

Jacques Cousteau (JAC) NERR Water Quality Metadata
(formerly known as Mullica River (MUL) NERR)
January 2003-December 2003
Latest Update: June 30, 2021

I. Data Set & Research Descriptors

1) Principal investigator & contact persons:

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2) Entry verification:

The data are uploaded to the PC from the YSI data loggers as .dat files and exported as .csv files. Graphs are automatically created from the .dat files using the EcoWatch software. The graphs are evaluated for suspect data, which appear as sudden spikes, flat lines, or other anomalies.

Pre-deployment and post-retrieval readings are identified by depth and salinity values near zero. First and last readings are then compared with pre-deployment and post-retrieval readings taken with a YSI 600XL sonde attached to a 610-DM or 650-MDS display. All irregular data observed from graphs are documented on tracking sheets. The appropriate files are then imported into an Excel macro created by the NERR Centralized Data Management Office (CDMO).

The CDMO cdmomac3.xls macro allows the user to automatically format column widths to the correct number of decimal places based on YSI sensor specifications. It also allows the user 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 and produce single parameter and missing data point graphs on a monthly basis. These graphs are instrumental in identifying anomalous data between deployments. Spikes, flat lines, and other anomalies are identified on the graphs as row numbers on the Excel spreadsheet. After referencing the spreadsheet, data are either removed or retained and noted in the metadata. In some cases, dates of anomalous data are compared to tide charts, phases of the moon, and known climatic events to determine potential causes for anomalies.

Missing data are denoted by periods (.) and documented in section 11 (Data Anomalies) of this document. Any erroneous data that are identified as being caused by probe failures, as determined upon examination of the data plots, are deleted and replaced with periods and noted in section 11. Symptoms of probe failure are extreme noise in the record, unrealistically high or negative data, and noisy or negative readings in standard solutions. Examples of many such failures are given in the CDMO Manual (Version 4). Sensor readings that greatly deviate from known values of standards after deployments are not necessarily believed to be the result of probe failure. These erroneous readings may be the result of fouling. If fouling is known to be the reason for these data, these data were removed from monthly files and noted in section 11 (Data Anomalies) of this document. If the specific cause of the anomalies cannot be identified, the date and timestamp of the anomalous data are noted in section 11 (Data Anomalies) of this document, but the data are not deleted. When all the macros are run and the data is checked and formatted properly, the monthly data files are saved as text files and then uploaded to the CDMO server. Gregg Sakowicz is responsible for data management and transferring data files to CDMO. Upon data review by the CDMO, all periods were later removed for data dissemination purposes and left blank.

3) Research objectives:

The water quality of the Mullica River and Great Bay has traditionally been relatively clean and free of excessive nutrient loading from anthropogenic sources. This is due to the fact that there is very little development or industry within the drainage basin of the Mullica River and its tributaries. Great Bay had a large source of nutrient loading coming from a menhaden fish processing factory that was in operation from the early 1930's to the early 1960's and affected the lower portion of the bay. The river is relatively deep, five to nine meters in the section that is monitored. Great Bay depth averages about two meters. The river also has a dark color due to tannins and humic compounds that are a natural product coming from the Pine Barrens and are present in large amounts within the river. It is believed that nutrients entering the river upstream do not get utilized within the river because of the lack of light penetration. The great depth of the river and the dark color from the tannins flowing down the river from the Pine Barrens prevent the utilization of these nutrients by planktonic organisms. Where the river empties into the bay, light penetration reaches the bottom of the bay and allows the utilization of the nutrients by phytoplankton making this region more productive (Durand 1979). Water circulation questions within this unique estuary can be addressed by the use of data loggers. Because of the close proximity of the lower station to Little Egg Inlet, the effects of an influx of ocean water can have dramatic effects on both the water quality and on the biological aspect of the region. Upwelling along the coast is a common occurrence during the summer months. The influx of this water into the bay can and does affect larval fish transport into and out of the bay. The colder ocean waters can have dramatic effects on the growth rates of many different species living in the area. Data loggers have been useful in tracking the physical changes within the estuary due to occurrences such as upwelling and storm events and will be helpful in translating the resulting biological events.

4) Research methods:

The YSI 6000/6600 dataloggers are programmed to record temperature, specific

conductance, dissolved oxygen, pH, depth, and turbidity every 30 minutes. Presently, four instruments are located in the Jacques Cousteau Reserve. These monitoring sites extend from the fresh water/salt water interface at Lower Bank, approximately 25 kilometers up the Mullica River from the point where it joins Great Bay to the mouth of Great Bay, a distance of eight kilometers. Thus the data loggers cover a total of 33 kilometers in this estuarine system. One previously monitored non-SWMP site (Buoy 115) was discontinued in August of 1999. This site, Buoy 115 in Little Egg Harbor Bay, borders the Edwin B. Forsythe Refuge on Holgate (Long Beach Island). It was discontinued for 2003, but it is scheduled to be reinstated in 2004.

Extremely cold temperatures during the winter of 2002-2003 resulted in an ice-over of Great Bay, preventing access to and the recovery of dataloggers deployed at Buoy 139 and Buoy 126 until 03/18/03 and 03/26/03, respectively. Recovery efforts earlier in March 2003 at both sites were thwarted by damages incurred as a result of ice floe movements. The PVC pipe and mounting hardware were bent severely at Buoy 126, preventing the extraction of the datalogger. The PVC pipe and mounting hardware were torn entirely from Buoy 139 and were later recovered from under the structure. Recovery of the instruments and hardware from both sites, requiring divers from Rutgers University Marine Field Station (RUMFS), occurred during the aforementioned dates.

Damage similar to that of B139 was incurred at the Lower Bank site during the winter of 2002-2003. The datalogger had been removed prior to the event, but the damage required that the pipe be replaced in late May of 2003. No damage was incurred at the Chestnut Neck site.

After the damage incurred by the mounting hardware during the winter of 2002-2003, it was decided to deploy dataloggers in cages at Buoys 126 and 139 for the remainder of 2003. These cages, measuring 1m x 1m x 1m, are made of 1/4" steel with diagonal cross-pieces in the center. The dataloggers were affixed to this center cross-piece with heavy duty cable ties. This assured that no matter how the cage came to rest on the bottom, the datalogger and its probes would always be at the same approximate depth and would be located approximately 0.5m above the sediment. Deployments utilizing this method were first made on 04/16/03 for Buoy 126 and 04/23/03 for Buoy 139. The use of PVC pipes was continued at the Lower Bank and Chestnut Neck sites. The continuation of using the caging technique will most likely be discontinued in 2004 and we will return to the method utilizing PVC pipes for all the SWMP sites.

Every thirty minutes (eastern standard time, EST) during each sampling period, measurements of specific conductance, salinity, temperature, dissolved oxygen, (percent saturation and mg/L), water level, pH, and turbidity are recorded. After approximately 14 days, the data logger is removed from the PVC pipe or cage. This period of time was often extended during 2003 because of weather restrictions and vessel availability. A YSI 600XL data logger attached to a YSI 610-DM or 650-MDS handheld unit is then lowered into the pipe and samples in-situ water conditions at the same depth which data is recorded. A different calibrated and programmed YSI data logger is then switched with the data logger being replaced. The data logger is brought back to the laboratory for downloading, cleaning, and re-calibration. It is then reprogrammed for exchange at a different location. The beginning and end of each data file is compared to the YSI 600XL values and the data are checked for probe failure and fouling. The data loggers are programmed to start recording data a few hours before they are deployed in the field.

Calibration standards required for pH and conductivity are purchased from Fisher Scientific supply. A two point calibration is used for pH, the first being pH 7 followed by pH 4. The lower pH standard is used because of the more acidic properties of the Mullica River. A standard of 20,000 us/cm is used to calibrate for conductivity. The membrane on the oxygen probe is changed when anomalous data is recorded, and almost every deployment during the summer months. The membrane is stretched over the face of the probe and is burned in by allowing the data logger to run in an unattended sampling mode sampling every 30 minutes for at least six hours. Dissolved oxygen is calibrated using a calibration cup filled with about 1/4 inch tap water, which creates a 100% water-saturated air environment for the sensor when the data logger is placed in the cup. The sensors are allowed to equilibrate in the cup before DO (% saturation) is calibrated. DO calibrations are performed immediately before deployment. Data loggers are allowed to sample inside the calibration cup at least one hour following retrieval to assure the membrane functioned properly during deployment. Calibration of the turbidity probe is performed with a 0 NTU (National Turbidity Units) standard (de-ionized water) and a 123 NTU standard in a glass beaker; the depth of each solution is always 3 inches or greater. Turbidity wipers are replaced after every deployment. Used conductivity and pH standards are stored for rinsing probes and performing post-deployment calibrations prior to cleaning loggers. Great care is taken to clean the data loggers before calibration, and each used standard is used as a rinse solution at least twice before being discarded (unless egregious contamination is suspected). Servicing an instrument generally takes about two hours for each data logger plus the time involved with retrieval and deployment.

5) Site location and character:

The Jacques Cousteau National Estuarine Research Reserve (JACNERR) at Mullica River/Great Bay is located on the northeast coast of the United States on the Atlantic Ocean. The estuary is near Tuckerton, New Jersey about 14 kilometers north of Atlantic City. All three locations can be characterized by having no macroalgae and fast moving tidal currents. All sites are in an undisturbed area with little impact from development or pollution. There were four active sampling stations in 2003:

1) Buoy 126 (B6) - 39° 30.478' N, 74° 20.308' W- located three kilometers from Little Egg Inlet on the eastern side of Great Bay and is 100 meters from the nearest land that is a natural marsh island. This is a naturally deep area that has never been dredged. It is located about 0.5 kilometers from an area in the Intracoastal Waterway, which is dredged regularly. The dredged material is coarse sand. The data logger at this location is attached to Intracoastal Waterway Buoy 126 and is the closest monitoring station to Little Egg Inlet. This site can be characterized by having strong tidal currents, 2-3 knots, fine to coarse sand bottom with an extensive blue mussel bed surrounding the area. As reference, the 2002 averages for this site were as follows: the depth is 3.0 meters with a tidal range of 1.8 to 4.3 meters. Salinity averages 30.0 ppt with a maximum of 32.6 and a minimum of 19.6 ppt. Temperatures at this site range from 1.2 to 28.2 degrees Celsius. Values for pH at this site ranged from 7.4 - 8.2 with an average value of 7.9 and were not as variable as values from the previous year. Groundwater inputs from margins of the estuary as well as surface flow from Mullica River account for the majority of freshwater coming into the system at this site, followed by input from rainwater from the marsh surface and above.

