 until
10/28/97 00:00:00; datasonde out of water 10/28/97 06:00:00 until 10/28/97
14:00:00; datasonde out of water 10/28/97 17:30:00 until 10/29/97 00:30:00;
datasonde out of water 10/29/97 07:00:00 until 10/29/97 12:00:00; datasonde out
of water 10/29/97 20:00:00 until 10/30/97 01:00:00; datasonde out of water
10/30/97 07:00:00 until 10/30/97 13:00:00; datasonde out of water 10/30/97
20:30:00 until 10/31/97 01:30:00; datasonde out of water 10/31/97 08:30:00 until
10/31/97 12:30:00; datasonde out of water 11/1/97 00:00:00 until 11/1/97
02:30:00; datasonde out of water 11/1/97 12:00:00 until 11/1/97 12:30:00;
datasonde out of water 11/2/97 12:00:00 until 11/2/97 14:30:00; datasonde out of
water 11/4/97 00:00:00 until 11/4/97 03:30:00; datasonde out of water 11/4/97
11:00:00 until 11/4/97 16:00:00; datasonde out of water 11/5/97 00:00:00 until

11/5/97 04:30:00; datasonde out of water 11/5/97 12:00:00 until 11/5/97 16:30:00; datasonde out of water 11/6/97 01:00:00 until 11/6/97 05:00:00; datasonde out of water 11/6/97 12:00:00 until 11/6/97 17:30:00; datasonde out of water 11/7/97 01:00:00 until 11/7/97 05:00:00; datasonde out of water 11/9/97 19:30:00 until 11/9/97 20:30:00; datasonde out of water 11/10/97 07:00:00 until 11/10/97 08:00:00; datasonde out of water 11/10/97 18:30:00 until 11/10/97 21:00:00; datasonde out of water 11/11/97 07:00:00 until 11/11/97 10:00:00; datasonde out of water 11/11/97 18:30:00 until 11/11/97 22:30:00; datasonde out of water 11/12/97 07:00:00 until 11/12/97 11:30:00; datasonde out of water 11/12/97 19:00:00 until 11/13/97 00:00:00; datasonde out of water 11/13/97 07:00:00 until 11/13/97 12:00:00; datsonde removed from the water 11/13/97 14:00:00 for the rest of the year.