2) Chestnut Neck (NE) - 39° 32.872' N, 74° 27.676' W - located 12 kilometers up the Mullica River from the mouth of the river. The river begins at a line drawn

between Graveling Point and Oysterbed Point on the northwestern side of Great Bay. The Mullica River at this location is quite wide, about 250 meters. The data logger is attached to the dock of a small marina along the southern shore of the river adjacent to the main channel. This location has never been dredged. As reference, the 2002 averages for this site were as follows: The average depth at this location is 1.6 meters with a tidal range of 0.5 to 2.5 meters. The depth in the middle of the Mullica River at this location is about six meters. The pH averages 7.3 for the year with a range of from 6.6 to 7.9. The average salinity here is 18.6 ppt with a range of 2.7 to 27.5 ppt. The site is characterized by having tidal currents of less than one knot, during both ebb and flood tide, and has a sandy bottom. Freshwater input is primarily from groundwater and watershed runoff.

3) Lower Bank (BA) - 39° 35.618' N, 74° 33.091' W - located 13 kilometers upriver of the Chestnut Neck location. The Mullica River at this site is about two hundred meters wide. The data logger is attached to a bridge going over the Mullica River and is located in the center of the river. The northern bank of the river is sparsely developed with single-family houses and has a steep bank about five meters high. The southern shore has an extensive marsh and fresh water wetland area about three kilometers wide. This site can be characterized by having fast tidal currents, just over one knot, deep water, and fine sand sediment. As reference, the 2002 averages for this site were as follows: The average depth is 1.6 meters with a tidal range of 0.6 to 2.5 meters. pH ranges from 4.0 to 7.4. The salinity averages 4.6 ppt with a range of from 0.0 to 18.6 ppt. 2001 temperatures ranged from 0.0 to 31.1 degrees Celsius. Freshwater input is primarily from groundwater and watershed runoff.

4) Buoy 139 (B9) - 39° 29.883'N, 74° 22.873' W - located 4 kilometers from Buoy 126 on the western side of Great Bay and is located about one to one and one-half kilometers from land. The closest landform is an extensive salt marsh about 1.5 kilometers wide, which borders the upland area. This area is dredged on a regular basis every five to six years to maintain the channel at a depth of eight feet by the U.S. Army Corp of Engineers. The surrounding depth of the bay is about five to six feet deep. This site is characterized by having maximum currents of about 1.5 knots with a muddy sand bottom and with little structure or shell. As reference, the 2002 averages for this site were as follows: The average depth is 2.47 meters with a tidal range of 1.77 to 3.29 meters. The average pH is 8.0 with a range of 7.2 to 8.5, and salinity values averaged 26.1 with a range of 12.1 to 32.8 ppt. Groundwater inputs from margins of the estuary as well as surface flow from Mullica River account for the majority of freshwater coming into the system at this site, followed by input from rainwater from the marsh surface and above.

6) Data collection period:

Buoy 126			
Deployment	Began	Ended	
B6121802	12/18/02 11:00:00	01/09/03 14:30:00	
B6010903	01/09/03 15:30:00	01/21/03 19:30:00	
B6042103	04/21/03 13:00:00	04/29/03 09:00:00	
B6042903	04/29/03 09:30:00	05/20/03 10:30:00	
B6052003	05/20/03 11:00:00	06/02/03 08:30:00	
B6060203	06/02/03 09:30:00	06/20/03 09:30:00	
B6062003	06/20/03 10:00:00	07/01/03 13:00:00	
B6070103	07/01/03 13:30:00	07/25/03 10:30:00	
B6072503	07/25/03 11:30:00	08/11/03 09:30:00	
B6081103	08/11/03 10:00:00	08/26/03 08:00:00	

B6082603	08/26/03 08:30:00	09/26/03 08:30:00
B6092603	09/26/03 09:00:00	10/17/03 08:30:00
B6101703	10/17/03 09:30:00	11/05/03 13:00:00
B6110503	11/05/03 13:30:00	11/21/03 11:30:00
B6112203	11/22/03 11:30:00	12/12/03 13:30:00*

*= no datalogger deployed for remainder of 2003 in anticipation of ice-over

Buoy 139

Deployment	Began	Ended
B9121202	12/12/02 23:00:00	03/19/03 11:00:00
B9042303	04/23/03 09:00:00	05/20/03 10:00:00
B9052003	05/20/03 10:30:00	06/10/03 13:00:00
B9061003	06/10/03 13:30:00	06/24/03 12:00:00
B9062403	06/24/03 12:30:00	07/18/03 09:00:00
B9071803	07/18/03 09:30:00	08/04/03 10:00:00
B9080403	08/04/03 10:30:00	08/20/03 10:00:00
B9082003	08/20/03 10:30:00	09/11/03 10:00:00
B9091103	09/11/03 11:00:00	10/01/03 10:00:00
B9101003	10/10/03 10:30:00	10/20/03 10:30:00
B9102003	10/20/03 11:00:00	11/07/03 13:30:00
B9110703	11/07/03 14:00:00	11/26/03 09:30:00
B9112603	11/26/03 10:00:00	12/16/03 10:00:00*

*= B9 no datalogger deployed for remainder of 2003 in anticipation of ice-over

Chestnut Neck

Deployment	Began	Ended
NE121202	12/12/02 15:00:00	01/02/03 10:00:00
NE010203	01/02/03 14:00:00	01/16/03 14:00:00
NE021103	02/11/03 13:30:00	02/26/03 13:30:00
NE022703	02/27/03 15:00:00	03/18/03 13:00:00
NE031903	03/19/03 15:00:00	04/09/03 14:00:00
NE041403	04/14/03 11:00:00	05/06/03 14:30:00
NE050803	05/08/03 12:30:00	06/07/03 12:30:00
NE062003	06/20/03 11:30:00	07/08/03 08:30:00
NE071403	07/14/03 08:00:00	07/29/03 08:00:00
NE072903	07/29/03 13:30:00	08/14/03 11:00:00
NE081503	08/15/03 14:00:00	08/28/03 09:30:00
NE082803	08/28/03 15:30:00	09/11/03 08:00:00
NE091103	09/11/03 13:00:00	09/24/03 10:30:00
NE092503	09/25/03 14:00:00	10/08/03 09:30:00
NE100903	10/09/03 11:30:00	10/29/03 11:00:00
NE102903	10/29/03 15:00:00	11/12/03 10:00:00
NE111303	11/13/03 11:30:00	12/03/03 13:30:00*

*= no datalogger deployed for remainder of 2003 in anticipation of ice-over

Lower Bank

Deployment	Began	Ended
BA121902	12/19/02 10:30:00	01/08/03 13:30:00
BA010803	01/08/03 14:00:00	01/16/03 13:30:00
BA061203	06/12/03 11:30:00	07/10/03 12:30:00
BA071003	07/10/03 13:00:00	07/25/03 09:30:00
BA072503	07/25/03 10:00:00	08/09/03 14:30:00
BA080903	08/09/03 15:00:00	08/28/03 11:00:00
BA082803	08/28/03 11:30:00	09/11/03 09:30:00
BA091103	09/11/03 10:00:00	10/02/03 10:30:00

BA100203	10/02/03 11:30:00	10/16/03 10:00:00
BA101603	10/16/03 12:00:00	10/30/03 11:30:00
BA103003	10/30/03 12:00:00	11/13/03 13:30:00
BA111303	11/13/03 14:00:00	12/11/03 14:00:00
BA121103	12/11/03 14:30:00	01/08/04 11:00:00

7) Distribution

According to the Ocean and Coastal Resource Management Data Dissemination Policy for the NERRS System-wide Monitoring Program, 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 the 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 1. Principal investigators and contact persons), from the Data Manager at the Centralized Data Management Office (please see personnel directory under general information link on CDMO homepage) and online at the CDMO homepage <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:

During 2003, weekly ichthyoplankton sampling at Little Sheepshead Creek Bridge (LSCB) continued as part of the long-term sampling conducted by Rutgers University in the JCNERR. Presence and abundance of larval fishes are determined with a plankton net (1 m, 1 mm mesh) deployed during night flood tides from abridge near Little Egg Inlet (New Jersey) in the Great Bay/Little Egg harbor portion of the NERR. Wire-mesh trapping conducted in the Rutgers boat basin, and system-wide otter trawling also continued in 2001 as part of long-term sampling within the Reserve.

Roger Hoden continued long-term monitoring and evaluation of diamondback terrapin (*Malaclemys terrapin terrapin*) habitat utilization along Great Bay Boulevard, within the JCNERR. The Boulevard, which bisects a seven-mile long peninsula within the Reserve, offers valuable insight into juvenile and adult terrapin behavior. Samples for mortality studies are collected daily along the boulevard by staff of the Rutgers field station on their way to and from the field station, located at the end of this road.

Amanda McGuirk, a NERR Graduate Research Fellow, has been working with the JCNERR's Research Coordinator, Dr. Michael Kennish, on nutrient analysis

of Great Bay and the Mullica River. Her study utilizes an ISCO sampler and spot sampling techniques documented in the NERR Standard Operating Procedure for SWMP.

Data from all four SWMP sites were used to tide-correct depth data for proximal REMUS missions in 2003. Visit <http://marine.rutgers.edu/rumfs/MarineOps/Marineopsmain.htm> for more information.

A datalogger was temporarily deployed in the RUMFS boat basin during the October-November 2003 dredging. These data, and data obtained from Buoy 126, Buoy 139, and an auxiliary datalogger site at Little Sheepshead Creek (maintained by RUMFS), was used in analyses of fish population dynamics as related to dredging activities.

During the October-November boat basin dredging at RUMFS, Steve Awbury et al. studied the re-suspension of alleged sediment contaminants. Datalogger data from Buoy 139, Buoy 126, and a datalogger temporarily deployed in the RUMFS boat basin during that period, were used as references for water parameters sampled in the water column within the dredge spoils.

Drs. Kenneth W. Able and Thomas Grotheus from the Rutgers University Marine Field Station are studying species distributions, daily movements, and seasonal migration patterns of striped bass using surgically implanted hydroacoustic transmitters and an array of buoy-mounted receivers. The study area includes the Mullica River/Great Bay estuary, the southern end of Barnegat Bay, and the coastal ocean outside of Little Egg Inlet off Tuckerton, New Jersey. Visit www.stripertracker.org for more information.

Other projects orchestrated in the year 2003 in the JCNERR include a biofouling project conducted by the Research Coordinator, looking at fouling organisms that settle in the vicinity of Buoy 126 and the YSI data logger. Several biofouling panels constructed of aluminum plates were secured in the sediment. One set of panels was retrieved per month from June through the end of October and were processed for species content after the samples were preserved. An expanded biofouling study was conducted in Little Egg Harbor and Barnegat Bay during the summer of 2003.

In addition to the aforementioned biofouling survey, the RC also began a study looking at the species composition of the benthos near SWMP water quality sites. Samples were obtained with a manually operated Van Veen grab sampler and stored in 1 quart Nalgene jars for future analysis.

Surveys of submerged aquatic vegetation (SAV) were conducted in the Little Egg Harbor estuary via aerial photography, visual surveys by divers along a transect, and core sampling. Data from the lower-estuary dataloggers (B126 and B139) will be used to discern the effect of water quality, among other parameters, on SAV bed dynamics.

REMUS (Remote Environmental Monitoring UnitS) surveys, utilizing side-scan sonar, mapped areas of seafloor in the vicinity of Buoy 126 in 2003. Depth data from the dataloggers deployed at this SWMP site were used to tide-correct REMUS's position in the vertical water column. From the data collected by REMUS, three-dimensional maps, revealing bedforms and sediment densities (both relating to potential organism habitats), were constructed.

Relating to the aforementioned REMUS surveys were collection of sediments within the mapped areas. Sediment grain-size, density, and composition all affect the hydroacoustic signal emitted and collected by REMUS. These sediments were collected via a Van veen grab sampler and later processed to reveal grain size and composition.

II. Physical Structure Descriptors

9) Variable sequence, range of measurements, units, resolution, and accuracy:

YSI 6000/6600 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:

BA = Lower Bank
 NE = Chestnut Neck
 B6 = Buoy 126
 B9 = Buoy 139

File definitions: site/wq/month/year (ex.: B6wq0103 = Buoy 126 water quality data from January 2003).

11) Data anomalies:

BUOY 126 (B6)

January B60103

There are some slightly negative turbidity values reported 01/01 00:00 - 01/09 14:30 (B6121803 deployment). These negative values are likely the result of calibration error and are small, so they were therefore not deleted.

The last sample taken during this month occurred on 01/21/03 19:30:00. This

datalogger was "stranded" in its PVC housing due to a sudden ice-over affecting the entire estuary. Retrieval was attempted at the time of the first thaw in early March, but the PVC pipe was bent, preventing extrication of the datalogger. A full salvage of the datalogger, pipe, and stainless steel mounting hardware (also severely damaged) was made on 03/26/03 by a Rutgers University diver (Joe Doborro).

All turbidity values collected during the B6010903 deployment (01/09/03 15:30:00 - 01/21/03 19:30:00) were deleted because the datalogger was not equipped with a turbidity probe due to a YSI recall; values reported in the dataset are therefore erroneous.

February B60203

No data were obtained during this entire month (02/01/2003 00:00:00 - 02/28/2003 23:30:00) due to the datalogger being iced-in at the site but inoperative.

March B60303

No data were obtained during this entire month (03/01/2003 00:00:00 - 03/31/03 23:30:00) due to 1) the datalogger being iced-in at the site but inoperative (03/01/2003 00:00:00 to 03/26/2003 unspecified time) and 2) the datalogger not being replaced upon retrieval (a "salvage mission" occurred on 03/26/2003 unspecified time) because all the mounting hardware had to be removed from the structure for repair and to extricate the datalogger.

April B60403

No data were obtained from 04/01/03 00:00:00 to 04/21/03 12:30:00 (the latter date and time being when a temporary site repair was made and a datalogger was deployed at this site). Because the mounting hardware and PVC pipe was so severely damaged, the datalogger was instead deployed in a "tumble cage" (see Section 4: Research Methods).

All turbidity values for the B6042103 deployment (04/21/03 13:00:00 to 04/29/03 09:00:00) were deleted because the datalogger was not equipped with a turbidity probe due to a YSI recall; values reported in the dataset were therefore erroneous.

May B60503

The range of depths reported by the datalogger increased greatly towards the end of the B6042903 deployment (05/18 04:00). Upon retrieval, it was found that the cage, which was also covered in a large quantity of marcoalgae, was being lifted from the bottom by strong currents. It was also discovered during post-calibration that the batteries had failed during the deployment. Because it is unclear whether the depth values reported were resultant of the cage lifting from the bottom or destabilized because of battery failure, these data (05/12 - 05/18) were not deleted but should be considered suspect.

There are a number of high turbidity "spikes" recorded during the latter half of the B6042903 deployment (starting approximately 05/11/03 through 05/18 04:00). Because the site may have experienced higher than typical current velocities (as visually observed and recorded during recovery as well as apparent from depth data obtained during this deployment) and recent storm events, highly elevated turbidity values may have indeed been possible. These data were therefore not

deleted.

All turbidity values from the B6052003 deployment for May (05/20/03 11:00:00 to 05/31/03 23:30:00) are considered suspect. Many turbidity values recorded during this deployment were quite negative and technician was unable to obtain a stable suitable (most reported values quite negative) post-calibration with the probe. Therefore, turbidity for the reported period were not deleted but should be considered suspect.

All D.O. values for May from the B6052003 deployment (05/20/03 11:00:00 to 05/31/03 23:30:00) should be considered suspect. Reason: The D.O. values during the approximate the latter half of the deployment were a bit low as compared to retrieval D.O. values (with handheld 610 unit) and the successive deployment (datalogger replacing this one). However, the technician could not find an obvious inflection in the pattern or malfunction of the D.O. probe or membrane, so no values were deleted.

Data are missing from and including 05/18/03 04:30:00 until 05/20/03 10:30:00 due to battery failure during the B6042903 deployment.

June B60603

All turbidity values for June are considered suspect. Many turbidity values recorded during this deployment were quite negative and technician was unable to obtain stable suitable post-calibration with the probe. Therefore, turbidity for the reported period were not deleted but should be considered suspect.

There are some elevated turbidity "spikes" reported 06/12/03 09:30:00, 06/12/03 11:00:00, 06/12/03 11:30:00, 06/12/03 12:00:00, and 06/12/03 12:30:00. While elevated relative to proximal values, such ephemeral elevated turbidity levels are possible. These data were therefore not deleted.

All D.O. values for June from the B6052003 deployment (applicable data: 06/01/03 00:00:00 to 06/02/03 08:30:00) should be considered suspect. Reason: The D.O. values during the approximate the latter half of the deployment were a bit low as compared to retrieval D.O. values (with handheld 610 unit) and the successive deployment (datalogger replacing this one). However, the technician could not find an obvious inflection in the pattern or malfunction of the D.O. probe or membrane, so no values were deleted.

There is a discrepancy between the last pH value reported during the B6052003 deployment (05/20 - 06/02) and the first pH value reported by the B6060203 deployment (06/02 - 06/20). Because this discrepancy was not extremely large the pH values from either deployment were not deleted.

There appears to be a small discrepancy between D.O values at time of retrieval of the B6062003 deployment (06/20 - 07/01) and both the field sample (with a YSI 600XL sonde paired with a 650 MDS unit) and the successive deployment (B6070103).

Technician cannot find an obvious inflection or malfunction of the D.O. probe or membrane. None of the D.O. values for June from this deployment (06/20/03 10:00:00 to 06/30/03 23:30:00) were deleted, but values should be considered suspect.

The B6062003 deployment post-calibration value for turbidity seems too high (2.6), but the turbidity values reported during the deployment seem reasonable.

All turbidity values reported for June (06/20/03 10:00:00 to 06/30/03 23:30:00) from this deployment could therefore be regarded as suspect, but were not deleted.

The temperature values reported during the B6062003 deployment (06/20 - 07/01) appear to conflict with what was reported by a 650 MDS unit as well as the prior (B6060203) and successive (B6070103) deployments. It was found retrospectively that the Temperature probe on the #11 datalogger continually read approximately 2 degrees lower than other dataloggers in 2003. Therefore, Temperature, DO mg/L, Salinity, Specific Conductivity, Depth, pH, and Turbidity reported for June (06/20/03 10:00:00 to 06/30/03 23:30:00) during this deployment should be considered suspect but were not deleted.

Discovered retrospectively, the caging method employed was not heavy enough to withstand the strongest of tide-driven currents. This can be seen as a dramatic reduction in depth as the cage was lifted from the bottom and swung upwards like a pendulum. Depth data should be regarded as suspect for the following dates and times:

06/11/03 14:30:00 - 16:30:00
06/12/03 15:30:00 - 16:30:00
06/13/03 16:00:00 - 18:00:00
06/14/03 00:30:00 - 01:00:00
06/15/03 01:00:00 - 01:30:00
06/16/03 02:30:00 - 03:00:00
06/17/03 02:30:00 - 03:30:00

July B60703

All turbidity values for July are considered suspect. Many turbidity values recorded during this deployment were quite negative and technician was unable to obtain stable suitable (most reported values quite negative) post-calibration with the probe. Therefore, turbidity for the reported period were not deleted but should be considered suspect.

There appears to be a discrepancy between D.O. values at time of retrieval of the B6062003 deployment and both the field sample (with a 650 MDS unit) and the successive deployment (B6070103). Technician cannot find an obvious inflection or malfunction of the D.O. probe or membrane. None of the D.O. values for July from this deployment (07/01/03 00:00:00 to 07/01/03 13:00:00) were deleted from the B6062003 deployment, but values could be considered suspect.

The B6062003 deployment post-calibration value for turbidity seems too high (2.6), but the turbidity values reported during the deployment seem reasonable. All turbidity values reported for July from this deployment (07/01/03 00:00:00 to 07/01/03 13:00:00) could therefore be regarded as suspect, but were not deleted.

The temperature values reported during the B6062003 deployment appear to conflict with what was reported by a 650 MDS unit as well as the prior (B6060203) and successive (B6070103) deployments. It was found retrospectively that the Temperature probe on the #11 datalogger continually read approximately 2 degrees lower than other dataloggers in 2003. Therefore, Temperature, DO mg/L, Salinity, Specific Conductivity, Depth, pH, and Turbidity reported for July from this deployment (07/01/03 00:00:00 to 07/01/03 13:00:00) should be considered suspect but were not deleted.

D.O. values reported for July from the B6070103 deployment (07/01 - 07/25) seem

O.K. at the beginning but appear to have degraded over the period of this deployment. This became evident when the last value(s) of this deployment were compared with the first value(s) of the next deployment. This depression of the D.O. values is probably due to fouling during the unintentional extended deployment time experienced by the B6070103 deployment. Because there is no definite event such as a membrane failure or sudden probe/sonde failure, none of the D.O. values were deleted for this deployment (07/01/03 13:30:00 to 07/25/03 10:30:00), but the values reported should be considered suspect.

There is an apparent discrepancy between the last salinity (ppt and mS/cm) values reported in the B6070103 deployment (07/25/03 10:30:00) and the first values reported for the B6072503 deployment (07/25/03 11:30:00), but no values from either deployment were deleted.

There is also an apparent discrepancy between the last pH values reported in the B6070103 deployment (07/25/03 10:30:00) and the first pH values reported for the B6072503 deployment (07/25/03 11:30:00), but no values from either deployment were deleted.

There are numerous sudden and high turbidity values ("spikes") reported for the B6070103 deployment (07/07/03 03:30:00, 07/16/03 04:30:00, 07/16/03 05:00:00, 07/16/03 12:00:00, 07/16/03 12:30:00, 07/16/03 13:00:00, 07/16/03 14:00:00, 07/20/03 09:30:00, and 07/21/03 00:00:00). Because turbidity values returned to typical after these spikes, they were not deleted, but should be considered suspect because they were likely caused by temporary occlusion of the optics by alga, crustaceans, or fishes.

August B60803

All turbidity values for August are considered suspect. Many turbidity values recorded during this deployment were negative. Therefore, turbidity for the reported period were not deleted but should be considered suspect.

There were some relatively elevated turbidity values reported for August from the B6072503 deployment: 08/10/03 15:00:00 and all values from approximately 08/10/03 21:30:00 to the end of the deployment (08/11/03 09:30:00). While the former value was likely the result of a ephemeral occlusion of the optics (possibly by macroalgae or an unspecified motile creature such as a crustacean or fish) and the latter values were likely the result of some sort of fouling, none of these values were deleted but should be considered suspect.

During the B6081103 deployment, both the retrieval and post-calibration values for D.O. were much too low. In the reported values, there was a sudden drop in recorded D.O. values between 08/26/03 01:30:00 and 08/26/03 02:00:00. This is the time of suspected membrane failure, so all D.O. values (% and mg/L) between and including 08/26/03 02:00:00 and 08/26/03 08:00:00 were deleted.

The start and end logger temperature values for the B6081103 deployment were low as compared to the handheld 650 MDS unit. It was found retrospectively that the Temperature probe on the #11 datalogger continually read approximately 2 degrees lower than other dataloggers in 2003. Therefore, Temperature, DO mg/L, Salinity, Specific Conductivity, Depth, pH, and Turbidity reported during this deployment (08/11/03 10:00:00 to 08/26/03 08:00:00) should be considered suspect but were not deleted.

There is a mismatch in pH value(s) reported at the end of the B6072503 deployment (08/11/03 09:30:00) and the beginning of the B6081103 deployment

(08/11/03 10:00:00). Neither dataset was deleted.

September B60903

The passage of Hurricane Isabel through waters south of NJ and then inland through Maryland and Pennsylvania appears to have influenced parameters among the four SWMP sites within the JCNERR. Strong winds and rainfall were experienced locally, as well as some flooding, between the latter hours of September 17th and midday hours of September 19th. The effects of this event (spanning the aforementioned period of time) can be seen in the B6wq0903 data, specifically: a depression of temperature values, the loss of the cyclic tidal signature concerning salinity and conductivity, a slight increase and loss of the tidal signature concerning depth, and a relative stabilization and loss of the tidal signature concerning pH. No reliable comment can be made concerning DO% and DO concentration during this period because the record of these values appears to have been compromised independently of this event.

There were numerous elevated turbidity values reported during the B6082603 deployment: 09/12/03 04:00:00, 09/12/03 06:00:00, 09/12/03 06:30:00, 09/12/03 07:00:00, 09/12/03 08:00:00, 09/12/03 08:30:00, 09/12/03 09:00:00, 09/12/03 09:30:00, 09/12/03 10:00:00, 09/12/03 10:30:00, 09/12/03 11:00:00, 09/12/03 11:30:00, 09/24/03 18:00:00, 09/25/03 12:30:00, 09/26/03 05:00:00. Because turbidity values returned to what is possible in the proximal waters shortly after these anomalous events, none of these values were deleted but should be considered suspect.

Dissolved oxygen values for 09/09/03 03:00:00 - 09/26/03 08:30:00 were deleted due to bubble apparent on membrane at time of retrieval and calibration, with constantly falling post-calibration values and comparison of field readings to last value retrieved from sonde. Reason for deterioration of data unknown. Remaining DO values for this deployment should be considered suspect.

There was an apparent destabilization of all values except Temperature during the b6092603 deployment, likely due to battery compartment flooding discovered during post-calibration. The mismatch between the groundtruth data obtained with the YSI 600XL and the discrepancies between the previous and successive deployments (B6082603 and B6101703, respectively) were so extreme that all values for September from this b6092603 deployment (09/26/03 09:00:00 to 09/30/03 23:30:00) except temperature were deleted.

October B61003

There was an apparent destabilization of all values except Temperature during the b6092603 deployment, likely due to battery compartment flooding discovered during post-calibration. The mismatch between the groundtruth data obtained with the YSI 600XL and the discrepancies between the previous and successive deployments (B6082603 and B6101703, respectively) were so extreme that all values from the b6092603 deployment for October (10/01/03 00:00:00 to 10/17/03 08:30:00) except for temperature were deleted.

The start and end logger temperature values for the B6101703 deployment were low as compared to the handheld 650 MDS unit. It was found retrospectively that the Temperature probe on the #11 datalogger continually read approximately 2 degrees lower than other dataloggers in 2003. Therefore, Temperature, DO mg/L, Salinity, Specific Conductivity, Depth, pH, and Turbidity reported for October (10/17/03 09:30:00 to 10/31/03 23:30:00) during this deployment should

be considered suspect but were not deleted because they still fell within a reasonable range of values.

There is a single very high turbidity "spike" on 10/29/03 06:30:00, likely caused by temporary occlusion of the turbidity probe optics. Data was not deleted but should be considered suspect.

The pH probe obviously malfunctioned during the B6101703 deployment. The pH values fall far below what would be considered realistic values. The pH data from this deployment for October (10/17/03 09:30:00 to 10/31/03 23:30:00) were therefore deleted.

November B61103

The start and end logger temperature values for the B6101703 deployment were low as compared to the handheld 650 MDS unit. It was found retrospectively that the Temperature probe on the #11 datalogger continually read approximately 2 degrees lower than other dataloggers in 2003. Therefore, Temperature, DO mg/L, Salinity, Specific Conductivity, Depth, pH, and Turbidity reported for November (11/01/03 00:00:00 to 11/05/03 13:00:00) during this deployment should be considered suspect but were not deleted.

The pH probe obviously malfunctioned during the B6101703 deployment. The pH values fall far below what would be considered realistic values at 10/23/03 00:00:00. The pH data from this deployment for November (11/01/03 00:00:00 to 11/05/03 13:00:00) were therefore deleted.

D.O. (%) and D.O. (mg/L) dropped dramatically at 11/07/03 14:30:00. It can be presumed that the D.O. membrane became compromised at this time, rendering D.O. values (%) and mg/L) reported for the remainder of the B6110503 deployment (from 11/07/03 14:30:00 to 11/21/03 11:30:00) inaccurate and therefore they were deleted.

There are numerous elevated turbidity values ("spikes") reported for November during the B6110503 deployment: 11/08/03 05:30:00, 11/08/03 18:00:00, 11/08/03 20:00:00, 11/13/03 14:00:00, 11/13/03 14:30:00, 11/14/03 02:00:00-12:00:00, 11/14/03 15:00:00-18:30:00, 11/14/03 23:00:00, 11/14/03 14:30:00, 11/15/03 00:00:00, 11/15/03 03:00:00, 11/15/03 03:30:00, 11/15/03 08:30:00-10:00:00, 11/15/03 15:00:00-16:30:00, 11/15/03 21:30:00, 11/15/03 23:00:00, 11/18/03 03:00:00, 11/19/03 07:00:00, 22:00:00, 22:30:00. None of these values were deleted because there were numerous storms, high-wind events, and dredging in the RUMFS boat basin during this time.

There were also numerous elevated turbidity values ("spikes") reported for November in the B6112203 deployment: 11/25/03 01:00:00- 11/25/03 03:00:00, 11/27/03 06:00:00, 11/29/03 08:30:00, 11/29/03 09:00:00, 11/29/03 16:30:00, 11/29/03 17:00:00-20:30:00, 11/29/03 21:30:00 - 11/29/03 23:30:00, 11/30/03 01:00:00, 11/30/03 01:30:00, 11/30/03 05:00:00, 11/30/03 10:00:00, 11/30/03 10:30:00, 11/30/03 11:30:00- 11/30/03 12:30:00, 11/30/03 14:00:00, 11/30/03 17:00:00- 11/30/03 18:30:00, 11/30/03 23:30:00. None of these values were deleted because there were numerous storms, high-wind events, and dredging in the RUMFS boat basin during this time.

All turbidity values for November are considered suspect. Many turbidity values recorded during this deployment were negative. Therefore, turbidity for the reported period were not deleted but should be considered suspect.

December B61203

There are no data from 12/12/03 14:00:00 to 12/31/03 23:30:00 because the site was discontinued for the remainder of 2003 in the anticipation of ice-formation.

Buoy 139 (B9)

January B90103

Deleted all data 01/26/03 00:00:00 to 01/31/03 23:30:00. Reason: this datalogger was lost when ice floes destroyed the PVC housing. It was later found by a diver during a salvage operation on 03/18/03 buried in the bottom sediment under the structure. Judging by the depth data recorded, it appears that the datalogger was torn from the housing and sank to the bottom sometime on 01/26/03. Since the datlogger presumably fell probes-down into the sediment, the accuracy of the data is questionable from this time until it ceased recording data and was therefore deleted.

Deleted all turbidity values (01/01/03 00:00:00 to 01/25/03 23:30:00). The datalogger used for the B9121202 deployment was not equipped with a turbidity probe due to a YSI recall, so the values recorded are incorrect.

Inserted the date, timestamp, and empty (blank) values for the parameters for 01/25/03 20:00:00. Inexplicably, this information (and the data accompanying it) is missing from the data downloaded from the datalogger, as if it skipped the sampling period.

The pH values for January (01/01/03 00:00:00 to 01/25/03 23:30:00) from the B9121202 deployment rose to higher-than-expected level but were not deleted.

February B90203

Deleted all data 02/01/03 00:00:00 to 02/28/03 23:30:00. Reason: this datalogger was lost when ice floes destroyed the PVC housing. It was later found by a diver during a salvage operation on 03/18/03 buried in the bottom sediment under the structure. Judging by the depth data recorded, it appears that the datalogger was torn from the housing and sank to the bottom sometime on 01/26/03. Since the datlogger presumably fell probes-down into the sediment, the accuracy of the data is questionable from this time until it ceased recording data and was therefore deleted.

March B90303

Deleted all data 03/01/03 00:00:00 to 03/19/03 11:00:00. Reason: this datalogger was lost when ice floes destroyed the PVC housing. It was later found by a diver during a salvage operation on 03/18/03 buried in the bottom sediment under the structure. Judging by the depth data recorded, it appears that the datalogger was torn from the housing and sank to the bottom sometime on 01/26/03. Since the datlogger presumably fell probes-down into the sediment, the accuracy of the data is questionable from this time until it ceased recording data and was therefore deleted.

There were no data from 03/19/03 11:30:00 to 03/31/03 23:30:00. No datalogger was deployed at this time.

April B90403

There are no data 04/01/03 00:00:00 to 04/23/03 08:30:00. No datalogger was deployed at this time.

All D.O. data (% D.O. and D.O. mg/L) from 04/23/03 09:00 to 04/30/03 23:30:00 suspect due to higher than normal values. D.O. probe calibrated during pre-deployment calibration but was a little high (124.6%) during post deployment calibration, but membrane stable. Data retained but suspect.

Because the PVC pipes and mounting brackets were destroyed by ice floes in early 2003, the SWMP station was restored to an operational state using "tumble cages" (see materials and methods) and a new datalogger was deployed on 04/23/03 09:00:00.

Deleted all turbidity values for April from the B9042303 deployment (04/23/03 09:00:00 to 04/30/03 23:30:00) because the datalogger was not equipped with a turbidity probe due to a recall by YSI, so the values recorded are incorrect.

May B90503

Deleted all turbidity values for May from the B9042303 deployment (05/01/03 00:00:00 to 05/20/03 10:00:00) because the datalogger was not equipped with a turbidity probe due to a recall by YSI, so the values recorded are incorrect.

Deleted all turbidity values for May from the B9052003 deployment (05/20/03 10:30:00 to 05/31/03 23:30:00) because the datalogger was not equipped with a turbidity probe due to a recall by YSI

All D.O. data (% D.O. and D.O. mg/L) from 05/01/03 00:00 to 05/20/03 10:00:00 suspect due to higher than normal values. D.O. probe calibrated during pre-deployment calibration but was a little high (124.6%) during post deployment calibration, but membrane stable. Data retained but suspect.

All D.O. data (% D.O. and D.O. mg/L) from 05/20/03 10:30:00 to 05/31/03 23:30:00 deleted. Pre and post deployment calibration failed as well as visual examination of plots during QA/QC showed obvious failure of D.O. membrane or probe at 05/20/03 10:30:00.

Temp, D.O., SpCond, etc for May (05/20/03 10:30:00 to 05/31/03 23:30:00) from the B9052003 deployment look a bit low as compared to previous deployment. It was found retrospectively that the Temperature probe on the #11 datalogger continually read approximately 2 degrees lower than other dataloggers. Therefore, Temperature, DO mg/L, Salinity, Specific Conductivity, Depth, pH, and Turbidity reported during this deployment can be considered suspect but were not deleted.

June B90603

Deleted all turbidity values for June (06/01/03 00:00:00 to 06/10/03 13:00:00) from the B9052003 deployment because the datalogger was not equipped with a turbidity probe due to a recall by YSI

All D.O. data (% D.O. and D.O. mg/L) for June (06/01/03 00:00:00 to 06/10/03 13:00:00) from the B9052003 deployment were deleted. Reason: visual examination of plots during QA/QC obvious failure of D.O. membrane or probe at 05/27/03 09:00:00.

Temp, D.O., SpCond, etc for June (06/01/03 00:00:00 to 06/10/03 13:00:00) from the B9052003 deployment look a bit low as compared to previous and successive deployments. It was found retrospectively that the Temperature probe on the #11 datalogger continually read approximately 2 degrees lower than other dataloggers. Therefore, Temperature, DO mg/L, Salinity, Specific Conductivity, Depth, pH, and Turbidity reported during this deployment can be considered suspect but were not deleted.

Possible degradation of D.O. membrane by end of B9062403 deployment. D.O. data for June (06/24/03 12:30:00 to 06/30/03 23:30:00) from this deployment not deleted but should be considered suspect.

July B90703

All turbidity values for July are considered suspect. Many turbidity values recorded during this deployment were negative. Therefore, turbidity for the reported period were not deleted but should be considered suspect.

Possible degradation of D.O. membrane by end of B9062403 deployment. D.O. data for July (07/01/03 00:00:00 to 07/18/03 09:00:00) from this deployment not deleted but should be considered suspect.

Temp, SpCond, and D.O. at end of the B9071803 deployment do not agree with the B9080403 deployment start values. It was found retrospectively that the Temperature probe on the #11 datalogger continually read approximately 2 degrees lower than other dataloggers. Therefore, Temperature, DO mg/L, Salinity, Specific Conductivity, Depth, pH, and Turbidity reported for July (07/18/03 09:30:00 to 07/31/03 23:30:00) from this deployment can be considered suspect but were not deleted.

August B90803

Temp, SpCond and Salinity, and D.O. at end of the B9071803 deployment do not agree with the B9080403 deployment start values. It was found retrospectively that the Temperature probe on the #11 datalogger continually read approximately 2 degrees lower than other dataloggers. Therefore, Temperature, DO mg/L, Salinity, Specific Conductivity, Depth, pH, and Turbidity reported for August (08/01/03 00:00:00 to 08/04/03 10:00:00) from this deployment can be considered suspect but were not deleted.

There appeared to be a mismatch in pH values between the last value(s) of the B9080403 and first values of the B9082003 deployments. The values reported for August (08/20/03 10:30:00 to 08/31/03 23:30:00) from the B9082003 deployment seem a bit high but were not deleted.

All turbidity values for August are considered suspect. Many turbidity values recorded during this deployment were negative. Therefore, turbidity for the reported period were not deleted but should be considered suspect.

Turbidity value on 08/12/03 11:00:00 was notably high (1267 NTU) and was deleted. Reason for data spike unknown.

September B90903

The passage of Hurricane Isabel through waters south of NJ and then inland through Maryland and Pennsylvania appears to have influenced parameters among the four SWMP sites within the JCNERR. Strong winds and rainfall were

experienced locally, as well as some flooding, between the latter hours of September 17th and midday hours of September 19th. The effects of this event (spanning the aforementioned period of time) can be seen in the B9wq0903 data, specifically: a slight depression of water temperature, an increase and loss of tidal signature concerning salinity, an increase in and loss of tidal signature concerning DO % and DO concentration, an increase and dampening of tidal signature concerning water depth, a dampening of tidal signature in pH values (although issues with the pH probe discovered during post-calibration suggest some pH values obtained during this period may be compromised), and large elevations in turbidity values.

Temperature looks low and SpCond and Salinity high during the B9091103 deployment as compared to previous (B9082003) and following (B9100103) deployments. It was found retrospectively that the Temperature probe on the #11 datalogger continually read approximately 2 degrees lower than other dataloggers. Therefore, Temperature, DO mg/L, Salinity, Specific Conductivity, Depth, pH, and Turbidity reported for September (09/11/03 11:00:00 to 09/31/03 23:30:00) from this deployment can be considered suspect but were not deleted.

There appeared to be a mismatch in pH values between the last value(s) of the B9080403 and first values of the B9082003 deployments. The values reported for September (09/01/03 00:00:00 to 09/11/03 10:00:00) from the B9082003 deployment seem a bit high but were not deleted.

Technician had some problems getting pH probe to stabilize during post-retrieval calibration of B9091103 deployment. pH values started off OK in beginning on deployment and appear to end off a bit low; pH data for the entire deployment (09/11/03 11:00:00 to 10/01/03 10:00:00) deleted due to failure of diagnostic tests and pH probe needing replacement.

October B91003

Temperature looks low and SpCond and Salinity high during the B9091103 deployment as compared to previous (B9082003) and following (B9100103) deployments. It was found retrospectively that the Temperature probe on the #11 datalogger continually read approximately 2 degrees lower than other dataloggers. Therefore, Temperature, DO mg/L, Salinity, Specific Conductivity, Depth, pH, and Turbidity reported for October (10/01/03 00:00:00 to 10/01/03 10:00:00) from this deployment can be considered suspect but were not deleted.

Technician had some problems getting pH probe to stabilize during post-retrieval calibration of B9091103 deployment. pH values started off OK in beginning on deployment and appear to end off a bit low; pH data for the entire deployment (09/11/03 11:00:00 to 10/01/03 10:00:00) deleted due to failure of diagnostic tests and pH probe needing replacement.

DO values from the B100103 deployment were low as compared to next deployment (B9102003). D.O. values (10/10/03 10:30:00 to 10/20/03 10:30:00) considered suspect but not deleted.

November B91103

Temp values reported from the B9110703 deployment were low as compared to previous deployment (B9102003), next deployment (B9112603), and handheld YSI. It was found retrospectively that the Temperature probe on the #11 datalogger continually read approximately 2 degrees lower than other dataloggers. Therefore, Temperature, DO mg/L, Salinity, Specific Conductivity,

Depth, and Turbidity reported for November (11/07/03 14:00:00 to 11/26/03 09:30:00) from this deployment can be considered suspect but were not deleted.

pH data for the B9110703 deployment (11/07/03 14:00:00 - 11/26/03 09:30) deleted due to faulty probe. The probe was malfunctioning during pre-deployment calibration and no replacement was available.

No pH data were collected for November (11/26/03 10:00:00 to 11/30/03 23:30:00) during the B9112603 deployment. The probe was malfunctioning during pre-deployment calibration and no replacement was available. The probe was therefore deactivated before deployment.

December B91203

No pH data were collected for December (12/01/03 00:00:00 - 12/16/03 10:00:00) during the B9112603 deployment. The probe was malfunctioning during pre-deployment calibration and no replacement was available. The probe was therefore deactivated before deployment.

No data were collected from 12/16/03 10:30:00 - 12/31/03 23:30:00. Monitoring at the Bouy 139 site was discontinued for the remainder of the year in anticipation of ice-over.

Chestnut Neck (NE)

January NE0103

Deleted all turbidity values 01/01/03 00:00:00 to 01/02/03 10:00:00. Reason: the NE121202 datalogger was not equipped with a turbidity probe due to a recall by YSI

Missing data from 01/02/03 10:30:00 to 01/02/03 13:30:00. Reason: both dataloggers (NE121202 and NE010203 deployments) out of the water.

Deleted all turbidity values 01/02/03 14:00:00 to 01/16/03 14:00:00. Reason: the NE010203 datalogger was not equipped with a turbidity probe due to a recall by YSI

Missing data from 01/16/03 14:30:00 to 01/31/03 23:30:00. Reason: Ice-over prevented deployment.

February NE0203

There are missing data from 02/01/03 00:00:00 to 02/11/03 13:00:00. Reason: Ice-over prevented deployment.

Deleted all turbidity values 02/11/03 13:30:00 to 02/26/03 13:30:00. Reason: the NE021103 datalogger was not equipped with a turbidity probe due to a recall by YSI

Missing data from 02/26/03 14:00:00 to 02/27/03 14:30:00. Reason: the NE021103 and NE022703 dataloggers were both out of the water during this time.

Deleted all turbidity values 02/27/03 15:00:00 to 02/28/03 23:30:00. Reason: the NE022703 datalogger was not equipped with a turbidity probe due to a recall

by YSI

March NE0303

Deleted all turbidity values 03/01/03 00:00:00 to 03/18/03 13:00:00. Reason: the NE022703 datalogger was not equipped with a turbidity probe due to a recall by YSI

Missing data from 03/18/03 13:30:00 to 03/19/03 14:30:00. Both the NE022703 and NE031903 dataloggers out of water at this time.

Deleted all turbidity from 03/19/03 15:00:00 to 03/31/03 23:30:00. Reason: the NE031903 datalogger was not equipped with a turbidity probe due to a recall by YSI

April NE0403

Deleted all turbidity from 04/01/03 00:00:00 to 04/09/03 14:00:00. Reason: the NE031903 datalogger was not equipped with a turbidity probe due to a recall by YSI

Missing data from 04/09/03 14:30:00 to 04/14/03 10:30:00. Reason: both the NE031903 and NE041403 dataloggers were out of the water during this period.

Deleted all turbidity values from 04/14/03 11:00:00 to 04/30/03 23:30:00. Reason: the NE041403 datalogger was not equipped with a turbidity probe due to a recall by YSI

D.O. values for April from the NE041403 deployment (04/14/03 11:00:00 to 04/30/03 23:30:00) drop off towards the latter half of the deployment, and the D.O. probe reportedly failed post-calibration with a value of 77.5%. Because the probe displayed acceptable values during the beginning of the deployment and no obvious time of probe/membrane failure can be discerned, the D.O. data (both % and mg/L) were not deleted but should be regarded as suspect.

May NE0503

Deleted all turbidity values from 05/01/03 00:00:00 to 05/06/03 14:30:00. Reason: the NE041403 datalogger was not equipped with a turbidity probe due to a recall by YSI

D.O. values for May from the NE041403 deployment (05/01/03 00:00:00 to 05/06/03 14:30:00) drop off towards the latter half of the deployment, and the D.O. probe reportedly failed post-calibration with a value of 77.5%. Because the probe displayed acceptable values during the beginning of the deployment and no obvious time of probe/membrane failure can be discerned, the D.O. data (both % and mg/L) were not deleted but should be regarded as suspect.

D.O. values for May from the NE050803 deployment (05/08/03 12:30:00 to 05/31/03 23:30:00) were erratic and became impossibly low. The probe failed high/low testing before the deployment and post-calibration afterwards with a value of 78.5%. All D.O. data from this deployment for May (05/08/03 12:30:00 to 05/31/03 23:30:00) were therefore deleted.

There was a single very large turbidity "spike" (1493 NTU's) recorded at 05/17/03 10:00:00. This datum was not deleted but should be considered suspect.

Some other relatively high turbidity values were recorded at 05/30/03 04:30:00, 05/30/03 05:00:00, 05/30/03 09:00:00, 05/31/03 11:00:00, 05/31/03 18:30:00. These data were not deleted but should be considered suspect

June NE0603

D.O. values for June from the NE050803 deployment (06/01/03 00:00:00 to 06/07/03 12:30:00) were erratic and became impossibly low. The probe failed high/low testing before the deployment and post-calibration afterwards with a value of 78.5%. All D.O. data from this deployment for June (06/01/03 00:00:00 to 06/07/03 12:30:00) were therefore deleted.

There were two large turbidity spikes reported for June from the NE050803 deployment: 06/06/03 01:00:00 and 06/07/03 00:30:00. These data were not deleted but should be considered suspect.

There was a large increase in D.O. during the NE062003 deployment between approximately 06/26/03 16:00:00 and 06/27/03 05:30:00. Because the D.O. probe used was new and passed both calibration and post-calibration, these data were not deleted but could be considered suspect.

All turbidity values for June are considered suspect. Many turbidity values recorded during this deployment were negative. Therefore, turbidity for the reported period were not deleted but should be considered suspect.

July NE0703

Two very high D.O. values were recorded for July from the NE071403 deployment at 07/26/03 10:30:00 and 07/26/03 11:00:00. Because this probe demonstrated no other problems during this deployment and past post-calibration, these data were not deleted but should be considered suspect.

A turbidity spike was detected at 07/07/03 10:00:00 from the NE062003 deployment. There were also a few large turbidity spikes reported for July from the NE071403 deployment: 07/16/03 14:30:00, 07/23/03 21:00:00, 07/27/03 03:00:00, and 07/27/03 09:30:00. These data were not deleted but should be considered suspect.

August NE0803

There are D.O. mismatches in the end-beginning values among the NE072903, NE081503, and NE082803 deployments. Although the NE081503 deployment seems to be the problem set because it reported a low post-calibration value, all three deployments were low when compared to the field-calibration values. None of the data were deleted, but data from all three may be considered suspect.

There appears to be a slight mismatch in the last pH value(s) reported from the NE072903 deployment and the first value(s) of the NE081503 deployment. It appears that the pH values of the NE072903 deployment were low during post-calibration testing, but were satisfactory as compared to field-calibration values. Because this discrepancy was small, no data from either deployment were deleted, but those from the NE072903 deployment may be considered suspect.

All turbidity values for August are considered suspect. Many turbidity values recorded during this deployment were negative. Therefore, turbidity for

the reported period were not deleted but should be considered suspect.

September NE0903

The passage of Hurricane Isabel through waters south of NJ and then inland through Maryland and Pennsylvania appears to have influenced parameters among the four SWMP sites within the JCNERR. Strong winds and rainfall were experienced locally, as well as some flooding, between the latter hours of September 17th and midday hours of September 19th. The effects of this event (spanning the aforementioned period of time) can be seen in the NEwq0903 data, specifically: elevation and loss of tidal signature concerning salinity values, elevation and loss of tidal signature concerning DO % and DO concentration values, elevation and loss of tidal signature concerning pH values, and some elevated turbidity values. Because the temperature probe appears to have degraded during the latter period of the NE091103 deployment, comment concerning temperature is being reserved.

There is a single large turbidity spike at 09/06/03 10:30:00 from the NE082803 deployment, and another at 09/13/03 at 11:00:00 from the NE091103 deployment. Neither value was deleted but both could be considered suspect.

Temperature/Conductivity probe began to fail during the B091103 deployment. Temperature values spike wildly between 09/18/03 07:30:00 and the end of the deployment at 09/24/03 10:30:00. Because the other parameters (DO mg/L, depth, pH, turbidity, salinity, and sp. Conductivity) are dependent on the integrity of the temperature probe, these values along with temperature have been deleted.

Some turbidity values drop a bit too negative (-5 to -6) during the NE091103 Deployment (09/10 14:30 - 09/30 20:30), but only briefly. These values were not deleted but should be considered suspect.

October NE1003

Calibration sheet for the NE100903 deployment states that the DO and pH probes are "in bad shape"; the D.O. probe failed high/low testing and the pH Mv values were not satisfactory. However, post deployment calibration check for DO (109.5%) and pH (6.64) were good. Therefore the wide ranges of D.O. and pH values reported during this deployment (10/09/03 11:30:00 to 10/29/03 11:00:00) are considered suspect but were not deleted.

Two large turbidity "spikes" were reported for October on 10/02/03 22:30:00 and 10/31/03 09:00:00. These elevated values may have been the result of temporary occlusion of the optics and neither was deleted.

All turbidity values for October are considered suspect. Many turbidity values recorded during this deployment were negative. Therefore, turbidity for the reported period were not deleted but should be considered suspect.

November NE1103

There were numerous turbidity "spikes" reported in November, but the only one of concern occurred on 11/08/03 11:30:00. This value should be considered suspect but was not deleted. The remainder of high turbidity values occurred during the NE111303 deployment, (the first elevated value was at 11/13/03 21:00:00, with numerous more occurring before the end of the month), during which there were numerous storm events and strong NW winds resulting in (visually verified) periods of elevated turbidity. These data were therefore

not deleted from the dataset.

December NE1203

There is a single large turbidity spike at 12/03/03 13:30:00. This elevated value was likely the result of the datalogger coming in sudden contact with the bottom substrate; reportedly the PVC pipe came loose and the end holding the datalogger fell to the bottom due to the failure of the mounting hardware upon retrieval.

Missing data from 12/03/03 14:00:00 to 12/31/03 23:30:00. Reason: the PVC pipe at Chestnut Neck was damaged (hardware affixing PVC rusted/rotted). Site discontinued for remainder of 2003 in anticipation of ice-over.

Lower Bank

January BA0103

Deleted all turbidity values 01/01/03 00:00:00 to 01/08/03 13:30:00 . Reason: datalogger from the BA121902 deployment was not equipped with a turbidity probe due to a recall by YSI

Deleted all turbidity values 01/08/03 14:00:00 to 01/16/13:30:00. Reason: datalogger from the BA010803 deployment was not equipped with a turbidity probe due to a recall by YSI

Data missing for 01/16/03 14:00:00 to 01/31/03 23:30:00. Reason: no deployment due to ice-over.

February BA0203

Data missing for 02/01/03 00:00:00 to 02/28/03 23:30:00. Reason: no deployment due to ice-over.

March BA0303

Data missing for 03/01/03 00:00:00 to 03/31/03 23:30:00. Reason: no deployment due to ice-over.

April BA0403

Data missing for 04/01/03 00:00:00 to 04/30/03 23:30:00. Reason: There was no datalogger deployed during this period due to extensive damage to hardware by ice floes during the winter, requiring divers for salvage and reconstruction. No datalogger deployed because of damages sustained during early 2003 ice-over.

May BA0503

Data missing for 05/01/03 00:00:00 to 05/31/03 23:30:00. Reason: There was no datalogger deployed during this period due to extensive damage to hardware by ice floes during the winter, requiring divers for salvage and reconstruction.

June BA0603

Data missing for 06/01/03 00:00:00 to 06/12/03 11:00:00. Reason: There was no datalogger deployed during this period due to extensive damage to hardware by ice floes during the winter, requiring divers for salvage and reconstruction.

July BA0703

Turbidity spikes at 07/13/03 07:30:00, 07/14/03 03:30:00, 07/21/03 07:00:00, 07/23/03 04:30:00, 07/28/03 17:30:00. Suspect, but not deleted.

August BA0803

Turbidity spikes at 08/03/03 09:00:00, 08/05/03 16:00:00, 08/08/03 17:30:00, 08/09/03 08:30:00, 08/14/03 09:00:00, 08/18/03 03:00:00, 08/26/03 10:00:00, 08/26/03 12:30:00, 08/28/03 00:00:00, 08/29/03 06:00:00, 08/30/03 17:30:00. Suspect, but not deleted.

Large mismatches in D.O. values between BA082803 and BA091103 deployments. D.O. values from BA082803 appears to have plummeted beginning 09/04/03 14:30:00 due to two membrane punctures. D.O. values 09/04/03 14:30:00 - 09/11/03 09:30:00 have been deleted, however, DO values for the remaining deployment (08/28/03 11:30:00 through 09/04/03 14:00) should be considered suspect.

September BA0903

The passage of Hurricane Isabel through waters south of NJ and then inland through Maryland and Pennsylvania appears to have influenced parameters among the four SWMP sites within the JCNERR. Strong winds and rainfall were experienced locally, as well as some flooding, between the latter hours of September 17th and midday hours of September 19th. The effects of this event (spanning the aforementioned period of time) can be seen in the BAwq0903 data, specifically: a possible slight depression of temperature values, elevation and loss of tidal signature concerning salinity, elevation and loss of tidal signature concerning DO% and DO concentration, elevation and loss of tidal signature concerning depth, elevation and loss of tidal signature concerning pH, and a slight depression and loss of tidal signature concerning turbidity.

Large mismatches in D.O. values between BA082803 and BA091103 deployments. D.O. values from BA082803 appears to have plummeted beginning 09/04/03 14:30:00 due to two membrane punctures. Therefore, all D.O. values 09/04/03 14:30:00 - 09/11/03 09:30:00 were deleted. Do values for the remaining deployment (08/28/03 11:30:00 through 09/04/03 14:00) should be considered suspect.

There is a period of relatively elevated pH values between 09/18/03 12:30:00 to 09/19/03 11:00:00. Suspect, but not deleted.

Turbidity spikes recorded at 09/06/03 12:30:00, 09/08/03 10:00:00, and 09/08/03 13:30:00. Suspect, but not deleted.

October BA1003

D.O. values appear to have degraded toward the end of the BA091103 deployment, specifically between 10/01/03 00:30:00 and 10/02/03 10:30:00. These values should be considered suspect, but were not deleted.

Deleted all turbidity data from 10/02/03 11:30:00 to 10/16/03 10:00:00. Reason: malfunctioning turbidity probe was removed before deployment.

Deleted all turbidity data from 10/30/03 12:00:00 to 10/31/03 23:30:00. Reason: no turbidity probe during BA103003 deployment due to malfunction.

Turbidity spikes at 10/02/03 00:00:00 and 10/30/03 01:00:00. Suspect, but not deleted.

November BA1103

D.O. values seem to become erratic towards the end of the BA103003 deployment. Therefore all D.O. data 11/01/03 00:00:00 to 11/13/03 13:30:00 are suspect, but not deleted.

Deleted all turbidity data from 11/01/03 00:00:00 to 11/13/03 13:30:00. Reason: no turbidity probe during BA103003 deployment due to malfunction.

Very sharp reduction in depth data at the beginning of the BA111303 deployment from 11/13/03 14:00:00 to 11/15/03 12:00:00. Suspect, but not deleted because there were some extreme "blow out tides" during mid-November.

Turbidity spikes at 11/21/03 19:30:00, 11/22/03 07:30:00, 11/22/03 12:00:00, 11/23/03 09:30:00, 11/23/03 13:30:00, 11/25/03 11:00:00, 11/28/03 16:00:00, 11/28/03 16:30:00, 11/28/03 19:00:00, 11/29/03 14:30:00, 11/29/03 15:00:00. Additionally there is a cluster of elevated turbidity values 11/30/03 05:30:00 - 11/31/03 23:30:00. Suspect, but not deleted.

December BA1203

The pH values reported for the entire month appear to be (too) wide ranging. All pH data for 12/01/03 00:00:00 to 12/31/03 23:30:00 suspect, but not deleted.

All turbidity data 12/01/03 00:00:00 - 12/31/03 23:30:00 suspect but not deleted. There was a cluster of elevated turbidity values from the BA111303 deployment (12/01/03 00:00:00 - 12/11/03 14:00:00). There were many negative turbidity values from the BA121103 deployment (12/11/03 14:30:00 - 12/31/03 23:30:00).

12) Missing data:

Missing data are denoted by a period in the data set. Upon data review by the CDMO, all periods were later removed for data dissemination purposes and left blank. Data are missing due to equipment failure, instances when a particular probe was not deployed with the logger, maintenance/calibration of equipment, elimination of obvious outliers, or elimination of data due to calibration (both pre and post) problems. For more details on deleted data, see the Anomalous Data Section above (Section 11). To find out more details about missing data, contact the Research Technician at the JCNERR.

13) Post deployment information

Deployment DO% pH 7 pH 4 Depth Turb. SpCond Battery Logger ID

BUOY 126

B6121802 datasheet missing

B6010903* NR, NR, NR, NR, NR, NR, NR, NR

B6041603 49.7, 7.07, 4.05, -0.008, NP, 19.87, 12.4, 14

B6042903** 302.9, 7.02, 3.94, 0.065, 8.4, 20.60, 0, 7
 B6052003 96.1, 7.02, 4.13, -0.164, NS, 19.93, 12.0, 14
 B6060203 NS, 7.01, 3.97, 0.037, -0.8, 19.98, 10.4, 10
 B6062003 94.9, 7.05, 3.95, 0.044, 2.6, 20.08, 10.8, 11
 B6070103 61.4, 7.21, 4.10, 0.039, 0.5, 19.99, 11.7, 14
 B6072503 99.8, 6.96, 4.18, 0.014, 3.2, 20.10, 11.6, 9
 B6081103 81.1, 7.17, 0.016, 4.04, 2.8, 20.16, 11.8, 11
 B6082603 NS, 6.92, 3.90, 0.032, 8.1, 19.63, 10.8, 14
 B6092603*** 85.2, 7.12, 3.95, 0.048, 5.1, 19.47, 10.5, 0
 B6101703 88.5, 3.76, 2.66, 0.054, -1.1, 20.13, 11.1, 11
 B6110503 NS, 7.04, 4.12, -0.082, 0.4, 20.06, 12.9, 14,
 B6112203 96.3, 7.07, 3.95, 0.045, -0.2, 20.02, 12.3, 14

BUOY 139

B9121302* NR, NR, NR, NR, NR, NR, NR, NR
 B9042303 124.6, 7.03, 4.06, 0.189, NP, 20.27, 10.7, 0
 B9052003 NS, 7.26, 4.15, 0.017, NP, 19.90, 10.8, 11
 B9060903 101.3, 7.05, 3.93, -0.010, 3.3, 20.47, 11.4, 8
 B9062403 90.0, 6.97, 4.10, -0.009, 1.4, 19.93, 10.9, 10
 B9071803 NS, 7.00, 4.05, 0.010, -1.3, 19.84, 12.0, 11
 B9080403 96.7, 7.06, 3.7, 0.076, 1.7, 20.11, 11.6, 14
 B9082003 100.5, 6.91, 3.87, 0.005, 1.0, 19.98, 11.4, 9
 B9091103 102.3, 6.70, 5.85, 0.047, 2.5, 20.50, 11.5, 11
 B9100103 96.6, 7.06, NR, -0.138, -0.1, 20.15, 10.3, 14
 B9102003 103.2, 7.12, 4.10, 0.006, 4.5, 19.88, 9.8, NR
 B9110703 91.9, PD, PD, 0.055, 0.4, 20.24, 10.8, 11
 B9112603 104.5, PD, PD, 0.029, 0.6, 20.09, 10.7, 9

LOWER BANK

LB121902 97.3, 6.95, 4.03, 0.002, NP, 20.29, 11.8, 5
 LB010803 102.4, 6.93, 4.22, 0.001, NP, 20.06, 10.3, 13
 LB061103 88.0, 7.12, 4.18, 0.02, 0.0, 19.53, 11.9, 5
 LB071003 100.2, 7.18, 4.42, 0.095, 1.2, 20.15, 12.9, 13
 LB072503 88.0, 6.96, 3.92, 0.002, 3.0, 20.11, 11.8, 5
 LB080903 95.9, 6.90, 3.98, 0.037, 0.4, 18.77, 12.7, 13
 LB082803 59, 7.03, 4.03, 0.001, 1.5, 19.08, 11.3, 5
 LB091103 79, 6.93, 3.91, -0.031, 0.9, 18.83, 12.3, 13
 LB100203 99.7, 6.98, 4.03, -0.003, NP, 19.04, 11.0, 5
 LB101603 106.6, 7.03, 4.10, 0.079, 5.6, 19.84, 12.0, 13
 LB103003 97.5, 7.04, 4.11, -0.001, NP, 19.34, 10.8, 5
 LB111303 103.2, 7.06, 4.15, -0.309, 0.8, 19.97, 11.5, 13
 LB121103 108.1, 7.05, 4.24, 0.001, -20.0, 19.85, 10.4, 5

CHESTNUT NECK

CN121202 102.9, 7.28, 4.34, 0.002, NP, 20.29, 10.7, 6
 CN010203 100.8, 6.85, 3.79, 0.001, NP, 20.03, 12.3, 6
 CN021103 103.7, 7.01, 4.03, -0.004, NP, 20.25, 11.8, 6
 CN022703 109.5, 7.09, 4.11, 0.0, NP, 20.03, 11.6, 6
 CN031903 103.4, 7.00, 4.07, 0.001, NP, 19.73, 11.5, 6
 CN041403 77.5, 7.04, 4.2, 0.002, NP, 20.19, 10.3, 6
 CN050803 78.5, 7.17, 4.43, NR, 25.1, 19.7, 12.0, 6
 CN062003 97.7, 6.83, 3.85, -0.001, -2.2, 19.85, 11.8, 6
 CN071403 106.9, 7.18, 4.34, 0.00, 2.0, 20.9, 11.7, 6

CN072903	96.1, 6.45, 3.76, -0.001, 0.00, 19.84, 11.5, 6
CN081503	80.3, 7.19, 4.21, -0.002, -0.9, 18.93, 11.2, 6
CN082803	103.5, 6.90, 4.23, -0.003, -0.8, 18.88, 11.0, 6
CN091103	89.9, 6.99, 4.56, -0.002, 2.6, 12.16, 10.9, 6
CN092503	78.9, 7.07, 4.58, -0.004, -1.7, 18.79, 10.8, 6
CN100903	109.5, 6.64, 4.51, -0.003, 0.4, 19.73, 12.2, 6
CN102903	101.4, 7.14, 3.99, -0.001, -0.2, 19.71, 11.9, 6
CN111303	109.7, 7.30, 4.57, -0.002, 0.6, 19.55, 11.5, 6

NP= Data not recorded because no probe was installed on the datalogger. In the case of turbidity, no probes were installed for some deployments because of a recall by YSI

NR= data not recorded for unspecified reason.

NS= values never stabilized during post-calibration.

PD= Probe disabled (but not removed from datalogger) due to evident malfunction.

*= Batteries were dead upon retrieval because these dataloggers (at B126 and B139) were stranded due to ice floe formation and remained stranded longer than their respective batteries' lives. Post-calibration values were therefore not obtained.

**= Batteries were dead upon retrieval and post-calibration values were obtained with new batteries.

***= Battery compartment was flooded upon retrieval, but the datalogger appeared to remain operational until end of deployment.

14) Other Remarks/notes

On 06/21/2021 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.

In most cases when data logger is off by 40 or 60 seconds, it is a result of the DO warm up time. In cases where logger is off by 1 minute or more, it can be assumed that this is due to technician error when programming the time function of a data logger. The assumption of responsibility of SWMP monitoring by a new technician (Gregg Sakowicz) with no official training (only a short "apprenticeship" under the instruction of Sharon O'Donnell before her sudden departure from the reserve system) concerning the programming and other use of dataloggers in 2003 made it difficult to rectify all problems associated with D.O. warmup. Emphasis was placed on proper calibration and handling of water quality

parameters.

The water quality data are thoroughly scrutinized at the end of each year and graphs and tracking sheets are used to help indicate anomalous data. This method was used to diagnose the inaccuracy of the temperature probe on datalogger #11. When compared to the temperature values obtained with other dataloggers, it became evident that this unit was reporting temperature values approximately 1-2 C below actual temperature. Unfortunately the temperature probe is vital to the accuracy of the other probes; fortunately, this 1-2 C discrepancy did not drastically compromise the other parameters reported by datalogger #11, and the values were retained (as opposed to deleted from the final data set) and denoted as suspect.

Metadata dates and times are documented in the order that they were found. In most cases this order is monthly temperature, salinity, depth, dissolved oxygen, pH, and then turbidity. Monthly files were then compiled into yearly files and graphed. Any remaining anomalous data evident in the yearly graphs are documented last. In some cases, this data does not look suspect unless graphed over a year.

An additional version of the 2003 metadata is archived at the Rutgers University Marine Field Station in Tuckerton, NJ.

There were a few instances at this NERR site where turbidity recorded small negative values (-0001). Because turbidity has a range of accuracy of +/-2 NTU, the technician did not edit or delete these values in any way.

The B6 and B9 sites were operated by Gregg Sakowicz at the Rutgers University Marine Field station. The CN and BA sites were operated by technicians at Stockton University. All metadata was compiled and edited by Gregg Sakowicz.

One important note to be made concerning the operation of the CN and BA sites by Stockton University is that dataloggers deployed at these sites were programmed with the ambient time. They therefore had to be corrected to compensate for daylight savings time. The B6 and B9 sites did not require this correction.

Additional notes concerning deployments:

Buoy 126 (B6)

B6010903

Adjusted timestamps for entire deployment by - 00:01:00 (e.g.- 08:01:00 becomes 08:00:00) to compensate for miscalculated warmup time.

B6041603

Adjust timestamps for entire deployment - 00:01:00 to compensate for warmup time.

B6052003

Adjusted all times for this deployment by -00:00:03. Reason: warmup time on this unit is 57 seconds, unlike the 60 seconds of other units to which the SWM technician was acclimated.

B6060203

All timestamps for this deployment were adjusted to compensate for warm-up

time. However, something very odd happened during this deployment regarding the timestamp. At first, it appears that the timestamp should be adjusted by +00:00:57. However, by the third sample, the correction becomes +00:05:37. Because the first four values will be deleted as pre-deployment values, I will recommend that all pertinent values are adjusted by +00:05:37. However, the phenomenon is disconcerting.

B6070103

All timestamps adjusted by -00:01:00 to compensate for warmup time.

B6112203

Timestamp for entire deployment adjusted by - 00:01:00 to compensate for warmup time.

There were elevated turbidity values ("spikes") reported for December during the B6112203 deployment: 12/01/03 23:00:00, 12/01/03 23:30:00, 12/02/03 06:00:00, 12/02/03 16:30:00, 12/02/03 22:00:00, 12/06/03 03:30:00, 12/06/03 04:30:00, 12/06/03 17:30:00- 12/06/03 18:30:00, 12/06/03 22:00:00, 12/07/03 04:30:00, 12/07/03 16:30:00- 12/07/03 19:00:00, 12/07/03 21:30:00- 12/07/03 23:30:00, 12/11/03 20:30:00, 12/12/03 01:00:00- 12/12/03 04:00:00 12/12/03 05:30:00-06:30:00, 12/12/03 12:30:00- 12/12/03 13:30:00. None of these values were deleted because there were numerous storms, high-wind events, and dredging in the RUMFS boat basin during this time.

Buoy 139 (B9)

B9121302

Readjusted all timestamps by -00:52:00 to compensate for D.O. warmup time.

B9052003

Timestamp adjusted by -00:03:00 to compensate for D.O. warmup time.

Chestnut Neck (NE)

NE121202

Readjusted all timestamps by -00:00:40 to compensate for D.O. warmup time.

NE010203

Readjusted all timestamps by -00:00:40 to compensate for D.O. warmup time.

NE021103

Readjusted all timestamps by -00:00:40 to compensate for D.O. warmup time.

NE022703

Readjusted all timestamps by -00:00:40 to compensate for D.O. warmup time.

NE031903

Readjusted all timestamps by -00:00:40 to compensate for D.O. warmup time.

NE041403

Readjusted all timestamps -01:00:00 to compensate for daylight savings time.

Readjusted all timestamps by -00:00:40 to compensate for D.O. warmup time.

NE050803

Readjusted all timestamps -01:00:00 to compensate for daylight savings time.

Readjusted all timestamps by -00:00:40 to compensate for D.O. warmup time.

NE062003

Readjusted all timestamps -01:00:00 to compensate for daylight savings time.

Readjusted all timestamps by -00:00:40 to compensate for D.O. warmup time.

NE071403

Readjusted all timestamps -01:00:00 to compensate for daylight savings time.

Readjusted all timestamps by -00:00:40 to compensate for D.O. warmup time.

NE072903

Readjusted all timestamps -01:00:00 to compensate for daylight savings time.

Readjusted all timestamps by -00:00:40 to compensate for D.O. warmup time.

NE081503

Readjusted all timestamps -01:00:00 to compensate for daylight savings time.

Readjusted all timestamps by -00:00:40 to compensate for D.O. warmup time.

NE082803

Readjusted all timestamps -01:00:00 to compensate for daylight savings time.

Readjusted all timestamps by -00:00:40 to compensate for D.O. warmup time.

NE091103

Readjusted all timestamps -01:00:00 to compensate for daylight savings time.

Readjusted all timestamps by -00:00:40 to compensate for D.O. warmup time.

NE092503

Readjusted all timestamps -01:00:00 to compensate for daylight savings time.

Readjusted all timestamps by -00:00:40 to compensate for D.O. warmup time.

NE100903

Readjusted all timestamps -01:00:00 to compensate for daylight savings time.

Readjusted all timestamps by -00:00:40 to compensate for D.O. warmup time.

NE102903

Readjusted all timestamps -01:00:00 to compensate for daylight savings time

Readjusted all timestamps by -00:00:40 to compensate for D.O. warmup time.

NE111303

Readjusted all timestamps by -00:00:40 to compensate for D.O. warmup time.

There were some very low depths recorded during November, but none were deleted because there were many periods of strong NW winds, resulting in numerous "blow out" tides.

Lower Bank (BA)

BA121902

Adjusted timestamp -00:01:00 for entire deployment. Reason: compensate for

D.O. warmup time.

BA010803

Adjusted timestamp -00:01:00 for entire deployment. Reason: compensate for D.O. warmup time.

BA061103

Adjust timestamp -00:01:00 for entire deployment. Reason: compensate for D.O. warmup time.

Adjusted all timestamps -01:00:00 to compensate for daylight savings time

BA071003

Adjusted timestamp -00:01:00 for entire deployment. Reason: compensate for D.O. warmup time.

Adjusted all timestamps -01:00:00 to compensate for daylight savings time.

BA072503

Adjusted timestamp -00:01:00 for entire deployment. Reason: to compensate for D.O. warmup time.

Adjusted all timestamps -01:00:00 to compensate for daylight savings time.

BA080903

Adjusted timestamp -00:01:00 for entire deployment. Reason: to compensate for D.O. warmup time.

Adjusted all timestamps -01:00:00 to compensate for daylight savings time.

BA082803

Adjusted timestamp -00:01:00 for entire deployment. Reason: to compensate for D.O. warmup time.

Adjusted all timestamps -01:00:00 to compensate for daylight savings time.

BA091103

Adjusted timestamp -00:01:00 for entire deployment. Reason: to compensate for D.O. warmup time.

Adjusted all timestamps -01:00:00 to compensate for daylight savings time.

BA100203

Adjusted timestamp -00:01:00 for entire deployment. Reason: to compensate for D.O. warmup time.

Adjusted all timestamps -01:00:00 to compensate for daylight savings time.

BA101603

Adjusted timestamp -00:01:00 for entire deployment. Reason: to compensate for D.O. warmup time.

Adjusted all timestamps -01:00:00 to compensate for daylight savings time.

BA103003

Adjusted timestamp -00:01:00 for entire deployment. Reason: to compensate for D.O. warmup time.

BA111303

Adjusted all timestamps -00:01:00 to compensate for D.O. warmup time.

There is a note on the tracking sheet saying "Did not change the clock on this datalogger!". It appears that this datalogger was still on "summer time", so all timestamps were adjusted -01:00:00 to compensate for daylight savings time.

BA121103

Adjusted timestamp -00:01:00 for entire deployment. Reason: compensate for D.O. warmup time.